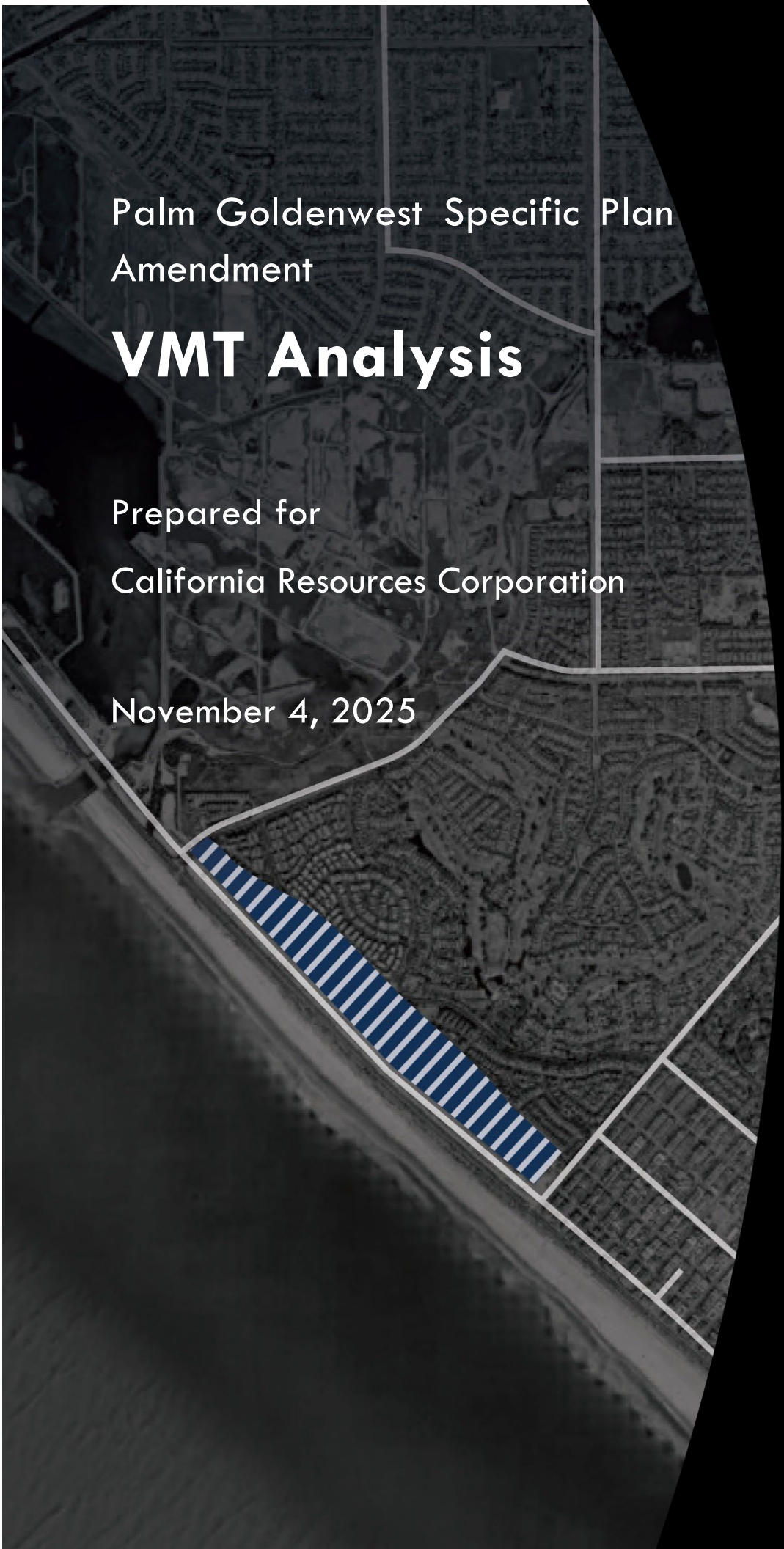


Palm Goldenwest Specific Plan Amendment

VMT Analysis

Prepared for

California Resources Corporation

November 4, 2025

Prepared by

Simon Lin, EIT

Jordan Mower

Meghan Macias, TE

Contact:
techservices@EPDsolutions.com

EPD SOLUTIONS, INC

949.794.1180
3333 Michelson Drive, Suite 500
Irvine, CA 92612

EPDSolutions.com

©EPD Solution, Inc.s

TABLE OF CONTENTS

1 Executive Summary 1
2 Introduction 7
2.1 Project Description 7
2.2 Project Trip Generation 10
3 VMT Background and Significance Threshold 11
3.1 City of Huntington Beach VMT Screening Criteria 11
3.2 VMT Significance Threshold 12
4 VMT Analysis 14
4.1 VMT Screening Analysis 14
4.2 VMT Analysis Methodology 18
4.3 Project VMT Evaluation 19
4.4 Project's Effect on VMT 20
5 VMT Mitigation 23
5.1 VMT Mitigation Overview 23
5.2 VMT Mitigation Measure 23
5.3 VMT Reduction Result 31
6 VMT Conclusion 33

List of Figures

Figure 1: Project Location....8
Figure 2: Project Site Plan....9
Figure 3: TPA Map Provided in City Guidelines....15
Figure 4: Low VMT Generating Area Map Provided in City Guidelines....16
Figure 5: Roadways Selected to Calculate Daily VMT....21

List of Tables

Table 1: Project Trip Generation....10
Table 2: OCTAM VMT Analysis of Project - TAZ 902 (Hotel)....19
Table 3: OCTAM VMT Analysis of Project – TAZ 902 (Residential)....20
Table 4: Project's Effect on VMT Results (Hotel)....22
Table 5: Project's Effect on VMT Results (Residential)....22
Table 6: All CAPCOA VMT Reduction Measures....23
Table 7: Applicable CAPCOA VMT Reduction Measures....25
Table 8: VMT Mitigation Results for the Project....29

Appendices

APPENDIX A – SCOPE OF WORK
APPENDIX B – OCTAM LAND USE INPUTS
APPENDIX C – OCTAM VMT OUTPUTS
APPENDIX D – SUPPORTING DOCUMENTATION FOR VMT MITIGATION

1 EXECUTIVE SUMMARY

This vehicle miles traveled (VMT) analysis has been prepared by EPD Solutions, Inc. (EPD) to analyze the potential traffic related impacts of the proposed Palm Goldenwest Specific Plan Amendment.

The proposed Project (Palm Goldenwest Specific Plan Amendment) would be located east of Pacific Coast Highway (PCH) between Seapoint Street and Goldenwest Street in the City of Huntington Beach. The Project site is currently used for oil production. The Project proposes to demolish all existing uses on site and redevelop the site with a mixed-use Project which would include 186 single-family detached units, 249 single-family attached units, 365 multi-family units, and a 350-room hotel. It is to be noted that some of the 365 multi-family units are proposed to be affordable housing.

The Project includes a total of 92.9 acres of mixed use and consists of two components: Hotel and Residential. The two components of the Project are discussed below:

- The Hotel component consists of lots totaling 16.0 acres in the center on the Project site and includes a 350-room hotel.
- The Residential component consists of lots totaling 53.2 acres and includes 186 single family detached units, 249 single-family attached units, and 365 multi-family units.

This VMT analysis is based on the requirements of the *City of Huntington Beach Transportation Impact Analysis Preparation Guide for Vehicle Miles Traveled and Level of Service Assessment* (City's Guidelines) adopted by the City of Huntington Beach City Council in October 2023.

Project VMT Screening Analysis

The City's Guidelines provide the following screening thresholds to identify if the Project would be considered to have a less-than-significant impact on VMT and therefore could be screened out from further VMT analysis:

1. **Transit Priority Area (TPA) Screening**

   Projects located within a TPA may be presumed to have a less-than-significant impact on VMT. According to the TPA map provided in the City of Huntington Beach Guidelines, the Project is not located within a TPA. Therefore, the Project would not meet Screening Criteria 1.

2. **Low VMT Area Screening**

   Projects located within a low VMT-generating area and consistent with the existing land use within that traffic analysis zone (TAZ) may be presumed to have a less-than-significant impact on VMT. According to the map provided in the City of Huntington Beach Guidelines, the Project is not located within a low VMT-generating area. Therefore, the Project would not meet the requirements of Screening Criteria 2.

3. **Project Type Screening**

   Projects that propose 100 % Affordable Housing, Local-Serving Retail, Educational/Institutional Land Uses, Municipal/Public Service Land Uses, Transit and Active Transportation Projects, and

Transportation Projects may be presumed to have a less-than-significant impact on VMT. This screening criteria also applies to projects generating less than 110 net daily vehicle trips. The Project does not propose any of the described land uses, and would generate 7,638 daily trips, which is more than 110 daily trips. Therefore, the Project would not meet the requirements of Screening Criteria 3.

The Project would not meet any of the City's screening criteria; therefore, a full analysis of VMT was prepared for the Project.

Project VMT Evaluation

The Project's Hotel component's VMT per Service Population (VMT/SP) would be 129.5% above the threshold under Project Baseline (2025) conditions and 132.9% above the threshold under Buildout 2050 conditions.

The Project's Residential component's VMT per capita (VMT/capita) would be 52.8% above the threshold under Project Baseline (2025) conditions and 47.6% above the threshold under Buildout 2050 conditions. Therefore, the Project would result in a significant project-generated VMT impact without mitigation, and mitigation would be required.

The Huntington Beach Citywide Boundary VMT/SP is 0.042% higher with the Hotel component of the Project added under Project Baseline (2025) conditions and 0.055% higher with the Hotel component of the Project added under Cumulative (2050) conditions; therefore, the Hotel component of the Project's effect on VMT would be significant, and mitigation would be required.

The Huntington Beach Citywide Boundary VMT/capita is 0.13% lower with the Residential component of the Project added under Project Baseline (2025) conditions and 0.11% lower with the Residential component of the Project added under Cumulative (2050) conditions; therefore, the Residential component of the Project's effect on VMT would be considered less than significant.

Project VMT Mitigation

The following VMT reduction measures that apply to the Project are part of the project design and are implemented as Project Design Features (PDFs):

- **PDF T-1: CAPCOA Measure T-1 Increase Residential Density:** This measure accounts for the VMT reduction achieved by a project that is designed with a higher density of dwelling units (du) compared to the average residential density in the U.S.
    - Increased densities affect the distance people travel and provide greater options for the mode of travel they choose. Increasing residential density results in shorter and fewer trips by single-occupancy vehicles and thus a reduction in VMT and GHG emissions. This measure is best quantified when applied to larger developments where the density is somewhat similar to the surrounding area.
    - The Project is designed to have a residential density of 15.04 du/acre, which is 65.3% higher than the density of a typical development of 9.1 du/acre.
    - Application of PDF T-1: CAPCOA Measure T-1 Increase Residential Density is anticipated to reduce the VMT of the Residential component by 14.35%.

- **PDF T-2: CAPCOA Measure T-4 Integrate Affordable and Below-Market Rate Housing:** This measure 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.
    - This measure would require that a percentage of the Multifamily residential units be permanently dedicated as affordable for lower income families.
    - The Project is designed to have 75 affordable units, which represents 9.38% of all proposed dwelling units.
    - Application of PDF T-2: CAPCOA Measure T-4 Integrate Affordable and Below-Market Rate Housing is anticipated to reduce the VMT of the Residential component by 2.68%.
- **PDF T-3: CAPCOA Measure 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.
    - Implementation of this measure requires the construction of new sidewalks or the repair and enhancement of existing degraded or substandard sidewalks. Within a 0.60 mile radius of the Project boundary, approximately 31.3 miles of sidewalk currently exist. The Project would construct approximately an additional 2.3 miles of sidewalk within the Project site, thereby improving connectivity and expanding the overall pedestrian network.
    - Application of PDF T-3: CAPCOA Measure T-18 Provide Pedestrian Network Improvement is anticipated to reduce the VMT of all Project components by 0.37%.

The following VMT mitigation measures (MMs) are proposed to be implemented by the Project

- **MM T-1: CAPCOA Measure T-6 Implement Commute Trip Reduction (CTR) Program (Mandatory Implementation and Monitoring).** The Specific Plan requires that this mitigation measure be implemented as a mandatory CTR program (CAPCOA Measure T-6) to enforce VMT reduction. The plan shall also include measures to encourage hotel guests to use alternative modes of transportation, such as offering on-site bicycles, providing bicycle parking for both guests and employees, incorporating shuttle services to transport guest to nearby destinations such as the Downtown/Pier Area and making public transit information readily available in the hotel lobby and on the website. The program will require participation from employees in carpooling, transit use, or biking, with established trip reduction targets, compliance measures, and monitoring procedures to ensure effectiveness. This program includes the following measures as a part of the measure:
    - **Measure T-7: Implement Commute Trip Reduction Marketing.** This measure will ensure that employees are informed about available transportation options, thereby maximizing participation in the CTR programs and contributing to the reduction of traffic congestion.
        - This measure shall be implemented through the Hotel's employer and the Project's homeowners association (HOA) which would provide the following features, or similar alternatives:
            - Onsite or online commuter information services

        - Employee transportation coordinators
        - Onsite or online transit pass sales
        - Guaranteed ride home service
    - Application of CAPCOA Measure T-7 Implement Commute Trip Reduction Marketing is anticipated to reduce the Project-generated VMT by 4.00%.
- **Measure T-8: Provide Ridership Program.** This measure will provide transit passes or other incentives to employees, encouraging the use of public transportation. Given the scale of employment in the Hotel, this program is expected to reduce vehicle use and lower VMT.
    - This measure shall be implemented through the Hotel's employer and the Project's homeowners association (HOA) which would promote the ridesharing program in a multifaceted approach that could include the following:
        - Designating a certain percentage of desirable parking spaces for ridesharing vehicles.
        - Designating adequate passenger loading and unloading and waiting areas for ridesharing vehicles.
        - Providing an app or website for coordinating rides
    - Application of CAPCOA Measure T-8 Provide Ridesharing Program is anticipated to reduce the Project-generated VMT by 4.00%.
- **Measure T-9: Implement Subsidized or Discounted Transit Program.** This measure involves offering subsidized or discounted transit passes to employees. By reducing the cost of public transportation, it aims to increase its use among employees, thereby decreasing single-occupancy vehicle trips and contributing to a reduction in vehicle miles traveled (VMT).
    - This measure shall be implemented by the Hotel Employer and the Projects homeowner's association (HOA), which would provide subsidies to employees for Orange County Transit Authority (OCTA) transit passes. There are four existing public transit stops on either side of the Project site, and a possible future fifth public transit stop at the main entry drive to the Project along the Pacific Coast Highway (PCH). The subsidies provided to the employees and residents for the OCTA transit fares would be $2.00 per single ride or $69.00 for a 30-day pass.
    - Application of CAPCOA Measure T-9 Implement Commute Trip Reduction Program is anticipated to reduce the Project-generated VMT by 0.01%.
- **Measure T-10: Provide End-of-Trip Bicycle Facilities.** End-of-trip facilities, including bike racks, lockers, and showers, will be provided to support employees who choose to bike to work. These facilities are necessary to facilitate and increase bicycle commuting.
    - This measure shall be implemented by installing and maintaining the bicycle facilities on site.
    - Application of CAPCOA Measure T-10 Provide End-of-Trip Bicycle Facilities is anticipated to reduce the Project-generated VMT by 0.15%.
- **Measure T-11: Provide Employer-Sponsored Vanpool.** This measure will support a vanpool program, reducing single-occupancy vehicle use. The vanpool program is particularly applicable to the large workforce anticipated in the Business Park phases.

        - This measure shall be implemented by the Hotel Employer which will implement and monitor the vanpool.
        - Application of CAPCOA Measure T-11 Provide Employer-Sponsored Vanpool is anticipated to reduce the Project-generated VMT by 4.61%.

- CTR programs discourage single-occupancy vehicle trips and encourage alternative modes of transportation such as carpooling, taking transit, walking, and biking, thereby reducing VMT and GHG emissions.
    - This measure shall be implemented by the Hotel Employer and will require participation from employees in carpooling, transit use, or biking, with established trip reduction targets, compliance measures, and monitoring procedures to ensure effectiveness.
    - Application of MM T-1: CAPCOA Measure T-6 Implement Commute Trip Reduction Program (Mandatory) is anticipated to reduce the VMT of the Hotel component by 13.14%.

- **MM T-2: CAPCOA Measure T-19-A 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. This encourages a mode shift on the roadway parallel to the bicycle facility from vehicles to bicycles, displacing VMT and thus reducing GHG
    - The Project proposes a Class II bike lane along the Pacif Coast Highway (PCH) which would provide a safe connection to the Huntington Beach Bike Trail (Class I Bike Path) which runs adjacent to the PCH.
    - Application of MM T-2: CAPCOA Measure T-19-A Construct or Improve Bike Facility is anticipated to reduce the VMT of all Project components by 0.61%.

Project VMT Mitigation Result

The mitigation measures are anticipated to result in a total VMT reduction of 13.62% for the Hotel component of the Project and 17.84% for the Residential component of the Project.

With mitigations incorporated, the Hotel component of the Project's VMT/SP would be 115.87% above the threshold under Project Baseline (2025) conditions and 119.25% above the threshold under Buildout (2050) conditions. The Hotel component's Project-Generated VMT impact would be considered significant and unavoidable with mitigation incorporated.

The Residential component of the Project's VMT would be 34.96% above the threshold under Baseline (2025) conditions and 29.76% above the threshold under Buildout (2050) conditions with mitigations incorporated. The Residential component's Project-Generated VMT impact would be considered significant and unavoidable with mitigation incorporated.

Additionally, with mitigations incorporated, the Huntington Beach Citywide Boundary VMT/SP is 0.057% lower with the Hotel component of the Project added under Project Baseline (2025) conditions and 0.041% lower with the Hotel component of the Project added under Cumulative (2050) conditions; therefore, the Hotel component of the Project's effect on VMT would be less than significant with mitigation incorporated.

Conclusion

The Project-Generated VMT impact of the Hotel component would be significant and unavoidable with mitigation incorporated. The Project-Generated VMT impact of the Residential component would be significant and unavoidable with mitigation incorporated.

Additionally, the Project Hotel component's effect on VMT would be less than significant with mitigation incorporated. The Project Residential component's effect on VMT would be less than significant.

2 INTRODUCTION

The scope of work for this VMT analysis was submitted to the City of Huntington Beach and is provided in Appendix A. The background of this analysis and project description for the proposed Palm Goldenwest Specific Plan Amendment (Project) is discussed in detail below.

This VMT analysis is based on the requirements of the *City of Huntington Beach Vehicles Mile Traveled (VMT) Guidelines* (City's Guidelines) updated by the City of Huntington Beach in October 2023.

2.1 Project Description

The proposed Palm Goldenwest Specific Plan Amendment Project would be located east of Pacific Coast Highway (PCH) between Seapoint Street and Goldenwest Street in the City of Huntington Beach. The Project site is currently used for oil production. The Project proposes to demolish all existing uses on site and redevelop the site with a mixed-use Project.

The Project includes a total of 92.9 acres of mixed-use and consists of two components: Hotel and Residential. The two components of the Project are discussed below:

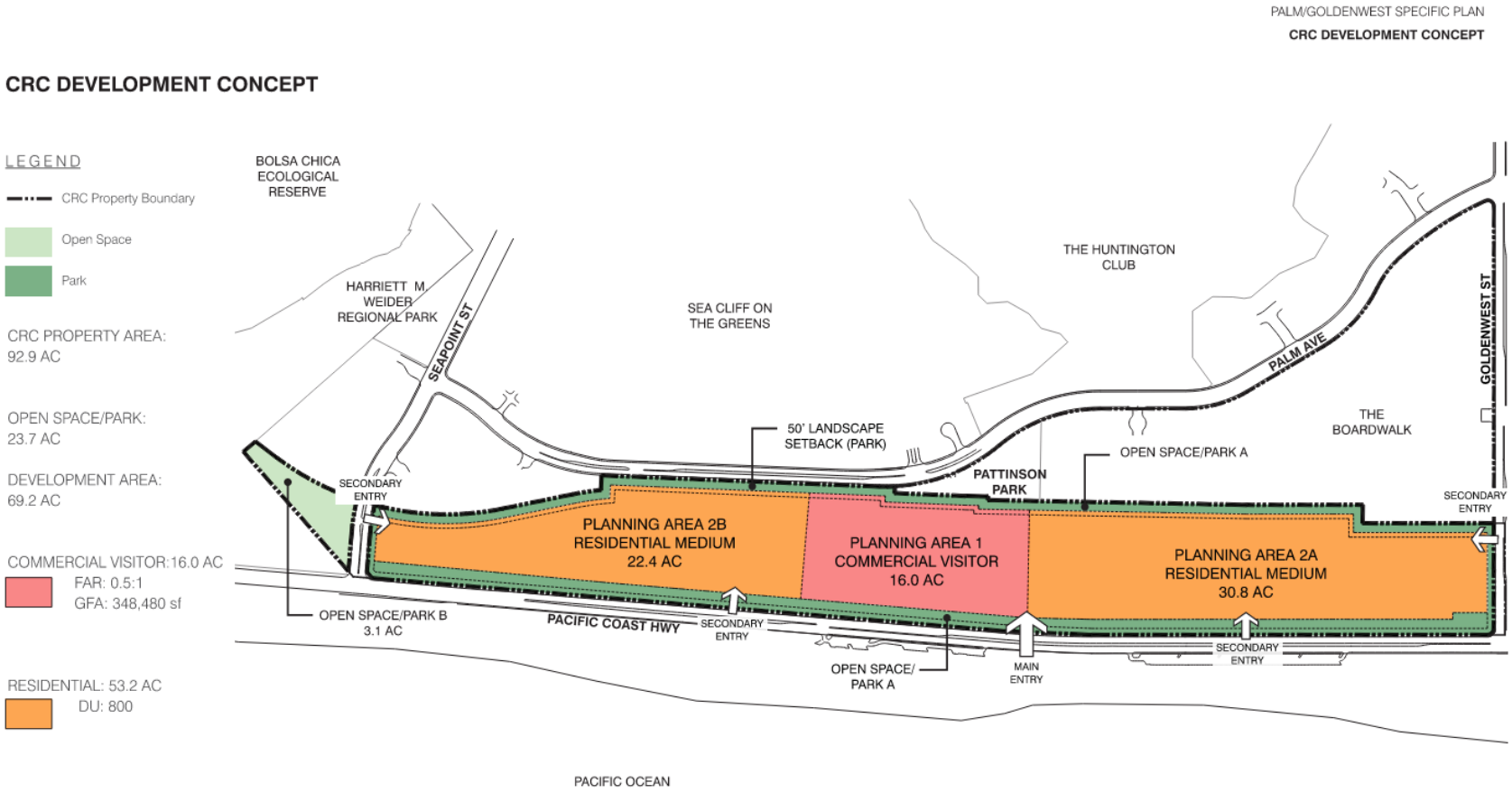
- The Hotel component consists of lots totaling 16.0 acres in the center on the Project site and includes a 350-room hotel that is approximately 348,480 square feet.
- The Residential component consists of lots totaling 53.2 acres and 800 total dwelling units. It includes 186 single family detached units, 249 single-family attached units, and 365 multi-family units. It is to be noted that 75 of the 365 multi-family units are proposed to be affordable housing.

The location of the Project is shown in Figure 1, *Project Location*, and the Project site plan is shown in Figure 2, *Project Site Plan*.

Figure 1: Project Location



Figure 2: Project Site Plan



2.2 Project Trip Generation

The Project trip generation was calculated using trip rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 12th Edition* (2025) for Single-Family Detached Housing (Land Use Code 210), Single-Family Attached Housing (Land Use Code 215), Multifamily Housing (Low-Rise) (Land Use Code 220) and Hotel (Land Use Code 310). The trip generation for the Project is shown in Table 1, *Project Trip Generation*. The Project would generate 7,638 daily trips, 516 trips during the AM peak hour, and 655 trips during the PM peak hour.

Table 1: Project Trip Generation

Land Use		Units	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Trip Rates									
Single-Family Detached Housing[1]		DU	9.09	0.19	0.51	0.70	0.58	0.35	0.93
Single-Family Attached Housing[2]		DU	6.57	0.12	0.35	0.47	0.29	0.22	0.51
Multifamily Housing (Low-Rise)[3]		DU	6.21	0.10	0.31	0.41	0.32	0.20	0.52
Hotel[4]		Rooms	5.84	0.18	0.16	0.34	0.24	0.23	0.47
Project Trip Generation									
Single-Family Detached Housing[1]	186	DU	1,691	35	95	130	107	66	173
Single-Family Attached Housing[2]	249	DU	1,636	29	88	117	72	55	127
Multifamily Housing (Low-Rise)[3]	365	DU	2,267	36	114	150	118	72	190
Hotel[4]	350	Rooms	2,044	62	57	119	84	81	165
Total Project Trip Generation			**7,638**	**162**	**354**	**516**	**381**	**274**	**655**

DU: Dwelling Unit

[1] Institute of Transportation Engineers, Trip Generation, 12th Edition, 2025. Land Use Code 210 - Single-Family Detached Housing (Average Rate).

[2] Institute of Transportation Engineers, Trip Generation, 12th Edition, 2025. Land Use Code 215 - Single-Family Attached Housing (Average Rate).

[3] Institute of Transportation Engineers, Trip Generation, 12th Edition, 2025. Land Use Code 220 - Multifamily Housing (Low-Rise) (Average Rate).

[4] Institute of Transportation Engineers, Trip Generation, 12th Edition, 2025. Land Use Code 310 - Hotel (Average Rate).

3 VMT BACKGROUND AND SIGNIFICANCE THRESHOLD

Senate Bill (SB) 743 was signed by Governor Brown in 2013 and required the Governor's Office of Planning and Research (OPR) to amend the California Environmental Quality Act (CEQA) Guidelines to replace level of service (LOS) as the appropriate method for evaluating transportation impacts under CEQA. SB 743 specified that the new criteria should promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses. The bill also specified that delay-based LOS could no longer be considered an indicator of a significant impact on the environment under CEQA. In response, the Natural Resources Agency amended the CEQA Guidelines to include Section 15064.3, *Determining the Significance of Transportation Impacts*. This section states that vehicle miles traveled (VMT) is the most appropriate measure of a project's transportation impacts and provides lead agencies with the discretion to choose the most appropriate methodology and thresholds for evaluating VMT. Section 15064.3(c) states that the provisions of the section shall apply statewide beginning on July 1, 2020.

3.1 City of Huntington Beach VMT Screening Criteria

The City's Guidelines provide the following screening thresholds to identify if a project would be considered to have a less-than-significant impact on VMT and therefore could be screened out from further VMT analysis:

1. **Transit Priority Area (TPA)[1] Screening**

   Projects located within a TPA may be presumed to have a less-than-significant impact on VMT.

2. **Low VMT Area Screening**

   Projects located within a low VMT-generating area and consistent with the existing land uses within that traffic analysis zone (TAZ) may be presumed to have a less-than-significant impact on VMT.

[1] A TPA is defined as a half-mile area around an existing major transit stop or an existing stop along a high quality transit corridor per the definitions below.

Pub. Resources Code, § 21064.3 - 'Major transit stop' means a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 20 minutes or less during the morning and afternoon peak commute periods.

Pub. Resources Code, § 21155 - For purposes of this section, a 'high-quality transit corridor' means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.

3. Project Type Screening

Projects that generate less than 110 daily vehicle trips, or propose affordable housing, local serving retail, educational/institutional land uses, or public service land uses. This screening criteria also includes transit and active transportation projects and transportation projects.

If a project meets one of the criteria above, then the VMT impact of the project would be considered less than significant and no further analysis of VMT would be required.

3.2 VMT Significance Threshold

Projects not screened through the steps above should complete VMT analysis and forecasting through the Orange County Transportation Analysis Model (OCTAM) to determine if they have a significant VMT impact.

A project would result in a significant VMT impact if either of the following conditions are satisfied:

- Residential Projects:
    - The Baseline Project-Generated VMT per Capita exceeds 15% below the City of Huntington Beach's Baseline VMT per Capita.
    - The Cumulative Project-Generated VMT per Capita exceeds 15% below the City of Huntington Beach's Cumulative VMT per Capita.

The Project-Generated VMT per Capita shall be calculated utilizing OCTAM and using the Production-Attraction (PA) methodology.

- Retail and Other Land Use Projects:
    - The Baseline Project-Generated VMT per Service Population exceeds the City of Huntington Beach's Baseline VMT per Service Population.
    - The Cumulative Project-Generated VMT per Service Population exceeds the City of Huntington Beach's Cumulative VMT per Service Population.

The Project-Generated VMT per Service Population shall be calculated utilizing OCTAM and using the Origin-Destination (OD) methodology.

- Mixed-Use Projects:
    - Mixed-use projects shall be evaluated by each project component and applying the Project-Generated VMT significance threshold for each project type individually (i.e. residential, office/industrial and/or retail/other land use project).

The Baseline and/or Cumulative Project's Effect on VMT would be considered significant if any of the following conditions are satisfied:

- Residential Projects:
    - The Baseline Project's Effect on Link-Level Citywide Boundary VMT per Capita to increase under the "With Project" condition compared to the "No Project" condition.

- The Cumulative Project's Effect on Link-Level Citywide Boundary VMT per Capita to increase under the "With Project" condition compared to the "No Project" condition.

The Project's Effect on VMT shall be calculated utilizing OCTAM, using the Citywide boundary and extracting the total link-level VMT.

- Retail and Other Land Use Projects:
  - The Baseline Project's Effect on Link-Level Citywide Boundary VMT per Service Population to increase under the "With Project" condition compared to the "No Project" condition.
  - The Cumulative Project's Effect on Link-Level Citywide Boundary VMT per Service Population to increase under the "With Project" condition compared to the "No Project" condition.

The Project's Effect on VMT shall be calculated utilizing OCTAM, using the Citywide boundary and extracting the total link-level VMT.

- Mixed-Use Projects:
  - Mixed-use projects shall be evaluated by each project component and applying the Project's Effect on VMT significance threshold for each project type individually (i.e. residential, office/industrial and/or retail/other land use project).

According to the City's Guidelines, if a project results in a significant impact under either of the impact criteria, feasible mitigation measures would be required to reduce the project impact to a less-than-significant level.

4 VMT ANALYSIS

4.1 VMT Screening Analysis

The applicability of each screening criterion to the Project is discussed below.

Screening Criteria 1 – Transit Priority Area (TPA) Screening

Per the City's Guidelines, projects located in a TPA may be presumed to have a less-than-significant VMT impact. A TPA is defined as within one-half mile of major transit stops or along a high-quality transit corridor.

The TPA map provided in the City of Huntington Beach Guidelines is shown in Figure 3. As shown, the Project site is not located within a TPA. Therefore, the Project does not meet the requirements of Screening Criteria 1.

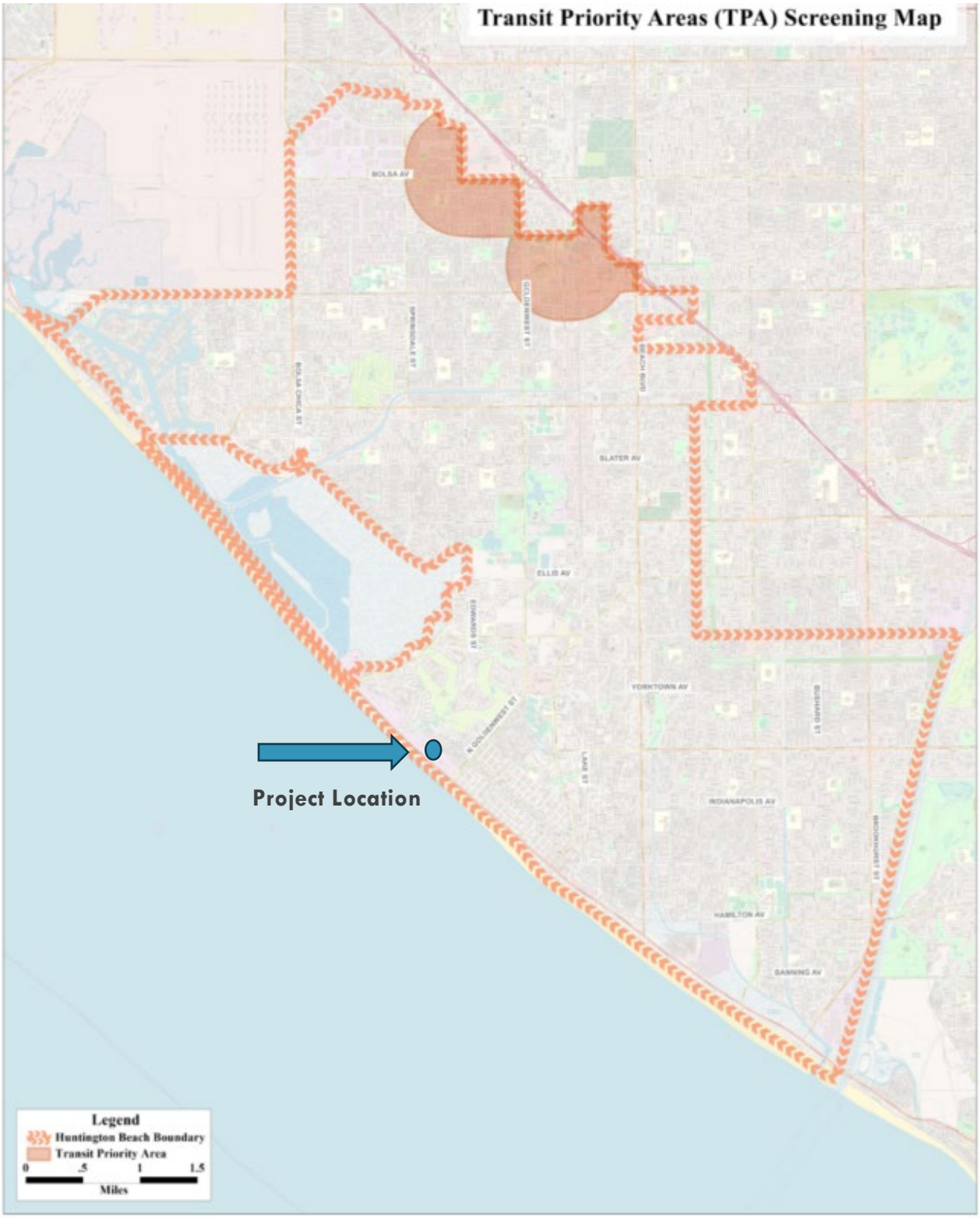
Screening Criteria 2 – Low VMT Area Screening

Projects located within a low VMT-generating area and consistent with the existing land use within that TAZ may be presumed to have a less-than-significant impact on VMT.

The Project is located in TAZ 902. All OCTAM land use inputs can be found in Appendix C. The low VMT generating area map provided in the City of Huntington Beach Guidelines is shown in Figure 4.

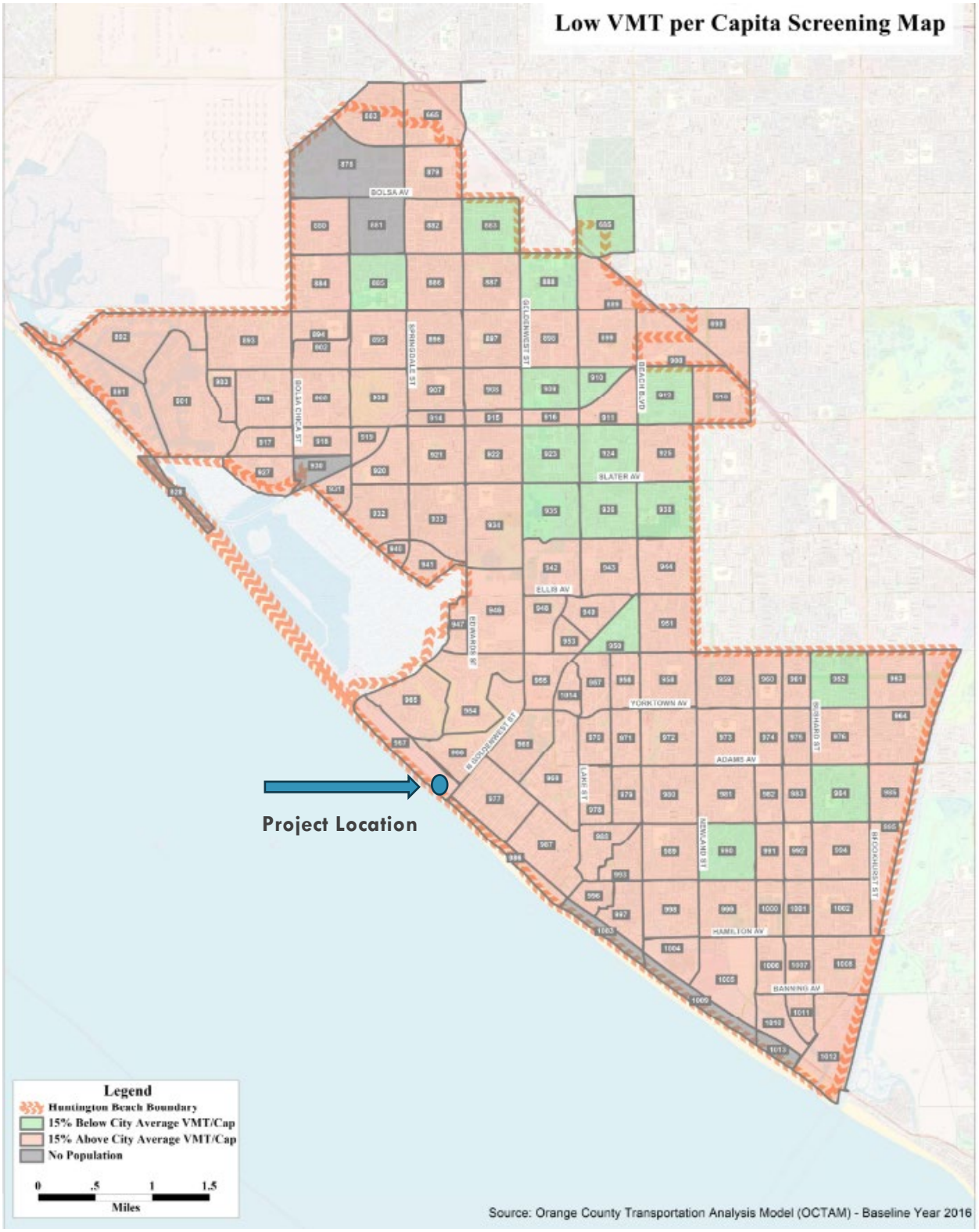
As shown in Figure 4, the Project is not located in a low VMT generating area; therefore, the Project would not meet the requirements of Screening Criteria 2.

