



MEMORANDUM

Date: February 7, 2017
To: Rita Brandin, Newland Communities
From: Katy Cole & Ryan Caldera, Fehr & Peers
Subject: **Newland Sierra TDM Program - VMT Reduction Evaluation**

SD16-0219

This memorandum evaluates the level of effectiveness of the Newland Sierra Travel Demand Management (TDM) Program. Each element of the proposed TDM Program is evaluated by comparing the element to standards developed by the California Air Pollution Control Officers Association (CAPCOA) and other case studies, to determine the Vehicle Miles of Travel (VMT) reduction expected due to implementation of the TDM Program.

This memo is organized as follows:

- **1. Project Description** – Provides a brief description of the land uses proposed as part of the Newland Sierra project and a summary of the transportation setting. Also includes a summary of the elements included in the Newland Sierra TDM program.
- **2. Methodology** – Provides the overall methodology used to estimate the VMT reduction associated with the TDM program.
- **3. TDM Program** – Provides a detailed description of the proposed TDM Program and supporting elements required to ensure that the program is effective.
- **4. Evaluation of TDM Strategies** – Provides detailed calculations to determine the effectiveness of each TDM program element at reducing project VMT.
- **5. TDM Program Metrics and Targets** – Provides performance metrics to ensure that the project sponsor is following through with implementing the TDM Program.



1. PROJECT DESCRIPTION

Land Uses and Transportation Setting

The proposed Newland Sierra development project (Project) is located west of I-15, approximately 6.4 miles north of the city of Escondido and approximately 4.6 miles north of the city of San Marcos. The 1,985-acre Project would consist of 2,135 residential units, 36 acres (gross) of parks, a 6-acre school site, and 81,000 square feet of commercial space. The Project also would include a system of trails, bike lanes, and pathways connecting to and within approximately 1,209 acres of open space.

To the southeast of the Project site, there are two existing Park-and-Ride lots, the first at the northeast quadrant of the Deer Springs Road / Mesa Rock Road intersection and the second at the northwest quadrant of the Deer Springs Road / Old Highway 395 intersection. (See **Figure 1** in the attachments). With respect to available transit, because the site of the proposed Project presently is undeveloped, there currently is no transit access to the Project site. For example, North County Transit District (NCTD) BREEZE Bus Route 389 runs on I-15 directly east of the Project site but presently does not stop near the site due to the present lack of demand for transit service. The Project site also is a few miles north of the Escondido Transit Center, which provides connections to BREEZE bus, LIFT shuttle, and SPRINTER light rail lines operated by NCTD.

Overview of TDM Program

TDM strategies have been used for over 30 years to reduce single occupant vehicle trips. The Newland Sierra TDM program would work to reduce the Project's impacts on the surrounding street network through: land use and design strategies that would create an environment that promotes alternative mode choice; commute/travel services for residents that would reduce out-going single occupant vehicle trips; and commute services for employees of the Project's commercial center that would reduce incoming single occupant vehicle trips.

A detailed description of the TDM Program is presented in subsequent sections of this memorandum. As an overview, the Newland Sierra TDM program would include the following VMT reduction strategies:

- LAND USE AND DESIGN STRATEGIES
 - o Land Use Diversity



- COMMUTE/TRAVEL SERVICES FOR RESIDENTS
 - o Pedestrian/Bicyclist Trails Network
 - o Electric Bike-Share Program
 - o Car-share Program
 - o Local Shuttle Service
 - o Ridesharing Support Features
 - o Transit Fare Subsidy for Residents
 - o TDM Program Marketing for Residents

- COMMUTE SERVICES FOR EMPLOYEES
 - o Transit Fare Subsidy for Employees
 - o TDM Program Marketing for Employees

2. METHODOLOGY

Fehr & Peers worked with the CAPCOA to develop the transportation section of the report *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA Report). This report is now used as a set of guidelines for quantifying the environmental benefits of mitigation measures, such as the Project's TDM Program. The CAPCOA guidelines were developed by conducting a comprehensive literature review of studies documenting the effects of TDM strategies on reducing VMT. Fehr & Peers developed a quantification tool based on the research performed for our work with CAPCOA, TDM+, which quantifies the effects of TDM programs on VMT reduction resulting from strategies implemented for a single development site up to a business campus or neighborhood.

TDM Effectiveness Quantification

To determine the amount of VMT reduction that would be attributable to the Newland Sierra TDM Program, Fehr & Peers compared the Program to CAPCOA standards and utilized the TDM+ tool. For those measures not addressed by the CAPCOA standards, Fehr & Peers utilized case studies to estimate VMT reduction.

The detailed calculations for each TDM strategy are described in the section *Evaluation of Recommended TDM Program Strategies*. For each strategy that is based on the CAPCOA Report, the related CAPCOA strategy code (for example, CAPCOA TRT-6 or SDT-3) is provided.



VMT Modeling Data

Based on travel demand model output from the San Diego Association of Governments (SANDAG) Series 12 model, which provides information on estimated VMT and vehicle trips that would be produced by the Newland Sierra Project, the proposed Project would generate 294,804 total VMT. This is a gross estimate of VMT prior to any reductions associated with the TDM Program.

3. TDM PROGRAM

The proposed Project would include a robust TDM Program that will reduce Newland Sierra's impacts on the surrounding street network while striving to achieve countywide air quality/greenhouse gas reduction goals. The TDM Program is organized into three main types of strategies as follows:

- **Land Use Strategies** –These strategies include land use diversity (mixed-use) and supporting design features (covered below in the "Commute/Travel Services for Residents" bullet points) that encourage residents/employees to walk, bike, or take transit within the Project area:
 - o Provide a mix of land uses, including residential, commercial, educational, and parks, so that residents of the Project have access to basic shopping, school, and recreation opportunities without having to travel outside of the Project site. This would lower vehicle miles traveled because residents can use alternative transportation modes to reach the various land uses available within the site, and if they do need to drive, the trip is very short.
- **Commute/Travel Services for Residents** - These strategies would provide residents with travel options other than private auto for trips to destinations inside and outside of the Project area:
 - o Develop a comprehensive trails network designed to provide multi-use trails between the various Project components, land uses, parks/open spaces, schools, and the Town Center. The trails network would provide connections to the various recreational trails and multi-modal facilities accessing the Project site. Additionally, the loop road would include 5-foot bike lanes on either side of the roadway.
 - o Provide bicycle racks along main travel corridors, adjacent to commercial developments, at public parks and open spaces, and at the retail, multi-family buildings within the Project site.



- o Implement an electric bike share program to further link the Project neighborhoods to one another and to reduce motorized vehicle trips. The bike share program would include the placement of eight kiosks throughout the Community. Electric bikes may be taken from one kiosk and left at another to promote sustainable transportation between planning areas within the Project. It is anticipated that each kiosk would contain approximately 10 to 20 electric bikes.
 - o Coordinate with a car-share organization to install three car-share stations with one car each (or a total of three cars) in the commercial area of the Project, available to residents on an on-demand basis.
 - o Coordinate a ride share or shuttle system that connects the various Project neighborhoods to the Town Center and to external transit facilities and resources such as the Park-and-Ride lots and the Escondido Transit Center
 - o Coordinate with SANDAG's iCommute program for carpool, vanpool, and rideshare programs that are specific to the Project's residents.
 - o Promote the adjacent Park-and-Ride lots at the northeast quadrant of the Deer Springs Road/Mesa Rock Road intersection and at the northwest quadrant of the Deer Springs Road/Old Highway 395 intersection to residents to encourage carpooling.
 - o Promote transit subsidies for residents.
 - o Promote available websites providing transportation options for residents.
 - o Create and distribute a "new resident" information packet addressing alternative modes of transportation.
 - o Promote a transportation options app for use on mobile devices (tech enabled mobility app).
 - o Coordinate with NCTD/Metropolitan Transit System (MTS) and SANDAG as to the future siting of transit stops/stations at the adjacent Park-and-Ride lots.
- **Commute Services for Employees** – These strategies would allow employees of the Town Center and other employers within the Project site to travel to work by means other than private auto:
 - o Provide transit subsidies for employees of the project's Town Center.
 - o Promote available websites providing transportation options for businesses in the Town Center.
 - o Promote the adjacent Park-and-Ride lots to employees to support carpooling.
 - o Implement a demand responsive shuttle service that provides access throughout the Project site, to the Park-and-Ride lots, and to the Escondido Transit Center.



