Geographic Needs Assessment Review

Introduction

The Orange County Transportation Authority (OCTA) is developing a Countywide Transportation Demand Management (TDM) Strategic Plan. As part of this initiative, this memorandum reviews existing data and provides high-level regional demographic and transportation indicators to inform the preparation of the TDM Plan. It includes maps depicting socio-economic characteristics, transportation infrastructure, and key macro indicators and travel patterns in Orange County. These maps will inform geographically where strategies may be better targeted to better support the overall TDM Strategic Plan.

The memorandum includes data and a summary for the following:

- **Demographics**
  - Population
  - Employment
  - Population and Employment Growth
  - Communities of Concern
  - Income
  - Vehicle Ownership
- **Major Trip Generators**
  - Key Destinations
  - Visitor Trips
- **Circulation Network**
  - Roadway Network
  - Bicycle Network
  - Transit Network
- **Travel Indicators and Patterns**
  - Daily Trips by Purpose
  - Inter and Intra-County Commuter Trips
  - Vehicle Miles Travelled

Demographics

For this section, several indicators were extracted from the Orange County Transportation Analysis Model (OCTAM). The OCTAM is a state-of-the-practice travel demand forecasting model designed to address transportation issues in Orange County. OCTAM is often used to evaluate multi-modal transportation alternatives to support regional planning activities in Orange County. Many regional transportation models such as OCTAM use socioeconomic demographic data as a key input. OCTAM version 5.0 uses Orange County demographic data based on Orange County Projections 2018 (OCP 2018), which was developed by the Center for Demographic Research.[1] OCP 2018 has a base year of 2016 and a horizon year of 2045. The demographic data is organized by traffic analysis zones (TAZs). OCTAM has 1741 TAZs within Orange County, which provides a more detailed breakdown when compared to data organized by zip codes or city boundaries. When available, the following data is provided at the TAZ level.

Population

According to the United States Census data, the population of Orange County as of 2022 is 3,186,989.[2] Orange County ranks the third most populous county in California, after Los Angeles and San Diego counties. Orange County primarily consists of single-family homes, which covers 22% of the county.

Figure 1 shows the countywide population density by TAZ. As shown in the figure, population density is higher in the northern half of the county, especially west of State Route (SR)- 55. The population is most dense in the Santa Ana and Anaheim areas along major freeway corridors, such as Interstate 5 (I-5), SR-91, and SR-22. The southern and eastern parts of the county have the lowest population densities. The southern half of the county generally consists of master planned communities developed with lower density suburban land use patterns.

Employment

According to the California Employment Development Department, the number of employed Orange County residents is 1,531,100.[3] **Figure 2** shows the existing countywide employment density by TAZ. Generally, when compared to population density, high employment areas are often confined to smaller and denser areas. The denser employment areas in the county predominately occur in the areas surrounding John Wayne Airport (SNA), downtown Santa Ana, Irvine Spectrum, and other areas where major freeways (I-5, SR-22, and SR-57) meet in the Cities of Orange and Santa Ana. Several of these employment nodes are located near major institutional facilities such as airports, hospitals, civic centers, stadiums, and shopping centers.

[1] In Orange County, sub-county level data is developed by the Center for Demographic Research (CDR) at California State University, Fullerton, in coordination with cities' and county's general plans, as well as major land developers. The CDR develops and maintains the Orange County Projections (OCP) for population, housing, and employment data.
[2] United States Census Bureau, "Explore Census Information", https://data.census.gov/
[3] As of August 2023, according to California State University, Fullerton | Center for Demographic Research, "Facts and Figures", https://www.fullerton.edu/cdr/ocff.pdf, September 2023

Figure 1 Population Density (2019)

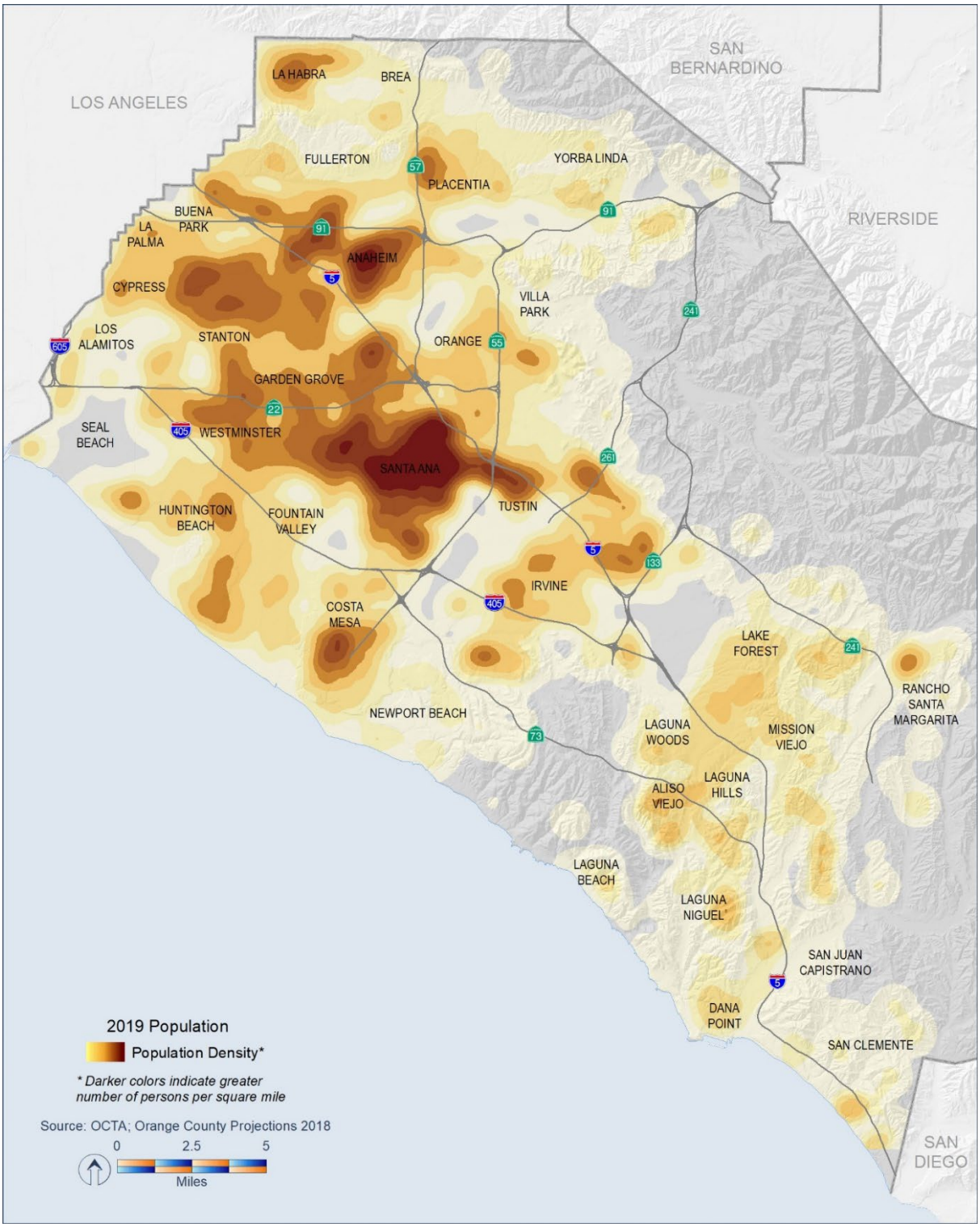
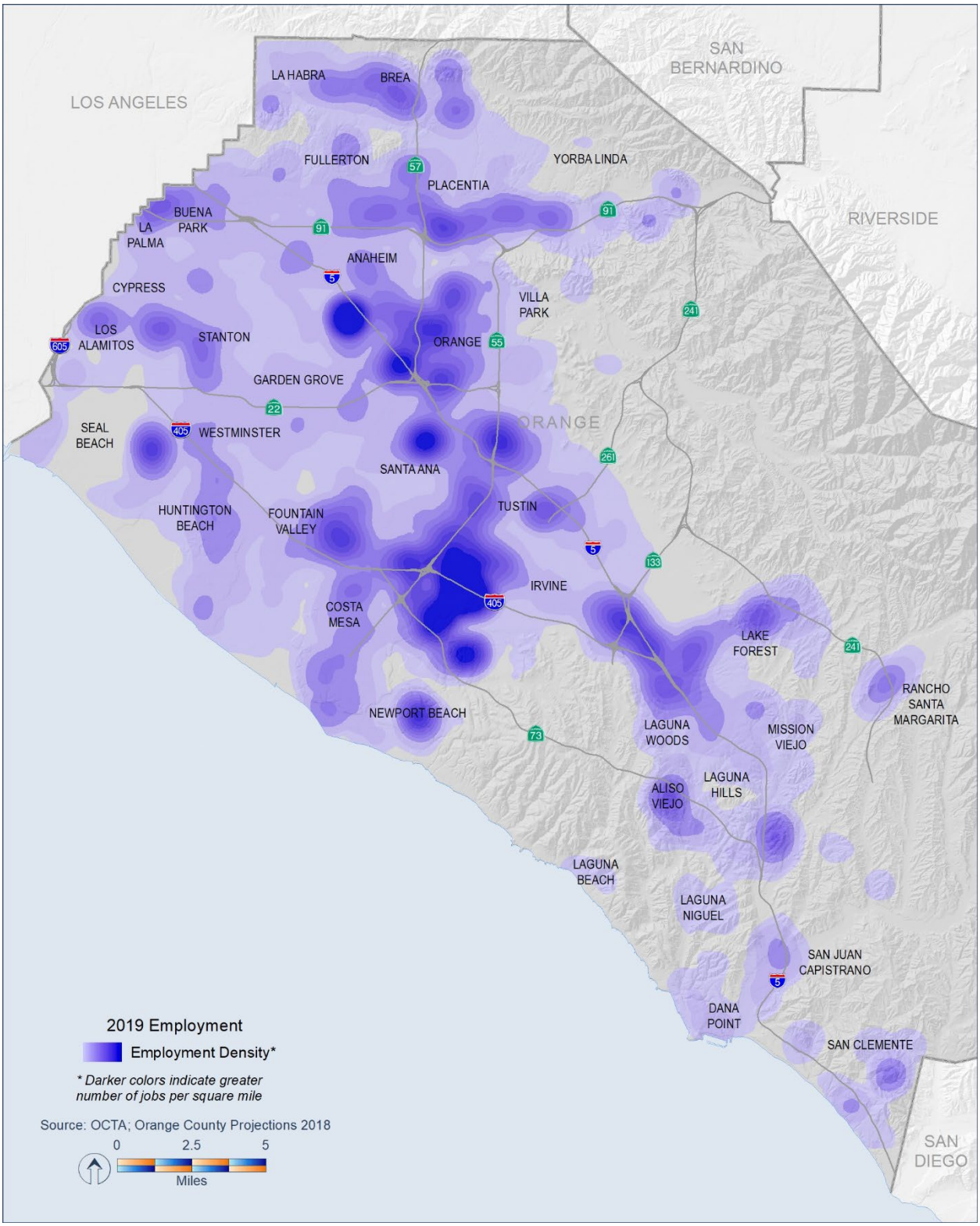


Figure 2 Employment Density (2019)



Population and Employment Growth

The OCP forecasts 3,488,505 individuals living in Orange County in 2040, or a growth rate of about 0.6% per year. **Figure 3** shows the projected 2045 population. **Figure 4** shows the anticipated growth in population density by TAZ in percent over existing. As shown in the figure, high population growth is scattered throughout the County. Most notably, population growth is anticipated in the Rancho Mission Viejo area in south county, in the areas surrounding John Wayne Airport and the Great Park in the City of Irvine, as well as the Anaheim Platinum Triangle area in the City of Anaheim.