Figure 3: TPA Map Provided in City Guidelines



Source: City of Huntington Beach Vehicle Miles Traveled (VMT) Guidelines (October 2023)

Figure 4: Low VMT Generating Area Map Provided in City Guidelines



Source: City of Huntington Beach Vehicle Miles Traveled (VMT) Guidelines (October 2023)

Screening Criteria 3 – Project Type Screening

Based on the guidelines referenced, the following projects would satisfy Screening Criteria 3 and can be presumed to have a less-than-significant impact on VMT:

- Projects Generating less than 110 net Daily Vehicle Trips
- 100 % Affordable Housing
- Local-Serving Retail
- Educational/Institutional Land Use
- Municipal/Public Service Land Use
- Transit and Active Transportation Projects
- Transportation Projects

As shown in Section 2.2, *Project Trip Generation*, the Project would generate 7,638 daily vehicle trips, which is over the 110 daily vehicle trips threshold. As mentioned in the Section 2.1 *Project Description*, the Project does propose a portion of the 365 multi-family units to be affordable housing, which is below the 100% requirement. The Project is not consistent with any of the Project types identified in Screening Criteria 3; therefore, the Project would not meet the requirements of Screening Criteria 3.

Therefore, the Project would not meet any of the City's screening criteria, and a full analysis of VMT was prepared for the residential portion of the Project.

4.2 VMT Analysis Methodology

As described in Section 3.2, *VMT Significance Threshold*, the City's Guidelines require the use of OCTAM for preparation of a VMT analysis.

OCTAM, which incorporated the most up to date roadway circulation and land use data from the City's General Plan, was utilized for the analysis. OCTAM includes validated scenarios for the Model's Base Year (2019) and Buildout (2050).

The Project is located within OCTAM TAZ 902. The OCTAM roadway network near the Project site was reviewed, and no changes were necessary for the roadway network. OCTAM was run for the Base Year (2019) and Buildout (2050) under No Project and With Project conditions (i.e., four full Model runs).

The Base and Buildout With Project conditions VMT were derived by adding the project land use to existing TAZ 902, where the Project is located. The Project's number of employees and number of households are discussed below and were added to TAZ 902 for both the Hotel and Residential components of the Project. All OCTAM land use inputs can be found in Appendix B.

- The potential employment generated by each project component was calculated using a rate of employment per square foot, based on land use type, from the *Southern California Association of Governments Connect SoCal Sustainable Communities Strategy* (September 3, 2020). The land use category "Services" which would yield 1 employee per 725 SF, was used for the Hotel component of the Project. Based on these rates, the Hotel component of the Project would add 481 employees in total. This Project employment was added to TAZ 902.
- The Residential portion of the Project would add 800 households. This Project number of households was added to TAZ 902.

The total OD VMT and PA VMT of the Project TAZ was evaluated using the OCTAM VMT post-processor from the OCTAM Base Year (2019) and Buildout (2050) With Project Model runs:

- To determine OD VMT/service population (hereafter referred to as VMT/SP), the total VMT of the Project TAZ is divided by the service population of the Project TAZ.
- To determine VMT/capita, the total VMT of the Project TAZ is divided by the population of the Project TAZ.
- The 2025 VMT/SP and the 2025 VMT/capita of the Project TAZ were interpolated using linear interpolation between the 2019 and 2050 Model outputs.

The VMT/SP and VMT/capita within the City of Huntington Beach under the No Project conditions for Base Year (2019) and Buildout (2050) were obtained using the No Project Model run. The City of Huntington Beach VMT/SP and VMT/capita for Project Baseline (2025) were calculated from the OCTAM results using linear interpolation between the 2019 and 2050 Model outputs. All OCTAM VMT outputs can be found in Appendix C.

4.3 Project VMT Evaluation

The Project's VMT analysis results of the Hotel component using OCTAM are shown in Table 2, *OCTAM VMT Analysis of Project – TAZ 902 (Hotel)*. The citywide VMT/SP for Huntington Beach is 21.08 for Base Year (2019) and 21.94 for Buildout (2050). The Hotel component's threshold of significance for Project Baseline (2025) per the City's Guidelines would be Project Baseline (2025), which was interpolated to be 21.24 VMT/service population.

As shown in Table 2, the Hotel component of the Project's VMT/SP would be 129.5% above the threshold under Project Baseline (2025) conditions and 132.9% above the threshold under Buildout (2050) conditions. Therefore, the Hotel component of the Project would result in a significant VMT impact, and mitigation would be required.

Table 2: OCTAM VMT Analysis of Project - TAZ 902 (Hotel)

	Base Year 2019	Baseline 2025	Buildout 2050
Project TAZ 902 Zone Total OD VMT	112,500	112,261	111,266
TAZ 902 Population	1,813	1,783	1,659
TAZ 902 Employment	520	520	519
TAZ 902 Enrollment	0	0	0
TAZ 902 Service Population	2,333	2,303	2,178
Project TAZ 902 VMT/SP	**48.22**	**48.75**	**51.09**
Huntington Beach Total OD VMT	6,857,151	6,890,762	7,030,804
Huntington Beach Population	199,551	197,829	190,653
Huntington Beach Employment	84,571	85,049	87,041
Huntington Beach Enrollment	41,232	41,535	42,800
Huntington Beach Service Population	325,354	324,413	320,494
Huntington Beach VMT/SP	**21.08**	**21.24**	**21.94**
% Above/Below Threshold	-	129.5%	132.9%
Impact?	**-**	**Yes**	**Yes**

Source: OCTAM

The Project's VMT analysis results of the Residential component using OCTAM are shown in Table 3, *OCTAM VMT Analysis of Project – TAZ 902 (Residential)*. The citywide VMT/capita for Huntington Beach is 15.19 for Base Year (2019) and 16.21 for Buildout (2050). Therefore, the Citywide VMT/capita for Project Baseline (2025) was interpolated to be 15.38 VMT/capita. The Residential component's threshold of significance for Baseline (2025) per the City's Guidelines would be 15% below Project Baseline (2025), or 13.07 VMT/capita.

As shown in Table 3, the Residential component of the Project's VMT/capita would be 52.8% above the threshold under Project Baseline (2025) conditions and 47.6% above the threshold under Buildout (2050) conditions. Therefore, the Residential portion of the Project would result in a significant VMT impact, and mitigation would be required.

Table 3: OCTAM VMT Analysis of Project – TAZ 902 (Residential)

	Base Year 2019	Baseline 2025	Buildout 2050
Project TAZ 902 Home-based VMT	36,076	35,622	33,730
TAZ 902 Population	1,813	1,783	1,659
Project HB VMT/Capita	**19.90**	**19.98**	**20.33**
Huntington Beach Total HB VMT	3,031,615	3,042,987	3,090,371
Huntington Beach Citywide Population	199,551	197,829	190,653
HB VMT/capita average for Huntington Beach	15.19	15.38	16.21
HB VMT/capita threshold for Huntington Beach	**12.91**	**13.07**	**13.78**
% Above/Below Threshold	-	52.8%	47.6%
Impact?	**-**	**Yes**	**Yes**

Source: OCTAM

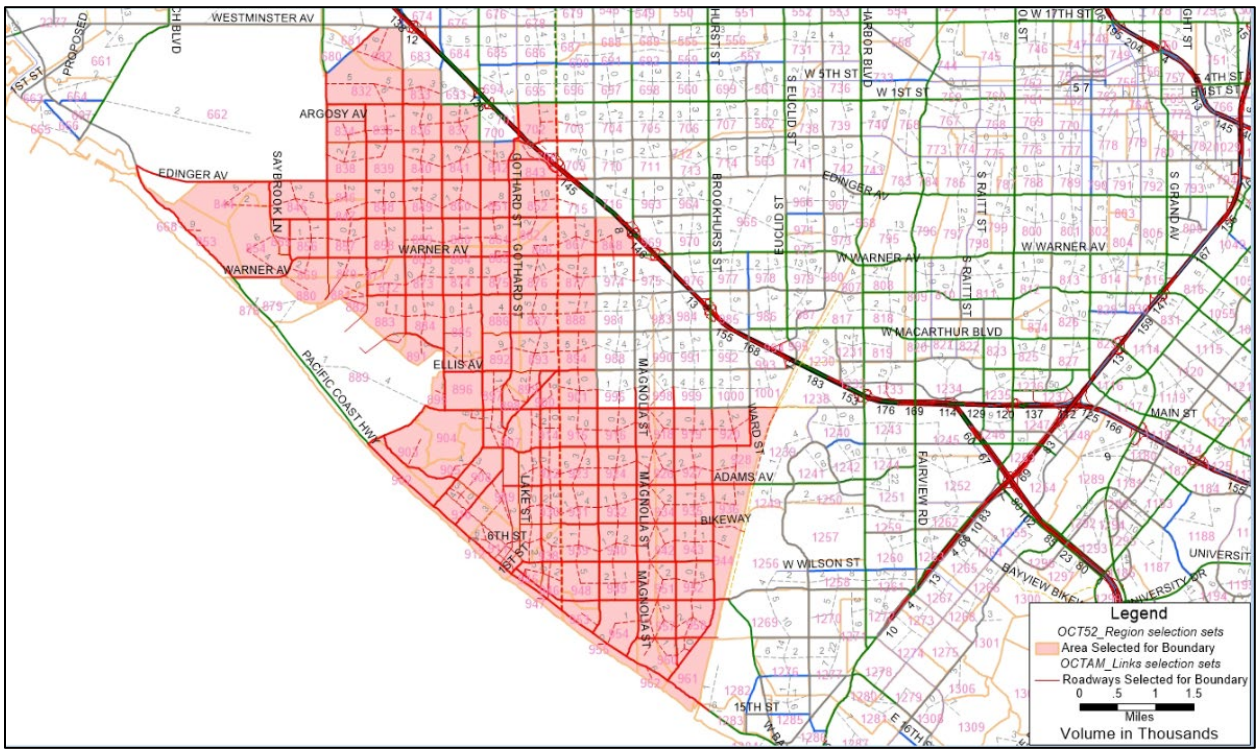
4.4 Project's Effect on VMT

According to the City's Guidelines, the baseline and/or cumulative Project's effect on VMT would be considered significant if any of the following conditions are satisfied:

- if the Residential component of the Project causes total daily VMT/capita within the City to be higher than the No Project scenario under baseline or cumulative conditions, the Residential component of the Project's effect on VMT would be considered significant.
- if the Hotel component of the Project causes total daily VMT/SP within the City to be higher than the No Project scenario under baseline or cumulative conditions, the Hote component of the Project's effect on VMT would be considered significant.

The daily VMT within the City is calculated by the sum of total link-based VMT of all the roadways within the City. The roadways selected to calculate daily VMT are shown below in Figure 5.

Figure 5: Roadways Selected to Calculate Daily VMT



To calculate the daily VMT/capita and daily VMT/SP, the total daily VMT within the City is divided by the total population and total service population of the City. The total population or service population within the City is calculated by the sum of total population or service population of all the TAZs within the City.

The Hotel component of the Project's effect on VMT results are shown in Table 4. The citywide VMT/SP for Huntington Beach is 7.036 for Base Year (2019) and 7.238 for Buildout (2050). Therefore, the City's threshold of significance for Project Baseline (2025) was interpolated to be 7.075 VMT/SP.

As shown in Table 4, the Huntington Beach Citywide Boundary VMT/SP is 0.042% higher with the Hotel component of the Project added under Project Baseline (2025) conditions and 0.055% higher with the Hotel component of the Project added under Cumulative (2050) conditions; therefore, the Hotel component of the Project's effect on VMT would be significant, and mitigation would be required.

Table 4: Project's Effect on VMT Results (Hotel)

	Base Year 2019	Baseline 2025	Cumulative Year 2050
Citywide Boundary VMT With Project	2,304,327	2,310,125	2,334,283
Citywide Population With Project	201,222	199,472	192,182
Citywide Employment With Project	85,052	85,530	87,522
Citywide Enrollment With Project	41,232	41,535	42,800
Citywide Service Population With Project	327,506	326,538	322,504
With Project Citywide Boundary VMT/SP	**7.036**	**7.075**	**7.238**
Citywide Boundary VMT No Project	2,288,262	2,294,091	2,318,376
Citywide Population With Project	199,551	197,829	190,653
Citywide Employment With Project	84,571	85,049	87,041
Citywide Enrollment With Project	41,232	41,535	42,800
Citywide Service Population No Project	325,354	324,413	320,494
No Project Citywide Boundary VMT/SP	**7.033**	**7.072**	**7.234**
% Above/Below Threshold	-	0.042%	0.055%
Impact?	-	**Yes**	**Yes**

The Residential component of the Project's effect on VMT results are shown in Table 5. The citywide VMT/capita for Huntington Beach is 11.452 for Base Year (2019) and 12.146 for Buildout (2050). Therefore, the City's threshold of significance for Project Baseline (2025) was interpolated to be 11.581 VMT/capita.

As shown in Table 5, the Huntington Beach Citywide Boundary VMT/capita is 0.129% lower with the Residential component of the Project added under Project Baseline (2025) conditions and 0.115% lower with the Residential component of the Project added under Cumulative (2050) conditions; therefore, the Residential component of the Project's effect on VMT would be less than significant.

Table 5: Project's Effect on VMT Results (Residential)

	Base Year 2019	Baseline 2025	Cumulative Year 2050
Citywide Boundary VMT With Project	2,304,327	2,310,125	2,334,283
Citywide Population With Project	201,222	199,472	192,182
With Project Citywide Boundary VMT/Capita	**11.452**	**11.581**	**12.146**
Citywide Boundary VMT No Project	2,288,262	2,294,091	2,318,376
Citywide Population With Project	199,551	197,829	190,653
No Project Citywide Boundary VMT/Capita	**11.467**	**11.596**	**12.160**
% Above/Below Threshold	-	-0.129%	-0.115%
Impact?	-	**No**	**No**

5 VMT MITIGATION

5.1 VMT Mitigation Overview

As shown previously in Table 2 through Table 5:

- The Hotel component of the Project's VMT/SP would be 129.5% above the threshold under Project Baseline (2025) conditions and 132.9% above the threshold under Buildout (2050) conditions.
- The Residential component of the Project's VMT/capita would be 52.8% above the threshold under Project Baseline (2025) conditions and 47.6% above the threshold under Buildout (2050) conditions.
- The Huntington Beach Citywide Boundary VMT/capita is 0.042% higher with the Hotel component of the Project added under Project Baseline (2025) conditions and 0.055% higher with the Hotel component of the Project added under Cumulative (2050) conditions.

Therefore, both Project components would require VMT mitigation measures. The City's Guidelines state that individual project mitigation measures are recommended to reduce project specific VMT impacts by implementing Transportation Demand Management (TDM) strategies. It should be noted that the City does not have a Citywide VMT reduction program, such as a fee program or VMT credit exchange. Therefore project-specific strategies were evaluated. The effectiveness of identified TDM strategies is based primarily on research documented in the California Air Pollution Control Officers Association (CAPCOA) *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity* (CAPCOA Handbook) (October 2024).

5.2 VMT Mitigation Measure

Table 6, *CAPCOA VMT Reduction Measures* shows all the CAPCOA VMT Reduction Measures and the justification of each measure's applicability to the Project. Table 7, *Applicable* CAPCOA VMT Reduction Measures shows only the Applicable CAPCOA VMT Reduction Measures and the justification for the measure's applicability to the Project.

Table 6: All CAPCOA VMT Reduction Measures

Mitigation		Applicable to Project?	Justification
Land Use Measures			
T-1	Increase Residential Density	Yes	Feasible
T-2	Increase Job Density	No	Ineffective at Project scale
T-3	Provide Transit Oriented Development	No	Not in a TPA.
T-4	Integrate Affordable and Below Market Rate Housing	Yes	Feasible
T-17	Improve Street Connectivity	No	Ineffective at Project Scale
Trip Reduction Programs			

T-5	Implement Commute Trip Reduction Program (Voluntary)	No	More than 250 employees
T-6	Implement Commute Trip Reduction Program (Mandatory Implementation and Monitoring)	Yes	Feasible
T-7	Implement Commute Trip Reduction Marketing	Yes	Feasible
T-8	Provide Ridership Program	Yes	Feasible
T-9	Implement Subsidized or Discounted Transit Program	Yes	Feasible
T-10	Provide End-of-Trip Bicycle Facilities	Yes	Feasible
T-11	Provide Employer-Sponsored Vanpool	Yes	Feasible
T-12	Price Workplace Parking	Yes	Feasible
T-13	Implement Employee Parking Cash-Out	Yes	Feasible
T-23	Provide Community-Based Travel Planning	Yes	Feasible
Parking or Road Pricing/Management			
T-14	Provide Electric Vehicle Charging Infrastructure	No	Does not Reduce VMT
T-15	Limit Residential Parking Supply	Yes	Feasible
T-16	Unbundle Residential Parking Costs from Property Cost	Yes	Feasible
T-24	Implement Market Price Public Parking (On-Street)	Yes	Feasible
Neighborhood Design			
T-18	Provide Pedestrian Network Improvement	Yes	Feasible
T-19-A	Construct or Improve Bike Facility	Yes	Feasible
T-19-B	Construct or Improve Bike Boulevard	No	Ineffective at Project Scale
T-20	Expand Bikeway Network	Yes	Feasible
T-21-A	Implement Conventional Carshare Program	No	Ineffective at Project Scale
T-21-B	Implement Electric Carshare Program	No	Ineffective at Project Scale
T-22-A	Implement Pedal (Non-Electric) Bikeshare Program	No	Ineffective at Project Scale
T-22-B	Implement Electric Bikeshare Program	No	Ineffective at Project Scale
T-22-C	Implement Scooter share Program	No	Ineffective at Project Scale
Transit			
T-25	Extend Transit Network Coverage or Hours	No	Ineffective at Project Scale
T-26	Increase Transit Service Frequency	No	Ineffective at Project Scale
T-27	Implement Transit-Supportive Roadway Treatments	No	Ineffective at Project Scale
T-28	Provide Bus Rapid Transit	No	Ineffective at Project Scale
T-29	Reduce Transit Fares	No	Ineffective at Project Scale
Clean Vehicles and Fuels			
T-30	Use Cleaner-Fuel Vehicles	No	Does not Reduce VMT

Table 7: Applicable CAPCOA VMT Reduction Measures

Mitigation		Being Implemented by the Project?	Justification
Land Use Measures			
T-1	Increase Residential Density	Yes	Feasible
T-4	Integrate Affordable and Below Market Rate Housing	Yes	Feasible
Trip Reduction Programs			
T-6	Implement Commute Trip Reduction Program (Mandatory Implementation and Monitoring)	Yes	Feasible
T-7	Implement Commute Trip Reduction Marketing	Yes	Feasible
T-8	Provide Ridership Program	Yes	Feasible
T-9	Implement Subsidized or Discounted Transit Program	Yes	Feasible
T-10	Provide End-of-Trip Bicycle Facilities	Yes	Feasible
T-11	Provide Employer-Sponsored Vanpool	Yes	Feasible
T-12	Price Workplace Parking	No	Economic Infeasibility
T-13	Implement Employee Parking Cash-Out	No	Economic Infeasibility
T-23	Provide Community-Based Travel Planning	No	Economic Infeasibility
Parking or Road Pricing/Management			
T-15	Limit Residential Parking Supply	No	Economic Infeasibility
T-16	Unbundle Residential Parking Costs from Property Cost	No	Economic Infeasibility
T-24	Implement Market Price Public Parking (On-Street)	No	Economic Infeasibility
Neighborhood Design			
T-18	Provide Pedestrian Network Improvement	Yes	Feasible
T-19-A	Construct or Improve Bike Facility	Yes	Feasible
T-20	Expand Bikeway Network	No	Ineffective at Project Scale

The following VMT reduction measures that apply to the Project are part of the project design and are implemented as Project Design Features (PDFs):

- **PDF T-1: CAPCOA Measure T-1 Increase Residential Density:** This measure accounts for the VMT reduction achieved by a project that is designed with a higher density of dwelling units (du) compared to the average residential density in the U.S.
    - Increased densities affect the distance people travel and provide greater options for the mode of travel they choose. Increasing residential density results in shorter and fewer trips by single-occupancy vehicles and thus a reduction in VMT and GHG emissions. This measure is best quantified when applied to larger developments where the density is somewhat similar to the surrounding area.
    - The Project is designed to have a residential density of 15.04 du/acre, which is 65.3% higher than the density of a typical development of 9.1 du/acre.
    - Application of PDF T-1: CAPCOA Measure T-1 Increase Residential Density is anticipated to reduce the VMT of the Residential component by 14.35%.

- **PDF T-2: CAPCOA Measure T-4 Integrate Affordable and Below-Market Rate Housing:** This measure 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.
    - This measure would require that a percentage of the Multifamily residential units be permanently dedicated as affordable for lower income families.
    - The Project is designed to have 75 affordable units, which represents 9.38% of all proposed dwelling units.
    - Application of PDF T-2: CAPCOA Measure T-4 Integrate Affordable and Below-Market Rate Housing is anticipated to reduce the VMT of the Residential component by 2.68%.
- **PDF T-3: CAPCOA Measure 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.
    - Implementation of this measure requires the construction of new sidewalks or the repair and enhancement of existing degraded or substandard sidewalks. Within a 0.60 mile radius of the Project boundary, approximately 31.3 miles of sidewalk currently exist. The Project would construct approximately an additional 2.3 miles of sidewalk within the Project site, thereby improving connectivity and expanding the overall pedestrian network.
    - Application of PDF T-3: CAPCOA Measure T-18 Provide Pedestrian Network Improvement is anticipated to reduce the VMT of all Project components by 0.37%.

The following VMT mitigation measures (MMs) are proposed to be implemented by the Project:

- **MM T-1: CAPCOA Measure T-6 Implement Commute Trip Reduction (CTR) Program (Mandatory Implementation and Monitoring).** The Specific Plan requires that this mitigation measure be implemented as a mandatory CTR program (CAPCOA Measure T-6) to enforce VMT reduction. The plan shall also include measures to encourage hotel guests to use alternative modes of transportation, such as offering on-site bicycles, providing bicycle parking for both guests and employees, incorporating shuttle services to transport guest to nearby destinations such as the Downtown/Pier Area and making public transit information readily available in the hotel lobby and on the website. The program will require participation from employees in carpooling, transit use, or biking, with established trip reduction targets, compliance measures, and monitoring procedures to ensure effectiveness. This program includes the following measures as a part of the measure:
    - **Measure T-7: Implement Commute Trip Reduction Marketing.** This measure will ensure that employees are informed about available transportation options, thereby maximizing participation in the CTR programs and contributing to the reduction of traffic congestion.
        - This measure shall be implemented through the Hotel's employer and the Project's homeowners association (HOA) which would provide the following features, or similar alternatives:
            - Onsite or online commuter information services

        - Employee transportation coordinators
        - Onsite or online transit pass sales
        - Guaranteed ride home service
    - Application of CAPCOA Measure T-7 Implement Commute Trip Reduction Marketing is anticipated to reduce the Project-generated VMT by 4.00%.
- **Measure T-8: Provide Ridership Program.** This measure will provide transit passes or other incentives to employees, encouraging the use of public transportation. Given the scale of employment in the Hotel, this program is expected to reduce vehicle use and lower VMT.
    - This measure shall be implemented through the Hotel's employer and the Project's homeowners association (HOA) which would promote the ridesharing program in a multifaceted approach that could include the following:
        - Designating a certain percentage of desirable parking spaces for ridesharing vehicles.
        - Designating adequate passenger loading and unloading and waiting areas for ridesharing vehicles.
        - Providing an app or website for coordinating rides
    - Application of CAPCOA Measure T-8 Provide Ridesharing Program is anticipated to reduce the Project-generated VMT by 4.00%.
- **Measure T-9: Implement Subsidized or Discounted Transit Program.** This measure involves offering subsidized or discounted transit passes to employees. By reducing the cost of public transportation, it aims to increase its use among employees, thereby decreasing single-occupancy vehicle trips and contributing to a reduction in vehicle miles traveled (VMT).
    - This measure shall be implemented by the Hotel Employer, which would provide subsidies to employees for Orange County Transit Authority (OCTA) transit passes. There are four existing public transit stops on either side of the Project site, and a possible future fifth public transit stop at the main entry drive to the Project along the Pacific Coast Highway (PCH). All hotel employees shall be provided free OCTA transit passes. The subsidies provided to the employees for the OCTA transit fares would be $2.00 per single ride or $69.00 for a 30-day pass.
    - Application of CAPCOA Measure T-9 Implement Commute Trip Reduction Program is anticipated to reduce the Project-generated VMT by 0.01%.
- **Measure T-10: Provide End-of-Trip Bicycle Facilities.** End-of-trip facilities, including bike racks, lockers, and showers, will be provided to support employees who choose to bike to work. These facilities are necessary to facilitate and increase bicycle commuting.
    - This measure shall be implemented by installing and maintaining the bicycle facilities on site.
    - Application of CAPCOA Measure T-10 Provide End-of-Trip Bicycle Facilities is anticipated to reduce the Project-generated VMT by 0.15%.
- **Measure T-11: Provide Employer-Sponsored Vanpool.** This measure will support a vanpool program, reducing single-occupancy vehicle use. The vanpool program is particularly applicable to the large workforce anticipated in the Business Park phases.

    - This measure shall be implemented by the Hotel Employer which will implement and monitor the vanpool.
    - Application of CAPCOA Measure T-11 Provide Employer-Sponsored Vanpool is anticipated to reduce the Project-generated VMT by 4.61%.

- CTR programs discourage single-occupancy vehicle trips and encourage alternative modes of transportation such as carpooling, taking transit, walking, and biking, thereby reducing VMT and GHG emissions.
    - This measure shall be implemented by the Hotel Employer and will require participation from employees in carpooling, transit use, or biking, with established trip reduction targets, compliance measures, and monitoring procedures to ensure effectiveness.
    - Application of MM T-1: CAPCOA Measure T-6 Implement Commute Trip Reduction Program (Mandatory) is anticipated to reduce the VMT of the Hotel component by 13.14%.

- **MM T-2: CAPCOA Measure T-19-A 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. This encourages a mode shift on the roadway parallel to the bicycle facility from vehicles to bicycles, displacing VMT and thus reducing GHG
    - The Project proposes a Class II bike lane along the Pacif Coast Highway (PCH) which would provide a safe connection to the Huntington Beach Bike Trail (Class I Bike Path) which runs adjacent to the PCH.
    - Application of MM T-2: CAPCOA Measure T-19-A Construct or Improve Bike Facility is anticipated to reduce the VMT of all Project components by 0.61%.

The project will be required to enforce the implementation of these VMT mitigation measures under CEQA. The Project's anticipated VMT mitigation results that could be achieved based on the applicable and full compliance of mitigation measures identified above are shown in Table 8 below. Supporting documents for the VMT mitigation measures are included in Appendix C.

Table 8: VMT Mitigation Results for the Project

VMT Mitigation	Hotel		Residential	
	Baseline 2025	**Buildout 2050**	**Baseline 2025**	**Buildout 2050**
% Above/Below Threshold	129.49%	132.87%	52.80%	47.60%
Impact?	**Yes**	**Yes**	**Yes**	**Yes**
Project Design Features	**VMT Reduction**	**VMT Reduction**	**VMT Reduction**	**VMT Reduction**
T-1: Increase Residential Density	-	-	-14.35%	-14.35%
T-4. Integrate Affordable and Below Market Rate Housing	-	-	-2.68%	-2.68%
T-18. Provide Pedestrian Network Improvement	-0.37%	-0.37%	-0.37%	-0.37%
Mitigation Measures	**VMT Reduction**	**VMT Reduction**	**VMT Reduction**	**VMT Reduction**
T-6: Implement Commute Trip Reduction Program (Mandatory Implementation and Monitoring)*	-12.77%	-12.77%	-	-
T-7: Implement Commute Trip Reduction Marketing	-4.00%	-4.00%	-	-
T-8: Provide Ridership Program	-4.00%	-4.00%	-	-
T-9: Implement Subsidized or Discounted Transit Program	-0.01%	-0.01%	-	-
T-10: Provide End-of-Trip Bicycle Facilities	-0.15%	-0.15%	-	-
T-11: Provide Employer-Sponsored Vanpool	-4.61%	-4.61%	-	-
T-19-A: Construct or Improve Bike Facility	-0.61%	-0.61%	-0.61%	-0.61%
Total VMT Reduction	**-13.62%**	**-13.62%**	**-17.84%**	**-17.84%**
% Above/Below Threshold with Mitigation	115.87%	119.25%	34.96%	29.76%
Impact with Mitigation?	**Yes**	**Yes**	**Yes**	**Yes**

*Measure T-6: Implement Commute Trip Reduction Program (Mandatory Inplementation and Monitoring) includes measures T-7 through T-11; therefore, the VMT Reduction for measure T-6 reflects the total VMT reduction from measures T-7 through T-11.
Source: OCTAM & CAPCOA

	Base Year 2019	Baseline 2025	Cumulative Year 2050
Citywide Boundary VMT With Project with mitigation	2,302,138	2,307,940	2,332,116
Citywide Population With Project	201,222	199,472	192,182
Citywide Employment With Project	85,052	85,530	87,522
Citywide Enrollment With Project	41,232	41,535	42,800
Citywide Service Population With Project	327,506	326,538	322,504
With Project Citywide Boundary VMT/SP with mitigation	**7.029**	**7.068**	**7.231**
Citywide Boundary VMT No Project	2,288,262	2,294,091	2,318,376
Citywide Population With Project	199,551	197,829	190,653
Citywide Employment With Project	84,571	85,049	87,041
Citywide Enrollment With Project	41,232	41,535	42,800
Citywide Service Population No Project	325,354	324,413	320,494
No Project Citywide Boundary VMT/SP	**7.033**	**7.072**	**7.234**
% Above/Below Threshold	-	-0.057%	-0.041%
Impact?	-	**No**	**No**

Source: OCTAM & CAPCOA

5.3 VMT Reduction Result

As shown in Table 8, the following VMT reductions are anticipated by applying the VMT mitigation measures identified in Section 5.2.

The combined effect of all measures is calculated based on the formula below:

$$\text{Reduction}_{\text{subsector}} = 1 - [(1 - A) \times (1 - B) \times (1 - C)]$$

Where A, B, and C are the individual measure reduction percentages for the measures to be combined in each subsector, as shown in the breakdown below:

- Hotel Component
  - Trip reduction program measures
    - T-6: Implement Commute Trip Reduction Program (Mandatory Implementation and Monitoring)
    - Application of trip reduction program measures is anticipated to reduce the VMT of the Hotel component by 12.77%.
  - Neighborhood Design measures
    - T-18. Provide Pedestrian Network Improvement
    - T-19-A: Construct or Improve Bike Facility
    - Application of neighborhood design measures is anticipated to reduce the VMT of the Hotel component by 0.98%.
  - Using the formula that calculates the combined effect of all measures above, the application of all measures is anticipated to reduce the VMT of the Hotel component by 13.62%.
- Residential Component
  - Land use measures
    - T-1 Increase Residential Density
    - T-4 Integrate Affordable and Below Market Rate Housing
    - Application of land use measures is anticipated to reduce the VMT of the Residential component by 17.03%.
  - Neighborhood Design measures
    - T-18. Provide Pedestrian Network Improvement
    - T-19-A: Construct or Improve Bike Facility
    - Application of neighborhood design measures is anticipated to reduce the VMT of the Residential component by 0.98%.
  - Using the formula that calculates the combined effect of all measures above, the application of all measures is anticipated to reduce the VMT of the Residential component by 17.84%.

In summary, the mitigation measures are anticipated to result in a total VMT reduction of 13.62% for the Hotel component of the Project and 17.84% for the Residential component of the Project. VMT mitigation percentage calculations are included in Appendix C.

With mitigations incorporated, the Hotel component of the Project's VMT/SP would be 115.87% above the threshold under Project Baseline (2025) conditions and 119.25% above the threshold under Buildout (2050) conditions. The Hotel component's Project-Generated VMT impact would be considered significant and unavoidable with mitigation incorporated.

The Residential component of the Project's VMT would be 34.96% above the threshold under Baseline (2025) conditions and 29.76% above the threshold under Buildout (2050) conditions with mitigations incorporated. The Residential component's Project-Generated VMT impact would be considered significant and unavoidable with mitigation incorporated.

Additionally, with mitigations incorporated, the Huntington Beach Citywide Boundary VMT/SP is 0.057% lower with the Hotel component of the Project added under Project Baseline (2025) conditions and 0.041% lower with the Hotel component of the Project added under Cumulative (2050) conditions; therefore, the Hotel component of the Project's effect on VMT would be less than significant with mitigation incorporated.

6 VMT CONCLUSION

In conclusion, the Project-Generated VMT impact of the Project is listed as follows:

- Project-Generated VMT impact of the Hotel component would be significant and unavoidable with mitigation incorporated.
- Project-Generated VMT impact of the Residential component would be significant and unavoidable with mitigation incorporated.

Additionally, the Project's Effect on VMT are also evaluated:

- The Project Hotel component's Effect on VMT would be less than significant with mitigation incorporated.
- The Project Residential component's Effect on VMT would be less than significant.

APPENDIX A – SCOPE OF WORK

Submitted on:	June 2, 2025
Prepared by:	Meghan Macias, TE, Chad Karns, and Hashem Basrawi, EIT
To:	Bob Stachelski City of Huntington Beach
Project Case #	To Be Determined
Site:	20101 Goldenwest Street
Subject:	LOS and VMT Scope of Work for Palm Goldenwest Mixed-Use Project

This memo outlines the proposed scope of work for the Level of Service (LOS) and Vehicle Miles Traveled (VMT) analyses for the proposed Palm Goldenwest Mixed-Use Project located East of Pacific Coast Highway (PCH) between Seapoint Street and Goldenwest Street. Further details regarding the Project description and proposed scope of work are provided below.

Project Name: Palm Goldenwest Specific Plan Amendment – CRC Property

Project Address: 20101 Goldenwest Street

Project Description: The Project proposes to demolish all existing uses on site and redevelop the site with a Mixed-Use Project (concept plan is provided in Attachment D) which would include 186 single-family detached units, 249 single-family attached units, 365 multi-family units, and a 350-room hotel. The Project location is shown in Figure 1, *Project Location*.

Project Access Plan: The Project site would be accessed through 3 signalized driveways along the PCH, 1 two-way stop control driveway along Seapoint Street, and 1 one-way stop control driveway along Goldenwest Street.

Proposed Traffic Control at Project Driveways: Traffic control at Project driveway intersections are shown below. Signalized control is recommended at all Project driveway intersections along PCH. Preliminary results show peak hour traffic signal warrants are anticipated to be met. Traffic signal warrants for all Project driveway intersections along PCH are provided in Attachment A. It is to be noted that peak hour traffic signal warrants were prepared using traffic counts collected at the intersections of PCH/Seapoint St and PCH/Goldenwest St on January 7, 2025 with an applied growth rate of 35% (obtained through Caltrans' PEMS - Performance Measurement System Data Source) to reflect peak summer conditions. Traffic count data is provided in Attachment B. Caltrans' PCH count data is provided in Attachment C.

- PCH/Northern Project Dwy – Signalized Control
- PCH/Central Project Dwy – Signalized Control
- PCH/Southern Project Dwy – Signalized Control
- Seapoint St/Project Dwy – Two-Way Stop Control
- Goldenwest St/Project Dwy – One-Way Stop Control

Trip Generation Rate(s): The Project trip generation was calculated using trip rates from the Institute of Transportation Engineers (ITE), *Trip Generation Manual 11th Edition*, 2021 for the Mixed-Use Project. Table 1 presents the trip generation estimates for the proposed Project. As shown in Table 1, the Project is forecast to generate 7,935 daily trips, 505 trips during the AM peak hour, and 644 trips during the PM peak hour. It is to be noted that the Project site is located within the "*Aera Parcel*" of the Palm/Goldenwest Specific Plan (SP) which includes a specified trip cap of 21,909 ADT (average daily traffic) per the Palm/Goldenwest SP

adopted on February 7, 2000. Given the estimated ADT of the Project's proposed use (i.e., 7,935 daily trips) and the Palm/Goldenwest SP allocated ADT (i.e., 21,909 daily trips), the Project would approximately utilize 36% of the allocated ADT specified in the Palm/Goldenwest SP.

Study Intersections: The following 28 intersections are proposed to be included in the study area:

1. PCH/Warner Ave
2. Bolsa Chica St/Warner Ave
3. PCH/Seapoint St
4. Seapoint St/Project Dwy
5. Seapoint St/Doral Dr
6. Seapoint St/Garfield Ave
7. Edwards St/Garfield Ave
8. PCH/Northern Project Dwy
9. PCH/Central Project Dwy
10. On-Site Project Roundabout
11. PCH/Southern Project Dwy
12. PCH/Goldenwest St
13. Goldenwest St/Project Dwy
14. Goldenwest St/Orange Ave
15. Goldenwest St/Palm Ave
16. Goldenwest St/Yorktown Ave
17. Goldenwest St/Garfield Ave
18. Goldenwest St/Ellis Ave
19. PCH/17th St
20. PCH/6th St
21. PCH/Main St
22. Main St/Garfield Ave
23. PCH/1st St
24. PCH/Beach Blvd
25. Beach Blvd/Atlanta Ave
26. Beach Blvd/Indianapolis Ave
27. Beach Blvd/Adams Ave
28. Beach Blvd/Yorktown Ave

The proposed study area is shown in Figure 2, *Project Study Area*.

Trip Distribution: The Project's trip distribution has been prepared and is provided in Figure 3, *Project Trip Distribution*. It is to be noted that the trip distribution is subject to change based on travel demand forecast model results from Orange County Transportation Analysis Model (OCTAM).

