BEACH BOULEVARD CORRIDOR STUDY

BASELINE CONDITIONS REPORT

JUNE 2019

Beach Boulevard Corridor Study – Baseline Conditions Report

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Contents

EXECUTIVE SUMMARY

Beach Boulevard (State Route 39, or SR 39) is the longest continuous north-south arterial in Orange County. The corridor extends through nine cities (Huntington Beach, Westminster, Garden Grove, Stanton, Anaheim, Buena Park, Fullerton, La Mirada, and La Habra) as well as through unincorporated Orange County, and is primarily under the jurisdiction of Caltrans.

The Beach Boulevard Corridor Study (Project) will develop a comprehensive multimodal transportation vision for the corridor. The Project will identify constraints and opportunities to improve and enhance local and regional mobility. The Project Corridor is defined as Beach Boulevard from State Route 1 (SR 1, also known as Pacific Coast Highway or PCH) in Huntington Beach and continues for about 21 miles north to State Route 72 (SR 72, also known as Whittier Boulevard) in La Habra. Given the configuration of the roadway network along the Project Corridor, and that modifications to Beach Boulevard may affect parallel facilities, for the purpose of this study, the Study Area has been defined as a 1.25 mile buffer around the Project Corridor.

This Baseline Conditions Report presents data and analysis for the current transportation circulation, travel market, land use, and infrastructure conditions across the Project Corridor and Study Area. The data and analysis in this report will be used to identify existing opportunities and constraints along the Corridor and support subsequent study recommendations.

The following is an overview of key findings for the baseline conditions analysis.

Demographics, Land Use, and Mode Split

Existing and future conditions related to population, employment and modes of travel shape transportation demands to, from and within the Study Area. Key findings regarding the Study Area's demographic, land use, and mode split context are as follows:

- **Near-Term and Long-Term Development Activity.** Near-term development projects totaling approximately 250,000 square feet of office, one million square feet of commercial and entertainment space, 300 hotel rooms, and about 1,400 residential units are expected to be constructed along the Project Corridor
- **Population Growth.** Total population in the Study Area is projected to grow by 7 percent between 2012 and 2040, about half the rate for Orange County as a whole (13 percent).
- **Employment Growth.** Total employment in the Study Area is projected to grow by 18 percent between 2012 and 2040, which is 6 percent lower than that of Orange County as a whole (24 percent).
- **Land Uses.** The predominant forecasted land use in the Study Area is residential with approximately 14,000 acres of new residential space

forecasted by 2040. Mixed land use has the second largest growth with 2,700 acres.

- **Mode Split.** Trips by auto modes (drive alone plus rideshare) for all trip purposes that start and end in the Study Area comprise 82 percent of Study Area trips, as compared to approximately 90 percent for Orange County as a whole. The share of transit trips within the Study Area is also higher than for Orange County as a whole, for all trip purposes and work trips.

The demographics and land use analysis findings will be used to inform near-term and long-term demand for multimodal improvements in the Study Area.

Roadway Infrastructure

Roadway infrastructure conditions form the framework under which potential improvements are implemented. Key findings regarding roadway infrastructure are as follows:

- **Curb-to-Curb Widths.** Generally, curb-to-curb widths vary across the Project Corridor from 110 feet to 125 feet, with the exception of about one mile within the City of Buena Park where the roadway narrows to 85 feet from curb to curb.
- **Roadway Jurisdiction.** Caltrans has jurisdiction over all of the Project Corridor except for portions of the roadway within the City of Buena Park. Relinquishment activities are currently under way in the City of Anaheim. The largely unified maintenance responsibility for the Project Corridor will simplify the coordination activities required to implement proposed improvements.
- **Traffic Signal Systems.** All signals have been updated to the latest controller type interconnected to the Caltrans District 12 Traffic Management Center (TMC) through either fiber or copper. Potential improvements to traffic signal systems can provide benefits to auto, pedestrian, bicycle, and transit circulation in the Study Area.
- **Programmed and Proposed Roadway Projects.** No near-term roadway or right-of-way improvement projects are expected along the Project Corridor at this time. Several ongoing and upcoming freeway improvement projects or large developments may affect traffic signal installations and/or streetscapes.

This information will be used in subsequent project tasks to identify improvement needs and opportunities to coordinate project improvements with ongoing or proposed infrastructure activities.

Vehicular Traffic Circulation

Travel by auto is the most widely used mode of transportation along the Project Corridor and thus is a key element of analysis. Key findings regarding vehicular traffic circulation are as follows:

- **Existing Traffic Volumes.** Existing daily traffic volumes for the Project Corridor range from a low of 29,400 near SR 1 to a high of nearly 83,600 near I-405. Traffic volumes generally are highest in the middle of the corridor and reduced in the northern and southern portions.
- **Existing Intersection Operations.** Of the intersections along the Project Corridor with performance data available, most operate at LOS D or better during peak hours.
- **Existing Travel Speeds.** Posted speed limits along the Project Corridor vary between 35 mph and 55 mph. Peak period travel speeds along the Project Corridor do not show any significant sections operating at speeds classified as LOS D or worse. A seasonality review shows that speeds are generally higher during the summer season during both the weekday and weekend peak periods.
- **Traffic Volume Forecasts.** Forecasted traffic volumes for the Project Corridor show a median growth of about 4 percent and an average growth of about 6 percent. The highest growth is projected in the City of La Habra (24 percent near SR 72).
- **Trip Patterns.** Generally, half of the trips along the Project Corridor originate or terminate in the Study Area. Between 0.1 and 14 percent of trips along the Project Corridor are attributed to highway to highway connections, with higher percentages observed at closely spaced highway facilities. As high as 43 percent of trips travel 5 miles along the Project Corridor for certain segments and as high as 7 percent of trips travel 15 miles along the Project Corridor for certain segments. Less than 1 percent of trips travel the entire length of the Project Corridor.
- **On-Street Parking and Loading.** On-street parking is provided along the Project Corridor in the southern and northern portions for a total of approximately 5.5 miles or 25 percent of the length of the Project Corridor. Loading zones are only provided on the northern end of the Project Corridor within the on-street parking area. However, on-street loading has been noted along the Huntington Beach auto dealership and in the Buena Park Entertainment Zone.
- **Goods Movement.** Heavy vehicle percentages of 1 to 5 percent were calculated along the Project Corridor with the highest reported in the City of La Habra.

As multimodal improvements are identified for the Project Corridor, this data will be used to inform potential benefits to vehicular traffic circulation as well as potential tradeoffs.

Transit Circulation

Based on the data and analysis presented in this section, the key findings for transit along the corridor are as follows:

- **Transit Coverage.** OCTA is the primary provider in terms of geographic coverage and hours of operation. Other transit providers include Metrolink and LA Metro. As project improvements are

developed for the Study Area, coordination among transit providers will allow for seamless connections between services.

- **OCTA Bus Service and Ridership.** Bus service frequencies vary widely for bus service in the study area. OCTA Route 29 runs the entire extent of the Project Corridor from SR 1 to the south to SR 72 to the north with headways of 15 minutes during peak periods and 20 minutes during off-peak periods. BRAVO route 529 runs between Edinger Avenue and Orangethorpe Avenue with headways of 12 minutes during peak periods and 18 minutes during off-peak periods. For other regular bus service in the study area, peak period headways range from 15 minutes to 75 minutes; BRAVO route 560 has 12-minute peak headways. Ridership at key Route 29 stops is generally above 100 average daily riders. Transit rider amenities at typical bus stops generally include benches and trash cans, but bus shelters are not consistently provided. In addition, most stops do not have bus pullouts (buses must stop within travel lanes).
- **Multimodal Transportation Hubs.** Transportation hubs in the study area consist of the Buena Park Metrolink Station, Goldenwest Transportation Center/Park-and-Ride, SR 1/First Street, and Fullerton Park-and-Ride. These hubs provide connectivity for OCTA bus service, LA Metro bus service, Metrolink rail service, OC Flex on-demand shuttle service, and park-and-ride users. However, there are opportunities for increase multimodal amenities at these locations such as secure bicycle storage.

The transit analysis findings will be used to define projects that improve bus travel time along the Project Corridor and improve connectivity to multimodal transportation hubs. As these projects are developed, coordination among transit providers will allow for seamless connections between services.

Bicycle and Pedestrian Circulation

Based on the data and analysis presented in this section, the key findings for bicycle and pedestrian circulation along the corridor are as follows:

- **Existing Bicycle Facilities.** The existing network of bicycle facilities is most comprehensive towards the southern end of the project corridor, such as within the City of Huntington Beach. Towards the northern portion of the study area, parallel and perpendicular routes to the project corridor have many gaps and provide largely local circulation within neighboring cities.
- **Existing Pedestrian Facilities**. Sidewalks are provided along the majority of the project corridor with a few noted gaps. The sidewalks are wider than 3 feet along the corridor although are subject to obstructions. Crossing opportunities are largely limited to major intersections.

- **Bicyclist and Pedestrian Volumes.** Active transportation activity levels vary along the project corridor, depending greatly on the land use context. Overall, Huntington Beach and Buena Park currently see the greatest amount of pedestrian activity, about 300-350 pedestrians at an intersection in a peak period. Huntington Beach also experiences the highest amount of bicyclist activity with 60 bicyclists observed in a peak period with Garden Grove experiencing the second highest at 30 bicyclists.
- **Relevant Plans and Projects.** These include numerous city-led and OCTA-prepared studies on mobility along the Project Corridor, as well as relevant citywide plans for circulation throughout the study area.

The bicycle and pedestrian analysis findings will be used to define projects that address existing facility gaps, improve connectivity to transit and other Study Area destinations, and improve the safety and comfort of bicyclists and pedestrians.

Opportunity Areas

Safety for all transportation users is critical element in the Study Area's multimodal network. The opportunity areas along the Project Corridor are based on a detailed assessment of collision data. Key findings are as follows:

- **High Collision Locations.** Along the Project Corridor, there is a higher concentration of collisions for all collision types in the cities of Huntington Beach, Anaheim and Buena Park. The highest number of collisions occur along the Edinger Avenue to Heil Avenue roadway segment which experiences some of the highest traffic volumes along the Project Corridor.
- **Bicyclist High-Injury Areas.** Along the Project Corridor, there is a higher concentration of collisions for bicyclists in the cities of Huntington Beach and Westminster. The highest number of bicycle collisions occur between Yorktown Avenue and Adams Avenue. This portion of the Project Corridor provides on-street parking which could influence the bicycle collision rates. In addition, bike lanes are not provided along the Project Corridor, however east-west connector roads do have bike lanes. The highest number of bicyclists are also reported in this area.
- **Pedestrian High-Injury Areas.** Along the Project Corridor, there is a higher concentration of collisions for pedestrians in the cities of Huntington Beach, Westminster, Anaheim and Buena Park. The highest number of pedestrian collisions occur along the SR 91 Eastbound Ramps to La Palma Avenue segment. This segment is located in a high pedestrian activity area within the Buena Park Entertainment Zone, which may relate to the rates.
- **Opportunity Areas.** Based on the high collision and high-injury bicyclist/pedestrian locations, there are opportunities for safety-

related enhancements at key locations within Huntington Beach, Westminster, Anaheim, and Buena Park. Contra-flow bicycle travel, negligence of right-of-way rules, illegal pedestrian behavior, and turning movements are the primary areas for potential improvements.

The safety analysis findings will be used to define locations along the Project Corridor that support safety improvements, and to identify potential safety countermeasures that address collision risk factors and patterns

Next Steps

Based on the findings of the baseline conditions analyses, the following are the next steps for the Project in the development of improvements to be advanced for implementation:

- **Corridor Segments:** Project Corridor segments will be defined to serve as a framework for identifying and describing improvements. The segmentation is intended to document differences and similarities in transportation conditions, land use conditions, and mobility needs along the Project Corridor.
- **Purpose, Need, and Goals:** The statement of purpose and need will document a common understanding of issues to be addressed through potential projects. The purpose and need will reflect the outcomes of the baseline conditions analysis and include input received from stakeholders.
- **Improvement Concepts:** The primary objective of the Project is to identify improvement concepts to be advanced for implementation. Potential concepts will be developed based on the findings of the baseline conditions analysis and will be consistent with the Project's purpose and need.
- **Concept Evaluation:** Potential concepts will be assessed to determine their effectiveness in meeting the purpose and need of the project. For those concepts that are most promising, conceptual designs and order of magnitude cost estimates (by ranges) will be developed.
- **Recommendations:** Based on the results of the above assessments, recommendations will be made for corridor-long improvements for each mode of travel.

Section 1
INTRODUCTION

1.1 PROJECT OVERVIEW

Beach Boulevard (State Route 39, or SR 39) is the longest continuous north-south arterial in Orange County. The corridor extends through nine cities (Huntington Beach, Westminster, Garden Grove, Stanton, Anaheim, Buena Park, Fullerton, La Mirada, and La Habra) as well through unincorporated Orange County. In addition, Beach Boulevard is a State facility under Caltrans jurisdiction. The corridor provides connections to and is crossed by four freeways (Interstate 405, State Route 22, State Route 91, and Interstate 5). The Project Corridor begins to the south at State Route 1 (SR 1) and continues for about 21 miles north to State Route 72 (SR 72).

The purpose of this Beach Boulevard Corridor Study (Project) is to develop a comprehensive multimodal transportation vision for the corridor. As part of this effort, the Project will identify constraints and opportunities to improve an enhance local and regional mobility.

The Study Area, for analysis purposes, is defined as the area within one mile of the Project Corridor as shown on **Figure 1-1**.

1.2 HISTORY OF PROJECT CORRIDOR

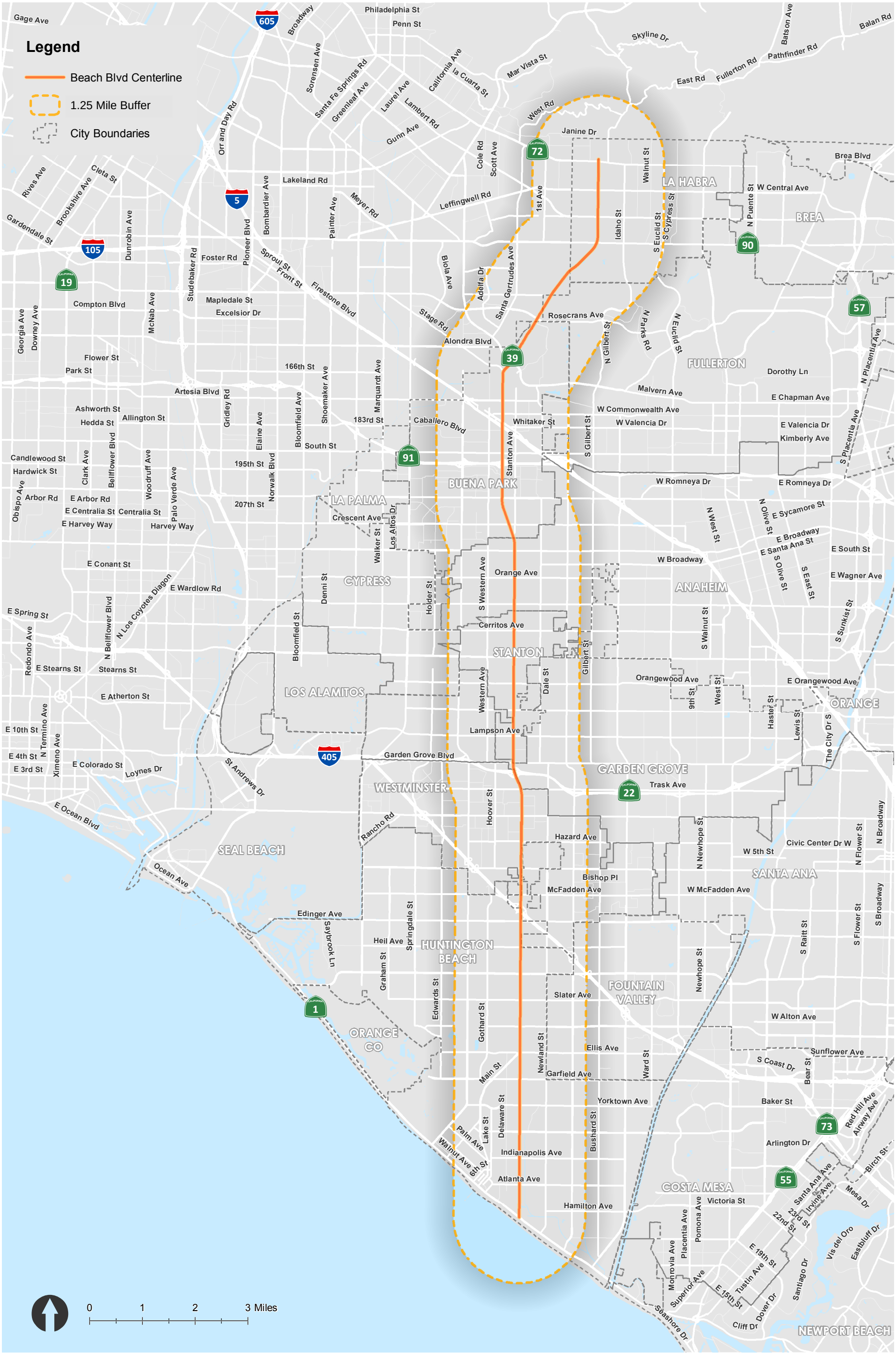
The following is the history of the Project Corridor, as summarized from Caltrans's State Route 39 Route Concept Report (June 2000).

> *Over the years SR 39 has had many names. These include: La Habra Road, Grand Avenue, Hampshire Street, Huntington Beach Boulevard, Route 62, and Route 171. In 1933, State officials, seeing the unified nature of the road designated the entire route as SR 39. In 1960, an Orange County street naming committee decided to name the entire route Beach Boulevard in honor of the "Road to Summer." It is the only north-south conventional route that provides direct access from inland Orange County to the coastal areas.*
>
> *SR 39 was first adopted as a State Highway – Conventional Route between Northern Station (rail station) and Ocean Avenue in November of 1935. The section(s) from Coast Boulevard to Ocean Avenue was added in June of 1937; from 22nd Street to Lampson Avenue in August of 1939; and from Lincoln Avenue to La Palma Avenue in December of 1941.*
>
> *A freeway portion of the route was adopted between Route 1 and Lampson Avenue in October of 1968, but later rescinded by the California Highway Commission in March of 1975.*

1.3 PURPOSE OF THIS REPORT

The Baseline Conditions Report presents data and analysis for transportation circulation, travel market, land use, and infrastructure conditions across the Project Corridor and Study Area. The report documents key findings for existing and planned future conditions that will be used to identify issues and opportunities and develop mobility improvement concepts. The baseline conditions analysis utilizes data assembled through field data collection, published plans and reports, and data sets provided by partner jurisdictions.

The data and analysis in this report will also be used to support subsequent study recommendations. (Subsequent next steps are described in Section 8 of this report.)



Study Area
Beach Blvd Corridor Study

Figure
1-1

Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet
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1.4 REPORT ORGANIZATION

The Baseline Conditions Report is organized as follows:

Section 2, Demographics, Land Use, and Mode Split: This section describes the Study Area's demographic, land use, and mode share context, including near-term development activity and long-term planned land uses. These attributes shape existing and future transportation demands to, from and within the Study Area.

Section 3, Roadway Infrastructure: This section summarizes physical characteristics and infrastructure conditions for the Project Corridor related to right-of-way and traffic signals. This section also describes the existing roadway jurisdiction for the Project Corridor (Caltrans or local jurisdiction) and infrastructure projects that are underway, programmed or planned. The data in this section establishes a framework for existing physical constraints along the Project Corridor; the infrastructure data also highlights opportunities for potential upgrades.

