6 TRANSIT PROPENSITY AND MARKET ANALYSIS

This analysis of current and future travel patterns and demand for transit service in Orange County considers the following factors:

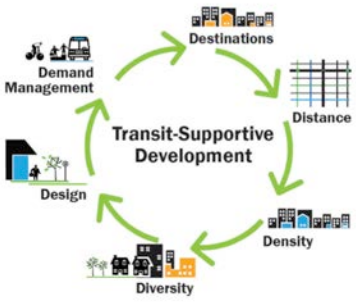
- Land use and the built environment, including current and future land uses, current and future population and employment density, and other major trip generators (colleges and universities, for example)
- Demographics
- Travel patterns and transit demand, including origins and destinations for all modes as well as assessment of transit demand based on regression analysis of the factors most indicative of transit propensity in Orange County

First, however, a brief overview of factors influencing transit demand.

TRANSIT DEMAND FACTORS

Population and employment density, land use diversity, urban design, regional destinations, and distance to quality transit are key factors influencing transit demand. Demand management (pricing, incentives, and other information-based programs) is also an important factor. Referred to as the "6Ds," these factors influence both transit demand and transit success in Orange County.

Figure 6-1 The "6 Ds" of Transit Demand

6D Factor	Principle	
Destinations	Align major destinations along reasonably direct corridors served by frequent transit	
Distance	Provide an interconnected system of pedestrian routes so that people can conveniently access transit	
Density	Concentrate higher densities close to frequent transit stops and stations and multimodal nodes	
Diversity	Provide a rich mix of pedestrian-friendly uses to support street-level activity throughout the day and night	
Design	Design high-quality pedestrian friendly spaces that connect people seamlessly to transit	
Demand Management	Provide attractive alternatives to driving by managing parking, providing incentives not to drive, and/or providing programs to help educate people about driving alternatives	

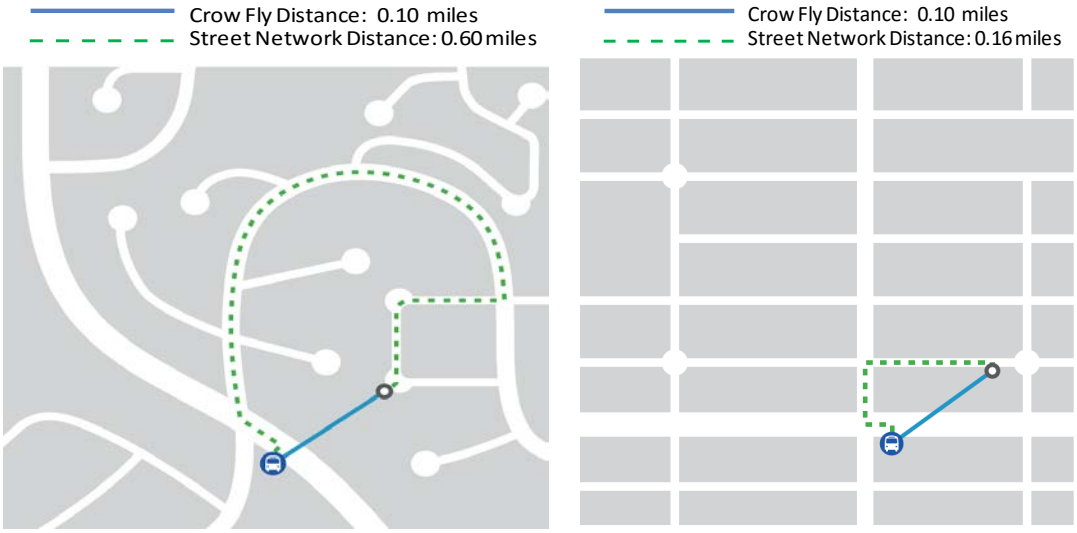
Destinations

People are more likely to choose transit when it conveniently takes them where they want to go. At present, OCTA serves most major destinations in Orange County. However, service is often infrequent, slow, or unreliable.

Distance

Both street connectivity and block length strongly influence people's likelihood of walking or biking to transit. Interconnected streets in a grid pattern tend to shorten distances between transit stops and destinations. Neighborhoods where all roads connect to arterials or collector streets allow transit customers to reach bus stops without walking out of their way, and provide more efficient routing options that support high-frequency service (see Figure 6-2). In addition to being important indicators of effective distance to transit, block length and street network connectivity are often used in transportation research as proxies for design quality. Short blocks and well-connected streets contribute to a higher-quality pedestrian experience and pedestrian realm, and they often occur in places where other elements of good design, such as adequate sidewalks, are also in place.

Figure 6-2 Street Network Design and Walk Distances to Transit



A disconnected street network (shown at left) with long blocks and indirect streets results in long walking distances and less efficient transit operations. A well-connected street network (shown at right) enables shorter, more direct walking connections and is easier to serve cost-effectively with transit.

Source: TransLink Transit Oriented Communities (2011)

The grid-like street pattern in parts of northern Orange County supports easy and comfortable access to transit (see Figure 6-2). However, in many newer areas—including much of South County—pedestrian connections to streets suitable for attractive transit are very limited.

Density

Population and employment densities determine how many people can access transit. By extension, they also strongly influence the amount of service that will be required, and in turn, the types of riders who will use transit. Infrequent service is inconvenient, and will largely serve residents and

workers who, for one reason or another, cannot drive. Frequent service, conversely, is convenient, and attracts many who choose to take transit. While frequent service is clearly desirable, service levels must match demand to constrain operating costs and to avoid running empty buses.

Diversity

Typical suburban zoning separates land uses, sets maximum densities and minimum lot sizes, and usually contains explicit regulations such as bulk and height limits and minimum parking requirements. This approach encourages automobile use and discourages transit use.

Mixed-use development, which reverses this approach, is again becoming more popular as it creates a more interesting environment. It also encourages transit, walking, and bicycling, and focuses much less on cars and parking. Mixed-use development also generates all-day activity in walkable environments that can be well served by transit.

Design

People will not use transit if it is difficult or dangerous to use. Safe and accessible streets are essential to ensure that people will be able to access transit easily and feel safe doing so. Transit stops and stations must also be attractive and clean and, at the very least, include amenities like benches, trash cans, and schedules. As OCTA plans for future investments in transit, coordination with cities to prioritize safe bicycle and pedestrian access will be required. A framework to invest in transit station amenities at high-demand stops also will be important to build demand.

Orange County has recently taken an important step toward higher-quality street design through the Orange County Council of Governments Complete Streets Initiative, which includes new guidelines for transit-oriented street design.

Demand Management

Demand management measures encourage transit use and discourage driving. OCTA already provides the C-Pass, U-Pass, and Perk Pass to encourage more students and employees to ride transit. However, the region needs a comprehensive transportation demand management program that works with employers and residents to provide transit-related information and incentives.

LAND USE AND BUILT ENVIRONMENT

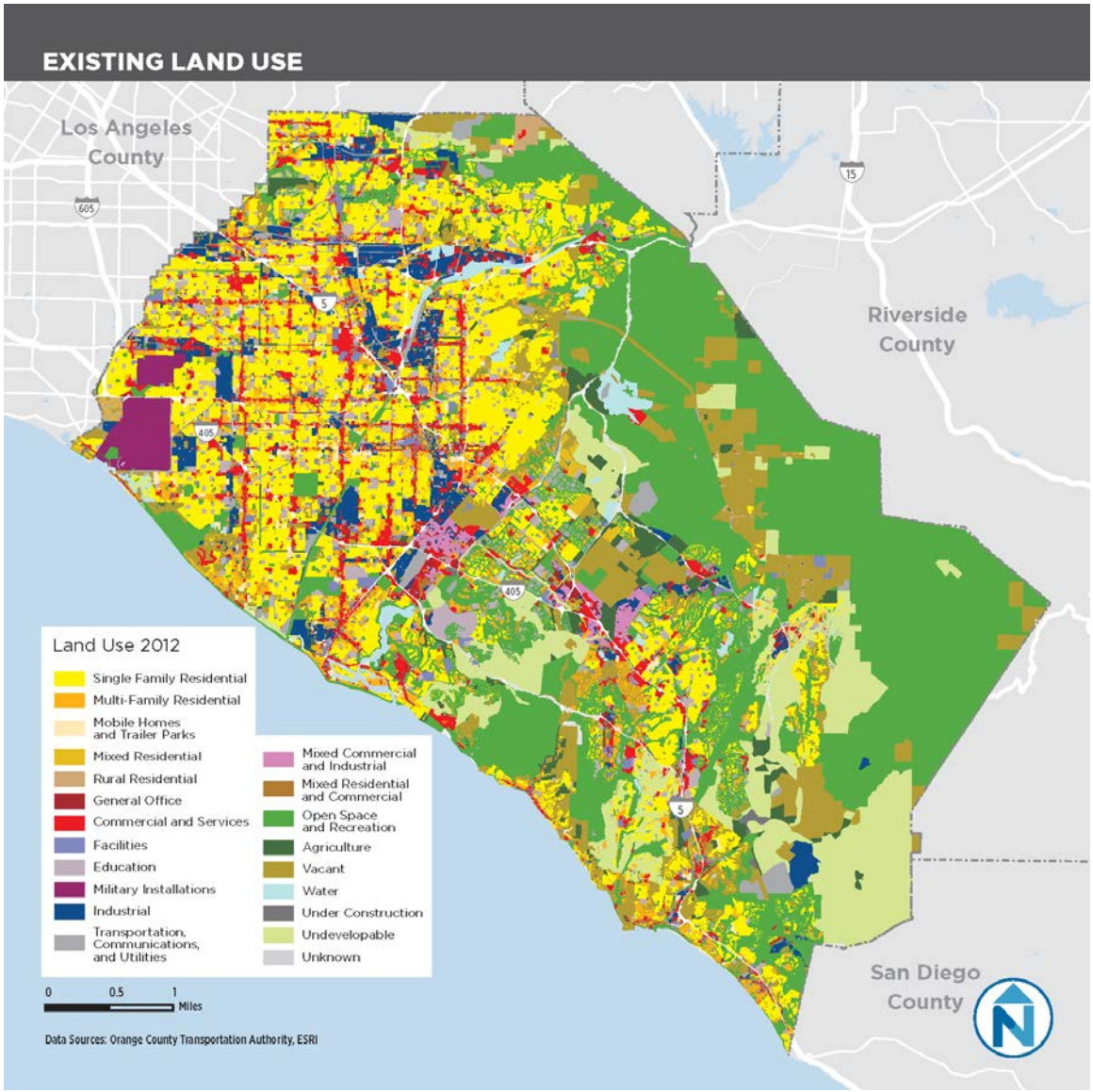
Like many areas of the United States that have developed rapidly since the 1940s, Orange County evolved around the car, with commercial development located primarily in business parks and residential development located largely in single-family subdivisions. In the last few decades, the county and Southern California as a whole have experienced significant demographic shifts that influence land use patterns. Compared to the postwar era, a smaller percentage of households have younger children at home, and the number of households without children is dramatically increasing. The housing market is expected to reflect these trends, increasing demand for smaller-lot single-family homes and multifamily housing closer to jobs, shopping, transit, and other destinations.[1]

Current Land Use

Today, single-family homes constitute the largest active land use in Orange County, covering 22 percent of the county. It is the dominant land use in the northern half of the county, supported by commercial businesses on an arterial grid network conducive to transit. Potentially rich transit markets such as multifamily housing and mixed-use properties tend to be clustered throughout the county, making those centers easier to serve by transit. In contrast to the built-up nature of the northern half of the county, South County is predominately open space, recreational space, and vacant and undevelopable land that does not generate significant transit demand. Where active land uses such as single-family homes occur in South County, development patterns are far more segregated than in the northern half, representing a disjointed patchwork as opposed to a filled-in grid. Existing land use throughout the county is shown in Figure 6-3.

[1] SCAG Regional Transportation Plan/Sustainable Communities Strategy, 2016.

Figure 6-3 Existing Land Uses (2012)



Future Land Use

The 2011 Orange County Sustainable Communities Strategy (SCS) is the county's most recent comprehensive transportation and land use plan. (As explained in Chapter 3 and below, it was later incorporated into the regional SCS developed by the Southern California Association of Governments). The following are key findings from the SCS:

- In recent decades Orange County has transformed from a suburban collection of bedroom communities to one of the most densely populated areas in the United States. Orange County is the most densely populated county in the SCAG region and has the highest residential density per square mile.
- Jurisdictions projected to experience the most population growth between 2008 and 2020 include Anaheim, Brea, Tustin, Irvine, and unincorporated areas.
- A majority of forecasted growth in these areas is expected to occur as a result of approved entitlements for large residential developments such as La Floresta in Brea, the Great Park in Irvine, and the Platinum Triangle in Anaheim.
- While population growth will occur in vacant areas, increased density will be most prevalent in established urban cores through infill, reuse, and mixed-use developments. These development patterns will result in more efficient land use, fostering improved environments for transit and non-motorized travel.
- Housing growth is projected to occur in and around areas forecast for increased employment growth. This will create opportunities to link housing at a human scale, increasing the propensity for transit and use of alternative modes for commute travel.
- Employment centers in the county are increasingly looking to locate near transit stations. Major employment growth was projected to occur near Fullerton, Buena Park, Tustin, and around the Irvine Spectrum and Anaheim Canyon, all near Metrolink rail stations, or high frequency bus corridors.
- As mixed uses develop in these emerging employment nodes centered on transit stations, social and commercial needs once satisfied only by private car will be met by walking, cycling, and transit.