The Center for Demographic Research forecasts 1,976,791 employed Orange County residents in July 2040, or a growth rate of about 1.7% each year. **Figure 5** shows the projected 2045 employment. **Figure 6** shows the anticipated growth in employment density by TAZ in percentage. As shown in the Figure, high employment growth tends to be around central Orange County.

Figure 3 Population Density (2045)

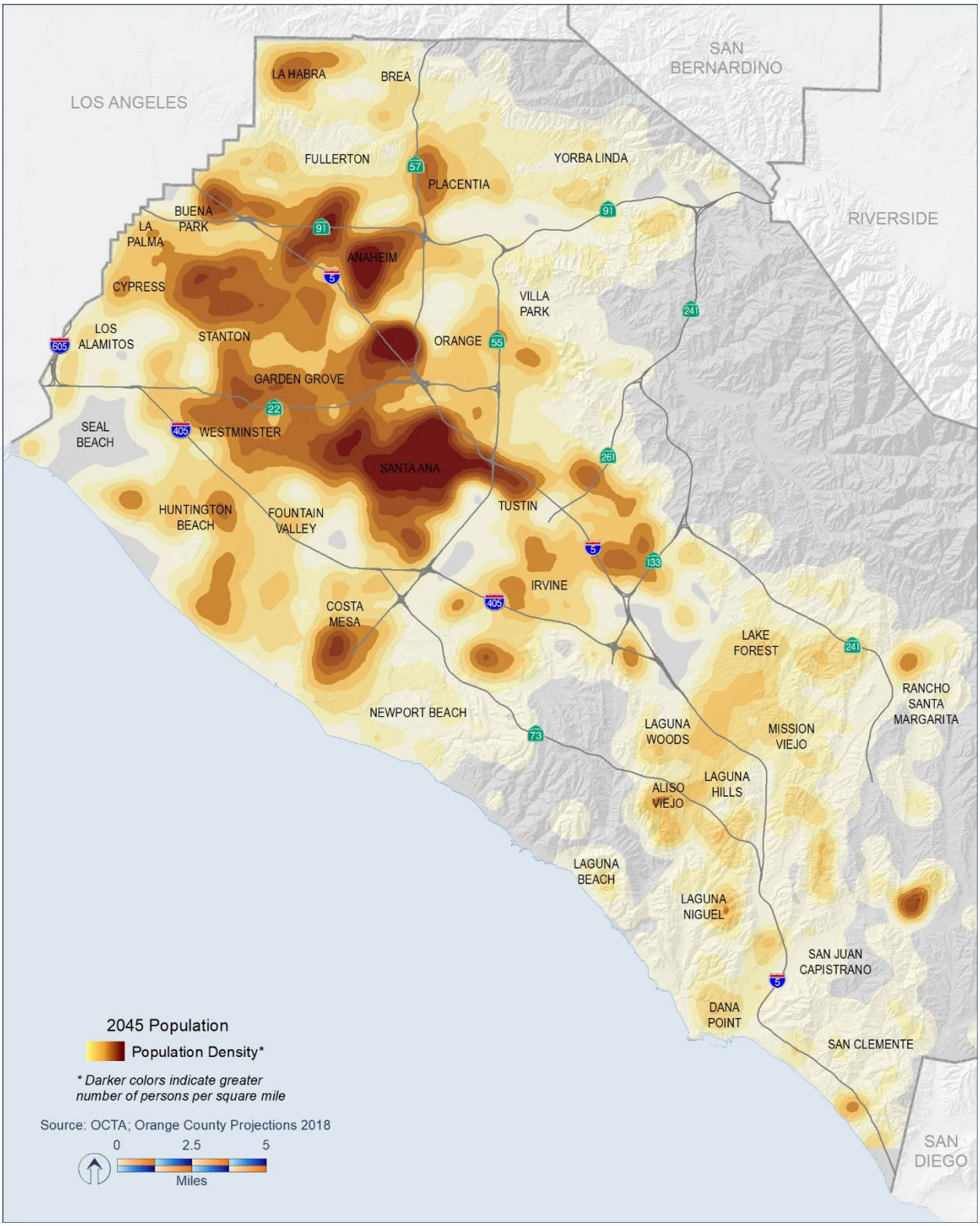


Figure 4 Population Change (2019 to 2045)

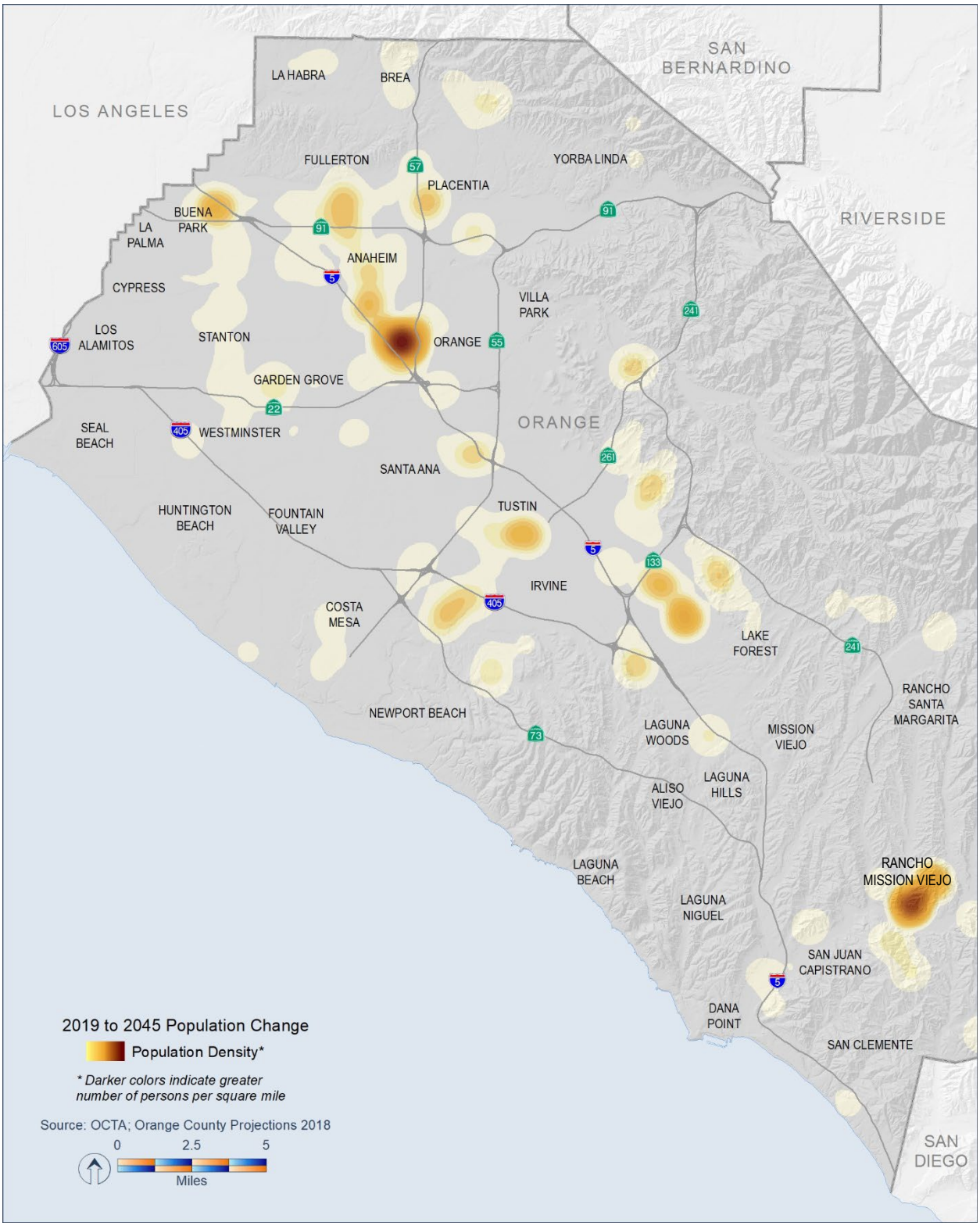


Figure 5 Employment Density (2045)