Section 4, Vehicular Traffic Circulation: This section presents the vehicular traffic volumes, speeds, and congestion for existing conditions. This section also presents conditions regarding on-street parking, loading, and goods movement. In addition, estimates of average trip lengths and origin/destination patterns in the Study Area are discussed. The data and analysis in this section serve to identify potential traffic operations improvements.

Section 5, Transit Circulation: This section describes existing bus services operating within the Study Area, along with associated multimodal hubs that allow for transfers between modes. The data and analysis will be used to identify opportunities to increase the attractiveness of transit as a travel option in the Study Area.

Section 6, Bicycle and Pedestrian Circulation: This section documents existing and planned bicycle and pedestrian facilities, sidewalk gaps and ADA facility deficiencies, and existing bicycle and pedestrian volumes. The data and analysis in this section will be used to identify opportunities to strengthen bicycle and pedestrian circulation for shorter-length trips and for connections to transit services.

Section 7, Opportunity Areas: This section presents the analysis of collisions throughout the Project Corridor and identifies locations with

high collision rates. The results of this analysis will be used to identify opportunities to improve safety for all modes of travel.

Section 8, Next Steps: This section describes the next steps for the Project following the Baseline Conditions Report. Immediate next steps include the finalization of corridor segments; the development of the purpose and need; and the development of improvement concepts for evaluation. Subsequent steps include the selection of preferred concepts to be advanced for project delivery as funding becomes available.

Section 2
DEMOGRAPHICS, LAND USE, AND MODE SPLIT

An understanding of demographic and land use conditions is an important first step in defining the users of the Project Corridor. Existing and future conditions related to population, employment, and development patterns shape transportation demands to, from and within the Study Area. This section describes the Study Area's demographic, land use, and travel mode context.

Topics covered in this section are as follows:

- Population and employment
- Near-term development activities
- Planned land use
- Mode split

2.1 POPULATION AND EMPLOYMENT

Population and employment data were analyzed for the Project Corridor to identify geographic areas where significant growth is projected. For existing conditions, year 2012 population and employment estimates for the Study Area were estimated using Traffic Analysis Zone (TAZ) data sets from the Center for Demographic Research (CDR) Orange County Projections 2014 Modified (OCP-2014) demographic data, provided by OCTA. **Table 2-1** summarizes year 2012 population estimates for the TAZs within the Study Area. Based on these data, the Study Area has approximately 481,450 residents and 144,980 employees. This represents almost 16 percent the County's residents and almost 9 percent of the County's jobs.

The Study Area represents almost 16 percent of Orange County's population and 8 percent of employment.

Table 2-1. Existing Population and Employment

Category	Study Area	Orange County
Population	481,450	3,071,540
Employment	144,980	1,526,230

Source: CDR OCP-2014 Modified

For year 2040 conditions, population and employment forecasts were calculated for the Study Area as summarized in **Table 2-2** and **Table 2-3**. The forecasts use 2040 land use data from OCTAM TAZs for the Study Area. Between 2012 and 2040, employment growth and population growth (as a percentage) in the Study Area are

projected to be lower than growth percentages for the County as a whole. As shown in the tables below, population growth in the Study Area is about half the amount projected for the County, whereas employment growth in the Study Area is projected to be about 75 percent of the countywide growth. **Figure 2-1** and **Figure 2-2** show the current population and employment for each TAZ in the Study Area as a function of the size of each TAZ (density).

Table 2-2. Study Area Population Growth

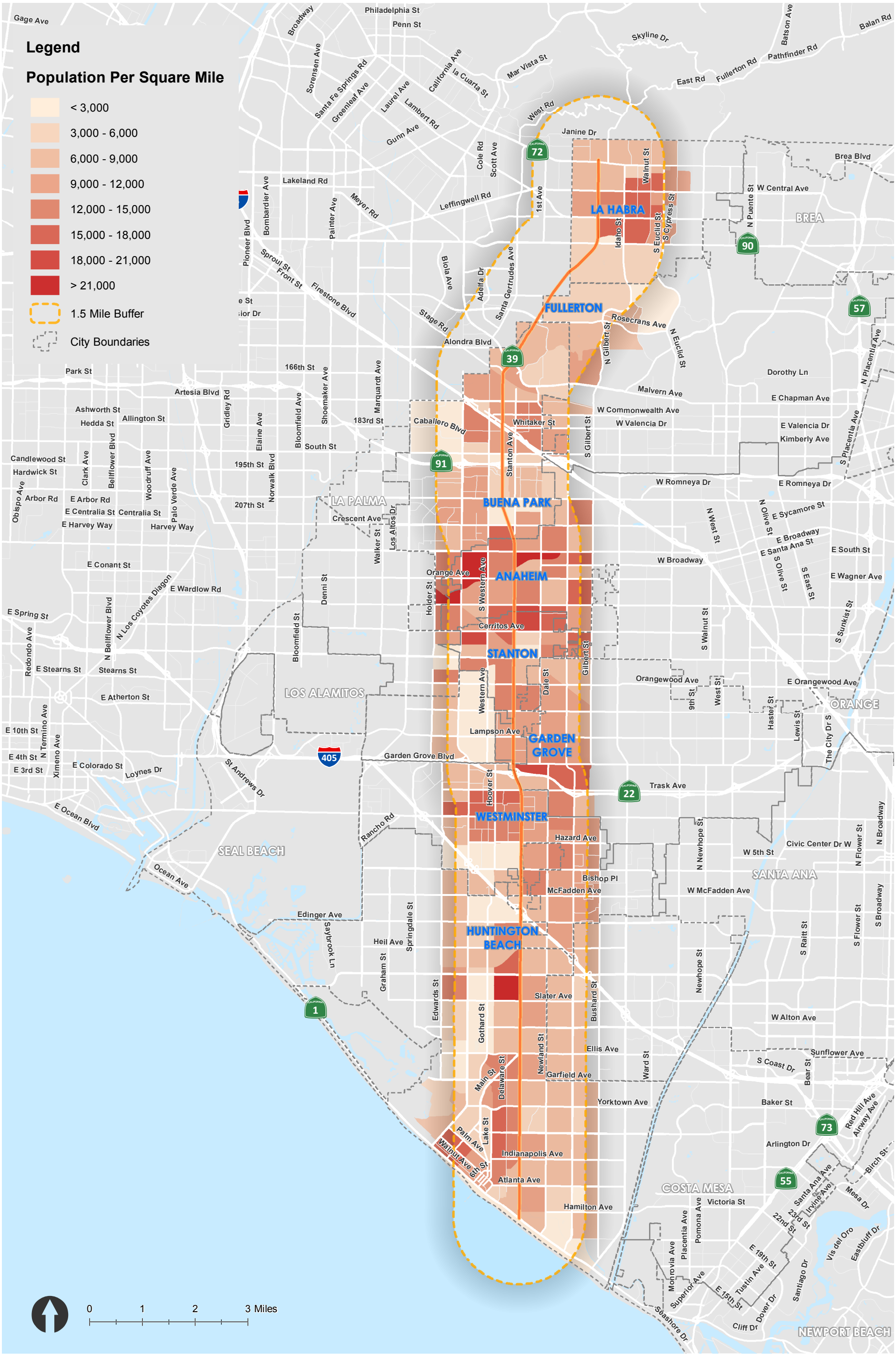
Model Year	Study Area	Orange County
Year 2012	481,450	3,071,540
Year 2040	515,660	3,461,450
Change	7%	13%

Source: CDR OCP-2014 Modified

Table 2-3. Study Area Employment Growth

Model Year	Study Area	Orange County
Year 2012	144,980	1,526,230
Year 2040	170,550	1,898,950
Change	18%	24%

Source: CDR OCP-2014 Modified



2012 Population Density by Traffic Analysis Zone (TAZ)
Beach Blvd Corridor Study

Figure **2-1**

Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet
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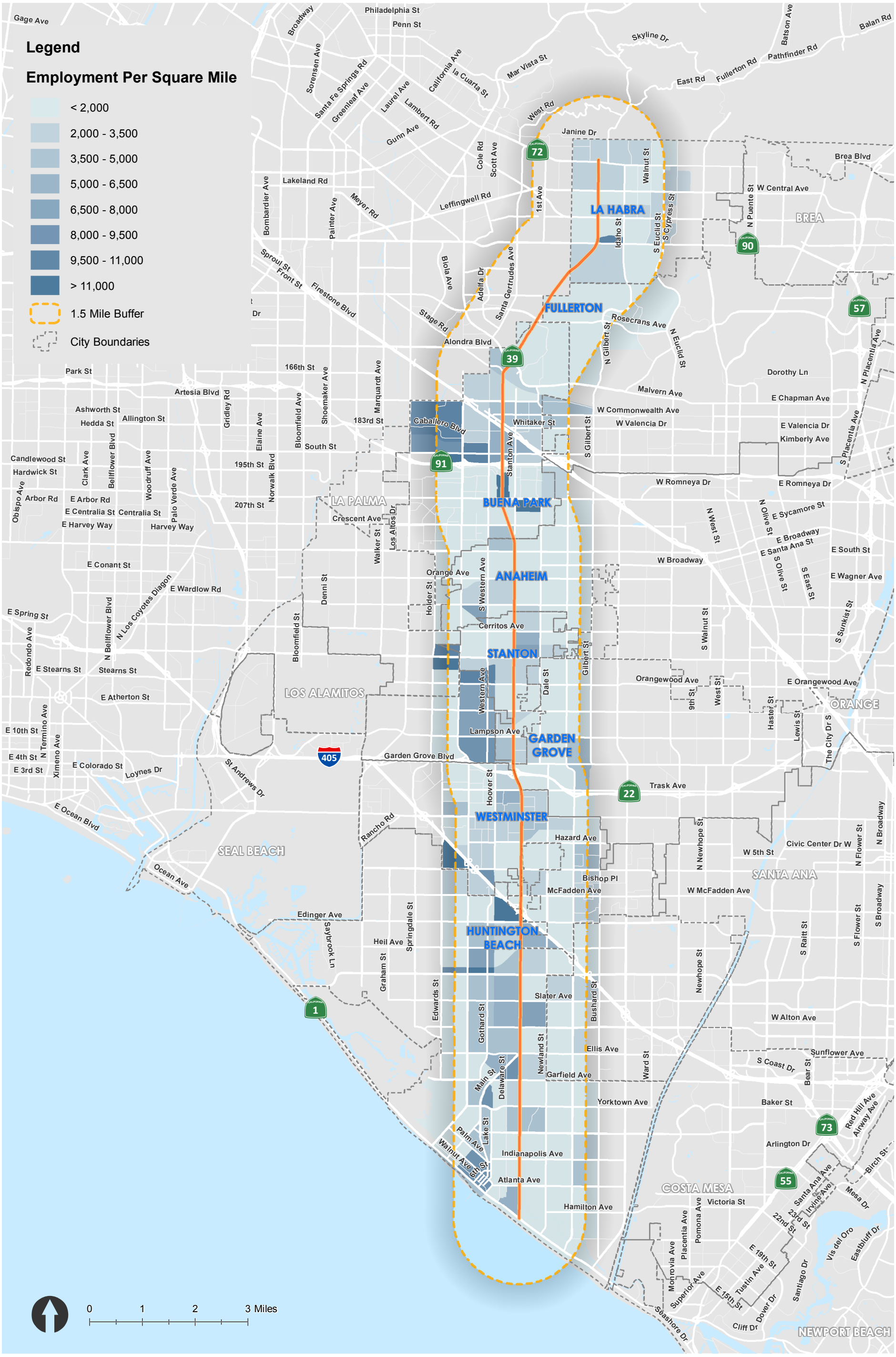

2012 Employment Density by Traffic Analysis Zone (TAZ)
Beach Blvd Corridor Study

Figure **2-1**

Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet
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2.2 NEAR-TERM DEVELOPMENT ACTIVITY

Local jurisdictions along the Project Corridor provided available data regarding development projects that are nearing completion, are approved, or are in the review process. **Table 2-4** summarizes the employment square footage and number of residential units expected to be constructed near-term within the Study Area. The locations of these development projects are shown in **Figure 2-3**. The projects listed are located on or abut the Project Corridor and are anticipated to have noticeable affect to operations along the Project Corridor.

Table 2-4. Near-Term Development Projects

City	Project	Location	Employment Square Footage	Housing Units
Huntington Beach	Chrysler Dealership Addition	16701 Beach Boulevard	3,000 SF automobile dealership (addition)	--
	Hyundai Dealership	17242 Beach Boulevard	7,300 SF dealership building	--
	Residential Develop-ment	18431 Beach Boulevard	--	39 residential units
	Subaru Dealership	18771 Beach Boulevard	17,232 SF dealership building	--
	The Learning Experience	17131 Beach Boulevard	10,000 SF child learning center; 13,000 outdoor play area	--
Stanton	Village Center	NW Corner of Beach Boulevard/ Garden Grove Boulevard	105,000 SF commercial	237 condo units

Multiple commercial, entertainment, residential, and mixed-use developments are planned along the Project Corridor.

City	Project	Location	Employment Square Footage	Housing Units
	12282 Beach Boulevard Mixed-Use Project	NE Corner of Beach Boulevard/ Catherine Street	4,296 SF kitchen/ restaurant; 1,471 SF outpatient clinic; 5,036 SF admin-istration / reception	120 beds/66 rooms Assisted Living
	11752 Beach Boulevard Condo Project	SE Corner of Beach/ Crager Street	--	17 condo units
Anaheim	39 Commons[1]	NE Corner of Beach/ Lincoln Avenue	Up to 380,000 SF commercial, retail, restaurants, entertain-ment, recreation, and hospitality uses	Up to 154 units
	Mixed Use Project	SE Corner of Beach/ Lincoln Avenue	N/A	Up to 60 units/ acre
Buena Park	The Source	NE Corner of Beach Boulevard/ Orangethorpe Avenue	178 hotel rooms; 50,000 SF office; 420,000 SF retail	100 condos
	Aloft Hotel	7851 Beach Boulevard	103,344 SF of dining, event space, meeting rooms, and hotel amenities (149 rooms)	--

City	Project	Location	Employment Square Footage	Housing Units
	Hotel Stanford	7860 Beach Boulevard	6,615 SF restaurant/ dining; 20,000 SF hotel amenities 191 rooms	--
	Butterfly Palladium	7711 Beach Boulevard	16,870 SF atrium; 4,281 SF restaurant; 9,756 SF lobby and special event space; 23,654 ancillary uses	--
	On Beach Mixed Use Project	SE Corner of Beach/ Franklin	6,123 SF restaurant; 2,284 SF retail; 36,303 SF medical office	60 units senior housing apartments
	Residential/ Commercial Mixed Use Development	NW Corner of Beach/9th	1,420 SF commercial	34 apartments
La Habra	Rancho La Habra	SE Corner of Beach/ Imperial	--	TBD

Source: Input provided by stakeholders in the Study Area and review of traffic studies and specific plans (2019). Actual development plans subject to change. Additional developments are also planned in the Study Area, but would not be located directly on Beach Boulevard or would have lower intensity of land uses.

2.3 LONG-TERM DEVELOPMENT ACTIVITY

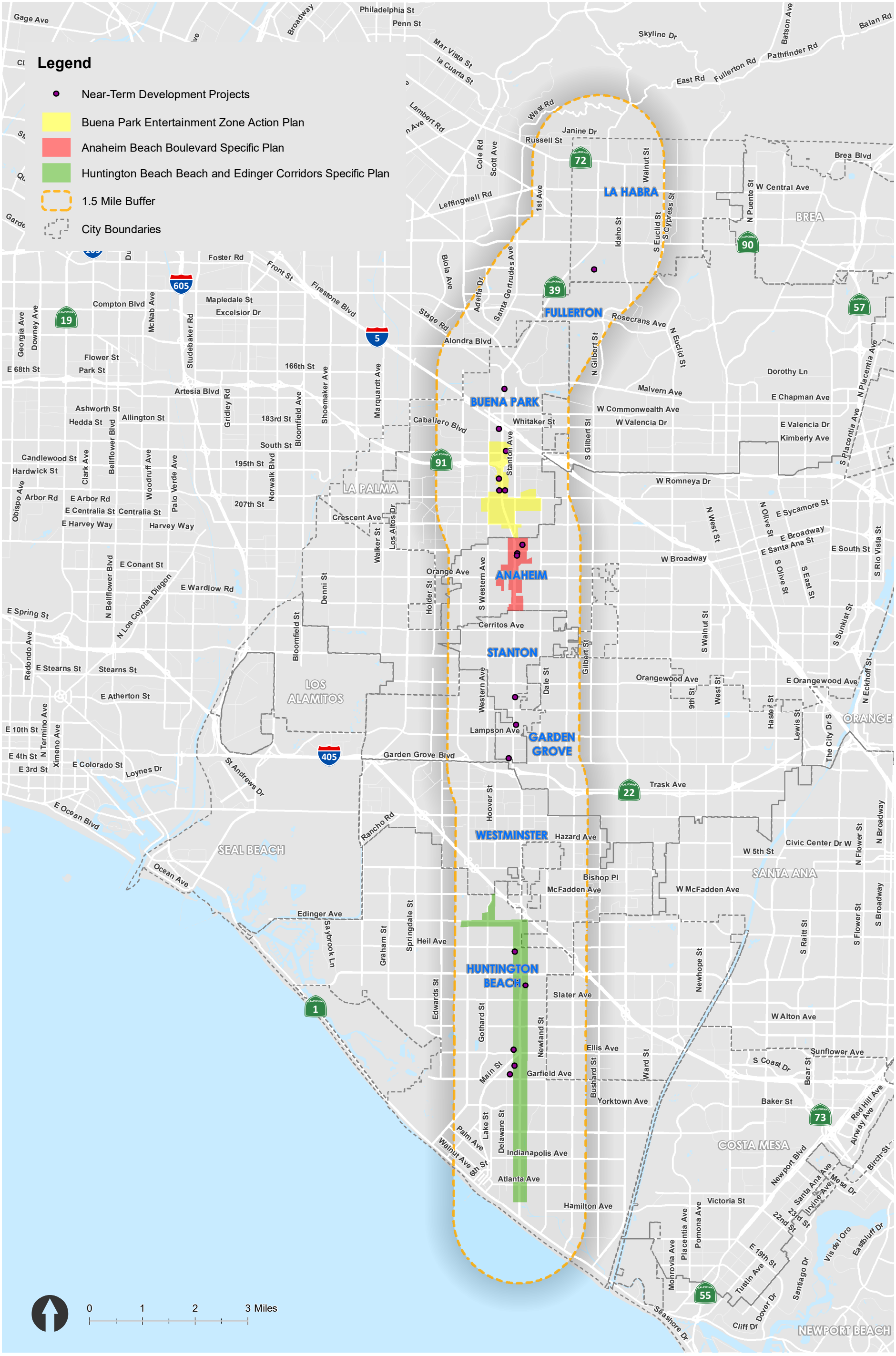
In addition to the Near-Term projects provided by the local jurisdictions, the following Long-Term development potentials have been identified through specific plans, corridor studies and other plans as shown in **Table 2-5**.

The locations of these potential future development projects are shown in **Figure 2-3**.