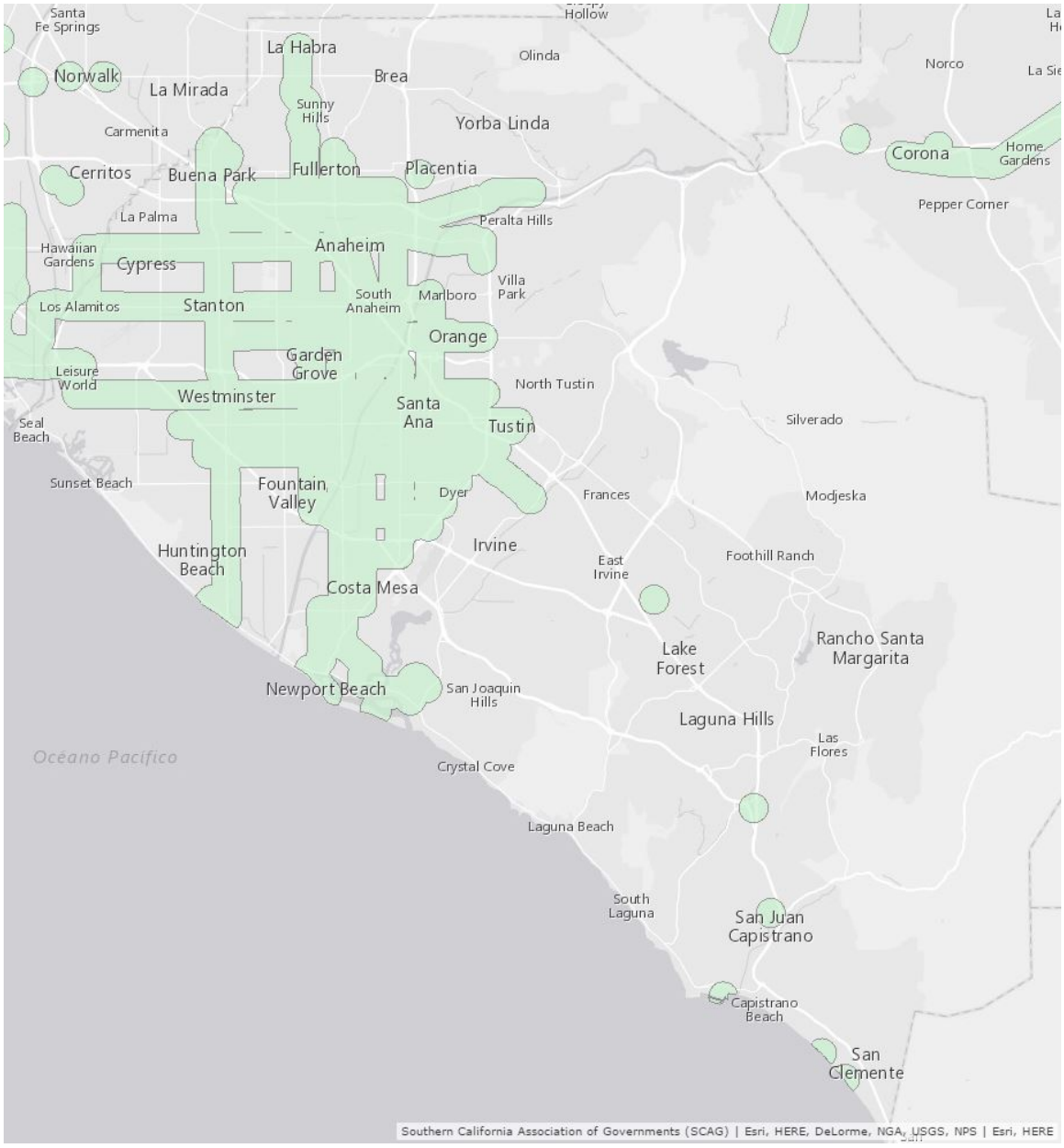
The 2016-2040 SCAG Regional Transportation Plan/Sustainable Community Strategy (2016 RTP/SCS) includes elements of the 2011 Orange County SCS. Recognizing that future growth and transportation investment must be linked, with special emphasis on improving access between housing and jobs, the plan identifies high-quality transit areas (HQTAs) in which to focus both infill development and investment. Consistent with state guidance, the plan defines HQTAs as areas within one-half mile of a fixed guideway transit stop, a ferry terminal served by either bus or rail service, or a bus corridor with headways of 15 minutes or less during peak commute hours.

While HQTAs account for only three percent of total land area in the SCAG region, they are projected to accommodate 46 percent of the region's future household growth and 55 percent of future employment growth. Today, 17 percent of households and 26 percent of jobs in Orange County are within HQTAs. HQTAs in Orange County as projected for the year 2040 are mapped in Figure 6-4.

- Given existing high-frequency bus corridors, HQTAs are projected to form a strong grid in the core urban areas of the northern half of the county. While changes are regularly made to OCTA service, there has been little change over the years to corridors with high-frequency service, which are primarily located in the north of the county.

- With the exception of Newport Beach, HQTAs in South County are confined to half-mile buffers around Metrolink stations in communities such as Irvine, Laguna Niguel, San Juan Capistrano, and San Clemente.
- The Dana Point Harbor in South County qualifies as an HQTA because it provides ferry service to Catalina Island and is served by OCTA bus service.

Figure 6-4 High Quality Transit Areas (2040)



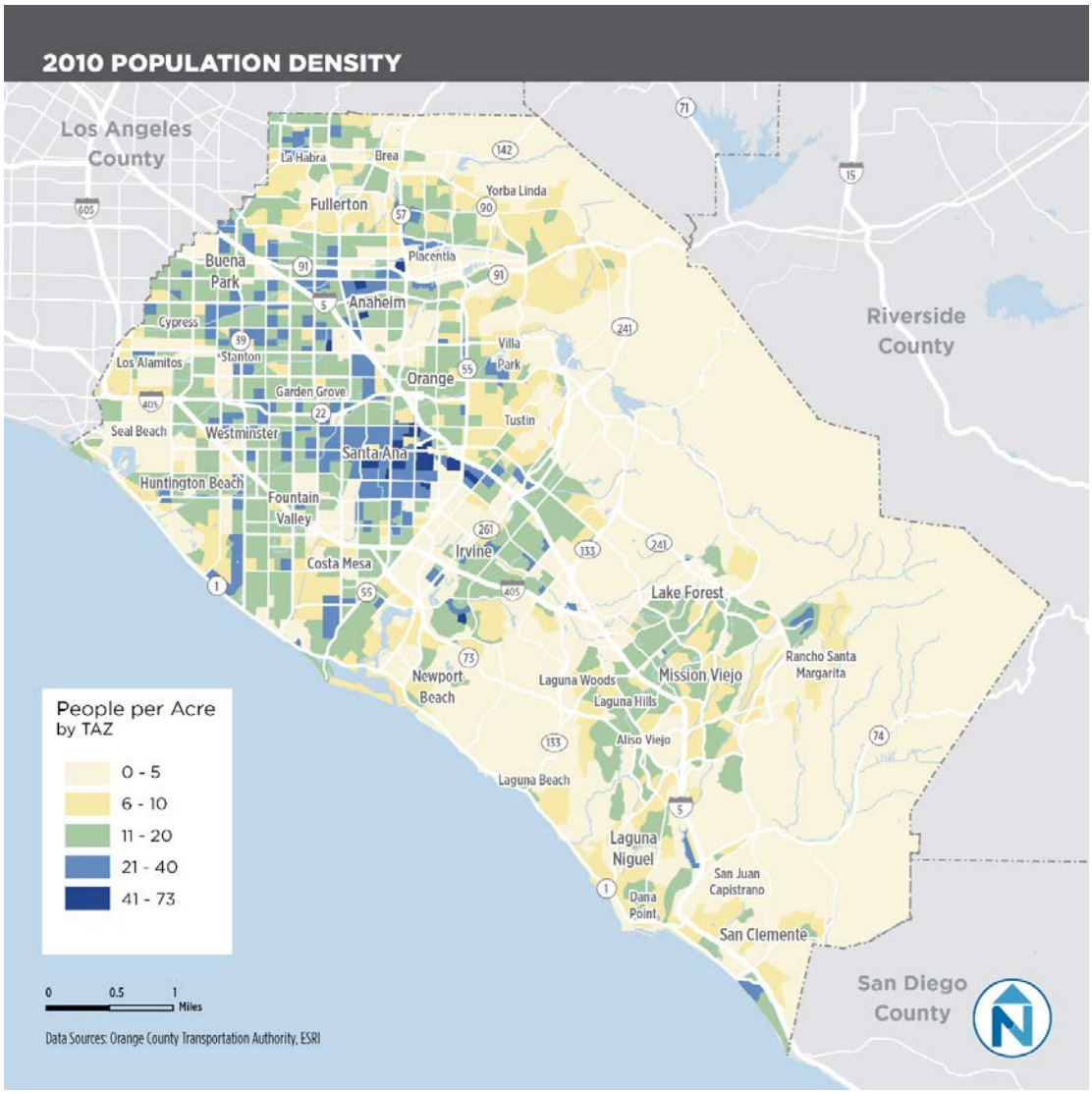
Source: Southern California Association of Governments (SCAG)

Current Population and Employment Density

The population of Orange County is just over 3 million people, making it the third most populous county in California following neighboring Los Angeles and San Diego Counties. At present, more than 1.3 million wage and salary jobs exist throughout the county. Existing (2010) countywide population density is shown in Figure 6-5. Key findings include the following:

- Population density is considerably higher in the northern half of the county.
- The highest population density areas are found throughout Santa Ana and in Anaheim along the state Route 91 corridor.
- Areas with the lowest population densities are primarily a result of geographic constraints (mountains) or restrictive land uses such as the Seal Beach National Wildlife Refuge and John Wayne Airport.

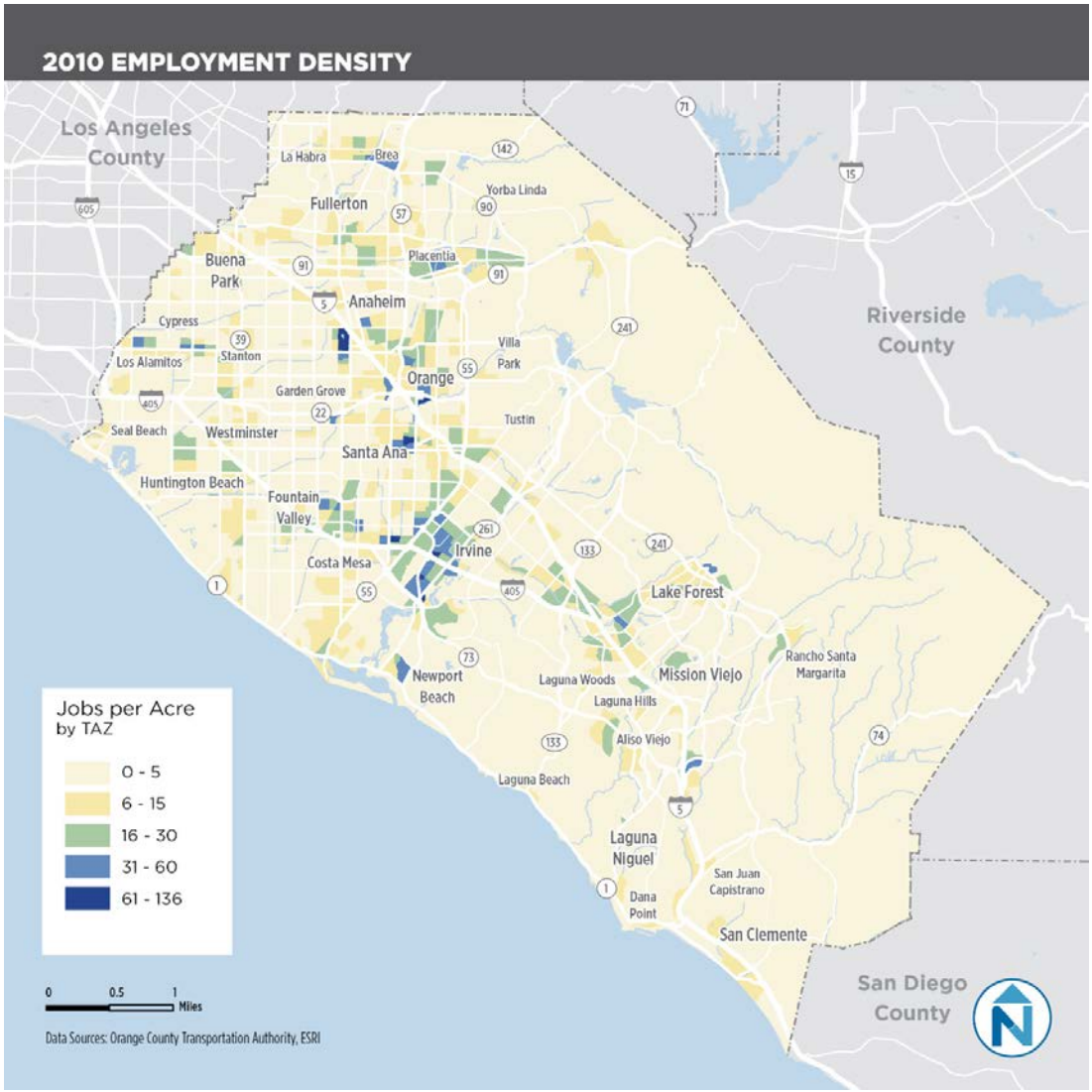
Figure 6-5 Existing Population Density (2010)



Existing (2010) countywide employment density is shown in Figure 6-6. Key findings include the following:

- Countywide, nodes of high employment density are more confined than nodes of high population density.
- As with population density, employment density is greater in the northern half of the county.
- Because centers of high employment density are more clustered than areas of high population density, these nodes may be easier to serve by transit.
- The Irvine Business Complex and the area directly south of John Wayne Airport along MacArthur Boulevard has some of the highest employment densities in the county despite having relatively low population density.
- Other nodes of high employment density include major activity sites such as Disneyland, the MainPlace mall, Brea Mall, Newport Center (Fashion Island), and Downtown Santa Ana.

Figure 6-6 Existing Employment Density (2010)



Future Population and Employment Density

Over the next two decades SCAG forecasts the population of Orange County to grow to over 3.6 million people, representing an increase of more than 21 percent between 2010 and 2035. Likewise, total wage and salary jobs are forecasted to reach almost 2 million, an increase of approximately 47 percent between 2010 and 2035. Projected population density and change are shown in Figure 6-7 and Figure 6-8. These figures illustrate the following:

- Neighborhoods with major projected increases in population density are fairly limited. Exceptions include the Platinum Triangle in Anaheim, Laguna Altura and Cypress Village in Irvine, Westside in Costa Mesa, and Downtown Fullerton.
- Areas with low existing population density projected to see moderate growth include the western side of State Route 241 north of Lake Forest and State Route 74 corridor near Rancho Mission Viejo in the southern half of the county.
- Patterns of projected population density, particularly in areas with the highest density, are relatively unchanged from existing patterns.
- As with existing population density, areas with the highest projected population density are found throughout Santa Ana and in Anaheim along State Route 91.
- The Platinum Triangle in southeast Anaheim (surrounding Angel Stadium and Anaheim-ARTIC Station) is projected to transition from low to medium existing population density to higher density.