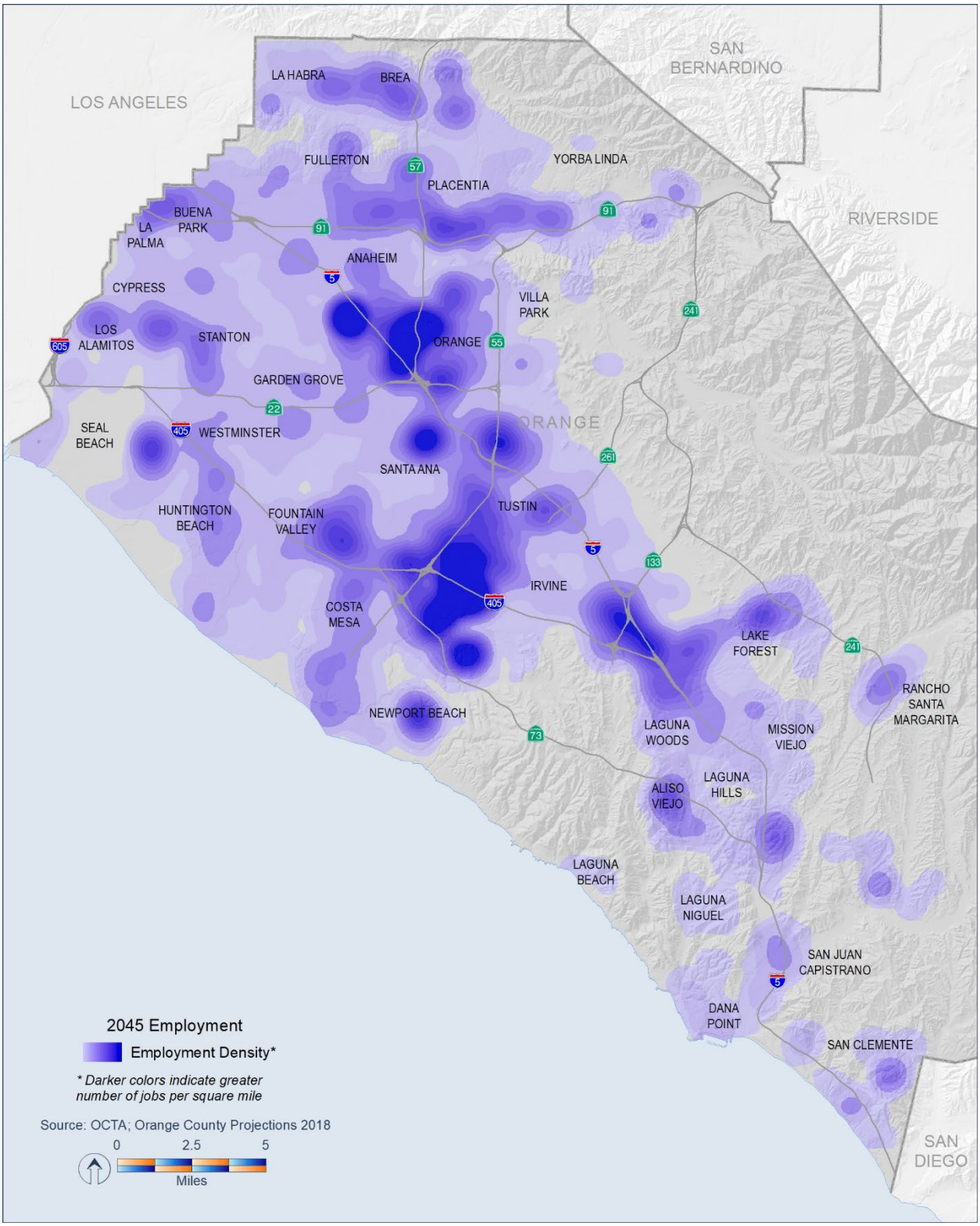
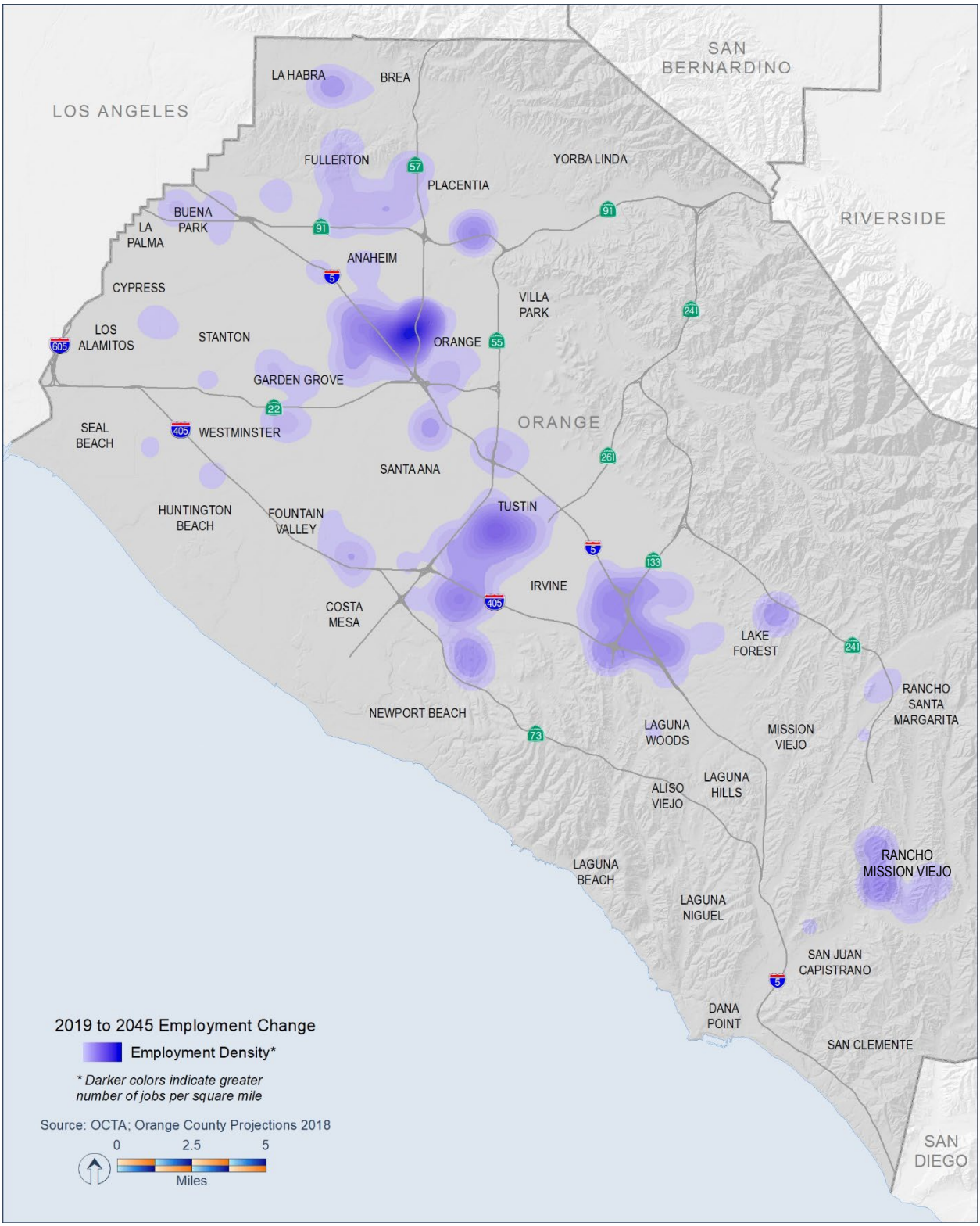


Figure 6 Employment Change (2019 to 2045)



Communities of Concern

The 2022 OCTA Long-Range Transportation Plan (LRTP) identified Communities of Concern, shown in **Figure 7**, as part of an equity analysis to ensure equitable distribution of transportation benefits within Orange County. Communities of Concern were defined using an adapted approach from the adopted Southern California Association of Governments' (SCAG) Regional Transportation Plan & Sustainable Communities Strategy (RTP/SCS)[4]. The process includes identifying the top one-third of Orange County census tracts with both the highest concentration of non-white population and households living in poverty (based on federal poverty level). The population of Orange County's Communities of Concern accounts for approximately 29% of the total population and the areas generally coincide with densely populated areas.

Income

According to United States Census data, the mean household income of Orange County is $113,702.[5] Orange County ranks the seventh highest county in California in terms of average household income. Northern and Central Orange County, which include parts of Westminster, Garden Grove, Santa Ana, Anaheim, and portions of southern Orange County have lower annual household income compared to the rest of Orange County. **Figure 8** shows the bottom one third of median household income in Orange County by census tracts, one of the criteria for Communities of Concern.

[4] Also known as Connect SoCal 2020. https://scag.ca.gov/read-plan-adopted-final-connect-socal-2020,; last accessed on March 15, 2024.