Table 2-5. Long-Term Development Projects

City	Project	Location	Employment Square Footage	Housing Units
Huntington Beach	Beach and Edinger Corridors Specific Plan (adopted 2010, amended 2015)	Beach Boulevard (Edinger to Atlanta), Edinger Avenue (Beach to Goldenwest)	738,000 SF retail; 112,000 SF office; 350 hotel rooms	2,100 dwelling units
Anaheim	Beach Boulevard Specific Plan (adopted December 2018)	Beach Boulevard (Stanton to Ball)	2,189,445 SF non-residential uses (including commercial, retail, and motels)	5,128 dwelling units
Buena Park	Entertainment Zone Action Plan (2008)	Beach Boulevard (Melrose to Stanton), La Palma Avenue (El Monte to Dale), Crescent Avenue (Western to Stanton)	700 hotel rooms; 313,426 SF entertain-ment retail; 950-seat dinner theater	--

Source: Traffic studies and specific plans as provided by each jurisdiction (2019). Actual development plans subject to change.



Near-Term and Long-Term Development Activities
Beach Blvd Corridor Study

Figure **2-3**

Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet
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2.4 STUDY AREA LAND USE

The land uses planned for the Project Corridor will generate additional demand for both existing transportation modes and new transportation services. The existing mix, intensity and character of land uses also provide context for street cross section elements and related improvements.

Since the Study Area jurisdictions have varying definitions for similar land use categories, the SCAG Land Use Database categories were applied. **Table 2-6** lists the land use category and size.

Existing land uses for the Project Corridor as presented in the 2012 Southern California Association of Governments (SCAG) land use database are shown in **Figure 2-4**.

The predominant future land use in the Study Area will continue to be residential.

Table 2-6. Existing 2012 Land Use

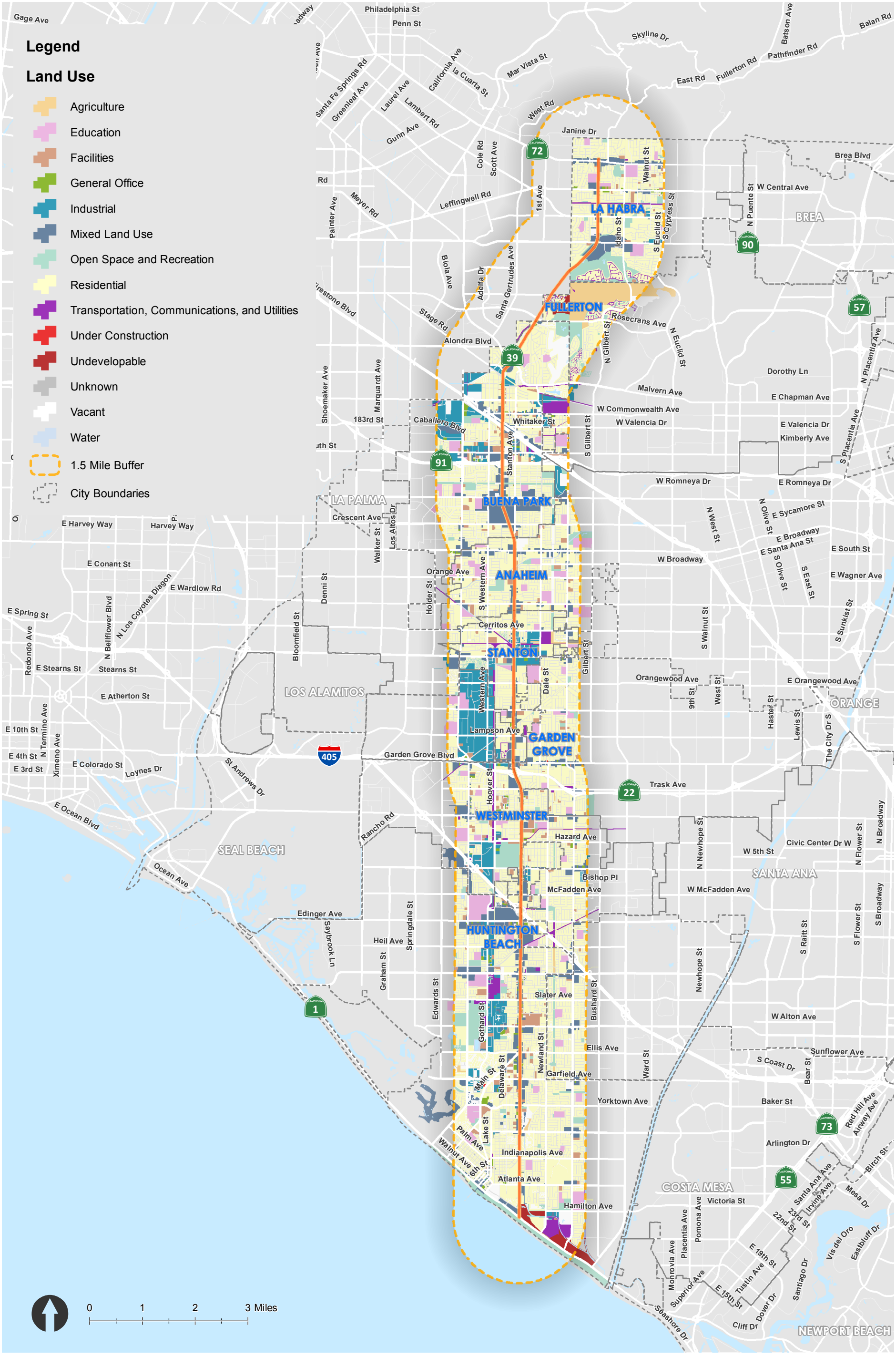
Land Use Category	Area (Acre)
Residential	13,760
Mixed Land Use	2,730
Industrial	1,690
Open Space and Recreation	1,670
Education	1,470
Vacant	1,120
Facilities	760
Transportation, Communications, and Utilities	640
Agriculture	520
General Office	210
Undevelopable	200
Water	70
Under Construction	10
Unknown	10

Source: SCAG Land Use Database

As shown in the figure below, there are four prevailing patterns for planned land uses in the Study Area:

- In the Study Area, most of the land use is residential.
- City of La Habra, Buena Park, Anaheim, Stanton, Westminster, Garden Grove and Huntington Beach are planned to have some mixed-use land use with varying levels of intensity along Project Corridor.

- Almost every city will provide open spaces and recreation area within 1.25 miles from Project Corridor.
- La Habra, Buena Park, Stanton, Garden Grove, Westminster, and Huntington Beach have industrial land use within 1.25 miles of the Project Corridor.



Existing Land Use
Beach Blvd Corridor Study

Figure **2-4**

Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet
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2.5 MODE SPLIT

The distribution of Study Area trips among various modes of travel was analyzed to provide an understanding of larger travel patterns and to establish a baseline for potential improvements. The Orange County Travel Demand Model version 4.0 (OCTAM) 2012 scenario was used to estimate existing mode split for the TAZs that encompass the Study Area. **Table 2-7** summarizes the results of the mode split analysis for the Study Area for existing conditions. The data shown are person trips for all trips that begin and/or end within the Study Area.

Table 2-7. Study Area Existing Mode Split

Travel Mode	All Trip Purposes		Work Trips Only	
	Study Area	Orange County	Study Area	Orange County
Drive Alone	28%	33%	62%	68%
Rideshare	54%	57%	22%	26%
Transit	18%	10%	16%	6%

Source: OCTA travel demand model (OCTAM) version 4.0

Trips are person trips not vehicle trips. Bike and walk modal splits were not provided in OCTAM.

For all trips in the Study Area, 82 percent are by cars, of which only 28 percent are drive-alone.

The results of the Study Area mode split analysis are as follows:

- Trips by personal auto (drive alone plus rideshare) for all trip purposes comprise 28 percent of Study Area trips, as compared to approximately 33 percent for Orange County as a whole.
- The share of drive alone trips for all purpose in the Study Area is comparable to that for Orange County as a whole. For home-based work trips, the share of drive alone trips for study area is lower than for Orange County.
- For all trip purposes, rideshare mode makes up more than half of all trips. However, for work trips only, the share drops to about a quarter of the trips.
- The share of transit trips within the Study Area is significantly higher than for Orange County as a whole. For all trip purposes, the transit share is almost double than that of the County; for work trips only, it is 2.5 times higher than the County rate. However, the share of transit for home-based work trips is lower than for all trip purposes.

2.6 KEY FINDINGS

Existing and future conditions related to population, employment, and modes split shape transportation demands to, from and within the Study Area. Key findings regarding the Study Area's demographic, land use, and mode split context are as follows:

- **Near-Term and Long-Term Development Activity.** Near-term development projects totaling approximately 250,000 square feet of office, one million square feet of commercial and entertainment space, 300 hotel rooms, and about 1,400 residential units are expected to be constructed along the Project Corridor.
- **Population Growth.** Total population in the Study Area is projected to grow by 7 percent between 2012 and 2040, about half the rate for Orange County as a whole (13 percent).
- **Employment Growth.** Total employment in the Study Area is projected to grow by 18 percent between 2012 and 2040, which is 6 percent lower than that of Orange County as a whole (24 percent).
- **Land Uses.** The predominant land use in the Study Area is residential with approximately 14,000 acres forecasted by 2040. Mixed land use is the second largest with 2,700 acres.
- **Mode Split.** Trips by auto modes (drive alone plus rideshare) for all trip purposes, that start and end in the Study Area, comprise 82 percent of Study Area trips, as compared to approximately 90 percent for Orange County as a whole. The share of transit trips within the Study Area is higher than for Orange County as a whole, for all trip purposes and work trips.

The demographics and land use analysis findings will be used to inform near-term and long-term demand for multimodal improvements in the Study Area.

Section 3 ROADWAY INFRASTRUCTURE

This section summarizes physical conditions and roadway infrastructure for the Project Corridor. This information will be used in subsequent project tasks to identify improvement needs and opportunities to coordinate project improvements with ongoing or proposed infrastructure activities.

Topics covered in this section are:

- Right-of-way
- Roadway jurisdiction
- Traffic signal systems
- Programmed and proposed projects

3.1 CURB-TO-CURB WIDTHS

Caltrans right-of-way along the Project Corridor extends from back-of-sidewalk to back-of-sidewalk (i.e., Caltrans generally has jurisdiction for both the street and the sidewalk). The curb-to-curb dimensions and limits for the Project Corridor were determined as it is anticipated that improvements would be focused on modifications to the vehicular traffic lanes and not within the sidewalks. Data regarding the publicly-owned rights-of-way for the Project Corridor was collected through right-of-way maps as provided by OCTA and local jurisdictions and corroborated via Google Earth satellite imagery.

Curb-to-curb widths along the Project Corridor range from 85 feet to 125 feet.

Table 3-1 summarizes the curb-to-curb widths for the Project Corridor, including widths, number of travel lanes, and median configurations. The following is an overview of the curb-to-curb conditions along the Project Corridor:

- South of the I-405 interchange, right-of-way widths generally vary from 110 feet (with six lanes) to 125 feet, with four travel lanes in each direction.
- Between the I-405 interchange and the SR 91 interchange, curb-to-curb widths generally vary from 110 feet to 120 feet, with four travel lanes in each direction.
- North of the SR 91 interchange, curb-to-curb widths vary from 95 feet to 115 feet, with three travel lanes in each direction.

- The narrowest segment of the Project Corridor is between Commonwealth Avenue and Franklin Street (in the former Downtown Buena Park); in this location, curb-to-curb width is 85 feet, with three travel lanes in each direction.

Table 3-1. Project Corridor Geometrics

City	Limits (Street)	Limits (Postmile)	Typical Curb-to-Curb Width (Feet)	No. Lanes (per direction)	Median Type/ Openings
Huntington Beach	SR 1 to I-405	0.000 - 5.800	110-125	3-4	Raised w/ LT pockets
Westminster	I-405 to SR 22	5.800 - 8.478	110-120	4	Raised w/ LT pockets
Garden Grove/ Stanton	SR 22 to Ball Road	8.478 - 11.681	110-120	4	Raised w/ LT pockets
Anaheim	Ball Rd to Stanton Avenue	11.681- 12.900	110-115	4	Raised
Buena Park/La Mirada	Stanton Avenue to SR 91 EB	12.900 - 14.378	110-120	4	Raised w/ LT pockets
	SR 91 EB to Auto Center Drive	14.378 - 15.150	95-115	3	Raised
	Auto Center Drive to Stage Road	15.150 - 16.130	85	3	Raised
	Stage Road to Rosecrans Avenue	16.130 - 17.340	105-115	3	Raised w/ LT pockets
La Mirada/ Fullerton	Rosecrans Avenue to Hillsborough Drive	17.340 - 18.340	110-115	3	Raised
La Mirada/ La Habra	Hillsborough Drive to SR 72	18.340 - 20.719	115	3	Raised w/ LT pockets

Source: Measurements conducted by using Google Earth satellite imagery

LT = Left turn

3.2 GOVERNING JURISDICTION

The maintenance responsibility for the Project Corridor will inform the coordination activities required to implement proposed improvements. Since the Project Corridor is a State Highway, the maintenance responsibility falls to Caltrans at all study locations except at locations that have been relinquished. These locations include:

Maintenance responsibility for the Project Corridor is primarily under Caltrans, except for portions of the roadway in the City of Buena Park.

- **Buena Park**: A portion of the Project Corridor within the City of Buena Park south of the I-5 interchange has been relinquished to the governance, operation, and maintenance of the City. This section between Stanton Avenue and 9th Street includes the following traffic signals:
  - Stanton Avenue
  - Crescent Avenue
  - La Palma Avenue
  - Wax Museum
  - Orangethorpe Avenue
  - The Source
  - 10th Street
  - 9th Street

The City of Anaheim is currently engaged in the relinquished process with Caltrans, which would allow for the governance, operation, and maintenance by the City. The section under consideration is Beach Boulevard between Ball Road and Anacapa Way. It is also noted that the City of Stanton has previously explored relinquishment proceedings to take over their portion of the Project Corridor (Acacia Avenue to Cerritos Avenue). However, the relinquishment process has not been initiated.

3.3 TRAFFIC SIGNAL SYSTEMS

Traffic signals influence mobility conditions for all modes along the Project Corridor – automobiles, bicyclists, pedestrians, and transit vehicles. The Project Corridor has 72 signalized intersections over its length. An inventory of traffic signal infrastructure was completed to identify improvement opportunities to benefit one or more modes along the Project Corridor. The signal inventory represents data as provided by the local jurisdictions, *OCTA Beach Boulevard TLSP Study*, various OCTA-led regional studies, and Caltrans.

The traffic signal inventory addresses the following components:

- **Controller type** – The signal controller type influences the type of software that is used. Traffic signal controllers along the Project Corridor have been updated to 2070 models under the corresponding central system. Caltrans runs the

TransSuite central system, while the City of Anaheim runs the Econolite Centracs central system.

- **Signal interconnect** – Signals may be connected to each other using GPS, fiber or copper. This interconnect allows for more efficient signal timing and improved traffic flow. Currently, all 72 intersections are interconnected via copper, Ethernet-over-copper, or fiberoptic.
- **Vehicle detection** – Signals may detect vehicles and bicyclists using loop detectors within the pavement or video cameras mounted above ground. Vehicle detection is provided at all 72 signals.
- **Closed-Circuit Television (CCTV) Cameras** – These provide traffic monitoring and recording of traffic data. CCTV Cameras are provided at the following 15 signalized intersections along the corridor:
    - Adams Avenue
    - Main Street / Ellis Avenue
    - Talbert Avenue
    - Slater Avenue
    - Edinger Avenue
    - Westminster Boulevard
    - Garden Grove Boulevard
    - Chapman Avenue
    - Orangewood Avenue
    - Lincoln Avenue
    - La Palma Avenue
    - Orangethorpe Avenue
    - La Mirada Boulevard / Malvern Avenue
    - Rosecrans Avenue
    - Imperial Highway (SR 90)

The Project Corridor has 72 signalized intersections over its length.

Key findings from the signal infrastructure inventory are that all 72 intersections provide signal interconnect and vehicle detection. CCTV cameras are also provided at 15 locations for traffic monitoring with connection to the Caltrans District 12 Traffic Management Center (TMC).

3.4 RELEVANT PLANS AND PROJECTS

Per the OCTA 2014 Master Plan of Arterial Highways (MPAH), the Project Corridor is classified as follows:

- South of the SR 91 interchange: eight-lane Smart Street (arterials with enhanced traffic carrying capacity).
- From the SR 91 interchange to Imperial Highway (SR 90): six-lane Smart Street.
- North of Imperial Highway (SR 90): Major Arterial Highway, described as a six-lane divided roadway.

With three to four travel lanes in each direction, raised medians throughout the Study Area, right-turn pockets, and provision of left-turn pockets at both signalized intersections and mid-block median openings, the Project Corridor is generally considered to be "built-out" as a roadway. As such, major right-of-way modifications or capacity-increasing projects are not under consideration along the Project Corridor. The Caltrans State Route 39 Route Concept Report (June 2000) also notes the current roadway configuration as their 2020 concept. The SR 39 concept notes the expansion of new technology to help improve operations along the Project Corridor, not physical widenings.

However, the roadway configuration of the Project Corridor is expected to change mainly through the following projects:

Major projects along the Project Corridor would involve freeway interchanges or large developments.

- **Freeway improvement projects** involving interchange ramps and signals. One ongoing example is the current I-405 freeway improvement project, which will be replacing overpass bridges and modifying access ramps.
- **Large development or redevelopment projects** involving new traffic signal installations or modifications of existing driveways. One recent example is The Source, a multi-use retail and commercial center in Buena Park, for which a new traffic signal was installed to provide access to the parking structure.

Additional infrastructure changes to the Project Corridor may occur through signal synchronization and transit signal priority projects which is currently under consideration by OCTA.

No near-term large infrastructure projects were identified along the Project Corridor.

Finally, several local jurisdictions have developed the following Specific Plans pertaining to specific portions of the Project Corridor aimed at revitalization, beautification, and multi-modal integration:

- City of Huntington Beach: Beach and Edinger Corridors Specific Plan (2015)
  - Provides guidelines for land use and density
  - Provides guidelines for lot and building design including lot frontage

    - Provides guidelines of new streets and connection to corridor, access to allowed land uses (vehicular and pedestrian), parking, and signage.
    - Proposes streetscape plan for the corridor including in the median
    - Planned circulation improvements including additional turn lanes at intersections and signal timing
- City of Anaheim: Beach Boulevard Specific Plan
    - Provides guidelines for land use and density
    - Provides guidelines for lot and building design including lot frontage
    - Provides guidelines for access to allowed land uses (vehicular and pedestrian), parking, and signage.
    - Proposes streetscape plan for the corridor including in the median
    - Outlines plans for pedestrian facilities improvement
- City of Buena Park: Beach Boulevard Multi-Modal Mobility Action Plan
    - Outlines strategies for drop-off areas and alternative entertain traffic circulation
    - Outlines locations for potential additional parking

Key findings are as follows:

- The Project Corridor is not likely to undergo major right-of-way modifications or capacity projects due to its established size and status as a regional arterial highway.
- Freeway interchange projects may affect the Project Corridor in the future, including the I-405 improvement project currently underway.
- Several local jurisdictions have developed Specific Plans for portions of the Project Corridor that may lead to development, pedestrian improvements, and/or streetscape projects.

3.5 KEY FINDINGS

Based on the data and analysis presented in this section, the key findings for roadway infrastructure along the Project Corridor are as follows:

- **Curb-to-Curb Widths.** Generally, curb-to-curb widths vary across the Project Corridor from 110 feet to 125 feet, with the exception of about one mile within the City of Buena Park where the roadway narrows to 85 feet.
- **Roadway Jurisdiction.** Caltrans has jurisdiction over all of the Project Corridor except for sections of the roadway within the City of Buena Park. Relinquishment activities are currently under way in the City of Anaheim. The largely unified maintenance responsibility for the Project Corridor will simplify

the coordination activities required to implement proposed improvements.