Analysis Scenarios: The TIA will be performed in accordance with the City of Huntington Beach Traffic Impact Analysis Guidelines within the City's General Plan (Policy CIRC 1.B). It is to be noted that the analysis would not need to be conducted in accordance with the Orange County Congestion Management Program (CMP) guidelines since none of the Project's study intersections are identified in the Orange County Congestion Management Program (CMP). The following scenarios will be evaluated in the Traffic Impact Analysis (TIA):

- Existing Conditions
- Opening Year Conditions
- Opening Year With Project Conditions

Level of service at the study intersections will be calculated for all scenarios mentioned above using the methods in the latest edition of the Highway Capacity Manual (HCM) for unsignalized intersections and Intersection Capacity Utilization (ICU) for signalized intersections. Project-generated impacts will be

identified by comparing the opening year LOS with and without the Project. For the purpose of LOS analysis, the opening year is assumed to be 2040. Additionally, a growth rate of 2% will be assumed for the purpose of this analysis for future conditions unless directed otherwise by the City.

Cumulative Projects: The list of cumulative projects will be requested from the City and included in the TIA.

Project Off-site Improvements: Based on the results of the traffic analysis, potential improvements will be identified to mitigate any identified off-site traffic deficiencies. Improvements planned to be implemented by other projects will be considered when identifying improvements.

Vehicle Miles Traveled (VMT) Analysis: The Project's VMT analysis would be prepared in accordance with the City's VMT Guidelines (prepared in October 2023). The following guidelines are included in the City's VMT Guidelines:

"Mixed-use projects shall be evaluated by each project component and applying the Project-Generated VMT significance threshold for each project type individually (i.e. residential, office/industrial and/or retail/other land use project).

A project would result in a Baseline and/or Cumulative significant Project-Generated VMT impact if any of the following conditions are satisfied:

Residential Projects:

The Baseline Project-Generated VMT per Capita exceeds 15% below the City of Huntington Beach's Baseline VMT per Capita.

The Cumulative Project-Generated VMT per Capita exceeds 15% below the City of Huntington Beach's Cumulative VMT per Capita.

The Project-Generated VMT per Capita shall be calculated utilizing OCTAM and using the Production-Attraction(PA) methodology.

Retail and Other Use Projects:

The Baseline Project-Generated VMT per Service Population exceeds the City of Huntington Beach's Baseline VMT per Service Population.

The Cumulative Project-Generated VMT per Service Population exceeds the City of Huntington Beach's Cumulative VMT per Service Population.

The Project-Generated VMT per Service Population shall be calculated utilizing OCTAM and using the Origin-Destination (OD) methodology."

We appreciate your review of this information. Upon completion of your review, please forward any comments or approval of this methodology to techservices@epdsolutions.com. If you have any questions, please do not hesitate to contact us by e-mail or on (949) 794-1180.

City Approval of Scope of Work:

_____
Signature

_____
Name

_____
Date

Table 1. Project Trip Generation

Land Use		Units	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Trip Rates									
Single-Family Detached Housing[1]		DU	9.43	0.18	0.52	0.70	0.59	0.35	0.94
Single-Family Attached Housing[2]		DU	7.2	0.15	0.33	0.48	0.32	0.25	0.57
Multifamily Housing (Low-Rise)[3]		DU	6.74	0.10	0.30	0.40	0.32	0.19	0.51
Hotel[4]		Rooms	7.99	0.26	0.20	0.46	0.30	0.29	0.59
Project Trip Generation									
Single-Family Detached Housing[1]	186	DU	1754	34	96	130	110	65	175
Single-Family Attached Housing[2]	249	DU	1793	37	83	120	81	61	142
Multifamily Housing (Low-Rise)[3]	365	DU	1591	23	71	94	76	44	120
Hotel[4]	350	Rooms	2797	90	71	161	106	101	207
Total Project Trip Generation			**7,935**	**184**	**321**	**505**	**373**	**271**	**644**

DU: Dwelling Unit

[1]Institute of Transportation Engineers, Trip Generation, 11th Edition, 2021. Land Use Code 210 - Single-Family Detached Housing (Average Rate).

[2]Institute of Transportation Engineers, Trip Generation, 11th Edition, 2021. Land Use Code 215 - Single-Family Attached Housing (Average Rate).

[3]Institute of Transportation Engineers, Trip Generation, 11th Edition, 2021. Land Use Code 220 - Multifamily Housing (Low-Rise) (Average Rate).

[4]Institute of Transportation Engineers, Trip Generation, 11th Edition, 2021. Land Use Code 310 - Hotel (Average Rate).

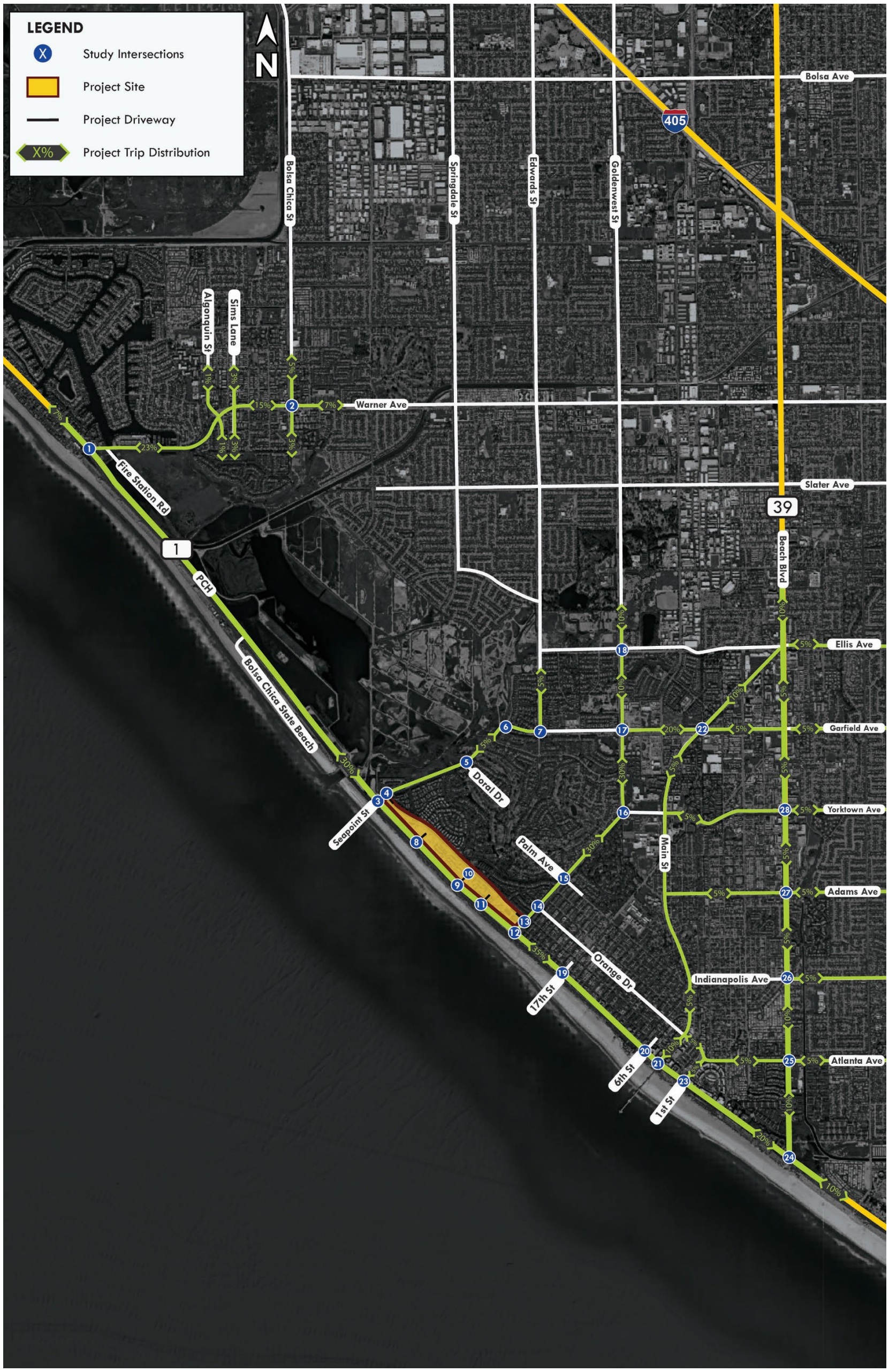
Figure 1: Project Location



Figure 2: Project Study Area



Figure 3: Project Trip Distribution



ATTACHMENT A – TRAFFIC SIGNAL WARRANTS

Signal Warrants Report For Intersection 8: PCH/North Project Dwy

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	E
1	1240	2051	108
2	1203	1989	105
3	1178	1948	103
4	1104	1825	96
5	980	1620	85
6	967	1600	84
7	955	1579	83
8	868	1436	76
9	856	1415	75
10	843	1395	73
11	732	1210	64
12	682	1128	59
13	670	1108	58
14	496	820	43
15	496	820	43
16	347	574	30
17	198	328	17
18	198	328	17
19	112	185	10
20	62	103	5
21	37	62	3
22	12	21	1
23	12	21	1
24	12	21	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	3291	2	108	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
2	3	3192	2	105	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3	3	3126	2	103	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
4	3	2929	2	96	No	No	No	No	No	Yes	Yes	Yes	Yes	No
5	3	2600	2	85	No	No	No	No	No	Yes	Yes	Yes	Yes	No
6	3	2567	2	84	No	No	No	No	No	Yes	Yes	Yes	Yes	No
7	3	2534	2	83	No	No	No	No	No	Yes	Yes	Yes	Yes	No
8	3	2304	2	76	No	No	No	No	No	No	Yes	Yes	No	No
9	3	2271	2	75	No	No	No	No	No	No	Yes	Yes	No	No
10	3	2238	2	73	No	No	No	No	No	No	Yes	Yes	No	No
11	3	1942	2	64	No	No	No	No	No	No	No	Yes	No	No
12	3	1810	2	59	No	No	No	No	No	No	No	Yes	No	No
13	3	1778	2	58	No	No	No	No	No	No	No	Yes	No	No
14	3	1316	2	43	No	No	No	No	No	No	No	No	No	No
15	3	1316	2	43	No	No	No	No	No	No	No	No	No	No
16	3	921	2	30	No	No	No	No	No	No	No	No	No	No
17	3	526	2	17	No	No	No	No	No	No	No	No	No	No
18	3	526	2	17	No	No	No	No	No	No	No	No	No	No
19	3	297	2	10	No	No	No	No	No	No	No	No	No	No
20	3	165	2	5	No	No	No	No	No	No	No	No	No	No
21	3	99	2	3	No	No	No	No	No	No	No	No	No	No
22	3	33	2	1	No	No	No	No	No	No	No	No	No	No
23	3	33	2	1	No	No	No	No	No	No	No	No	No	No
24	3	33	2	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	3	7	10	13	7	3

Warrant 3 Condition A

Orientation	E
Total Stopped Delay Per Vehicle on Minor Approach (s)	970.4
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	29:06
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	108
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	3399
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 9: PCH/Center Project Dwy

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	E
1	1243	2099	108
2	1206	2036	105
3	1181	1994	103
4	1106	1868	96
5	982	1658	85
6	970	1637	84
7	957	1616	83
8	870	1469	76
9	858	1448	75
10	845	1427	73
11	733	1238	64
12	684	1154	59
13	671	1133	58
14	497	840	43
15	497	840	43
16	348	588	30
17	199	336	17
18	199	336	17
19	112	189	10
20	62	105	5
21	37	63	3
22	12	21	1
23	12	21	1
24	12	21	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	3342	2	108	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
2	3	3242	2	105	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3	3	3175	2	103	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
4	3	2974	2	96	No	No	No	No	No	Yes	Yes	Yes	Yes	No
5	3	2640	2	85	No	No	No	No	No	Yes	Yes	Yes	Yes	No
6	3	2607	2	84	No	No	No	No	No	Yes	Yes	Yes	Yes	No
7	3	2573	2	83	No	No	No	No	No	Yes	Yes	Yes	Yes	No
8	3	2339	2	76	No	No	No	No	No	No	Yes	Yes	No	No
9	3	2306	2	75	No	No	No	No	No	No	Yes	Yes	No	No
10	3	2272	2	73	No	No	No	No	No	No	Yes	Yes	No	No
11	3	1971	2	64	No	No	No	No	No	No	No	Yes	No	No
12	3	1838	2	59	No	No	No	No	No	No	No	Yes	No	No
13	3	1804	2	58	No	No	No	No	No	No	No	Yes	No	No
14	3	1337	2	43	No	No	No	No	No	No	No	No	No	No
15	3	1337	2	43	No	No	No	No	No	No	No	No	No	No
16	3	936	2	30	No	No	No	No	No	No	No	No	No	No
17	3	535	2	17	No	No	No	No	No	No	No	No	No	No
18	3	535	2	17	No	No	No	No	No	No	No	No	No	No
19	3	301	2	10	No	No	No	No	No	No	No	No	No	No
20	3	167	2	5	No	No	No	No	No	No	No	No	No	No
21	3	100	2	3	No	No	No	No	No	No	No	No	No	No
22	3	33	2	1	No	No	No	No	No	No	No	No	No	No
23	3	33	2	1	No	No	No	No	No	No	No	No	No	No
24	3	33	2	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	3	7	10	13	7	3

Warrant 3 Condition A

Orientation	E
Total Stopped Delay Per Vehicle on Minor Approach (s)	1032.3
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	30:58
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	108
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	3450
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 11: PCH/South Project Dwy

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	E
1	1351	2172	102
2	1310	2107	99
3	1283	2063	97
4	1202	1933	91
5	1067	1716	81
6	1054	1694	80
7	1040	1672	79
8	946	1520	71
9	932	1499	70
10	919	1477	69
11	797	1281	60
12	743	1195	56
13	730	1173	55
14	540	869	41
15	540	869	41
16	378	608	29
17	216	348	16
18	216	348	16
19	122	195	9
20	68	109	5
21	41	65	3
22	14	22	1
23	14	22	1
24	14	22	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	3523	2	102	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
2	3	3417	2	99	No	No	No	No	No	Yes	Yes	Yes	Yes	No
3	3	3346	2	97	No	No	No	No	No	Yes	Yes	Yes	Yes	No
4	3	3135	2	91	No	No	No	No	No	Yes	Yes	Yes	Yes	No
5	3	2783	2	81	No	No	No	No	No	Yes	Yes	Yes	Yes	No
6	3	2748	2	80	No	No	No	No	No	Yes	Yes	Yes	No	No
7	3	2712	2	79	No	No	No	No	No	No	Yes	Yes	No	No
8	3	2466	2	71	No	No	No	No	No	No	Yes	Yes	No	No
9	3	2431	2	70	No	No	No	No	No	No	Yes	Yes	No	No
10	3	2396	2	69	No	No	No	No	No	No	No	Yes	No	No
11	3	2078	2	60	No	No	No	No	No	No	No	Yes	No	No
12	3	1938	2	56	No	No	No	No	No	No	No	Yes	No	No
13	3	1903	2	55	No	No	No	No	No	No	No	No	No	No
14	3	1409	2	41	No	No	No	No	No	No	No	No	No	No
15	3	1409	2	41	No	No	No	No	No	No	No	No	No	No
16	3	986	2	29	No	No	No	No	No	No	No	No	No	No
17	3	564	2	16	No	No	No	No	No	No	No	No	No	No
18	3	564	2	16	No	No	No	No	No	No	No	No	No	No
19	3	317	2	9	No	No	No	No	No	No	No	No	No	No
20	3	177	2	5	No	No	No	No	No	No	No	No	No	No
21	3	106	2	3	No	No	No	No	No	No	No	No	No	No
22	3	36	2	1	No	No	No	No	No	No	No	No	No	No
23	3	36	2	1	No	No	No	No	No	No	No	No	No	No
24	3	36	2	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	1	6	9	12	5	1

Warrant 3 Condition A

Orientation	E
Total Stopped Delay Per Vehicle on Minor Approach (s)	1466.3
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	41:32
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	102
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	3625
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 8: PCH/North Project Dwy

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	E
1	1894	1431	93
2	1837	1388	90
3	1799	1359	88
4	1686	1274	83
5	1496	1130	73
6	1477	1116	73
7	1458	1102	72
8	1326	1002	65
9	1307	987	64
10	1288	973	63
11	1117	844	55
12	1042	787	51
13	1023	773	50
14	758	572	37
15	758	572	37
16	530	401	26
17	303	229	15
18	303	229	15
19	170	129	8
20	95	72	5
21	57	43	3
22	19	14	1
23	19	14	1
24	19	14	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	3325	2	93	No	No	No	No	No	Yes	Yes	Yes	Yes	No
2	3	3225	2	90	No	No	No	No	No	Yes	Yes	Yes	Yes	No
3	3	3158	2	88	No	No	No	No	No	Yes	Yes	Yes	Yes	No
4	3	2960	2	83	No	No	No	No	No	Yes	Yes	Yes	Yes	No
5	3	2626	2	73	No	No	No	No	No	No	Yes	Yes	No	No
6	3	2593	2	73	No	No	No	No	No	No	Yes	Yes	No	No
7	3	2560	2	72	No	No	No	No	No	No	Yes	Yes	No	No
8	3	2328	2	65	No	No	No	No	No	No	No	Yes	No	No
9	3	2294	2	64	No	No	No	No	No	No	No	Yes	No	No
10	3	2261	2	63	No	No	No	No	No	No	No	Yes	No	No
11	3	1961	2	55	No	No	No	No	No	No	No	No	No	No
12	3	1829	2	51	No	No	No	No	No	No	No	No	No	No
13	3	1796	2	50	No	No	No	No	No	No	No	No	No	No
14	3	1330	2	37	No	No	No	No	No	No	No	No	No	No
15	3	1330	2	37	No	No	No	No	No	No	No	No	No	No
16	3	931	2	26	No	No	No	No	No	No	No	No	No	No
17	3	532	2	15	No	No	No	No	No	No	No	No	No	No
18	3	532	2	15	No	No	No	No	No	No	No	No	No	No
19	3	299	2	8	No	No	No	No	No	No	No	No	No	No
20	3	167	2	5	No	No	No	No	No	No	No	No	No	No
21	3	100	2	3	No	No	No	No	No	No	No	No	No	No
22	3	33	2	1	No	No	No	No	No	No	No	No	No	No
23	3	33	2	1	No	No	No	No	No	No	No	No	No	No
24	3	33	2	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	4	7	10	4	0

Warrant 3 Condition A

Orientation	E
Total Stopped Delay Per Vehicle on Minor Approach (s)	2062.8
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	53:17
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	93
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	3418
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 9: PCH/Center Project Dwy

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	E
1	1942	1447	93
2	1884	1404	90
3	1845	1375	88
4	1728	1288	83
5	1534	1143	73
6	1515	1129	73
7	1495	1114	72
8	1359	1013	65
9	1340	998	64
10	1321	984	63
11	1146	854	55
12	1068	796	51
13	1049	781	50
14	777	579	37
15	777	579	37
16	544	405	26
17	311	232	15
18	311	232	15
19	175	130	8
20	97	72	5
21	58	43	3
22	19	14	1
23	19	14	1
24	19	14	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	3389	2	93	No	No	No	No	No	Yes	Yes	Yes	Yes	No
2	3	3288	2	90	No	No	No	No	No	Yes	Yes	Yes	Yes	No
3	3	3220	2	88	No	No	No	No	No	Yes	Yes	Yes	Yes	No
4	3	3016	2	83	No	No	No	No	No	Yes	Yes	Yes	Yes	No
5	3	2677	2	73	No	No	No	No	No	No	Yes	Yes	No	No
6	3	2644	2	73	No	No	No	No	No	No	Yes	Yes	No	No
7	3	2609	2	72	No	No	No	No	No	No	Yes	Yes	No	No
8	3	2372	2	65	No	No	No	No	No	No	No	Yes	No	No
9	3	2338	2	64	No	No	No	No	No	No	No	Yes	No	No
10	3	2305	2	63	No	No	No	No	No	No	No	Yes	No	No
11	3	2000	2	55	No	No	No	No	No	No	No	No	No	No
12	3	1864	2	51	No	No	No	No	No	No	No	No	No	No
13	3	1830	2	50	No	No	No	No	No	No	No	No	No	No
14	3	1356	2	37	No	No	No	No	No	No	No	No	No	No
15	3	1356	2	37	No	No	No	No	No	No	No	No	No	No
16	3	949	2	26	No	No	No	No	No	No	No	No	No	No
17	3	543	2	15	No	No	No	No	No	No	No	No	No	No
18	3	543	2	15	No	No	No	No	No	No	No	No	No	No
19	3	305	2	8	No	No	No	No	No	No	No	No	No	No
20	3	169	2	5	No	No	No	No	No	No	No	No	No	No
21	3	101	2	3	No	No	No	No	No	No	No	No	No	No
22	3	33	2	1	No	No	No	No	No	No	No	No	No	No
23	3	33	2	1	No	No	No	No	No	No	No	No	No	No
24	3	33	2	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	4	7	10	4	0

Warrant 3 Condition A

Orientation	E
Total Stopped Delay Per Vehicle on Minor Approach (s)	2322.7
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	60:00
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	93
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	3482
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 11: PCH/South Project Dwy

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	E
1	2115	1544	88
2	2052	1498	85
3	2009	1467	84
4	1882	1374	78
5	1671	1220	70
6	1650	1204	69
7	1629	1189	68
8	1481	1081	62
9	1459	1065	61
10	1438	1050	60
11	1248	911	52
12	1163	849	48
13	1142	834	48
14	846	618	35
15	846	618	35
16	592	432	25
17	338	247	14
18	338	247	14
19	190	139	8
20	106	77	4
21	63	46	3
22	21	15	1
23	21	15	1
24	21	15	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	3659	2	88	No	No	No	No	No	Yes	Yes	Yes	Yes	No
2	3	3550	2	85	No	No	No	No	No	Yes	Yes	Yes	Yes	No
3	3	3476	2	84	No	No	No	No	No	Yes	Yes	Yes	Yes	No
4	3	3256	2	78	No	No	No	No	No	No	Yes	Yes	No	No
5	3	2891	2	70	No	No	No	No	No	No	Yes	Yes	No	No
6	3	2854	2	69	No	No	No	No	No	No	No	Yes	No	No
7	3	2818	2	68	No	No	No	No	No	No	No	Yes	No	No
8	3	2562	2	62	No	No	No	No	No	No	No	Yes	No	No
9	3	2524	2	61	No	No	No	No	No	No	No	Yes	No	No
10	3	2488	2	60	No	No	No	No	No	No	No	Yes	No	No
11	3	2159	2	52	No	No	No	No	No	No	No	No	No	No
12	3	2012	2	48	No	No	No	No	No	No	No	No	No	No
13	3	1976	2	48	No	No	No	No	No	No	No	No	No	No
14	3	1464	2	35	No	No	No	No	No	No	No	No	No	No
15	3	1464	2	35	No	No	No	No	No	No	No	No	No	No
16	3	1024	2	25	No	No	No	No	No	No	No	No	No	No
17	3	585	2	14	No	No	No	No	No	No	No	No	No	No
18	3	585	2	14	No	No	No	No	No	No	No	No	No	No
19	3	329	2	8	No	No	No	No	No	No	No	No	No	No
20	3	183	2	4	No	No	No	No	No	No	No	No	No	No
21	3	109	2	3	No	No	No	No	No	No	No	No	No	No
22	3	36	2	1	No	No	No	No	No	No	No	No	No	No
23	3	36	2	1	No	No	No	No	No	No	No	No	No	No
24	3	36	2	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	3	5	10	3	0

Warrant 3 Condition A

Orientation	E
Total Stopped Delay Per Vehicle on Minor Approach (s)	3753.7
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	91:45
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	88
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	3747
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

ATTACHMENT B – TRAFFIC COUNTS DATA

INTERSECTION TURNING MOVEMENT COUNTS

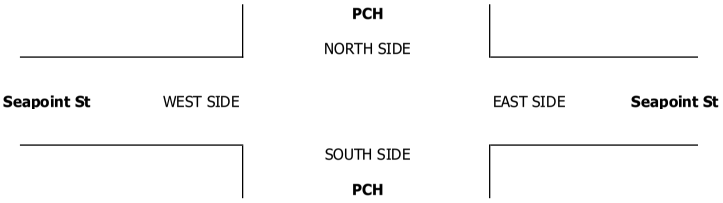
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Huntington Beach	PROJECT #:	SC5104
1/7/25	NORTH & SOUTH:	PCH	LOCATION #:	1
TUESDAY	EAST & WEST:	Seapoint St	CONTROL:	SIGNAL

	NOTES:								
PCE Adjusted	Class	1	2	3	4	5	6		
	Factor	1	1.5	2	3	2	2		

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

		NORTHBOUND PCH			SOUTHBOUND PCH			EASTBOUND Seapoint St			WESTBOUND Seapoint St				U-TURNS				
	LANES:	NL X	NT 2	NR 0	SL 1	ST 2	SR X	EL X	ET X	ER X	WL 1	WT X	WR 1	TOTAL	NB	SB	EB	WB	TTL
AM	7:00 AM	0	127	8	16	224	0	0	0	0	15	0	31	420					0
	7:15 AM	0	153	12	26	282	0	0	0	0	16	0	34	522					0
	7:30 AM	0	186	14	27	357	0	0	0	0	29	0	32	643					0
	7:45 AM	0	194	9	30	329	0	0	0	0	24	0	49	633					0
	8:00 AM	0	200	13	34	356	0	0	0	0	28	0	65	695					0
	8:15 AM	0	208	17	44	329	0	0	0	0	28	0	52	677					0
	8:30 AM	0	236	22	32	243	0	0	0	0	36	0	49	615					0
	8:45 AM	0	192	17	24	237	0	0	0	0	19	0	42	530					0
	VOLUMES	0	1,493	111	231	2,355	0	0	0	0	193	0	351	4,733	0	0	0	0	0
	APPROACH %	0%	93%	7%	9%	91%	0%	0%	0%	0%	35%	0%	65%						
	APP/DEPART	1,604	/	1,844	2,586	/	2,547	0	/	342	544	/	0	0					
	BEGIN PEAK HR		7:30 AM																
	VOLUMES	0	787	53	134	1,370	0	0	0	0	108	0	197	2,647					
	APPROACH %	0%	94%	6%	9%	91%	0%	0%	0%	0%	35%	0%	65%						
	PEAK HR FACTOR		0.934			0.964			0.000			0.827		0.953					
	APP/DEPART	839	/	984	1,504	/	1,477	0	/	187	305	/	0	0					
PM	4:00 PM	0	246	17	34	181	0	0	0	0	17	0	37	531					0
	4:15 PM	0	261	15	46	205	0	0	0	0	11	0	39	576					0
	4:30 PM	0	299	30	29	217	0	0	0	0	31	0	28	633					0
	4:45 PM	0	264	23	43	221	0	0	0	0	25	0	33	608					0
	5:00 PM	0	321	38	33	234	0	0	0	0	18	0	47	690					0
	5:15 PM	0	307	21	57	217	0	0	0	0	9	0	47	657					0
	5:30 PM	0	270	22	41	172	0	0	0	0	14	0	39	556					0
	5:45 PM	0	270	25	34	176	0	0	0	0	11	0	29	544					0
	VOLUMES	0	2,236	189	315	1,622	0	0	0	0	134	0	297	4,793	0	0	0	0	0
	APPROACH %	0%	92%	8%	16%	84%	0%	0%	0%	0%	31%	0%	69%						
	APP/DEPART	2,425	/	2,533	1,937	/	1,756	0	/	504	431	/	0	0					
	BEGIN PEAK HR		4:30 PM																
	VOLUMES	0	1,191	111	161	888	0	0	0	0	82	0	154	2,587					
	APPROACH %	0%	91%	9%	15%	85%	0%	0%	0%	0%	35%	0%	65%						
	PEAK HR FACTOR		0.908			0.957			0.000			0.915		0.938					
	APP/DEPART	1,302	/	1,345	1,049	/	970	0	/	272	236	/	0	0					



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:					
1/7/25	LOCATION:	Huntington Beach	PROJECT #:	SC5104	
TUESDAY	NORTH & SOUTH:	PCH	LOCATION #:	2	
	EAST & WEST:	Goldenwest St	CONTROL:	SIGNAL	

	NOTES:											
PCE Adjusted	Class	1	2	3	4	5	6			AM / PM / MD / OTHER / OTHER	◄ W	▲ N / S ▼ / E ►
	Factor	1	1.5	2	3	2	2					

		NORTHBOUND PCH			SOUTHBOUND PCH			EASTBOUND Goldenwest St			WESTBOUND Goldenwest St			
	LANES:	NL X	NT 2	NR 1	SL 1	ST 2	SR X	EL X	ET X	ER X	WL 2	WT X	WR 1	TOTAL
AM	7:00 AM	0	120	20	30	196	0	0	0	0	55	0	17	437
	7:15 AM	0	163	31	29	278	0	0	0	0	54	0	33	586
	7:30 AM	0	165	26	49	314	0	0	0	0	100	0	28	681
	7:45 AM	0	186	32	58	301	0	0	0	0	74	0	33	684
	8:00 AM	0	187	35	54	297	0	0	0	0	75	0	32	679
	8:15 AM	0	230	38	60	354	0	0	0	0	88	0	47	816
	8:30 AM	0	197	27	28	252	0	0	0	0	67	0	28	599
	8:45 AM	0	196	45	33	231	0	0	0	0	75	0	21	601
	VOLUMES	0	1,443	253	340	2,223	0	0	0	0	586	0	238	5,081
	APPROACH %	0%	85%	15%	13%	87%	0%	0%	0%	0%	71%	0%	29%	
	APP/DEPART	1,695	/	1,680	2,563	/	2,808	0	/	593	823	/	0	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	0	767	131	221	1,266	0	0	0	0	336	0	140	2,859
	APPROACH %	0%	85%	15%	15%	85%	0%	0%	0%	0%	71%	0%	29%	
	PEAK HR FACTOR		0.839			0.898			0.000			0.883		0.876
	APP/DEPART	898	/	907	1,486	/	1,601	0	/	351	475	/	0	0
PM	4:00 PM	0	245	46	35	153	0	0	0	0	35	0	27	540
	4:15 PM	0	262	55	43	185	0	0	0	0	43	0	31	618
	4:30 PM	0	328	63	49	225	0	0	0	0	40	0	38	742
	4:45 PM	0	252	82	59	185	0	0	0	0	47	0	41	665
	5:00 PM	0	296	58	69	200	0	0	0	0	50	0	35	706
	5:15 PM	0	350	76	38	200	0	0	0	0	27	0	44	735
	5:30 PM	0	251	67	54	176	0	0	0	0	36	0	24	606
	5:45 PM	0	299	66	43	163	0	0	0	0	39	0	20	629
	VOLUMES	0	2,280	512	390	1,484	0	0	0	0	317	0	258	5,240
	APPROACH %	0%	82%	18%	21%	79%	0%	0%	0%	0%	55%	0%	45%	
	APP/DEPART	2,792	/	2,538	1,874	/	1,801	0	/	902	575	/	0	0
	BEGIN PEAK HR		4:30 PM											
	VOLUMES	0	1,225	279	215	809	0	0	0	0	164	0	157	2,847
	APPROACH %	0%	81%	19%	21%	79%	0%	0%	0%	0%	51%	0%	49%	
	PEAK HR FACTOR		0.882			0.935			0.000			0.911		0.960
	APP/DEPART	1,504	/	1,382	1,023	/	972	0	/	493	321	/	0	0