[5] Retrieved from https://www.census.gov/quickfacts/orangecountycalifornia

Figure 7 Communities of Concern

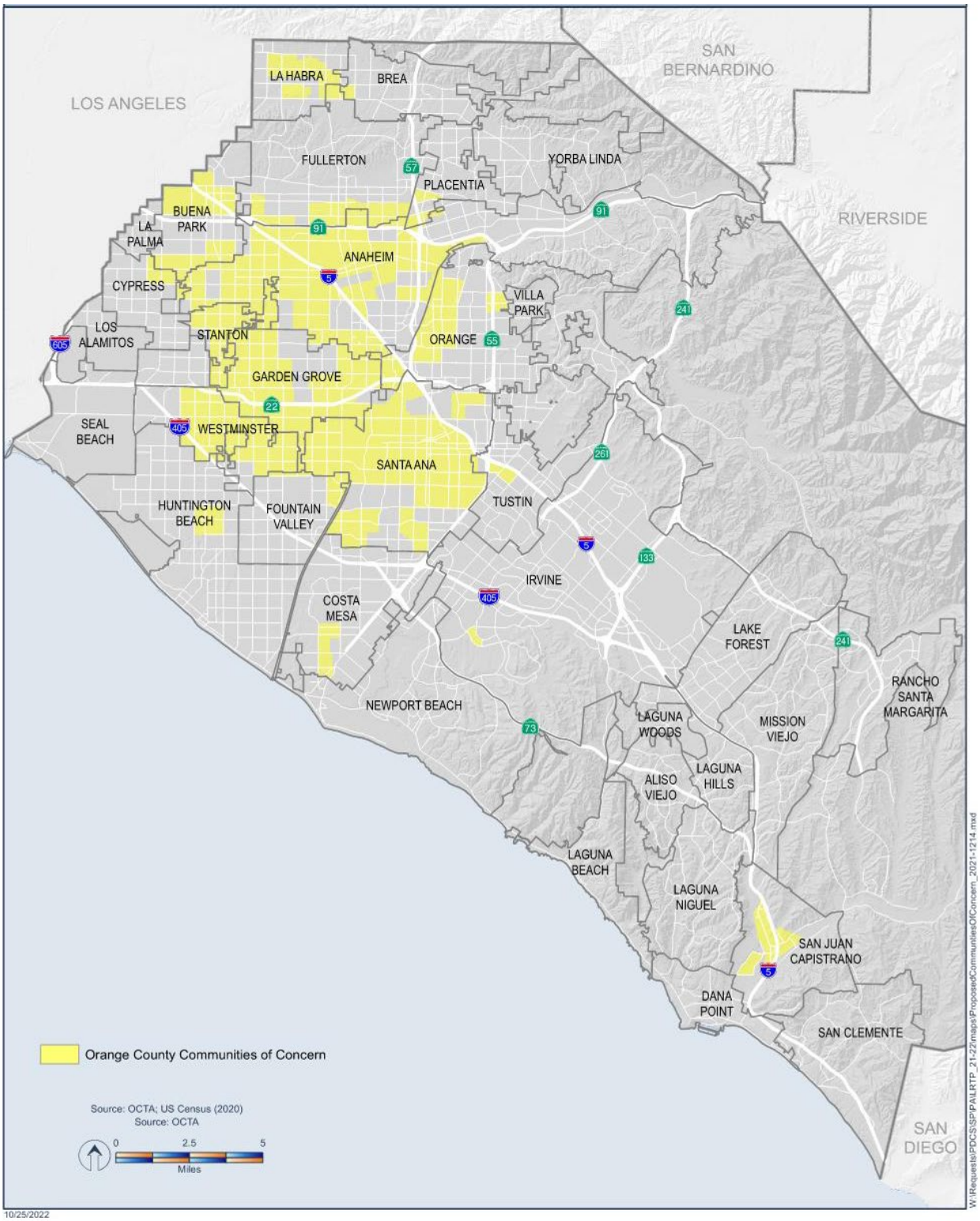
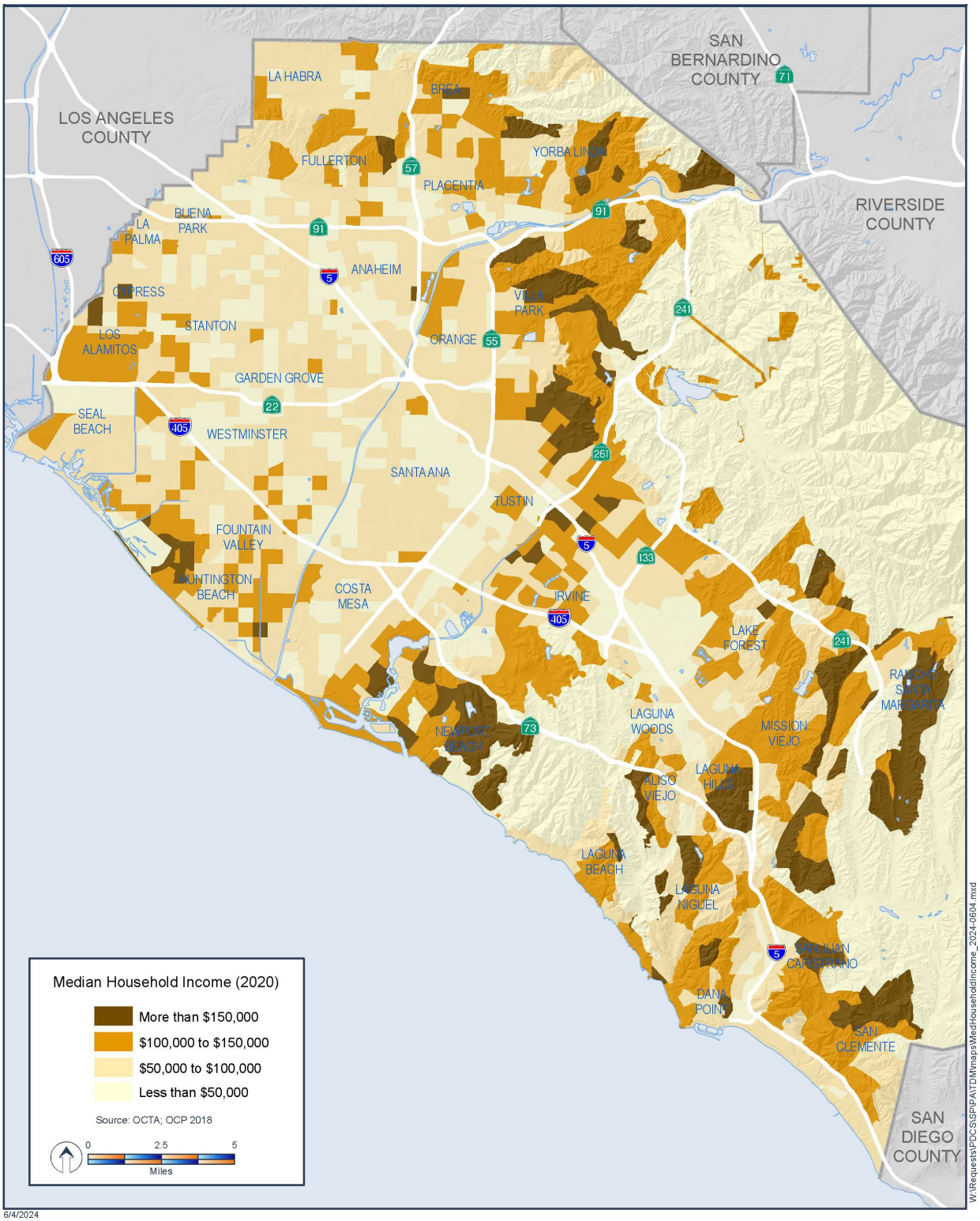


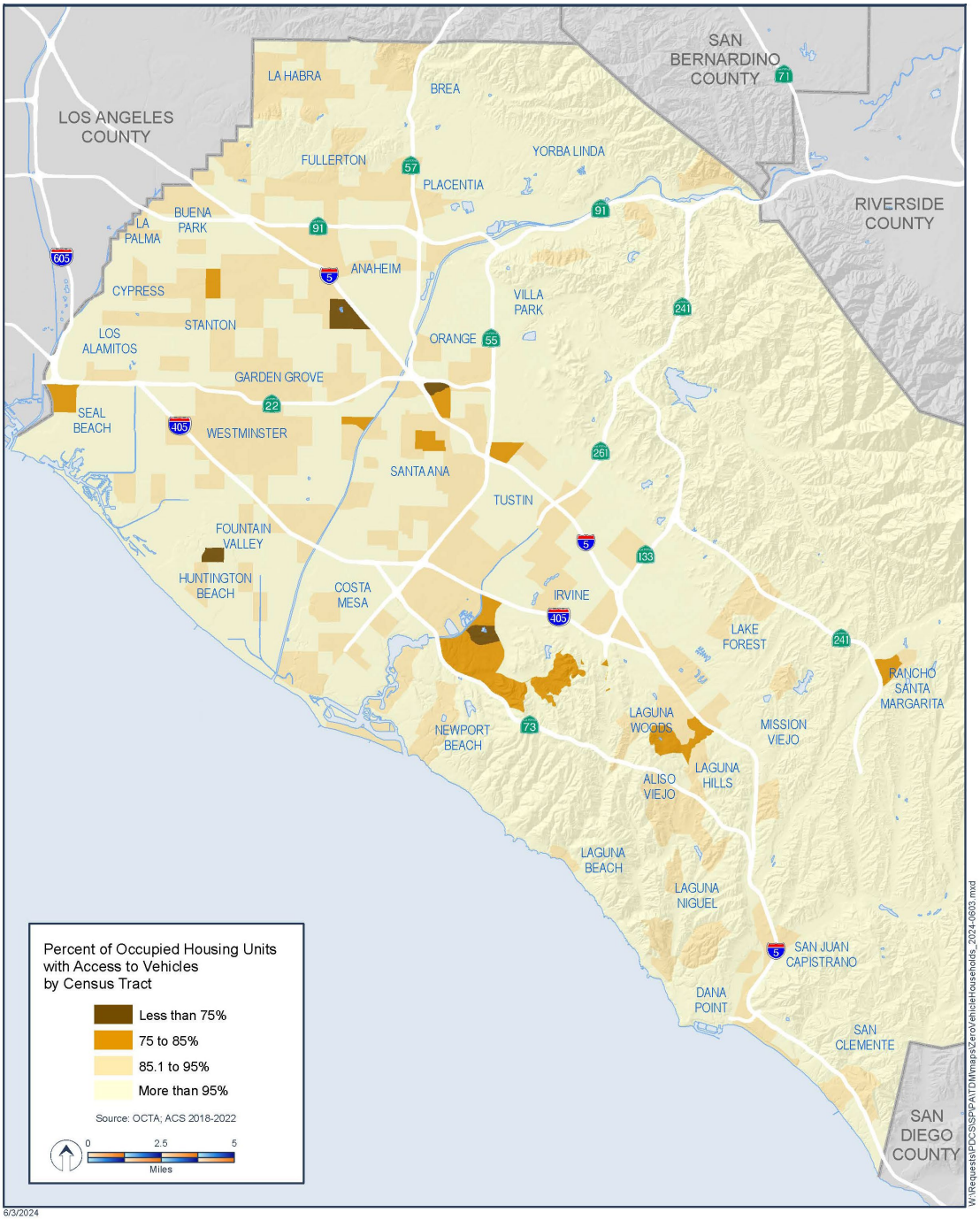
Figure 8 Median Annual Income



Vehicle Ownership

In general, Orange County is auto-oriented. According to United States Census data, only 4.6% of homes in Orange County are a zero-vehicle household. In comparison, 6.9% of households in the state of California do not own a car. **Figure 9** shows the percentage of households with access to vehicles by census tracts in Orange County. Households without access to vehicles are typically concentrated in lower income areas, near universities and colleges, or within senior housing communities such as City of Laguna Woods and Leisure World in the City of Seal Beach.

Figure 9 Housing with Access to Vehicles



Major Trip Generators

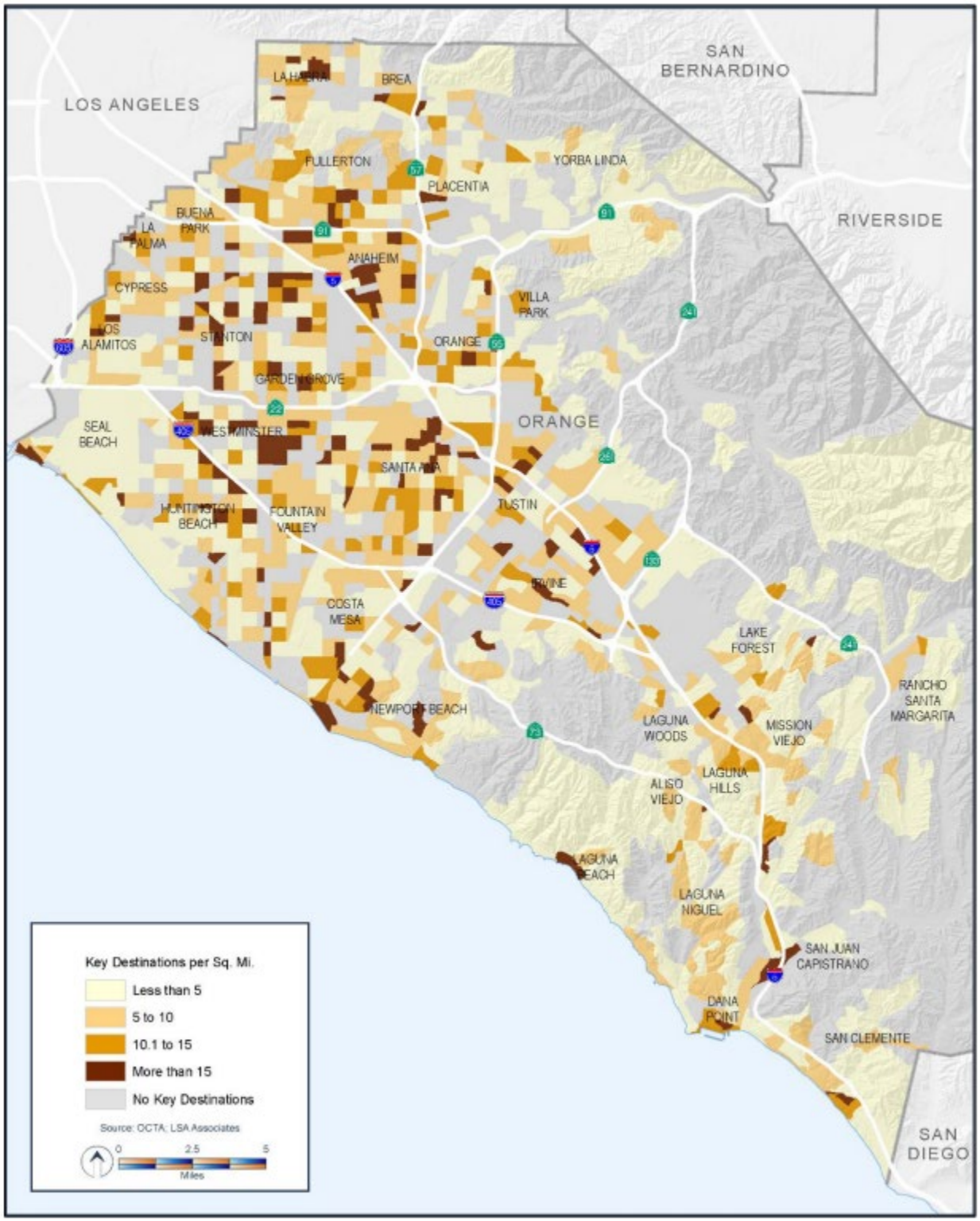
Trip generators are locations in Orange County that people travel to for various activities. This section introduces key destinations in Orange County, defined as destinations providing essential services such as educational institutions, medical services, grocery stores, and open space.