- **Traffic Signal Systems.** All signals have 2070 controller type interconnected to central systems through either fiber or copper. Potential improvements to traffic signal systems can provide benefits to auto, pedestrian, bicycle, and transit circulation in the Study Area.
- **Programmed and Proposed Projects.** No near-term roadway or right-of-way improvement projects are currently expected along the Project Corridor. Several ongoing and upcoming freeway improvement projects or large developments may affect traffic signal installations and/or streetscapes.

Section 4
VEHICULAR TRAFFIC CIRCULATION

Passenger vehicles are the most widely used mode of transportation along the Project Corridor and therefore, a critical element of analysis. As multimodal improvements are identified and developed, it will be important to consider enhancements to vehicular circulation as well as potential negative effects.

This section identifies areas of the Project Corridor with existing and/or future congestion, as well as key intersections that are over capacity. This section also includes a description of heavy vehicle and goods movement activity affecting the Project Corridor.

Topics covered in this section include:

- Number of lanes and posted speed limits
- Traffic volumes
- Intersection capacity analysis
- Travel speeds
- Seasonality
- Trip Patterns
- On-street parking
- Loading
- Heavy Vehicles and Goods Movement

4.1 NUMBER OF LANES AND POSTED SPEED LIMITS

The roadway conditions along the Project Corridor vary in terms of number of lanes and posted speed limits. **Table 5-1** documents these metrics for the major cross-sections along the Project Corridor.

Overall, the Project Corridor has a mix of three to four through lanes in each direction:

- Three lanes per direction from SR 1 to Ellis Avenue
- Four lanes per direction from Ellis Avenue to SR 91
- Three lanes per direction from SR 91 to SR 72

Speed limits vary between 35 mph and 55 mph as shown in the table below. The location with the lowest speed limit is within Buena Park north of I-5, where the Project Corridor has the narrowest curb-to-curb width (85 feet).

Table 4-1. Number of Lanes and Post Speed Limits

City	Roadway Section	Postmile	Posted Speed Limit (mph)	Number of Lanes (per direction)
Huntington Beach	SR 1 to Yorktown Avenue	0.000-2.130	50	3
	Yorktown Avenue to Ellis Avenue	2.130 - 3.120	45	3
	Ellis Avenue to I-405	3.120-5.800	40	4
Westminster / Garden Grove/ Stanton/ Anaheim/ Buena Park	I-405 to La Palma Avenue	5.800-13.730	45	4
Buena Park	La Palma Avenue to Auto Center Drive	13.730-15.150	40	3/4
	Auto Center Drive to Artesia Boulevard	15.150-15.573	35	3
	Artesia Boulevard to Malvern Avenue	15.573-16.370	40	3
Buena Park /La Mirada	Malvern Avenue to Rosecrans Avenue	16.370-17.340	50	3
La Mirada/ Fullerton/ La Habra	Rosecrans Avenue to Hillsborough Park	17.340-18.600	55	3
La Habra	Hillsborough Park to SR 90	18.600-19.168	50	3
	SR 90 to SR 72	19.168-20.719	45	3

Source: Posted speed limits noted by using Google Streetview and field review

4.2 EXISTING ROADWAY VOLUMES

Existing conditions related to traffic volume, speed, and intersection operations were analyzed to identify locations along the Project Corridor with existing capacity constraints. Historical trends in traffic volumes and speeds were analyzed for the most recent five-year period. This section documents the findings of this analysis.

4.2.1 Existing Traffic Volumes

Daily and peak hour traffic volumes for existing conditions were compiled for the Project Corridor using the following sources:

- Caltrans' Traffic Census Program (2017) – primary data source for peak hour and Annual Average (Daily Traffic) (AADT)[1] volumes for portions of the Project Corridor that are under state jurisdiction
- Counts provided by local jurisdictions

Current daily traffic volumes along the Project Corridor range from a low of 29,400 near SR 1 to a high of nearly 83,600 near I-405.

4.2.1.1 Existing Traffic Volumes

Table 5-2 summarizes the available daily and peak hour volumes (derived from peak hour intersection counts). As shown in **Table 5-2**, the Project Corridor has the lowest AADT volumes on the south end at SR 1 where Beach Boulevard has a six-lane cross-section. The highest traffic volumes are at the I-405 interchange as traffic enters and exists the I-405 Freeway.

Table 4-2. Existing Daily and Peak Hour Traffic Volumes

City	Nearest Cross-Street	Postmile	Existing Volume	
			Daily (AADT)[1]	Peak Hour[2]
Huntington Beach	SR 1	0.000	29,400	1,438
	Adams Avenue	1.630	42,600	2,758
	Ellis Avenue	3.120	65,100	4,099
	Talbert Avenue	3.611	66,500	4,396
	Slater Avenue	4.131	69,600	-

[1] Annual average daily traffic (AADT) is the total volume for the year divided by 365 days. The traffic count year is from October 1st through September 30th. Very few locations in California are actually counted continuously. Traffic Counting is generally performed by electronic counting instruments moved from location throughout the State in a program of continuous traffic count sampling. The resulting counts are adjusted to an estimate of annual average daily traffic by compensating for seasonal influence, weekly variation and other variables which may be present. Annual ADT is necessary for presenting a statewide picture of traffic flow, evaluating traffic trends, computing accident rates. planning and designing highways and other purposes. (Caltrans Census Program).

City	Nearest Cross-Street	Postmile	Existing Volume	
			Daily (AADT)[1]	Peak Hour[2]
	Warner Avenue	4.631	71,900	5,198
	I-405	5.800	83,600	5,529
Westminster	Bolsa Avenue	6.630	77,500	5,766
	Westminster Avenue	7.634	74,500	-
	SR 22	8.478	74,600	5,786
Stanton	Lampson Avenue	9.171	77,600	-
	Chapman Avenue	9.671	71,500	-
	Katella Avenue	10.660	64,600	4,986
	Cerritos Avenue	11.181	65,200	4,774
Anaheim	Ball Road	11.681	62,500	4,707
	Lincoln Avenue	12.685	66,700	4,403
Buena Park	SR 91	14.378	57,800	4,052
	I-5	15.070	57,800	3,884
	Auto Center Drive	15.150	57,600	-
	Artesia Boulevard	15.573	60,700	-
	Stage Road	16.130	66,400	-
	La Mirada Boulevard	16.380	48,600	-
La Mirada	Rosecrans Avenue	17.340	44,000	-
La Habra	SR 90	19.168	48,800	3,792
	Lambert Road	19.671	34,700	-
	SR 72	20.719	39,700	2,516

1: Caltrans Census Data, 2017
2: Highest volume of available AM or PM peak hour where available. Data collected between 2015 and 2017.

4.2.1.2 Intersection Operations

Signalized intersection level of service (LOS) is provided along the Project Corridor where available. Peak hour LOS grades range from LOS A to LOS F, with LOS A signifying free-flow traffic and LOS F signifying operations that are over capacity. LOS data was available along the corridor under both the Intersection Capacity Utilization (ICU) methodology and the Highway Capacity (HCM) methodology. Under the ICU methodology, the critical movement and critical movement capacity of an intersection are used to calculate a volume-to-capacity (V/C) ratio, which is then assigned a LOS grade. The HCM methodology assigns a level of service grade to an intersection based on the average control delay for vehicles at the intersection.

The LOS provided in **Table 4-3** is sourced from the following studies that were published in 2015 or later:

- Beach Boulevard Specific Plan EIR Traffic Study (Anaheim) (Dated August 2018 with 2016 traffic count data)
- Beach Blvd Signal Priority Implementation Plan, Deliverable 3: Beach Blvd Transit Corridor Review (OCTA) (Dated May 2018 with 2017 traffic count data)
- 5742 Beach Boulevard Mixed Use Project (Buena Park) (Dated April 2015 with 2014 count data)
- 12282 Beach Boulevard Project Revised Focused Traffic Analysis (Stanton) (Dated October 2014 with 2014 traffic count data)

Of the intersection with performance data available, most operate at LOS D or better, indicating that they do not typically experience high levels of congestion during the peak hours.

Table 4-3. Existing Daily and Peak Hour Traffic Volumes

City	Intersection	Postmile	AM Peak Hour		PM Peak Hour	
			V/C (Delay)	LOS	V/C (Delay)	LOS
Huntington Beach	Edinger Avenue	5.630	0.7	C	0.81	D
Westminster	Bolsa Avenue	6.630	0.82	D	0.79	C
	SR 22 EB Ramps	8.478	0.58	A	0.56	A
Garden Grove	SR 22 WB Ramps	8.478	0.71	C	0.71	C
Stanton	Catherine Avenue	9.360	0.436 (99.9)	A (F)	0.484 (99.9)	A (F)
	Katella Avenue	10.660	0.72	C	0.7	C
	Cerritos Avenue	11.181	0.719 (39.0)	C (D)	0.755 (45.8)	C (D)
Anaheim	Ball Road	11.681	0.736 (45.3)	C (D)	0.731 (47.6)	C (D)
	Orange Avenue	12.186	0.754 (44.4)	C (D)	0.691 (38.6)	B (D)
	Lincoln Avenue	12.685	0.604 (35.6)	B (D)	0.653 (39.9)	B (D)

City	Intersection	Postmile	AM Peak Hour		PM Peak Hour	
			V/C (Delay)	LOS	V/C (Delay)	LOS
Buena Park	La Mirada Boulevard	16.380	0.98 (65.1)	E (E)	0.86 (57.6)	D (E)
	Stage Road	16.130	0.73 (14.5)	C (B)	0.78 (18.8)	C (B)
	Franklin Street	15.808	0.83 (12.1)	D (B)	0.91 (17.2)	E (B)
	Holt Street	15.690	9.2	(A)	10.3	(B)
	Artesia Boulevard	15.573	0.76 (38.5)	C (D)	0.80 (40.1)	C (D)
	Commonwealth Avenue	15.316	0.67 (30.6)	B (C)	0.66 (30.3)	B (C)
	Auto Center Drive	15.150	0.62 (24.2)	B (C)	0.69 (44.9)	B (D)
	I-5 SB Ramps	15.070	0.66 (30.5)	B (C)	0.73 (38.4)	C (D)
	Orangethorpe Avenue	14.565	0.67	B	0.64	B
	SR 91 WB Ramps	14.378	0.59	A	0.7	C
	SR 91 EB Ramps	14.378	0.59	A	0.65	B
	La Palma Avenue	13.732	0.537	A	0.708	C
	Crescent Avenue	13.204	0.48	A	0.556	A

Source: Various planning documents and traffic studies as documented in the section.

4.2.2 Travel Speeds

Travel speeds were analyzed for the Project Corridor using National Performance Management Research Data Set (NPMRDS). NPMRDS

utilizes INRIX[2] data to provide comprehensive and consistent data for passenger and commercial freight roadway performance across the National Highway System. NPMRDS data for the AM (6:00 AM to 9:00 AM) and PM (4:00 PM to 7:00 PM) peak periods was obtained from January 1 to December 31, 2018 for midweek days (Tuesday, Wednesday, Thursday), and was used to determine average travel speeds on the Project Corridor.

4.2.2.1 Existing Traffic Speeds

Table 4-4 summarizes the typical weekday AM and PM peak period average travel speeds for the Project Corridor. The NPMRDS data used captures overall travel speeds including delays from traffic signals and vehicle queues. Therefore, the average travel speeds are often less than the posted speed limit and are influenced by both the number of traffic signals and operating conditions at individual intersections.

Peak period traffic speeds along the Project Corridor range from a low of 16 mph in the northern sections to a high of 28 mph in the south.

The slowest average speeds along the Project Corridor are generally in the northern section of the corridor between SR 91 and I-5 with speeds from 16 to 21 mph.

The highest average speeds along the Project Corridor are generally on the southern section of the corridor, south of I-405. Speeds for these sections reach a maximum of 36 to 40 mph, consistent with the higher posted speed limits of 40 to 50 mph.

Overall average speeds along the entire length of the Project Corridor are between 26 to 27 mph.

Based on the HCM methodologies, arterial roadway segments of one to two miles in length that have average speeds less than 13 mph are considered to operate at LOS D, E, or F conditions. Given the calculated speeds, the Project Corridor in general is not considered congested under existing conditions. However, there may be specific locations (e.g., near signals) with localized congestion that is not identified through this review of travel speeds.

Key findings based on the travel speed data analysis are as follows:

- With average segment speeds along the Project Corridor equating to LOS A through LOS C operations, there are not larger sections of the Project Corridor experiencing significant congestion for existing conditions. However, intersection-level congestion, discussed later in this section, may begin to affect conditions as traffic volumes increase.

[2] INRIX collects information about roadway speeds and travel times from users of the roadway. from anonymous mobile phones, connected cars, trucks, delivery vans, and other fleet vehicles equipped with GPS device.

- Generally, the PM peak period experience lower speeds than the AM peak period.
- Speeds for the segments do not show significant directional peaking, where slower speed in one direction during the AM peak period would be reflected in the opposite direction during the PM peak period. This indicates that activity on the Project Corridor tends to be relatively consistent and does not experience high concentration of employment centers in one location.

Table 4-4. Existing Midweek Peak Period Travel Speeds

Roadway Section	Postmile	Northbound (mph)		Southbound (mph)	
		AM	PM	AM	PM
SR 1 to I-405	0.000-5.800	25.9	22.2	26.9	25.0
I-405 to SR 22	5.800-8.478	26.9	19.4	21.4	21.5
SR 22 to SR 91	8.478-14.378	24.7	21.6	24.3	23.7
SR 91 to I-5	14.378-15.070	19.8	17.7	21.0	16.2
I-5 to SR 90	15.070-19.168	26.3	19.1	24.1	22.6
SR 90 to SR 72	19.168-20.719	23.0	22.3	25.4	23.1
Total Length (SR 1 to SR 72)	0.000-20.719	25.3	20.9	24.8	23.4

Source: National Performance Management Research Data Set (NPMRDS)
Data collected from January to December 2018

4.3 SEASONALITY

Due to the length of the corridor and the variety of the land use from north to south, there is significant variability in activity levels throughout the year. **Table 4-5** shows the seasonality for midweek weekday operations. As shown, travel speeds are generally higher along the corridor during the summer season. Typically, traffic volumes are lower (with correspondingly higher speeds) over the summer due to summer vacations and school year calendars. As such, the data does not show weekday peak period congestion at the southern end of the Project Corridor due to beach/recreational traffic.

Table 4-5. Existing Midweek Peak Period Travel Speeds

Roadway Section	Postmile	Summer Season (June to August)				Non-Summer Season			
		NB (mph)		SB (mph)		NB (mph)		SB (mph)	
		AM	PM	AM	PM	AM	PM	AM	PM
SR 1 to I-405	0.000-5.800	27.1	22.6	28.2	25.4	25.5	22.1	26.4	24.9
I-405 to SR 22	5.800-8.478	28.8	20.9	23.7	22.4	26.4	18.9	20.8	21.2
SR 22 to SR 91	8.478-14.378	25.9	22.6	25.2	24.3	24.4	21.3	24.0	23.5
SR 91 to I-5	14.378-15.070	19.9	17.9	21.7	16.3	19.7	17.7	20.8	16.2
1-5 to SR 90	15.070-19.168	27.1	20.2	25.8	23.5	26.1	18.7	23.5	22.3
SR 90 to SR 72	19.168-20.719	23.3	23.5	25.2	24.1	22.9	21.9	25.4	22.7
Total Length (SR 1 to SR 72)	0.000-20.719	26.3	21.8	26.0	24.0	25.0	20.6	24.4	23.1

Source: National Performance Management Research Data Set (NPMRDS)
Data collected from January to December 2018

Table 4-6 shows the seasonality for weekend operations. As shown, travel speeds are generally higher along the corridor during the summer season. The data also does not show slower speeds at the southern end of the Project Corridor due to beach/recreational traffic.

Table 4-6. Existing Weekend Peak Period Travel Speeds

Roadway Section	Postmile	Summer Season (June to August)				Non-Summer Season			
		NB (mph)		SB (mph)		NB (mph)		SB (mph)	
		AM	PM	AM	PM	AM	PM	AM	PM
SR 1 to I-405	0.000-5.800	27.0	22.9	29.6	24.4	25.3	23.0	28.3	24.7
I-405 to SR 22	5.800-8.478	30.3	23.9	27.4	24.7	28.6	23.2	27.6	24.0
SR 22 to SR 91	8.478-14.378	28.9	25.7	26.6	25.2	27.0	24.4	26.7	23.8

Roadway Section	Postmile	Summer Season (June to August)				Non-Summer Season			
		NB (mph)		SB (mph)		NB (mph)		SB (mph)	
		AM	PM	AM	PM	AM	PM	AM	PM
SR 91 to I-5	14.378-15.070	20.8	19.3	21.7	17.4	18.9	17.4	19.9	15.3
1-5 to SR 90	15.070-19.168	30.7	27.4	30.5	25.4	28.6	25.3	28.2	22.9
SR 90 to SR 72	19.168-20.719	26.6	22.3	26.6	22.2	25.2	22.4	25.7	22.8
Total Length (SR 1 to SR 72)	0.000-20.719	28.4	24.3	28.5	24.7	26.6	23.5	27.6	23.7

Source: National Performance Management Research Data Set (NPMRDS)
Data collected from January to December 2018

4.4 PROJECTED TRAFFIC VOLUMES

Traffic volume for the Project Corridor were projected for the year 2040 using the latest version of OCTAM. These projections are used to identify vehicular traffic circulation deficiencies in the future.

4.4.1 Projected Traffic Volumes

Year 2040 projected AADT volumes are shown in Table 4-7. Annual growth rates were calculated from the 2012 and 2040 OCTAM version 4.0 model average daily traffic (ADT)[3] outputs. These were then applied to AADT sourced from Caltrans' Traffic Census Program (2017) to determine the projected 2040 volume along the corridor.

Overall, the majority of the roadway segments are projected to grow by 1 percent to 5 percent between 2017 and 2040. The highest growth along the Project Corridor is projected in the City of La Habra near SR 72 and SR 90. These two sections are projected to grow by 20 percent or more between 2017 and 2040, which is almost one percent per year.

Minimal growth is projected within the cities of Huntington Beach (north of Ellis Avenue), Westminster, Stanton, and portions of Buena Park; in these locations, the growth would be less than 4 percent, or less than 0.2 percent per year.

[3] OCTAM reports ADT volumes, whereas the Caltrans Census Program data reports AADT. The OCTAM ADT volumes were used to estimate growth rates only, which were then applied to the AADT dataset.