Figure 6-7 Projected Population Density (2035)

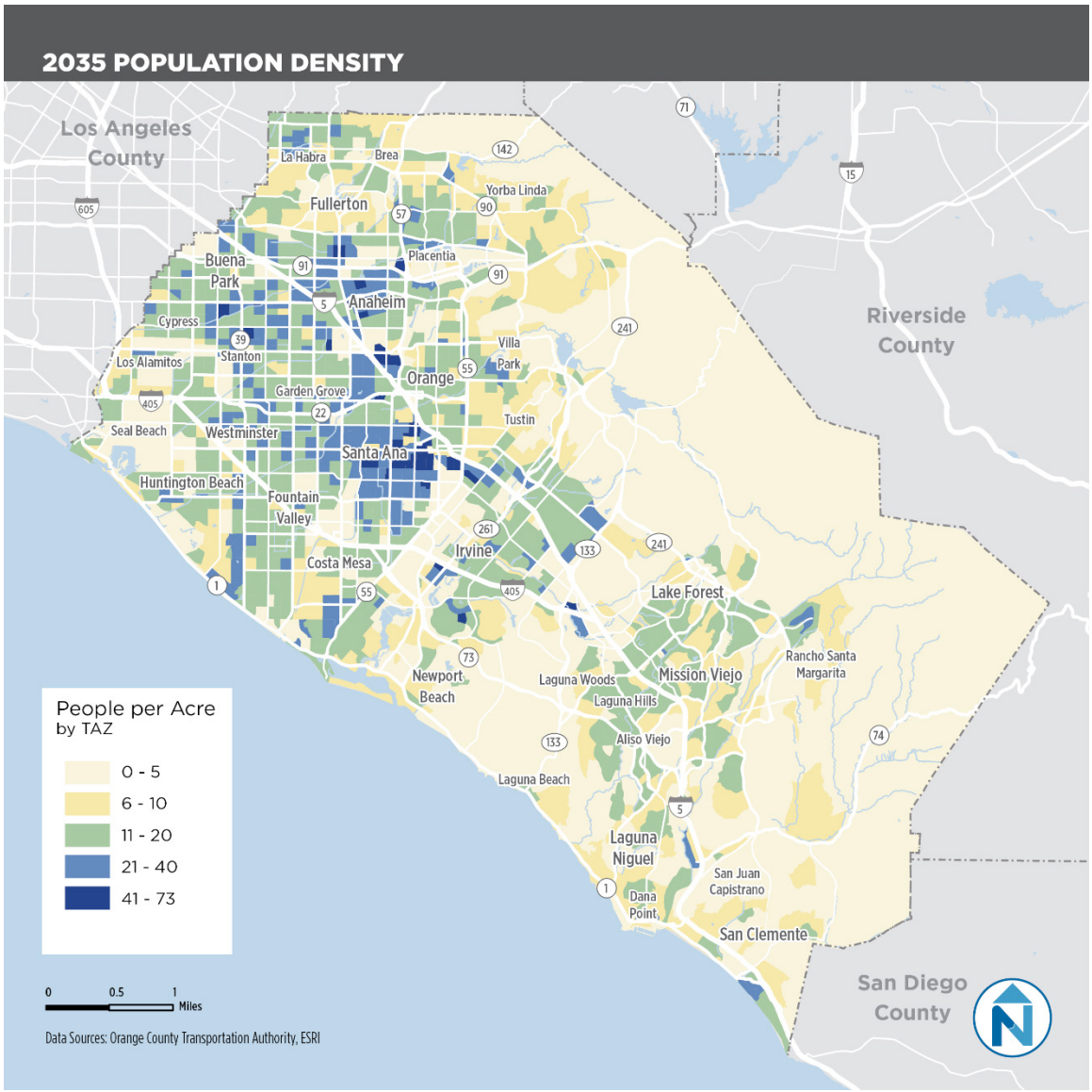
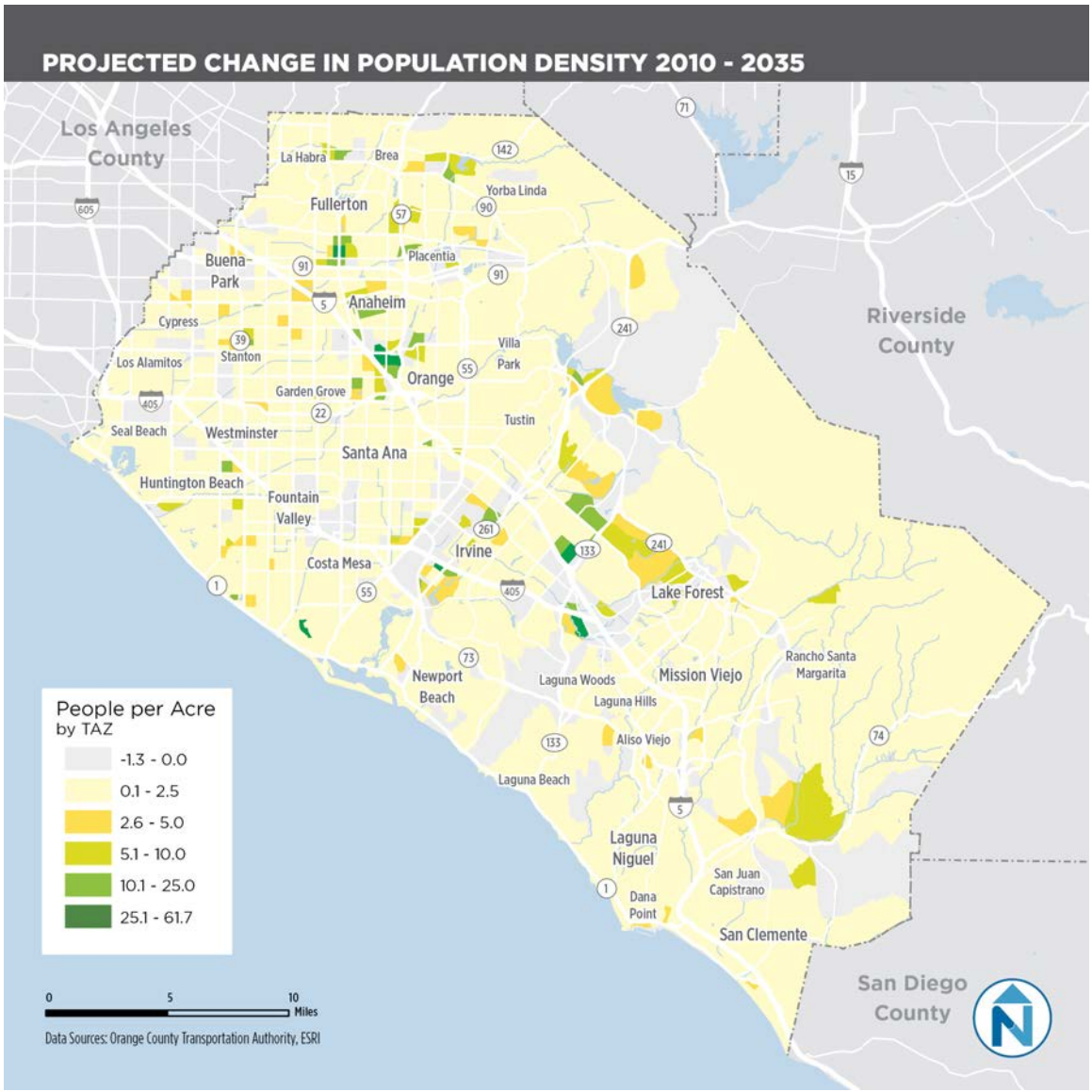


Figure 6-8 Projected Change in Population Density (2010 – 2035)



Projected (2035) employment density and change (2010-2035) are shown in Figure 6-9 and Figure 6-10, respectively. These maps illustrate the following findings:

- To a higher degree than population density, patterns of projected employment density are relatively unchanged from existing patterns.
- Areas with the highest projected employment density include the Irvine Business Complex, Downtown Santa Ana, and major activity sites like Disneyland and large shopping centers.
- Areas with low employment density projected to transition to medium or high density include the Platinum Triangle, southeastern Irvine around the Irvine Medical and Science Complex, and less developed areas surrounding UC Irvine and the Irvine Business Complex.
- Areas with major projected increases in employment density are limited, with the exception of the areas highlighted previously: the Platinum Triangle and areas near the Irvine Business Complex, UC Irvine, and the Irvine Medical and Science Complex.

Figure 6-9 Projected Employment Density (2035)

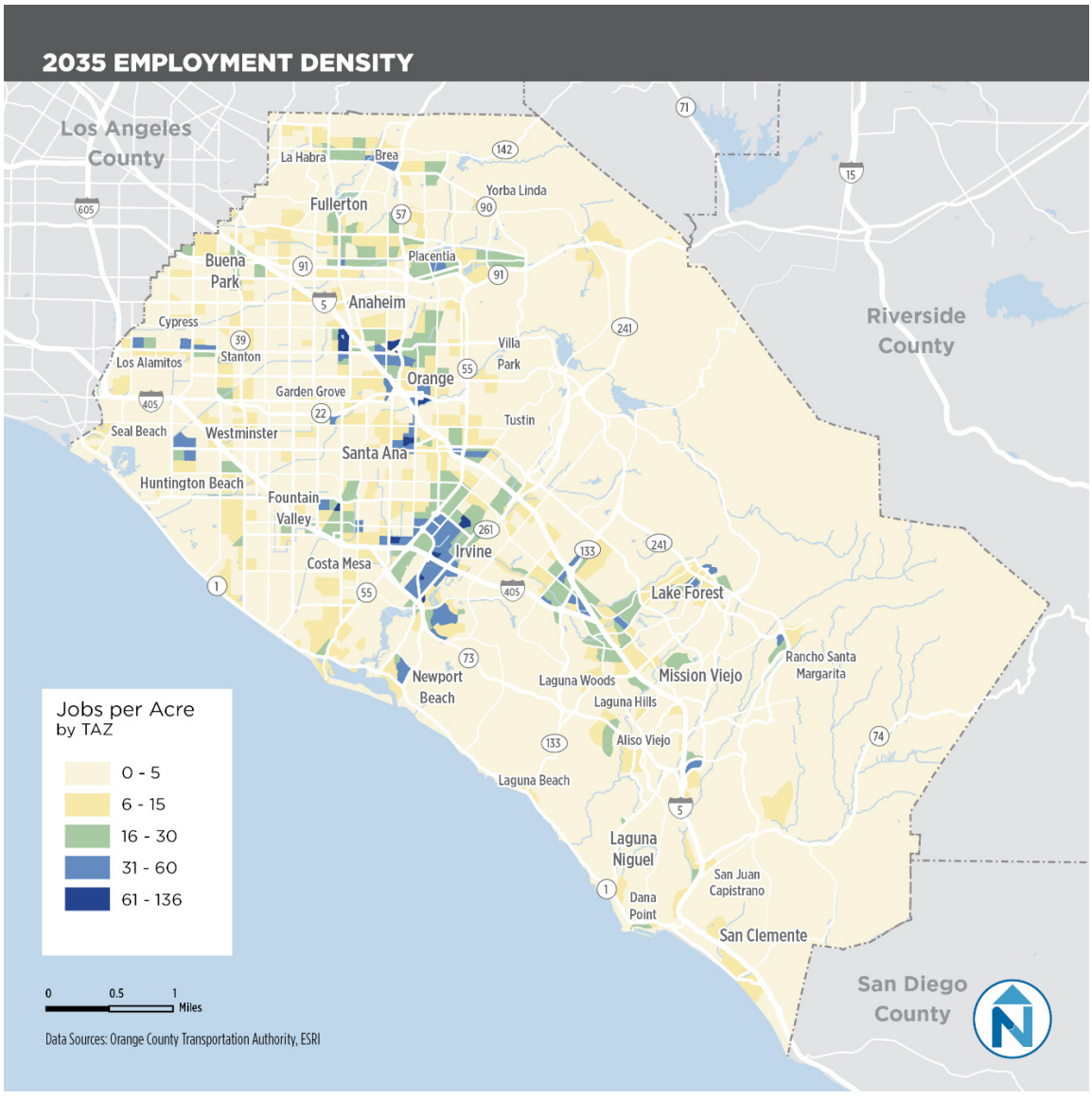
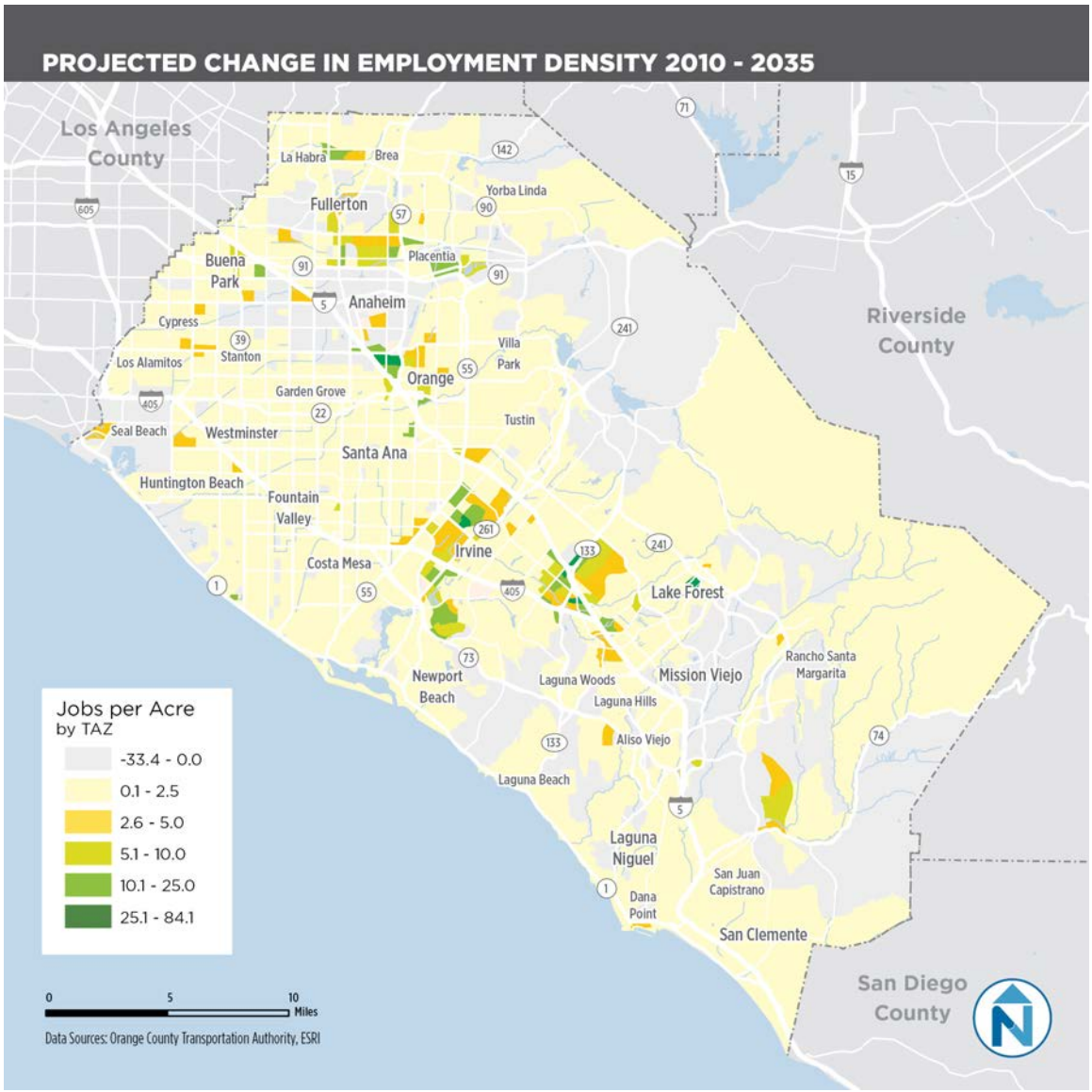


Figure 6-10 Projected Change in Employment Density (2010 – 2035)