- o Coordinate with SANDAG's iCommute program for carpool, vanpool, and rideshare programs that are specific to the Project's employees.
- o Coordinate with NCTD/MTS and SANDAG as to the future siting of transit stops/stations at the adjacent Park-and-Ride lots.

Transportation Coordinator

To ensure the TDM Program strategies are implemented and effective, a Transportation Coordinator (likely as part of a home owner's association) shall be established to monitor the Program.

As part of the home owner's association, a staff member or consultant will be designated to serve as the on-site Transportation Coordinator for both the employees and residents. Coordinators are responsible for developing, marketing, implementing, and evaluating TDM Programs; dedicated personnel on staff makes the TDM Program more robust, consistent and reliable. Additionally, residents and employees would have a designated point of contact for questions about the various TDM measures, which would allow them to easily stay informed of various TDM functions and eligibility.

It is anticipated that the Transportation Coordinator role would require approximately 8-16 hours per week.

The Transportation Coordinator's duties would include, but not be limited to, the following:

- Conduct transportation alternatives orientation for new employees and new residents.
- Assist with rideshare matching for employees commuting to the Project and residents commuting from their homes.
- Provide information on transit, bicycling, and walking to and from the Project.
- Act as source of information regarding the TDM Program, including compliance with regulatory requirements and new potential TDM benefits.
- Coordinate TDM Program monitoring (administer surveys and coordinate data collection).

Monitoring

Monitoring is necessary to ensure that the Project is implementing the TDM Program consistent with the analysis presented in this memorandum. Monitoring would start once the community is 85% occupied and occur every 3-5 years. The Transportation Coordinator would submit a monitoring report to San Diego County to document the implementation of the TDM Program. The details of the monitoring/reporting would be determined in collaboration with the County, but potentially would



include administering and summarizing community surveys and documenting TDM measures in operation/level of participation.

Table 2, TDM Program Performance Metrics and Targets, sets forth the applicable performance metrics and targets for each strategy identified for implementation herein. The purpose of the performance metrics is to ensure implementation of the VMT reduction strategies consistent with the analysis presented in this evaluation.

4. EVALUATION OF RECOMMENDED TDM PROGRAM STRATEGIES

As previously explained, CAPCOA standards were utilized to determine the VMT reduction anticipated to be achieved by implementation of each component, or VMT reduction strategy included in the TDM Program. A detailed description of that analysis is presented in this section. **Exhibit 1, TDM Program VMT Reduction Analysis**, presents a summary of the evaluation. The exhibit lists each VMT reduction measure analyzed here with a brief description, the applicable CAPCOA reference standard, and the projected VMT reduction based on application of the TDM+ tool. As shown on the exhibit, the total VMT reduction that would be achieved with implementation of the TDM Program VMT reduction strategies is **11.1 percent**.

Survey Data Used in Analysis

The CAPCOA guidance and VMT reduction equations include variables related to the community population, number of employees at the Town Center, and work related VMT for both residents and employees. Fehr & Peers utilized several data sources (provided in **Appendix A: National Household Travel Survey Data** and **Appendix B: U.S. Census Data**) to develop estimates for these variables as follows:

- Community Population: The Project proposes the construction of 2,135 dwelling units. Based on US Census Data (QuickFacts provided in the **Appendix B: US Census Data**), the average household size in San Diego County is 2.85 persons per dwelling unit. This equates to approximately 6,085 residents in the proposed Project ($2,135 \text{ dwelling units} \times 2.85 = 6,085$).
- Number of Employees at the Town Center: The San Diego General Plan estimates that a Community Shopping Center will have 400 square feet per employee. The Project's commercial center is estimated to employ 203 employees based on a gross area of 81,000 square feet ($81,000 \text{ square feet} / 400 \text{ square feet per employee} = 203 \text{ employees}$).



- VMT Associated with Residents vs. Employees: The total service population for the proposed Project is 6,288 (6,085 residents+203 employees=6,288). Employees account for 3.2% of the service population; therefore, Fehr & Peers assumes that they would account for 3.2% of the VMT generated by the Project.
- Residential based Work VMT: It is necessary to understand the amount of VMT that is due to residents of the proposed project traveling to work outside the project. Conservatively, we estimate that all of the residents work outside of the proposed Project area. Residents account for 96.8% of the service population ($6,085/6,288=96.8\%$). The 2009 National Household Travel Survey (summary provided in the **Appendix A: National Household Travel Survey Data**) provides information on trip purpose and indicates that 25% of home based trips are work related. Therefore 24.2% of the overall VMT is home based work related ($96.8\%*25\%=24.2\%$).

INDIVIDUAL STRATEGY EFFECTIVENESS

Land Use Strategies

Land-Use Diversity

The Newland Sierra Project consists of a wide range of land uses, including commercial, single- and multifamily residential, and park and open space. The mixed-use development will support walking and other modes of transport alternative to the automobile between residential and office/commercial locations (and vice versa). By providing varied land uses, the Project would reduce the need for travel outside of the Project site (i.e., reduces the need for external trips).

For a suburban development, like the proposed Project, to qualify for a VMT reduction due to land-use diversity, it should include, as the Newland Sierra Project does, at least three of the following on site uses (and/or offsite within $\frac{1}{4}$ mile): residential, retail, park, open-space, or office. Additionally, the subject development should minimize the need for external trips by including on-site services/facilities such as day care, banking/ATM, restaurants, vehicle refueling, and shopping.

The proposed project includes residential, retail, park, and open-space. The exact tenants of the retail/commercial uses have not yet been determined; however, for the anticipated uses are neighborhood serving commercial that would provide basic, everyday needs.

Based on the CAPCOA guidance (LUT-3), the amount of VMT reduction attributable to land-use diversity is determined based on the following equation:



% VMT Reduction = A (% increase in land use index versus single use development) * B (elasticity); Where:

- $A = (\text{land use index} - 0.15)/0.15$, where 0.15 refers to the single development land use index
- Land use index = $-a/\ln(6)$
- $a = \sum_{i=1}^6 a_i \times \ln(a_i)$
 a_i = land use area of land use i/total project area; a_1 =single family residential, a_2 =multifamily residential, a_3 =commercial, a_4 =industrial, a_5 =institutional, a_6 =park. If a land use is not present, a_i is set to 0.01.
- B = Elasticity of VMT, 0.09 based on CAPCOA LUT-3.

More information regarding this methodology can be found in the CAPCOA Report page 163.

For Newland Sierra, the % VMT Reduction is calculated as follows:

- $a_1=0.35, a_2=0.02, a_3=0.01, a_4=0.01, a_5=0.01, a_6=0.62$
- $a = 0.35 \times \ln(0.35) + 0.02 \times \ln(0.02) + 0.01 \times \ln(0.01) + 0.01 \times \ln(0.01) + 0.01 \times \ln(0.01) + 0.62 \times \ln(0.62) = -0.88$
- Land Use Index = $-(-0.88)/\ln(6) = 0.491$
- $A = (0.491 - 0.15)/0.15 = 2.28$ or 228%
- % VMT Reduction = $228\% \times 0.09 = 20.5\%$

For suburban developments like Newland Sierra, CAPCOA limits the VMT reduction attributable to land-use diversity to 5.0%. As such, a VMT reduction of **5.0%** attributable to land use diversity characteristics was applied to the overall calculation of VMT reduction.

Travel and Commute Services for Residents

Neighborhood/Site Enhancements

Pedestrian/Bicyclist Trails Network

Providing a trails network that can be used by pedestrians and bicyclists provides the infrastructure necessary for residents to walk and bike to different areas of the development instead of driving personal automobiles. According to CAPCOA, to be effective in reducing VMT, the network should provide high accessibility and interconnectivity and supporting amenities such as bicycle parking for



users so that they can walk and bike to all parts of the development. There are several CAPCOA strategies related to encouraging bicycle and pedestrian travel through design: SDT-1, SDT-6, SDT-7, SDT-9. Each is addressed below.