Table 4-7. Future Daily Traffic Volumes

City	Nearest Cross-Street	Postmile	Growth (%)	2017 AADT	2040 AADT
Huntington Beach	SR 1	0.000	3%	29,400	30,600
	Adams Avenue	1.630	12%	42,600	48,000
	Ellis Avenue	3.120	4%	65,100	67,500
	Talbert Avenue	3.611	3%	66,500	68,600
	Slater Avenue	4.131	3%	69,600	71,500
	Warner Avenue	4.631	1%	71,900	72,800
	I-405	5.800	4%	83,600	86,700
Westminster	Bolsa Avenue	6.630	1%	77,500	78,100
	Westminster Avenue	7.634	1%	74,500	75,100
	SR 22	8.478	1%	74,600	75,100
Stanton	Lampson	9.171	1%	77,600	78,200
	Chapman	9.671	1%	71,500	72,100
	Katella Avenue	10.660	1%	64,600	65,400
	Cerritos Avenue	11.181	3%	65,200	67,300
Anaheim	Ball Road	11.681	4%	62,500	64,900
	Lincoln Avenue	12.685	15%	66,700	76,300
Buena Park	SR 91	14.378	10%	57,800	63,400
	I-5	15.070	5%	57,800	60,600
	Auto Center Drive	15.150	3%	57,600	59,300
	Artesia Boulevard	15.573	4%	60,700	62,900
	Stage Road	16.130	2%	66,400	67,800
	La Mirada	16.380	10%	48,600	53,700
La Mirada	Rosecrans Avenue	17.340	10%	44,000	48,100
La Habra	SR 90	19.168	20%	48,800	58,300
	Lambert Road	19.671	13%	34,700	39,400
	SR 72	20.719	24%	39,700	49,400

Source: OCTA travel demand model (OCTAM) version 4.0
Volumes rounded to the nearest 100

4.5 TRIP PATTERNS

Trips by automobile (both drive alone and rideshare) make up the majority of travel within the Study Area. Automobile trip patterns were analyzed in greater detail to understand how the Project

Corridor is used for trips to, from, within, and through the Study Area and the length of trips on the Project Corridor. The findings from this analysis will then be used in conjunction with other analyses (presented in subsequent sections) to define multimodal improvements.

The analysis of auto travel market conditions uses GPS probe data from StreetLight Data (StreetLight) to understand trip origins, destinations, and routes. The analysis focuses on personal vehicle travel only and represents a sample of completed auto trips over one year (January 1 to December 31, 2018). Data was collected for the AM (6:00 AM to 9:00 AM) and PM (4:00 PM to 7:00 PM) peak periods.

The results of the origin/destination analysis and trip route analysis are discussed in the following sections.

4.5.1.1 Origin/Destination Analysis

The origin/destination analysis addresses where auto trips using the Project Corridor begin and end and how long these trips are on the corridor. This data uses the terms local trips, freeway connector trips, and trip length, defined as follows:

- **Local Trips:** Trips that both start and end in the Study Area. Local trips are within a 1.25 mile east-west range, centering around the Project Corridor.
- **Highway Connector Trips:** Regional through trips use portions of the Project Corridor to connect between the east-west highways along the corridor.
- **Trip Length:** The average length of trips along the Project Corridor.

LOCAL TRIPS

Local trips are defined as having both the origin and the destination of the trip within the Project Corridor. Two scenarios were then analyzed with two different origin and destination pairs:

- **From Beach Boulevard:** In this scenario, trips start from Beach Boulevard and end elsewhere in the Study Area (1.25 east-west zone).
- **To Beach Boulevard:** In this scenario, trips start in the Study Area and end on Beach Boulevard.

Table 4-8 below shows the percentage of local trips at various segments along the Project Corridor, as well an average for the entire length of the corridor.

Table 4-8. Local Trips (Weekday)

Roadway Segment	Postmile	From Beach Boulevard		To Beach Boulevard	
		AM	PM	AM	PM
SR 1 to I-405	0.000-5.800	50%	68%	66%	62%
I-405 to SR 22	5.800-8.478	51%	64%	59%	57%
SR 22 to SR 91	8.478-14.378	47%	61%	60%	54%
SR 91 to I-5	14.378-15.070	44%	59%	52%	52%
I-5 to SR 90	15.070-19.168	40%	56%	50%	53%
SR 90 to SR 72	19.168-20.719	44%	54%	41%	51%
Project Corridor Average		46%	60%	55%	55%

Source: StreetLight Data January to December 2018

As shown in the tables above, more than half of the trips within the Study Area have an origin or destination along Beach Boulevard. There is a higher percentage of local trips from Beach Boulevard during the weekday PM peak period than during the AM peak period. Conversely, there is a similar percentage of local trips to Beach Boulevard during both peak hours.

HIGHWAY CONNECTOR TRIPS

The Project Corridor provides access to multiple freeways and highways. The following analysis was conducted to determine how much of the vehicular traffic on the Project Corridor are trips that are using the Project Corridor to connect between these regional facilities. In order to determine these percentages, origin and destination pairs were set from each highway to the others.

Table 4-9 and **Table 4-10** below show the percent of total trips between the highway origin and destination (O/D) pairs. Each O/D pair shows the percentage of the total trips on the Project Corridor that travels between the two locations. For example, the 3.8 percent AM peak period trips for the SR 1 and I-405 origin-destination pair includes both trips from SR 1 to I-405 and from I-405 to SR 1.

Table 4-9. Highway to Highway Trips (AM Peak Period)

OD	SR 1	I-405	SR 22	SR 91	I-5	SR 90	SR 72
SR 1	-	3.8%	1.1%	0.3%	0.2%	0.1%	0.1%
I-405		-	6.2%	2.9%	2.0%	0.2%	0.3%
SR 22			-	5.1%	2.8%	0.3%	0.3%
SR 91				-	8.6%	3.4%	3.2%
I-5					-	2.1%	3.0%
SR 90						-	14.0%
SR 72							-

Source: StreetLight Data January to December 2018

Table 4-10. Highway to Highway Trips (PM Peak Period)

OD	SR 1	I-405	SR 22	SR 91	I-5	SR 90	SR 72
SR 1	-	2.5%	0.8%	0.2%	0.1%	0.1%	0.1%
I-405		-	5.1%	2.3%	1.6%	0.1%	0.2%
SR 22			-	4.0%	2.3%	0.3%	0.2%
SR 91				-	6.8%	2.7%	2.4%
I-5					-	1.6%	2.2%
SR 90						-	9.6%
SR 72							-

Source: StreetLight Data January to December 2018

As shown in the tables above, the highest highway-to-highway connection occurs on the northern end of the corridor between SR 90 and SR 72, where 10 to 14 percent of the trips are connecting between these two facilities. In addition, the closely spaced freeways of I-5 and SR 91 experience a high percentage of trips on the Project Corridor which indicates that this segment of the Project Corridor may be used as a cut-through or to bypass congestion at the I-5/SR 91 interchange. A higher percentage of highway-to-highway activity (14 percent) uses the Project Corridor in the AM peak period compared to the PM peak period (10 percent), suggesting a higher level of congestion on the freeways during this

period. The data also shows that only 0.1 percent of trips travel the entire length of the corridor from SR 1 to SR 72.

PROJECT CORRIDOR TRIP LENGTH

Given the overall length of the Project Corridor (approximately 21 miles long), a trip length analysis was conducted to determine if the corridor is used for the longer extents or for short connector trips. The data was reviewed for the weekday AM and PM peak periods for each direction (northbound and southbound).

In the northbound direction, 0.8 percent of trips travel the entire length of the Project Corridor in the weekday AM peak period, and 0.2 percent travel the entire length of the Project Corridor in the weekday PM peak period. In the southbound direction, 0.3 percent of the trips travel the entire length of the corridor in the weekday AM peak period and 0.1 percent in the weekday PM peak period.

In addition, an evaluation of trip lengths was conducted to determine the percentage of trips that utilized 5, 10, or 15 miles of the Project Corridor. The Project Corridor was segmented to better identify the location of these trip lengths; the locations were selected because of their relation to the distances being evaluated.

Table 4-11 and **Table 4-12** show the results of this evaluation for the AM and PM peak periods, respectively.

Table 4-11. Trip Length Review (Weekday AM Peak Period)

Trip Start Location	Postmile	5 mile Trip Length	10 mile Trip Length	15 mile Trip Length
Northbound				
SR 1	0.000	43.2%	15.3%	7.5%
Ellis Avenue	3.120	35.9%	10.1%	1.9%
I-405	5.800	30.4%	6.4%	1.1%
SR 22	8.478	26.3%	4.6%	NA
Katella Avenue	10.660	20.5%	4.7%	NA
Lincoln Avenue	12.685	17.6%	NA	NA
I-5	15.070	29.7%	NA	NA
Southbound				
SR 72	20.719	26.3%	6.6%	2.5%
SR 90	19.168	26.8%	7.5%	1.5%

Trip Start Location	Postmile	5 mile Trip Length	10 mile Trip Length	15 mile Trip Length
I-5	15.070	42.4%	10.1%	2.5%
Lincoln Avenue	12.685	33.2%	5.6%	NA
Katella Avenue	10.660	35.8%	3.7%	NA
SR 22	8.478	24.3%	NA	NA
I-405	5.800	13.7%	NA	NA

Source: StreetLight Data January to December 2018
NA = remaining distance along corridor for this location is less than the distance under review

Table 4-12. Trip Length Review (PM Peak Period)

Trip Start Location	Postmile	5 mile Trip Length	10 mile Trip Length	15 mile Trip Length
Northbound				
SR 1	0.000	17.1%	4.5%	1.4%
Ellis Avenue	3.120	25.5%	7.6%	0.7%
I-405	5.800	16.9%	3.5%	0.7%
SR 22	8.478	18.9%	2.1%	NA
Katella Avenue	10.660	14.5%	2.0%	NA
Lincoln Avenue	12.685	9.4%	NA	NA
I-5	15.070	20.3%	NA	NA
Southbound				
SR 72	20.719	23.7%	4.0%	1.1%
SR 90	19.168	19.7%	4.4%	1.1%
I-5	15.070	26.0%	5.1%	0.4%
Lincoln Avenue	12.685	25.4%	4.4%	NA
Katella Avenue	10.660	25.4%	2.7%	NA
SR 22	8.478	19.0%	NA	NA
I-405	5.800	11.3%	NA	NA

Source: StreetLight Data January to December 2018
NA = remaining distance along corridor for this location is less than the distance under review

During the weekday AM peak hour, generally about 10 to 25 percent of the trips travel a distance of 5 to 10 miles along Beach Boulevard, about 5 to 10 percent traveling a distance of 10 to 15 miles, and less than 5 percent travel more than 15 miles. The longest trips tend to occur at the southern end of the Project Corridor in the northbound direction. In the southbound direction, the longest trips tend to occur at the northern end of the Project Corridor and in the vicinity of I-5.

During the weekday PM peak hour, generally about 20 to 40 percent of the trips travel a distance of 5 to 10 miles along Beach Boulevard, about 5 to 15 percent traveling a distance of 10 to 15 miles, and less than 2 percent travel more than 15 miles. The longest trips tend to occur at the southern end of the Project Corridor in the northbound direction. In the southbound direction, the longest trips tend to occur at the northern end of the Project Corridor and in the area between I-5 and SR 22.

Overall, there are generally shorter distances traveled along the Project Corridor during the weekday PM peak hour than during the AM peak hour.

4.6 ON-STREET PARKING

On-street parking is provided along several portions of the Project Corridor and affects vehicular traffic operations for existing conditions and potential improvements. A field review was conducted to identify locations with on-street parking. The summary of the field review is as follows:

- On-street parking generally present from SR 1 to Ellis Avenue (Huntington Beach)
- On-street parking generally present from Hillsborough Drive and SR 72 (La Mirada/La Habra)

This data will be used to inform the development of concepts by 1) identifying where parking interactions with vehicular (and potentially bicycle) traffic occur; and 2) identifying areas where on-street parking supports adjacent land uses.

4.7 ON-STREET LOADING

Loading zones are not specifically provided along the Study Corridor, with the exception of within the City of La Habra. In the section of Beach Boulevard between Hillsborough Drive and SR 72, truck parking is prohibited, but loading and unloading is permitted. In addition, commercial in-street loading activities were observed at the auto dealerships located in the City of Huntington Beach between Yorktown Avenue to Talbert Avenue. On-street passenger loading activities were also observed in the City of Buena Park in the

Buena Park Entertainment Zone (vehicles were observed to drop-off or pick-up passengers along the curb, although no stopping is permitted).

4.8 HEAVY VEHICLES AND GOODS MOVEMENT

Caltrans maintains the official government source for State highways truck route information and identifies the Project Corridor is identified as a Truck Route by Caltrans.

Given its configuration and location in the county, the Corridor has demands for heavy vehicles (vehicles with three axles or more) and provides access to local land uses and freeway facilities.

The Caltrans Census Program (2016 dataset) was used for truck data for the Project Corridor. **Table 4-13** summarizes the truck (two or more axels – excluding pickups and vans with only four tires) percentages in each direction along the Project Corridor. Overall, the amount of truck activity is in the northern end of the Project Corridor in the City of La Habra, with over 4.5 percent of the vehicles classified as trucks. At other locations along the corridor, the truck percentage varies between 1 and 3 percent.

In comparison, the other State Routes in the Study Area have heavy vehicle percentages between 1.1 and 6.5 percent (SR 1 is approximately 1.1 percent, SR 90 is approximately 6.5 percent, and SR 72 is approximately 2.5 percent).

Table 4-13. Heavy Vehicle Percentages along the Project Corridor

City	Nearest Cross-Street	Postmile	Truck %[1]
Huntington Beach	SR 1	0.000	2.16
	Ellis Avenue	3.120	1.08
	I-405	5.800	1.71
Westminster	SR 22	8.478	2.52
Anaheim	Lincoln Avenue	12.685	2.98
Buena Park	SR 91	14.378	2.02
La Habra	SR 90	19.168	4.62

Source: Caltrans Census Data, 2016 (Latest data available)

4.9 KEY FINDINGS

Based on the analysis of vehicular traffic circulation, the following key findings relate to the vehicular roadway network, traffic volumes, traffic speeds, intersection operations, trip patterns, and goods movement.

Existing Traffic Volumes. Existing daily traffic volumes for the Project Corridor range from a low of 29,400 near SR 1 to a high of nearly 83,600 near I-405. Traffic volumes generally are highest in the middle of the corridor and are lower in the northern and southern portions.

Existing Intersection Operations. Of the intersections along the Project Corridor with performance data available, most operate at LOS D or better during peak hours. Per the Caltrans Guide for the Preparation of Traffic Impact Studies (2002), LOS D is considered to be acceptable operating conditions (however, this target can vary depending on input from the local jurisdiction and historic operating conditions).

Existing Traffic Speeds. Posted speed limits along the Project Corridor vary between 35 mph and 55 mph. Peak period travel speeds along the Project Corridor do not show any significant sections operating at speeds classified as LOS D or worse. A seasonality review shows that travel speeds are generally higher during the summer season for weekday and weekend peak periods.

Traffic Volume Forecasts. Forecasted traffic volumes for the Project Corridor show a median growth of about 4 percent and an average growth of about 6 percent. The highest growth is projected in the City of La Habra (24 percent near SR 72).

Trip Patterns. Generally, half of the trips along the Project Corridor originate or terminate in the Study Area. Between 0.1 and 14 percent of trips along the Project Corridor are attributed to highway to highway connections with the highest percentages observed at closely spaced highway facilities. Less than 1 percent of trips travel the entire length of the Project Corridor. As high as 43 percent of trips travel 5 miles along the Project Corridor for certain segments and as high as 7 percent of trips travel 15 miles along the Project Corridor for certain segments.

On-Street Parking and Loading. On-street parking is provided along the Project Corridor in the southern and northern portions for a total of approximately 5.5 miles or 25 percent of the length of the Project Corridor. Loading zones are only provided on the northern end of the Project Corridor in the area where on-street is located. However, on-street loading has been noted along the Huntington Beach auto dealership and in the Buena Park Entertainment Zone.

Goods Movement. Heavy vehicle percentages of 1 to 5 percent are found along the Project Corridor with the highest reported in the City of La Habra.

Section 5
TRANSIT CIRCULATION

This section provides a summary of the transit providers and associated transit services along the Project Corridor. Transit services provide mobility options for those who choose not to drive or are unable to do so due to physical or other limitations. Transit also provides an alternative to vehicular capacity improvements for accommodating travel demand.

Topics covered in this section are:

- Existing transit network and ridership (includes bus stop amenities)
- Multimodal transportation hubs
- Regional transit improvements
- Relevant plans and projects

5.1 EXISTING TRANSIT NETWORK

The existing OCTA transit routes in the Study Area are shown in **Figure 5-1**. The Orange County Transportation Authority operates over 60 different routes throughout Orange County. In the Study Area, OCTA operates the following types of services:

- Regular bus service (local fixed routes and community routes)
- Bus Rapid Transit (BRAVO! routes)

In addition, Anaheim Resort Transportation network (ART) operates the Buena Park Line (Route 18) with one-hour headways from 9:00 AM to 9:00 PM connecting the Anaheim Resort Area and the Buena Park Entertainment Zone.

The Surf City Shuttle also operates between May and September in the City of Huntington Beach on weekends and holidays between 10:00 AM and 10:00 PM. Two routes (City Loop and Coastal Loop) operate along the Project Corridor between SR 1 and Center Avenue.

The La Habra Express Route 103B operates on weekdays in the City of La Habra between 6:10 AM and 6:26 PM with headways of 65-75 minutes.

In addition, OC Vanpool and ACCESS provide special request-based transportation throughout Orange County.

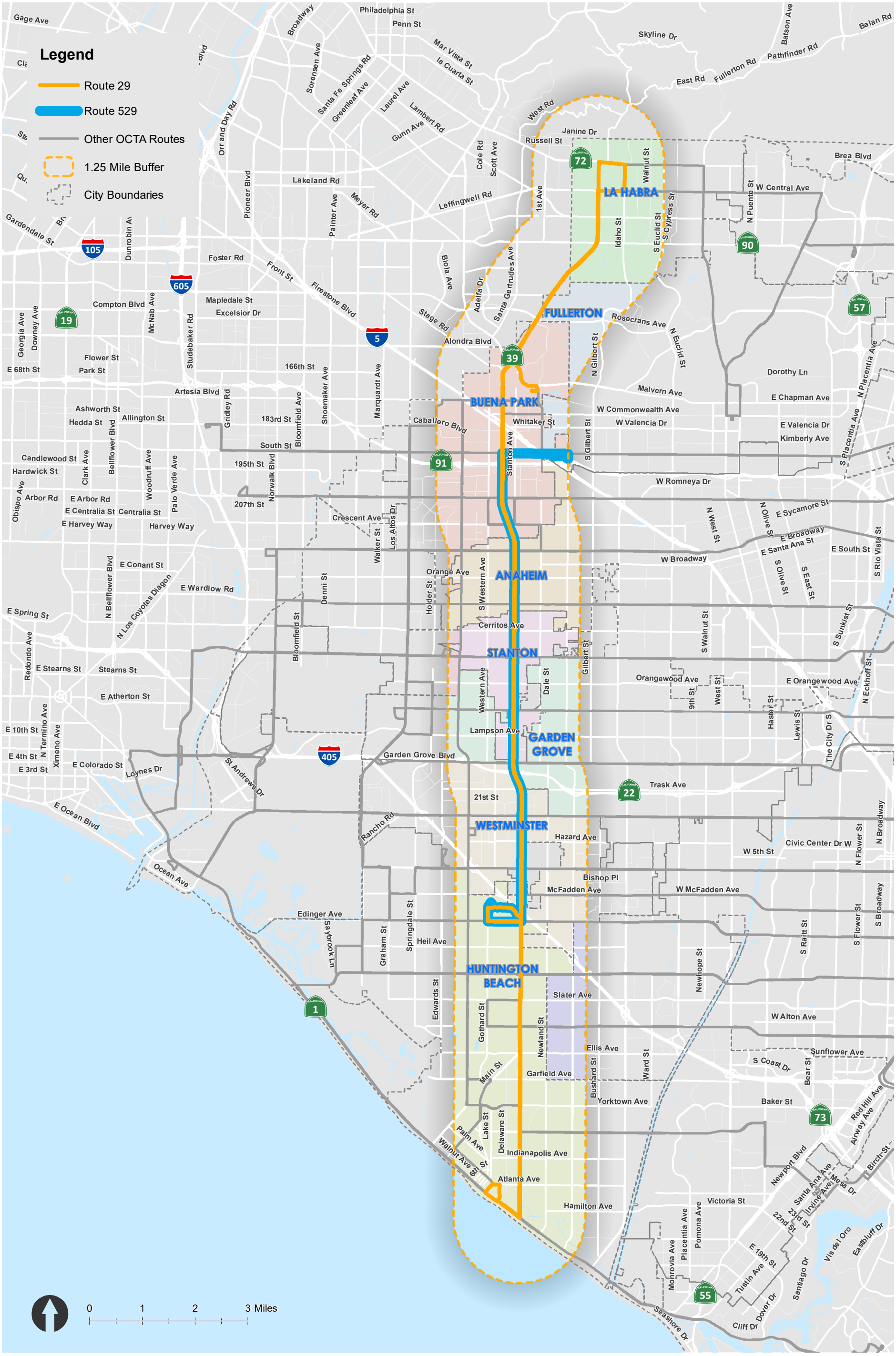
Table 5-1 summarizes the OCTA bus routes and hours of operation as well as headways in the Study Area. OCTA Route 29 runs the entire extent of the Project Corridor from SR 1 to the south to SR 72 to the north with headways of 15 minutes during peak periods and 20 minutes during off-peak periods, while the BRAVO! Route 529 runs between Edinger Avenue and Orangethorpe Avenue with

headways of 12 minutes during peak periods and 18 minutes during off-peak periods.