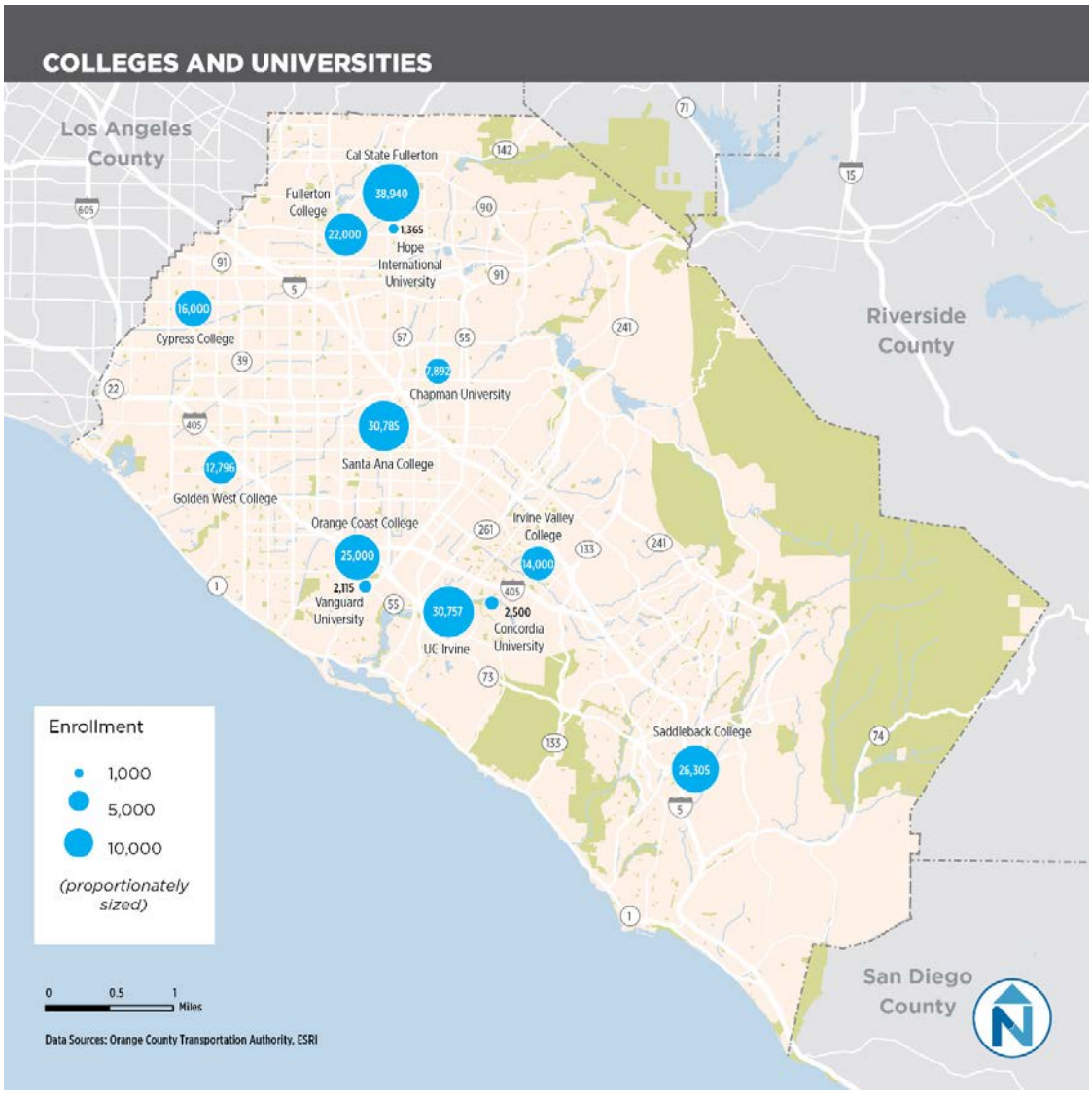
Other Trip Generators

Colleges and Universities

Orange County is home to numerous universities, colleges, and community colleges, which are major employment centers. However, with their generally young and lower-income student bodies, these institutions represent a major potential source of transit ridership beyond employees. College and university transit ridership can be further increased when the transit operator partners with a school to provide discounted fares, as OCTA has done in many cases, or when campuses offer their own service such as UC Irvine's Anteater Express shuttle. Colleges and universities also generate all-day demand for transit—well beyond the peak hours—although demand fluctuates seasonally.

As shown in Figure 6-11, the location of major colleges and universities in Orange County corresponds to areas of higher population density in the northern half of the county. Large institutions with enrollments of over 20,000 students include Cal State Fullerton and Fullerton College in Fullerton, Orange Coast College in Costa Mesa, Santa Ana College in Santa Ana, UC Irvine in Irvine, and Saddleback College in Mission Viejo.

Figure 6-11 Major College and Universities



Major Retail

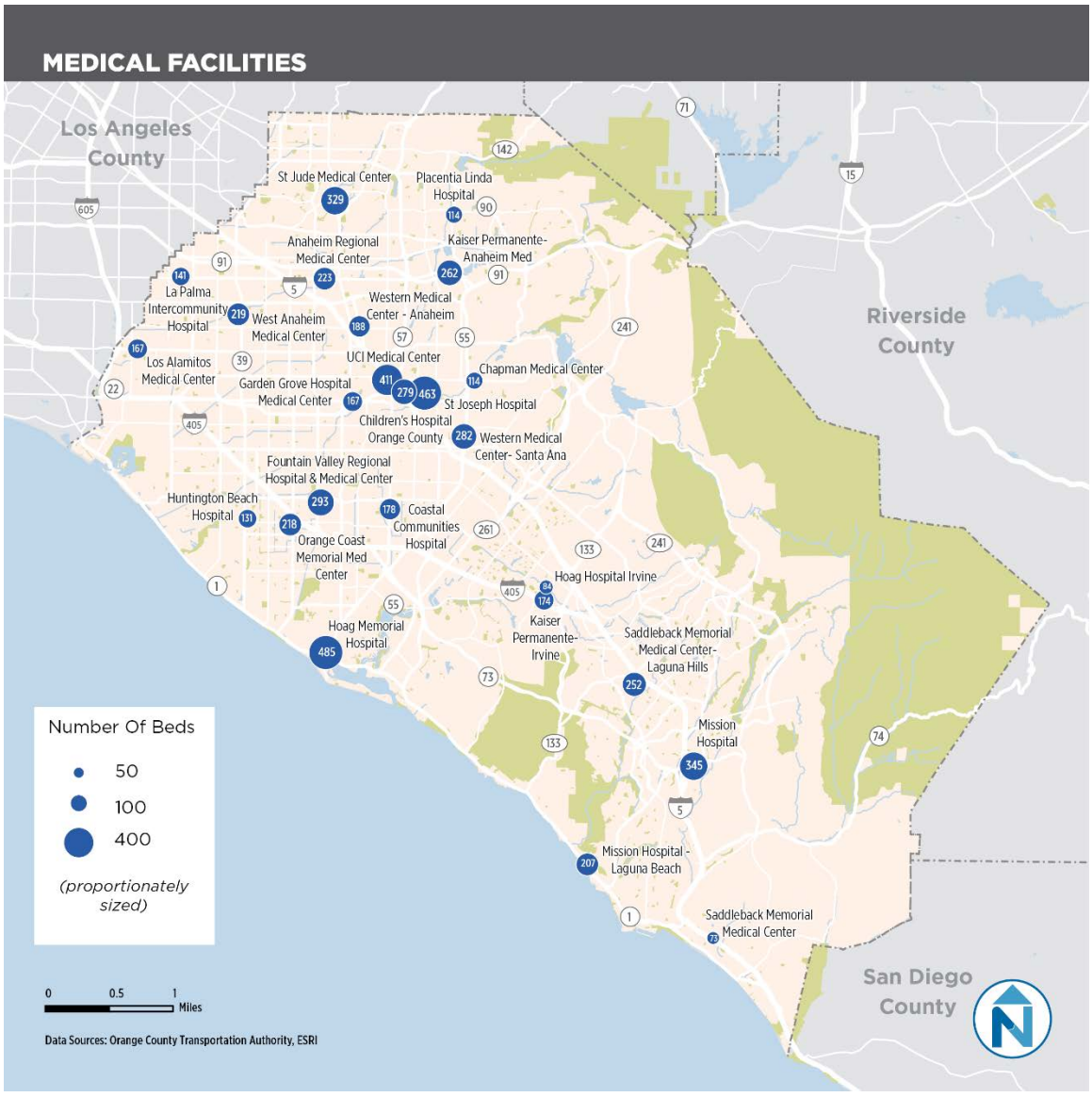
Like colleges and universities, malls and shopping centers are major job centers and major generators of non-work trips; they are also sources of all-day demand. Figure 6-12 shows the distribution of the largest shopping centers within the county by number of stores; a majority of the retail centers are sited along major corridors in the roadway network such as Interstate 405 and Interstate 5. In addition to being major destinations for shoppers, some of the largest facilities, such as Fashion Island in Newport Beach and Westfield MainPlace in Santa Ana, are areas of the county with high employment density (see Figure 6-6).

Figure 6-12 Major Retail Centers

Medical Facilities

Figure 6-13 presents the distribution of the largest medical centers within the county by number of beds. In general, the distribution of major medical facilities correlates to population distribution, with most facilities located in the urbanized areas of the northern half of the county and facilities in the less populated southern half sited along the I-405 and I-5 corridors.

Figure 6-13 Major Medical Facilities



Other Major Attractions

In addition to schools, shopping malls, and hospitals, the following are also major trip generators: theme parks, stadiums, and arenas.. As shown in Figure 6-14, Orange County's most notable major attractions are in the northern half of the county, often near the intersections of major freeways. Disneyland, which draws visitors from all over the word, also represents a node of high employment density. Venues like Angel Stadium and Honda Center, which host sporting events and concerts, are important given the sheer volume of trips they attract at specific times.

Figure 6-14 Major Attractions

DEMOGRAPHICS

Demographic characteristics such as age, gender, ethnicity, and income tend to correlate with transit use. Figure 6-15 through Figure 6-27 illustrate a broader range of demographic inputs, as well as the ways Orange County populations with a tendency toward transit use (such as low-income and youth populations) overlap spatially. Transit demand generally can be expected to be higher in these areas.

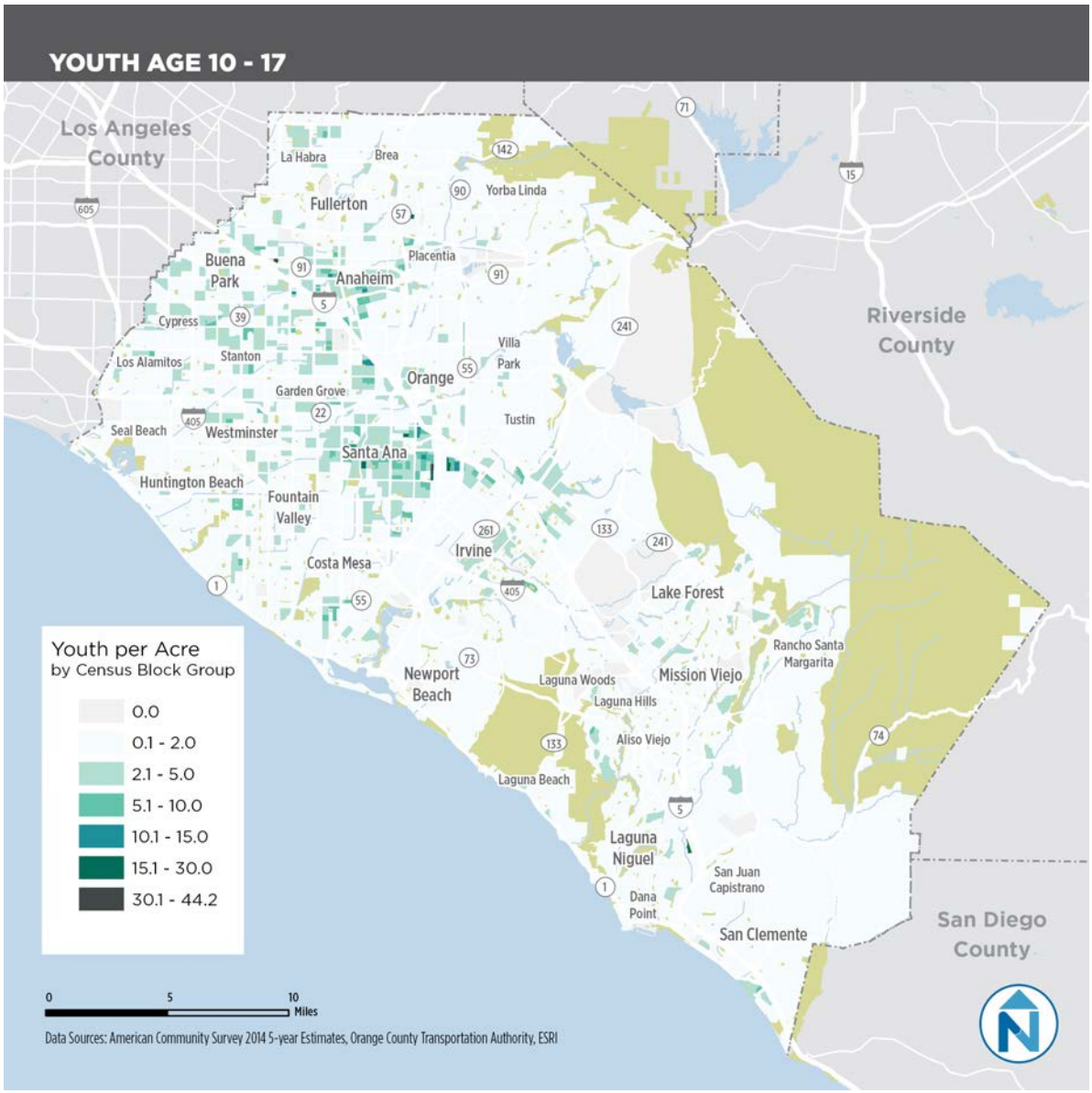
Population Characteristics

Youth

People under 18 are a strong ridership group in many communities. Young people will use transit if it is affordable and meets their educational and recreational transportation needs. Today, approximately 22.6 percent of Orange County residents are under the age of 18. Figure 6-15 represents the density of youth living in Orange County:

- The northern half of the county, particularly around Santa Ana and Anaheim, has clusters of higher density youth populations.
- Areas with higher density youth populations correspond to areas with higher rates of low-income households, households speaking limited English, and large average household size.