CAPCOA estimates that for urban and suburban projects, providing a pedestrian network within the project site that also connects to off-site pedestrian networks will reduce VMT by **2.0%**. (CAPCOA SDT-1)

As to bicycle trails specifically, the research performed for CAPCOA found that while bicycle trails did not result in a direct VMT reduction; however, providing bike trails supports the effectiveness of other TDM measures (CAPCOA SDT-9). Similarly, while providing short-term and long-term bike parking facilities throughout the development does not result in a direct VMT reduction according to CAPCOA (CAPCOA SDT-6, CAPCOA SDT-7), bike parking increases the effectiveness of other measures as it provides the end user facilities necessary for bicycling.

Most of the pedestrian/bicycle network surrounding the Project site is rural and neither sidewalks nor bike lanes are provided. There is an existing sidewalk on the east side of Mesa Rock Road beginning at the existing ARCO station and continuing north to the current terminus of the roadway. Per the *County of San Diego General Plan Mobility Element*, Deer Springs Road is designated as a Class II bike route along its entirety. Additionally, as part of the Project, a pedestrian path and 8-foot shoulders that bikes could utilize will be constructed along Deer Springs Road that will connect to existing pedestrian/bicycle facilities along Twin Oaks Valley Road.

The Project's pedestrian/bicycle trail system would connect with these existing and planned pedestrian/bicycle facilities. The Project also proposes improvements to Camino Mayor, which connects to many existing rural pedestrian trails. CAPCOA SDT-1 states that pedestrian networks in a suburban context that extend within the project site and connect to off-site networks are expected to reduce VMT by 2%. Since the Newland Sierra Project is providing an interconnected pedestrian/bicycle trail system with appropriate amenities such as street furniture and bicycle parking, the full **2%** VMT reduction per CAPCOA SDT-1 is expected as a result of the Project's trail system.

Electric Bike-Share Program

Electric bike sharing kiosks provide residents and visitors the option of biking to and from their locations instead of driving. Placed strategically and regularly throughout the development, this measure would support the provision of a bike and trails network as more people would have access to bicycles.



While CAPCOA does not attribute VMT reductions to bike sharing programs specifically (CAPCOA TRT-12), CAPCOA does address VMT reductions related to providing a Neighborhood Electric Vehicle (NEV) Network (CAPCOA SDT-3). In this case, the Newland Sierra electric bike share program would combine a bike share program with electric bikes, which is a type of electric vehicle similar to the NEV program considered by CAPCOA.

CAPCOA associates a VMT reduction with NEV participation and ownership, along with a travel network that accommodates NEV use, including features such as charging facilities, striping, signage, and educational tools (CAPCOA SDT-3). The VMT reductions are based on market penetration levels (i.e., percent of households with access to a NEV) and an average reduction in total VMT per NEV household of 12.7%. According to CAPCOA, the following is the equation to be applied in determining VMT reduction for an electric vehicle network:

$$\% \text{ VMT Reduction} = (\text{Percent Market Penetration} * 12.7\%)$$

As to Newland Sierra, with seven kiosks and an average of 15 electric bicycles per kiosk (105 bicycles total), there would be approximately 1 electric bicycle per 20 households (2,135 households/105 bicycles = 20.3 households per bicycle) or a 0.05 market penetration (105 bicycles/2,135 households = 0.05). Under the CAPCOA NEV formula, this would result in a VMT reduction of approximately **0.6%** ($0.05 \times 12.7\% = 0.635\%$).

Car-share Program

Car-share programs are membership-based programs that provide members access to a shared fleet of vehicles (CAPCOA TRT-9). Cost is generally based on a per mile or hourly basis. There are three common categories of car-share programs: transit station-based, employer-based, or residential-based/citywide. Each of these programs has slightly different uses. Transit station-based car-share generally is intended to close the "last mile" gap by allowing users to drive from the transit station to their final destination. Employer-based car-share programs can provide transit/bike/walk commuters with an opportunity to conduct business/day trips while also providing a guaranteed ride home. Residential based/citywide car-share programs generally replace entire home-based trips.

The CAPCOA methodology calculates the reduction in overall VMT attributable to car-share programs as follows:

$$\% \text{ VMT Reduction} = (\% \text{ reduction in car-share member annual VMT}) * (\text{number of car-share members per shared car}) * (\text{deployment level based on urban or suburban context})$$



As to Newland Sierra, which is suburban in context, the calculations for % VMT Reduction are as follows:

- % reduction in car-share member annual VMT = 37% (CAPCOA page 246)
- number of car-share members per shared car = 20 (CAPCOA page 246)
- deployment level (suburban context) = 1 shared car / 2,000 population (CAPCOA page 246)
- % VMT Reduction = $37\% * 20 * (1 / 2,000) = 0.4\%$

Implementing a car-share program for the Newland Sierra project that provides at least one car per 2,000 residents would result in a **0.4%** VMT Reduction. As described previously, the Project population estimate is 6,085. To qualify for the full 0.4% VMT Reduction, at least three (3) shared cars must be installed in the Project ($6,085/2,000=3.0$).

Transit System Improvements Strategies

Network Expansion (through Local Shuttle Service)

The TDM Program includes the provision of local shuttle service through coordination with the local transit operator (NCTD) or a private contractor. A local shuttle service, whether privately operated or publicly operated, would function as a transit network expansion such that it would connect the Newland Sierra development to existing transit stations in the surrounding areas. As a result, CAPCOA classifies the addition of shuttle services as a transit network expansion that results in a VMT reduction (CAPCOA TST-3, CAPCOA TST-6). The CAPCOA Report provides the following formula for calculating the percent VMT reduction associated with transit network expansion:

$$\% \text{ VMT Reduction} = (\% \text{ increase in transit network coverage}) * (\text{elasticity of transit}) * (\text{existing transit mode share}) * (\text{adj. factor} = 0.67)$$

According to the CAPCOA Report, transit network expansion results in VMT reductions ranging from 0.1-8.2%.

Reducing headways and increasing frequency also is associated with VMT reduction. (CAPCOA TST-4). The CAPCOA Report provides the following formula for calculating the percent VMT reduction associated with reductions in headways/increased frequencies:

$$\% \text{ VMT Reduction} = (\% \text{ reduction in headways}) * (\text{elasticity of transit}) * (\text{level of implementation factor}) * (\text{existing transit mode share}) * (\text{adj. factor} = 0.67)$$



According to the CAPCOA Report, increasing transit service frequency results in VMT reductions ranging from 0.02-2.5%.

For the Newland Sierra development, the proposed shuttle service would cover the entire development area and provide service to transit hubs, Park-and-Ride lots, commercial areas, parks, and residential communities.¹ While NCTD does not currently have plans to expand service to this area, the proposed shuttles would take users from the residential areas and commercial center to the Escondido Transit Center, approximately 10 miles away. This reasonably allows for 30 minute headways between shuttles and connects Newland Sierra residents to the SPRINTER light rail and BREEZE bus lines. Additionally, the transit network would increase by 100% since there is no existing service in the development. Thus, per CAPCOA standards for a suburban development (CAPCOA TST-3), the following equation inputs are provided and the resulting percentage reduction:

- % increase in transit network coverage = 100%
- elasticity of transit = 1.01 (CAPCOA page 277)
- existing transit mode share = 1.3% (CAPCOA page 277)
- adjustment factor = 0.67 (CAPCOA page 277)
- % VMT Reduction = $100\% * 1.01 * 1.3\% * 0.67 = 0.9\%$

Service Frequency/Speed Increase (through Local Shuttle Service)

As to frequency, transit headways would be reduced by 100% since there is no existing service on the Newland Sierra development site. Per CAPCOA standards for a suburban development where more than 50% of the transit lines are being improved (CAPCOA TST-4), the following equation inputs are provided and the resulting percentage reduction:

- % reduction in headways: 100%
- elasticity of transit = 0.32 (CAPCOA page 281)
- level of implementation factor = 85% (CAPCOA page 281)
- existing transit mode share = 1.3% (CAPCOA page 281)
- adjustment factor = 0.67 (CAPCOA page 281)
- % VMT Reduction = $100\% * 0.32 * 85\% * 1.3\% * 0.67 = 0.3\%$

¹ Additional alternative transportation services that would be available to Newland Sierra residents and would serve as supplemental services are: on-call taxi services provided to aging adults through the Independent Transportation Network of America, subsidized commercial taxis, and carpooling and vanpooling options available through the SANDAG 511 transportation information service. Please see **Appendix C: Additional Information** for additional information regarding these services.