ATTACHMENT C – CALTRANS' COUNTS DATA

DI	RTE	CO	PRE	PM	CS	LEG	YR	AM DIR	AM WAY PHV	AM K FACTOR AMT	AM D FACTOR AMT	AM KD FACTOR	AM HOUR	AM DAY	AM MONTH	PM DIR	PM WAY PHV	PM K FACTOR AMT	PM D FACTOR AMT	PM KD FACTOR	PM HOUR	PM DAY	PM MONTH
05	001	MON	R	89.177	525	O	16	S	3140	7.920	71.400	5.660	7	WED	JAN	N	3,517	9.470	66.900	6.340	16	THU	JUL
04	001	SM		0.000	163	A	16	S	470	15.790	58.680	9.260	12	SUN	JUL	S	480	15.850	59.700	9.460	13	SUN	JUL
04	001	SM		26.432	433	B	16	S	671	11.230	65.850	7.390	10	SAT	JUL	N	744	13.050	62.840	8.200	17	SUN	JUL
04	001	MRN		28.600	65	A	16	N	356	14.500	65.080	9.440	10	SAT	JUL	N	406	18.610	57.840	10.760	13	SAT	JUL
01	001	MEN		15.950	181	A	16	S	167	12.840	60.730	7.800	12	SUN	AUG	N	150	12.650	55.350	7.000	15	MON	AUG
01	001	MEN		33.910	123	A	17	N	99	13.640	55.310	7.550	10	SUN	JUN	N	100	14.180	53.760	7.620	16	FRI	JUN
01	001	MEN	R	49.370	114	B	16	N	367	11.700	53.420	6.250	12	SAT	AUG	N	397	11.940	56.630	6.760	13	SAT	AUG
01	001	MEN		90.630	999	B	16	N	73	22.120	60.330	13.350	12	MON	AUG	S	93	25.410	66.910	17.000	14	SUN	AUG
01	001	MEN		105.480	764	B	17	S	82	17.010	62.120	10.570	12	WED	AUG	N	87	19.850	56.490	11.210	15	WED	AUG
02	003	SIS		8.800	106	A	17	N	32	12.830	66.670	8.560	9	SAT	AUG	S	33	13.900	63.460	8.820	14	THU	AUG
04	004	CC	R	41.960	486	B	15	E	772	8.250	65.370	5.390	11	WED	JUN	E	502	6.360	55.170	3.510	13	WED	JUN
10	004	SJ		6.037	327	A	17	W	641	8.490	66.430	5.640	6	TUE	AUG	E	906	10.590	75.250	7.970	15	FRI	JUN
10	004	SJ		6.037	328	B	17	W	681	8.510	68.030	5.790	6	TUE	AUG	E	902	10.590	72.390	7.660	15	FRI	JUN
10	004	SJ		24.870	336	B	16	W	375	10.560	60.980	6.440	11	SUN	JUL	W	438	10.750	69.970	7.520	16	SUN	AUG
11	005	SD	R	51.201	905	A	17	N	7603	6.980	51.760	3.610	10	SAT	JUN	N	7,411	6.520	53.960	3.520	17	THU	JUN
11	005	SD	R	54.390	954	A	17	N	6030	7.650	54.530	4.170	11	SUN	AUG	N	5,496	7.370	51.590	3.800	13	SUN	JUN
06	005	KIN		12.362	571	B	17	N	1354	7.190	58.950	4.240	12	FRI	JUN	N	2,125	10.180	65.370	6.650	17	SUN	JUN
03	005	YOL		5.530	65	B	15	N	2318	7.250	57.190	4.140	7	WED	JUL	S	2,994	9.250	57.890	5.350	17	FRI	JUN
03	005	YOL	R	7.086	75	A	17	N	1558	7.120	55.500	3.950	10	THU	JUN	N	1,791	8.700	52.250	4.550	16	FRI	JUL
03	005	YOL	R	22.610	80	A	17	N	1946	8.480	63.310	5.370	9	FRI	AUG	N	2,173	9.570	62.600	5.990	17	FRI	JUN
03	005	COL	R	17.975	85	B	17	N	1852	10.120	59.970	6.070	11	FRI	JUN	N	2,061	10.950	61.650	6.750	13	FRI	AUG
03	005	GLE	R	9.872	345	B	17	S	1363	10.180	52.140	5.310	11	SAT	AUG	S	1,748	11.230	60.610	6.810	16	SUN	AUG
03	005	GLE	R	10.877	202	B	17	N	1684	10.110	57.200	5.780	11	FRI	JUN	N	1,945	10.490	63.690	6.680	17	FRI	AUG
03	005	GLE	R	24.817	92	B	17	S	1391	9.260	53.870	4.990	11	SUN	AUG	S	1,717	10.650	57.870	6.160	15	SUN	AUG
03	005	GLE	R	27.812	95	A	17	N	1507	9.350	58.780	5.490	10	FRI	JUN	S	1,679	10.500	58.300	6.120	13	SUN	JUL
02	005	TEH	R	26.525	321	B	17	S	1967	7.730	66.810	5.170	8	TUE	AUG	N	2,259	9.080	65.330	5.930	16	SAT	AUG
02	005	SHA	R	14.459	304	A	17	N	3082	8.450	53.520	4.520	12	THU	JUL	S	3,290	9.030	53.480	4.830	15	THU	AUG
02	005	SHA	R	15.448	196	A	17	N	2737	8.290	55.720	4.620	10	FRI	AUG	N	2,927	9.220	53.620	4.940	15	FRI	JUN
02	005	SHA	R	24.080	309	A	17	N	1586	10.990	63.570	6.980	12	THU	AUG	N	1,620	11.850	60.200	7.130	15	SAT	JUL
02	005	SHA	R	26.035	273	B	17	N	2031	13.270	66.850	8.870	11	SUN	AUG	N	2,029	10.820	81.950	8.860	14	WED	JAN
02	005	SIS	R	11.170	310	O	17	S	1441	4.810	71.510	3.440	8	TUE	AUG	N	1,783	6.720	63.380	4.260	13	FRI	AUG
02	005	SIS	R	22.999	294	O	17	N	1040	10.440	60.570	6.320	9	SAT	JUL	N	1,247	12.050	62.950	7.580	15	FRI	AUG
11	008	SD		14.594	806	B	17	W	7281	6.910	59.510	4.110	7	THU	AUG	E	7,411	7.980	52.460	4.180	15	THU	JUN
11	008	SD	R	18.727	824	B	17	W	7730	11.830	67.150	7.940	7	FRI	JUL	E	8,228	14.630	57.810	8.460	17	WED	JUL
04	009	SCL		0.000	50	A	16	N	288	13.850	64.290	8.910	12	SAT	JUN	S	337	13.270	78.560	10.420	17	SUN	JUN
08	010	SBD		31.405	150	B	17	W	7791	6.710	67.540	4.530	7	TUE	AUG	E	7,116	6.820	60.720	4.140	16	THU	JUL
10	012	CAL		13.872	155	A	15	E	489	11.910	68.490	8.160	8	MON	JAN	W	431	11.620	61.840	7.190	15	TUE	JAN
11	015	SD		0.405	909	A	17	S	4417	6.970	57.790	4.030	6	THU	JUN	N	5,130	8.640	54.170	4.680	16	TUE	JUL
11	015	SD	M	15.000	999	X	17	S	11760	7.860	57.140	4.490	7	TUE	AUG	S	10,492	7.660	52.330	4.010	15	FRI	AUG
11	015	SD	M	26.026	934	B	17	S	9465	6.560	66.810	4.380	6	THU	JUL	N	9,205	7.270	58.590	4.260	16	THU	JUN
03	016	SAC	R	22.848	910	A	17	E	325	8.730	60.630	5.290	11	SAT	JUL	E	369	8.860	67.830	6.010	17	MON	JUL
08	018	SBD	R	17.732	814	B	15	N	867	10.320	80.430	8.300	10	FRI	JUL	N	1,068	11.810	86.550	10.220	16	FRI	JUL
08	018	SBD		73.783	899	A	15	S	449	10.590	51.670	5.470	11	FRI	JAN	S	493	9.540	62.960	6.010	13	THU	JAN
10	026	SJ		6.850	52	A	16	W	418	9.570	66.560	6.370	7	WED	AUG	E	357	9.050	60.100	5.440	17	MON	AUG
03	028	PLA		0.830	156	A	15	W	524	7.340	62.460	4.580	11	SAT	JAN	E	629	9.310	59.060	5.500	16	FRI	JAN
03	028	PLA		11.028	167	O	16	W	560	7.810	56.400	4.400	12	SAT	JAN	W	675	9.450	56.160	5.310	16	TUE	JAN
07	033	VEN		11.210	84	A	17	N	686	10.620	53.220	5.650	7	MON	AUG	S	749	11.520	53.580	6.170	14	SUN	AUG
06	033	KER	R	11.555	56	A	15	S	271	8.710	75.280	6.560	5	TUE	JUL	N	237	9.580	59.850	5.730	16	FRI	JUL
06	033	KER		18.790	57	B	15	S	577	6.360	99.140	6.310	2	WED	JUL	S	504	10.280	53.620	5.510	15	FRI	JAN
06	033	FRE	R	18.588	608	B	17	N	282	7.690	78.990	6.070	5	THU	AUG	S	285	8.890	69.010	6.140	16	TUE	AUG
10	033	MER	R	5.635	191	B	16	S	616	10.250	63.900	6.550	12	SAT	JUN	S	541	9.440	60.990	5.750	13	SUN	JUL
02	036	TEH		44.004	112	A	15	W	137	13.120	54.150	7.100	11	SAT	AUG	W	154	11.560	69.060	7.980	14	SUN	AUG
02	036	TEH		55.260	286	A	16	W	121	16.020	59.020	9.450	10	SUN	AUG	W	158	16.250	75.960	12.340	15	SUN	AUG
02	036	TEH		82.205	225	O	16	W	126	18.610	60.580	11.270	11	SUN	AUG	W	161	20.660	69.700	14.400	13	SUN	AUG
02	036	PLU		6.287	218	B	16	W	257	16.710	77.640	12.970	10	SUN	AUG	E	218	14.790	74.400	11.000	17	FRI	AUG
02	036	PLU		8.840	114	O	16	W	382	14.660	51.830	7.600	11	SAT	AUG	E	375	14.400	51.800	7.460	13	SAT	AUG
02	036	PLU		9.180	235	A	16	W	296	12.100	61.540	7.450	11	SUN	AUG	W	296	12.150	61.280	7.450	13	SUN	AUG
02	036	LAS		0.760	115	B	16	W	117	11.840	50.650	6.000	12	SUN	AUG	W	130	12.610	52.850	6.660	15	FRI	AUG
02	036	LAS		25.045	296	O	17	W	585	9.480	54.830	5.200	10	SAT	JUL	W	641	10.470	54.410	5.690	15	THU	JUN
07	039	LA		17.813	746	O	16	N	269	18.000	63.900	11.500	11	SUN	JUN	S	312	18.600	71.720	13.340	16	SUN	JUN
08	040	SBD	R	28.481	855	B	17	W	1061	12.050	63.690	7.680	11	SUN	JUL	W	1,055	11.300	67.540	7.630	14	SUN	JUL
05	041	SLO		14.520	277	B	17	S	987	13.690	50.180	6.870	10	SAT	JUL	S	1,137	15.790	50.130	7.910	19	FRI	JUL
06	041	KIN		8.098	33	A	17	S	701	11.660	76.860	8.960	9	SAT	JUL	N	675	12.680	68.040	8.630	17	SUN	JUN
06	041	KIN		20.080	38	B	17	S	536	9.800	70.900	6.940	10	SAT	JUN	N	550	11.180	63.730	7.130	16	SUN	JUN
06	041	KIN		33.004	414	B	17	S	536	9.660	69.160	6.680	10	SAT	JUN	N	576	11.210	64.070	7.180	16	SUN	JUN
06	041	MAD		35.770	620	A	16	N	720	10.370	62.770	6.510	9	SAT	AUG	S	654	9.300	63.620	5.920	17	SUN	AUG
06	041	MPA		4.918	153	O	16	N	381	15.740	78.560	12.370	10	SAT	AUG	S	353	14.090	81.340	11.460	17	SUN	AUG
02	044	SHA		32.000	284	A	17	E	285	11.490	63.900	7.340	9	SAT	JUL	W	278	12.990	55.160	7.160	15	SUN	JUL
02	044	SHA	R	49.353	118	B	16	E	144	14.650	73.850	10.820	10	SAT	AUG	W	128	15.480	62.140	9.620	15	SUN	AUG
02	044	SHA		62.685	119	B	16	W	129	17.320	53.750	9.310	12	SAT	AUG	W	130	15.510	60.470	9.380	14	SUN	AUG
02	044	LAS		37.247	120	B	17	W	138	13.910	58.970	8.200	10	FRI	JUN	E	144	16.770	51.060	8.560	13	SUN	JUN
05	046	SLO		45.480	544	B	17	W	1205	9.060	62.370	5.650	12	SAT	AUG	E	1,226	9.460	60.750	5.750	14	SUN	JUN
06	046	KER		0.000	68	A	17	E	524	11.720	55.690	6.530	12	SUN	JUL	W	560	13.170	52.980	6.980	16	FRI	JUL
06	046	KER		20.543	4	A	15	E	468	10.070	58.870	5.930	12	SUN	JUL	E	558	12.680	55.740	7.070	15	MON	JUL
10	049	TUO	R	6.468	176	B	16	N	65	11.410	67.010	7.650	11	SAT	JUL	S	61	10.710	67.030	7.180	16	FRI	JUL
03	049	ED		24.480	260	B	17	S	398	8.290	73.160	6.060	7	THU	AUG	N	410	10.150	61.560	6.250	17	FRI	JUN
03	049	NEV	R	13.663	212	B	15	S	1192	8.040	56.250	4.520	12	SUN	JUN	S	1,297	8.850	55.620	4.920	17	WED	JUN
03	049	SIE		47.440	217	B	17	N	49	23.060	61.250	14.120	11	SUN	JUL	N	51	20.750	70.830	14.700	14	SUN	AUG
02	049	PLU		7.500	121	B	16	S	62	9.410	65.960	6.210	8	TUE	AUG	S	76	10.810	70.370	7.610	17	MON	AUG
03	050	ED		80.439	387	O	16	W	1016	7.130	50.800	3.620	12	SAT	JAN	E	1,277	8.490	53.630	4.550	16	SAT	JAN
11	052	SD		0.324	720	A	17	E	5478	8.490	71.460	6.070	8	TUE	AUG	E	5,944	9.080	72.520	6.590	17	TUE	JUN
11	054	SD		4.207	816	A	17	W	5865	8.040	59.840	4.810	7	WED	AUG	E	5,071	7.900	52.670	4.160	16	TUE	AUG
07	060	LA	R	7.774	499	A	16	W	8141	6.450	56.900	3.670	7	WED	JUL	W	7,719	6.590	52.760	3.480	14	SUN	JUL
08	062	SBD		125.761	986	A	17	W	311	13.320	81.410	10.850	9	SUN	JUN	W	295	13.600	75.640	10.290	16	SUN	JUN
11	067	SD		15.200	972	A	17	S	1639	7.370	85.370	6.290	6	WED	AUG	N	1,597	8.450	72.560	6.130	16	WED	AUG
03	070	BUT		4.060	628	B	17	E	633	8.240	53.190	4.380	11	SAT	JUL	W	711	9.250	53.220	4.920	14	FRI	JUL
02	070	PLU		33.026	306	B	16	W	131	14.010	71.200	9.980	11	SUN	AUG	W	120	13.860	65.930	9.140	14	SUN	AUG
02	070	PLU		43.785	122	B	16	E	644	11.850	53.220	6.300	12	FRI	AUG	E	574	10.600	53.000	5.620	13	THU	AUG
02	070	PLU	R	66.628	255	B	16	W	190	12.540	53.980	6.770	12	THU	AUG	W	192	10.080	67.850	6.840	18	FRI	AUG
11	076	SD		32.870	831	B	17	W	441	8.120	66.820	5.430	9	FRI	JUN	W	603	9.160	81.050	7.420	20	SUN	JUL
04	077	ALA		0.098	29	A	15	S	939	6.380	68.640	4.380	7	THU	JUN	N	852	7.000	56.760	3.970	18	MON	JUN
11	078	SD		4.384	971	A	17	W	5084	6.930	54.500	3.770	7	TUE	AUG	W	5,163	7.190	53.320	3.830	16	THU	JUN
11	078	IMP		21.023	719	A	17	W	216	14.630	79.120	11.580	8	MON	JAN	W	216	15.220	76.060	11.580	14	MON	JAN
08	078	RIV		9.352	775	A	17	W	117	11.230	65.360	7.340	12	FRI	JUN	W	121	10.790	70.350	7.590	13	SUN	JUL
03	080	PLA		7.421	451	A	15	W	4613	7.990	59.750	4.770	11	MON	JUL	E	4,676	8.400	57.590	4.840	16	FRI	JAN
03	080	PLA	R	26.209	325	A	17	W	2998	11.620	61.020	7.090	12	SUN	JUL	E	3,007	11.150	63.830	7.110	13	SAT	JUL
03	080	NEV	R	9.007	759	A	16	W	3005	13.350	73.620	9.820	10	TUE	JUL	W	2,655	14.270	60.830	8.680	14	SUN	AUG
04	082	SM		12.963	185	B	15	S	1330	9.410	56.600	5.330	8	MON	JAN	S	1,333	9.980	53.510	5.340	17	WED	JUL
03	084	YOL		11.770	343	B	17	N	113	12.930	73.380	9.490	7	MON	JUL	S	132	17.720	62.560	11.080	17	FRI	JUL
10	088	SJ		9.610	329	A	17	E	511	8.080	64.200	5.190	9	SAT	JUL	W	608	9.010	68.470	6.170	17	MON	JAN
10	089	ALP		23.972	653	O	15	S	372	17.030	68.260	11.620	10	FRI	JUL	N	706	31.660	69.690	22.060	17	THU	JUL
03	089	ED		0.000	653	O	15	S	372	17.030	68.260	11.620	10	FRI	JUL	N	706	31.660	69.690	22.060	17	THU	JUL
03	089	ED		8.550	655	B	16	N	323	11.300	57.470	6.500	12	SAT	AUG	N	360	13.660	53.020	7.240	15	FRI	JUL
03	089	PLA	T	8.569	667	A	17	N	858	12.580	58.650	7.380	9	WED	JUL	S	803	12.250	56.350	6.900	16	FRI	JUN
03	089	PLA		13.058	668	O	15	N	638	10.360	62.060	6.430	11	SUN	JAN	N	659	10.830	61.300	6.640	15	SUN	JAN
02	089	PLU		8.710	126	B	16	N	197	14.780	58.280	8.610	11	SUN	AUG	S	187	14.780	55.330	8.180	13	FRI	AUG
02	089	PLU	R	42.185	129	B	16	N	161	13.490	69.400	9.360	10	SUN	AUG	S	164	18.370	51.900	9.530	14	FRI	AUG
02	089	TEH	R	0.010	130	A	16	N	95	30.670	77.240	23.690	10	SAT	AUG	S	98	29.930	81.670	24.440	17	SUN	AUG
02	089	SHA		21.719	195	B	17	N	220	18.590	63.580	11.820	12	SUN	AUG	S	143	12.840	59.830	7.680	13	WED	AUG
02	089	SHA		30.000	242	O	17	S	130	15.730	58.300	9.170	12	THU	AUG	N	131	16.640	55.510	9.240	13	MON	AUG
12	091	ORA	R	3.020	723	A	16	E	10060	6.190	59.650	3.690	6	FRI	JUL	E	10,745	6.930	56.830	3.940	14	TUE	JUL
12	091	ORA		6.800	412	A	16	W	8208	7.000	52.410	3.670	7	WED	JAN	W	8,326	6.690	55.650	3.720	16	MON	JUN
12	091	ORA	R	10.091	913	A	16	E	10297	6.340	52.040	3.300	12	SAT	JUN	W	11,433	6.230	58.790	3.660	15	TUE	JUN
01	096	HUM		3.590	108	O	17	W	116	9.890	58.000	5.730	12	THU	AUG	W	138	12.700	53.700	6.820	13	MON	AUG
02	097	SIS	L	0.000	268	A	17	N	547	9.930	50.050	4.970	12	MON	AUG	N	621	9.660	58.420	5.640	16	TUE	AUG
02	097	SIS		20.190	183	B	17	N	364	13.750	72.510	9.970	9	FRI	AUG	N	460	15.640	80.560	12.600	17	SUN	AUG
02	097	SIS		53.809	290	B	17	N	285	9.350	62.360	5.830	10	WED	AUG	N	411	12.130	69.310	8.410	17	WED	AUG
06	099	TUL		23.489	632	B	17	S	2117	7.330	53.500	3.920	12	MON	JAN	N	2,619	8.680	55.910	4.850	14	FRI	JUN
03	099	SUT		30.252	561	A	17	N	1293	7.450	51.840	3.860	12	THU	JUN	N	1,501	8.360	53.630	4.480	15	FRI	JUN
03	099	SUT	T	30.629	562	A	17	S	976	7.510	56.940	4.280	7	TUE	AUG	N	1,109	8.050	60.400	4.860	17	WED	AUG
03	099	SUT		40.250	564	B	17	S	766	7.330	54.710	4.010	10	SAT	AUG	N	851	8.360	53.290	4.460	16	WED	AUG
07	101	LA		27.600	703	B	16	N	8024	7.530	55.630	4.190	8	WED	JUN	N	6,949	6.820	53.200	3.630	13	SUN	JUN
05	101	SLO		17.756	441	B	17	N	3325	7.200	66.350	4.780	6	WED	AUG	S	3,458	8.350	59.530	4.970	15	WED	JUN
05	101	SLO		52.440	239	A	17	N	2703	9.060	50.680	4.590	11	FRI	JUL	S	2,939	9.630	51.860	4.990	15	FRI	AUG
05	101	MON	R	32.015	508	B	15	S	975	11.660	50.050	5.840	11	SUN	JUL	N	1,218	13.890	52.480	7.290	14	SUN	JUL
05	101	MON		47.694	741	A	17	N	1611	9.160	54.590	5.000	12	SUN	AUG	N	1,833	9.930	57.300	5.690	14	SUN	JUN
05	101	SBT		7.550	711	B	16	S	3018	9.070	54.910	4.980	11	SAT	AUG	S	2,803	8.460	54.690	4.630	15	SAT	AUG
04	101	SCL		3.197	58	B	16	N	3029	9.180	54.450	5.000	11	SUN	JUN	N	3,168	8.960	58.340	5.230	16	SUN	JUN
01	101	MEN		42.200	164	O	17	N	904	9.610	56.610	5.440	10	SAT	JUL	N	1,002	11.100	54.310	6.030	15	FRI	JUL
01	101	MEN		55.380	115	B	17	S	535	10.900	60.250	6.570	12	SUN	JUN	S	588	12.370	58.390	7.220	13	SUN	JUL
01	101	HUM		33.246	928	A	17	S	437	10.980	52.910	5.810	11	FRI	AUG	N	523	11.470	60.600	6.950	15	WED	AUG
01	101	HUM	R	51.840	801	B	17	S	557	10.310	59.000	6.090	11	FRI	AUG	N	615	11.140	60.290	6.720	15	MON	AUG
01	101	HUM		57.510	185	B	17	N	667	9.230	55.450	5.120	12	FRI	AUG	N	818	11.570	54.210	6.270	15	FRI	AUG
01	101	HUM		65.540	110	A	17	S	1149	7.970	61.350	4.890	11	SUN	AUG	S	1,420	10.280	58.800	6.040	17	TUE	AUG
01	101	HUM		125.730	133	O	17	S	307	13.830	56.230	7.770	11	SUN	JUL	N	349	14.970	59.050	8.840	14	SAT	JUL
01	101	DN	R	0.510	134	O	17	N	279	14.140	53.970	7.630	11	SAT	AUG	S	293	15.620	51.310	8.010	14	SUN	AUG
01	101	DN		23.770	806	A	17	N	340	14.200	53.210	7.560	11	THU	JUL	N	378	14.160	59.340	8.400	16	WED	AUG
01	101	DN	R	28.410	930	B	17	S	591	10.820	51.660	5.590	12	MON	JUL	N	634	10.220	58.650	5.990	17	TUE	AUG
01	101	DN		45.890	807	B	17	N	476	10.490	54.530	5.720	12	FRI	AUG	N	542	11.550	56.400	6.510	16	FRI	AUG
07	105	LA	R	18.100	520	O	15	E	1304	9.440	71.410	6.740	7	WED	JAN	E	1,448	9.470	79.000	7.480	17	WED	JUN
11	111	IMP		57.625	709	B	17	N	110	10.740	61.450	6.600	11	SUN	JAN	N	175	14.830	70.850	10.500	15	SAT	JAN
03	113	YOL		22.076	722	O	17	S	513	9.850	77.140	7.600	5	MON	AUG	N	653	13.350	72.480	9.670	15	FRI	AUG
03	113	SUT		0.000	722	O	17	S	513	9.850	77.140	7.600	5	MON	AUG	N	653	13.350	72.480	9.670	15	FRI	AUG
11	115	IMP	L	10.901	880	B	17	N	430	9.090	63.890	5.800	7	THU	JAN	N	441	11.120	53.520	5.950	15	FRI	JAN
10	120	TUO		15.516	174	A	16	E	436	14.280	73.520	10.500	9	SAT	JUL	W	427	14.490	70.930	10.280	16	SUN	JUL
10	120	TUO	R	23.897	35	B	16	E	431	13.240	69.630	9.220	10	SAT	JUN	W	445	16.570	57.420	9.520	13	SUN	AUG
09	120	MNO		51.860	100	B	17	W	33	21.400	60.000	12.840	12	SUN	JUL	W	35	22.180	61.400	13.620	14	FRI	AUG
03	128	YOL		4.637	730	B	17	W	196	15.240	70.000	10.670	11	SAT	AUG	E	266	19.920	72.680	14.480	15	FRI	AUG
05	135	SB	M	11.722	222	B	17	N	632	28.620	61.840	17.700	7	WED	JUL	N	1,311	45.280	81.080	36.710	16	TUE	JUL
05	135	SB		10.930	221	B	17	N	1149	8.610	56.460	4.860	7	WED	JAN	S	1,294	10.050	54.480	5.470	17	THU	AUG
09	136	INY		17.730	938	B	17	E	61	18.160	64.210	11.660	10	FRI	JUL	W	67	20.460	62.620	12.810	14	TUE	AUG
08	138	SBD	R	37.848	853	B	15	E	427	7.210	86.790	6.260	7	TUE	JAN	W	513	9.910	75.890	7.520	17	FRI	JAN
02	139	LAS		0.000	142	A	16	S	342	10.560	54.290	5.730	12	FRI	AUG	S	333	9.890	56.440	5.580	16	WED	JUN
02	139	MOD		0.231	144	B	17	N	92	19.970	71.320	14.240	12	FRI	AUG	N	72	18.110	61.540	11.150	14	FRI	AUG
02	139	MOD	R	0.231	228	A	17	N	95	14.440	60.510	8.740	11	FRI	AUG	N	85	12.140	64.390	7.820	14	MON	AUG
02	139	MOD		50.684	230	O	17	N	149	10.370	61.070	6.330	11	SAT	AUG	N	155	11.600	56.780	6.580	14	WED	AUG
02	139	SIS		0.000	230	O	17	N	149	10.370	61.070	6.330	11	SAT	AUG	N	155	11.600	56.780	6.580	14	WED	AUG
02	139	SIS		5.042	100	B	17	N	365	15.510	75.100	11.650	12	WED	AUG	N	381	16.020	75.900	12.160	14	SUN	AUG
02	139	SIS		5.043	145	B	17	N	365	14.930	75.100	11.210	12	WED	AUG	N	381	15.420	75.900	11.700	14	SUN	AUG
06	145	FRE		35.149	47	A	16	N	441	8.140	59.430	4.840	12	MON	JUL	N	741	12.160	66.880	8.130	16	FRI	JUL
06	145	MAD		8.060	99	A	16	S	708	6.940	72.250	5.010	6	WED	JAN	N	731	8.940	57.920	5.180	17	FRI	JAN
06	145	MAD		11.020	101	A	16	N	471	8.770	55.150	4.840	12	SUN	JUL	N	487	8.450	59.170	5.000	17	FRI	JUL
06	145	MAD		25.459	53	B	16	N	269	7.150	68.800	4.920	12	SAT	JAN	S	307	9.900	56.750	5.620	15	SUN	JUL
02	147	PLU		0.000	146	A	16	S	74	15.450	53.620	8.290	12	SAT	AUG	S	70	15.120	51.850	7.840	14	SUN	AUG
06	155	KER	R	11.016	565	B	15	W	68	17.440	81.930	14.290	5	FRI	JUN	E	40	12.820	65.570	8.400	14	TUE	JUN
09	158	MNO		3.860	503	B	17	N	161	19.420	52.100	10.120	12	SAT	JUN	S	177	21.180	52.520	11.130	16	SUN	JUL
09	158	MNO		7.180	509	A	17	N	86	15.860	75.440	11.960	10	SUN	AUG	S	77	18.780	57.040	10.710	13	SAT	AUG
03	160	SAC		11.460	818	A	17	N	363	13.590	54.920	7.460	12	SAT	JUL	N	456	14.950	62.720	9.380	16	FRI	JUL
03	160	SAC		21.100	820	B	17	S	131	12.580	55.510	6.980	12	SUN	JUL	N	161	15.670	54.760	8.580	16	FRI	JUL
03	160	SAC		26.250	312	B	17	N	332	20.060	66.530	13.350	10	SUN	JUL	S	359	24.290	59.440	14.430	13	SUN	JUL
02	161	SIS		19.361	152	B	17	W	63	10.490	57.270	6.010	10	FRI	AUG	E	67	12.110	52.760	6.390	16	THU	AUG
03	162	BUT		22.899	769	A	17	W	275	7.040	74.320	5.230	7	WED	JUN	E	309	9.240	63.580	5.880	16	FRI	JUN
06	166	KER		0.010	109	A	15	W	144	7.720	63.720	4.920	5	MON	JUL	E	182	9.320	66.670	6.220	16	SUN	JUL
06	166	KER		22.765	613	B	15	W	599	19.540	93.160	18.210	5	SAT	JUL	E	607	20.760	88.870	18.450	14	SAT	JUL
06	166	KER		24.620	187	B	15	W	537	22.950	86.060	19.750	5	SAT	JUL	E	518	22.360	85.200	19.050	14	THU	JUL
09	167	MNO		0.000	949	A	17	E	26	22.530	63.420	14.290	11	SAT	AUG	W	24	19.230	68.570	13.190	13	TUE	AUG
09	167	MNO		21.331	602	B	17	W	16	26.040	64.000	16.670	7	SUN	AUG	E	14	22.920	63.640	14.580	13	SUN	JUL
09	168	MNO		1.450	943	B	17	W	27	18.930	69.230	13.110	12	THU	JUN	W	28	19.420	70.000	13.590	15	WED	JUL
02	172	TEH		0.000	153	A	16	W	15	19.310	53.570	10.340	12	SUN	AUG	E	17	17.240	68.000	11.720	18	FRI	AUG
02	172	TEH		8.917	154	B	16	E	25	28.570	65.790	18.800	12	SAT	AUG	E	23	31.580	54.760	17.290	15	SUN	AUG
08	173	SBD	L	0.000	988	A	15	W	101	14.200	60.480	8.590	12	SUN	AUG	W	165	25.510	55.000	14.030	16	FRI	AUG
06	178	KER	R	42.941	413	B	15	W	284	11.320	68.770	7.780	11	SUN	AUG	W	246	10.250	65.780	6.740	14	SUN	AUG

09	182	MNO		0.000	950	A	16	S	90	16.180	55.900	9.050	9	TUE	JUL	N	85	13.870	61.590	8.540	16	TUE	JUL
09	190	INY		24.550	918	A	17	E	70	15.360	70.000	10.750	10	THU	AUG	W	80	15.670	78.430	12.290	16	SAT	AUG
01	197	DN	R	0.000	741	A	17	N	208	13.790	61.360	8.460	11	SAT	JUL	N	221	14.280	62.960	8.990	14	SAT	AUG
06	198	FRE		22.660	43	A	17	W	92	8.330	57.860	4.820	7	THU	JUN	E	113	7.700	76.870	5.920	22	THU	JUN
06	198	TUL	R	19.762	18	A	17	E	523	10.660	64.250	6.850	10	SAT	JUL	E	458	11.040	54.330	6.000	13	SUN	JUL
06	198	TUL		27.960	408	B	17	E	458	12.990	69.710	9.060	11	SAT	JUL	W	426	11.060	76.210	8.430	18	SUN	JUL
06	198	TUL		27.960	630	A	17	E	498	13.520	73.240	9.900	10	SAT	JUL	W	484	13.380	71.920	9.620	17	SUN	JUL
06	198	TUL		42.350	135	A	17	E	338	17.630	81.060	14.290	10	SAT	JUL	W	286	14.840	81.480	12.090	17	SUN	JUL
01	199	DN		4.160	730	B	17	S	308	11.560	64.570	7.460	12	TUE	AUG	N	318	15.000	51.370	7.700	13	SUN	JUN
06	201	TUL		13.970	27	B	17	W	92	10.650	77.310	8.240	5	SAT	JUN	E	91	11.280	72.220	8.150	15	WED	JUN
08	215	RIV	R	15.515	603	B	17	S	4887	6.760	61.000	4.120	7	WED	JUN	N	4,938	7.580	55.000	4.170	17	FRI	JUN
03	220	SAC		3.114	922	B	17	E	97	22.370	59.150	13.230	12	SAT	JUL	W	60	14.600	56.080	8.190	15	FRI	JUL
03	267	NEV	M	1.419	929	A	16	E	955	10.480	56.950	5.970	11	FRI	JUL	W	1.082	10.660	63.420	6.760	16	MON	JUL
03	267	NEV	M	1.419	928	B	16	E	805	10.180	56.250	5.720	11	SAT	JUL	W	1.045	12.110	61.360	7.430	16	FRI	JUL
06	269	FRE		24.764	940	B	17	S	217	11.860	70.000	8.300	5	THU	JUN	N	216	11.660	70.820	8.260	15	THU	JUN
09	270	MNO		0.000	978	A	17	E	66	27.110	89.190	24.180	9	WED	AUG	W	63	35.900	64.290	23.080	13	THU	AUG
01	271	MEN		7.290	196	B	17	N	85	19.540	52.150	10.190	11	WED	AUG	S	85	19.310	52.800	10.190	13	MON	JUN
01	281	LAK		15.300	281	A	15	E	496	11.840	80.780	9.560	7	THU	JAN	W	420	11.220	72.170	8.100	17	WED	JAN
01	299	HUM		0.000	192	A	17	W	678	9.100	59.320	5.400	8	TUE	JAN	W	717	10.680	53.430	5.710	16	THU	AUG
01	299	HUM	R	7.600	475	O	15	W	238	11.360	53.130	6.030	12	FRI	AUG	E	272	13.130	52.510	6.900	16	FRI	AUG
02	299	TRI	R	58.110	208	B	17	W	281	9.110	65.200	5.940	10	TUE	JUL	E	307	12.430	52.210	6.490	16	FRI	JUN
02	299	SHA		21.648	209	O	17	W	612	10.310	56.880	5.860	12	SAT	JUL	E	658	10.910	57.770	6.300	15	SAT	JUN
02	299	SHA		80.085	164	B	17	W	238	9.880	53.600	5.300	11	SAT	AUG	W	264	11.020	53.330	5.880	15	WED	AUG
02	299	SHA		91.560	165	B	17	W	175	9.470	56.270	5.330	11	FRI	AUG	W	191	11.320	51.340	5.810	13	WED	AUG
02	299	LAS		3.900	166	B	17	W	86	9.740	63.240	6.160	9	TUE	AUG	W	89	10.090	63.120	6.370	14	MON	AUG
09	395	KER	R	1.152	654	B	17	S	357	12.330	62.850	7.750	12	SUN	JUL	S	357	11.830	65.510	7.750	14	SUN	JUL
09	395	KER	R	23.480	919	B	17	S	287	12.920	59.180	7.650	11	SUN	JUN	S	318	12.760	66.390	8.470	14	SUN	JUN
09	395	INY	R	3.022	110	A	17	S	668	15.650	64.730	10.130	11	SUN	AUG	S	864	17.440	75.130	13.100	14	SUN	AUG
09	395	INY		73.500	644	A	17	S	816	15.950	66.780	10.650	12	SUN	AUG	S	766	13.830	72.330	10.000	14	SUN	JAN
09	395	MNO	R	13.931	310	B	17	S	813	12.510	84.690	10.590	11	SUN	JAN	S	653	11.920	71.370	8.510	13	SUN	JAN
09	395	MNO		40.336	987	A	17	N	492	20.190	55.530	11.210	10	SUN	AUG	S	405	15.090	61.180	9.230	13	WED	AUG
09	395	MNO		58.240	989	A	17	S	340	16.760	57.430	9.620	12	WED	JUL	S	327	16.470	56.190	9.260	13	FRI	AUG
09	395	MNO		76.300	526	B	17	N	377	18.580	52.510	9.760	11	SUN	AUG	N	324	16.300	51.430	8.380	13	SUN	AUG
09	395	MNO		76.300	527	A	17	S	384	18.500	54.470	10.080	11	SUN	JUL	S	323	16.530	51.270	8.480	14	FRI	AUG
09	395	MNO		80.610	909	A	17	N	322	18.420	53.050	9.770	12	SUN	AUG	N	316	18.110	52.930	9.590	14	SUN	AUG
09	395	MNO		116.965	530	B	17	S	351	15.860	55.020	8.730	10	SUN	JUL	N	328	13.530	60.290	8.160	14	SUN	JUL
09	395	MNO		120.490	991	B	17	S	325	14.670	56.620	8.300	11	SAT	JUL	N	302	14.330	53.830	7.720	14	FRI	JUN
02	395	MOD		3.216	246	B	17	S	135	17.360	77.140	13.390	11	TUE	AUG	S	224	25.990	85.500	22.220	16	MON	AUG
02	395	MOD		22.070	177	B	17	S	380	11.260	57.490	6.470	11	TUE	AUG	S	436	10.570	70.210	7.420	18	MON	AUG
02	395	MOD		28.285	178	A	17	S	184	17.950	87.620	15.730	10	TUE	AUG	S	465	42.910	92.630	39.740	16	MON	AUG
12	405	ORA		21.200	434	A	16	N	12887	6.450	51.440	3.320	6	WED	AUG	S	13,649	7.010	50.120	3.510	15	FRI	JAN
03	505	YOL		10.623	964	A	17	N	920	10.620	70.660	7.500	11	THU	AUG	N	1,041	13.080	64.900	8.490	15	FRI	JUN
03	505	YOL		10.623	342	B	17	N	1083	7.460	77.080	5.750	7	SAT	JUL	N	1,270	10.490	64.270	6.740	13	FRI	AUG
04	580	ALA		10.689	532	A	17	E	8430	6.060	62.180	3.770	7	THU	AUG	W	10,713	7.220	66.330	4.790	14	WED	AUG
11	805	SD		1.805	681	A	17	N	9517	8.330	67.460	5.620	12	SAT	JUL	N	10,511	9.180	67.590	6.210	17	THU	JUL
11	805	SD		11.096	925	B	17	N	9576	5.770	73.350	4.230	6	WED	JAN	S	10,077	7.210	61.850	4.460	15	THU	JAN

ATTACHMENT D – PROJECT CONCEPT PLAN

CRC DEVELOPMENT CONCEPT

LEGEND

- CRC Property Boundary
- Open Space
- Park

CRC PROPERTY AREA:
92.9 AC

OPEN SPACE/PARK:
23.7 AC

DEVELOPMENT AREA:
69.2 AC

COMMERCIAL VISITOR:16.0 AC
FAR: 0.5:1
GFA: 348,480 sf

RESIDENTIAL: 53.2 AC
DU: 800

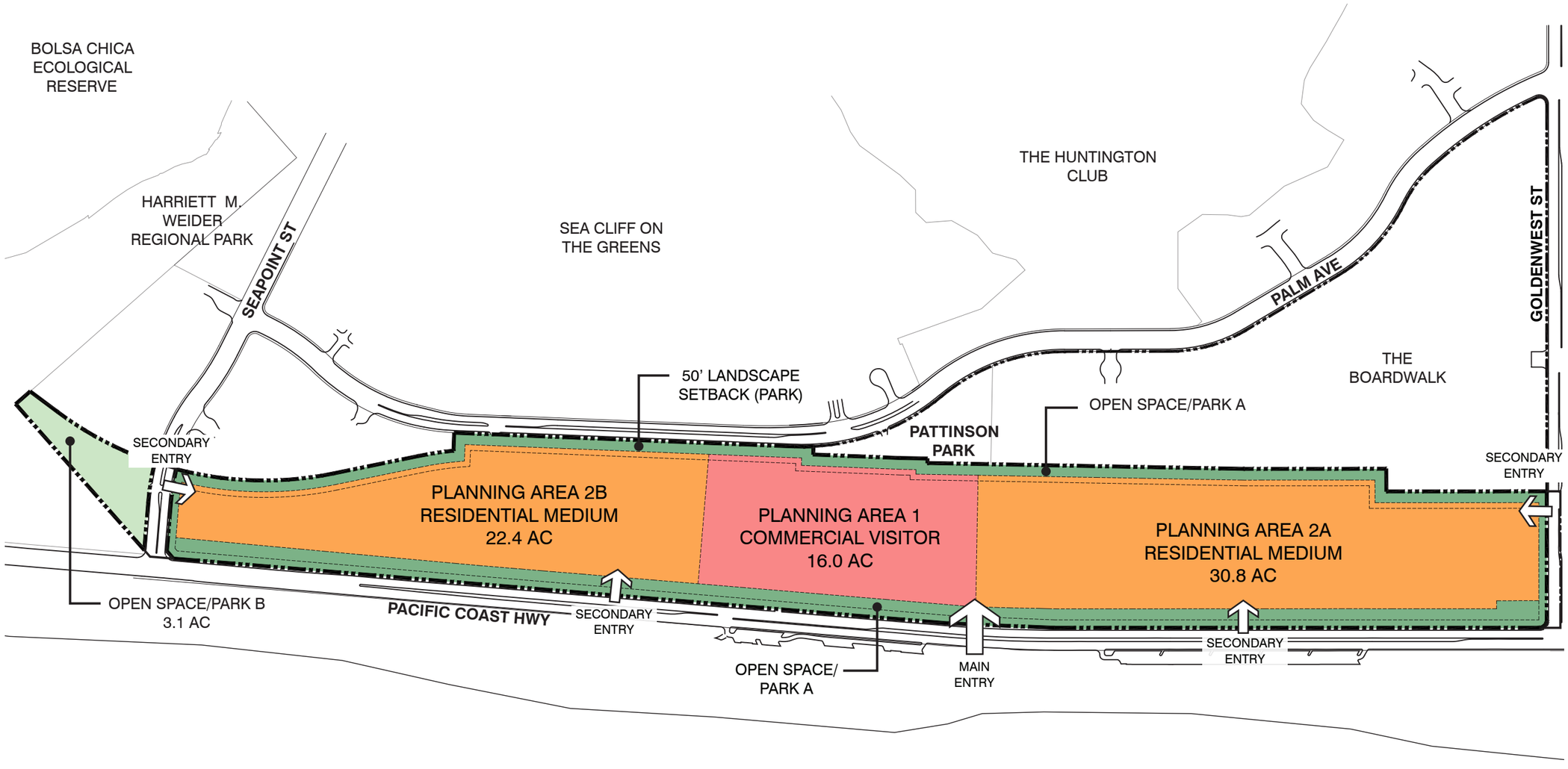


FIGURE 2.1: DEVELOPMENT CONCEPT PLAN

APPENDIX B – OCTAM LAND USE INPUTS

Model Run SED	CRC Huntington Beach	
TAZ	902	
Land Use Category	Service Employment	Household
Square Footage/DU to Add	348,480	800
SF/Employee[1]	725	
Total Input to TAZ	**481 Employees**	**800 DU**

[1] SCAG Connect SoCal SCS

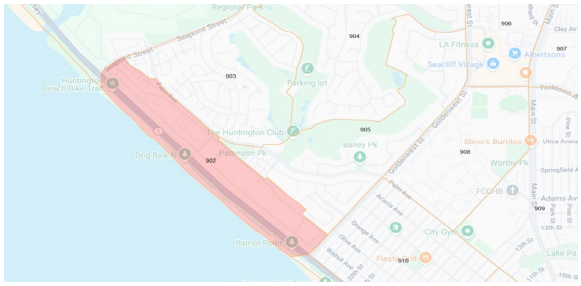


TABLE 6 Building Square Footage Factors for Residential Units and Employment by Type

BUILDING TYPE	SUBURBAN SQFT/UNIT	URBAN SQFT/UNIT
RESIDENTIAL		
Small Lot Detached Single Family	2,400	1,650
Large Lot Detached Single Family	3,000	2,100
Attached Single Family	1,800	1,800
Multifamily, 2 to 4 units	2,000	1,850
Multifamily, 5 plus units	1,200	1,200
COMMERCIAL	**SUBURBAN SQFT/EMPLOYEE**	**URBAN SQFT/EMPLOYEE**
Retail Services	750	475
Accommodation	2,000	1,850
Restaurant	750	475
Entertainment and Recreation	1,200	900
Other Services	850	650
Office Services	350	280
Education	1,050	900
Medical and Health Services	800	725
Public Administration	700	620
Manufacturing	650	575
Transportation and Warehousing	1,700	1,200
Utilities	350	275
Wholesale	660	600
Construction	400	275