Table 5-1. Study Area OCTA Bus Routes

Bus Route	Weekday Hours of Operation (weekdays)	Headways (minutes) (peak/ off-peak)	Weekend Service?	Weekday Daily Ridership (October 2018)
1	5:30A - 10:15P	75/70	Yes	1,702
21	6:15A - 8:15P	60/NA	No	265
25	4:45A - 10:45P	55/55	Yes	1,325
29	4:00A - 1:00A	15/20	Yes	5,888
30	4:30A - 10:30P	30/30	Yes	2,259
38	4:15A - 12:00A	15/20	Yes	3,820
42	4:45A - 11:45P	18/18	Yes	5,119
46	4:30A - 11:45P	30/30	Yes	2,324
50	4:15A - 1:00A	15/30	Yes	3,901
54	5:15A - 11:30P	15/20	Yes	4,272
56	4:45A- 9:45P	30/40	Yes	1,460
60	4:15A - 1:15A	20/20	Yes	9,612
64	4:30A - 11:30P	15/15	Yes	6,855
66	4:15A 11:45P	15/18	Yes	6,578
70	4:30A - 11:30P	15/20	Yes	3,343
72	5:15A - 9:00P	30/30	Yes	1,744
76	6:00A - 7:00P	60/60	No	349
129	5:30A - 9:15P	45/70	Yes	597
143	4:30A - 11:00P	75/75	Yes	611
178	5:30A - 9:45P	75/75	No	389
529	6:00A - 6:45P	12/18	No	NA
560	6:15A - 6:45P	12/16	No	3,324

Source: OCTA Bus Routes and Schedules (www.octa.net)



Transit Routes in Study Area
Beach Blvd Corridor Study

Figure
5-1

Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet
Data Source: Delete if there isn't one.

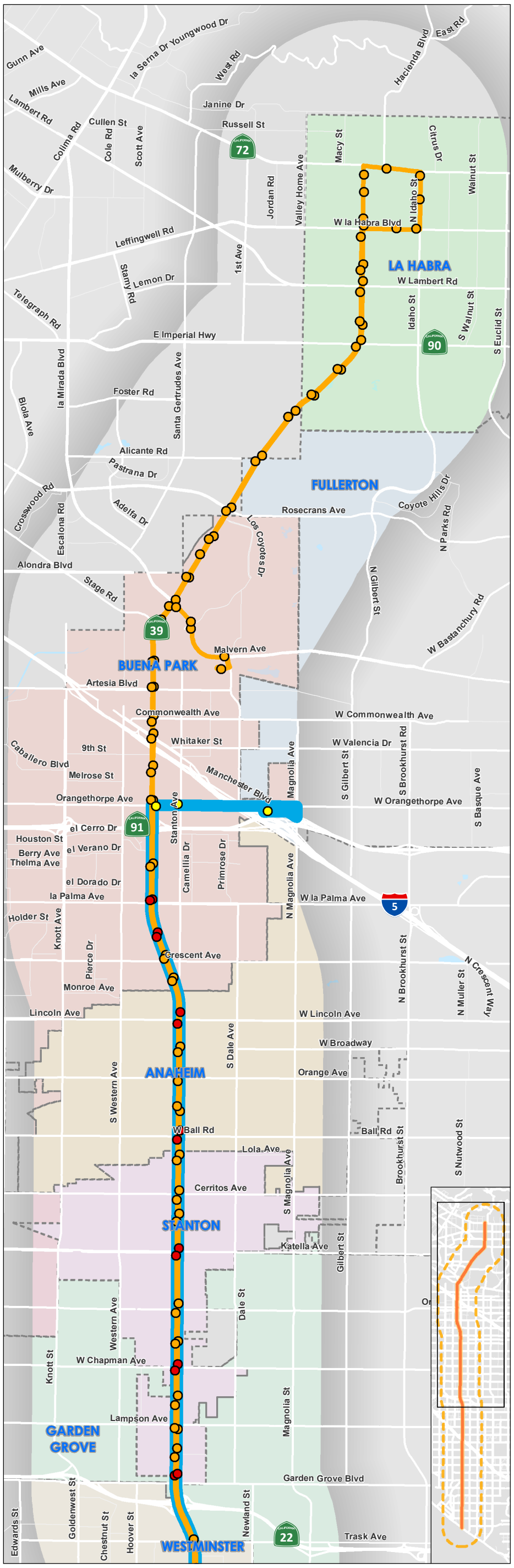
5.1.1 Project Corridor Bus Stop Location and Ridership

OCTA bus stops are generally located approximately 0.25 miles apart. **Figure 5-2** shows the locations of bus stops for Routes 29, 29A, and 529 which operate along the Project Corridor. **Table 5-2** summarizes the average weekday daily boardings from October 2018 for key stops along Route 29. For this evaluation, key Route 29 stops are those that are shared with Route 529 as well as stops at Buena Park Metrolink Station, Goldenwest Transportation Center, and Downtown Huntington Beach (SR 1/First Street).

Table 5-2. Average Ridership at Stops on Project Corridor

Bus Stop (Location) (Direction)	Average Weekday Daily Boardings
#3002 (SR 1-First) (North)	117
#2561 (First-Orange) (South)	1
#2716 (Center-Gothard) (North)	38
#2720 (Center-Huntington Village) (South)	7
#7323 (Beach-McFadden) (North)	133
#7340 (Beach-McFadden) (South)	36
#7338 (Beach-Bolsa) (South)	109
#7325 (Beach-Bolsa) (North)	187
#7334 (Beach-Westminster) (South)	200
#7329 (Beach-Westminster) (North)	244
#7093 (Beach-Garden Grove) (North)	127
#2177 (Beach-Garden Grove) (South)	100
#7112 (Beach-Chapman) (South)	159
#7097 (Beach-Chapman) (North)	162
#7108 (Beach-Katella) (South)	177
#7101 (Beach-Katella) (North)	139
#116 (Beach-Ball) (South)	130
#106 (Beach-Ball) (North)	99
#111 (Beach-Lincoln) (South)	215
#110 (Beach-Lincoln) (North)	113
#784 (Beach-Crescent) (South)	17
#753 (Beach-Crescent) (North)	7
#783 (Beach-La Palma) (South)	151
#754 (Beach-La Palma) (North)	69
#8254 (Buena Park Metrolink Station Zone 1) (South)	34
#8291 (Malvern-Burlingame) (South)	2

Source: OCTA Transit Operations



Legend

- Route 529 Stops
- Routes 529/29/29A Stops
- Routes 29/29A Stops
- Route 29A-Only Stops
- Route 29
- Route 529
- 1.25 Mile Buffer
- City Boundaries

OCTA

Bus Stops Along Project Corridor
Beach Blvd Corridor Study

Figure
5-2

Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet
Data Source: Delete if there isn't one.

5.1.2 Bus Stop Amenities

Amenities for transit users are an important component in making transit a convenient and attractive travel option. Facilities such as shelters, benches, lighting, and trash containers increase the safety and comfort for passengers. Implementation of more advanced improvements, such as real-time bus arrival signage, could improve the customer experience. Concrete bus pads provide a durable pavement surface at high-volume bus stops and prevent problems related to asphalt distortion.

The key OCTA bus stops on the Project Corridor were evaluated to identify facilities that are currently provided, and potential opportunities for improvement. Key locations are defined as locations along the Bravo! 529 Route as well as the Route 29/A stops at Buena Park Metrolink Station, Goldenwest Transportation Center, and Downtown Huntington Beach (SR 1/First Street), which are important transfer locations.

Table 5-3 lists these key bus stop locations and the facilities available at each. While OCTA has published Bus Safety and Design Guidelines (2004) to provide local jurisdictions with a set of suggested design criteria for bus stop design and placement, potential opportunities exist at many of these key stops, in particular for shelters and real-time signage. Additionally, most of these key stops do not have a bus pullout, meaning that the buses must stop within the vehicular travel lane.

Table 5-3. Facilities at Key Bus Stops

Stop	Jurisdiction	Shelter	Bench	Trash Can	Bus Pad	Bus Pullout
3002	Huntington Beach	✓	✓	✓	✓	✓
2561	Huntington Beach	✗	✓	✓	✗	✗
2716	Huntington Beach	✗	✗	✗	✗	✗
2720	Huntington Beach	✓	✓	✓	✗	✗
7323	Westminster	✓	✓	✓	✓	✗
7340	County	✗	✓	✓	✗	✗
7338	Westminster	✓	✓	✓	✓	✗
7325	Westminster	✓	✓	✓	✓	✗
7334	Westminster	✓	✓	✓	✓	✗
7329	Westminster	✓	✓	✓	✓	✗
7093	Stanton	✓	✓	✓	✓	✗

Stop	Jurisdiction	Shelter	Bench	Trash Can	Bus Pad	Bus Pullout
2177	Stanton	✗	✗	✗	✓	✗
7112	Stanton	✓	✓	✓	✓	✗
7097	Stanton	✓	✓	✓	✓	✗
7108	Stanton	✓	✓	✓	✓	✗
7101	Stanton	✗	✓	✓	✓	✗
116	Anaheim	✗	✓	✓	✓	✗
106	Anaheim	✗	✗	✓	✓	✗
111	Anaheim	✗	✗	✓	✓	✗
110	Anaheim	✗	✓	✓	✓	✗
784	Buena Park	✗	✓	✓	✗	✓
753	Buena Park	✓	✓	✓	✗	✓
783	Buena Park	✗	✓	✓	✓	✗
754	Buena Park	✗	✓	✓	✓	✗
8254	Buena Park	✓	✓	✓	✓	✓
8291	Buena Park	✗	✗	✗	✗	✗

Source: OCTA Transit

5.1.3 Other Transit Services

In addition to the primary OCTA bus services provided in the Study Area, connections to Metrolink and Amtrak services are also provided at the Buena Park Metrolink Station. Both Amtrak and Metrolink serve Orange County along the LOSSAN Corridor. Amtrak's Pacific Surfliner connects the Southern California coast between San Luis Obispo and San Diego. Metrolink's commuter rail serves the Los Angeles metropolitan area, connecting Los Angeles, Orange, Riverside, and Ventura counties. The Orange Line runs along the LOSSAN Corridor, 91 Line provide service to Riverside, and the Inland Empire-Orange County Line provide service to San Bernardino and Riverside, which is to the east of Orange County. Metrolink trains have stops at the Buena Park Metrolink Station from 4:49 AM to 7:17 PM on weekdays, with more frequent services during commuter peak hours (westbound in the morning and eastbound in the evening).

5.2 MULTIMODAL TRANSPORATION HUBS

Transit service in the Study Area is organized around numerous transportation hubs that allow for transfers between transit services

and other transportation modes. Currently, transportation hubs are located in the Study Area at the following four locations:

- SR 1/First Street (Huntington Beach)
  - Transfers from Route 29 to Routes 1 and 25
- Goldenwest Transportation Center/Park-and-Ride
  - Transfers from Routes 29 and 529 to Routes 29, 66, 70, 211, and 701
  - OC Flex on-demand shuttle service.
- Buena Park Metrolink Station
  - Transfers from Route 29 to Routes 21, 24, and 25
  - Transfers to/from Metrolink Orange County Line and 91/Perris Valley Line
- Fullerton Park-and-Ride
  - Transfers from Route 529 to Routes 25, 26, 30, 33, 35, and 721
  - Transfers to/from LA Metro Route 460.

5.3 RELEVANT PLANS AND PROJECTS

Transit conditions for the Project Corridor are also addressed through the following completed and ongoing OCTA and Metrolink plans and studies. In some cases, the data and analysis from these documents were used as part of the analysis presented in this section.

- SCAG 2016-2040 Regional Transportation Plan/ Sustainable Communities Strategy (2016 RTP/SCS)
  - Vision to provide more compact communities that are connected seamlessly by numerous public transit options (including expanded bus and rail service) which would reduce drive-alone trips thereby improving air quality and reducing greenhouse gas emissions
- OCTA 2018 Long-Range Transportation Plan (LRTP) (2018)
  - Goal to provide high-quality transit between Fullerton Park-and-Ride and Downtown Huntington Beach
- OCTA Beach Boulevard Signal Priority Implementation Plan (2018)
  - Primary recommendations include queue jump lanes, detailed intersection operations analyses, TSP Architecture plan, and upgrade recommendations for on-board, roadside, and central systems
- OCTA OC Transit Vision (2018)
  - Identified the Project Corridor as one of ten transit opportunity corridors in Orange County
  - Goal to provide high-quality transit on existing Bravo! routes
- OCTA State of OC Transit (2017)
  - Provided the basis for the OC Transit Vision document

- Metrolink 10-Year Strategic Plan 2015-2025 (2015)
- Metrolink Short-Range Transit Plan 2015-2020 (2015)
- City of Buena Park: Beach Boulevard Multi-Modal Mobility Action Plan
    - Provides recommendations on potential additional transit stops or relocating stops
- City of Anaheim: Beach Boulevard Specific Plan
    - Outlines a goal to provide improvements to support future transit services
- City of Stanton: Livable Beach Boulevard Mobility Plan
    - Focused on 3 miles of Beach Boulevard to encourage transit-oriented development, upgrade bus stops, integrate more transit opportunities including BRAVO! service, and improve streetscape.

5.4 KEY FINDINGS

Based on the data and analysis presented in this section, the key findings for transit along the corridor are as follows:

- **Transit Coverage.** OCTA is the primary provider in terms of geographic coverage and hours of operation. As project improvements are developed for the Study Area, enhanced coordination among transit providers will allow for seamless connections between services.
- **OCTA Bus Service and Ridership.** Bus service frequencies vary widely for bus service in the study area. Route 29 has headways of 15 minutes during peak periods and 20 minutes during off-peak periods, while BRAVO! Route 529 has headways of 12 minutes during peak periods and 18 minutes during off-peak periods. For other regular bus service in the study area, peak period headways range from 15 minutes to 75 minutes. Ridership at key route 29 stops is generally above 100 average daily boardings per stop. Transit rider amenities at key Route 29 stops generally include benches and trash cans, but bus shelters are not consistently provided. In addition, most stops do not have bus pullouts.
- **Multimodal Transportation Hubs.** Transportation hubs in the study area consist of the Buena Park Metrolink Station, Goldenwest Transportation Center/Park-and-Ride, SR 1/First Street, and Fullerton Park-and-Ride. These hubs provide connectivity between OCTA bus service, LA Metro bus service, Metrolink rail service, OC Flex on-demand shuttle service, and park-and-ride users. There may be opportunities for increase multimodal amenities at these locations such as secure bicycle storage to further encourage their usage.

Section 6
BICYCLE AND PEDESTRIAN CIRCULATION

Biking and walking provide mobility options for shorter-distance trips within the Project Corridor and for groups such as youth and seniors who are not able to drive. In addition, bicyclist and pedestrian networks are an important part of providing safe access to transit services.

This section provides a summary of bicycle and pedestrian infrastructure and circulation along the Project Corridor.

Topics covered in this section are:

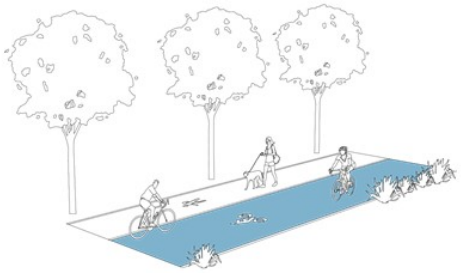
- Existing bicycle facilities
- Exiting pedestrian facilities (including sidewalks and intersection/roadway crossings)
- Bicyclist and pedestrian volumes
- Relevant plans and projects

6.1 EXISTING BICYCLE FACILITIES

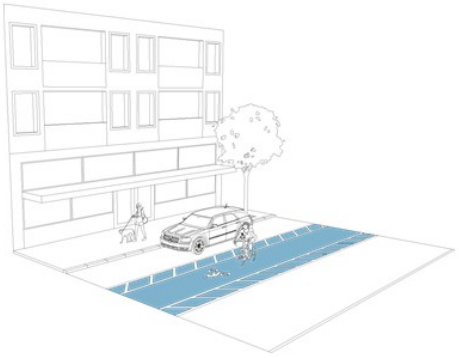
There are four classes of bicycle facilities, defined as follows and shown in Exhibit 6-1:

- Class I – Provides a completely separated facility designed for the exclusive use of bicyclists and pedestrians with crossing points minimized.
- Class II – Provides a restricted right-of-way designated lane for the exclusive or semi-exclusive use of bicycles with through travel by motor vehicles or pedestrians prohibited, but with vehicle parking and cross-flows by pedestrians and motorists permitted.
- Class III – Provides a bicycle route designated by signs or permanent markings and shared with motorists.
- Class IV – Provides a bikeway for the exclusive use of bicycles and includes a separation required between the separated bikeway and the through vehicular traffic. The separation may include, but is not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking. Facilities in this class are referred to as cycle tracks or protected bike lanes.