The total VMT reduction for increase in transit network and headways is **1.2%**.

Commute Trip Reduction for Residents

Ridesharing Support Features for Residents (Applies to Residential-based Work Trips)

Promoting both new and existing rideshare options to residents reduces single-occupancy vehicle trips and associated VMT. The CAPCOA Report identifies the establishment of Park-and-Ride lots (CAPCOA RPT-4) and related ride-sharing programs (CAPCOA TRT-3) as reducing VMT by increasing carpooling and vanpooling. Park-and-Ride lots connect users to carpooling, vanpooling, and transit options even though such options might not be close to their homes. CAPCOA considers the establishment of Park-and-Ride lots as a grouped strategy with minimal standalone VMT reduction but a contributor to VMT reduction when used in conjunction with a suite of other TDM strategies. (CAPCOA RPT-4)

Two existing Park-and-Ride lots already exist near the Project site to serve the Newland Sierra development. The first lot is located in the northeast quadrant of Deer Springs Road and Mesa Rock Road, and the second lot is located in the northwest quadrant of Deer Springs Road and Old Highway 395. (See Figure 1 in the Attachments.)

Relatedly, expanding iCommute, the TDM program for the San Diego region (operated by SANDAG and the 511 transportation information service) also would contribute to VMT reductions. iCommute assists users in setting up carpools and vanpools, planning transit trips, and promoting alternative mode choices such as biking. Expanding this service to the Newland Sierra development area would make it more convenient for residents to use alternative modes of transportation.

As to the Newland Sierra site, which is designated as Suburban in context, VMT reduction is calculated based on CAPCOA standard TRT-3. This strategy is only applicable to home based work VMT generated by the proposed project site. The focus of this standard is to reduce commute trips for residents through promoting both iCommute and Park-and-Ride lots. The following is the CAPCOA equation to calculate the VMT reduction attributable to ride-sharing support features:

$$\% \text{ VMT Reduction} = (\% \text{ reduction in commute VMT}) * (\% \text{ employees eligible}) * (\% \text{ Home based Work VMT})$$

- % reduction in commute VMT = 5% (CAPCOA page 228)
- % employees eligible = 50% (CAPCOA suggests an eligibility rate of 20-100%; for Newland Sierra 50% is used)



- % home based work VMT = 24.2%
- % VMT Reduction = $5\% * 50\% * 24.2\% = 0.6\%$

Based on the projected population demographics and development characteristics of the Newland Sierra Project, a **0.6%** VMT reduction is estimated to result from the establishment of a ridesharing support program (iCommute) in conjunction with the Park-and-Ride lots.

Transit Fare Subsidy for Residents (Applies to Residential-based Work Trips)

CAPCOA associates certain levels of transit fare subsidy with corresponding levels of commuter participation in transit based on locational context (CAPCOA TRT-4). Although the CAPCOA methodology is applied to subsidies for employees, the same methodology can be used for the Newland Sierra residents (CAPCOA page 232). For the Suburban context, CAPCOA provides that a subsidy of \$2.98 per person per day incentivizes a 7.9% reduction in commute VMT when residents are given a subsidy at their place of employment.

The CAPCOA Report provides the following formula for calculating the percent VMT reduction associated with resident transit fare subsidies of \$2.98 per person per day based on the methodology for CAPCOA TRT-4:

$$\begin{aligned} \text{\% VMT Reduction} = & (\text{\% residents eligible to participate}) * (7.9\% \text{ reduction in commute VMT}) * \\ & (\text{adjustment from commute VT (vehicle trips) to overall VMT}) * (\text{\% Home based Work VMT}) \end{aligned}$$

The transit fare subsidy will be offered in conjunction with the Local Shuttle Service program previously discussed. Based on the above equation, the following are the inputs and resulting percentage reduction for this category:

- % residents eligible to participate = 50% (CAPCOA suggests an eligibility rate of 20-100%; for Newland Sierra 50% is used)
- reduction in commute VMT = 7.9% (CAPCOA page 231)
- adjustment from commute VT (vehicle trips) to VMT = 1 (CAPCOA Appendix C)
- % home based work VMT = 24.2%
- % VMT Reduction = $50\% * 7.9\% * 1 * 24.2\% = 0.96\%$

At the level of \$2.98 per day, which equates to between 60% and 100% of an existing round trip NCTD fare, depending on service class, a transit subsidy corresponds to a **0.9%** VMT reduction (CAPCOA TRT-4).



To qualify for the full 0.9% VMT Reduction, 4.0% (7.9%*50%) of residents must participate in this program.

TDM Program Marketing (Applies to Residential based Work Trips)

To ensure that residents are aware of all alternative transportation mode options available, "new resident" information packets will be distributed to all new residents. A website also will be created with the same information so that this information is always accessible. These sources will include information regarding the shuttles, bike share kiosks, iCommute, Park-and-Ride lots, and all other alternative transportation options.

The continued expansion and utilization of iCommute, SANDAG's TDM program, also would support the successful dispensation of transportation choice information. Using "new resident" information packets, a transportation information website, and iCommute to dispense transportation information falls under CAPCOA standard TRT-7: Commute Trip Reduction Marketing. This strategy focuses on reducing the commute trips of the residents of Newland Sierra. The CAPCOA Report provides the following equation to calculate the VMT reduction percentage:

$$\% \text{ VMT Reduction} = (\% \text{ reduction in commute trips}) * (\% \text{ population eligible}) * (\text{adjustment from commute VT (vehicle trips) to VMT}) * (\% \text{ Home based Work VMT})$$

- % reduction in vehicle trips = 4% (CAPCOA page 241)
- % population eligible = 50% (CAPCOA suggests an eligibility rate of 20-100%; for Newland Sierra 50% is used)
- adjustment from VT to VMT = 1.0 (CAPCOA page 241)
- % home based work VMT = 24.2%
- $\% \text{ VMT Reduction} = 4\% * 50\% * 1.0 * 24.2\% = 0.5\%$

By utilizing progressive and effective strategies to spread information, implementation of a TDM marketing program is expected to result in a **0.5%** VMT reduction.



Commute Services for Employees

Commute Trip Reduction for Employees

Transit Fare Subsidy for Employees

As previously noted, CAPCOA associates certain levels of transit fare subsidy with corresponding levels of commuter participation in transit based on locational context (CAPCOA TRT-4). For the Suburban context, CAPCOA provides that a subsidy of \$2.98 per person per day incentivizes a 7.9% reduction in commute VMT when employees are given a subsidy at their place of employment.

The CAPCOA Report provides the following formula for calculating the percent VMT reduction associated with employee transit fare subsidies of \$2.98 per person per day:

$$\begin{aligned} \% \text{ VMT Reduction} &= (\% \text{ employees eligible to participate}) * (7.9\% \text{ reduction in commute VMT}) \\ &* (\text{adjustment from commute VT to commute VMT}) * (\% \text{ employee based VMT}) \end{aligned}$$

The transit fare subsidy will be offered in conjunction with the Local Shuttle Service program previously discussed. It is estimated that 100% of employees who commute to jobs located within the Newland Sierra development's planning areas would be eligible to receive a transit fare subsidy provided by employers. The following calculations illustrate the process in determining VMT reduction for this category:

- % employees eligible to participate = 100%
- reduction in commute VMT = 7.9% (CAPCOA page 231)
- adjustment from commute VT to commute VMT = 1.0 (CAPCOA page 231)
- % employee based VMT = 3.2%
- % VMT Reduction = $100\% * 7.9\% * 1.0 * 3.2\% = 0.3\%$

At the level of \$2.98 per day, which equates to between 60% and 100% of an existing round trip North County Transit District fare, depending on service class, a transit subsidy corresponds to a **0.3%** VMT reduction (CAPCOA TRT-4). The Project's commercial center is estimated to employ 203 employees, to qualify for 0.3% VMT reduction, at least 16 employees (7.9% of employees) must participate in this program based on this estimation.



TDM Program Marketing for Employees (Applies to Commercial based Work Trips)

To ensure that employees are aware of all alternative transportation mode options available, employees will have access to the commute trip reduction program information provided on the website. The website will have a dedicated page related to transportation programs available to employees of the proposed Town Center. Information will be provided regarding the shuttles, transit subsidies, iCommute, Park-and-Ride lots, and other alternative transportation options.