Source: SCAG

CRC Huntington Beach

8033.06 7957.34

No Project 2019

ZONE	TOT_POP	HH_POP	EMP_POP	TOT_HH	MDN_INC	RET_EMP	SVC_EMP	BAS_EMP	SCH_ENR	UNIV_ENR	COUNTY	ACERAGE	POPDEN	PARK_COS	TERM_TIM	CBD	AT	SHORT_W	LONG_WA	NO_WALK	EXTERNAL	STUDYAREA
902	142	142	74	68	141477	0	10	29	0	0	2	140	1.02	0	1	0	3	0.798	0.202		0	0 RSA 38

Plus Project 2019

ZONE	TOT_POP	HH_POP	EMP_POP	TOT_HH	MDN_INC	RET_EMP	SVC_EMP	BAS_EMP	SCH_ENR	UNIV_ENR	COUNTY	ACERAGE	POPDEN	PARK_COS	TERM_TIM	CBD	AT	SHORT_W	LONG_WA	NO_WALK	EXTERNAL	STUDYAREA
902	1813	1813	945	868	141477	0	491	29	0	0	2	140	12.95	0	1	0	3	0.798	0.202		0	0 RSA 38

Plus Project - No project

ZONE	TOT_POP	HH_POP	EMP_POP	TOT_HH	MDN_INC	RET_EMP	SVC_EMP	BAS_EMP	SCH_ENR	UNIV_ENR	COUNTY	ACERAGE	POPDEN	PARK_COS	TERM_TIM	CBD	AT	SHORT_W	LONG_WA	NO_WALK	EXTERNAL	STUDYAREA
902	1671	1671	871	800	0	0	481	0	0	0	0	0	0	0	0	0	0	0	0		0	0 RSA 38

No Project 2050

ZONE	TOT_POP	HH_POP	EMP_POP	TOT_HH	MDN_INC	RET_EMP	SVC_EMP	BAS_EMP	SCH_ENR	UNIV_ENR	COUNTY	ACERAGE	POPDEN	PARK_COS	TERM_TIM	CBD	AT	SHORT_W	LONG_WA	NO_WALK	EXTERNAL	STUDYAREA
902	130	130	69	68	141477	0	11	27	0	0	2	140	1.02	0	1	0	3	0.798	0.202		0	0 RSA 38

Plus Project 2050

ZONE	TOT_POP	HH_POP	EMP_POP	TOT_HH	MDN_INC	RET_EMP	SVC_EMP	BAS_EMP	SCH_ENR	UNIV_ENR	COUNTY	ACERAGE	POPDEN	PARK_COS	TERM_TIM	CBD	AT	SHORT_W	LONG_WA	NO_WALK	EXTERNAL	STUDYAREA
902	1659	1659	881	868	141477	0	492	27	0	0	2	140	11.85	0	1	0	3	0.798	0.202		0	0 RSA 38

Plus Project - No project

ZONE	TOT_POP	HH_POP	EMP_POP	TOT_HH	MDN_INC	RET_EMP	SVC_EMP	BAS_EMP	SCH_ENR	UNIV_ENR	COUNTY	ACERAGE	POPDEN	PARK_COS	TERM_TIM	CBD	AT	SHORT_W	LONG_WA	NO_WALK	EXTERNAL	STUDYAREA
902	1529	1529	812	800	0	0	481	0	0	0	0	0	0	0	0	0	0	0	0		0	0 RSA 38

APPENDIX C – OCTAM VMT OUTPUTS

Zone ID	Time Perio	Home-Base	Home-Based	Other	VMT (PA)	Total VMT (OD)	Home-Based V	Home-Based	Other	VMT (OD	Total	Intrazona	Total Vehicle	Total Intrazon	Average Tri	Population	Employmen	Enrollment	Service Popul	HBVMT_per	HBWVMT_p	TOTVMT_per_SerPop (OD)		HBVMT_per	HBWVMT_per_Emp (OD)
902	Daily	36075.8	6095.24	66563.3	112500	37325.3	6306.34	68868.7	1693.64	18746.2	1377.92	6.37982	1813	520	0	2333	19.8984	11.7216		48.2213	20.5876	12.1276

Zone ID	Time Perio	Home-Bas	Home-Bas	Other VMT	Total VMT (	Home-Bas	Home-Bas	Other VMT	Total Intraz	Total Vehic	Total Intraz	Average Tri	Population	Employme	Enrollment	Service Po	HBVMT_pe	HBWVMT_	TOTVMT_p	HBVMT_pe	HBWVMT_per_Emp (OD)
902	Daily	33730.2	6140.77	67512.1	111266	34949.7	6362.79	69953	1704.78	18407.5	1386.98	6.43699	1659	519	0	2178	20.3316	11.8319	51.0861	21.0667	12.2597

Zone ID	Time Perio	Home-Based VMT (PA)	Home-Based	Other VMT (PA	Total VMT (OD	Home-Based V	Home-Based	Other VMT (OD	Total Intrazona	Total Vehicle	Total Intrazon	Average Tri	Population	Employmer	Enrollment	Service Popu	HBVMT_pe	HBVMT_	TOTVMT_per_SerPop (OD)	HBVMT_pe	HBVMT_	County	City
682	Daily	53592.9	5278.35	12151.5	73829.2	55710.6	5486.92	12631.7	60.8952	8851.77	87.4887	8.41692	2706	305	0	3011	19.8052	17.3061	24.5198	20.5878	17.9899	Orange	HUNTINGTON BEACH
702	Daily	29675.1	5523.22	14032.4	52593	31701.8	5900.43	14990.7	43.095	7319	92.3734	7.2717	2512	384	0	2896	11.8133	14.3834	18.1606	12.6201	15.3657	Orange	HUNTINGTON BEACH
832	Daily	883.124	91310.7	39670.2	139547	934.579	96630.9	41981.6	82.0439	14872.3	111.676	9.44846	50	5836	0	5886	17.6625	15.6461	23.7083	18.6916	16.5577	Orange	HUNTINGTON BEACH
833	Daily	24378.9	4382.31	7432.25	39044.6	26299.4	4727.53	8017.72	31.6073	5585.35	58.3755	7.05866	1510	274	1500	3284	16.145	15.9938	11.8894	17.4168	17.2538	Orange	HUNTINGTON BEACH
834	Daily	5420.58	74574.3	115652	202662	5614.93	77248	119799	727.092	30190.5	1353.79	7.00271	352	4817	0	5169	15.3994	15.4815	39.2072	15.9515	16.0365	Orange	HUNTINGTON BEACH
835	Daily	37.4406	57394.6	56034.5	120957	39.9123	61183.5	59733.6	131.658	16874	261.487	7.27317	7	3855	0	3862	5.34866	14.8884	31.3198	5.70175	15.8712	Orange	HUNTINGTON BEACH
836	Daily	25407	4122.55	10524.7	43513.4	27601.2	4478.57	11433.6	43.513	6289.06	86.4199	7.00829	1780	261	556	2597	14.2736	15.7952	16.7552	15.5063	17.1593	Orange	HUNTINGTON BEACH
837	Daily	28627.4	6423.73	13706.3	51254.5	30093.5	6752.7	14408.3	47.7089	7626.4	93.3315	6.7976	1977	424	0	2401	14.4802	15.1503	21.3471	15.2218	15.9262	Orange	HUNTINGTON BEACH
838	Daily	12715.8	22344.5	24235.6	62957.5	13501	23724.3	25732.2	82.8085	9028.73	137.371	7.07144	887	1460	175	2522	14.3357	15.3044	24.9633	15.221	16.2495	Orange	HUNTINGTON BEACH
839	Daily	2913.6	16152.1	15058.2	38596.5	3295.49	18269.1	17031.9	19.557	5426.27	36.6336	7.15762	221	1103	2443	3767	13.1837	14.6438	10.246	14.9117	16.5631	Orange	HUNTINGTON BEACH
840	Daily	27619.9	6438.41	12389.8	50287.5	29902.9	6970.6	13414	57.5435	7573.87	112.247	6.73177	1831	453	723	3007	15.0846	14.2128	16.7235	16.3314	15.3876	Orange	HUNTINGTON BEACH
841	Daily	27239.2	4234.91	10182.1	43763.4	28617.1	4449.14	10697.2	37.9936	6714.24	73.9139	6.58484	1742	291	141	2174	15.6367	14.553	20.1304	16.4277	15.2891	Orange	HUNTINGTON BEACH
842	Daily	21129	23848.3	137472	188634	21845.2	24656.7	142132	288.838	26691.5	525.241	7.19799	1392	1750	12025	15167	15.1789	13.6276	12.4371	15.6934	14.0895	Orange	HUNTINGTON BEACH
843	Daily	22713.4	68725.1	163260	261194	23292.6	70477.7	167423	1210.16	41009.6	1770.13	6.62557	1447	4764	33	6244	15.6969	14.4259	41.8312	16.0972	14.7938	Orange	HUNTINGTON BEACH
844	Daily	51736.1	5919.91	13874.3	75877.8	54880.6	6279.71	14717.6	200.397	8029.57	174.801	9.63459	2265	322	0	2587	22.8416	18.3848	29.3304	24.2298	19.5022	Orange	HUNTINGTON BEACH
845	Daily	68505.8	10444.2	21674.2	105771	72009.7	10978.4	22782.8	291.698	14066.5	422.176	7.73062	3939	702	57	4698	17.3917	14.8778	22.514	18.2812	15.6387	Orange	HUNTINGTON BEACH
846	Daily	14789	3415.54	7602.97	27251.9	15616.7	3606.7	8028.48	22.95	3813.15	27.4582	7.1926	798	234	448	1480	18.5326	14.5963	18.4134	19.5698	15.4132	Orange	HUNTINGTON BEACH
847	Daily	13768.6	4857.87	9610.53	29502.2	14385.5	5075.53	10041.1	38.8964	4728.06	64.7829	6.31814	1051	359	0	1410	13.1005	13.5317	20.9235	13.6874	14.138	Orange	HUNTINGTON BEACH
848	Daily	26567.5	7977.89	22249.9	60104.5	28115.5	8442.72	23546.3	148.388	9541.62	294.841	6.484	1779	598	78	2455	14.934	13.341	24.4825	15.8041	14.1183	Orange	HUNTINGTON BEACH
849	Daily	40343.3	4098.76	11007.2	59955.6	43621.9	4431.86	11901.8	79.7043	8921.6	155.996	6.83078	2899	278	474	3651	13.9163	14.7437	16.4217	15.0472	15.9419	Orange	HUNTINGTON BEACH
850	Daily	24540.2	6089.54	19546.4	53882.9	26353.1	6539.4	20990.4	74.4452	8407.05	145.084	6.51279	1669	469	391	2529	14.7035	12.9841	21.306	15.7898	13.9433	Orange	HUNTINGTON BEACH
851	Daily	26149.1	17163.7	39221	86767.3	27490.4	18044.1	41232.8	192.588	13673.7	311.967	6.47932	1707	1333	0	3040	15.3188	12.876	28.5419	16.1045	13.5365	Orange	HUNTINGTON BEACH
852	Daily	47619.6	14045.8	42866.9	111442	50767.2	14974.3	45700.4	247.734	16597.1	379.267	6.8563	3417	1033	13	4463	13.9361	13.5971	24.9702	14.8573	14.4959	Orange	HUNTINGTON BEACH
853	Daily	42701.7	10563.2	25916.4	83586.4	45077.3	11150.9	27358.2	358.172	9587.8	257.127	8.91985	2020	605	0	2625	21.1394	17.4598	31.8424	22.3155	18.4312	Orange	HUNTINGTON BEACH
854	Daily	60070.6	9592.61	17333.9	91606.8	63253.6	10100.9	18252.3	292.461	11380.2	367.528	8.29178	3121	618	0	3739	19.2472	15.522	24.5003	20.2671	16.3445	Orange	HUNTINGTON BEACH
855	Daily	21034.7	11794	26935.4	62987.5	22169.2	12430.1	28388.1	205.066	10397.8	371.513	6.26179	920	985	687	2592	22.8638	11.9736	24.3007	24.0969	12.6194	Orange	HUNTINGTON BEACH
856	Daily	85177.9	9387.78	19584.2	121137	90391.3	9962.38	20782.8	283.949	17428	630.835	7.19482	4902	699	0	5601	17.3761	14.3303	21.6277	18.4397	14.2523	Orange	HUNTINGTON BEACH
857	Daily	41215.1	11908.5	32461	90148.7	43413	12543.6	34192.1	341.29	14664.9	747.784	6.45303	2522	961	0	3483	16.3422	12.3918	25.8825	17.2137	13.0526	Orange	HUNTINGTON BEACH
858	Daily	10211.3	4427.57	10765.7	27498.7	11053	4792.54	11653.1	35.2248	4256.3	63.2285	6.54973	608	347	0	955	16.795	12.7596	28.7945	18.1793	13.8113	Orange	HUNTINGTON BEACH
859	Daily	20603.1	1341.49	3266.48	27221.4	22246	1448.46	3526.95	14.794	3910.59	25.2638	7.0024	1187	93	670	1950	17.3573	14.4246	13.9597	18.7413	15.5748	Orange	HUNTINGTON BEACH
860	Daily	18118.3	2211.07	4984.59	27085.3	19386.1	2365.78	5333.38	16.3068	4180.62	32.9468	6.5263	1313	165	0	1478	13.7992	13.4004	18.3256	14.7647	14.3381	Orange	HUNTINGTON BEACH
861	Daily	23128.2	15033.2	23518.7	66213.2	24828	16138	25247.2	126.85	11000.7	260.98	6.15346	1709	1225	0	2934	13.5332	12.272	22.5676	14.5278	13.1739	Orange	HUNTINGTON BEACH
862	Daily	11768.8	1111.38	1819.58	15628.7	12512.6	1181.62	1934.57	2.73065	2280.09	5.30228	6.86923	829	78	0	907	14.1964	14.2485	17.2312	15.0935	15.1489	Orange	HUNTINGTON BEACH
863	Daily	24327.1	1656.39	3445.39	31298.1	25872.3	1761.6	3664.23	14.847	4380.7	26.3339	7.18434	1393	120	0	1513	17.4638	13.8033	20.6861	18.573	14.68	Orange	HUNTINGTON BEACH
864	Daily	11955.8	7592.98	11306.9	32261.9	12500.6	7939.04	11822.2	30.8081	4926.65	47.7227	6.60618	680	616	0	1296	17.582	12.3263	24.8934	18.3833	12.888	Orange	HUNTINGTON BEACH
865	Daily	5346.83	8547.16	23236.8	37936.3	5462.82	8732.58	23740.9	56.8154	6907.07	102.158	5.56649	385	716	0	1101	13.8879	11.9374	34.4562	14.1892	12.1963	Orange	HUNTINGTON BEACH
866	Daily	39557.3	8805.3	23553.3	77351.7	42547.2	9470.85	25333.6	123.16	12145.7	206.413	6.46841	2668	675	129	3472	14.8266	13.0449	22.2787	15.9472	14.0309	Orange	HUNTINGTON BEACH
867	Daily	28310.1	11747.3	47334.4	91499.1	29640.7	12299.4	49559	202.371	15688.3	415.136	5.97759	1978	970	0	2948	14.3125	12.1106	31.0377	14.9852	12.6798	Orange	HUNTINGTON BEACH
868	Daily	23568.9	3489.6	7673.14	37274.5	25294.5	3745.09	8234.94	20.8262	5326.67	32.146	7.03627	1606	239	0	1845	14.6755	14.6008	20.203	15.75	15.6698	Orange	HUNTINGTON BEACH
869	Daily	30169.8	7315.1	12282	52914.8	32078.1	7777.79	13058.9	91.584	7199.77	143.561	7.48606	1698	546	0	2244	17.7679	13.3976	23.5806	18.8917	14.245	Orange	HUNTINGTON BEACH
870	Daily	26805.3	3012.06	6856.49	39524.9	28889.2	3246.22	7389.52	38.9145	5197	67.4052	7.6977	1560	195	0	1755	17.1829	15.4465	22.5213	18.5187	16.6473	Orange	HUNTINGTON BEACH
871	Daily	9363.78	903.386	1816.66	12900.9	9996.91	964.467	1939.49	3.74788	1768.29	7.1869	7.3233	561	64	0	625	16.6912	14.1154	20.6414	17.8198	15.0698	Orange	HUNTINGTON BEACH
872	Daily	15704.4	3763.8	7877.74	28606.1	16428.1	3937.24	8240.74	41.3871	4593.37	82.8783	6.33294	1024	298	730	2052	15.3364	12.6302	13.9406	16.043	13.2122	Orange	HUNTINGTON BEACH
873	Daily	38431	5348.28	10852.7	58331.4	41033.3	5710.43	11587.6	85.0842	8693.34	196.221	6.85483	2335	428	0	2763	16.4587	12.496	21.1116	17.5732	13.3421	Orange	HUNTINGTON BEACH
874	Daily	43404.7	5513.11	15295.6	69380.5	46897.4	5956.75	16526.4	117.034	10644.3	240.136	6.65729	3121	411	321	3853	13.9073	13.4139	18.0069	15.0264	14.4933	Orange	HUNTINGTON BEACH
875	Daily	8984.95	12498.8	26509.2	51018.3	9551.34	13286.7	28180.3	88.3044	8930.38	144.434	5.79676	846	1048	1504	3398	10.6205	11.9263	15.0142	11.29	12.6781	Orange	HUNTINGTON BEACH
876	Daily	51188.9	35482.7	64405.8	160792	54480.6	37764.4	68547.4	752.849	28041.4	1472.36	6.02354	4694	2949	618	8261	10.9052	12.0321	19.464	11.6064	12.8058	Orange	HUNTINGTON BEACH
877	Daily	29057.5	4811.82	11350	48249.9	31004.9	5134.31	12110.7	45.6931	7936.16	90.0672	6.14372	2337	373	423	3133	12.4337	12.9003	15.4005	13.267	13.7649	Orange	HUNTINGTON BEACH
880	Daily	22867.3	998.225	3496.02	27671.4	23126.3	1009.53	3535.61	19.4453	3300.24	21.9565	8.43488	1128	54	0	1182	20.2724	18.4856	23.4107	20.502	18.695	Orange	HUNTINGTON BEACH
881	Daily	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Orange	HUNTINGTON BEACH
882	Daily	12894.1	736.128	1849.98	15742	13112.1	748.577	1881.26	6.16404	1914.22	8.47186	8.25701	556	43	0	599	23.1908	17.1193	26.2804	23.583	17.4088	Orange	HUNTINGTON BEACH
883	Daily	34824.9	2610.63	5990.19	44619.1	35781.9	2682.38	6154.82	51.661	6135.74	99.1284	7.38286	1959	172	0	2131	17.7769	15.1781	20.9381	18.2654	15.5952	Orange	HUNTINGTON BEACH
884	Daily	37134.4	7129.61	6476.13	54443.3	39844.6	7649.94	6948.77	59.7311	7458.59	119.336	7.40996	2131	545	658	3334	17.4258	13.0818	16.3297	18.6976	14.0366	Orange	HUNTINGTON BEACH
885	Daily	24015.9	1955.68	5006.51	33285.1	25804.4	2101.33	5379.36	26.4264	4909.95	42.2943	6.83258	1586	136	839	2561	15.1424	14.38	12.9969	16.2701	15.4509	Orange	HUNTINGTON BEACH
886	Daily	120.572	9247.92	13126	24120	129.285	9916.21	14074.5	14.0844	3757.96	18.7071	6.44672	42	725	0	767	2.87077	12.7558	31.4472	3.07822	13.6775	Orange	HUNTINGTON BEACH
887	Daily	24775.7	15960.1	25098.6	70945.4	26699.1	17199.2	27047.1	149.075	12451.1	290.499	5.82177	2123	1345	0	3468	11.6701	11.8663	20.4571	12.5761	12.7875	Orange	HUNTINGTON BEACH
888	Daily	33442.8	15838	36537.1	91706.4	35737.5	16924.8	39044.1	258.315	15924	487.937	5.92433	2706	1292	0	3998	12.3587	12.2585	22.9381	13.2068	13.0997	Orange	HUNTINGTON BEACH
890	Daily	6045.97	632.882	1116.72	8014.05	6215.41	650.619	1148.02	2.18209	1044.76	3.50707	7.69445	327	42	0	369	18.4892	15.0686	21.7183	19.0074	15.4909	Orange	HUNTINGTON BEACH
891	Daily	16001.1	2646.64	2773.56	22194.4	16578.6	2742.16	2873.67	13.9232	2810.07	21.4897	7.95403	871	177	0	1048	18.3709	14.9528	21.1779	19.034	15.4924	Orange	HUNTINGTON BEACH
892	Daily	2130.6	16842.9	29240.8	50186.9	2217.76	17532	30437.1	88.7956	8253.24	115.841	6.15653	134	1314	0	1448	15.9	12.8181	34.6594	16.5505	13.3425	Orange	HUNTINGTON BEACH
893	Daily	30009.9	13274.7	29600.3	77172.2	31775.1	14055.5	31341.5	198.252	13708	378.897	5.77489	2098	1114	0	3212	14.304	11.9162	24.0262	15.1454	12.6172	Orange	HUNTINGTON BEACH
894	Daily	30194.1	7880.07	26853.3	69288.4	32222.1	8409.35	28656.9	129.963	11745.3	241.241	6.01167	2026	660	0	2686	14.9033	11.9395	25.7961	15.9043	12.7414	Orange	HUNTINGTON BEACH
895	Daily	6455.36	670.72	1113.12	8475.85	6640.77	689.985	1145.09	2.01995	1115.25	2.06639	7.61222	313	45	0	358	20.6242	14.9049	23.6755	21.2165	15.333	Orange	HUNTINGTON BEACH
896	Daily	14113	3234.78	5990.58	25134.3	15199	3483.71	6451.57	26.6455	3867.12	31.6339	6.54616	1006	247	708	1961	14.0288	13.0963	12.8171	15.1084	14.1041	Orange	HUNTINGTON BEACH
897	Daily	11306.8	1601.32	2943.94	16906	12058.5	1707.79	3139.68	8.90247	2702.74	17.1733	6.29181	738	127	0	865	15.3208	12.6088	19.5445	16.3395	13.4472	Orange	HUNTINGTON BEACH
898	Daily	11865.4	661.562	1588.61	15000.7	12609.5	703.049	1688.23	4.61382	2409.85	9.66719	6.24791	869	48	0	917	13.6541	13.7825	16.3585	14.5103	14.6468	Orange	HUNTINGTON BEACH
899	Daily	29756.7	8172.59	24254.4	65472.8	31330.6	8604.87	25537.3	165.186	11456.8	339.968	5.87466	1909	698	0	2607	15.5876	11.7086	25.1142	16.4121	12.3279	Orange	HUNTINGTON BEACH
900	Daily	17122.8	16899.6	45497.7	85541.5	18419.4	18179.3	48942.9	312.997	15423.8	510.579	5.71495	1921	1452	0	3373	8.91349	11.6388	25.3607	9.58844	12.5202	Orange	HUNTINGTON BEACH
901	Daily	48058.4	11148.3	24954	88615.5	50602.2	11738.4	26274.9	232.972	15147.6	455.899	6.01582	3309	940	0	4249	14.5235	11.8599	20.8556	15.2923	12.4877	Orange	HUNTINGTON BEACH
902	Daily	2847.56	468.298	48612.2	55668.2	3052.66	502.027	52113.5	1149.47	10161.6	935.192	5.90899	142	39	0	181	20.0533	12.0076	307.559	21.4976	12.8725	Orange	HUNTINGTON BEACH
903	Daily	39650.3	5670.03	10330.7	57585.5	41028.6	5867.12	10689.8	163.096	6607.99	120.335	8.85102	1912	324	0	2236	20.7376	17.5001	25.7538	21.4585	18.1084	Orange	HUNTINGTON BEACH
904	Daily	22406.9	9079.88	19277.2	52712	23266.8	9428.32	20016.9	185.24	9469.02	305.382	5.73209	1868	739	0	2607	11.9952	12.2867	20.2194	12.4555	12.7582	Orange	HUNTINGTON BEACH
905	Daily	27995.9	4446.44	7858.75	41696.8	28965.5	4600.44	8130.93	77.1033	6674.88	131.598	6.36068	1767	362	0	2129	15.8437	12.283	19.5852	16.3924	12.7084	Orange	HUNTINGTON BEACH
906	Daily	11611.3	8234.37	22231.1	43864.6	12104.7	8584.24	23175.7	143.619	9040.05	360.587	5.03729	1195	733	12	1940	9.71657	11.2338	22.6106	10.1294	11.7111	Orange	HUNTINGTON BEACH
907	Daily	13419.5	4899.18	10735.8	30087	13896.4	5073.3	11117.3	47.9047	5377.84	71.4801	5.66097	795	420	43	1258	16.8798	11.6647	23.9166	17.4798	12.0793	Orange	HUNTINGTON BEACH
908	Daily	14958.1	3387.58	7515.48	28604.5	16544.8	3746.94	8312.74	32.0691	5187.5	75.1577	5.58891	1183	296	2983	4462	12.6442	11.4445	6.4107	13.9855	12.6586	Orange	HUNTINGTON BEACH
909	Daily	27160.2	30455.1	15676.8	77860.1	28853	32353.3	16653.9	169.194	12323.2	278.55	6.45023	1828	2817	2051	6696	14.8579	10.8112	11.6279	15.7839	11.485	Orange	HUNTINGTON BEACH
910	Daily	71794.7	8302.33	16363.7	103779	77241.9	8932.24	17605.3	338.493	15747.5	577.031	6.81855	4312	623	0	4935	16.65	13.3264	21.0293	17.9132	14.3375	Orange	HUNTINGTON BEACH
911	Daily	53918.8	30515.4	60496.6	152571	56761.1	32124	63685.7	1388.36	28597.3	2613.2	5.81826	3451	2584	0	6035	15.6241	11.8094	25.281	16.4477	12.4319	Orange	HUNTINGTON BEACH
912	Daily	1191.25	3699.27	13891.7	21397.7	1357.14	4214.41	15826.1	10.9287	4444.29	15.0174	4.82849	77	406	0	483	15.4708	9.11151	44.3016	17.6252	10.3803	Orange	HUNTINGTON BEACH
913	Daily	26270.9	5653.25	6384.2	41447.3	28423.5	6116.47	6907.31	41.7817	6636.53	88.732	6.32358	1857	515	23	2395	14.147	10.9772	17.3058	15.3062	11.8766	Orange	HUNTINGTON BEACH
914	Daily	20741.5	4389.98	12774	41703.4	22819.6	4829.83	14053.9	52.3164	6928	108.837	6.10794	1526	398	0	1924	13.5921	11.0301	21.6754	14.9539	12.1353	Orange	HUNTINGTON BEACH
915	Daily	25366.1	8095.23	12007.7	48188.6	26883.3	8579.41	12725.9	73.1014	8030.22	137.557	6.09623	1640	712	382	2734	15.4671	11.3697	17.6257	16.3922	12.0497	Orange	HUNTINGTON BEACH
916	Daily	24943.6	5269.3	16077.3	49554.6	26702.6	5640.88	17211.1	71.5145	8090.68	147.497	6.22963	1745	424	0	2169	14.2943	12.4276	22.8467	15.3023	13.304	Orange	HUNTINGTON BEACH
917	Daily	11870.2	3878.02	7789.48	25320.7	12769.4	4171.79	8379.55	22.8093	4181.82	45.5509	6.11612	921	304	744	1969	12.8883	12.7566	12.8597	13.8647	13.723	Orange	HUNTINGTON BEACH
918	Daily	11803.9	2741.95	3789.94	19688	12674.4	2944.16	4069.44	7.92507	3009.54	16.1597	6.57454	872	211	0	1083	13.5366	12.995	18.1791	14.5348	13.9534	Orange	HUNTINGTON BEACH
919	Daily	27575.3	2926.26	9519.86	43095.6	29693.4	3151.04	10251.1	36.6307	6657.52	78.4313	6.54482	1938	196	0	2134	14.2287	14.9299	20.1947	15.3217	16.0767	Orange	HUNTINGTON BEACH
920	Daily	26037.8	4425.16	11586.1	44839	27765.4	4718.77	12354.8	43.6407	6834.46	84.5584	6.63645	1980	292	34	2306	13.1504	15.1547	19.4445	14.0229	16.1602	Orange	HUNTINGTON BEACH
921	Daily	31707.9	2341.61	5855.76	43470.3	34540.7	2550.8	6378.9	39.5433	6821.37	89.9614	6.45197	2076	201	0	2277	15.2736	11.6498	19.0911	16.6381	12.6906	Orange	HUNTINGTON BEACH
922	Daily	23193.9	4355.56	9979.42	41634.7	25731.4	4832.07	11071.2	62.6294	7420.44	170.4	5.73405	1986	424	291	2701	11.6787	10.2725	15.4145	12.9564	11.3964	Orange	HUNTINGTON BEACH
923	Daily	15645.3	18249.9	38887.7	76131.6	16365.1	19089.5	40676.9	323.546	15827.4	685.005	5.00634	1325	1757	0	3082	11.8078	10.387	24.702	12.3511	10.8648	Orange	HUNTINGTON BEACH
924	Daily	24714.1	4922.9	11632	45181.3	27057	5389.59	12734.7	61.5153	7422.85	127.952	6.18512	1776	404	516	2696	13.9156	12.1854	16.7587	15.2348	13.3406	Orange	HUNTINGTON BEACH
925	Daily	13738	2484.01	6522.08	24360.2	14714.2	2660.51	6985.51	16.9898	3828.69	35.1724	6.41706	843	197	0	1040	16.2966	12.6092	23.4233	17.4546	13.5051	Orange	HUNTINGTON BEACH
926	Daily	15801.5	1189.08	1912.9	20326.8	16991.2	1278.61	2056.93	4.19929	3006.12	8.51426	6.77961	989	85	0	1074	15.9772	13.9892	18.9262	17.1802	15.0425	Orange	HUNTINGTON BEACH
927	Daily	58154.8	10184.1	29252.8	103713	61802.5	10822.9	31087.7	299.147	16748	633.751	6.41756	3572	779	448	4799	16.2807	13.0733	21.6114	17.3019	13.8933	Orange	HUNTINGTON BEACH
928	Daily	33214.5	6459.98	16161.7	60231.7	35829.2	6968.51	17434	103.186	9498.63	199.523	6.46605	2312	451	538	3301	14.3661	14.3237	18.2465	15.4971	15.4512	Orange	HUNTINGTON BEACH
929	Daily	35423.7	2734.27	5924.34	47775.3	38391.3	2963.33	6420.66	48.486	7314.96	115.304	6.62904	2264	241	0	2505	15.6465	11.3455	19.072	16.9573	12.296	Orange	HUNTINGTON BEACH
930	Daily	24987.5	2386.91	6210.73	36468	27132.4	2591.8	6743.84	36.9706	5926.01	94.9034	6.24771	1574	227	0	1801	15.8752	10.515	20.2488	17.2379	11.4176	Orange	HUNTINGTON BEACH
931	Daily	35995.1	6035.81	10758	56745.3	38692.8	6488.17	11564.3	94.1035	9355.03	194.975	6.18459	2478	539	0	3017	14.5259	11.1982	18.8085	15.6145	12.0374	Orange	HUNTINGTON BEACH
932	Daily	29452.3	2651.71	5911.61	41602	32230.8	2901.87	6469.31	40.4694	6565.33	84.4312	6.41292	2096	207	592	2895	14.0517	12.8102	14.3703	15.3773	14.0187	Orange	HUNTINGTON BEACH
933	Daily	13182.7	3866.91	8521.06	27401.1	14126.3	4143.73	9131.05	31.2914	4563.14	64.2586	6.0837	841	318	359	1518	15.675	12.1601	18.0508	16.7971	13.0306	Orange	HUNTINGTON BEACH
934	Daily	14663	1853.96	3158.5	20838.9	15530	1963.59	3345.27	9.41505	3279.21	19.0844	6.38917	1007	142	0	1149	14.561	13.0561	18.1365	15.4221	13.8281	Orange	HUNTINGTON BEACH
935	Daily	25731.1	7546.35	22827.1	59645.2	27355	8022.59	24267.6	140.554	10085.9	306.363	6.08459	1879	586	586	3051	13.6941	12.8777	19.5494	14.5583	13.6904	Orange	HUNTINGTON BEACH
936	Daily	16364.2	6445.08	18277.7	43382.3	17278.4	6805.14	19298.8	85.4177	6944.79	126.67	6.35027	1117	466	0	1583	14.6501	13.8306	27.4051	15.4685	14.6033	Orange	HUNTINGTON BEACH
937	Daily	33031.3	2802.01	6038.59	45262.8	35706.3	3028.92	6527.61	48.4489	7152.83	98.3596	6.40933	2265	227	0	2492	14.5834	12.3436	18.1633	15.7644	13.3433	Orange	HUNTINGTON BEACH
938	Daily	18512	1535.9	2803.82	23703.7	19202.2	1593.17	2908.37	11.8689	3829.72	32.4601	6.2392	1215	133	0	1348	15.2362	11.5482	17.5844	15.8043	11.9787	Orange	HUNTINGTON BEACH
939	Daily	22955.1	2583.67	6636.35	34840	24856.4	2797.66	7186	48.1464	5898.11	104.382	6.00509	1839	230	683	2752	12.4824	11.2333	12.6599	13.5162	12.1637	Orange	HUNTINGTON BEACH
940	Daily	16660.5	4524.84	13627.6	37133.5	17771.1	4826.46	14536	84.6669	6530.76	175.598	5.82973	1748	350	0	2098	9.53119	12.9281	17.6995	10.1665	13.7899	Orange	HUNTINGTON BEACH
941	Daily	15098.2	5060.7	8331.59	30345.7	16081.4	5390.23	8874.1	34.5256	4766.57	70.216	6.4542	935	407	0	1342	16.1478	12.4342	22.6123	17.1993	13.2438	Orange	HUNTINGTON BEACH
942	Daily	12486.2	1672.4	3255.85	18874	13532.7	1812.56	3528.73	8.58623	2966.53	17.1635	6.39643	796	126	1092	2014	15.6862	13.273	9.37138	17.0008	14.3854	Orange	HUNTINGTON BEACH
943	Daily	30911.4	2645.97	7260.18	43753.2	33134.6	2836.27	7782.34	52.6858	6759.26	115.054	6.57724	2118	181	512	2811	14.5946	14.6186	15.565	15.6443	15.67	Orange	HUNTINGTON BEACH
944	Daily	23032.8	3912.91	9968.12	38952.2	24304.7	4128.99	10518.6	58.4956	5579.83	73.824	7.06387	1357	265	0	1622	16.9733	14.7657	24.0149	17.9106	15.5811	Orange	HUNTINGTON BEACH
945	Daily	6791.86	7954.22	18108.4	33344.2	6893.11	8072.8	18378.3	83.8911	6519.02	145.527	5.21854	466	673	0	1139	14.5748	11.8191	29.275	14.7921	11.9952	Orange	HUNTINGTON BEACH
946	Daily	14725	8057.82	16255.4	41350.8	15597.3	8535.13	17218.4	120.648	8097.17	311.724	5.29579	1071	736	0	1807	13.7489	10.9481	22.8837	14.5633	11.5966	Orange	HUNTINGTON BEACH
947	Daily	0	390.778	30420.1	33528.9	0	425.25	33103.7	479.097	6731.31	601.826	5.39194	0	37	0	37	0	10.5616	906.187	0	11.4933	Orange	HUNTINGTON BEACH
948	Daily	57746.6	6913.18	18476.8	87790.7	60979.4	7300.2	19511.1	282.322	13700.8	485.235	6.62159	3454	551	0	4005	16.7188	12.5466	21.9203	17.6547	13.249	Orange	HUNTINGTON BEACH
949	Daily	19565.2	2187.47	4324.98	28213.8	21167.9	2366.66	4679.27	25.3161	4347.17	53.9827	6.56588	1373	169	0	1542	14.2499	12.9436	18.2969	15.4173	14.0039	Orange	HUNTINGTON BEACH
950	Daily	3475.81	2714.16	5060.98	12288.5	3796.33	2964.45	5527.67	6.15238	2193.73	11.9158	5.6294	228	212	2440	2880	15.2448	12.8027	4.26682	16.6506	13.9833	Orange	HUNTINGTON BEACH
951	Daily	12719.3	2846.59	2755.79	19016	13201.3	2954.46	2860.22	9.13497	2920.01	18.3126	6.55025	867	221	0	1088	14.6705	12.8805	17.4779	15.2264	13.3686	Orange	HUNTINGTON BEACH
952	Daily	28836.6	3240.14	11289.7	45902.7	30523.1	3429.65	11950	80.8023	7282.98	172.045	6.44387	1905	233	0	2138	15.1373	13.9062	21.4699	16.0226	14.7195	Orange	HUNTINGTON BEACH
953	Daily	17024	2138.29	3784.15	24659.9	18295.3	2297.97	4066.72	20.7055	3139.21	22.7724	7.90621	874	138	0	1012	19.4783	15.4949	24.3675	20.9328	16.6519	Orange	HUNTINGTON BEACH
954	Daily	50.6561	3729.72	3468.7	7823.82	54.6723	4025.43	3743.72	1.50913	1103.61	2.5199	7.10417	29	272	0	301	1.74676	13.7122	25.9928	1.88525	14.7994	Orange	HUNTINGTON BEACH
955	Daily	0	1285.06	319.352	1900.45	0	1522.17	378.276	0.00442885	187.409	0.00648048	10.1409	0	91	0	91	0	14.1216	20.884	0	16.7271	Orange	HUNTINGTON BEACH
956	Daily	14823.1	820.997	2698.07	18980.8	15339.2	849.581	2792.01	11.8604	2854.32	23.9182	6.70185	949	48	0	997	15.6197	17.1041	19.0379	16.1636	17.6996	Orange	HUNTINGTON BEACH
957	Daily	12271.6	1181.16	2801.05	17064.2	12883.4	1240.05	2940.7	11.6788	2674.43	23.6541	6.43302	802	81	559	1442	15.3013	14.5822	11.8337	16.0641	15.3092	Orange	HUNTINGTON BEACH
958	Daily	44208	6341.49	13914.2	68031.8	46655	6692.49	14684.3	184.71	10531.2	417.74	6.70858	2906	442	0	3348	15.2127	14.3473	20.3201	16.0547	15.1414	Orange	HUNTINGTON BEACH
959	Daily	6938.84	264.853	1011.35	8498.6	7178.35	273.995	1046.26	2.39106	1170.91	4.60617	7.28474	379	13	0	392	18.3083	20.3733	21.6801	18.9402	21.0766	Orange	HUNTINGTON BEACH
960	Daily	9548.73	15868.9	5883.93	31963.8	9750.74	16204.6	6008.41	26.8294	4189.79	60.9714	7.73514	581	1166	0	1747	16.435	13.6097	18.2964	16.7827	13.8976	Orange	HUNTINGTON BEACH
961	Daily	6953.99	3339.54	2497.65	14811	8052.07	3866.88	2892.04	6.58434	1977.25	15.3848	7.54608	543	245	0	788	12.8066	13.6308	18.7957	14.8289	15.7832	Orange	HUNTINGTON BEACH
962	Daily	0	0	41496.8	44166.9	0	0	44166.9	788.4	7735.86	817.375	6.26994	0	0	0	0	0	0	0	0	0	Orange	HUNTINGTON BEACH
		3031614.603			6857151.47								199551	84571	41232	325354							