Figure 6-15 Density of Youth Population



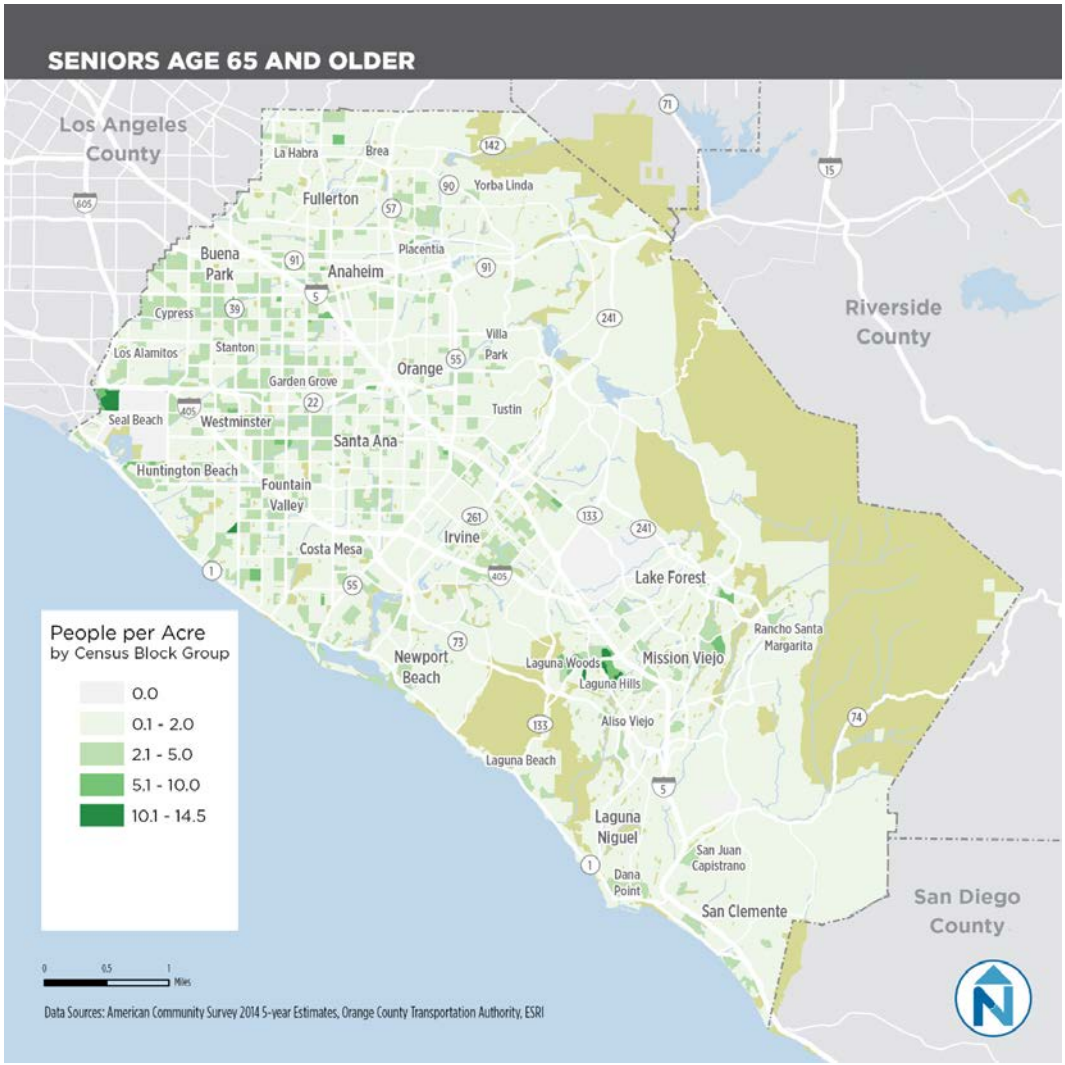
Older Adults

As people age, they often become less comfortable driving or less able to operate a vehicle. Costs associated with auto operation and maintenance can also be a burden as older adults transition to fixed incomes. Transit offers older adults the freedom to stay in their homes, or age in place, even as they transition away from driving.

Recent surveys have shown that the baby boomer generation desires a more active retirement lifestyle than previous generations. Boomers are living longer, staying more active, and seeking out neighborhoods that are walkable and served by transit. Today, approximately 13.6 percent of Orange County residents are age 65 or older. Figure 6-16 represents the density of seniors living within Orange County:

- The largest senior populations are found in a few distinct clusters, such as the Leisure World gated retirement community in Seal Beach and communities surrounding Laguna Woods and Laguna Hills.
- Areas of moderate senior population density are widely dispersed throughout the residential parts of the county.

Figure 6-16 Density of Senior Population

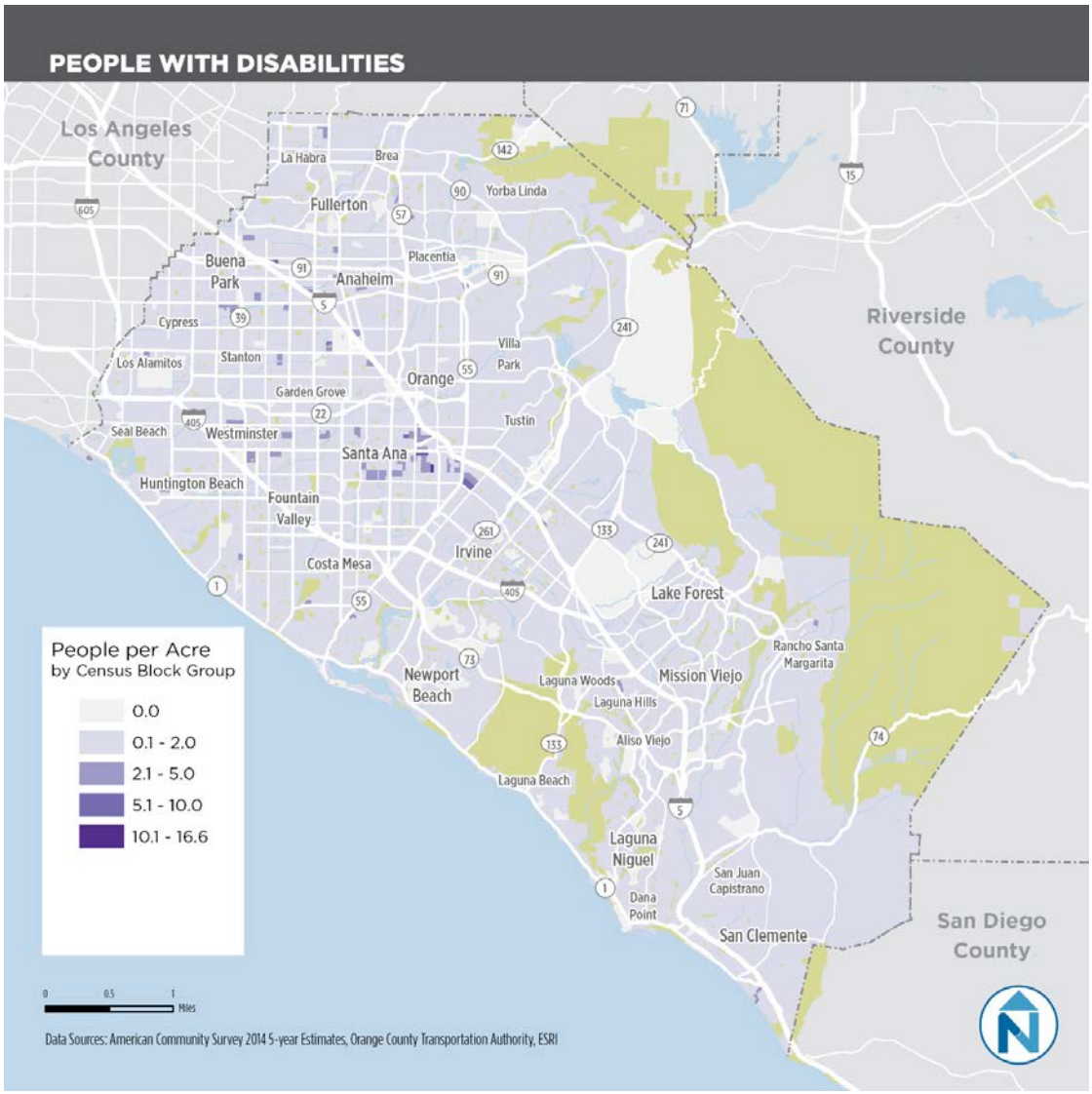


People with Disabilities

People with disabilities often depend on transit for their daily mobility needs. Public transit, including specialized paratransit services, is an essential resource to ensure people with disabilities are able to remain active members of the community. Figure 6-17 represents the density of persons with a disability living within Orange County. Key findings include the following:

- Clusters of people with disabilities correlate to areas of the county with higher population density, such as Santa Ana.
- Areas with the highest density of people with disabilities do not correspond to areas of the county with the highest density of seniors.
- Overall, most census block groups throughout the county have fewer than two residents with a disability per acre.
- The distribution of people with disabilities across the county indicates where there may be a greater need for access and demand-responsive transit service.

Figure 6-17 Density of Populations with Disabilities

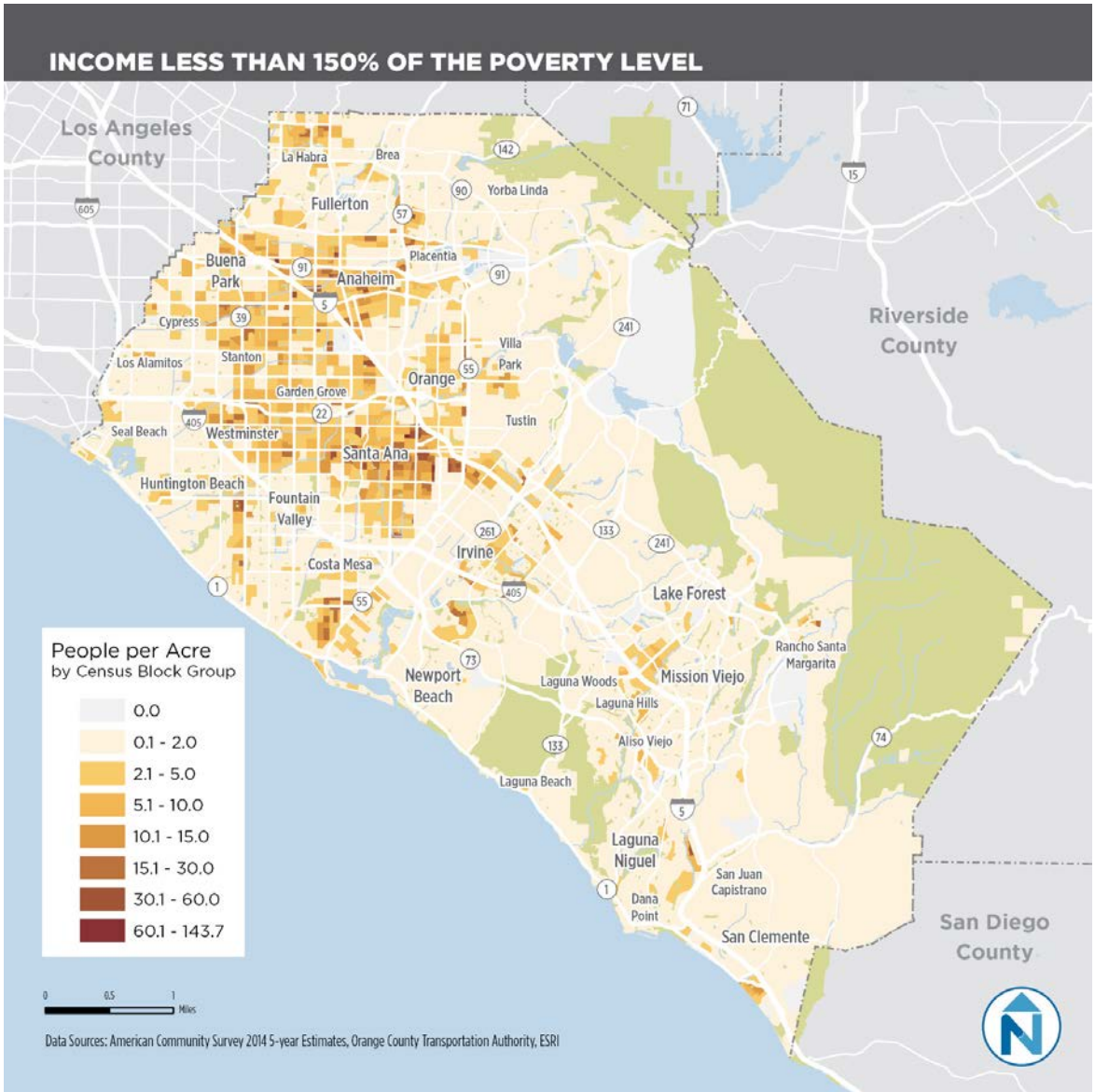


Income

Households with low incomes are generally more dependent on transit services than those with higher incomes. Low-income households are those that earn up to 150 percent of the federal poverty level. The federal poverty level ranges from an annual income of $11,880 for one-person households to $40,890 for households of eight (and $4,160 for each additional person thereafter). Conversely, the 2014 median household income in Orange County was almost $76,000. Figure 6-18 represents the density of low-income households throughout the county:

- Areas of the county with the highest density of low-income households correspond to the highest population densities.
- In many cases, census blocks with the highest rates of low-income households correlate to census blocks with a high density of non-white populations and large average household size.
- Areas of low-income populations are far more prevalent in the northern half of the county.