The continued expansion and utilization of iCommute, SANDAG's TDM program, also would support the successful dispensation of transportation choice information. The commute transportation programs marketing falls under CAPCOA standard TRT-7: Commute Trip Reduction Marketing. This strategy focuses on reducing the commute trips. The CAPCOA Report provides the following methodology to calculate % VMT reduction for this strategy:

% VMT Reduction = (% reduction in commute trips) * (% population eligible) * (adjustment from commute VT (vehicle trips) to VMT) * (% Home based Work VMT)

- % reduction in vehicle trips = 4% (CAPCOA page 241)
- % population eligible = 100%
- adjustment from VT to VMT = 1.0 (CAPCOA page 241)
- % employee based VMT = 3.2%
- % VMT Reduction = $4\% * 100\% * 1.0 * 3.2\% = 0.1\%$

By utilizing progressive and effective strategies to spread information, CAPCOA attributes a **0.1% VMT** reduction for TDM Program Marketing targeted to employees of the proposed Town Center.

TDM EFFECTIVENESS QUANTIFICATION SUMMARY

Based on the methodology outlined in the CAPCOA Report, when determining the overall VMT reduction, the VMT reduction separately calculated for each of the individual strategies (within their overall TDM strategy category) should be dampened, or diminished, according to a multiplicative formula to account for the fact that some of the strategies may be redundant or applicable to the same populations. The multiplicative equation to accomplish this adjustment is as follows:

Overall % VMT Reduction = $1 - (1-A) * (1-B) * (1-C) * (1-D) * \dots$

Where A, B, C, D, ... = individual mitigation strategy reduction percentages



For example, if two strategies were proposed with corresponding VMT reductions of 20% and 10%, the equation would be $[1-(1-20%)*(1-10\%)]$ or $[1-(80\%*90\%)]$, which equates to a 28% reduction rather than the 30% reduction that would otherwise be seen with a direct sum. Therefore, the overall VMT reduction was calculated as a dampened, or diminished, total according to the equation above, which produces a conservative overall estimate.

Moreover, several categories of VMT reduction strategies have maximum VMT reduction caps and reduction factors, as outlined where applicable in the individual TDM strategies. CAPCOA methodologies sometimes result in VMT reductions that are unreasonably large given the context of the project, so the CAPCOA Report offers category maximums and reductions to normalize the results.

The following is a summary of the VMT reductions attributed to each of the individual strategies (organized in their respective TDM strategy categories as required in the CAPCOA methodology):

Land Use Strategies:

- **Land Use/Diversity: 5.0%**

Travel and Commute Services for Residents

- **Neighborhood/Site Enhancements: 3.0%**
 - o Pedestrian/Bicyclist Trails Network: 2.0%
 - o Electric Bike-Share Program: 0.6%
 - o Car-share Program: 0.4%
 - o Category % VMT Reduction = $1 - (1 - 2.0\%) * (1 - 0.6\%) * (1 - 0.4\%) = 3.0\%$
- **Transit System Improvements Strategies: 1.2%**
 - o Network Expansion (through Local Shuttle Service): 0.9%
 - o Service Frequency/Speed Increase (through Local Shuttle Service): 0.3%
 - o Category % VMT Reduction = $1 - (1 - 0.9\%) * (1 - 0.3\%) = 1.2\%$
- **Commute Trip Reduction (CTR) for residents (home based work): 2.0%**
 - o Ridesharing Support Features for Residents: 0.6%
 - o Transit Fare Subsidy for Residents: 0.9%
 - o TDM Program Marketing for Residents: 0.5%
 - o Category % VMT Reduction = $1 - (1 - 0.6\%) * (1 - 0.9\%) * (1 - 0.5\%) = 2.0\%$



Commute Services for Employees

- **Commute Trip Reduction (CTR) for employees: 0.4%**
 - o Transit Fare Subsidy for Employees: 0.3%
 - o TDM Program Marketing for Employees: 0.1%
 - o Category % VMT Reduction = $1 - (1 - 0.3\%) * (1 - 0.1\%) = 0.4\%$

Summing all of the strategies results in a total of 11.6%; however, the overall VMT Reduction is calculated using the multiplicative formula to account for the fact that some of the strategies may be redundant or applicable to the same populations:

Overall VMT Reduction: $1 - (1 - 5.0\%) * (1 - 3.0\%) * (1 - 1.2\%) * (1 - 2.0\%) * (1 - 0.4\%) = 11.1\%$

The TDM reduction for each category after the overall multiplicative formula is applied are:

- Land Use Strategies: 4.7%
- Travel and Commute Services for Residents: 6.1%
- Travel and Commute Service for Employees: 0.3%

Table 1, TDM Program VMT Reduction Analysis Summary, provides a summary of the TDM Program quantification described above relative to the CAPCOA standards to determine the VMT reduction that would be achieved by each individual strategy. **Table 2, TDM Program Performance Metrics and Targets**, sets forth the applicable performance metrics and targets for each strategy identified for implementation in this memorandum. The purpose of the performance metrics is to ensure implementation of the VMT reduction strategies consistent with the analysis presented in this evaluation.

TABLE 1 – TDM PROGRAM VMT REDUCTION ANALYSIS SUMMARY

Newland Sierra TDM Measure	Required Elements for TDM Measure Effectiveness	CAPCOA Reference ¹	Individual Strategy VMT Reduction	Combined Strategy VMT Reduction
LAND USE AND DESIGN STRATEGIES				
Land-Use Diversity	• Provide a mix of land uses, including residential, commercial, educational, and parks so that residents of the project have access to basic shopping, school, and recreation	LUT-3: Land Use/Location	5.0%	4.7%



TABLE 1 – TDM PROGRAM VMT REDUCTION ANALYSIS SUMMARY

Newland Sierra TDM Measure	Required Elements for TDM Measure Effectiveness	CAPCOA Reference ¹	Individual Strategy VMT Reduction	Combined Strategy VMT Reduction
	opportunities without having to travel outside of the project Site. This would lower vehicle miles traveled because residents can use alternative transportation modes to reach the various land uses available within the Site.			
TRAVEL AND COMMUTE SERVICES FOR RESIDENTS				
Pedestrian/Bicyclist Trails Network	- Develop a comprehensive trails network designed to provide multi-use trails between the various project components, land-uses, parks/open spaces, schools, and the Town Center. The trails network would provide connections to the various recreational trails and multi-modal facilities accessing the project Site. Additionally, the loop road includes 5-foot-wide bike lanes on both sides of the roadway. - Provide bicycle racks along main travel corridors, adjacent to commercial developments, at public parks and open spaces, and at retail and multi-family buildings within the project Site.	SDT-1: Provide Pedestrian Network Improvements – Within Project site and Connecting Off-Site SDT-6: Provide Bike Parking in Non-Residential Projects SDT-7: Provide Bike Parking in Multi-Unit Residential Projects SDT-9: Dedicate Land for Bike Trails	2%	6.1%
Electric Bike-Share Program	Implement an electric bike share program to further link the project neighborhoods to on another and to reduce motorized vehicle trips. The bike share program includes the placement of eight kiosks throughout the Community. Electric bikes can be taken from one kiosk and left at another to promote sustainable transportation between planning areas. It is anticipated that each kiosk will contain 10-20 electric bikes.	TRT-12: Implement Bike-Sharing Programs SDT-3: Neighborhood Electric Vehicle Network	0.6%	
Car-share Program	Coordinate with a car-share organization to install three car-share stations with one car each (for a total of three cars) in the commercial area of the project Site, available to residents on an on-demand basis.	TRT-9: Implement Car-Sharing Program	0.4%	
Local Shuttle Service	Coordinate a ride share or shuttle system that	TST-3: Expand Transit	1.2%	