Zone ID	Time Perio	Home-Based VMT (PA)	Home-Bas	Other VMT	Total VMT (OD)	Home-Bas	Home-Bas	Other VMT	Total Intraz	Total Vehic	Total Intraz	Average Tri	Population	Employment	Enrollment	Service Po	HBVMT_pe	HBWVMT_	TOTVMT_per_SerPop	HBVMT_pe	HBWVMT_	County	City
682	Daily	54569.1	5271.37	12758.9	75451.6	56713	5478.47	13260.1	60.7863	8898.81	87.3322	8.55597	2637	317	0	2954	20.6936	16.6289	25.5422	21.5066	17.2822	Orange	HUNTINGTON BEACH
702	Daily	30373.3	5481.65	14923	54337	32502.2	5865.87	15968.9	43.3303	7478.59	92.8779	7.35118	2483	400	0	2883	12.2325	13.7041	18.8474	13.0899	14.6647	Orange	HUNTINGTON BEACH
832	Daily	830.866	95512	46231.6	151085	880.46	101213	48991.1	97.3234	16157.4	132.474	9.42201	45	6466	0	6511	18.4637	14.7714	23.2045	19.5658	15.6531	Orange	HUNTINGTON BEACH
833	Daily	24070.4	4353.72	8005.03	39338.9	25993	4701.47	8644.44	28.7265	5471	53.055	7.25555	1386	287	1291	2964	17.3668	15.1697	13.2722	18.754	16.3814	Orange	HUNTINGTON BEACH
834	Daily	5311.76	70872.3	106634	189909	5517.79	73621.2	110770	580.674	27309.3	1081.17	7.21852	322	4763	0	5085	16.4961	14.8798	37.347	17.136	15.4569	Orange	HUNTINGTON BEACH
835	Daily	32.93	58247.1	61213.8	127316	35.0856	62060.1	65221	146.102	17634.3	290.173	7.33219	7	4092	0	4099	4.70428	14.2344	31.0603	5.01224	15.1662	Orange	HUNTINGTON BEACH
836	Daily	24382.3	4303.46	11197.6	43583.8	26644.5	4702.74	12236.6	41.4914	6146.88	82.4049	7.1799	1635	287	429	2351	14.9127	14.9946	18.5384	16.2963	16.3859	Orange	HUNTINGTON BEACH
837	Daily	27869.5	6243.82	14231.2	50755	29259	6555.12	14940.8	44.1991	7374.19	86.4653	6.95838	1810	435	0	2245	15.3975	14.3536	22.608	16.1652	15.0693	Orange	HUNTINGTON BEACH
838	Daily	12974.7	21922.6	26490.8	65040.9	13746.7	23227	28067.2	86.6063	9143.45	143.671	7.21732	812	1501	198	2511	15.9787	14.6053	25.9024	16.9295	15.4744	Orange	HUNTINGTON BEACH
839	Daily	2924.9	16842.4	15898.6	40157.9	3293.28	18963.6	17901	19.6063	5513.07	36.7259	7.32939	208	1212	2072	3492	14.062	13.8964	11.5	15.8331	15.6465	Orange	HUNTINGTON BEACH
840	Daily	28457	6171.95	12816.8	51259.6	30744.5	6668.07	13847	55.8627	7545.61	108.969	6.88533	1757	457	555	2769	16.1964	13.5054	18.5119	17.4983	14.591	Orange	HUNTINGTON BEACH
841	Daily	25938.1	4108.34	10370.9	42348.9	27177.7	4304.68	10866.5	33.9939	6345.05	66.1327	6.73921	1599	298	49	1946	16.2215	13.7864	21.762	16.9967	14.4452	Orange	HUNTINGTON BEACH
842	Daily	24604.6	25236.3	196976	253389	25259.8	25908.2	202221	336.504	33216.3	611.919	7.76132	1550	1949	18575	22074	15.874	12.9483	11.4791	16.2966	13.2931	Orange	HUNTINGTON BEACH
843	Daily	23346.4	66864.6	164843	262859	24060.9	68910.9	169887	1158.33	40795.7	1694.32	6.69287	1395	4941	60	6396	16.7358	13.5326	41.0974	17.2479	13.9467	Orange	HUNTINGTON BEACH
844	Daily	46735.5	5343.05	13296	69813.6	49908.9	5705.85	14198.8	139.306	7529.81	121.513	9.40489	2069	310	0	2379	22.5885	17.2357	29.3458	24.1222	18.406	Orange	HUNTINGTON BEACH
845	Daily	65340.5	9610.08	21464.2	101705	68925.4	10137.3	22641.9	254.184	13269.2	367.881	7.86356	3622	673	55	4350	18.0399	14.2795	23.3804	19.0297	15.0629	Orange	HUNTINGTON BEACH
846	Daily	14748.7	3298.48	7516.36	27005	15580.4	3484.47	7940.19	20.3834	3633.39	24.3874	7.47705	735	234	326	1295	20.0663	14.096	20.8533	21.1978	14.8909	Orange	HUNTINGTON BEACH
847	Daily	13370	4173.81	8687.48	27503.9	14018.6	4376.31	9108.97	31.1472	4240.77	51.8763	6.55847	971	316	0	1287	13.7693	13.2083	21.3706	14.4373	13.8491	Orange	HUNTINGTON BEACH
848	Daily	26389	7770.62	22829.7	60334	27937.8	8226.66	24169.6	141.133	9313.73	280.425	6.66344	1633	605	110	2348	16.1599	12.844	25.6959	17.1082	13.5978	Orange	HUNTINGTON BEACH
849	Daily	39081.2	3944.9	11526.6	59357.9	42523.7	4292.39	12541.9	75.9181	8630.31	148.586	6.98938	2653	281	522	3456	14.7309	14.0388	17.1753	16.0285	15.2754	Orange	HUNTINGTON BEACH
850	Daily	23766.5	5105.54	16327.5	49196.8	25868.3	5557.04	17771.4	54.7795	7338.63	106.758	6.7952	1529	412	273	2214	15.5438	12.3921	22.2208	16.9184	13.488	Orange	HUNTINGTON BEACH
851	Daily	29938.4	16442.1	41158.1	91971.9	31454.6	17274.8	43242.5	202.792	14222.1	328.496	6.60513	1773	1360	0	3133	16.8857	12.0898	29.3559	17.7409	12.7021	Orange	HUNTINGTON BEACH
852	Daily	61189.2	14379.8	46586.6	128941	64588	15178.5	49174.2	300.16	18767	459.529	7.02666	4177	1109	0	5286	14.6491	12.9664	24.3929	15.4628	13.6866	Orange	HUNTINGTON BEACH
853	Daily	41314.3	10237	26169	82416.4	43810.6	10855.5	27750.3	338.506	9320.06	243.009	9.04236	1855	611	0	2466	22.2719	16.7545	33.4211	23.6176	17.7668	Orange	HUNTINGTON BEACH
854	Daily	57628.4	9029.09	17663.2	89320.5	61045.5	9564.48	18710.6	268.698	10785.9	337.665	8.52316	2853	596	0	3449	20.1992	15.1495	25.8975	21.3969	16.0478	Orange	HUNTINGTON BEACH
855	Daily	19878.2	11957.8	27895.6	63074.3	20990.7	12627	29456.7	195.261	10183.3	353.75	6.39695	845	1022	557	2424	23.5246	11.7004	26.0208	24.841	12.3552	Orange	HUNTINGTON BEACH
856	Daily	84067.6	9091.64	20532.5	121175	89601.1	9690.08	21884	280.625	17014.4	623.451	7.37571	4476	696	0	5172	18.7819	13.0627	23.4291	20.0181	13.9225	Orange	HUNTINGTON BEACH
857	Daily	40248.4	11687.4	33628.3	90281.4	42467.4	12331.7	35482.3	323.941	14232.4	709.771	6.65237	2323	976	33	3332	17.3261	11.9748	27.0953	18.2813	12.6349	Orange	HUNTINGTON BEACH
858	Daily	9961.82	4437.42	11340.5	27867.7	10785.4	4804.27	12278.1	35.1147	4217.82	63.0309	6.69893	561	363	0	924	17.7573	12.2243	30.1599	19.2253	13.2349	Orange	HUNTINGTON BEACH
859	Daily	20020	1326.22	3366.89	26724.7	21649.6	1434.17	3640.94	13.5242	3733.95	23.0954	7.19811	1104	97	542	1743	18.1341	13.6724	15.3326	19.6101	14.7852	Orange	HUNTINGTON BEACH
860	Daily	17784.5	2140.91	5042.99	26755.8	19057.6	2294.17	5404.01	15.3809	4004.42	31.0761	6.72995	1212	169	0	1381	14.6736	12.6681	19.3742	15.7241	13.575	Orange	HUNTINGTON BEACH
861	Daily	31044.4	15354.6	25169	76166	33038.9	16341.1	26786	160.702	12442.6	330.627	6.27521	2170	1326	0	3496	14.3062	11.5797	21.7866	15.2253	12.3236	Orange	HUNTINGTON BEACH
862	Daily	11364	999.693	1841.63	15147.5	12117.7	1066	1963.77	2.38661	2147.93	4.63423	7.06626	765	75	0	840	14.8549	13.3292	18.0327	15.8401	14.2133	Orange	HUNTINGTON BEACH
863	Daily	22997.1	1475.61	3346.05	29693.3	24546.8	1575.04	3571.52	12.8882	4059.76	22.8597	7.35229	1270	111	0	1381	18.108	13.2938	21.5013	19.3282	14.1896	Orange	HUNTINGTON BEACH
864	Daily	11565.2	7678.51	12068.9	32674.9	12068.3	8012.57	12594	31.0932	4940.09	48.1644	6.67299	620	662	0	1282	18.6535	11.599	25.4874	19.465	12.1036	Orange	HUNTINGTON BEACH
865	Daily	5160.09	8261	23676.3	37916	5273.95	8443.28	24198.7	54.5746	6826.52	98.1286	5.62711	354	739	0	1093	14.5765	11.1786	34.6898	14.8982	11.4253	Orange	HUNTINGTON BEACH
866	Daily	42541.7	8554.32	24897.8	81471.5	45608.1	9170.92	26692.4	125.154	12431	209.754	6.65616	2692	700	198	3590	15.803	12.2205	22.694	16.9421	13.1013	Orange	HUNTINGTON BEACH
867	Daily	29398.9	11401.1	49698.4	94713.3	30768.1	11932.1	52013.1	197.74	15776	405.636	6.1492	1866	1016	0	2882	15.755	11.2215	32.8637	16.4888	11.7442	Orange	HUNTINGTON BEACH
868	Daily	23261.2	3425.3	8085.06	37322.5	24967.7	3676.59	8678.21	19.4625	5181.68	30.041	7.24101	1489	249	0	1738	15.622	13.7562	21.4744	16.7681	14.7654	Orange	HUNTINGTON BEACH
869	Daily	29194.3	7058.1	12234.6	51183.1	30817.6	7450.57	12914.9	83.6225	6836.07	131.081	7.62111	1550	542	0	2092	18.835	13.0223	24.4661	19.8824	13.7464	Orange	HUNTINGTON BEACH
870	Daily	26344.3	2946.32	7133.99	38930.7	28156.9	3149.03	7624.82	38.8376	5064.49	67.2719	7.78271	1437	199	0	1636	18.3329	14.8056	23.7963	19.5942	15.8243	Orange	HUNTINGTON BEACH
871	Daily	9271.99	841.551	1856.02	12696	9834.71	892.625	1968.66	3.58729	1703.14	6.87895	7.48259	520	62	0	582	17.8307	13.5734	21.8144	18.9129	14.3972	Orange	HUNTINGTON BEACH
872	Daily	15619.6	3588.68	7899.84	28412.1	16370.9	3761.31	8279.85	36.5895	4358.34	73.2711	6.62195	946	295	526	1767	16.5112	12.165	16.0793	17.3054	12.7502	Orange	HUNTINGTON BEACH
873	Daily	37142.1	5058.17	11132.1	57321.2	39920.1	5436.49	11964.7	81.9848	8368.64	189.073	6.99784	2147	425	0	2572	17.2995	11.9016	22.2866	18.5934	12.7917	Orange	HUNTINGTON BEACH
874	Daily	43702.4	5473.6	16040.9	70806.7	47448.2	5942.74	17415.8	119.248	10608.5	244.678	6.82059	2996	431	289	3716	14.5869	12.6998	19.0545	15.8372	13.7883	Orange	HUNTINGTON BEACH
875	Daily	8693.57	12265.8	27466.2	51754.1	9291.11	13108.9	29354.1	86.2425	8916.23	141.062	5.88796	794	1099	1412	3305	10.9491	11.1609	15.6593	11.7017	11.928	Orange	HUNTINGTON BEACH
876	Daily	53346.7	33920.8	65009.5	162182	56816.8	36127.3	69238.3	724.825	27735.2	1417.55	6.13497	4565	3003	626	8194	11.686	11.2957	19.7928	12.4462	12.0304	Orange	HUNTINGTON BEACH
877	Daily	31872	4780.97	11952.6	51709.9	33907.6	5086.32	12716	47.0198	8212.59	92.6824	6.3625	2411	394	350	3155	13.2194	12.1344	16.3898	14.0637	12.9094	Orange	HUNTINGTON BEACH
880	Daily	23029.9	950.589	3541.53	28696.9	24013	991.166	3692.71	18.7298	3261.93	21.1485	8.84915	1073	52	0	1125	21.4631	18.2806	25.5083	22.3793	19.0609	Orange	HUNTINGTON BEACH
881	Daily	2961.94	82.004	567.032	4166.38	3417.52	94.617	654.247	0.353398	449.02	0.480703	9.28799	140	2	0	142	21.1567	41.002	29.3407	24.4109	47.3085	Orange	HUNTINGTON BEACH
882	Daily	12332.9	663.997	1800.82	15099.3	12584.3	677.531	1837.53	5.22814	1775.08	7.18556	8.53788	509	40	0	549	24.2296	16.5999	27.5033	24.7235	16.9383	Orange	HUNTINGTON BEACH
883	Daily	33586.4	2370.22	5880.82	43086.7	34589.3	2440.99	6056.41	44.7347	5735.49	85.838	7.61851	1800	162	0	1962	18.6591	14.631	21.9606	19.2163	15.0678	Orange	HUNTINGTON BEACH
884	Daily	35707.6	7165.75	6953.8	53684.5	38471.9	7720.48	7492.12	59.3121	7186.3	118.498	7.58724	1954	580	501	3035	18.2741	12.3547	17.6885	19.6888	13.3112	Orange	HUNTINGTON BEACH
885	Daily	22946.2	2037.88	5406.66	32919.2	24855.3	2207.43	5856.5	25.9316	4718.96	41.5026	7.03229	1458	152	756	2366	15.7381	13.4071	13.9134	17.0475	14.5226	Orange	HUNTINGTON BEACH
886	Daily	3671.18	9077.01	14082.3	28484.8	3897.54	9636.69	14950.6	24.9452	4459.49	33.1324	6.42963	233	760	0	993	15.7562	11.9434	28.6856	16.7277	12.6798	Orange	HUNTINGTON BEACH
887	Daily	27454.4	16829.4	27728.7	77098.1	29393.3	18017.9	29686.9	170.366	13413.7	331.989	5.88057	2239	1520	0	3759	12.2619	11.072	20.5103	13.1279	11.8539	Orange	HUNTINGTON BEACH
888	Daily	34590.5	14982	36046.6	91663.8	37032.6	16039.7	38591.5	238.36	15461.9	450.243	6.09031	2660	1294	0	3954	13.0039	11.578	23.1825	13.922	12.3954	Orange	HUNTINGTON BEACH
890	Daily	5847.85	592.151	1157.38	7847.39	6040.28	611.637	1195.47	2.16542	1008.82	3.48028	7.80351	307	41	0	348	19.0484	14.4427	22.55	19.6752	14.918	Orange	HUNTINGTON BEACH
891	Daily	15249.6	2165.41	2848.4	21051	15842.3	2249.58	2959.11	13.3725	2632.48	20.6396	8.05471	801	151	0	952	19.0382	14.3405	22.1124	19.7782	14.8979	Orange	HUNTINGTON BEACH
892	Daily	7235.91	16087.4	31008.8	56507.9	7525.68	16731.6	32250.6	123.214	9221.84	160.744	6.22272	419	1352	0	1771	17.2695	11.8989	31.9073	17.961	12.3754	Orange	HUNTINGTON BEACH
893	Daily	34658.2	13391.7	32173	84469	36492.6	14100.5	33875.9	220.261	14675.7	420.959	5.91024	2279	1204	0	3483	15.2076	11.1227	24.2518	16.0126	11.7114	Orange	HUNTINGTON BEACH
894	Daily	30637.4	7462.49	27946.3	70109.1	32522.1	7921.56	29665.4	125.291	11596.3	232.568	6.15851	1871	672	0	2543	16.3749	11.1049	27.5695	17.3822	11.788	Orange	HUNTINGTON BEACH
895	Daily	6469.94	624.028	1076.37	8425.55	6672.04	643.521	1109.99	1.81976	1075.64	1.86159	7.84493	290	44	0	334	22.3101	14.1825	25.2262	23.007	14.6255	Orange	HUNTINGTON BEACH
896	Daily	13514	3138.18	6148.66	24648	14608.3	3392.4	6646.77	24.7301	3709.76	29.3599	6.69037	926	255	529	1710	14.594	12.3066	14.414	15.7763	13.3035	Orange	HUNTINGTON BEACH
897	Daily	15647.5	1640.89	3391.82	21726.4	16439.1	1723.89	3563.4	12.3202	3379.39	23.7661	6.47094	942	136	0	1078	16.6109	12.0653	20.1543	17.4512	12.6757	Orange	HUNTINGTON BEACH
898	Daily	12086.3	584.763	1630.61	15528.4	13123	634.923	1770.48	4.23649	2339.76	8.87658	6.66021	797	44	0	841	15.1647	13.2901	18.4642	16.4655	14.4301	Orange	HUNTINGTON BEACH
899	Daily	30083.9	7936.99	25414.4	66645.1	31606.1	8338.59	26700.4	161.332	11431.1	330.314	5.98911	1758	732	0	2490	17.1126	10.8429	26.7651	17.9785	11.3915	Orange	HUNTINGTON BEACH
900	Daily	15934.8	16023.5	44801.9	82843.8	17197.7	17293.5	48352.6	296.635	14817.3	478.121	5.75678	1780	1474	0	3254	8.95214	10.8708	25.4591	9.66164	11.7323	Orange	HUNTINGTON BEACH
901	Daily	49968	10086.2	24217.6	89168	52871.2	10672.2	25624.7	210.327	14594.3	411.586	6.27226	3145	902	0	4047	15.8881	11.182	22.0331	16.8112	11.8317	Orange	HUNTINGTON BEACH
902	Daily	2696.75	460.441	49603	56707	2898.48	494.884	53313.6	1153.24	10149.7	938.254	6.03093	130	38	0	168	20.7442	12.1169	337.541	22.296	13.0233	Orange	HUNTINGTON BEACH
903	Daily	37500.8	5384.26	10870	55752.1	38894	5584.29	11273.8	160.603	6310.67	118.495	8.9777	1742	324	0	2066	21.5274	16.6181	26.9855	22.3272	17.2355	Orange	HUNTINGTON BEACH
904	Daily	21241.6	8575.66	19898.8	51687.9	22084.1	8915.8	20688	174.549	9153.72	287.757	5.81024	1706	744	0	2450	12.4511	11.5264	21.0971	12.945	11.9836	Orange	HUNTINGTON BEACH
905	Daily	27618.5	4076.69	7731.96	40899.9	28650.1	4228.97	8020.77	69.9205	6353.34	119.338	6.54955	1619	347	0	1966	17.059	11.7484	20.8036	17.6962	12.1872	Orange	HUNTINGTON BEACH
906	Daily	12870.7	7664.74	22522.4	45087.1	13477.3	8025.97	23583.9	142.41	9081.38	357.553	5.15195	1231	733	13	1977	10.4555	10.4567	22.8058	10.9482	10.9495	Orange	HUNTINGTON BEACH
907	Daily	18294.1	4955.78	11494.8	35824.5	18862.7	5109.81	11852.1	58.0797	6064.73	86.6626	5.98295	1013	444	41	1498	18.0593	11.1617	23.9149	18.6206	11.5086	Orange	HUNTINGTON BEACH
908	Daily	14460.1	3752.66	8791.38	29634.9	15868.8	4118.24	9647.83	36.6341	5298.24	85.8565	5.67845	1099	351	2665	4115	13.1576	10.6913	7.20168	14.4393	11.7329	Orange	HUNTINGTON BEACH
909	Daily	27648.8	30911.8	17011.1	79988.4	29264.7	32718.4	18005.3	167.706	12381.7	276.1	6.59369	1699	3022	1518	6239	16.2736	10.2289	12.8207	17.2247	10.8267	Orange	HUNTINGTON BEACH
910	Daily	71775	8154.49	17034.3	104623	77444.4	8798.6	18379.9	321.231	15281.2	547.605	7.07919	3993	642	0	4635	17.9752	12.7017	22.5724	19.3951	13.705	Orange	HUNTINGTON BEACH
911	Daily	54627.2	29234.1	61271.1	152882	57544.2	30795.1	64542.8	1276.07	27653.5	2401.85	6.00382	3238	2579	0	5817	16.8707	11.3354	26.2819	17.7715	11.9407	Orange	HUNTINGTON BEACH
912	Daily	3400.04	3522.24	13890	23456.4	3832	3969.72	15654.6	19.197	4627.49	26.3791	5.0938	205	379	0	584	16.5856	9.29352	40.165	18.6927	10.4742	Orange	HUNTINGTON BEACH
913	Daily	25797.4	5487.08	6669.46	41192.6	27998.8	5955.3	7238.58	39.4801	6396.54	83.844	6.51911	1697	538	28	2263	15.2018	10.199	18.2027	16.499	11.0693	Orange	HUNTINGTON BEACH
914	Daily	21770.4	4264.68	13600	43602.3	23949.4	4691.55	14961.3	55.5317	7095.34	115.526	6.23896	1511	416	0	1927	14.4079	10.2516	22.627	15.85	11.2778	Orange	HUNTINGTON BEACH
915	Daily	30426	7975.71	12672	53849.7	32079.7	8409.2	13360.8	78.2264	8532.2	147.201	6.41282	1781	743	0	2524	17.0837	10.7345	21.3351	18.0122	11.3179	Orange	HUNTINGTON BEACH
916	Daily	24608.3	5739.5	18143.3	52088.5	26433.9	6165.29	19489.3	79.3346	8304.87	163.625	6.38835	1607	490	0	2097	15.3132	11.7133	24.8395	16.4492	12.5822	Orange	HUNTINGTON BEACH
917	Daily	11892.3	3764.81	7822.5	25373.5	12851.5	4068.49	8453.49	21.5648	4055.14	43.0656	6.31892	846	309	664	1819	14.0571	12.1838	13.9492	15.1909	13.1666	Orange	HUNTINGTON BEACH
918	Daily	11788.4	2618.72	4159.46	19937.5	12658.8	2812.07	4466.57	7.8295	2967.61	15.9648	6.75203	800	212	0	1012	14.7355	12.3524	19.7011	15.8235	13.2645	Orange	HUNTINGTON BEACH
919	Daily	26758.2	2625.13	9146.73	41661.7	28933	2838.49	9890.16	31.7647	6226.73	68.0127	6.75951	1772	185	0	1957	15.1006	14.1899	21.2885	16.3279	15.3432	Orange	HUNTINGTON BEACH
920	Daily	25690.6	4210.4	11899.3	44797.2	27532.5	4512.27	12752.4	40.6734	6585.96	78.8091	6.87806	1826	295	32	2153	14.0694	14.2726	20.8069	15.0781	15.2958	Orange	HUNTINGTON BEACH
921	Daily	31310.2	2143.12	5727.89	42774.9	34182	2339.7	6253.26	34.1682	6467.32	77.7329	6.68913	1912	195	0	2107	16.3756	10.9904	20.3013	17.8776	11.9984	Orange	HUNTINGTON BEACH
922	Daily	27390.9	4552.46	11222.3	47316.9	30025	4990.26	12301.6	75.0229	8167.17	204.12	5.93264	2152	469	293	2914	12.7281	9.70673	16.2378	13.9522	10.6402	Orange	HUNTINGTON BEACH
923	Daily	15576.1	14609	33324.9	66944	16418.3	15398.9	35126.8	239.333	13349.8	506.711	5.19381	1218	1486	0	2704	12.7883	9.83112	24.7574	13.4797	10.3627	Orange	HUNTINGTON BEACH
924	Daily	24676.5	4885.49	12408.4	45848	26956.3	5336.86	13554.8	61.8258	7285.53	128.597	6.39746	1634	425	447	2506	15.1019	11.4953	18.2953	16.4972	12.5573	Orange	HUNTINGTON BEACH
925	Daily	14009.5	2341.37	6673.27	24760.3	15065.9	2517.92	7176.48	16.0127	3743.85	33.1496	6.66835	781	195	0	976	17.9379	12.007	25.3691	19.2905	12.9124	Orange	HUNTINGTON BEACH
926	Daily	16149.2	1070.18	1910.15	20511.5	17315.9	1147.49	2048.14	3.89731	2923.46	7.90197	7.03384	917	80	0	997	17.6109	13.3772	20.5732	18.8832	14.3436	Orange	HUNTINGTON BEACH
927	Daily	56919.2	10009.3	30666.9	103551	60392.4	10620.1	32538.2	285.849	16348.4	605.58	6.55949	3272	813	459	4544	17.3958	12.3116	22.7884	18.4573	13.0628	Orange	HUNTINGTON BEACH
928	Daily	33310.1	6183.85	16208.3	59950.6	35850.6	6655.48	17444.5	95.5161	9165.56	184.692	6.66473	2142	457	509	3108	15.551	13.5314	19.2891	16.737	14.5634	Orange	HUNTINGTON BEACH
929	Daily	34696.5	2800.28	6610.75	48105.8	37841.7	3054.12	7210	51.0488	7170.38	121.398	6.81726	2096	264	0	2360	16.5537	10.6071	20.3838	18.0542	11.5686	Orange	HUNTINGTON BEACH
930	Daily	25033.9	2273.77	6354.79	36594	27214	2471.78	6908.2	34.2797	5729.84	87.9959	6.48009	1472	228	0	1700	17.0067	9.97269	21.5259	18.4878	10.8412	Orange	HUNTINGTON BEACH
931	Daily	35983.7	5692	11251.1	56992.4	38747.8	6129.23	12115.4	92.604	9078.7	191.869	6.40271	2261	539	0	2800	15.915	10.5603	20.3544	17.1375	11.3715	Orange	HUNTINGTON BEACH
932	Daily	29120	2534.4	5914.33	40985.6	31768.5	2764.9	6452.23	36.4878	6221.92	76.1243	6.66295	1935	209	413	2557	15.0491	12.1263	16.0288	16.4178	13.2292	Orange	HUNTINGTON BEACH
933	Daily	12638.7	3973.68	9293.48	27708	13517.9	4250.11	9939.98	31.6037	4531.66	64.8997	6.19609	775	343	349	1467	16.308	11.5851	18.8875	17.4425	12.391	Orange	HUNTINGTON BEACH
934	Daily	14643.2	1913.69	3552.51	21267.7	15486.6	2023.91	3757.12	10.1475	3250.96	20.5692	6.58048	931	156	0	1087	15.7285	12.2673	19.5655	16.6344	12.9738	Orange	HUNTINGTON BEACH
935	Daily	25202.7	7212.43	23188.9	59127.6	26799.8	7669.48	24658.4	132.76	9827.4	289.373	6.18523	1731	597	415	2743	14.5596	12.0811	21.5558	15.4822	12.8467	Orange	HUNTINGTON BEACH
936	Daily	16184.8	6362.57	18740.2	43651.6	17111.5	6726.87	19813.3	80.8783	6815.31	119.939	6.50758	1028	488	0	1516	15.7439	13.038	28.7939	16.6454	13.7846	Orange	HUNTINGTON BEACH
937	Daily	33734.2	2642.08	6178.1	46073.2	36523.7	2860.56	6688.97	45.3332	7003.34	92.0343	6.6598	2121	223	0	2344	15.9049	11.8479	19.6558	17.22	12.8276	Orange	HUNTINGTON BEACH
938	Daily	18298.5	1407.69	2919.44	23381.4	18909.7	1454.71	3016.95	10.8114	3629.82	29.5681	6.49138	1111	127	0	1238	16.4703	11.0842	18.8864	17.0204	11.4544	Orange	HUNTINGTON BEACH
939	Daily	22829.3	2607.53	6867.95	35233.6	24899.1	2843.93	7490.61	44.6602	5672.04	96.8238	6.31167	1691	241	507	2439	13.5005	10.8196	14.4459	14.7245	11.8005	Orange	HUNTINGTON BEACH
940	Daily	16305	4250.02	13984.7	36984.3	17459	4550.83	14974.5	75.9918	6237.26	157.606	6.0708	1600	340	0	1940	10.1906	12.5001	19.0641	10.9119	13.3848	Orange	HUNTINGTON BEACH
941	Daily	14472.9	4827.72	8689.14	29936.9	15479.8	5163.57	9293.61	31.2685	4541.09	63.5919	6.6791	861	403	0	1264	16.8094	11.9795	23.6843	17.9788	12.8128	Orange	HUNTINGTON BEACH
942	Daily	12401.1	1721.61	3264.5	18866.5	13456.2	1868.08	3542.25	7.91253	2795.08	15.8168	6.78548	734	136	713	1583	16.8952	12.6589	11.9182	18.3327	13.7359	Orange	HUNTINGTON BEACH
943	Daily	29546.1	2364.17	7266.52	42297.1	31899.3	2552.47	7845.29	45.0474	6337.76	98.3734	6.77183	1949	166	538	2653	15.1596	14.242	15.9431	16.367	15.3764	Orange	HUNTINGTON BEACH
944	Daily	22559.3	4016.26	10608.9	39273.9	23826.9	4241.95	11205	55.2502	5514.41	69.7282	7.20312	1251	285	0	1536	18.033	14.0922	25.569	19.0463	14.884	Orange	HUNTINGTON BEACH
945	Daily	6615.03	8897.56	21059.1	38736.4	7006.58	9424.21	22305.6	90.654	7051.21	153.904	5.60302	426	790	0	1216	15.5282	11.2627	31.8556	16.4474	11.9294	Orange	HUNTINGTON BEACH
946	Daily	14967.3	8541.08	18415.4	44252	15798.5	9015.42	19438.1	120.782	8225.14	263.357	5.54289	976	800	0	1776	15.3353	10.6763	24.9167	16.187	11.2693	Orange	HUNTINGTON BEACH
947	Daily	0	388.913	34193.1	36374.5	0	409.071	35965.4	504.438	6700.62	468.959	5.75609	0	36	0	36	0	10.8031	1010.4	0	11.3631	Orange	HUNTINGTON BEACH
948	Daily	60003.9	6463.29	18643.2	90394.6	63729.4	6864.58	19800.7	248.563	13151.3	427.214	7.08465	3148	527	0	3675	19.061	12.2643	24.5972	20.2444	13.0258	Orange	HUNTINGTON BEACH
949	Daily	19960.9	2234.41	4683.22	28987.3	21526.9	2409.71	5050.64	24.2633	4227.81	51.7377	6.93548	1264	177	0	1441	15.7918	12.6238	20.1161	17.0308	13.6142	Orange	HUNTINGTON BEACH
950	Daily	3762.69	2683.66	4759.12	12223.3	4104.47	2927.42	5191.41	5.2334	2018.44	10.136	6.08377	216	215	1976	2407	17.4199	12.4821	5.07823	19.0022	13.6159	Orange	HUNTINGTON BEACH
951	Daily	12793.2	2677.01	2965.6	19145.9	13285.9	2780.11	3079.82	8.31923	2776.97	16.6774	6.93317	796	213	0	1009	16.0719	12.5681	18.9751	16.6909	13.0522	Orange	HUNTINGTON BEACH
952	Daily	29221.7	3268.99	11953.9	47350.4	31132.2	3482.71	12735.5	70.8491	7069.33	150.852	6.8338	1744	242	0	1986	16.7556	13.5082	23.8421	17.851	14.3914	Orange	HUNTINGTON BEACH
953	Daily	16671.5	2087.89	4034.51	24593.3	17987.6	2252.72	4353.02	19.7255	3045.03	21.6945	8.12798	805	142	0	947	20.7099	14.7034	25.9697	22.3449	15.8642	Orange	HUNTINGTON BEACH
954	Daily	10889.2	3652.31	4773.21	19963.1	11254.7	3774.92	4933.46	16.3361	2668.89	27.2775	7.55098	482	268	0	750	22.5916	13.628	26.6175	23.3501	14.0855	Orange	HUNTINGTON BEACH
955	Daily	0	1268.45	347.012	1892.71	0	1486.15	406.567	0.004382	191.51	0.006412	9.88341	0	97	0	97	0	13.0768	19.5125	0	15.3211	Orange	HUNTINGTON BEACH
956	Daily	15516.2	899.059	2974.35	20044.3	16040.1	929.414	3074.78	11.4015	2835.27	22.9927	7.12336	877	56	0	933	17.6924	16.0546	21.4837	18.2897	16.5967	Orange	HUNTINGTON BEACH
957	Daily	12317.4	1256.19	3059.36	17470.1	12937.4	1319.42	3213.34	10.4348	2548.96	21.1344	6.90699	739	89	386	1214	16.6677	14.1145	14.3905	17.5066	14.8249	Orange	HUNTINGTON BEACH
958	Daily	45945	6061.35	14372.5	69943.7	48412.4	6386.87	15144.4	158.818	10128.6	359.182	7.14323	2671	434	0	3105	17.2014	13.9662	22.5261	18.1252	14.7163	Orange	HUNTINGTON BEACH
959	Daily	7042.86	356.055	1258.17	8962.67	7291.46	368.623	1302.59	2.64527	1154.39	5.09588	7.7961	350	20	0	370	20.1225	17.8028	24.2234	20.8328	18.4312	Orange	HUNTINGTON BEACH
960	Daily	10009.3	11363.1	5533.51	27584.1	10261.6	11649.5	5672.98	20.9034	3586.43	47.5042	7.78859	541	860	0	1401	18.5015	13.2129	19.6889	18.9679	13.5459	Orange	HUNTINGTON BEACH
961	Daily	7515.88	3774.86	2872.25	16185.3	8589.05	4313.86	3282.37	6.73352	2038.98	15.7333	7.99632	518	287	0	805	14.5094	13.1528	20.1059	16.5812	15.0309	Orange	HUNTINGTON BEACH
962	Daily	0	0	42651.6	45270.4	0	0	45270.4	751.804	7723.54	779.434	6.41099	0	0	0	0	0	0	0	0	0	Orange	HUNTINGTON BEACH
		3090370.896			7030803.7								190653	87041	42800	320494							

APPENDIX D – SUPPORTING DOCUMENTATION FOR VMT MITIGATION

T-1. Increase Residential Density



GHG Mitigation Potential



Up to 30.0% of GHG emissions from project VMT in the study area

Co-Benefits (icon key on pg. 34)



Climate Resilience

Increased density can put people closer to resources they may need to access during an extreme weather event. Increased density can also shorten commutes, decreasing the amount of time people are on the road and exposed to hazards such as extreme heat or flooding.

Health and Equity Considerations

Neighborhoods should include different types of housing to support a variety of household sizes, age ranges, and incomes.

Measure Description

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

Subsector

Land Use

Locational Context

Urban, suburban

Scale of Application

Project/Site

Implementation Requirements

This measure is most accurately quantified when applied to larger developments and/or developments where the density is somewhat similar to the surrounding neighborhood.

Cost Considerations

Depending on the location, increasing residential density may increase housing and development costs. However, the costs of providing public services, such as health care, education, policing, and transit, are generally lower in more dense areas where things are closer together. Infrastructure that provides drinking water and electricity also operates more efficiently when the service and transmission area is reduced. Local governments may provide approval streamlining benefits or financial incentives for infill and high-density residential projects.

Expanded Mitigation Options

When paired with Measure T-2, *Increase Job Density*, the cumulative densification from these measures can result in a highly walkable and bikeable area, yielding increased co-benefits in VMT reductions, improved public health, and social equity.

GHG Reduction Formula

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

GHG Calculation Variables

ID	Variable	Value	Unit	Source
Output				
A	Percent reduction in GHG emissions from project VMT in study area	0–30.0	%	calculated
User Inputs				
B	Residential density of project development	[ ]	du/acre	user input
Constants, Assumptions, and Available Defaults				
C	Residential density of typical development	9.1	du/acre	Ewing et al. 2007
D	Elasticity of VMT with respect to residential density	-0.22	unitless	Stevens 2016

Further explanation of key variables:

- (C) – The residential density of typical development is based on the blended average density of residential development in the U.S. forecasted for 2025. This estimate includes apartments, condominiums, and townhouses, as well as detached single-family housing on both small and large lots. An acre in this context is defined as an acre of developed land, not including streets, school sites, parks, and other undevelopable land. If reductions are being calculated from a specific baseline derived from a travel demand forecasting model, the residential density of the relevant transportation analysis zone should be used instead of the value for a typical development.
- (D) – A meta-regression analysis of five studies that controlled for self-selection found that a 0.22 percent decrease in VMT occurs for every 1 percent increase in residential density (Stevens 2016).