Figure 6-18 Density of Low-Income Populations

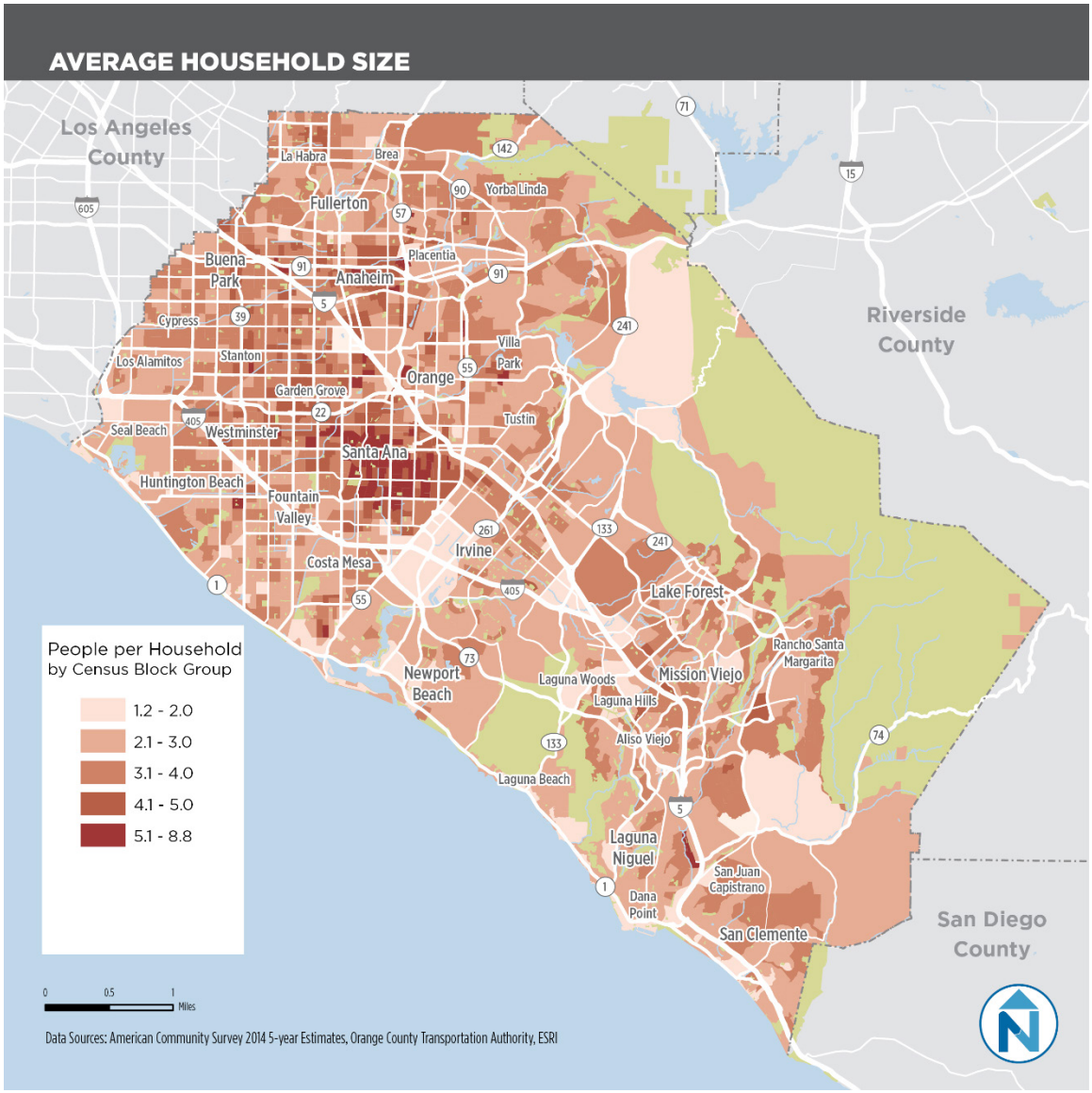


Household Size

Historically, greater household size is an indicator of travel demand commonly observed in lower-income and new immigrant communities. In 2014, the average persons per household in the county was 3.04, compared to 2.95 statewide and just 2.63 nationally. Figure 6-19 represents the density of people per household throughout Orange County. Key findings include the following:

- The areas with the greatest density of large households (more than five people) are consistent with the areas of highest population density, such as central Santa Ana.
- Areas in the northern half of the county with average household sizes above the county average correspond to areas with high rates of low-income households, youth, Latino populations, and limited English speaking households.

Figure 6-19 Density of People per Household

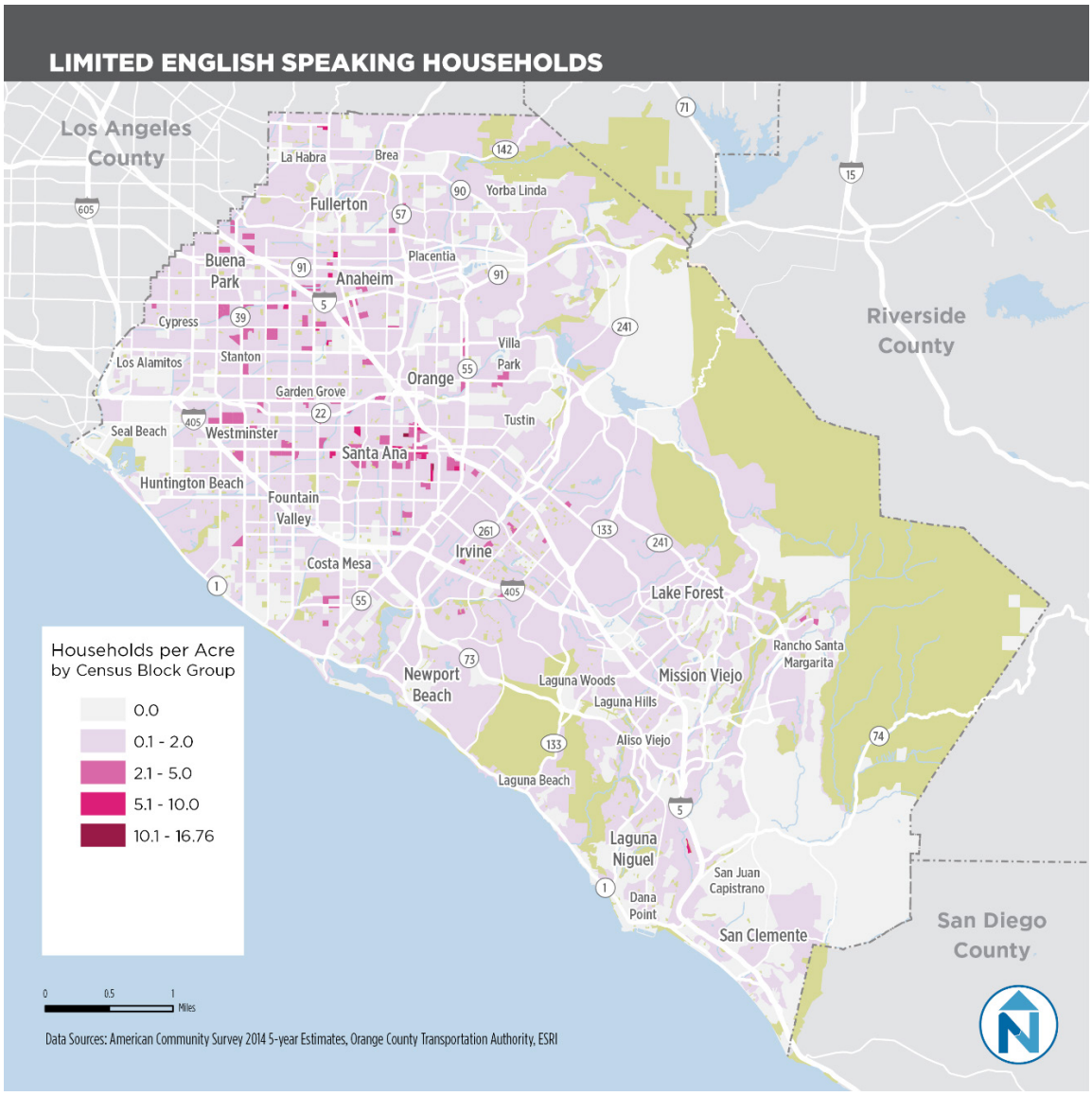


Limited English Proficiency

Individuals who have limited English proficiency (LEP) often have lower incomes because of the barriers that they face in participating in the job market. As a result, LEP populations typically have higher rates of transit use than those of native or fluent English speakers. In 2014, more than 45 percent of people over the age of five in Orange County spoke a language other than English at home, highlighting the diversity of the region. Figure 6-20 represents the density of LEP households throughout the county. Key findings include the following:

- The highest density of LEP households is primarily confined to the highest population density areas in the northern half of the county.
- The location of high density LEP areas corresponds to areas with high rates of low-income households and Latino populations.

Figure 6-20 Density of Limited English Speaking Households



Ethnicity

In the United States, whites are generally less likely to use transit than other racial and ethnic groups. As a group, non-white populations are more likely to have lower incomes and less access to automobiles, and to live in areas with higher population densities. (There are, of course, significant variations both among and within groups.)

Figure 6-21 presents the density of white (non-Hispanic) populations across the county, while Figure 6-22 through Figure 6-26 map the density of non-white populations throughout Orange County. The figures represent the following findings:

- The highest density white populations are most prevalent along the coast and in the southern half of the county.
- In general, non-white populations are far more prevalent in the northern half of the county.
- High-density clusters of Latino populations largely correspond to areas of overall high population density, such as Anaheim and Santa Ana.
- Denser populations of Asians or Pacific Islanders are most prevalent in the northwest quadrant of the county, with a considerable cluster forming a triangle between Westminster, Garden Grove, and Santa Ana. In contrast to all other non-white groups, Asian or Pacific Islander populations also have a considerable presence in Irvine.
- The density of African-American and black populations is low across the county, with the largest population stretching from Los Alamitos to Anaheim in the northwest quadrant of the county.
- Higher density patterns for populations identifying as “other” or mixed race are similar to that of Latino populations but of less intensity outside of core areas.
- The density of American Indian/Alaskan Native populations is low throughout the county.