TABLE 1 – TDM PROGRAM VMT REDUCTION ANALYSIS SUMMARY

Newland Sierra TDM Measure	Required Elements for TDM Measure Effectiveness	CAPCOA Reference ¹	Individual Strategy VMT Reduction	Combined Strategy VMT Reduction
	connects the various project neighborhoods to the Town Center and to external transit facilities and resources such as the park-and-ride lots and the Escondido Transit Center.	Network TST-4: Increase Transit Service Frequency/Speed TST-6: Provide Local Shuttles		
Ridesharing Support Features for Residents	- Coordinate with SANDAG's iCommute program for carpool, vanpool, and rideshare programs that are specific to the project's residents. - Promote the adjacent park-and-ride lots at the northeast quadrant of the Deer Springs Road/Mesa Rock Road intersection and at the northwest quadrant of the Deer Springs Road/Old Highway 395 intersection to residents to encourage carpooling.	RPT-4: Install Park-and-Ride Lots TRT-3: Provide Ride-Sharing Programs	0.6%	
Transit Fare Subsidy for Residents	Provide subsidized transit passes for residents.	TRT-4: Implement Subsidized or Discounted Transit Program	0.9%	
TDM Program Marketing for Residents	- To ensure that the TDM Program strategies are implemented and effective, a transportation coordinator (likely as part of a homeowner's association (HOA)) would be established to monitor the TDM Program, and would be responsible for developing, marketing, implementing, and evaluating the TDM Program. Promote available websites providing transportation options for residents. - Promote available websites providing transportation options for residents. - Create and distribute a "new resident" information packet addressing alternative modes of transportation. - Promote a transportation option app for use on mobile devices. - Coordinate with NCTD and SANDAG about	TRT-7: Commute Trip Reduction Marketing	0.5%	



TABLE 1 – TDM PROGRAM VMT REDUCTION ANALYSIS SUMMARY

Newland Sierra TDM Measure	Required Elements for TDM Measure Effectiveness	CAPCOA Reference ¹	Individual Strategy VMT Reduction	Combined Strategy VMT Reduction
	future siting of transit stops/stations at the adjacent park-and-ride lots.			
COMMUTE SERVICES FOR EMPLOYEES				
Transit Fare Subsidy for Employees	Provide transit subsidies for employees of the project's Town Center.	TRT-4: Implement Subsidized or Discounted Transit Program	0.3%	0.3%
TDM Program Marketing for Employees	- Promote available websites providing transportation options for businesses in the Town Center. - Promote the adjacent park-and-ride lots to employees to support carpooling. - Implement a demand-responsive shuttle service that provides access throughout the project Site, to the park-and-ride lots, and to the Escondido Transit Center. - Coordinate with SANDAG's iCommute program for carpool, vanpool, and rideshare programs that are specific to the project's employees. - Coordinate with NCTD and SANDAG on the future siting of transit stops/stations at the adjacent park-and-ride lots.	TRT-7: Commute Trip Reduction Marketing	0.1%	
VMT REDUCTION PRE-ADJUSTMENT				11.6%
OVERALL VMT REDUCTION (multiplicative formula applied)				11.1%

Notes: ¹ **CAPCOA Designations:** **SDT:** Neighborhood/Site Enhancements; **TRT:** Commute Trip Reduction Program; **TST:** Transit System Improvement; **RPT:** Road Pricing/Management
Source: Fehr & Peers.



TDM PROGRAM PERFORMANCE METRICS AND TARGETS

TABLE 2—TDM PROGRAM PERFORMANCE METRICS AND TARGETS

TDM Strategy	Description	Metric/ Performance Measure	Target	Collection Method	Collection Frequency	When Target Should Be Met
LAND USE AND DESIGN STRATEGIES						
Land-Use Diversity	Provide a mix of land uses, including residential, commercial, educational, and parks so that residents of the project have access to basic shopping, school, and recreation opportunities without having to travel outside of the project Site. This would lower vehicle miles traveled because residents can use alternative transportation modes to reach the various land uses available within the Site.	Percentage of residential, retail, and park/open space land use	62% park and open space; 35% single family residential; 2% multifamily residential, and 1% commercial land use	Field verification	Once after full build-out of all development	Full build-out of all development
TRAVEL AND COMMUTE SERVICES FOR RESIDENTS						
Pedestrian/Bicyclist Trails Network	Develop a comprehensive trails network designed to provide multi-use trails between the various project components, land-uses, parks/open spaces, schools, and the Town Center. The trails network would provide connections to the various recreational trails and multi-modal facilities accessing the project Site. Additionally, the loop road includes 5-foot-wide bike lanes on both sides of the roadway. Provide bicycle racks along main travel corridors, adjacent to commercial developments, at public parks and open spaces, and at retail and multi-family buildings within the project Site.	Pedestrian and bike network build-out that provides internal pedestrian and bike facilities that connect off-site	Full build-out of planned pedestrian and bike trails network that provides internal and external pedestrian and bike connections.	Field verification	Once after full build-out of all development	Full build-out of all development
Electric Bike-Share Program	Implement an electric bike share program to further link the project neighborhoods to on another and to reduce motorized vehicle trips. The bike share program includes the placement of eight kiosks throughout the Community. Electric bikes can be taken from one kiosk and left at another to promote sustainable transportation between planning areas. It is anticipated that each kiosk will contain 10-20 electric bikes.	Establishment of electric bike share kiosks	Eight electric bike share kiosks with 10-20 electric bikes each.	Field verification	Once after full build-out of all development	Full build-out of all development
Car-share Program	Coordinate with a car-share organization to install three car-share stations with one car each (for a total of three cars) in the commercial area of the project Site, available to residents on an on-demand basis.	Establishment of car-share stations through Zipcar or a similar service	Establishment of three (3) shared cars throughout the development	Field verification	Once after full build-out of all development	Full build-out of all development
Transit System Improvement: Network Expansion. Transit System Improvement: Service Frequency/Speed Increase	Coordinate a ride share or shuttle system that connects the various project neighborhoods to the Town Center and to external transit facilities and resources such as the park-and-ride lots and the Escondido Transit Center.	Development and deployment of local shuttle service	Shuttle service connects all seven planning areas to commercial area, Park-and-Ride lots, and Escondido Transit Center	Transportation Coordinator Reports	Annually after full build-out of all development	Full build-out of all development



TABLE 2—TDM PROGRAM PERFORMANCE METRICS AND TARGETS

TDM Strategy	Description	Metric/ Performance Measure	Target	Collection Method	Collection Frequency	When Target Should Be Met
Ridesharing Support Features	Coordinate with SANDAG’s iCommute program for carpool, vanpool, and rideshare programs that are specific to the project’s residents. Promote the adjacent park-and-ride lots at the northeast quadrant of the Deer Springs Road/Mesa Rock Road intersection and at the northwest quadrant of the Deer Springs Road/Old Highway 395 intersection to residents to encourage carpooling.	iCommute service area and program offerings, ride-sharing system development	Expansion of iCommute to include Project area, and development of ride-sharing- system	Transportation Coordinator Reports (based on resident surveys)	Annually after full build-out of all development	Full build-out of all development
		Utilization of Park-and-Ride lots	Residents using Park-and-Ride lots	Field Verification and Transportation Coordinator Reports (based on resident surveys)	Annually after full build-out of all development	Full build-out of all development
Transit Fare Subsidy for Residents	Provide subsidized transit passes for residents.	Percentage of residents participating in subsidized transit pass program.	Resident participation rate of approximately 4% (estimated approximately 243 residents)	Transportation Coordinator Reports	Annually after full build-out of all development	Full build-out of all development
TDM Program Marketing for Residents	To ensure that the TDM Program strategies are implemented and effective, a transportation coordinator (likely as part of a homeowner’s association (HOA)) would be established to monitor the TDM Program, and would be responsible for developing, marketing, implementing, and evaluating the TDM Program. Promote available websites providing transportation options for residents. Promote available websites providing transportation options for residents. Create and distribute a “new resident” information packet addressing alternative modes of transportation. Promote a transportation option app for use on mobile devices. Coordinate with NCTD and SANDAG about future siting of transit stops/stations at the adjacent park-and-ride lots.	Distribution of “new resident” packet, launch of website, and mobile app with travel demand management program information	Materials created and maintained.	Transportation Coordinator Reports & Resident Surveys	Annually after full build-out of all development	Full build-out of all development
COMMUTE SERVICES FOR EMPLOYEES						
Transit Fare Subsidy for Employees	Provide subsidizes transit passes for employees.	Percentage of employees participating in subsidized transit pass program.	Employee participation rate of approximately 7.9% (estimated approximately 16 employees)	Transportation Coordinator Coordination with Employers (Employee Survey)	Annually after full build-out of all development	Full build-out of all development
TDM Program Marketing for Employees	Promote available websites providing transportation options for businesses in the Town Center. Promote the adjacent park-and-ride lots to employees to support carpooling. Implement a demand-responsive shuttle service that provides access throughout the project Site, to the park-and-ride lots, and to the Escondido Transit Center. Coordinate with SANDAG’s iCommute program for carpool, vanpool, and rideshare programs that are specific to the project’s	Dedicated webpage that provides commute trip reduction program information for employees of the Project’s Town Center.	Materials created and maintained.	Transportation Coordinator Reports	Annually after full build-out of all development	Full build-out of all development