GHG Calculation Caps or Maximums

Measure Maximum

(A_{max}) The percent reduction in GHG emissions (A) is capped at 30 percent. The purpose for the 30 percent cap is to limit the influence of any single built environmental factor (such as density). Projects that implement multiple land use strategies (e.g., density, design, diversity) will show more of a reduction than relying on improvements from a single built environment factor.

Subsector Maximum

($\sum A_{max_{T\text{-}1 \text{ through } T\text{-}4}} \leq 65\%$) This measure is in the Land Use subsector. This subcategory includes Measures T-1 through T-4. The VMT reduction from the combined implementation of all measures within this subsector is capped at 65 percent.

Example GHG Reduction Quantification

The user reduces VMT by increasing the residential density of the project study area. In this example, the project's residential density would be 15 du per acre (B), which would reduce GHG emissions from project VMT by 14.2 percent.

$$A = \frac{15 \frac{du}{ac} - 9.1 \frac{du}{ac}}{9.1 \frac{du}{ac}} \times -0.22 = -14.2\%$$

Quantified Co-Benefits

Improved Local Air Quality

The percent reduction in GHG emissions (A) would be the same as the percent reduction in NO_X, CO, NO_2, SO_2, and PM. Reductions in ROG emissions can be calculated by multiplying the percent reduction in GHG emissions (A) by an adjustment factor of 87 percent. See *Adjusting VMT Reductions to Emission Reductions* above for further discussion.

Energy and Fuel Savings

The percent reduction in vehicle fuel consumption would be the same as the percent reduction in GHG emissions (A).

VMT Reductions

The percent reduction in VMT would be the same as the percent reduction in GHG emissions (A).

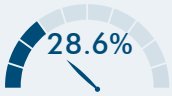
Sources

- Ewing, R., K. Bartholomew, S. Winkelman, J. Walters, and D. Chen. 2007. *Growing Cooler: The Evidence on Urban Development and Climate Change*. October. Available: https://www.nrdc.org/sites/default/files/cit_07092401a.pdf. Accessed: January 2021.
- Stevens, M. 2016. Does Compact Development Make People Drive Less? *Journal of the American Planning Association* 83:1(7–18), DOI: 10.1080/01944363.2016.1240044. November. Available: https://www.researchgate.net/publication/309890412_Does_Compact_Development_Make_People_Drive_Less. Accessed: January 2021.

T-4. Integrate Affordable and Below Market Rate Housing



GHG Mitigation Potential



Up to 28.6% of GHG emissions from project/site multifamily residential VMT

Co-Benefits (icon key on pg. 34)

Climate Resilience

Increasing affordable housing creates the opportunity for a greater diversity of people to be closer to their desired destinations and the resources they may need to access during an extreme weather event. Close proximity to destinations allows for more opportunities to use active transportation and transit and to be less reliant on private vehicles. Alleviating the housing-cost burden also enables more people to remain housed, and increases people's capacity to respond to disruptions, including climate impacts.

Health and Equity Considerations

Neighborhoods should include different types of housing to support a variety of household sizes, age ranges, abilities, and incomes.

Measure Description

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.

Subsector

Land Use

Locational Context

Urban, suburban

Scale of Application

Project/Site

Implementation Requirements

Multifamily residential units must be permanently dedicated as affordable for lower income families. The California Department of Housing and Community Development (2021) defines lower-income as 80 percent of area median income or below, and affordable housing as costing 30 percent of gross household income or less.

Cost Considerations

Depending on the source of the affordable subsidy, BMR housing may have implications for development costs but would also have the benefit of reducing costs for public services, similar to Measure T-1, *Increase Residential Density*.

Expanded Mitigation Options

Pair with Measure T-1, *Increase Residential Density*, and Measure T-2, *Increase Job Density*, to achieve greater population and employment diversity.

GHG Reduction Formula

$A = B \times C$

GHG Calculation Variables

ID	Variable	Value	Unit	Source
Output				
A	Percent reduction in GHG emissions from Project/Site VMT for multifamily residential developments	0–28.6	%	calculated
User Inputs				
B	Percent of multifamily units permanently dedicated as affordable	0–100	%	user input
Constants, Assumptions, and Available Defaults				
C	Percent reduction in VMT for qualified units compared to market rate units	-28.6	%	ITE 2021

Further explanation of key variables:

- (B) – This refers to percent of multifamily units in the project that are deed restricted or otherwise permanently dedicated as affordable.
- (C) – The 11th Edition of the *ITE Trip Generation Manual* (ITE 2021) contains daily vehicle trip rates for market rate multifamily housing that is low-rise and not close to transit (ITE code 221) as well as affordable multifamily housing (ITE code 223). While these rates do not account for trip length, they serve as a proxy for the expected difference in vehicle trip generation and VMT generation presuming similar trip lengths for both types of land use. If the user has information about trip length differences between market rate and affordable housing, then adjusting the percent reduction accordingly is recommended.

  Users should note that the ITE trip rate estimates are based on a small sample of studies for the affordable housing rate and that no stratification of affordable housing by number of stories was available. This is an important distinction since the multifamily low-rise vehicle trip rate applies to four or fewer stories. Therefore, this measure may not apply to affordable housing projects with more than four stories.

GHG Calculation Caps or Maximums

Measure Maximum

(A_{max}) The maximum GHG reduction from this measure is 28.6 percent. This maximum scenario is presented in the below example quantification.

Subsector Maximum

($\sum A_{max_{T\text{-}1 \text{ through } T\text{-}4}} \leq 65\%$) This measure is in the Land Use subsector. This subsector includes Measures T-1 through T-4. The VMT reduction from the combined implementation of all measures within this subsector is capped at 65 percent.

Example GHG Reduction Quantification

The user reduces project VMT by requiring a portion of the multifamily residential units to be permanently dedicated as affordable. In this example, the percent of units (B) is 100 percent, which would reduce GHG emissions from VMT by 28.6 percent.

$$A = 100\% \times -28.6\% = -28.6\%$$

Quantified Co-Benefits

Improved Local Air Quality

The percent reduction in GHG emissions (A) would be the same as the percent reduction in NO_X, CO, NO_2, SO_2, and PM. Reductions in ROG emissions can be calculated by multiplying the percent reduction in GHG emissions (A) by an adjustment factor of 87 percent. See *Adjusting VMT Reductions to Emission Reductions* above for further discussion.

Energy and Fuel Savings

The percent reduction in vehicle fuel consumption would be the same as the percent reduction in GHG emissions (A).

VMT Reductions

The percent reduction in VMT would be the same as the percent reduction in GHG emissions (A).

Sources

- California Department of Housing and Community Development. 2021. *Income Limits*. Available: https://www.hcd.ca.gov/grants-funding/income-limits/index.shtml#:~:text=%E2%80%9CAffordable%20housing%20cost%E2%80%9D%20for%20lower,of%20gross%20income%2C%20with%20variations. Accessed; November 2021.
- Institute of Transportation Engineers (ITE). 2021. *Trip Generation Manual*. 11th Edition. Available: https://www.ite.org/technical-resources/topics/trip-and-parking-generation/. Accessed; November 2021.

T-6. Implement Commute Trip Reduction Program (Mandatory Implementation and Monitoring)

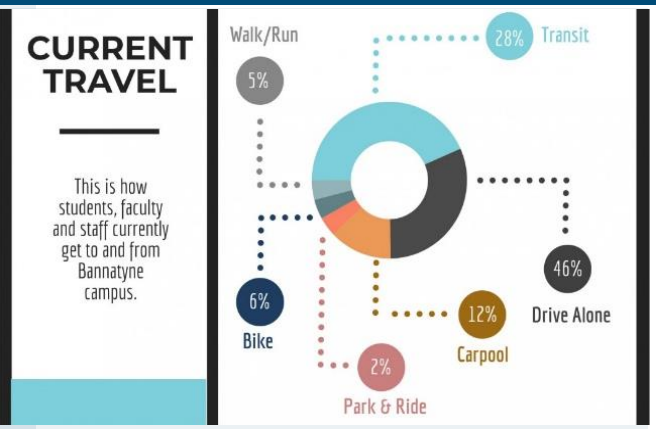


Photo Credit: University of Manitoba, 2018

GHG Mitigation Potential



Up to 26.0% of GHG emissions from project/site employee commute VMT

Co-Benefits (icon key on pg. 34)



Climate Resilience

Commute trip reduction programs could result in less traffic, potentially reducing congestion or delays on major roads during peak AM and PM traffic periods. When this reduction occurs during extreme weather events, it better allows emergency responders to access a hazard site. Lower transportation costs would also increase community resilience by freeing up resources for other purposes.

Health and Equity Considerations

Design of CTR programs needs to consider existing mobility options in diverse communities and ensure equitable access and benefit to all employees.

Measure Description

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 and GHG emissions.

Subsector

Trip Reduction Programs

Locational Context

Urban, suburban

Scale of Application

Project/Site

Implementation Requirements

The mandatory CTR program must include all other elements (i.e., Measures T-7 through T-11) described for the voluntary program (Measure T-5) plus include mandatory trip reduction requirements (including penalties for non-compliance) and regular monitoring and reporting to ensure the calculated VMT reduction matches the observed VMT reduction.

Cost Considerations

Employer costs may include recurring, direct costs for transit subsidies, capital and maintenance costs for alternative transportation infrastructure, and labor costs for staff to manage the program. If the local municipality has a mandatory VMT reduction ordinance, additional employer costs could include non-compliance penalties if the municipality fines CTR programs that do not meet a VMT goal. Municipal costs may include the labor costs for government staff to track the efficacy of the program, which may be outweighed by revenue generated from fines collected from non-compliant businesses.

Expanded Mitigation Options

This program typically serves as a complement to the more effective workplace CTR measures, such as pricing workplace parking (Measure T-12) or implementing employee parking "cash-out" (Measure T-13).

GHG Reduction Formula

$A = B \times C \times D$

GHG Calculation Variables

ID	Variable	Value	Unit	Source
Output				
A	Percent reduction in GHG emissions from project/site employee commute VMT	0–26.0	%	calculated
User Inputs				
B	Percent of employees eligible for program	0–100	%	user input
Constants, Assumptions, and Available Defaults				
C	Percent reduction in vehicle mode share of employee commute trips	-26	%	Nelson\Nygaard Consulting Associates 2015
D	Adjustment from vehicle mode share to commute VMT	1	unitless	assumed

Further explanation of key variables:

- (B) – This refers to the percent of employees that would be able to participate in the program. This will usually be 100 percent. Employees who might not be able to participate could include those who work nighttime hours when transit and rideshare services are not available or employees who are required to drive to work as part of their job duties. This input does not refer to the percent of employees who participate in the program.
- (C) – A multiyear study of mode share on Genentech's South San Francisco campuses tracked the long-run change in employee commute mode share with implementation of mandatory CTR. Between 2006 and 2014, employee vehicle mode share (includes single-occupied vehicles and carpools) decreased from approximately 90 percent to 64 percent, which is a 26 percent reduction (Nelson\Nygaard Consulting Associates 2015).
- (D) – The adjustment factor from vehicle mode share to commute VMT is 1. This assumes that all vehicle trips will average out to typical trip length. Thus, it can be assumed that a percentage reduction in vehicle trips will equal the same percentage reduction in VMT.

GHG Calculation Caps or Maximums

Measure Maximum

(A_{max}) The maximum GHG reduction from this measure is 26 percent. This maximum scenario is presented in the below example quantification.

Subsector Maximum

($\sum A_{max_{T\text{-}5 \text{ through } T\text{-}13}} \leq 45\%$) This measure is in the Trip Reduction Programs subsector. This subcategory includes Measures T-5 through T-13. The employee commute VMT reduction from the combined implementation of all measures within this subsector is capped at 45 percent.

Mutually Exclusive Measures

If this measure is selected, the user may not also take credit for Measure T-5, which represents the same implementation activities as Measure T-5, except that the CTR program would be mandatory. Users should select either Measure T-5 or T-6.

If this measure is selected, the user may not also take credit for Measures T-7 through T-11. Measure T-6 accounts for the combined GHG reductions achieved by each of these individual measures. To combine the GHG reductions from T-6 with any of these measures would be considered double counting. However, the user may take credit for Measure T-12 and T-13 within the larger CTR subcategory, so long as the combined VMT reduction does not exceed 45 percent, as noted above.

Example GHG Reduction Quantification

The user reduces employee commute VMT by requiring that the employer of the proposed project offer a mandatory CTR program to their employees. In this example, the percent of employees eligible (B) is 100 percent, which would reduce GHG emissions from employee commute VMT by 26 percent.

$$A = 100\% \times -26\% \times 1 = -26\%$$

Quantified Co-Benefits

Improved Local Air Quality

The percent reduction in GHG emissions (A) would be the same as the percent reduction in NO_X, CO, NO_2, SO_2, and PM. Reductions in ROG emissions can be calculated by multiplying the percent reduction in GHG emissions (A) by an adjustment factor of 87 percent. See *Adjusting VMT Reductions to Emission Reductions* above for further discussion.

Energy and Fuel Savings

The percent reduction in vehicle fuel consumption would be the same as the percent reduction in GHG emissions (A).

VMT Reductions

The percent reduction in VMT would be the same as the percent reduction in GHG emissions (A).

Sources

- Nelson/Nygaard Consulting Associates. 2015. *Genentech–South San Francisco Campus TDM and Parking Report*. June. Available: http://ci-ssf-ca.granicus.com/MetaViewer.php?view_id=2&clip_id=859&meta_id=62028. Accessed: January 2021.

T-7. Implement Commute Trip Reduction Marketing



Photo Credit: Sacramento Area Council of Governments, 2012

GHG Mitigation Potential



Up to 4.0% of GHG emissions from project/site employee commute VMT

Co-Benefits (icon key on pg. 34)

Climate Resilience

Commute trip reduction programs could result in less traffic, potentially reducing congestion or delays on major roads during peak AM and PM traffic periods. When this reduction occurs during extreme weather events, it better allows emergency responders to access a hazard site. Lower transportation costs would also increase community resilience by freeing up resources for other purposes.

Health and Equity Considerations

Design of CTR programs needs to consider existing mobility options in diverse communities and ensure equitable access and benefit to all employees. CTR programs may need to include multi-language materials.

Measure Description

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 and GHG emissions.

Subsector

Trip Reduction Programs

Locational Context

Urban, suburban

Scale of Application

Project/Site

Implementation Requirements

The following features (or similar alternatives) of the marketing strategy are essential for effectiveness.

- Onsite or online commuter information services.
- Employee transportation coordinators.
- Onsite or online transit pass sales.
- Guaranteed ride home service.

Cost Considerations

Employer costs include labor and materials for development and distribution of survey and marketing materials to promote the program and educate potential participants.

Expanded Mitigation Options

This measure could be packaged with other commute trip reduction measures (Measures T-8 through T-13) as a comprehensive CTR program (Measure T-5 or T-6).

GHG Reduction Formula

$A = B \times C \times D$

GHG Calculation Variables

ID	Variable	Value	Unit	Source
Output				
A	Percent reduction in GHG emissions from project/site employee commute VMT	0–4.0	%	calculated
User Inputs				
B	Percent of employees eligible for program	0–100	%	user input
Constants, Assumptions, and Available Defaults				
C	Percent reduction in employee commute vehicle trips	-4	%	TRB 2010
D	Adjustment from vehicle trips to VMT	1	unitless	assumed

Further explanation of key variables:

- (B) – This refers to the percent of employees that would be able to participate in the program. This will usually be 100 percent. Employees who might not be able to participate could include those who work nighttime hours when transit and rideshare services are not available or employees who are required to drive to work as part of their job duties. This input does not refer to the percent of employees who actually participate in the program.
- (C) – A review of studies measuring the effect of transportation demand management measures on traveler behavior notes that the average empirically-based estimate of reductions in vehicle trips for full-scale, site-specific employer support programs is 4 to 5 percent. To be conservative, the low end of the range is cited (TRB 2010).
- (D) – The adjustment factor from vehicle trips to VMT is 1. This assumes that all vehicle trips will average out to typical trip length ("assumes all trip lengths are equal"). Thus, it can be assumed that a percentage reduction in vehicle trips will equal the same percentage reduction in VMT.

GHG Calculation Caps or Maximums

Measure Maximum

(A_{max}) The maximum GHG reduction from this measure is 4 percent. This maximum scenario is presented in the below example quantification.

Subsector Maximum

($\sum A_{max_{T\text{-}5 \text{ through } T\text{-}13}} \leq 45\%$) This measure is in the Trip Reduction Programs subsector. This subcategory includes Measures T-5 through T-13. The employee commute VMT reduction from the combined implementation of all measures within this subsector is capped at 45 percent.

Mutually Exclusive Measures

If this measure is selected, the user may not also take credit for either Measure T-5 or T-6. However, this measure may be implemented alongside other individual CTR measures (Measures T-8 through T-13). The efficacy of individual programs may vary highly based on individual employers and local contexts.

Example GHG Reduction Quantification

The user reduces employee commute VMT by requiring that employers of a project market to employees travel options for modes alternative to single-occupied vehicles. In this example, the percent of employees eligible (B) is 100 percent, which would reduce GHG emissions from employee commute VMT by 4 percent.

$$A = 100\% \times -4\% \times 1 = -4\%$$

Quantified Co-Benefits

Improved Local Air Quality

The percent reduction in GHG emissions (A) would be the same as the percent reduction in NO_X, CO, NO_2, SO_2, and PM. Reductions in ROG emissions can be calculated by multiplying the percent reduction in GHG emissions (A) by an adjustment factor of 87 percent. See *Adjusting VMT Reductions to Emission Reductions* above for further discussion.

Energy and Fuel Savings

The percent reduction in vehicle fuel consumption would be the same as the percent reduction in GHG emissions (A).

VMT Reductions

The percent reduction in VMT would be the same as the percent reduction in GHG emissions (A).

Sources

- Transportation Research Board (TRB). 2010. *Traveler Response to Transportation System Changes Handbook, Third Edition: Chapter 19, Employer and Institutional TDM Strategies*. June. Available: http://www.trb.org/Publications/Blurbs/163781.aspx. Accessed: January 2021.

T-8. Provide Ridesharing Program



GHG Mitigation Potential



Up to 8.0% of GHG emissions from project/site employee commute VMT

Co-Benefits (icon key on pg. 34)

Climate Resilience

Ridesharing programs could result in less traffic, potentially reducing congestion or delays on major roads during peak AM and PM traffic periods. When this reduction occurs during extreme weather events, it better allows emergency responders to access a hazard site. Lower transportation costs would also increase community resilience by freeing up resources for other purposes.

Health and Equity Considerations

Program should include all onsite workers, such as contractors, interns, and service workers. Because ridesharing is vehicle-based, and some employees may not be in areas with feasible rideshare networks, design of programs need to ensure equitable benefits to those with and without access to rideshare opportunities.

Measure Description

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, VMT, and GHG emissions.

Subsector

Trip Reduction Programs

Locational Context

Urban, suburban

Scale of Application

Project/Site

Implementation Requirements

Ridesharing must be promoted through a multifaceted approach. Examples include the following.

- Designating a certain percentage of desirable parking spaces for ridesharing vehicles.
- Designating adequate passenger loading and unloading and waiting areas for ridesharing vehicles.
- Providing an app or website for coordinating rides.

Cost Considerations

Costs of developing, implementing, and maintaining a rideshare program in a way that encourages participation are generally borne by municipalities or employers. The beneficiaries include the program participants saving on commuting costs, the employer reducing onsite parking expenses, and the municipality reducing cars on the road, which leads to lower infrastructure and roadway maintenance costs.

Expanded Mitigation Options

When providing a ridesharing program, a best practice is to establish funding by a non-revocable funding mechanism for employer-provided subsidies. In addition, encourage use of low-emission ridesharing vehicles (e.g., shared Uber Green).

This measure could be paired with any combination of the other commute trip reduction strategies (Measures T-7 through T-13) for increased reductions.

GHG Reduction Formula

$A = B \times C$

GHG Calculation Variables

ID	Variable	Value	Unit	Source
Output				
A	Percent reduction in GHG emissions from project/site employee commute VMT	0–8.0	%	calculated
User Inputs				
B	Percent of employees eligible for program	0–100	%	user input
Constants, Assumptions, and Available Defaults				
C	Percent reduction in employee commute VMT	Table T-8.1	%	SANDAG 2019

Further explanation of key variables:

- (B) – This refers to the percent of employees that would be able to participate in the program. This will usually be 100 percent. Employees who might not be able to participate could include those who work nighttime hours when transit and rideshare services are not available or employees who are required to drive to work as part of their job duties. This input does not refer to the percent of employees who actually participate in the program.
- (C) – The percent reduction in employee commute VMT by place type is provided in Table T-8.1 in Appendix C. The reduction differs by place type because the willingness and ability to participate in carpooling is higher in urban areas than in suburban areas. Note that this measure is not applicable for implementation in rural areas (SANDAG 2019).

GHG Calculation Caps or Maximums

Measure Maximum

(A_{max}) The maximum GHG reduction from this measure is 8 percent.

Subsector Maximum

($\sum A_{max_{T\text{-}5 \text{ through } T\text{-}13}} \leq 45\%$) This measure is in the Trip Reduction Programs subsector. This subcategory includes Measures T-5 through T-13. The employee commute VMT reduction from the combined implementation of all measures within this subsector is capped at 45 percent.

Mutually Exclusive Measures

If this measure is selected, the user may not also take credit for either Measure T-5 or T-6. However, this measure may be implemented alongside other individual CTR measures (Measures T-7 and T-9 through T-13). The efficacy of individual programs may vary highly based on individual employers and local contexts.

Example GHG Reduction Quantification

The user reduces employee commute VMT by requiring that employers of a project provide a ridesharing program to their employees. In this example, the percent of employees eligible (B) at a packaging and distribution center is 50 percent and the place type of the project is urban (C). GHG emissions from employee commute VMT would be reduced by 4 percent.

$A = 50\% \times -8\% = -4\%$

Quantified Co-Benefits

Improved Local Air Quality

The percent reduction in GHG emissions (A) would be the same as the percent reduction in NO_X, CO, NO_2, SO_2, and PM. Reductions in ROG emissions can be calculated by multiplying the percent reduction in GHG emissions (A) by an adjustment factor of 87 percent. See *Adjusting VMT Reductions to Emission Reductions* above for further discussion.

Energy and Fuel Savings

The percent reduction in vehicle fuel consumption would be the same as the percent reduction in GHG emissions (A).

VMT Reductions

The percent reduction in VMT would be the same as the percent reduction in GHG emissions (A).

Sources

- San Diego Association of Governments (SANDAG). 2019. *Mobility Management VMT Reduction Calculator Tool–Design Document*. June. Available: https://www.icommutesd.com/docs/default-source/planning/tool-design-document_final_7-17-19.pdf?sfvrsn=ec39eb3b_2. Accessed: January 2021.

T-9. Implement Subsidized or Discounted Transit Program



GHG Mitigation Potential



Up to 5.5% of emissions from employee/resident vehicles accessing the site

Co-Benefits (icon key on pg. 34)

Climate Resilience

Subsidized and discounted transit programs increase the capacity of low-income populations to use transit to evacuate or access resources during an extreme weather event. They could also incentivize more people to use transit, resulting in less traffic and better allowing emergency responders to access a hazard site during an extreme weather event. Lower overall out-of-pocket costs would also help increase community resilience by freeing up resources for other purposes.

Health and Equity Considerations

Program should include all onsite workers, such as contractors, interns, and service workers.

Measure Description

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 and thus a reduction in GHG emissions.

Subsector

Trip Reduction Programs

Locational Context

Urban, suburban

Scale of Application

Project/Site

Implementation Requirements

The project should be accessible either within 1 mile of high-quality transit service (rail or bus with headways of less than 15 minutes), 0.5 mile of local or less frequent transit service, or along a designated shuttle route providing last-mile connections to rail service. If a well-established bikeshare service (Measure T-22-A) is available, the site may be located up to 2 miles from a high-quality transit service.

If more than one transit agency serves the site, subsidies should be provided that can be applied to each of the services available. If subsidies are applied for only one service, all variable inputs below should also pertain only to the service that is subsidized.

Cost Considerations

The employer cost is the recurring, direct cost for transit subsidies. The subsidies will lower the per capita income of the transit service, decreasing the revenue of the local transit agency. This cost may be offset by increased revenue from increased ridership. The beneficiaries include the program participants saving on commuting cost, the employer reducing onsite parking expenses, and the municipality reducing cars on the road, which leads to lower infrastructure and roadway maintenance costs.

Expanded Mitigation Options

This measure could be paired with any combination of the other commute trip reduction strategies (Measures T-7 through T-13) for increased reductions.

GHG Reduction Formula

$$A = \frac{C}{B} \times G \times D \times E \times F \times H \times I$$

GHG Calculation Variables

If subsidies or discounts target employees, the GHG reduction from this measure may be limited to work-related employee trips only (i.e., home-to- work) and work-to-other, where at least one trip end is work). If residents are targeted, the GHG reductions extend to all trips.

ID	Variable	Value	Unit	Source
Output				
A	Percent reduction in GHG emissions from employee/resident vehicles accessing the site	0–5.5	%	calculated
User Inputs				
B	Average transit fare without subsidy	[ ]	$	user input
C	Subsidy amount	[ ]	$	user input
D	Percent of employees/residents eligible for subsidy	0–100	%	user input
E	Percent of project-generated VMT from employees/residents	0–100	%	user input
Constants, Assumptions, and Available Defaults				
F	Transit mode share of all trips or work trips	Table T-3.1 or Table T-9.1	%	FHWA 2017
G	Elasticity of transit boardings with respect to transit fare price	-0.43	unitless	Taylor et al. 2008
H	Percent of transit trips that would otherwise be made in a vehicle	50	%	Handy & Boarnet 2013
I	Conversion factor of vehicle trips to VMT	1.0	unitless	assumption

Further explanation of key variables:

- (B and C) – The average transit fare and subsidy amount can be presented as either a fare per ride, or the cost of a monthly pass for typical transit service near the site. Pricing should be based on the expected means of subsidy implementation; for instance, if a monthly pass is provided to all residents, prices should be input on a monthly basis.
- (D) – The percentage of employees/residents associated with the site who have access to the subsidy. If subsidy is provided as an employee benefit, care should be taken to account for any contract or temporary workers who do not receive such benefits.
- (E) – The percentage of project-generated VMT from employees/residents is used to adjust the percent reduction in GHG emissions from the scale of employee and/or resident-generated VMT to project-generated VMT. If subsidies or discounts target employees at an office development, this value would simply be 100 percent. If the project site is a multifamily development with no onsite workers, this value would also be

100 percent. If the project site is a retail development, this value would be less than 100 percent, as it does not account for retail shopper trips to the site. The share of total VMT generated by employees for visitor-intensive uses, such as retail or medical offices, can be roughly estimated by multiplying the total number of employees by two (to account for both arrival and departure), divided by the total number of daily trips.

- (F) – Ideally, the user will calculate transit mode share for work trips or all trips of a Project/Site at a scale no larger than a census tract. Potential data sources include the U.S. Census, California Household Travel Survey (preferred), or local survey efforts. Care should be taken *not* to present the reported commute mode share as retrieved from the American Community Survey (ACS), unless the land use is office or employment based and the tables are based on work location (rather than home location). If the subsidies or discounts target employees and their commute trips, then the mode share should use the home-to-work trip purpose. If the user is not able to provide a project-specific value using one of the data sources described above, they have the option to input the transit mode share for one of the six most populated CBSAs in California. The transit mode share for work trips by CBSA is presented in Table T-9.1 in Appendix C (FHWA 2017). The transit mode share for all trips is provided in Table T-3.1 in Appendix C.
- (G) – A cross-sectional analysis of transit use in 265 urbanized areas in the U.S. found that a 0.43 percent decrease in transit boardings occurs for every 1 percent increase in transit fare price (Taylor et al. 2008). A policy brief summarizing the results of transit service strategies found this analysis to fall in the mid-point of observed, short-term values (Handy & Boarnet 2013). Price elasticities of transit demand vary based on both long-term and short-term demand, service type, and service location (Litman 2020 and Handy & Boarnet 2013).
- (H) – Not all new transit trips replace a vehicle trip. The share of transit trips that would otherwise be made by private vehicle ranges from less than 5 percent to 50 percent across studies. This assumption is based on observed values for high quality BRT service under the assumption that this measure is implemented alongside marketing measures and is targeted primarily at reducing vehicle commute trips. (Handy & Boarnet 2013). Note that this study looked at service improvements rather than fare changes and is used as a proxy variable. If project-specific or location-specific information is available, it should be substituted for this assumptive variable.
- (I) – The adjustment factor from vehicle trips to VMT is 1. This assumes that all vehicle trips will average out to typical trip length ("assumes all trip lengths are equal"). Thus, it can be assumed that a percentage reduction in vehicle trips will equal the same percentage reduction in VMT. Subsidies or discounts targeting commute trips may have a higher factor as they are generally longer than the trip lengths for other purposes.

GHG Calculation Caps or Maximums

Measure Maximum

(A_{max}) The GHG reduction is capped at 5.5 percent, which is based on the following assumptions:

- (C=B) – The subsidy coverage is capped at 100 percent of the typical transit fare.
- (D) – All employees are eligible for the subsidy.

- (E) – All project-generated VMT is from employee-generated VMT.
- (F) – Employees at an office development in the San Francisco-Oakland-Hayward CBSA have a default transit mode share for work trips of 25.60 percent.

Subsector Maximum

$(\sum A_{max_{T\text{-}5 \text{ through } T\text{-}13}} \leq 45\%)$ This measure is in the Trip Reduction Programs subsector. This subcategory includes Measures T-5 through T-13. The employee commute VMT reduction from the combined implementation of all measures within this subsector is capped at 45 percent.

Mutually Exclusive Measures

If this measure is selected, the user may not also take credit for either Measure T-5 or T-6. However, this measure may be implemented alongside other individual CTR measures (Measures T-7, T-8, T-10 through T-13). The efficacy of individual programs may vary highly based on individual employers and local contexts.

Example GHG Reduction Quantification

In this example, the user reduces VMT by providing all employees (D) of a proposed office development in the San Francisco-Oakland-Hayward CBSA a 100 percent transit subsidy in the form of a $100 monthly transit pass (C=B). The user would reduce GHG emissions from VMT by 5.5 percent.

$$A = \left(\frac{\$100}{\$100} \times -0.43\right) \times 100\% \times 100\% \times 25.60\% \times 50\% \times 1 = -5.5\%$$

Quantified Co-Benefits

Improved Local Air Quality

The percent reduction in GHG emissions (A) would be the same as the percent reduction in NO_X, CO, NO_2, SO_2, and PM. Reductions in ROG emissions can be calculated by multiplying the percent reduction in GHG emissions (A) by an adjustment factor of 87 percent. See *Adjusting VMT Reductions to Emission Reductions* above for further discussion.

Energy and Fuel Savings

The percent reduction in vehicle fuel consumption would be the same as the percent reduction in GHG emissions (A).

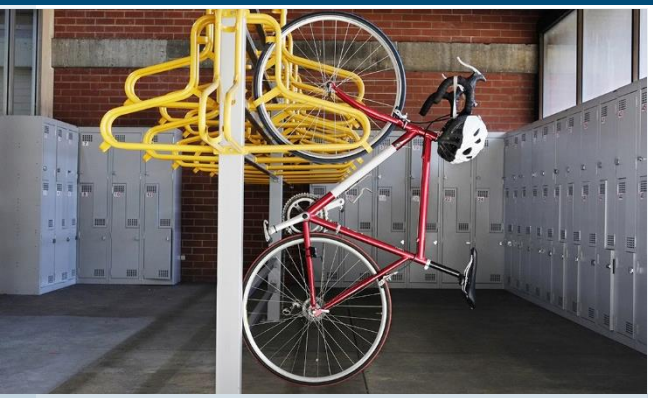
VMT Reductions

The percent reduction in VMT would be the same as the percent reduction in GHG emissions (A).

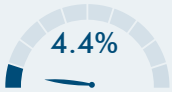
Sources

- Federal Highway Administration (FHWA). 2017. *National Household Travel Survey–2017 Table Designer*. Travel Day PMT by TRPTRANS by HH_CBSA, Workers by WRKTRANS by HH_CBSA. Available: https://nhts.ornl.gov/. Accessed: January 2021.
- Handy, L. and S. Boarnet. 2013. *Impacts of Transit Service Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions*. Available: http://www.arb.ca.gov/cc/sb375/policies/transitservice/transit_brief.pdf. Accessed: January 2021.
- Litman, T. 2020. *Transit Price Elasticities and Cross-elasticities*. Victoria Transport Policy Institute. April. Available: https://www.vtpi.org/tranelas.pdf. Accessed: January 2021.
- Taylor, B., D. Miller, H. Iseki, and C. Fink. 2008. *Nature and/or Nurture? Analyzing the Determinants of Transit Ridership Across US Urbanized Areas*. Transportation Research Part A: Policy and Practice, 43(1), 60-77. Available: https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.367.5311&rep=rep1&type=pdf. Accessed: January 2021.

T-10. Provide End-of-Trip Bicycle Facilities



GHG Mitigation Potential



Up to 4.4% of GHG emissions from project/site employee commute VMT

Co-Benefits (icon key on pg. 34)

Climate Resilience

End-of-trip bicycle facilities could take more cars off the road, resulting in less traffic and better allowing emergency responders to access a hazard site during an extreme weather event. They could also make it easier for bicycle users to access resources in an extreme weather event.

Health and Equity Considerations

Facilities should be inclusive of all gender identities and expressions. Consider including gender-neutral, single-occupancy options to allow for additional privacy for those who want it.

Measure Description

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 and GHG emissions.

Subsector

Trip Reduction Programs

Locational Context

Urban, suburban

Scale of Application

Project/Site

Implementation Requirements

End-of-trip facilities should be installed at a size proportional to the number of commuting bicyclists and regularly maintained.

Cost Considerations

Employer costs include capital and maintenance costs for construction and maintenance of facilities and potentially labor and materials costs for staff to monitor facilities and provide marketing to encourage use of new facilities. The beneficiaries include the program participants saving on commuting cost, the employer reducing onsite parking expenses, and the municipality reducing cars on the road, which leads to lower infrastructure and roadway maintenance costs.

Expanded Mitigation Options

Best practice is to include an onsite bicycle repair station and post signage on or near secure parking and personal lockers with information about how to reserve or obtain access to these amenities.

This measure could be paired with any combination of the other commute trip reduction strategies (Measures T-7 through T-13) for increased reductions.

GHG Reduction Formula

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

GHG Calculation Variables

ID	Variable	Value	Unit	Source
Output				
A	Percent reduction in GHG emissions from employee project/site commute VMT	0.1–4.4	%	calculated
User Inputs				
	None			
Constants, Assumptions, and Available Defaults				
B	Bike mode adjustment factor	1.78 or 4.86	unitless	Buehler 2012
C	Existing bicycle trip length for all trips in region	Table T-10.1	miles	FHWA 2017a
D	Existing vehicle trip length for all trips in region	Table T-10.1	miles	FHWA 2017a
E	Existing bicycle mode share for work trips in region	Table T-10.2	%	FHWA 2017b
F	Existing vehicle mode share for work trips in region	Table T-10.2	%	FHWA 2017b

Further explanation of key variables:

- (B) – The bike mode adjustment factor should be provided by the user based on type of bike facility. A study found that commuters with showers, lockers, and bike parking at work are associated with 4.86 times greater likelihood to commute by bicycle when compared to individuals without any bicycle facilities at work. Individuals with bike parking, but no showers and lockers at the workplace, are associated with 1.78 times greater likelihood to cycle to work than those without trip-end facilities (Buehler 2012).
- (C and D) – Ideally, the user will calculate bicycle and auto trip length for a Project/Site at a scale no larger than a census tract. Potential data sources include the U.S. Census, California Household Travel Survey (preferred), or local survey efforts. If the user is not able to provide a project-specific value using one of these data sources, they have the option to input the trip lengths for bicycles and vehicles for one of the six most populated CBSAs in California, as presented in Table T-10.1 in Appendix C (FHWA 2017a). Trip lengths are likely to be longer for areas not covered by the listed CBSAs, which represent the denser areas of the state.
- (E and F) – Ideally, the user will calculate bicycle and auto mode share for work trips for a Project/Site at a scale no larger than a census tract. Potential data sources include the U.S. Census, California Household Travel Survey (preferred), or local survey efforts. If the user is not able to provide a project-specific value using one of these data sources, they have the option to input the regional average mode shares for bicycle and vehicle

work trips for one of the six most populated CBSAs in California, as presented in Table T-10.2 in Appendix C (FHWA 2017b). If the project study area is not within the listed CBSAs or the user is able to provide a project-specific value, the user should replace these regional defaults in the GHG reduction formula. For areas not covered by the listed CBSAs, which represent the denser areas of the state, bicycle mode share is likely to be lower and vehicle share higher than presented in Table T-10.2.

GHG Calculation Caps or Maximums

Measure Maximum

(A_{max}) The maximum GHG reduction from this measure is 4.4 percent. This maximum scenario is presented in the below example quantification.

Subsector Maximum

($\sum A_{max_{T\text{-}5 \text{ through } T\text{-}13}} \leq 45\%$) This measure is in the Trip Reduction Programs subsector. This subcategory includes Measures T-5 through T-13. The employee commute VMT reduction from the combined implementation of all measures within this subsector is capped at 45 percent.

Mutually Exclusive Measures

If this measure is selected, the user may not also take credit for either Measure T-5 or T-6. However, this measure may be implemented alongside other individual CTR measures (Measures T-7, T-8, T-9, and T-11 through T-13). The efficacy of individual programs may vary highly based on individual employers and local contexts.

Example GHG Reduction Quantification

The user reduces VMT by providing end-of-trip facilities for the project's employees, which encourages bicycle trips in place of vehicle trips. In this example, the type of bike facility provided by the project is parking with showers, bike lockers, and personal lockers (B). The project is within San Jose-Sunnyvale-Santa Clara CBSA, and the user does not have project-specific values for trip lengths and mode shares and for bicycles and vehicles. Per Tables T-10.1 and T-10.2 in Appendix C, inputs for these variables are 2.8 miles, 11.5 miles, 4.1 percent, and 86.6 percent, respectively (C, D, E, and F). GHG emissions from employee commute VMT would be reduced by 4.4 percent.

$$A = \frac{2.8 \text{ miles} \times \left(4.1\% - (4.86 \times 4.1\%)\right)}{11.5 \text{ miles} \times 86.6\%} = -4.4\%$$

Quantified Co-Benefits

Improved Local Air Quality

The percent reduction in GHG emissions (A) would be the same as the percent reduction in NO_X, CO, NO_2, SO_2, and PM. Reductions in ROG emissions can be

calculated by multiplying the percent reduction in GHG emissions (A) by an adjustment factor of 87 percent. See *Adjusting VMT Reductions to Emission Reductions* above for further discussion.