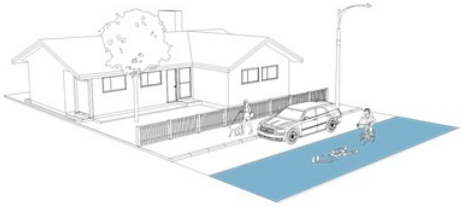
Class I
Bicycle Path



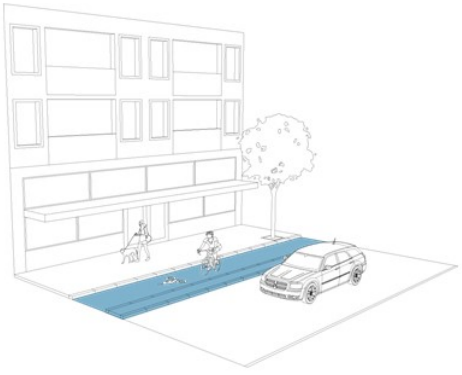
Class II
Bicycle Lane



Class III
Bicycle Route



Class IV
Separated On-Street Facility



Source: Complete Streets Initiative Design Handbook, OCCOG

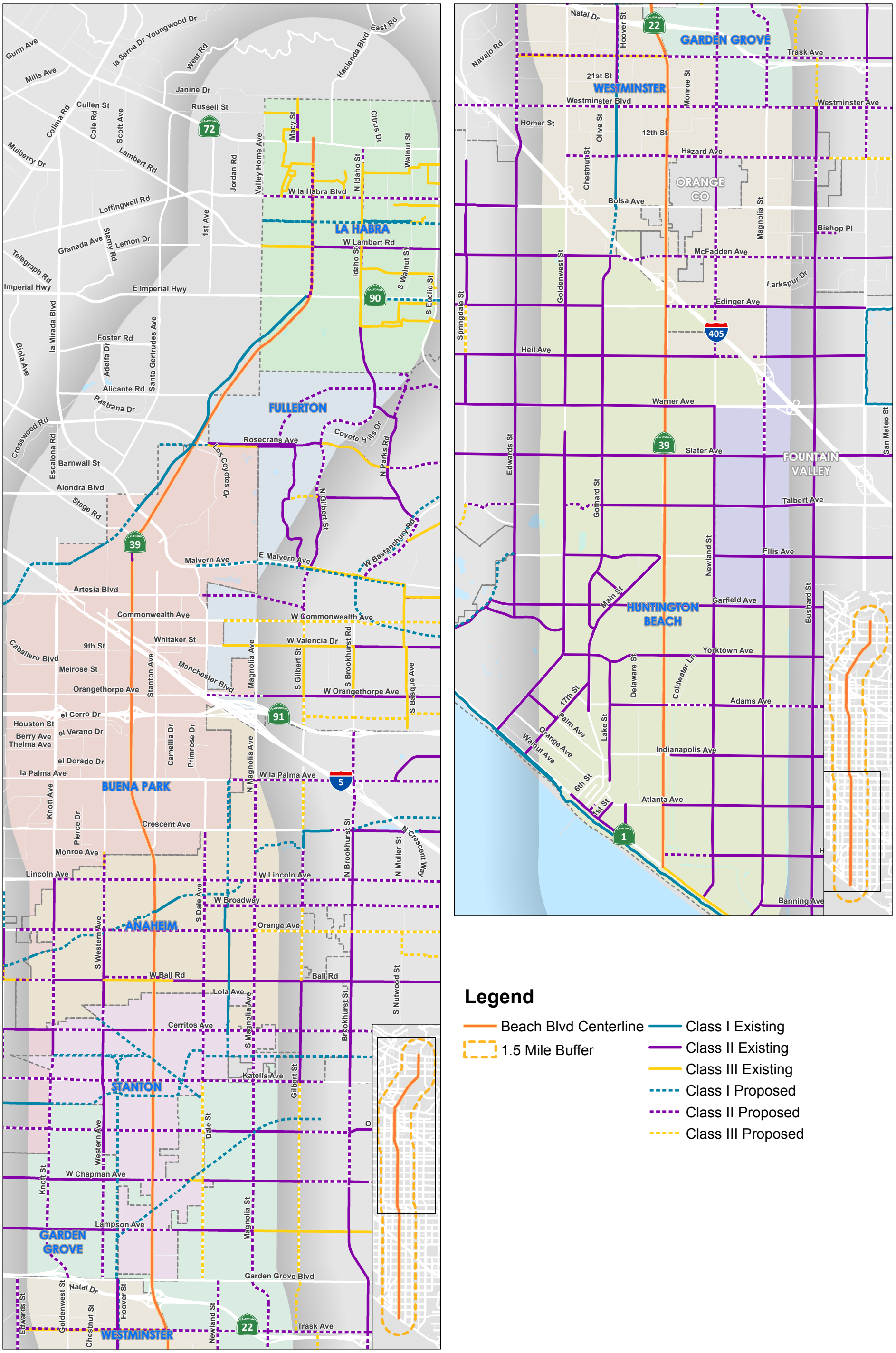
Exhibit 6-1 Bicycle Facility Classification

Existing bicycle facilitates in the Study Area are shown in **Figure 6-1**. As shown, few bicycle facilities are provided or planned along the Project Corridor. However, several portions of the Study Area have bike facilities, including a portion of the OC Loop in La Habra and Buena Park, as well as several Class II facilities in Huntington Beach.

Few bicycle facilities are provided along the Project Corridor.

Existing bicycle routes are most well established in Huntington Beach. Other cities such as La Habra have a number of existing bike paths, though they serve a largely local circulation function.

Along the Project Corridor, seven bicycle routes cross Beach Boulevard, with six of those located in Huntington Beach. Similarly, parallel bicycle routes are concentrated mainly in Huntington Beach. However, planned bike facility upgrades, as shown in **Figure 6-1,** will work to connect paths throughout the study area, including planned facilities in Stanton, Orange and Westminster that will provide more continuous viable alternative North/South paths, such as those along Western Avenue and Knott Street.



Legend

- Beach Blvd Centerline
- 1.5 Mile Buffer
- Class I Existing
- Class II Existing
- Class III Existing
- Class I Proposed
- Class II Proposed
- Class III Proposed

OCTA

Existing and Proposed Bicycle Facilities by Class
Beach Boulevard Corridor Study

Figure
6-1

Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet
Data Source: Delete if there isn't one.

6.2 EXISTING PEDESTRIAN FACILITIES

The presence of sidewalks is a basic element of pedestrian mobility. Sidewalks are provided along the Project Corridor with the exception of the following locations and side (east or west) of the roadway:

- 21306-21190 Beach Boulevard (E), Huntington Beach
- Driftwood Drive to Indianapolis Avenue (E), Huntington Beach
- Taylor Drive to Sterling Drive (E), Huntington Beach
- Darwin Avenue to Harhay Avenue (W), Unincorporated Orange County
- N Stanton Ave to Anaheim City Limits (E), Anaheim
- Knotts Pedestrian Tunnel to Grand Avenue (W), Buena Park
- Cameron Drive to Durango Drive (E), Buena Park
- Westridge Plaza S to SR 90 (W), La Habra

Generally, sidewalks widths along the Project Corridor are greater than 3 feet (which is the minimum recommended sidewalk width). **Table 6-1** shows any special pedestrian facilities each jurisdiction. It should be noted that at some intersections, pedestrian buttons are located in the middle of the crossing at the median. This has not been highlighted as a pedestrian amenity as it is recommended to provide adequate time to cross the entire length or provide a 6 foot refuge island[4].

Table 6-1. Existing Pedestrian Facilities

City	Limits (Streets)	Limits (Postmiles)	Special Pedestrian Facilities
Huntington Beach	SR 1to I-405	0 - 5.8	Wider sidewalks, Garfield Avenue to Adams Avenue; pedestrian island at SR 1
Westminster	Edinger Avenue/ Heil Avenue to SR 22	5.12 - 8.54	Wider bus stop; continental crosswalk at Bolsa/McFadden
Garden Grove	Trask Avenue to Garden Grove Boulevard	8.54 - 8.72	NA

While the majority of the Project Corridor has sidewalks, curb cuts and ramps in place, there are sidewalk gaps in some locations and obstructions

[4] Caltrans Highway Design Manual 405.4 (3).

City	Limits (Streets)	Limits (Postmiles)	Special Pedestrian Facilities
Stanton	Garden Grove Blvd to Strarr Street	8.66 - 11.52	Continental[1] crosswalk at Orangewood Road
Anaheim	Starr Street to Stanton Avenue	11.52 - 12.95	Continental[1] crosswalk at Ball Road
Buena Park	Stanton Avenue to Rosecrans Avenue	12.95 - 17.25	Pedestrian island N of I-5; bulb out at 9th Street
Fullerton	Rosecrans Avenue to Hawks Pointe Drive	17.50 - 17.85	NA
La Mirada	Rosecrans Avenue to Hillsborough Drive	17.25 - 18.48	NA
La Habra	Hillsborough Drive[2] to SR 72	18.48 - 20.71	NA
Unincorporated Orange County	McFadden Avenue to Hazard Avenue	6.13 - 7.14	Continental[1] crosswalk at McFadden Avenue

Source: Measurements conducted by using Google Earth satellite imagery
1: continental sidewalks = a high visibility crosswalk treatment with sets of multiple bars perpendicular to the direction of crossing
2: La Habra city limits begins north of Hillsborough Drive

Where sidewalk facilities are present, the Americans with Disabilities Act (ADA) ensures that the design of these facilities provides for ease of use by individuals of all abilities. A preliminary review of the Project Corridor was completed to identify general areas where sidewalk gaps and/or ADA deficiencies are present. For ADA compliance, the review focused on the following requirements:

- Sufficient sidewalk clearance for wheelchair-bound individuals
- Sidewalk slopes and ramps consistent with slope requirements
- Curb ramps compliant with slope requirements and containing detectable warning devices

For ADA compliance, gaps were identified for all three categories and outlined in **Figure 6-2**. Curb-cuts and ADA-compliant ramps are provided for the most part throughout the corridor, with one missing

ramp across from Westridge Plaza in La Habra. Segments of missing sidewalks in La Habra, Buena Park, Anaheim, Unincorporated County, and Huntington Beach also pose a barrier to pedestrians. Obstructions such as utility poles/light posts, sign/signal posts, hydrants, and utility boxes on sidewalks are present throughout the corridor, particularly in La Habra, Buena Park, Westminster and Unincorporated Orange County.

6.3 PEDESTRIAN CROSSINGS

Crosswalks are provided at most signalized intersections along the Project Corridor. Signalized intersections without pedestrian crossings across the Project Corridor are found at:

- I-405 Ramps (Huntington Beach)
- SR 22 Ramps (Huntington Beach)
- SR 91 Ramps (Buena Park)
- I-5 Ramps (Buena Park)
- Los Coyotes Drive (Buena Park)

In addition, mid-block crossings (i.e., between major intersections) are also provide at the following locations:

- Knott's Berry Farm underground crossing (between Crescent Avenue and La Palma Avenue)

Given the typical spacing of signalized intersections (about half-mile intervals), the absence of mid-block crossings can result in a significant barrier to pedestrian connectivity.

Pedestrian crossings are provided across the Project Corridor at all signalized intersections with the exception of five locations. A mid-block underground crossing is provided at Knott's Berry Farm.

Legend

- Beach Blvd Centerline
- 1.25 Mile Buffer
- Sidewalk Obstruction
- Missing Ramp
- Missing Sidewalk

OCTA

Existing Pedestrian Environment Gaps
Beach Boulevard Corridor Study

Figure **6-2**

Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet
Data Source: Delete if there isn't one.

6.4 BICYCLIST AND PEDESTRIAN VOLUMES

Available existing weekday AM and PM peak period bicyclist and pedestrian volumes for intersections along the Project Corridor are shown in **Table 6-2**. Data was only available at 14 of 71 total signalized intersections along the Project Corridor. From this limited dataset, intersections with the highest levels of peak period activity are descried below.

High bicycle volumes:

- SR 1 in Huntington Beach
- SR 22 WB in Garden Grove
- I-405 SB Ramp/Edinger Avenue in Huntington Beach
- SR 72 in La Habra

High pedestrian volumes:

- Orangethorpe Avenue in Buena Park
- Katella Avenue in Stanton
- Warner Avenue in Huntington Beach
- Bolsa Avenue in Westminster
- SR 1 in Huntington Beach

Based on available data, the cities of Huntington Beach and Buena Park experience the highest volume of pedestrian and traffic.

Table 6-2. Peak Period Bicycle and Pedestrian Volumes

City	Project Corridor Intersection	AM Peak Period		PM Peak Period	
		Bicycle	Pedestrian	Bicycle	Pedestrian
Huntington Beach	SR 1	43	66	60	254
Huntington Beach	Adams Avenue	8	41	11	97
Huntington Beach	Warner Avenue	8	134	12	300
Huntington Beach	Edinger Avenue	8	27	23	81
Westminster	Bolsa Avenue	1	110	3	243
Westminster	SR 22 EB	1	14	17	41
Garden Grove	SR 22 WB	8	10	39	52
Stanton	Katella Avenue	3	148	5	289

City	Project Corridor Intersection	AM Peak Period		PM Peak Period	
		Bicycle	Pedestrian	Bicycle	Pedestrian
Buena Park	SR 91 EB Ramp	2	32	3	49
Buena Park	SR 91 WB Ramp	3	25	4	42
Buena Park	Orangethorpe Avenue	4	171	5	349
Buena Park	I-5 SB Ramps	2	23	4	68
La Habra	SR 90	1	69	3	127
La Habra	SR 72	11	63	18	104

Source: Various count data sources provided by stakeholders
AM Peak Period = 6:00 to 9:00 AM; PM Peak Period 3:00 to 7:00 PM

6.5 RELEVANT PLANS AND PROJECTS

Bicycle and pedestrian circulation conditions for the Project Corridor are also addressed through the following completed and ongoing plans. In some cases, the data and analysis from these documents were used as part of the analysis presented in this section.

- Caltrans "Toward an Active California" State Bicycle and Pedestrian Plan
  - Outlines objectives, strategies, and actions to support active transportation travel
- OCTA Districts 1 and 2 Bikeways Strategy
  - Identifies potential regional bikeways in the Fourth Supervisorial District in Orange County (includes cities of Buena Park, Costa Mesa, Cypress, Fountain Valley, Garden Grove, Huntington Beach, La Palma, Los Alamitos, Newport Beach, Santa Ana, Seal Beach, Stanton, and Westminster)
  - In the Study Area, the study lists improvements along:
    - Newland Street and Western Avenue (Magnolia-Hoover corridor)
    - Pacific Electric Right-of-Way
- OCTA Fourth District Bikeways Strategy
  - Identifies potential regional bikeways in the Fourth Supervisorial District in Orange County (includes cities of Anaheim, Brea, Buena Park, Fullerton, La Habra, Placentia, and Yorba Linda)
  - In the Study Area, the study lists improvements along:
    - Edison Transmission Corridor

        - Carbon Creek
        - Crescent Avenue
        - Orangethorpe Avenue
        - Stanton Avenue
        - Brea Creek Trail
        - Coyote Creek Trail (extending onto Beach Boulevard)
        - Rosecrans Boulevard
        - Union Pacific Right-of-Way Trail

- City of Anaheim: Beach Boulevard Specific Plan
    - Provides guidelines for land use and density
    - Provides guidelines for lot and building design including lot frontage
    - Provides guidelines access to allowed land uses (vehicular and pedestrian), parking, and signage.
    - Proposes streetscape plan for the corridor including in the median
    - Outlines plans for pedestrian facilities improvement
- City of Anaheim: Bicycle Master Plan
    - Describes long-range planning for developing bicycle infrastructure in a city as outlined in Figure 6-1 above
- City of Buena Park: Beach Boulevard Multi-Modal Action Plan
    - Outlines strategies for circulation improvement in the area including pedestrian crossings
    - Outlines strategies for pedestrian improvements including shorter crossings, restriping crossings, buffers for sidewalks, and providing amenities along sidewalks such as lighting and shade
    - Outlines proposed bike network in the area however none are planned along the Project Corridor
- City of Buena Park: Entertainment Corridor Action Plan
    - Outlines plans for land use, public space, streetscape, better and safer pedestrian connections, and potential for a tram service in the area
- City of Huntington Beach: Beach Edinger Corridor Specific Plan
    - Provides guidelines for land use and density
    - Provides guidelines for lot and building design including lot frontage
    - Provides guidelines of new streets and connection to corridor, access to allowed land uses (vehicular and pedestrian), parking, and signage
    - Proposes streetscape plan for the corridor including in the median
- City of Huntington Beach: Bicycle Master Plan

    - Describes long-range planning for developing bicycle infrastructure in a city as outlined in Figure 6-1 above
- City of La Habra: Master Bikeway Plan
    - Describes long-range planning for developing bicycle infrastructure in a city as outlined in Figure 6-1 above
- City of La Habra: Union Pacific Rail Line Bikeway Plan
    - Outlines plans for a trail to provide primarily off-street connections for pedestrian and bicyclists forming part of the OC Loop (66 miles of connections throughout Orange County)
- City of La Habra: Complete Streets Plan
    - Sets a vision for active and safe streets throughout the city
    - Outlines funding for Beach Boulevard landscaping improvements
- City of Garden Grove: Active Streets Master Plan
    - Provides policy recommendations to improve biking and walking including streetscape design, land use recommendations including bicycle friendly business districts, and proposed complete street improvement corridors on adjacent and crossing corridors
- City of Stanton: Livable Beach Boulevard Mobility Plan
    - Focused on 3-miles of Beach Boulevard to encourage mixed-use development, transit-oriented development, provide safer pedestrian crossings, upgrade bus stops, integrate more transit opportunities including Bravo! service, and improve streetscape.

6.6 KEY FINDINGS

Based on the data and analysis presented in this section, the key findings for bicycle and pedestrian circulation along the corridor are as follows:

- **Existing Bicycle Facilities.** Bicycle facilities are most comprehensive in the southern end of the Project Corridor. Towards the northern portion of the Study Area, parallel and perpendicular routes to the project corridor have many gaps and provide largely local circulation within neighboring cities.
- **Existing Pedestrian Facilities.** Facilities include sidewalks along the majority of the project corridor with a few isolated gaps. However, sidewalks are wider than 3 feet along the corridor and are subject to obstructions. Crossing opportunities are largely limited to major intersections.
- **Bicyclist and Pedestrian Volumes**. Active transportation activity levels vary along the project corridor, depending greatly on the land use context. Overall, Huntington Beach and Buena Park currently see the greatest amount of

pedestrian activity, about 300-350 pedestrians in a peak period. Huntington Beach also experience the great amount of bicyclist activity with 60 bicyclists observed in a peak period with Garden Grove experiencing the second highest at 30 bicyclists.

- **Relevant Plans and Projects.** These include numerous city-led studies on mobility and Beach Boulevard, as well as relevant citywide plans for circulation throughout the study area.

Section 7
OPPORTUNITY AREAS

Safety for all transportation users is a critical element in the Study Area's multimodal network. This section discusses safety conditions along the Beach Boulevard Corridor based on analysis of collision data. The analysis findings will be used to identify opportunities to enhance safety-related issues to facilitate safe and convenient circulation for all user groups.

Topics covered in this section are:

- High total collision locations
- High bicycle collision locations
- High pedestrian collision locations

The analysis of safety conditions relies on collision data from the Statewide Integrated Traffic Records System (SWITRS) database that is mapped through the Transportation Injury Mapping System (TIMS).

For analysis of high-collision locations, SWITRS data for all collision types for the Beach Boulevard corridor was provided by OCTA. The collision data for the most recent five-year period from the data provided (2008 to 2012) was utilized for this analysis.

The ArcMap software was used to analyze the collisions at intersections and roadway segments separately. For the purposes of this analysis, 44 intersections of major arterials with regional connection were selected along the corridor.

The collisions that occurred along the roadway segments in-between the intersections above were assessed separately. Collisions that occurred along the roadway segments were primarily at midblock locations, as well as at minor intersections.

7.1 HIGH COLLISION LOCATIONS

The numbers of total collisions that occurred at each study intersection are presented as a color value scale in **Figure 7-1.** The numbers of total collisions that occurred along each roadway segment are presented as a color value scale in **Figure 7-2**.

Based on this data, the intersections with the greatest number of total collisions are Beach Boulevard/Edinger Avenue and Beach Boulevard/Lincoln Avenue. The roadway segments with the greatest number of total collisions are from Edinger Avenue to Heil Avenue, from Slater Avenue to Talbert Avenue, and from the SR 91 Eastbound Ramps to La Palma Avenue.