Key Destinations

Figure 10 shows key destinations in Orange County. Many of the major trip generators in Orange County are situated in north and central county.

- **Education Institutions** - Orange County is home to multiple higher-education institutes such as the University of California, Irvine (UCI), California State University, Fullerton, and Chapman University, as well as several community colleges. These sites generate trips by students, staff, and visitors.
- **Medical Facilities** – Medical facilities generate both employee and visitor trips. Most medical facilities are located in the northern half of the county, which tracks the population density patterns in the county.
- **Grocery Stores** – Grocery stores are major job centers and trip generators. It should be noted that due to consumer shopping habit shifts and local housing needs in recent years, several grocery stores are included as part of developments with a mix of residential, entertainment and mixed-use commercial uses.
- **Open Space** – Open spaces attract recreational trips, as well as visitor trips. In addition to several regional parks, Orange County is home to many popular beaches such as Huntington Beach, Seal Beach, Laguna Beach, etc.

Figure 10 Key Destinations per square mile



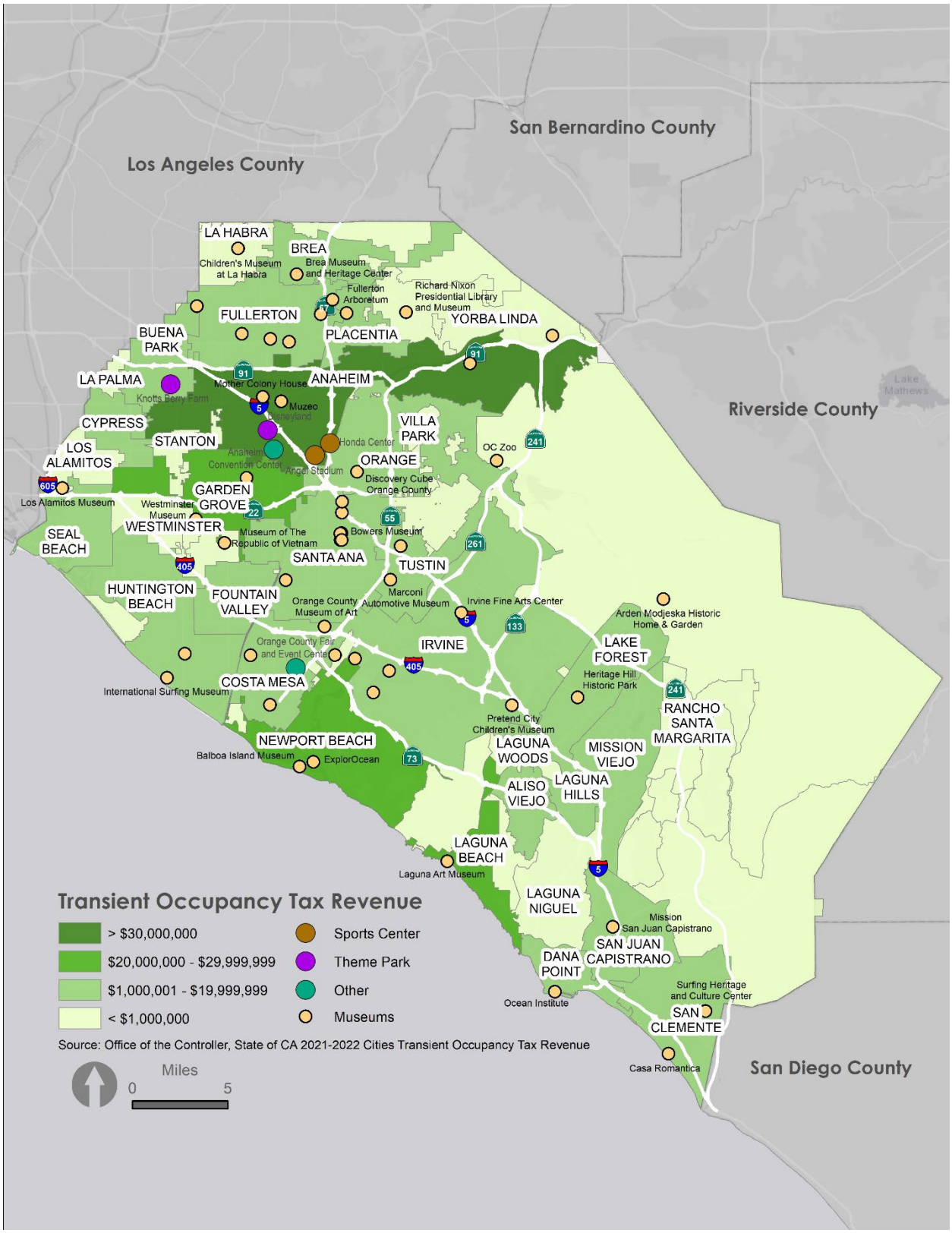
Visitor Trips

Orange County is home to several key destinations that attract visitors and help bolster the local economy.

Figure 11 shows the revenue generated from the Transit Occupancy Tax (TOT), a tax owed to the city by anyone who occupies a hotel room within the city for less than 31 days. TOT revenues can be used as an indication of visitor activity, as it relates to hotel and short-term housing rentals. [6] Cities with higher number of major attractions including theme parks, beaches, sports centers, museums, convention centers and fairgrounds tend to see higher TOT revenue. As shown in the figure, the City of Anaheim leads with the highest amount of revenue received from their TOT, which is at 15% tax rate. Anaheim generated approximately $177 million in TOT revenue in the 2021-2022 year . Other top cities include Newport Beach, Garden Grove, and Laguna Beach, with approximately $26.5 million, $23.5 million, and $21 million generated, respectively.

[6] TOT rates generally range from 8% to 12%, the highest being 15%. The Cities of La Habra, Rancho Santa Margarita and Villa Park do not collect TOT.

Figure 11 Transient Occupancy Tax Revenue



Circulation Network

This section introduces Orange County's circulation network, which includes numerous freeways, arterial roadway network, over 1000 miles of bike network and a transit network served by several bus and rail lines.

Roadway Network

As shown in **Figure 12**, numerous freeways pass through Orange County. There are multiple park and ride locations throughout Orange County, with the majority of them located adjacent to I-405 and I-5 corridors. North county has fewer park and ride locations compared to the corridors located within 5 miles from the coast.

Figure 13 shows the planned regional arterial highway network within Orange County through the Master Plan of Arterial Highways (MPAH) administered by OCTA. Much of Orange County is accessible through the grid-like street network. In the north county there is an extensive network grid generally oriented north-south and east-west. South of SR-55 and especially in South County the roadway network is less dense and have alignments constrained due to hilly terrain and open space areas.