Energy and Fuel Savings

The percent reduction in vehicle fuel consumption would be the same as the percent reduction in GHG emissions (A).

VMT Reductions

The percent reduction in VMT would be the same as the percent reduction in GHG emissions (A).

Sources

- Buehler, R. 2012. *Determinants of bicycle commuting in the Washington, DC region: The role bicycle parking, cyclist showers, and free car parking at work.* Transportation Research Part D, 17, 525–531. Available: http://www.pedbikeinfo.org/cms/downloads/DeterminantsofBicycleCommuting.pdf. Accessed: January 2021.
- Federal Highway Administration (FHWA). 2017a. *National Household Travel Survey–2017 Table Designer*. Travel Day PT by TRPTRANS by HH_CBSA. Available: https://nhts.ornl.gov/. Accessed: January 2021.
- Federal Highway Administration (FHWA). 2017b. *National Household Travel Survey–2017 Table Designer.* Workers by WRKTRANS by HH_CBSA. Available: https://nhts.ornl.gov/. Accessed: January 2021.

T-11. Provide Employer-Sponsored Vanpool



Photo Credit: UCLA Transportation/Flickr, 2021

GHG Mitigation Potential



Up to 20.4% of GHG emissions from project/site employee commute VMT

Co-Benefits (icon key on pg. 34)

Climate Resilience

Employer-sponsored vanpools could result in less traffic, potentially reducing congestion or delays on major roads during peak AM and PM traffic periods. When this reduction occurs during extreme weather events, it better allows emergency responders to access a hazard site.

Health and Equity Considerations

Consider using zero-emission or plug-in electric vehicles (PHEVs) for additional emission reduction benefits.

Measure Description

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, thereby reducing GHG emissions.

Subsector

Trip Reduction Programs

Locational Context

Urban, suburban, rural

Scale of Application

Project/Site

Implementation Requirements

Vanpool programs are more appropriate for the building occupant or tenant (i.e., employer) to implement and monitor than the building owner or developer.

Cost Considerations

Employer costs primarily include the capital costs of vehicle acquisition and the labor costs of drivers, either through incentives to current employees or the hiring of dedicated drivers. The beneficiaries include the program participants saving on commuting cost, the employer reducing onsite parking expenses, and the municipality reducing cars on the road, which leads to lower infrastructure and roadway maintenance costs.

Expanded Mitigation Options

When implementing a vanpool service, best practice is to subsidize the cost for employees that have a similar origin and destination and provide priority parking for employees that vanpool.

This measure could be paired with any combination of the other commute trip reduction strategies (Measures T-7 through T-13) for increased reductions.

GHG Reduction Formula

$$A = \frac{((1 - B) \times C \times F) + \left(B \times \frac{D}{E} \times G\right)}{((1 - B) \times C \times F) + (B \times D \times F)} - 1$$

GHG Calculation Variables

ID	Variable	Value	Unit	Source
Output				
A	Percent reduction in GHG emissions from project/site employee commute VMT	3.4–20.4	%	calculated
User Inputs				
	None			
Constants, Assumptions, and Available Defaults				
B	Percent of employees that participate in vanpool program	2.7	%	SANDAG 2019
C	Average length of one-way vehicle commute trip in region	Table T-11.1	miles per trip	FHWA 2017
D	Average length of one-way vanpool commute trip	42.0	miles per trip	SANDAG 2019
E	Average vanpool occupancy (including driver)	6.25	occupants	SANDAG 2019
F	Average emission factor of average employee vehicle	307.5	g CO_2e per mile	CARB 2020
G	Vanpool emission factor	763.4	g CO_2e per mile	CARB 2020

Further explanation of key variables:

- (B) – The percent of employees that would participate in a vanpool program is based on a survey of commuters in San Diego County (SANDAG 2019). If the project is not within San Diego County or the user is able to provide a project-specific value for within San Diego County, the user should replace the default employee participation rate in the GHG reduction formula.
- (C) – Ideally, the user will calculate auto commute trip lengths for a Project/Site at a scale no larger than a census tract. Potential data sources include the U.S. Census, California Household Travel Survey (preferred), or local survey efforts. If the user is not able to provide a project-specific value using one of these data sources, they have the option to input the regional average one-way auto commute trip length for one of the six most populated CBSAs in California, as presented in Table T-11.1 in Appendix C (FHWA 2017). Trip lengths are likely to be longer for areas not covered by the listed CBSAs, which represent the denser areas of the state.
- (D and E) – The average one-way vanpool commute trip length and occupancy are based on data from the San Diego Association of Government's regional vanpool program (SANDAG 2019). If the project is not within San Diego County or the user is

able to provide a project-specific value for within San Diego County, the user should replace these defaults in the GHG reduction formula.

- (F and G) – The average GHG emission factors for employee commute and vanpool vehicles were calculated in terms of CO_2e per mile using EMFAC2017 (v1.0.3). The model was run for a 2020 statewide average using diesel and gasoline fuel. The average of the light-duty automobile (LDA) and light duty truck (LDT1/LDT2) vehicle categories represents employee non-vanpool vehicles and the light-heavy duty truck (LHDT1) vehicle category conservatively represents a large cargo vanpool vehicle. The running emission factors for CO_2, CH_4, and N_2O (CARB 2020) were multiplied by the corresponding 100-year GWP values from the IPCC's Fourth Assessment Report (IPCC 2007). If the user can provide a project-specific value (i.e., for a future year and project location), the user should run EMFAC to replace the defaults in the GHG reduction formula.

GHG Calculation Caps or Maximums

Measure Maximum

(A_{max}) For projects in San Diego County that use default CBSA data from Table T-11.1 and (B_{max}), the maximum percent reduction in GHG emissions (A) is 20.4 percent. This maximum scenario is presented in the below example quantification.

(B_{max}) The percent of employees that participate in the vanpool program is capped at 15 percent, which is based on the high end of vanpool participation survey data for several successful programs in the U.S. (SANDAG 2019).

Subsector Maximum

($\sum A_{max_{T\text{-}5 \text{ through } T\text{-}13}} \leq 45\%$) This measure is in the Trip Reduction Programs subsector. This subcategory includes Measures T-5 through T-13. The employee commute VMT reduction from the combined implementation of all measures within this subsector is capped at 45 percent.

Mutually Exclusive Measures

If this measure is selected, the user may not also take credit for either Measure T-5 or T-6. However, this measure may be implemented alongside other individual CTR measures (Measures T-7 through T-10, T-12, and T-13). The efficacy of individual programs may vary highly based on individual employers and local contexts.

Example GHG Reduction Quantification

The user reduces employee commute VMT by requiring that the employer of the project to sponsor a vanpool program. In this example, the project is in the San Diego-Carlsbad CBSA and would have an average vehicle commute trip length of 14.52 miles (C). The percent of employees that participate in the vanpool program is 15 percent (B_{max}). GHG emissions from employee commute would be reduced by 20.4 percent.

$$A = \frac{\left((1-15\%) \times 14.52 \frac{\text{miles}}{\text{trip}} \times 307.5 \frac{\text{g } CO_2e}{\text{miles}}\right) + \left(15\% \times \frac{42 \frac{\text{miles}}{\text{trip}}}{6.25 \text{ occupants}} \times 763.4 \frac{\text{g } CO_2e}{\text{miles}}\right)}{\left((1-15\%) \times 14.52 \frac{\text{miles}}{\text{trip}} \times 307.5 \frac{\text{g } CO_2e}{\text{miles}}\right) + \left(15\% \times 42 \frac{\text{miles}}{\text{trip}} \times 307.5 \frac{\text{g } CO_2e}{\text{miles}}\right)} - 1 = -20.4\%$$

Quantified Co-Benefits

Improved Local Air Quality

The percent reduction in GHG emissions (A) would be the same as the percent reduction in NO_X, CO, NO_2, SO_2, and PM. Reductions in ROG emissions can be calculated by multiplying the percent reduction in GHG emissions (A) by an adjustment factor of 87 percent. See *Adjusting VMT Reductions to Emission Reductions* above for further discussion.

Energy and Fuel Savings

The percent reduction in vehicle fuel consumption (H) can be calculated using the GHG reduction formula except that (F) and (G) should be replaced by (I) and (J), as follows.

Fuel Use Reduction Formula

$$H = \frac{\left((1-B) \times C \times I\right) + \left(B \times \frac{D}{E} \times J\right)}{\left((1-B) \times C \times I\right) + (B \times D \times I)} - 1$$

Fuel Use Reduction Calculation Variables

ID	Variable	Value	Unit	Source
Output				
H	Percent reduction in fuel use from project/site employee commute VMT	4.7–21.4	%	calculated
User Inputs				
	None			
Constants, Assumptions, and Available Defaults				
I	Fuel efficiency of average employee vehicle	0.03639	gallon (gal) per mile	CARB 2020
J	Fuel efficiency of vanpool vehicle	0.08328	gal per mile	CARB 2020

Further explanation of key variables:

- (I and J) – The average fuel efficiencies for employee commute and vanpool vehicles were calculated using EMFAC2017 (v1.0.3). The model was run for a 2020 statewide average using diesel and gasoline fuel. The average of the LDA,

LDT1, and LDT2 vehicle categories represents employee non-vanpool vehicles, and the LHDT1 vehicle category conservatively represents a large cargo vanpool vehicle. If the user can provide a project-specific value (i.e., for a future year and project location), the user should run EMFAC to replace the defaults in the fuel use reduction formula.

- Please refer to the GHG Calculation Variables table above for definitions of variables that have been previously defined.



VMT Reductions

The percent reduction in VMT can be calculated using a modified version of the GHG reduction formula, as shown below.

$$\%\ \text{VMT Reduction} = \frac{((1 - B) \times C) + \left(B \times \frac{D}{E}\right)}{C} - 1$$

Sources

- California Air Resources Board (CARB). 2020. *EMFAC2017 v1.0.3*. August. Available: https://arb.ca.gov/emfac/emissions-inventory. Accessed: January 2021.
- Federal Highway Administration (FHWA). 2017. *National Household Travel Survey–2017 Table Designer*. Travel Day VT by HH_CBSA by TRPTRANS by TRIPPURP. Available: https://nhts.ornl.gov/. Accessed: January 2021.
- Intergovernmental Panel on Climate Change (IPCC). 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 996 pp. Available: https://www.ipcc.ch/report/ar4/wg1/. Accessed: January 2021.
- San Diego Association of Governments (SANDAG). 2019. *Mobility Management VMT Reduction Calculator Tool–Design Document*. June. Available: https://www.icommutesd.com/docs/default-source/planning/tool-design-document_final_7-17-19.pdf?sfvrsn=ec39eb3b_2. Accessed: January 2021.

T-18. Provide Pedestrian Network Improvement



GHG Mitigation Potential



Up to 6.4% of GHG emissions from vehicle travel in the plan/community

Co-Benefits (icon key on pg. 34)



Climate Resilience

Improving pedestrian networks increases accessibility of outdoor spaces, which can provide health benefits and thus improve community resilience. This can also improve connectivity between residents and resources that may be needed in an extreme weather event.

Health and Equity Considerations

Ensure that the improvements also include accessibility features to allow for people of all abilities to use the network safely and conveniently. Ensure that sidewalks connect to nearby community assets, such as schools, retail, and healthcare.

Measure Description

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.

Subsector

Neighborhood Design

Locational Context

Urban, suburban, rural

Scale of Application

Plan/Community

Implementation Requirements

The GHG reduction of this measure is based on the VMT reduction associated with expansion of sidewalk coverage expansion, which includes not only building of new sidewalks but also improving degraded or substandard sidewalk (e.g., damaged from street tree roots). However, pedestrian network enhancements with non-quantifiable GHG reductions are encouraged to be implemented, as discussed under *Expanded Mitigation Options*.

Cost Considerations

Depending on the improvement, capital and infrastructure costs may be high. However, improvements to the pedestrian network will increase pedestrian activity, which can increase businesses patronage and provide a local economic benefit. The local municipality may achieve cost savings through a reduction of cars on the road leading to lower infrastructure and roadway maintenance costs.

Expanded Mitigation Options

When improving sidewalks, a best practice is to ensure they are contiguous and link externally with existing and planned pedestrian facilities. Barriers to pedestrian access and interconnectivity, such as walls, landscaping buffers, slopes, and unprotected crossings should be minimized. Other best practice features could include high-visibility crosswalks, pedestrian hybrid beacons, and other pedestrian signals, mid-block crossing walks, pedestrian refuge islands, speed tables, bulb-outs (curb extensions), curb ramps, signage, pavement markings, pedestrian-only connections and districts, landscaping, and other improvements to pedestrian safety (see Measure T-35, *Provide Traffic Calming Measures*).

GHG Reduction Formula

$$A = \left(\frac{C}{B} - 1\right) \times D$$

GHG Calculation Variables

ID	Variable	Value	Unit	Source
Output				
A	Percent reduction in GHG emissions from household vehicle travel in plan/community	0–6.4	%	calculated
User Inputs				
B	Existing sidewalk length in study area	[ ]	miles	user input
C	Sidewalk length in study area with measure	[ ]	miles	user input
Constants, Assumptions, and Available Defaults				
D	Elasticity of household VMT with respect to the ratio of sidewalks-to-streets	-0.05	unitless	Frank et al. 2011

Further explanation of key variables:

- (B and C) – Sidewalk length should be measured on both sides of the street. For example, if one 0.5-mile-long street has full sidewalk coverage, the sidewalk length would be 1.0 mile. If there is only sidewalk on one side of the street, the sidewalk length would be 0.5 mile. The recommended study area is 0.6 mile around the pedestrian network improvement. This represents a 6- to 10-minute walking time.
- (D) – A study found that a 0.05 percent decrease in household vehicle travel occurs for every 1 percent increase in the sidewalk-to-street ratio (Frank et al. 2011; Handy et al. 2014).

GHG Calculation Caps or Maximums

Measure Maximum

(A_{max}) The percent reduction in GHG emissions (A) is capped at 3.4 percent, which is based on the following assumptions:

- 35.2 percent of vehicle trips are short trips (2 mile or less, average of 1.29 miles) and thus could easily shift to walking (FHWA 2019).
- 64.8 percent of vehicle trips are longer trips that are unlikely to shift to walking (2 miles or more, average of 10.93 miles) (FHWA 2019).
- So $A_{max} = \frac{35.2\% \times 1.29 \text{ miles}}{64.8\% \times 10.93 \text{ miles}} = 6.4\%$

Subsector Maximum

($\sum A_{max_{T\text{-}18 \text{ through } T\text{-}22\text{-}C}} \leq 10\%$) This measure is in the Neighborhood Design subsector. This subcategory includes Measures T-18 through T-22-C. The VMT reduction from the combined implementation of all measures within this subsector is capped at 10 percent.

Example GHG Reduction Quantification

The user reduces household VMT by improving the pedestrian network in the study area. In this example, the existing sidewalk length (B) is 9 miles, and the sidewalk length with the measure (C) would be 10 miles. With these conditions, the user would reduce GHG emissions from household VMT within the study area by 0.6 percent.

$$A = \left(\frac{10 \text{ miles}}{9 \text{ miles}} - 1\right) \times -0.05 = -0.6\%$$

Quantified Co-Benefits

Improved Local Air Quality

The percent reduction in GHG emissions (A) would be the same as the percent reduction in NO_X, CO, NO_2, SO_2, and PM. Reductions in ROG emissions can be calculated by multiplying the percent reduction in GHG emissions (A) by an adjustment factor of 87 percent. See *Adjusting VMT Reductions to Emission Reductions* above for further discussion.

Energy and Fuel Savings

The percent reduction in vehicle fuel consumption would be the same as the percent reduction in GHG emissions (A).

VMT Reductions

The percent reduction in household VMT would be the same as the percent reduction in GHG emissions (A).

Improved Public Health

Users are directed to the Integrated Transport and Health Impact Model (ITHIM) (CARB et al. 2020). The ITHIM can quantify the annual change in health outcomes associated with active transportation, including deaths, years of life lost, years of living with disability, and incidence of community and individual disease.

Sources

- California Air Resources Board (CARB), California Department of Public Health (CDPH), and Nicholas Linesch Legacy Fund. 2020. Integrated Transport and Health Impact Model. Available: https://skylab.cdph.ca.gov/HealthyMobilityOptionTool-ITHIM/#Home. Accessed: September 17, 2021.
- Federal Highway Administration (FHWA). 2019. *2017 National Household Travel Survey Popular Vehicle Trip Statistics*. Available: https://nhts.ornl.gov/vehicle-trips. Accessed: January 2021.

- Frank, L., M. Greenwald, S. Kavage, and A. Devlin. 2011. *An Assessment of Urban Form and Pedestrian and Transit Improvements as an Integrated GHG Reduction Strategy*. WSDOT Research Report WA-RD 765.1, Washington State Department of Transportation. April. Available: www.wsdot.wa.gov/research/reports/fullreports/765.1.pdf. Accessed: January 2021.
- Handy, S., S. Glan-Claudia, and M. Boarnet. 2014. *Impacts of Pedestrian Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions: Policy Brief*. September. Available: https://ww2.arb.ca.gov/sites/default/files/2020-06/Impacts_of_Pedestrian_Strategies_on_Passenger_Vehicle_Use_and_Greenhouse_Gas_Emissions_Policy_Brief.pdf. Accessed: January 2021.

T-19-A. Construct or Improve Bike Facility



GHG Mitigation Potential



Up to 0.8% of GHG emissions from vehicles parallel roadways

Co-Benefits (icon key on pg. 34)

Climate Resilience

Constructing and improving bike facilities can incentivize more bicycle use and decrease vehicle use, which have health benefits and can thus improve community resilience. This can also improve connectivity between residents and resources that may be needed in an extreme weather event.

Health and Equity Considerations

Prioritize low-income and underserved areas and communities with lower rates of vehicle ownership or fewer transit options. Make sure that the bicycle facility connects to a larger existing bikeway network that accesses destinations visited by low-income or underserved communities.

Measure Description

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 and thus reducing GHG emissions. 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*.

Subsector

Neighborhood Design

Locational Context

Urban, suburban

Scale of Application

Plan/Community. This measure reduces VMT on the roadway segment parallel to the bicycle facility (i.e., the corridor). An adjustment factor is included in the formula to scale the VMT reduction from the corridor level to the plan/community level.

Implementation Requirements

The bicycle lane facility must be either Class I, II, or IV. Class I bike paths are physically separated from motor vehicle traffic. Class IV bikeways are protected on-street bikeways, also called cycle tracks. Class II bike lanes are striped bicycle lanes that provide exclusive use to bicycles on a roadway.

Cost Considerations

Capital and infrastructure costs for new bike facilities may be high. The local municipality may achieve cost savings through a reduction of cars on the road leading to lower infrastructure and roadway maintenance costs.

Expanded Mitigation Options

Implement alongside Measures T-22-A, T-22-B, and/or T-22-C to ensure that micromobility users can ride safely along bicycle lane facilities and not have to ride along pedestrian infrastructure, which is a risk to pedestrian safety.

GHG Reduction Formula

$$A = -B \times \frac{\frac{F}{I} \times (C + D) \times E \times G}{H}$$

GHG Calculation Variables

ID	Variable	Value	Unit	Source
Output				
A	Percent reduction in GHG emissions from displaced vehicles on roadway parallel to bicycle facility	0–0.8	%	calculated
User Inputs				
B	Percent of plan/community VMT on parallel roadway	0–100	%	user input
C	Active transportation adjustment factor	Table T-19.1	unitless	CARB 2020
D	Credits for key destinations near project	Table T-19.2	unitless	CARB 2020
E	Growth factor adjustment for facility type	Table T-19.3	unitless	CARB 2020
Constants, Assumptions, and Available Defaults				
F	Annual days of use of new facility	Table T-19.4	days per year	NOAA 2017
G	Existing regional average one-way bicycle trip length	Table T-10.1	miles per trip	FHWA 2017
H	Existing regional average one-way vehicle trip length	Table T-10.1	miles per trip	FHWA 2017
I	Days per year	365	days per year	standard

Further explanation of key variables:

- (B) – The percent of total plan/community VMT within the roadway parallel to the bike facility should represent the expected total VMT generated by all land use in that area, including office, residences, retail, schools, and other uses. The most appropriate source for this data is from a local travel demand forecasting model. An alternate method uses VMT per worker or VMT per resident as calculated for SB 743 compliance and screening purposes multiplied by the population in the area.
- (C, D, and E) – The active transportation adjustment factor, key destination credit, and growth factor adjustment should be looked up by the user in Tables T-19.1 through T-19.3 in Appendix C. The active transport adjustment factor is based on the existing annual average daily traffic (AADT) of the facility, length of the proposed bike facility, and the city population. The key destination credit is based on the number of key destinations within 0.5-mile of the facility. The growth factor is based on the type of proposed bicycle facility.
- (F) – The annual days of use for the new facility should be looked up by users in Table T-19.4 based on the county in which the project is located. The days of use is based on the number of days per year where there is no rainfall (i.e., <=0.1 inches) (NOAA 2017).

- (G and H) – Ideally, the user will calculate bicycle and vehicle trip lengths for the corridor at a scale no larger than the surrounding census tract. Potential data sources include the U.S. Census, California Household Travel Survey (preferred), or local survey efforts. If the user is not able to provide a project-specific value using one of these data sources, they have the option to input regional average one-way bicycle and vehicle trip lengths for one of the six most populated CBSAs in California provided in Table T-10.1 in Appendix C (FHWA 2017).

GHG Calculation Caps or Maximums

Measure Maximum

(A_{max}) For projects that use CBSA data from Table T-10.1 in Appendix C, the maximum percent reduction in GHG emissions (A) is 0.8 percent. This is based on a neighborhood project the size of a large corridor (B = 100%) within the CBSA of Sacramento-Roseville-Arden-Arcade that uses the highest values for (C, D, and E) in Tables T-19.1 through T-19.3 and annual use days for Sacramento County (F) in Table T-19.4. This maximum scenario is presented in the below example quantification.

(C_{max}) The active transportation adjustment factor (C) was determined for roadways with AADT ranging from 1 to 30,000 (CARB 2020). Roadways with AADT greater than 30,000 are generally not appropriate for bicycle facilities. Care should be taken by the user in interpreting the results from this equation for a project roadway with AADT greater than 30,000.

Subsector Maximum

($\sum A_{max_{T\text{-}18 \text{ through } T\text{-}22\text{-}C}} \leq 10\%$) This measure is in the Neighborhood Design subsector. This subcategory includes Measures T-18 through T-22-C. The VMT reduction from the combined implementation of all measures within this subsector is capped at 10 percent.

Example GHG Reduction Quantification

The user reduces VMT by constructing a bicycle facility that displaces vehicle trips with bicycle trips. In this example, the following assumptions are made to obtain inputs from Tables T-19.1 through T-19.3 in Appendix C:

- Percent of plan/community VMT on parallel roadway (B) = 100%. The project would establish a bike corridor the whole length of a central commercial thoroughfare. It is assumed this main street makes up the entire neighborhood.
- Active transportation adjustment factor (C) = 0.0207. Existing AADT on the roadway parallel to the proposed bicycle facility is 10,000, the facility length is 2.5 miles, and the project site is in a university town with a population of 200,000.
- Key destination credit (D) = 0.003. There are 10 key destinations within 0.25 mile of the project site.
- Growth factor adjustment (E) = 1.54. The bike facility would be a new Class IV bikeway.

The project is within the Sacramento-Roseville-Arden-Arcade CBSA and the user does not have project-specific values for average bicycle and vehicle trip lengths. Accordingly, the inputs of 2.9 miles and 10.9 miles, respectively (G and H), from Table T-10.1 in Appendix C are assumed. The user would displace GHG emissions from project study area VMT by 0.8 percent.

$$A = \textbf{-100\%} \times \left(\frac{\frac{307 \text{ days}}{365 \text{ days}} \times (\textbf{0.0207} + \textbf{0.003}) \times \textbf{1.54} \times 2.9 \text{ miles}}{10.9 \text{ miles}} \right) = -0.8\%$$

Quantified Co-Benefits

Improved Local Air Quality

The percent reduction in GHG emissions (A) would be the same as the percent reduction in NO_X, CO, NO_2, SO_2, and PM. Reductions in ROG emissions can be calculated by multiplying the percent reduction in GHG emissions (A) by an adjustment factor of 87 percent. See *Adjusting VMT Reductions to Emission Reductions* above for further discussion.

Energy and Fuel Savings

The percent reduction in vehicle fuel consumption would be the same as the percent reduction in GHG emissions (A).

VMT Reductions

The percent reduction in VMT would be the same as the percent reduction in GHG emissions (A).

Improved Public Health

Users are directed to the ITHIM (CARB et al. 2020). The ITHIM can quantify the annual change in health outcomes associated with active transportation, including deaths, years of life lost, years of living with disability, and incidence of community and individual disease.

Sources

- California Air Resources Board (CARB). 2020. *Quantification Methodology for the Strategic Growth Council's Affordable Housing and Sustainable Communities Program*. September. Available: https://ww2.arb.ca.gov/sites/default/files/classic/cc/capandtrade/auctionproceeds/draft_sgc_ahsc_qm_091620.pdf. Accessed: January 2021.
- California Air Resources Board (CARB), California Department of Public Health (CDPH), and Nicholas Linesch Legacy Fund. 2020. Integrated Transport and Health Impact Model. Available: https://skylab.cdph.ca.gov/HealthyMobilityOptionTool-ITHIM/#Home. Accessed: September 17, 2021.
- Federal Highway Administration (FHWA). 2017. *National Household Travel Survey–2017 Table Designer*. Travel Day PT by TRPTRANS by HH_CBSA. Available: https://nhts.ornl.gov/. Accessed: January 2021.

- National Oceanic and Atmospheric Administration (NOAA). 2021. *Global Historical Climatology Network–Daily (GHCN-Daily), Version 3*. 2015-2019 Average of Days Per Year with Precipitation >0.1 Inches. Available: https://www.ncei.noaa.gov/access/search/data-search/daily-summaries?bbox=38.922,-120.071,38.338,-119.547&place=County:1276&dataTypes=PRCP&startDate=2015-01-01T00:00:00&endDate=2019-01-01T23:59:59. Accessed: May 2021.

T-1. Increase Residential Density

GHG Reduction formula	GHG Reduction formula
$A = \frac{B - C}{C} * D$	$-14.4\% = \frac{9849624 - 9.1}{9.1} * -0.22$

User Inputs		Value	Unit	Source
B	Residential density of project development	15.037594	DU/acre	User input
Constants, Assumptions, and Available Defaults				
C	Residential density of a typical development	9.1	DU/acre	Ewing 2007
D	Elasticity of VMT with respect to residential density	-0.22	Unitless	Stevens 2016
Output				
A	Percent reduction in GHG emissions from project VMT in study area	-14.35%	%	Calculated

T-4. Integrate Affordable and Below Market Rate Housing

GHG Reduction formula	GHG Reduction formula
A = B * C	-2.7% = 0.09375 * -0.286

User Inputs		Value	Unit	Source
B	Percent of multifamily units permanently dedicated as affordable	9.38%	DU/acre	User input
Constants, Assumptions, and Available Defaults		0.01		
C	Percent reduction in VMT for qualified units compared to market rate units	-28.60%	DU/acre	Ewing 2007
Output				
A	Percent reduction in GHG emissions from project/site VMT for multi family residential developments	-2.68%	%	Calculated

T-7. Implement Commute Trip Reduction Marketing

GHG Reduction formula	GHG Reduction formula	
A = B * C * D	-4 = 1 * -0.04 * 1	Implement

User Inputs		Value	Unit	Source
B	Percent of employees eligible for program	100.00%	%	User input
Constants, Assumptions, and Available Defaults				
C	Percent reduction in employee commute vehicle trips	-4.00%	%	TRB 2010
D	Adjustment from vehicle trips to VMT	1.00	Unitless	Assumed
Output				
A	Percent reduction in GHG emissions from project/site employee commute VMT	-4.00	%	Calculated

T-8. Provide Ridership Program

GHG Reduction formula	GHG Reduction formula
A = B * C	-4 = 1 * -0.04

User Inputs		Value	Unit	Source
B	Percent of employees eligible for program	100.00%	%	User input
Constants, Assumptions, and Available Defaults				
C	Percent reduction in employee commute VMT	-4.00%	%	TRB 2010
Output				
A	Percent reduction in GHG emissions from project/site employee commute VMT	-4.00	%	Calculated

T-9. Implement Subsidized or Discounted Transit Program

GHG Reduction formula	GHG Reduction formula
A = (C/B) * G * D * E * F * H * I	

User Inputs		Value	Unit	Source
B	Average Transit Fare witout Subsidy	2	$	User input
C	Subsidy amount	2	$	User input
D	Percent of residents eligible for subsidy	100.00%	%	User input
E	Percent of project-generated VMT from employees/residents	100.00%	%	User input
Constants, Assumptions, and Available Defaults				
F	Transit mode share of all trips or work trips	5.39%	%	FHWA 2017
G	Elasticity of transit boardings with respect to transit fare price	-0.43	unitless	Taylor et al. 2008
H	Percent of transit trips that would otherwise be made in a vehicle	50.00%	%	
I	Conversion factor of vehicle trips to VMT	1	unitless	Handy and Boarnet 2013
Output				
A	Percent reduction in GHG emissions from employee/resident vehicles accessing the site	-0.012	%	Calculated

T-10. Provide End-of-Trip Bicyclce Facilities

GHG Reduction formula	GHG Reduction formula
$A = \frac{C * (E - (B * E))}{D * F}$	$-0.2\% = \frac{1.78 - 9.7}{9.7} * 0.01$

User Inputs		Value	Unit	Source
Constants, Assumptions, and Available Defaults				
B	Bike mode adjustment factor	1.78	unitless	Buehler 2012
C	Existing bicycle trip length for all trips in region	1.7	miles	FHWA 2017a
D	Existing vehicle trip length for all trips in region	9.7	miles	FHWA 2017a
E	Existing bicycle mode share for work trips in region	1.00%	%	FHWA 2017b
F	Existing vehicle mode share for work trips in region	90.70%	%	FHWA 2017b
Output				
A	Percent reduction in GHG emissions from project VMT in study area	-0.15%	%	Calculated

T-11. Provide Employer-Spnospred Vanpool

GHG Reduction formula	GHG Reduction formula
$A = * \frac{(E - (B * E))}{D * F}$	

User Inputs		Value	Unit	Source
Constants, Assumptions, and Available Defaults				
B	Bike mode adjustment factor	2.70%	unitless	SANDAG 2019
C	Existing bicycle trip length for all trips in region	14.07	miles per trip	FHWA 2017
D	Existing vehicle trip length for all trips in region	42	miles per trip	SANDAG 2019
E	Existing bicycle mode share for work trips in region	6.25	occupants	SANDAG 2019
F	Existing vehicle mode share for work trips in region	307.5	g CO2e per mile	CARB 2020
G		763.4	g CO2e per mile	CARB 2020
Output				
A	Percent reduction in GHG emissions from project VMT in study area	-4.61%	%	Calculated

T-18. Provide Pedestrian Network Improvement

GHG Reduction formula	GHG Reduction formula
$A = \frac{C}{B} - 1 * D$	$-0.4\% = \frac{31.3 - 33.6}{33.6} * -0.05$

User Inputs		Value	Unit	Source
B	Existing sidewalk length in study area	31.30	miles	User Input
C	Sidewalk length in study area with this measure	33.6	miles	Ewing 2007
Constants, Assumptions, and Available Defaults				
D	Elasticity of household VMT with respect to the ratio of sidewalks-to-streets	-0.05	Unitless	Frank et al. 2011
Output				
A	Percent reduction in GHG emissions from household vehicle travel in plan/community	-0.37%	%	Calculated

T-19-A: Construct or Improve Bike Facility

***The percent reduction in VMT would be the same as the percent reduction in GHG emissions (A).**

GHG Reduction Formula

$$A = -B \times \frac{F}{I} \times (C + D) \times E \times G = -1 \times \frac{335}{365} \times (0.0038 + 0) \times 1 \times 1.7 \div 9.7 = -0.061\%$$

Where,			Value Source	Unit
B = Percent of plan/community VMT on parallel roadway	=	100%		%
C = Active transportation adjustment factor	=	0.0038	Per Table T-19.1	Unitless
D = Credits for key destinations near project	=	0	Per Table T-19.2	Unitless
E = Growth factor adjustagent for facility type	=	1	Per Table T-19.3	Unitless
F = Annual days of use of new facility	=	335	Per Table T-19.4	Days Per Year
G = Existing regional average one-way bicycle trip length	=	1.7	Per Table T-10.1	Miles Per Trip
H = Existing regional average one-way vehicle trip length	=	9.7	Per Table T-10.1	Miles Per Trip
I = Days per year	=	365		Days Per Year
A = Percent reduction in GHG emissions from displaced vehicles on roadway parallel to bicycle facility	=	**-0.061%**		%

Value C - Active transportation adjustagent factor = 0.0038

Table T-19.1. Active Transportation Adjustment Factors

Average Daily Traffic (vehicle trips per day)	One-way Facility Length[1]	Adjustment Factor for a Population > 250,000 or a Non-university Town with Population < 250,000	Adjustment Factor for a University Town with Population <250,000
1 to 12,000	≤1	0.0019	0.0104
	1.02 to 2	0.0029	0.0155
	>2	0.0038	0.0207
12,001 to 24,000	≤1	0.0014	0.0073
	1.02 to 2	0.0020	0.0109
	>2	0.0027	0.0145
24,001 to 30,000	≤1	0.0010	0.0052
	1.02 to 2	0.0014	0.0078
	>2	0.0019	0.0104

Source: California Air Resources Board. 2020. Quantification Methodology for the Strategic Growth Council's Affordable Housing and Sustainable Communities Program. September. Available: https://ww2.arb.ca.gov/sites/default/files/classic/cc/capandtrade/auctionproceeds/draft_sgc_ahsc_qm_091620.pdf. Accessed: January 2021.

< = less than; > = greater than; ≤ = less than or equal to

[1]Measurements of bike facilities should not include the length of crosswalks.

Table T-19.2. Key Destination Credits[1,2]

Number of Key Destinations[3]	Credit within ½ Mile of Facility	Credit Within ¼ Mile of Facility
0 to 2	0.0000	0.000
3	0.0005	0.001
4 to 6	0.0010	0.002
≥ 7	0.0015	0.003

Source: California Air Resources Board. 2020. *Quantification Methodology for the California Natural Resource Agency's Urban Greening Grant Program*. March. Available: https://ww2.arb.ca.gov/sites/default/files/classic/cc/capandtrade/auctionproceeds/cnra_ug_finalqm.pdf. Accessed: January 2021.

≥ = greater than or equal to

[1] The largest value from either credit column that matches the project activities should be used. For example, if there are 3 activity centers within ¼ mile of the facility and 7 activity centers within ½ mile of the facility, the correct value to use is 0.0015.

[2] These metrics should be evaluated for the project location site and surrounding area which can extend a distance not to exceed a ½ mile. If a shopping center has multiple activity centers, each of those activity centers would count individually. For example, if a bank, grocery store, and post office are all located in a shopping center, they would be input as three activity centers for the purposes of this quantification methodology.

[3] Key destination examples: banks, post offices, grocery stores, medical centers, pharmacies, office parks, places of worship, public libraries, schools, universities, colleges, and light rail stations (park & ride).

Value E - Growth factor adjustagent for facility type	=	1

Table T-19.3. Growth Factor Adjustment

Facility Type	Growth Factor Adjustment
New Class I bike path[1] or Class IV bikeway[2]	1.54
New Class II bike lane[3]	1.0
Conversion from Class II to IV	0.54

Source: California Air Resources Board. 2020. *Quantification Methodology for the Strategic Growth Council's Affordable Housing and Sustainable Communities Program*. September. Available: https://ww2.arb.ca.gov/sites/default/files/classic/cc/capandtrade/auctionproceeds/sgc_ahsc_qm_022521.pdf. Accessed: March 2021.

[1] Class I bike paths are physically separated from motor vehicle traffic.

[2] Class IV bikeways are protected on-street bikeways, also called cycle tracks.

[3] Class II bike lanes are striped bicycle lanes that provide exclusive use to bicycles on a roadway.

Value F - Annual days of use of new facility	=	335

Table T-19.4. Bike Facility Default Days of Use per Year by County

County	Days	County	Days	County	Days	County	Days
Alameda	302	Kern	333	Placer	291	San Joaquin	314
Alpine	291	Kings	328	Plumas	292	San Luis Obispo	321
Amador	302	Lake	298	Riverside	337	San Mateo	295
Butte	294	Los Angeles	332	Sacramento	307	Solano	309
Calaveras	304	Lassen	309	San Benito	315	Stanislaus	319
Contra Costa	307	Madera	314	San Bernardino	333	Sutter	304
Colusa	309	Marin	296	Santa Barbara	328	Tehama	297
Del Norte	252	Mariposa	307	Santa Clara	307	Trinity	277
El Dorado	295	Mendocino	279	Santa Cruz	304	Tulare	314
Fresno	320	Merced	316	San Diego	323	Tuolumne	299
Glenn	304	Modoc	287	San Francisco	301	Ventura	334
Humboldt	262	Mono	311	Shasta	283	Yolo	311
Imperial	353	Monterey	310	Sierra	301	Yuba	293
Inyo	331	Orange	335	Siskiyou	280	Statewide	311

Value G - Existing regional average one-way bicycle trip length	=	1.7
Value H - Existing regional average one-way vehicle trip length	=	9.7

Table T-10.1. Average One-Way Bicycle and Vehicle Trip Length of All Trips by California Core-Based Statistical Area

	Trip Length (miles)	
Core-Based Statistical Area	Bicycle	Vehicle
Los Angeles-Long Beach-Anaheim	1.7	9.7
Riverside-San Bernardino-Ontario	2.2	11.7
Sacramento-Roseville-Arden-Arcade	2.9	10.9
San Diego-Carlsbad	2.0	19.1
San Francisco-Oakland-Hayward	2.1	12.4
San Jose-Sunnyvale-Santa Clara	2.8	11.5