Figure 6-21 Density of White (not Hispanic or Latino) Populations

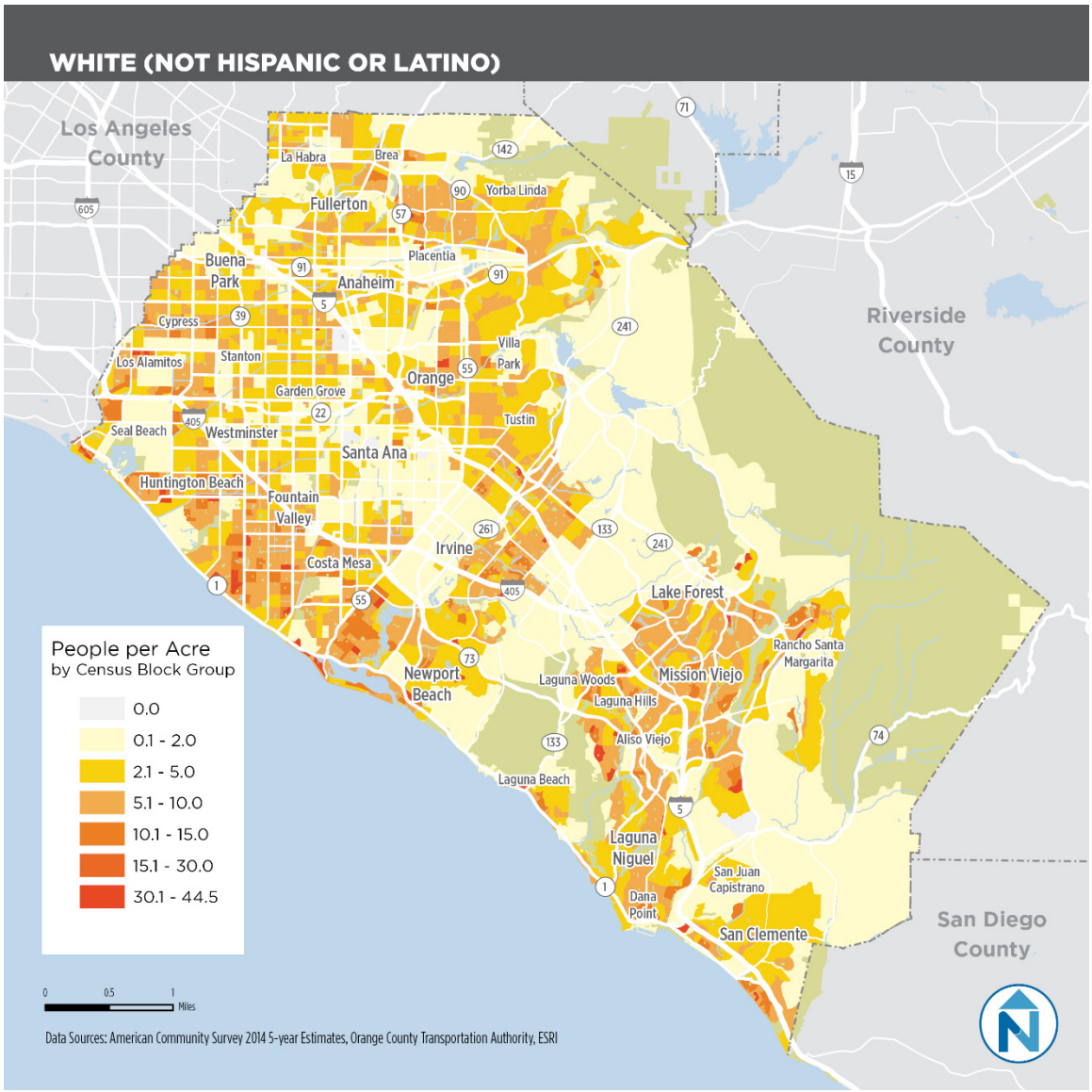


Figure 6-22 Density of Latino (Non-White) Populations

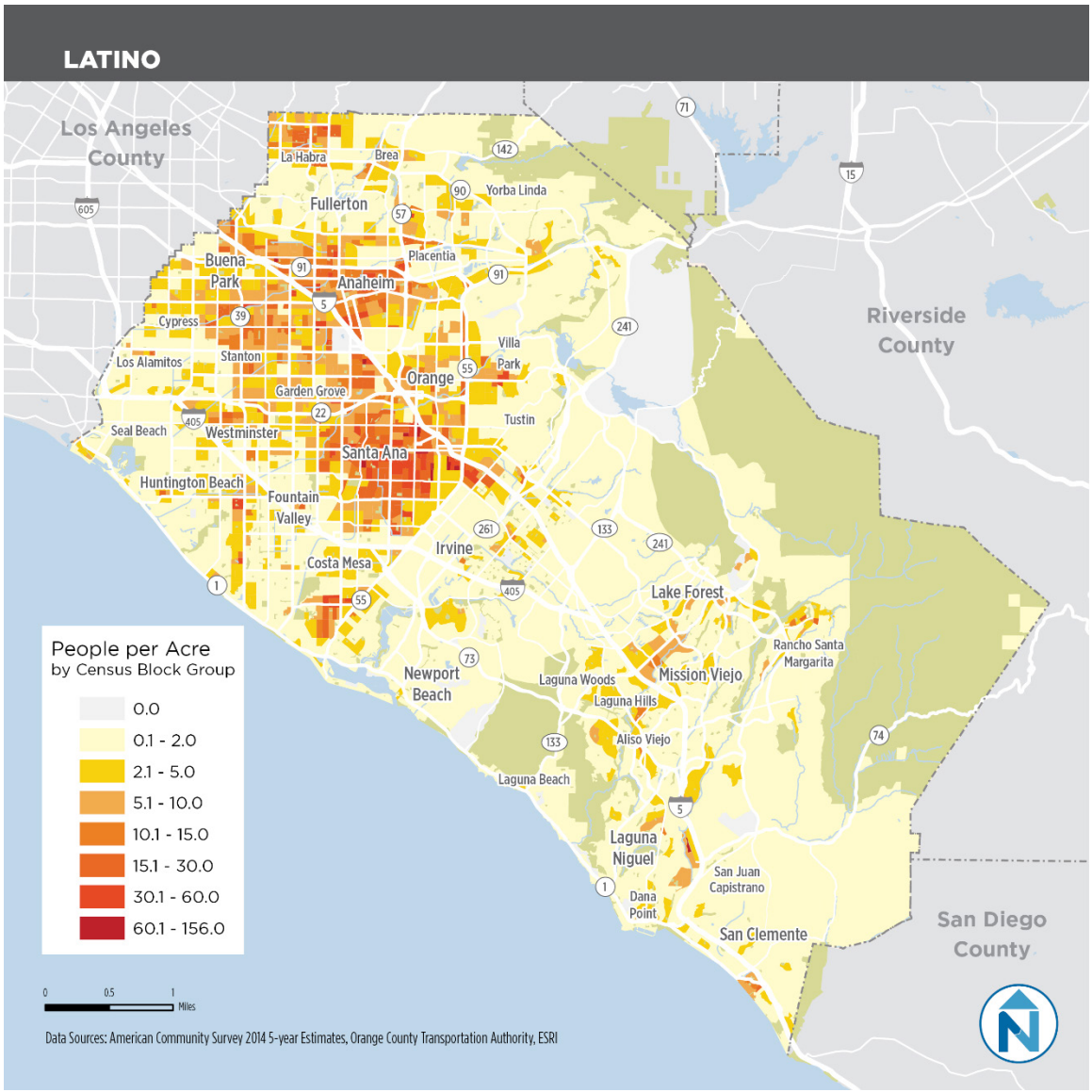


Figure 6-23 Density of Asian or Pacific Islander Populations

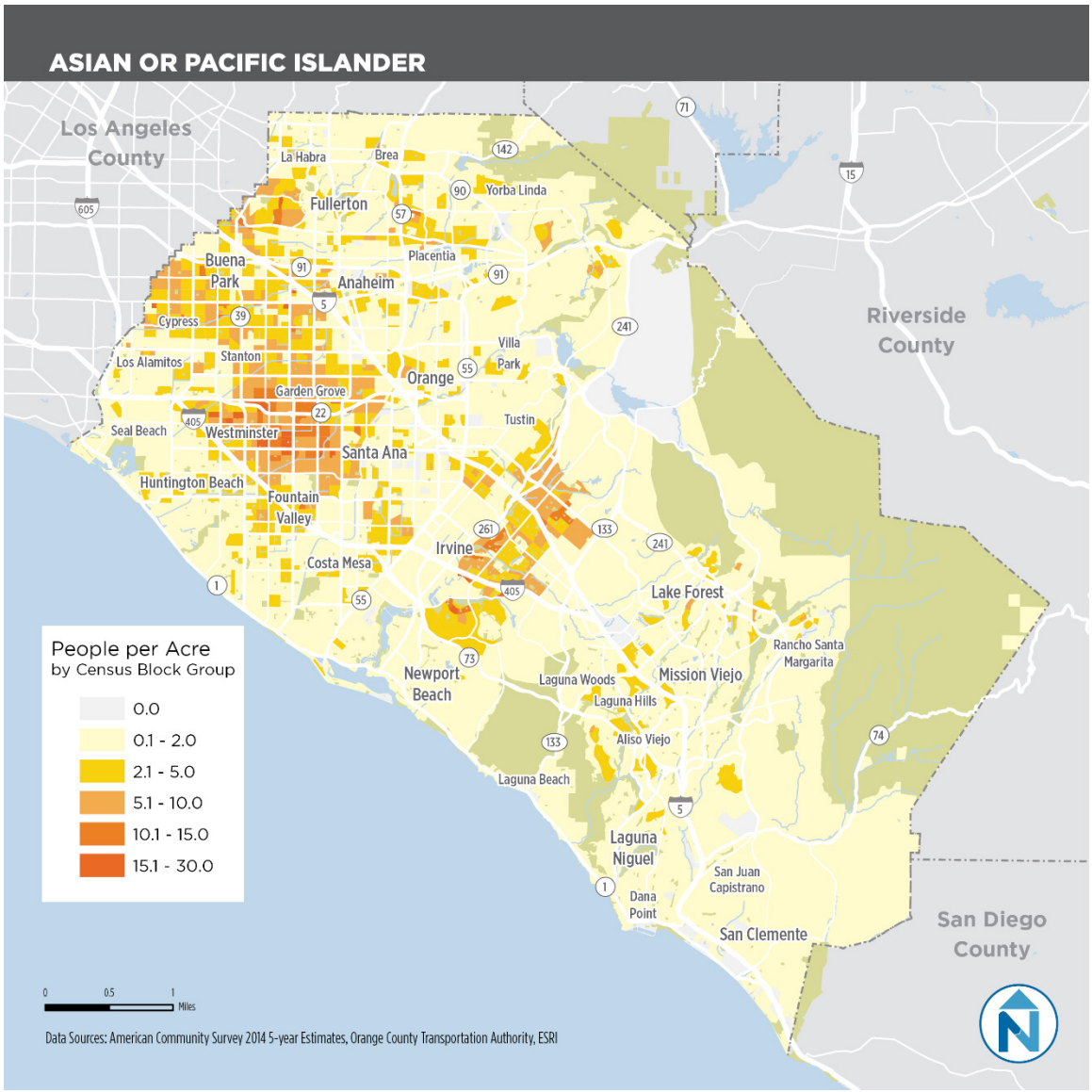


Figure 6-24 Density of African-American/Black Populations

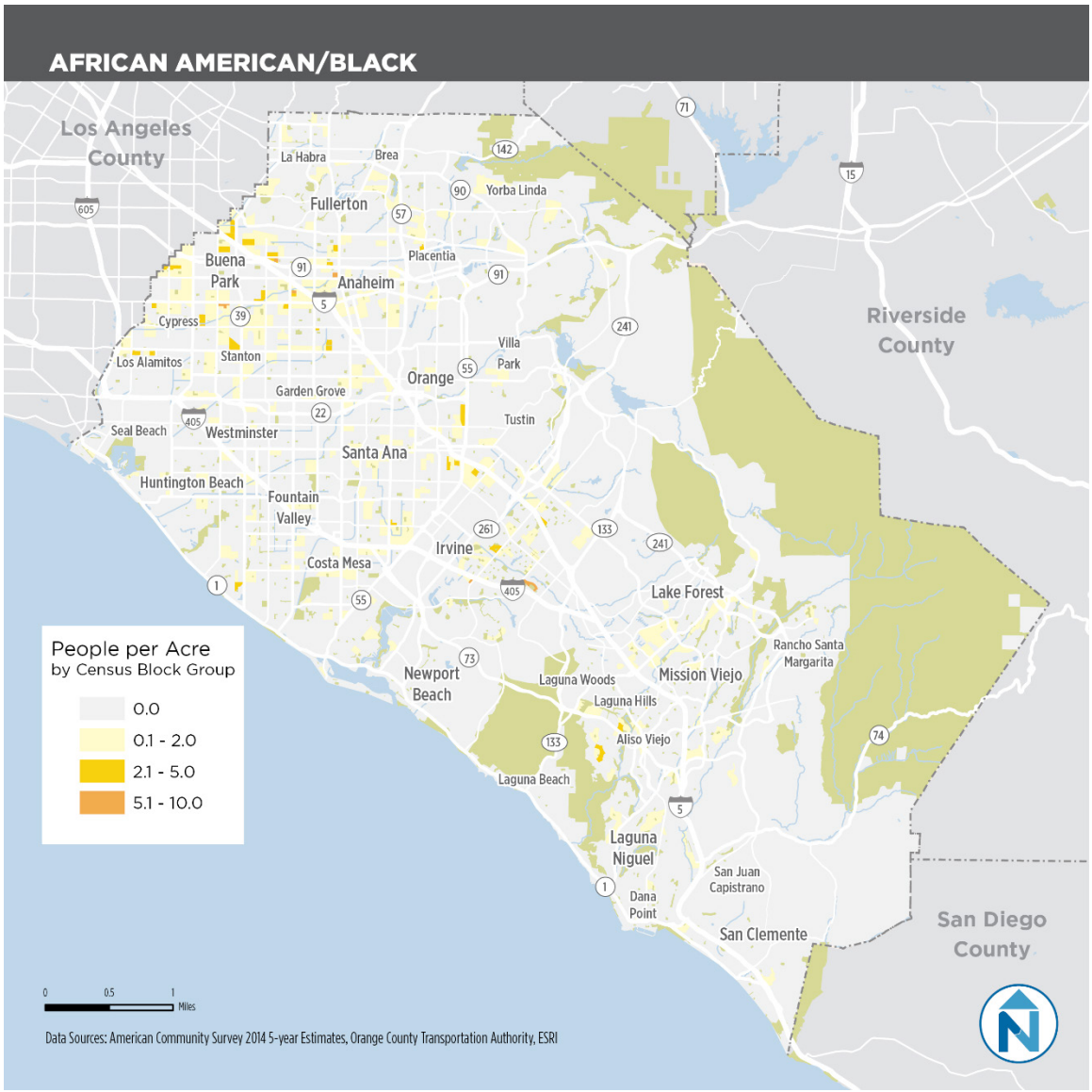


Figure 6-25 Density of Other or More Than One Race

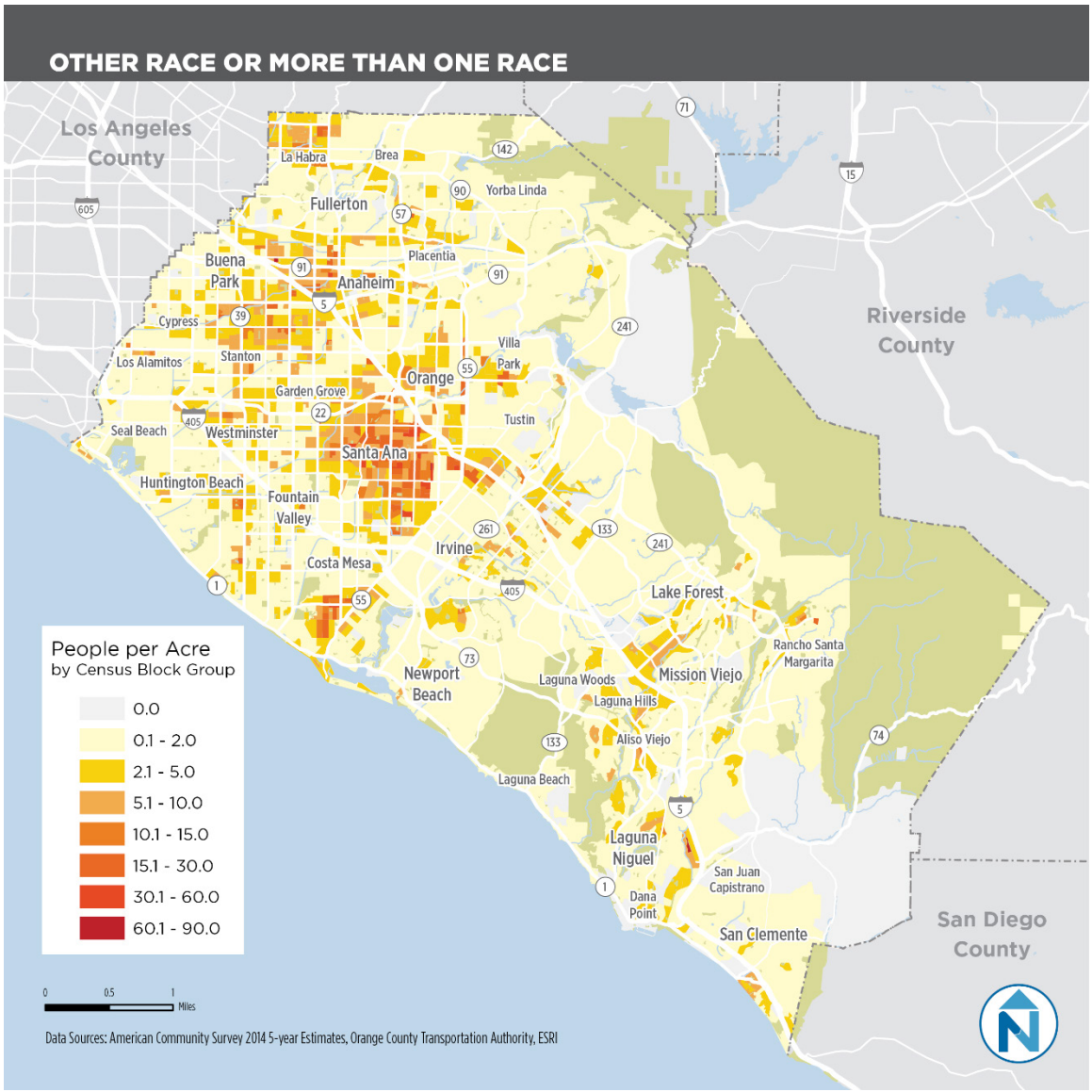
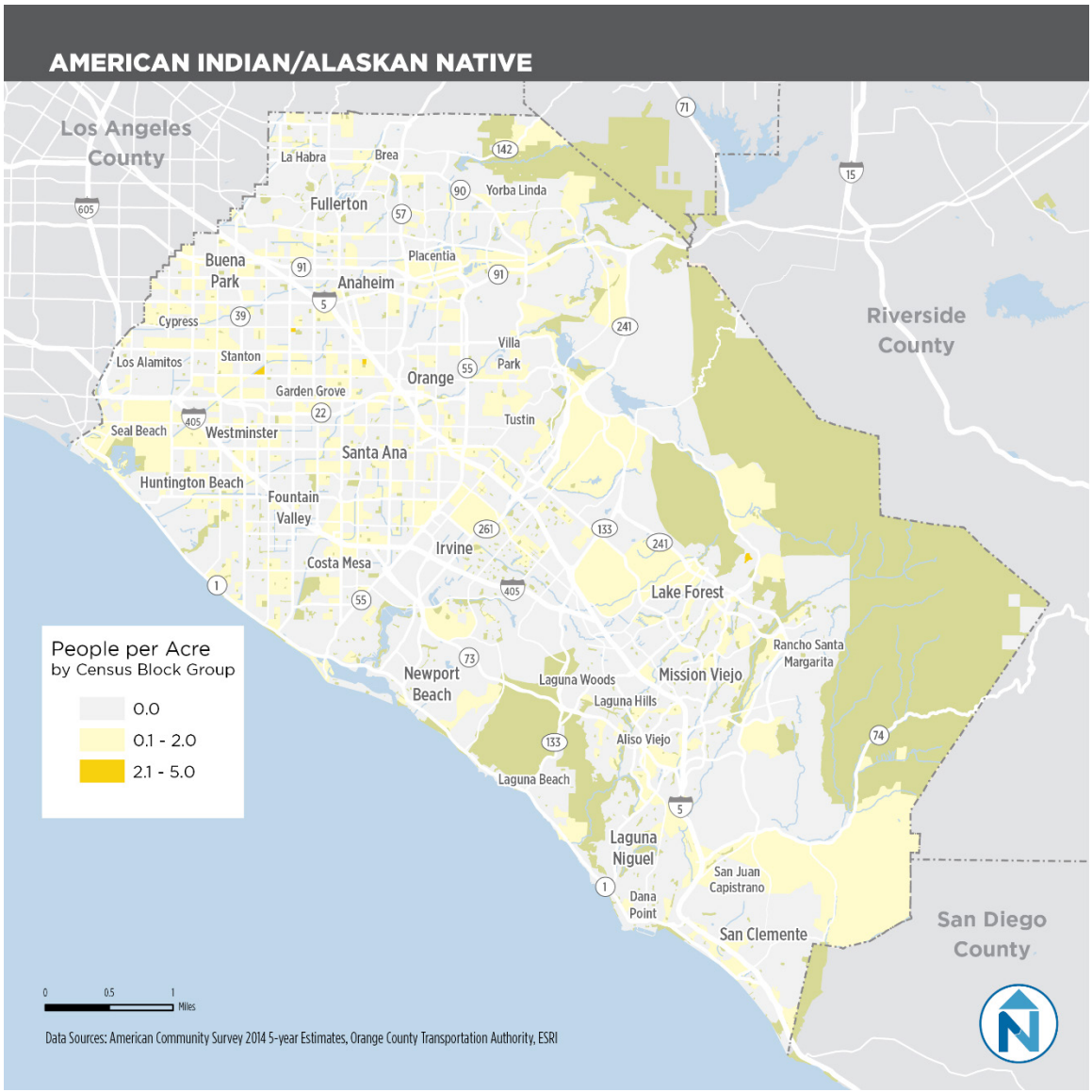