Figure 12 Freeway System and Park and Ride Lots

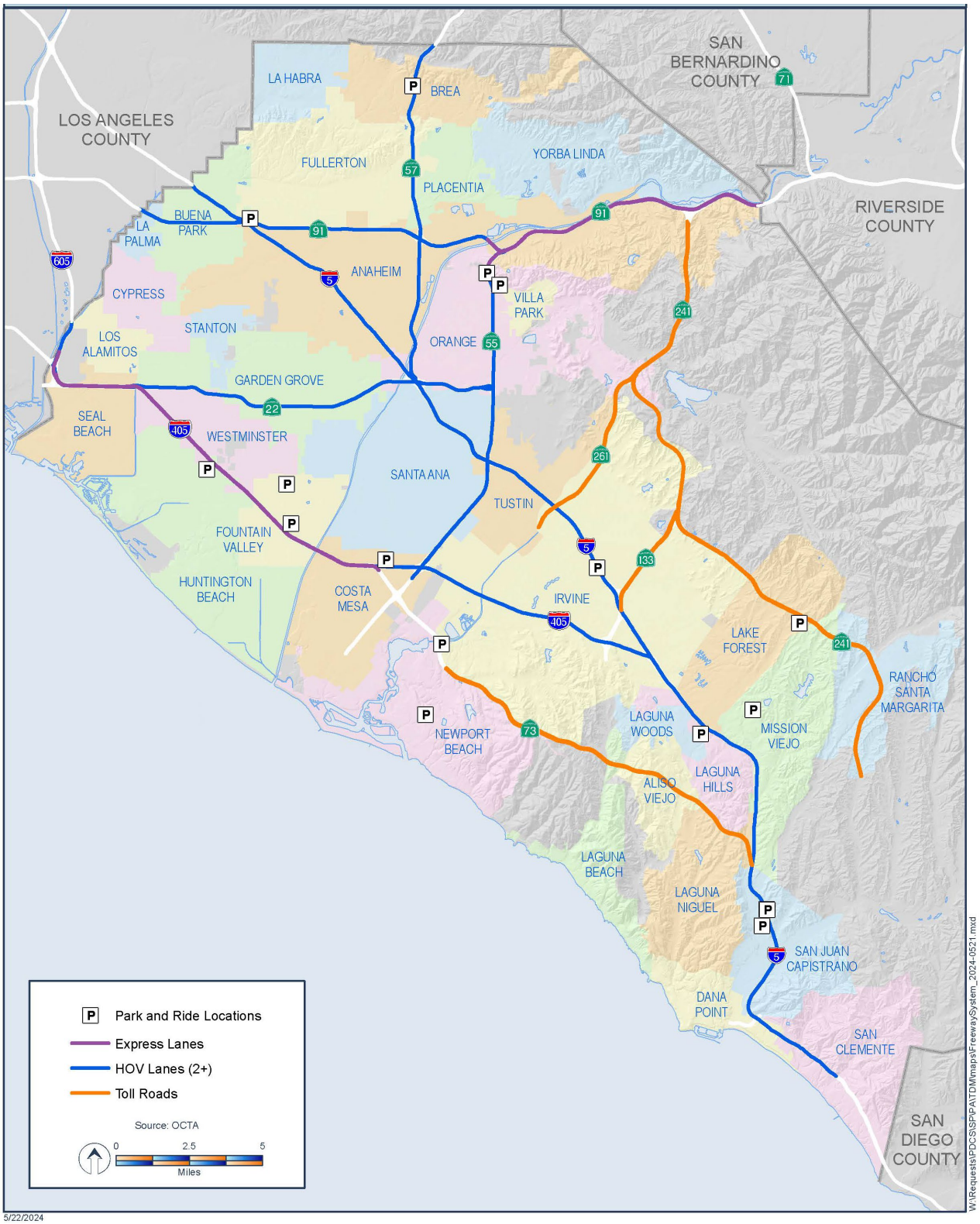
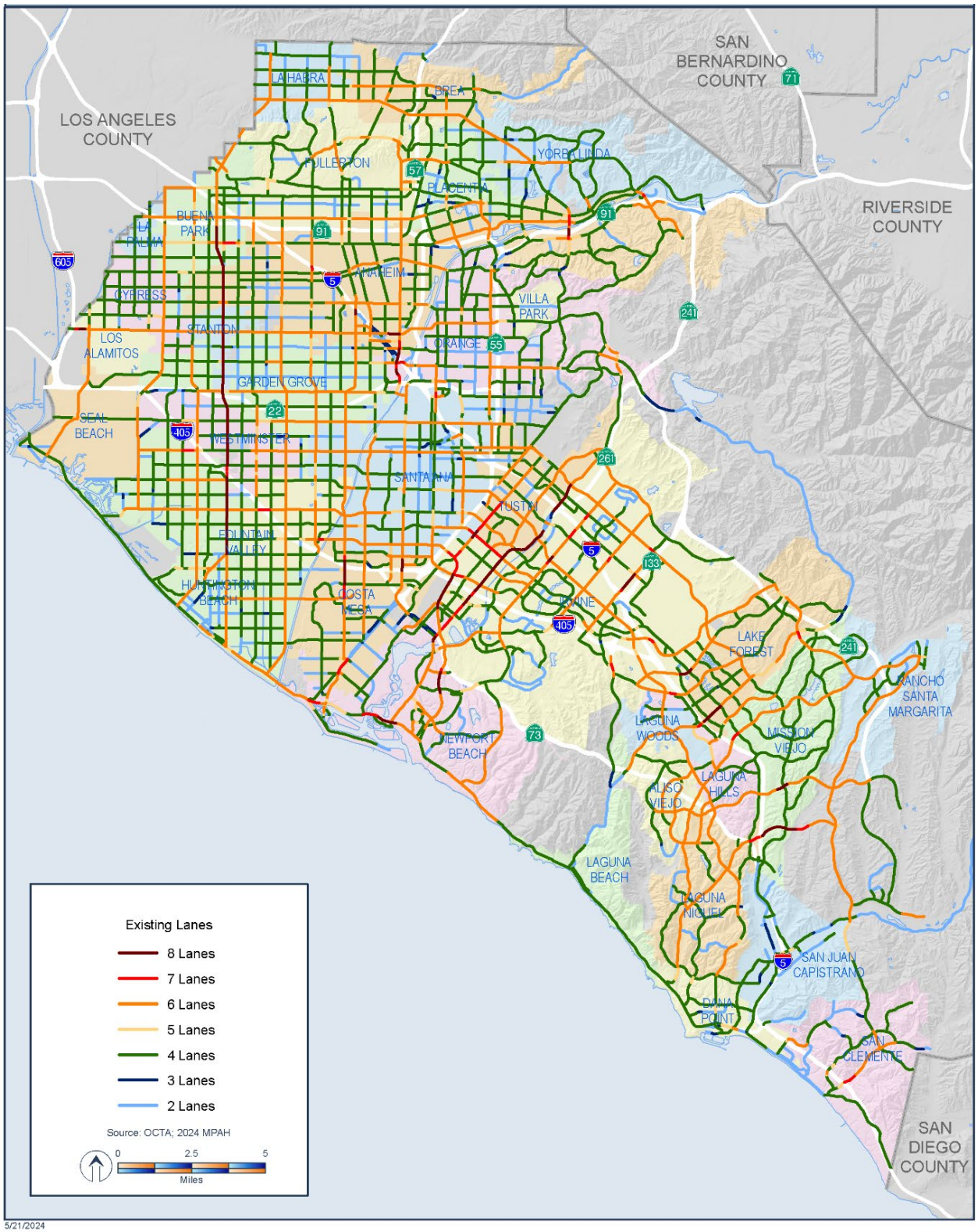


Figure 13 MPAH System



Bicycle Network

The existing bikeway network in the county includes Class I bike paths, Class II on-street bike lanes, Class III sharrows, and Class IV separated bike lane maintained by various agencies.

Figure 14 shows the existing bikeway network. Orange County is served by over 300 miles of Class I bike paths, or shared use paths, along river trails. These bikeway facilities are designed to accommodate a variety of users including pedestrians and bicyclists. Shared use paths are typically parallel to a roadway but physically separated from vehicular traffic. Shared use paths and greenways serve both a transportation purpose (like commuting to work/school) and recreational purpose. The Orange County OC Loop (OC Loop) vision is 66 miles of off-street paths that traverse 17 cities in the county providing opportunities for people to bike, walk and connect. Within a mile of its proposed route, the OC Loop serves about 650,000 residents and connects to 340,000 jobs[7], with sections including the Santa Ana River Trail, the San Gabriel River Trail, Pacific Coast Highway, and the El Cajon Trail.

Most of the roadway network has been developed primarily for auto use with high traffic volumes and speeds, which can discourage bicylists. In south Orange County, the bicycle network also presents many gaps and hilly terrain presenting additional challenges to riders.

Transit Network

Orange County is serviced by multiple transit agencies, including OCTA, Amtrak, and Metrolink, with much of the network concentrated in North and Central Orange County. **Figure 15** shows the transit network in Orange County.

A transportation center is typically served by several bus or rail lines where riders can transfer routes. They vary in sizes, amenities, and modes accommodated. The largest transit center in Orange County is the Anaheim Regional Transportation Intermodal Center (ARTIC). ARTIC is a multi-modal transportation hub providing connections from OCTA buses, Metrolink, Amtrak, Anaheim Resort Transit (ART), shuttle and charter bus service, taxis, bikes, and other private transportation services. OCTA operates other transportation centers throughout the County, including:

- Fullerton Transportation Center
- Goldenwest Transportation Center
- Laguna Beach Transportation Center
- Laguna Hills Transportation Center
- Newport Transportation Center

Figure 16 shows the existing High Frequency Corridors (as of February 2019) and the forecasted 2045 High Frequency Corridors, as defined by OCTA. High frequency corridors are corridors where fixed-route bus service is provided every 15 minutes (or more often) during peak commute periods. Most of the existing high frequency transit corridors are concentrated in the north and central parts of the County. South county cities have limited transit service with lower

[7] OCTA, "OC Loop", https://www.octa.net/getting-around/active/oc-bike/oc-loop/

service frequencies and a lower density network when compared to northern and central portions of the county.