7.2 BICYCLIST HIGH-INJURY AREAS

The numbers of bicycle collisions that occurred at each study intersection are presented as a color value scale in **Figure 7-3.** The numbers of bicycle collisions that occurred along each roadway segment are presented as a color value scale in **Figure 7-4.** The intersections with the greatest number of bicycle collisions are Beach Boulevard/Westminster Boulevard, Beach Boulevard/Edinger Avenue, and Beach Boulevard/Adams Avenue. The roadway segments with the greatest number of bicycle collisions are from Yorktown Avenue to Adams Avenue, from Main Street/Ellis Avenue to Garfield Avenue, and from La Mirada Boulevard to Artesia Boulevard. The highest violation type noted for pedestrian collisions along these roadway segments were wrong side of the road, where bicyclists were not following California Vehicle Code rules. Improper turning by automobiles and bicyclists not respecting automobile right-of-way were the second and third highest violation type for bicycle collisions.

7.3 PEDESTRIAN HIGH-INJURY AREAS

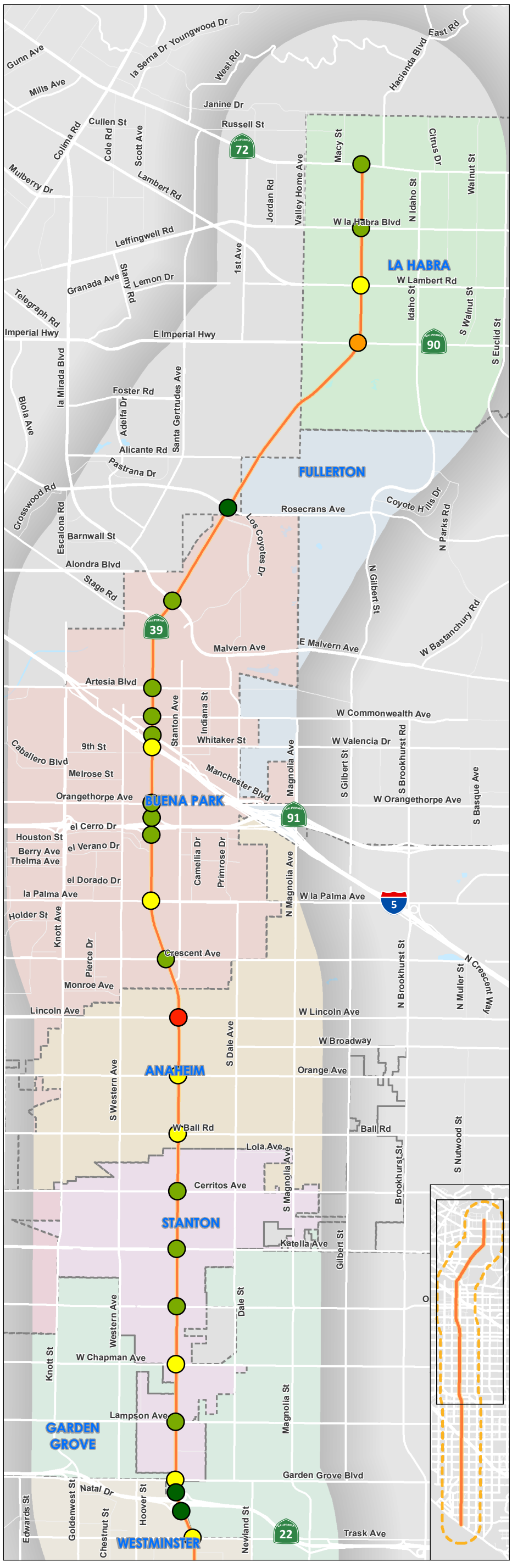
The numbers of pedestrian collisions that occurred at each study intersection are presented as a color value scale in **Figure 7-5.** The numbers of pedestrian collisions that occurred along each roadway segment are presented as a color value scale in **Figure 7-6.** The intersections with the greatest number of pedestrian collisions are Beach Boulevard/Main Street/Ellis Avenue and Beach Boulevard/ Lincoln Avenue. The roadway segments with the greatest number of pedestrian collisions are from the SR 91 Eastbound Ramps to La Palma Avenue, from Trask Avenue to Westminster Boulevard, and from Slater Avenue to Talbert Avenue. The highest violation types noted for pedestrian collisions along these roadway segments were with respect to the pedestrian right-of-way, and drivers not yielding to pedestrian and pedestrian violations where pedestrians were not following California Vehicle Code rules.

7.4 KEY FINDINGS

Locations with high amounts of collisions or those within high-injury collisions provide opportunities to improve circulation, especially by bicyclists and pedestrians. Key findings are as follows:

- **High Collision Locations.** Along the Project Corridor, there is a higher concentration of collisions for all collision types in the cities of Huntington Beach, Anaheim and Buena Park. The highest number of collisions occur along the Edinger Avenue to Heil Avenue roadway segment which experiences some of the highest traffic volumes along the Project Corridor.

- **Bicyclist High-Injury Areas.** Along the Project Corridor, there is a higher concentration of collisions for bicyclists in the cities of Huntington Beach and Westminster. The highest number of bicycle collisions occur along the Yorktown Avenue to Adams Avenue. This portion of the Project Corridor provides on-street parking which could influence the amount of bicycle collisions. Note that bike lanes are not provided along the Project Corridor, however east-west connector roads do have bike lanes. The highest number of bicyclists are also reported in this area.
- **Pedestrian High-Injury Areas.** Along the Project Corridor, there is a higher concentration of collisions for pedestrians in the cities of Huntington Beach, Westminster, Anaheim and Buena Park. The highest number of pedestrian collisions occur at the along the SR 91 Eastbound Ramps to La Palma Avenue segment. This segment is located in a high pedestrian activity area within the Buena Park Entertainment Zone. In addition, there are high amounts of passenger loading and unloading activities as well as heavy vehicle traffic and a population of visitors who are new to the area.
- **Opportunity Areas.** Based on the high collision and high-injury bicyclist/pedestrian locations, there are opportunities for safety-related enhancements at key locations within Huntington Beach, Westminster, Anaheim, and Buena Park. Wrong way bicycle travel, not following right-of-way rules, illegal pedestrian behavior, and turning vehicles are the primary areas for potential improvements.



Legend

Total Crashes

- 0 - 6 Crashes
- 7 - 26 Crashes
- 27 - 38 Crashes
- 39 - 53 Crashes
- 54 - 70 Crashes

Beach Blvd Centerline

City Boundaries

OCTA

Number of Total Crashes at Intersections
Beach Blvd Corridor Study

Figure
7-1

Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet
Data Source: Delete if there isn't one.

Legend

Total Crashes

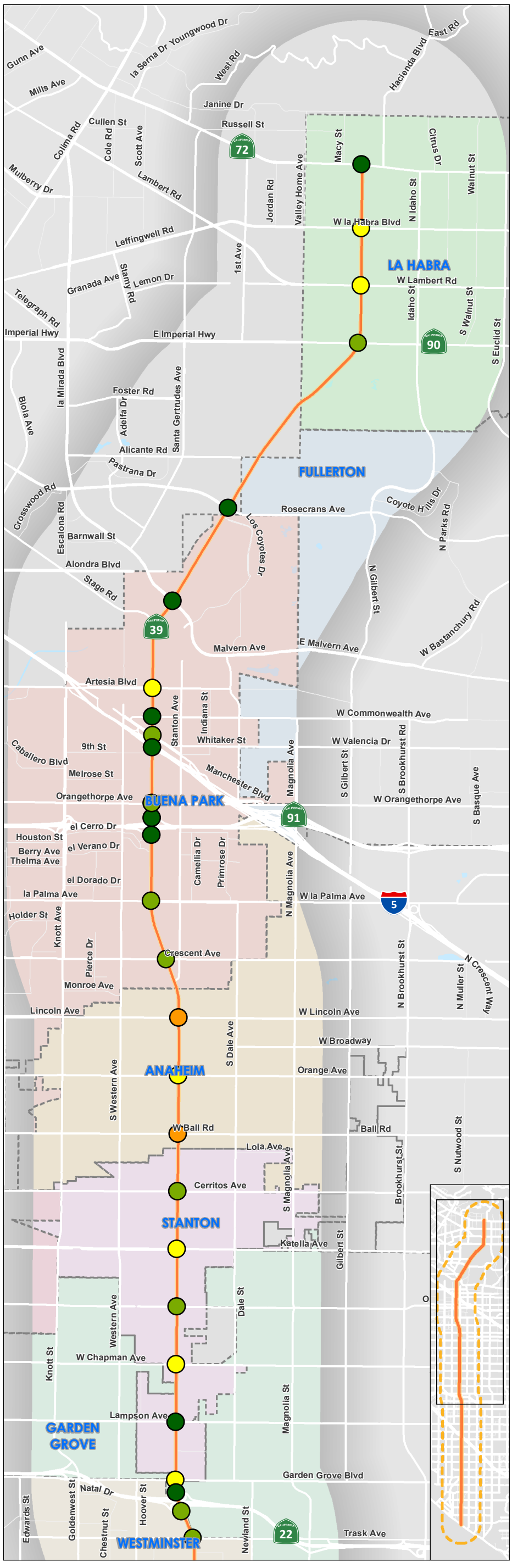
- 0 - 8 Crashes
- 9 - 19 Crashes
- 20 - 31 Crashes
- 32 - 47 Crashes
- 48 - 88 Crashes
- Major Intersections
- City Boundaries

OCTA

Number of Total Crashes Along Roadway Segments
Beach Blvd Corridor Study

Figure
7-2

Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet
Data Source: Delete if there isn't one.



Legend

Bicycle Crashes

- 0 Crashes
- 1 - 2 Crashes
- 3 - 4 Crashes
- 5 - 6 Crashes
- 7 - 8 Crashes

Beach Blvd Centerline

City Boundaries

OCTA

Number of Bicycle Crashes at Intersections
Beach Blvd Corridor Study

Figure
7-3

Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet
Data Source: Delete if there isn't one.

Legend

Bicycle Crashes

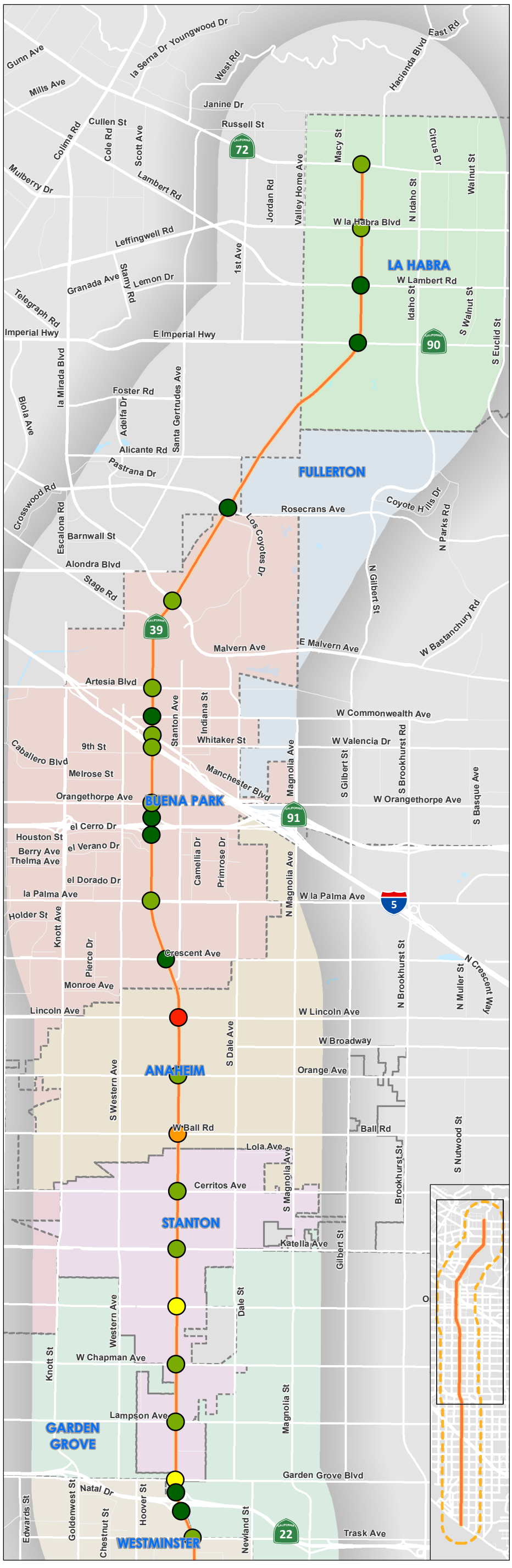
- 0 Crashes
- 1 - 2 Crashes
- 3 - 4 Crashes
- 5 - 6 Crashes
- 7 - 8 Crashes
- Major Intersections
- City Boundaries

OCTA

Number of Bicycle Crashes Along Roadway Segments
Beach Blvd Corridor Study

Figure **7-4**

Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet
Data Source: Delete if there isn't one.



Legend

Pedestrian Crashes

- 0 Crashes
- 1 - 2 Crashes
- 3 - 4 Crashes
- 5 Crashes
- 6 - 9 Crashes

Beach Blvd Centerline

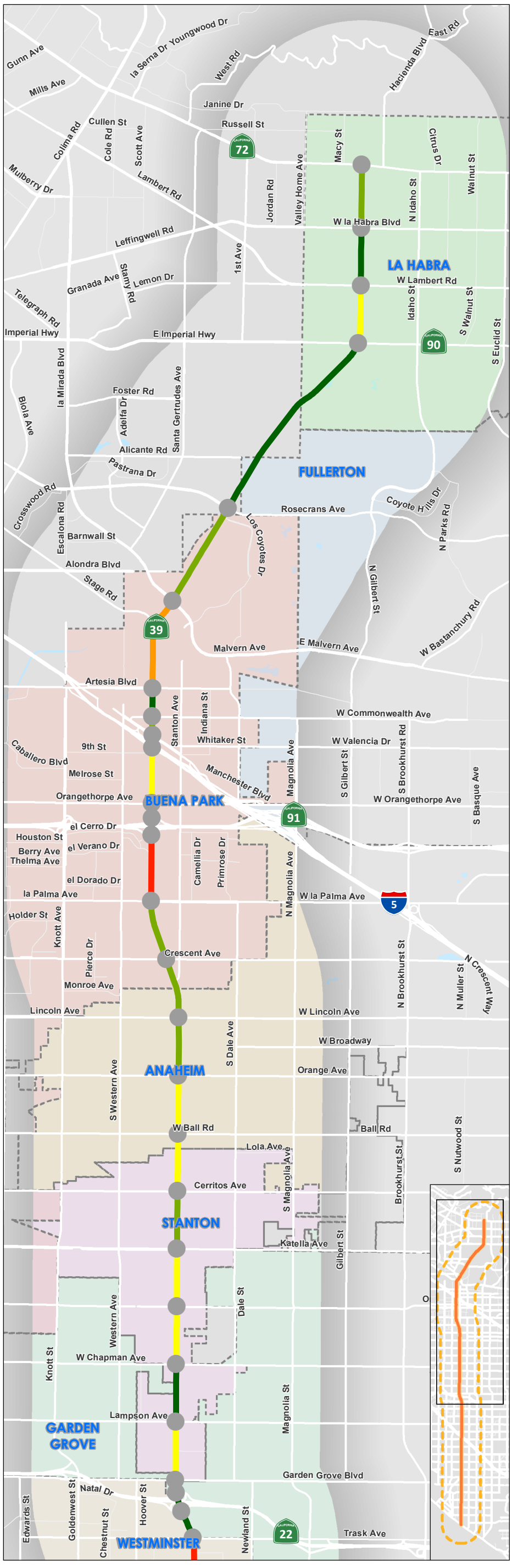
City Boundaries

OCTA

Number of Pedestrian Crashes at Intersections
Beach Blvd Corridor Study

Figure **7-5**

Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet
Data Source: Delete if there isn't one.



Legend

Pedestrian Crashes

- 0 Crashes
- 1 Crashes
- 2 - 3 Crashes
- 4 - 5 Crashes
- 6 - 7 Crashes
- Major Intersections
- City Boundaries

OCTA

Number of Pedestrian Crashes Along Roadway Segments
Beach Blvd Corridor Study

Figure **7-6**

Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet
Data Source: Delete if there isn't one.

Section 8
NEXT STEPS

Based on the findings of the baseline conditions analyses, the following are the next steps for the Project in the development of improvements to be advanced for implementation:

Corridor Segments: Project Corridor segments will be defined to serve as a framework for identifying and describing improvements. The segmentation is intended to document differences and similarities in transportation conditions, land use conditions, and mobility needs along the Project Corridor.

Purpose, Need, and Goals: The statement of purpose and need will document a common understanding of issues to be addressed through potential projects. The purpose and need will reflect the outcomes of the baseline conditions analysis and include input received from stakeholders.

Concept Evaluation: Potential concepts will be assessed to determine their effectiveness in meeting the purpose and need of the project. For those concepts that are most promising, conceptual designs and order of magnitude cost estimates (using ranges of values) will be developed and available for local agency and Caltrans for implementation.

Recommendations: Based on the results of the above assessments, recommendations will be made for corridor-long improvements for each mode of travel.

Subsequent steps include community engagement activities to inform the refinement of improvement concepts. The improvement concepts then will be evaluated based on stakeholder input and technical analyses, with the preferred improvement concepts to be advanced for project delivery.

Section 9
REFERENCES

This section lists the documents and data sources referenced in this report.

- OCTA geodatabase data source
  - OCBikeways (bikeway geometry and status)
  - CurbCutsAndRamps (locations of curb cuts and curb ramps)
  - Demographics (TAZ level demographics data 2012 to 2045)
  - LUGrouped (geometry boundary of land use)
  - OnStreetParking (on-replace street parking locations)
  - SidewalkObstructions (locations of side-walk obstructions)
  - Sidewalks
  - SWITRS (The Statewide Integrated Traffic Records System (SWITRS) Crash data from 2003 to 2012)
  - Route (bus routes)
- Center for Demographic Research (CDR) Orange County Projections 2014 Modified (OCP-2014) demographic data
- Orange County Travel Demand Model version 4.0 (OCTAM)
- OCTA Transit Operations - Ridership data along Project Corridor and Study Area
- OCTA Districts 1 and 2 Bikeways Strategy (December 2013)
- OCTA Fourth District Bikeways Strategy (February 2012)
- Beach Boulevard TLSP (2010)
- State Route 39 Route Concept Report (June 2000)
- City of Huntington Beach - Beach and Edinger Corridors Specific Plan (adopted 2010, amended 2015)
- City of Anaheim - Beach Boulevard Specific Plan
- Beach Boulevard Specific Plan EIR Traffic Study (August 2018)
- Buena Park - Entertainment Zone Action Plan (2008)
- Beach Boulevard Multi-Modal Mobility Action Plan
- OCTA 2018 Long-Range Transportation Plan (LRTP) (2018)
- OCTA Beach Blvd. Signal Priority Implementation Plan (2018)
- OCTA OC Transit Vision (2018)
- OCTA State of OC Transit (2017)
- Metrolink 10-Year Strategic Plan 2015-2025 (2015)
- Metrolink Short-Range Transit Plan 2015-2020 (2015)
- OCTA 2014-2019 Strategic Plan (2014)
- Caltrans "Toward an Active California" State Bicycle and Pedestrian Plan
- City of Anaheim: Bicycle Master Plan
- City of Buena Park: Entertainment Corridor Action Plan
- City of Huntington Beach: Bicycle Master Plan
- City of La Habra: Master Bikeway Plan

- City of La Habra: Union Pacific Rail Line Bikeway Plan
- City of La Habra: Complete Streets Plan
- City of Garden Grove: Active Transportation Plan
- City of Stanton: Livable Beach Boulevard Mobility Plan