TABLE 2—TDM PROGRAM PERFORMANCE METRICS AND TARGETS

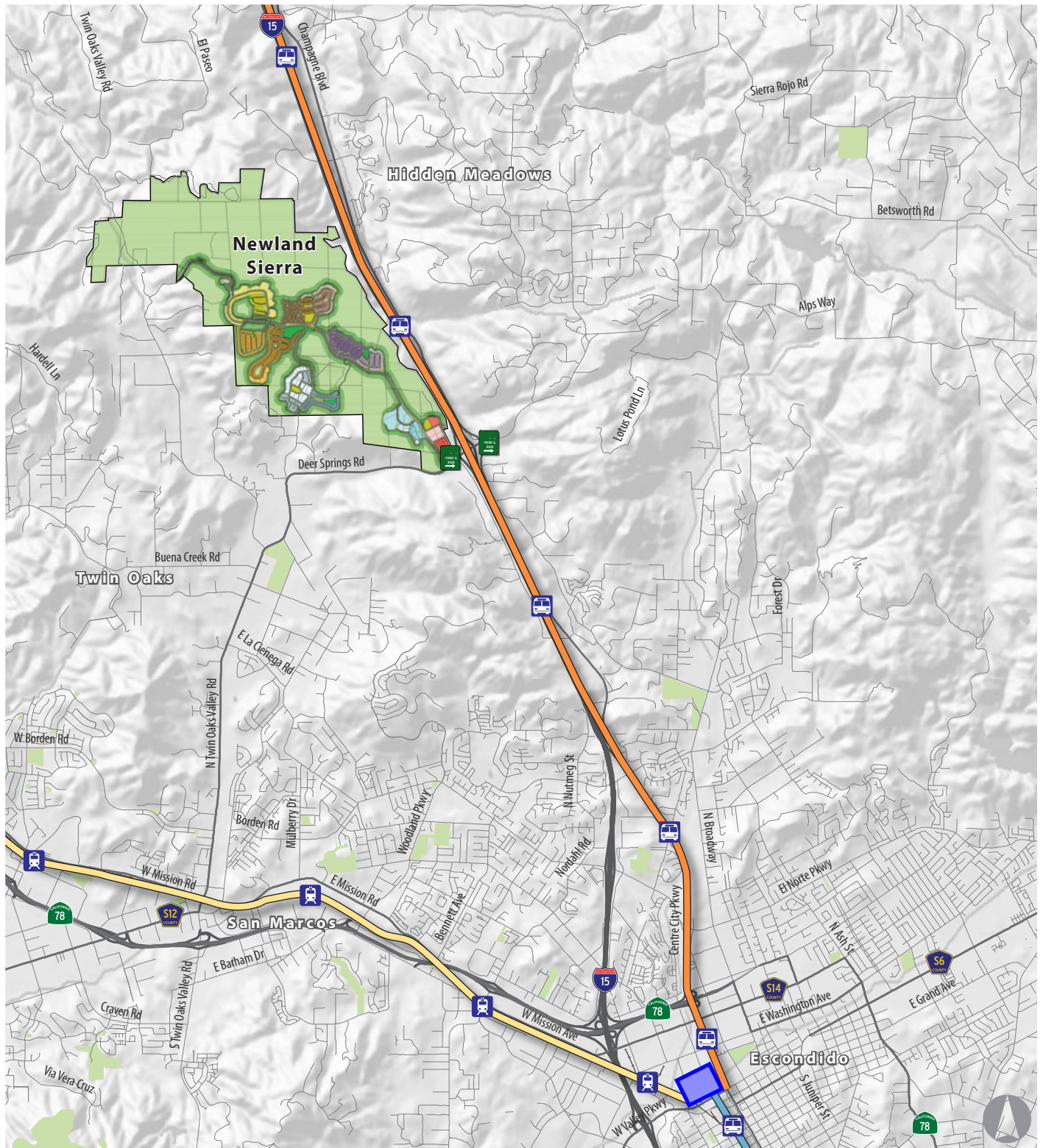
TDM Strategy	Description	Metric/ Performance Measure	Target	Collection Method	Collection Frequency	When Target Should Be Met
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employees.
Coordinate with NCTD and SANDAG on the future siting of transit stops/stations at the adjacent park-and-ride lots.

Source: Fehr & Peers.



FIGURES & APPENDICIES



Major Transit Connections at Escondido Transit Center

-  BREEZE Route 389 (Service to/from Pala)
-  BREEZE Rapid Route 350 (Service to/from Del Lago Transit Station - Provides Connections to San Diego)
-  SPRINTER Route (Service to/from Oceanside)
-  Park-and-Ride Lot
-  Escondido Transit Center

0 0.5 1 2 3 4 Miles



Figure 1
Newland Sierra Development Project
Project Location and Existing Transit Facilities



APPENDIX A

NATIONAL HOUSEHOLD TRAVEL SURVEY DATA

2009 NHTS

Vehicle Trips (Travel Day VT,
annualized)

Number of Vehicle Trips (VT) by Purpose

Trip purpose summary	Travel Day Vehicle Trips		
	Sample Size	Sum (Millions)	Percent
Refused	140	27	0
Don't know	199	53	0
Not ascertained	20	2	0
Home	255,692	79,901	34.2
Work	101,537	37,799	16.2
School/Daycare/Religious activity	19,655	6,511	2.8
Medical/Dental services	15,658	3,759	1.6
Shopping/Errands	163,004	45,353	19.4
Social/Recreational	64,252	19,714	8.4
Family personal business/Obligations	24,678	6,775	2.9
Transport someone	51,763	18,755	8
Meals	50,077	14,677	6.3
Other reason	1,467	523	0.2
All	748,142	233,849	100

Sum of Work, School, Medical, Shopping, Social,
Family personal business, Transport someone,
Meals, and Other reason Trips: 153,866 Trips

Work Trips: 37,799 Trips

Work Trips / Sum: 25%

6,085 Residents / 6,288 Service Population = 96.8% (Service Population calculated in Appendix B: US Census Data)

% Residents * % Home-based Work Trips = 96.8% * 25% = 24.2% Home-based Work VMT



APPENDIX B

US CENSUS DATA



U.S. Department of Commerce (<http://www.commerce.gov/>) | Blogs (http://www.census.gov/about/contact-us/social_media.html) | Index A-Z (<http://www.census.gov/about/index.html>) |

Glossary (<http://www.census.gov/glossary/>) | FAQs (<http://ask.census.gov/>)

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Welcome to QuickFacts

San Diego County, California

Go to Dynamic Version (<http://quickfacts/map/IPE120213/06073>)

QuickFacts provides statistics for all states and counties, and for cities and towns with a population of 5,000 or more.