Figure 13 Bikeway Network

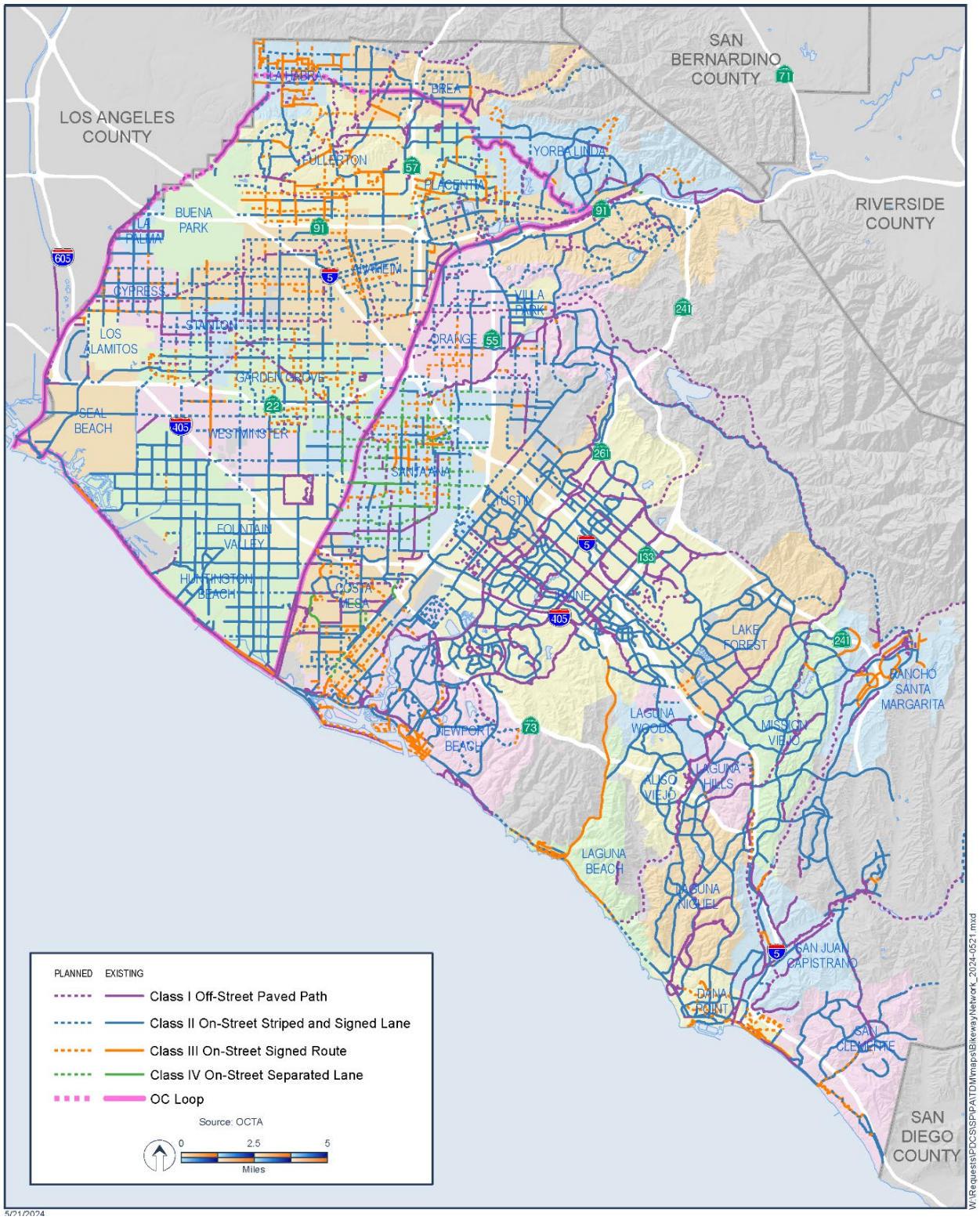


Figure 14 Transit Network

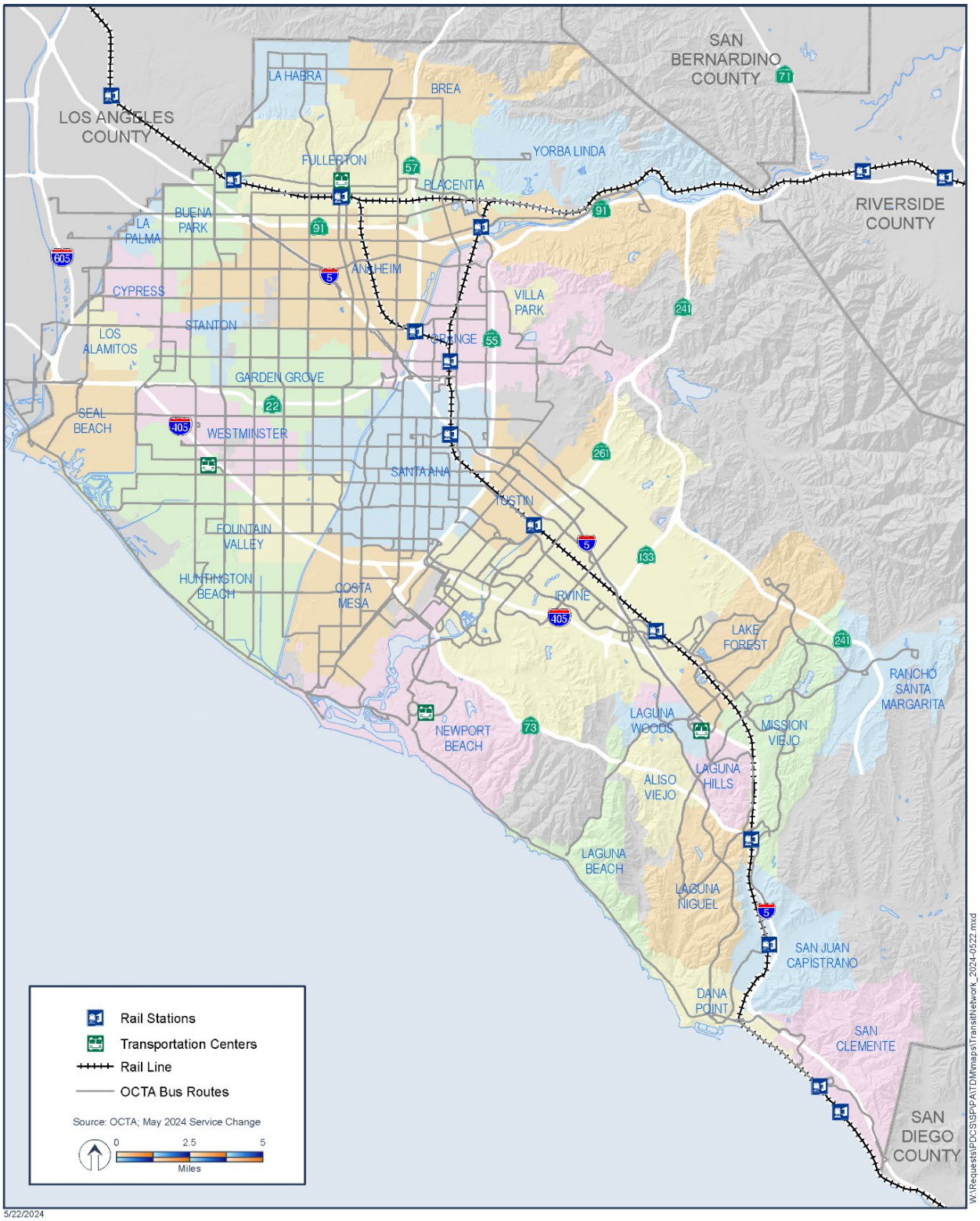
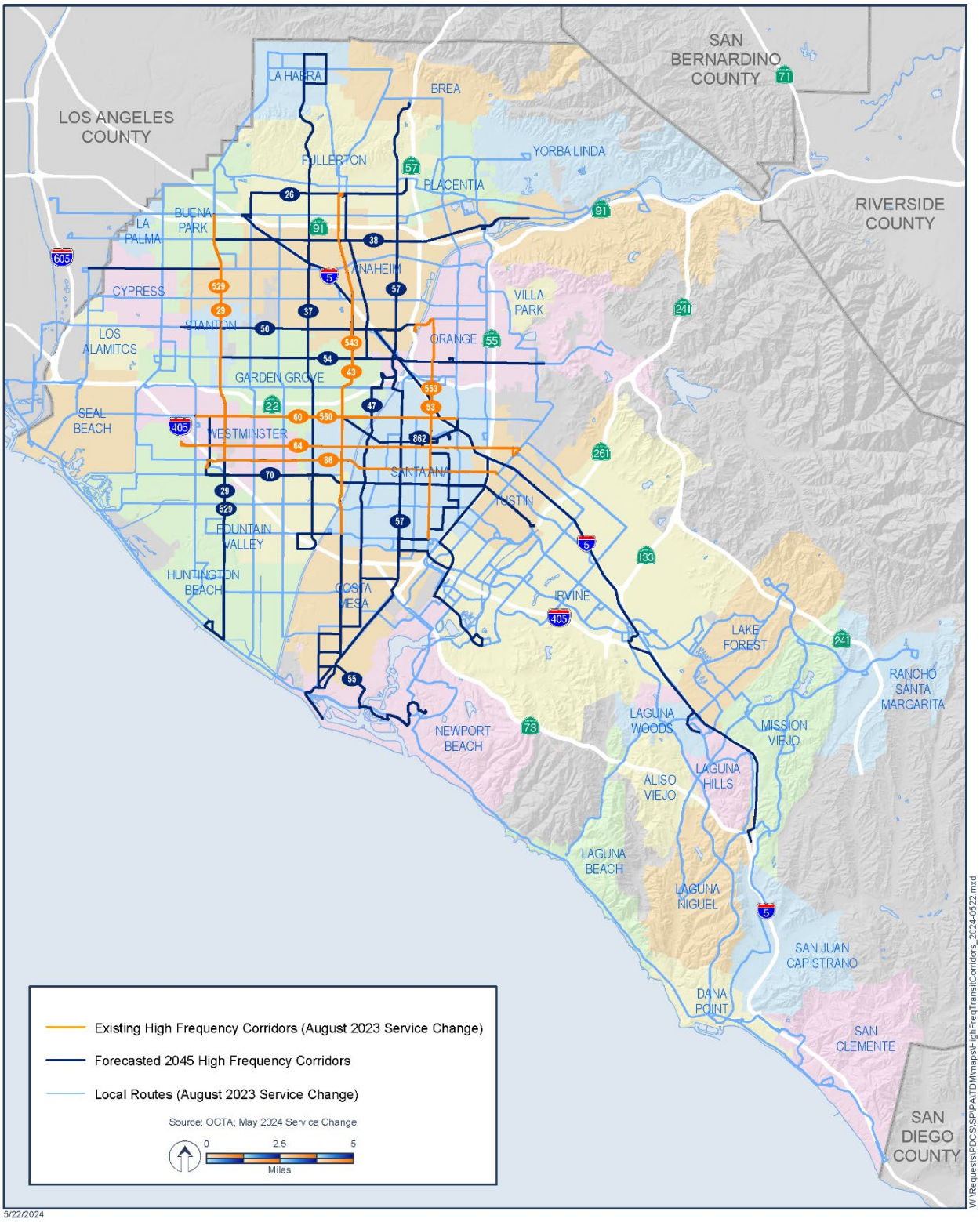


Figure 15 High Frequency Transit Corridors



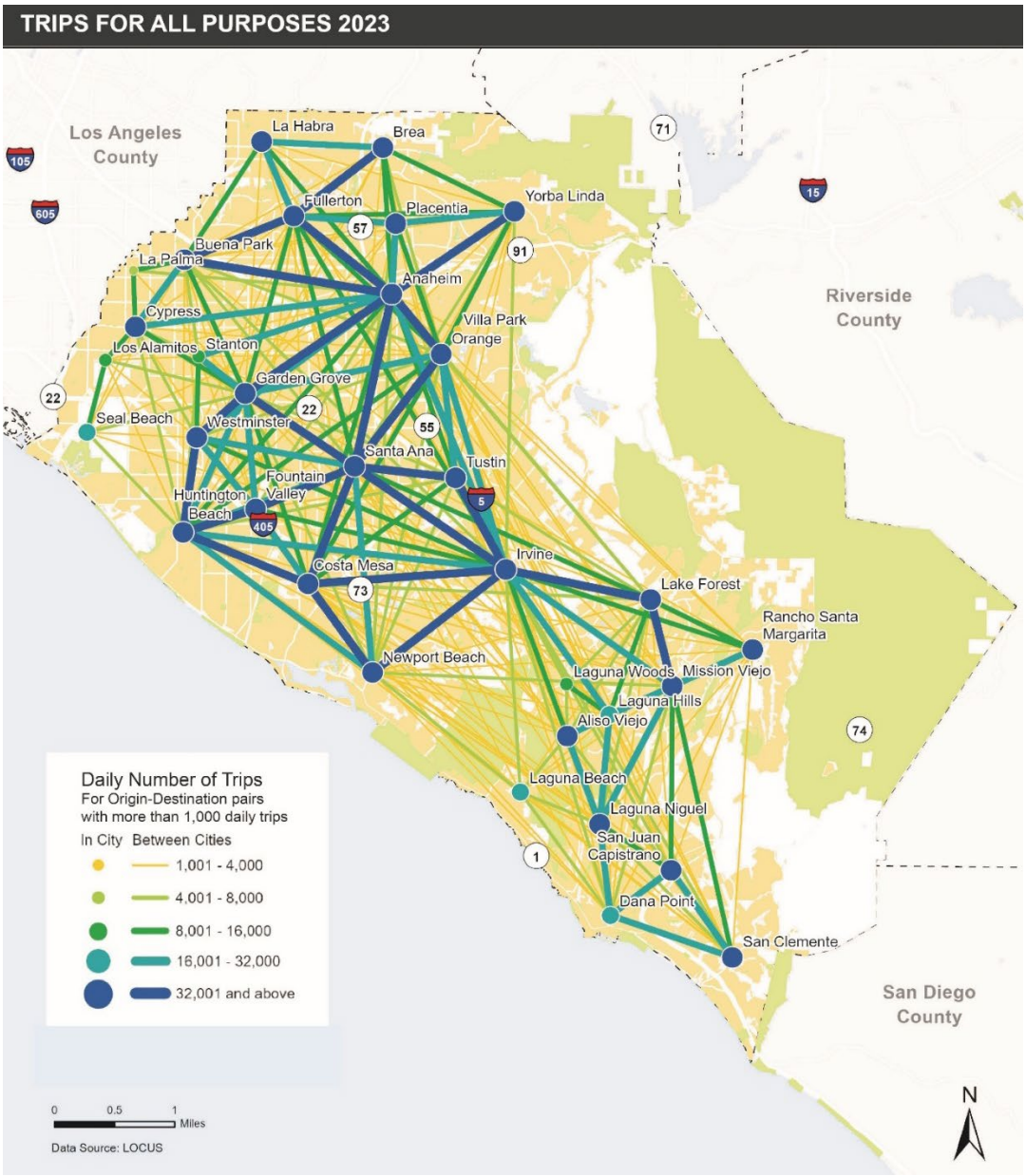
Travel Indicators and Patterns

This section discusses travel patterns in Orange County and vehicle miles traveled (VMT) trends in Orange County.

Daily Trips

The existing daily trips for all trip purpose types by automobile and modes (single occupant and multiple occupants) are shown in **Figure 17.** As shown in the figure, the highest concentration of trip pairings occurs in north and central Orange County.

Figure 17 Trips for All Purposes:



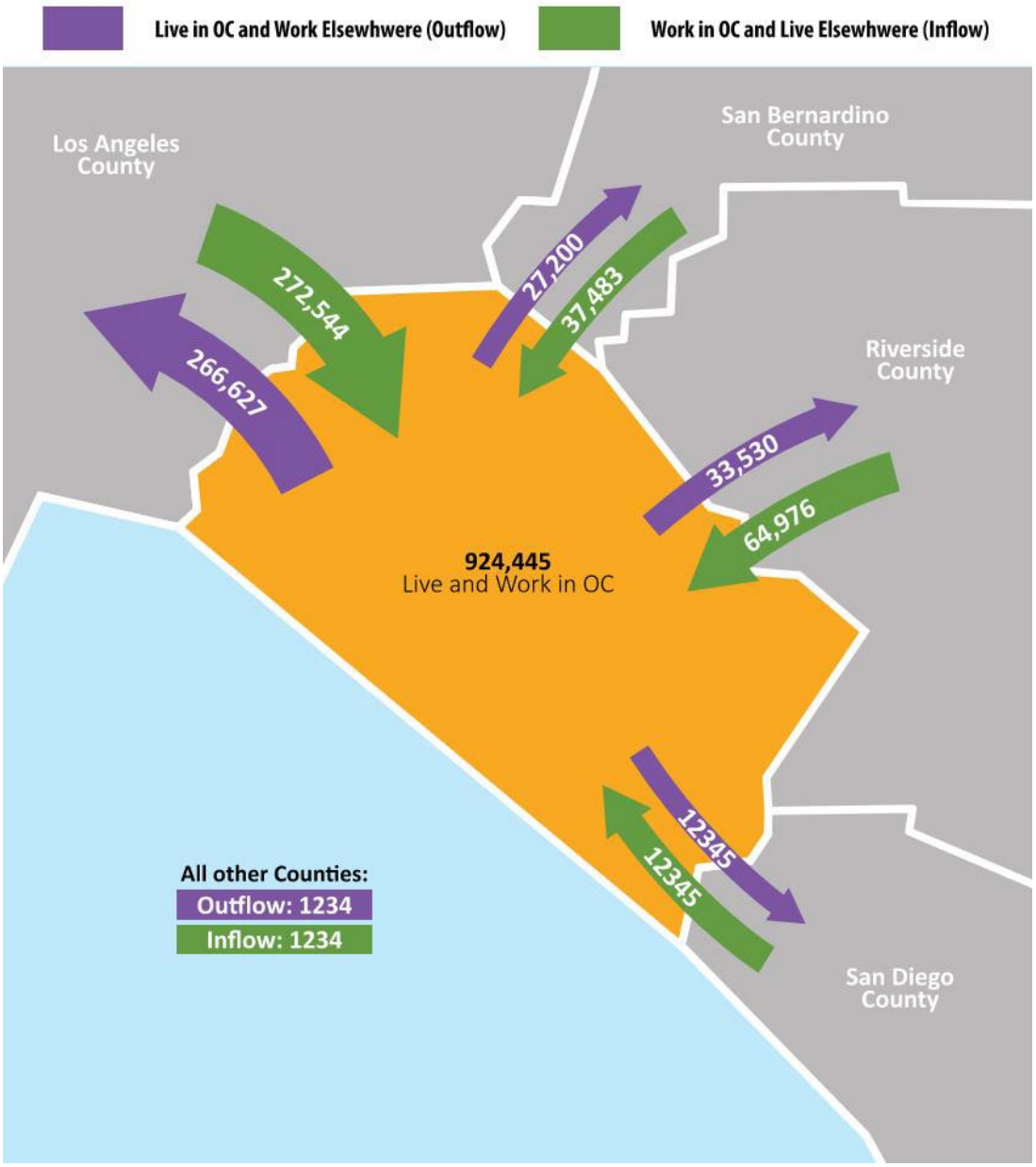
Source: OCTA OC Transit Vision (2024)

Inter and Intra-County Commuter Trips

As shown in **Figure 18**, Orange County sees more commute trips into Orange County than out. While trips to/from Los Angeles and San Diego Counties are relatively balanced, the number of inflow commuter trips from Riverside and San Bernardino significantly outpace outflow commuter trips to these counties. According to the OCTA LRTP, Directions 2045[8], Orange County will add 1 job for every 1.3 new residents (including non-workers) between 2019 and 2045. This is higher than the entire SCAG region, which is expected to add 1 job for every 2.2 residents.

[8] https://www.octa.net/pdf/LRTP_Directions2045_Final_noAppendix.pdf

Figure 18 Intercounty Commuting Patterns



Source: OCTA Directions 2045 Long Range Transportation Plan (2023)

Vehicle Miles Traveled

Vehicle Miles Travelled, or VMT, is a metric that provides a measure of the total number of miles traveled by a vehicle in a timeframe. VMT is often used to identify area wide or regional travel patterns. It is a useful metric in determining where resources are needed and assess policies designed to encourage the use of public transit and other sustainable modes. For this analysis, VMT is provided as an efficiency metric (VMT per capita and VMT per employee) on a daily basis. VMT per capita and VMT per employee are calculated as the total VMT by the respective user groups divided by the total population or total employment in an area.

Figure 19 and **Figure 20** show the average VMT per capita and the average VMT per employee, respectively. Takeaways include:

- Much of the County exceeds the county average VMT per capita, especially in the southern and the northeastern parts of the county. Central Orange County, including City of Santa Ana, tends to be below the county average VMT.
- In general, the areas east of SR-55 and north of I-5 exceed the County average VMT per employee. The areas below average county VMT are mostly located in central and northwest Orange County including parts of Cities of Santa Ana and Garden Grove.

Figure 19 Average VMT Per Capita by TAZ

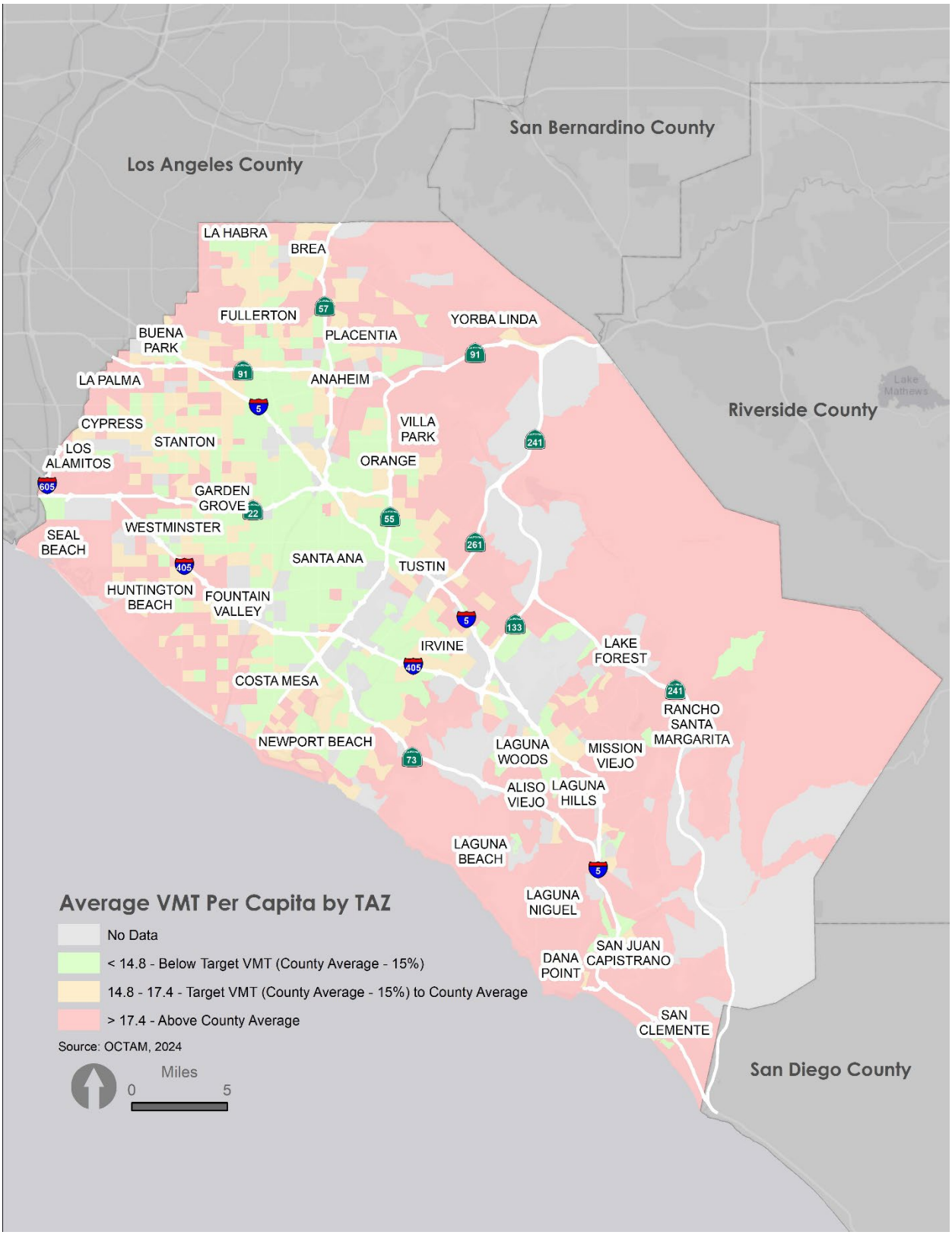


Figure 16 Average VMT Per Employee by TAZ