QuickFacts

People

San Diego County, California

Population

Population estimates, July 1, 2015, (V2015)	3,299,521
Population estimates base, April 1, 2010, (V2015)	3,095,308
Population, percent change - April 1, 2010 (estimates base) to July 1, 2015, (V2015)	6.6%
Population, Census, April 1, 2010	3,095,313

Age and Sex

Persons under 5 years, percent, July 1, 2015, (V2015)	6.5%
Persons under 5 years, percent, April 1, 2010	6.6%
Persons under 18 years, percent, July 1, 2015, (V2015)	22.1%
Persons under 18 years, percent, April 1, 2010	23.4%
Persons 65 years and over, percent, July 1, 2015, (V2015)	13.1%
Persons 65 years and over, percent, April 1, 2010	11.4%
Female persons, percent, July 1, 2015, (V2015)	49.7%
Female persons, percent, April 1, 2010	49.8%

Race and Hispanic Origin

White alone, percent, July 1, 2015, (V2015) (a)	76.1%
White alone, percent, April 1, 2010 (a)	64.0%
Black or African American alone, percent, July 1, 2015, (V2015) (a)	5.6%
Black or African American alone, percent, April 1, 2010 (a)	5.1%
American Indian and Alaska Native alone, percent, July 1, 2015, (V2015) (a)	1.3%
American Indian and Alaska Native alone, percent, April 1, 2010 (a)	0.9%
Asian alone, percent, July 1, 2015, (V2015) (a)	12.1%
Asian alone, percent, April 1, 2010 (a)	10.9%
Native Hawaiian and Other Pacific Islander alone, percent, July 1, 2015, (V2015) (a)	0.6%
Native Hawaiian and Other Pacific Islander alone, percent, April 1, 2010 (a)	0.5%
Two or More Races, percent, July 1, 2015, (V2015)	4.3%
Two or More Races, percent, April 1, 2010	5.1%
Hispanic or Latino, percent, July 1, 2015, (V2015) (b)	33.4%
Hispanic or Latino, percent, April 1, 2010 (b)	32.0%
White alone, not Hispanic or Latino, percent, July 1, 2015, (V2015)	46.3%
White alone, not Hispanic or Latino, percent, April 1, 2010	48.5%

Population Characteristics

Veterans, 2010-2014	236,014
Foreign born persons, percent, 2010-2014	23.4%

Housing

Housing units, July 1, 2015, (V2015)	1,194,415
Housing units, April 1, 2010	1,164,786
Owner-occupied housing unit rate, 2010-2014	53.4%
Median value of owner-occupied housing units, 2010-2014	\$412,800
Median selected monthly owner costs -with a mortgage, 2010-2014	\$2,375
Median selected monthly owner costs -without a mortgage, 2010-2014	\$501
Median gross rent, 2010-2014	\$1,328
Building permits, 2015	9,883

Families and Living Arrangements

Households, 2010-2014	1,083,811
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QuickFacts

Persons per household, 2010-2014	2.85
Living in same house 1 year ago, percent of persons age 1 year+, 2010-2014	84.1%
Language other than English spoken at home, percent of persons age 5 years+, 2010-2014	37.3%

Education

High school graduate or higher, percent of persons age 25 years+, 2010-2014	85.8%
Bachelor's degree or higher, percent of persons age 25 years+, 2010-2014	35.1%

Health

With a disability, under age 65 years, percent, 2010-2014	5.8%
Persons without health insurance, under age 65 years, percent	 13.4%

Economy

In civilian labor force, total, percent of population age 16 years+, 2010-2014	61.9%
In civilian labor force, female, percent of population age 16 years+, 2010-2014	57.0%
Total accommodation and food services sales, 2012 (\$1,000) (c)	10,403,824
Total health care and social assistance receipts/revenue, 2012 (\$1,000) (c)	21,337,795
Total manufacturers shipments, 2012 (\$1,000) (c)	33,320,461
Total merchant wholesaler sales, 2012 (\$1,000) (c)	35,937,366
Total retail sales, 2012 (\$1,000) (c)	39,786,069
Total retail sales per capita, 2012 (c)	\$12,523

Transportation

Mean travel time to work (minutes), workers age 16 years+, 2010-2014	24.6
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Income and Poverty

Median household income (in 2014 dollars), 2010-2014	\$63,996
Per capita income in past 12 months (in 2014 dollars), 2010-2014	\$31,043
Persons in poverty, percent	 14.7%

Businesses**San Diego County, California**

Total employer establishments, 2014	79,958
Total employment, 2014	1,202,583
Total annual payroll, 2014	61,752,012
Total employment, percent change, 2013-2014	1.8%
Total nonemployer establishments, 2014	258,892
All firms, 2012	293,426
Men-owned firms, 2012	154,416
Women-owned firms, 2012	105,329
Minority-owned firms, 2012	106,472
Nonminority-owned firms, 2012	175,754
Veteran-owned firms, 2012	25,354
Nonveteran-owned firms, 2012	255,209

Geography**San Diego County, California**

Population per square mile, 2010	735.8
Land area in square miles, 2010	4,206.63
Metropolitan or Micropolitan Statistical Area	San Diego-Carlsbad, CA Metro Area
FIPS Code	06073

Export to CSV (</quickfacts/download.php?fips=06073&type=csv>) Export to Excel (</quickfacts/download.php?fips=06073>)

 This geographic level of poverty and health estimates are not comparable to other geographic levels of these estimates

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable. Click the Quick Info  icon to the left of each row in TABLE view to learn about sampling error.

The vintage year (e.g., V2015) refers to the final year of the series (2010 thru 2015).
Different vintage years of estimates are not comparable.

(a) Includes persons reporting only one race
(b) Hispanics may be of any race, so also are included in applicable race categories
(c) Economic Census - Puerto Rico data are not comparable to U.S. Economic Census data

D Suppressed to avoid disclosure of confidential information

F Fewer than 25 firms

FN Footnote on this item in place of data

NA Not available

S Suppressed; does not meet publication standards

X Not applicable

Z Value greater than zero but less than half unit of measure shown

Up one level

[California \(/quickfacts/map/IPE120213/06/accessible\)](/quickfacts/map/IPE120213/06/accessible)

U.S. Census Quick Facts

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Income and Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.

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Fehr & Peers Calculations:

Project Residents: 2,135 dwelling units * 2.85 persons per dwelling unit (above) = **6,085 Residents**

Project Employees: 81,000 square feet / 400 square feet per employee (San Diego General Plan) = **203 Employees**

Service Population: 6,085 Residents + 203 Employees = 6,288

Percent of Home-based Work Trips in **Appendix A: National Household Travel Survey Data**



APPENDIX C

ADDITIONAL INFORMATION



INDEPENDENT TRANSPORTATION NETWORK AMERICA (ITN)

Independent Transportation Network America (ITN) is a volunteer-based on-call taxi service that provides rides to aging adults. ITN supports sustainable, community-based transportation by leading a nationally operated and research-driven transportation network.

In the Newland Sierra development area, 325 active adult lots and clusters will be built. The foundation of an ITN affiliate volunteer program will accommodate for the large population of aging adults. Because a shuttle service is already in place, CAPCOA would evaluate headway reductions to consider VMT reductions. (CAPCOA TST-4) ITN only serves aging residents who would likely already be utilizing the shuttle system. Moreover, because ITN vehicles are do not run on a set schedule with consistent headways, this strategy is expected to support the VMT reduction provided by the future local shuttle service.

SUBSIDIZED COMMERCIAL TAXIS

Santa Clara Valley Transportation Authority (VTA) recently ran a six-month pilot program to test the viability of an on-demand transit service and the software to support it. The project ended on July 1, 2016 and was usable via a free smartphone app. Fehr and Peers also recently launched a “first-mile-last-mile” campaign in Centennial, Colorado that partners with Lyft, a private on-call taxi-like service. Beginning in August, 2016, the city will pay for rides to and from a local transit center with the goal of reducing VMT. The program will end after six months, at which time data will be available for study. Applying these innovations to the iCommute mobile platform could provide even more options for the Newland Sierra development community. These VMT reductions would fall under other measures already accounted for and would further support the effectiveness of these measures.

Providing subsidized commercial taxis to residents of the Newland Sierra development gives residents and employees more freedom to use public transit for large trips. Many commuters chose to drive personal automobiles to work instead of using public transit because they might need to make a small trip during the day (e.g. groceries, going to lunch, etc.) that transit does not fulfill. By providing commercial taxis, residents and employees can take advantage of public transit while still maintaining the freedom to make smaller trips when they need to do so. Shifting a portion of daily travel from personal automobile to public transit reduces VMT.



The CAPCOA report does not specifically mention the subsidization of commercial taxis as a VMT reduction measure; however, it does note that employer or development subsidized transit passes reduce VMT. (CAPCOA TRT-4) Fehr and Peers also recently launched a “first-mile-last-mile” campaign in Centennial, Colorado that partners with Lyft, a private on-call taxi-like service. Beginning in August, 2016, the city will pay for rides to and from a local transit center with the goal of reducing VMT. The program will end after six months, at which time data will be available for study.

VMT reduction for subsidized transit is already accounted for in the section titled *Encourage Use of Regional Transit* in this Appendix and should not be applied a second time. Subsidizing commercial taxis would instead support the effectiveness of other measures in the TDM program.