Figure 6-26 Density of American Indian/Alaskan Native Populations

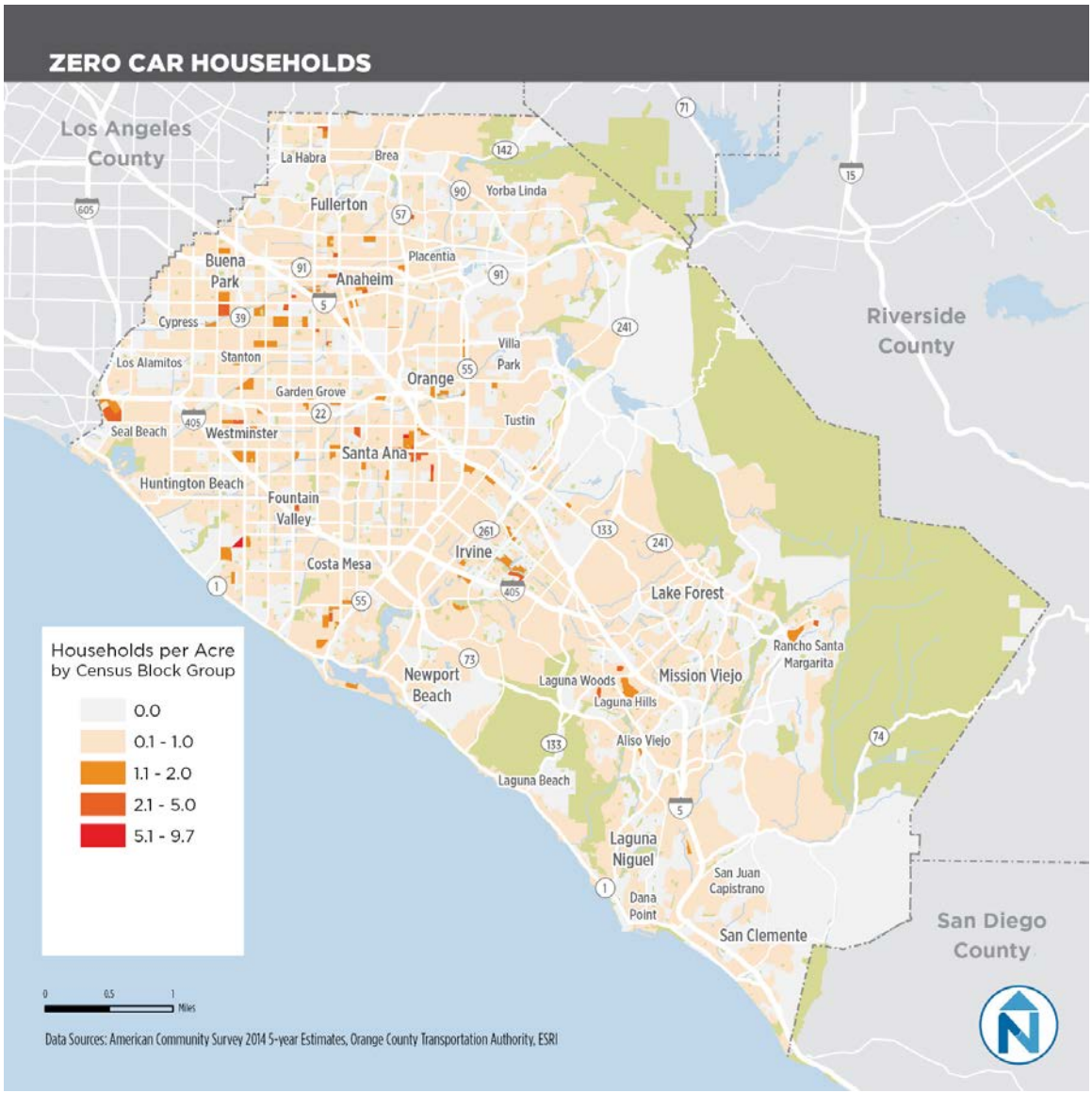


Vehicle Access

In auto-oriented areas with limited transit options, people who can afford a car tend to own a car. The rate of zero-vehicle households in Orange County is approximately 4.3 percent, compared to 7.5 percent across the state of California. Figure 6-27 represents the density of zero-vehicle households throughout the county:

- The overall density of zero-vehicle households throughout the county is low.
- Census groups with the highest density of zero-vehicle households correlate to areas with high rates of low-income and senior populations.

Figure 6-27 Density of Households without a Vehicle



TRAVEL AND TRANSIT DEMAND

Travel Patterns Analysis

In addition to socioeconomic, land use, and demographic conditions, understanding travel patterns is essential to assessing transit and overall travel demand throughout Orange County. The following section presents maps of existing (2010) and projected future (2035) average weekday travel flows (daily trips) when schools are in session. The maps show travel flows both within the county and to and from neighboring counties.

The data is based on OCTA's travel demand model, with 2035 projections based on the Master Plan of Arterial Highways, which includes planned changes to the roadway network. Travel patterns shown are between incorporated cities and census-designated places (CDPs) in unincorporated areas[2]. Remaining unincorporated areas accounting for relatively small numbers of trips are not included in the analysis. Numbers of trips within and between cities and CDPs are, of course, partly a factor of total numbers of residents and jobs within each; for this reason, cities including Anaheim, Santa Ana, and Irvine are both major origins and destinations.

Daily Trips by Purpose

Figure 6-28 presents existing daily trips for all purposes and modes (both single occupant and multiple occupants). In general, the northern half of the county has the highest concentration of travel pairs with the highest number of daily trips between them. Areas of the county with high levels of population density, employment, and activity sites—such as Anaheim, Irvine, and Santa Ana—have heavy daily travel flows between them and multiple other communities. In general, the highest levels of daily trips are shorter trips within communities and between neighboring communities. Longer trips to more distant communities and cross-county flows representing longer trips are less prevalent.

[2] CDPs within Orange County include the following: Coto de Caza, Ladera Ranch, Las Flores, Midway City, North Tustin, and Rossmoor

Figure 6-28 Existing Travel Flows: All Purposes and Modes

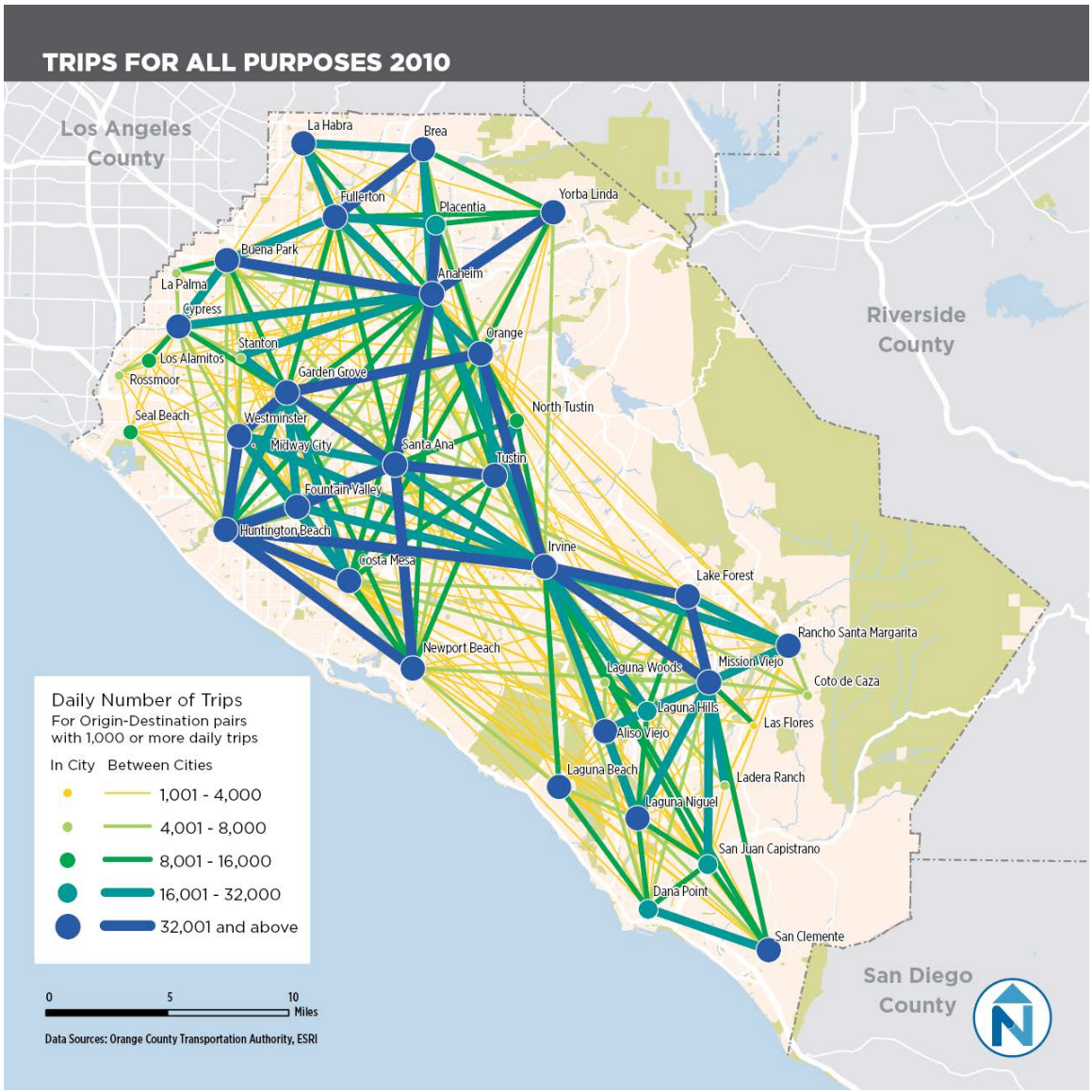


Figure 6-29 through Figure 6-32 show trips by all modes that begin at home (called a *home-based origin*). Key findings include the following:

- Commute trips are largely concentrated in the northern part of the county, including Irvine and Newport Beach. Trips to college and university campuses are more broadly distributed, although Irvine (including UC Irvine as well as Irvine Valley College and Concordia University) is a notable destination.
- K-12 school trips are similarly dispersed.
- Home-based trips for purposes other than traveling to work or school largely occur within the northern part of the county, where most destinations are located.

Figure 6-29 Existing Travel Flows: Home-Based Work Trips

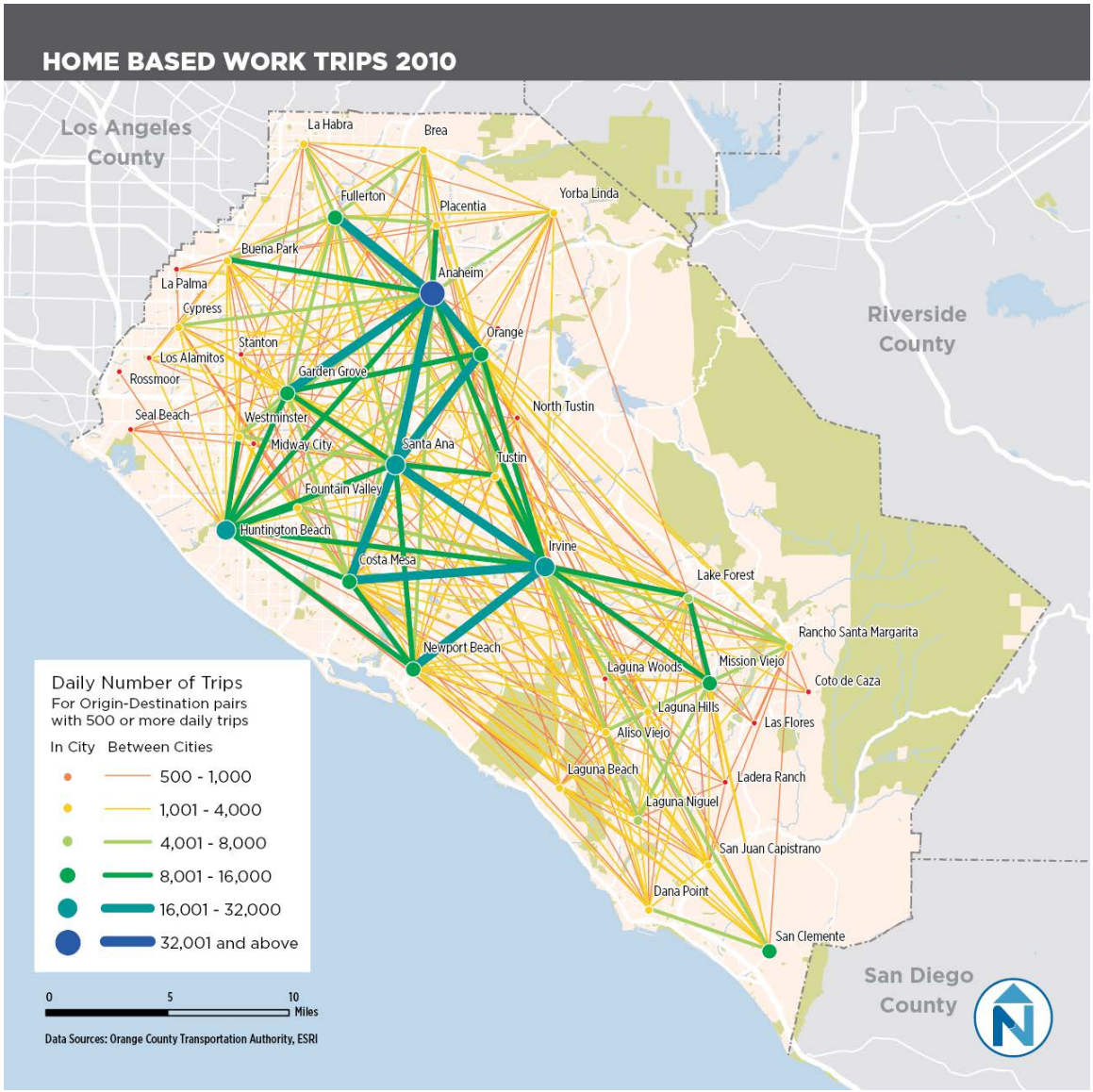


Figure 6-30 Existing Travel Flows: Home-Based University Trips

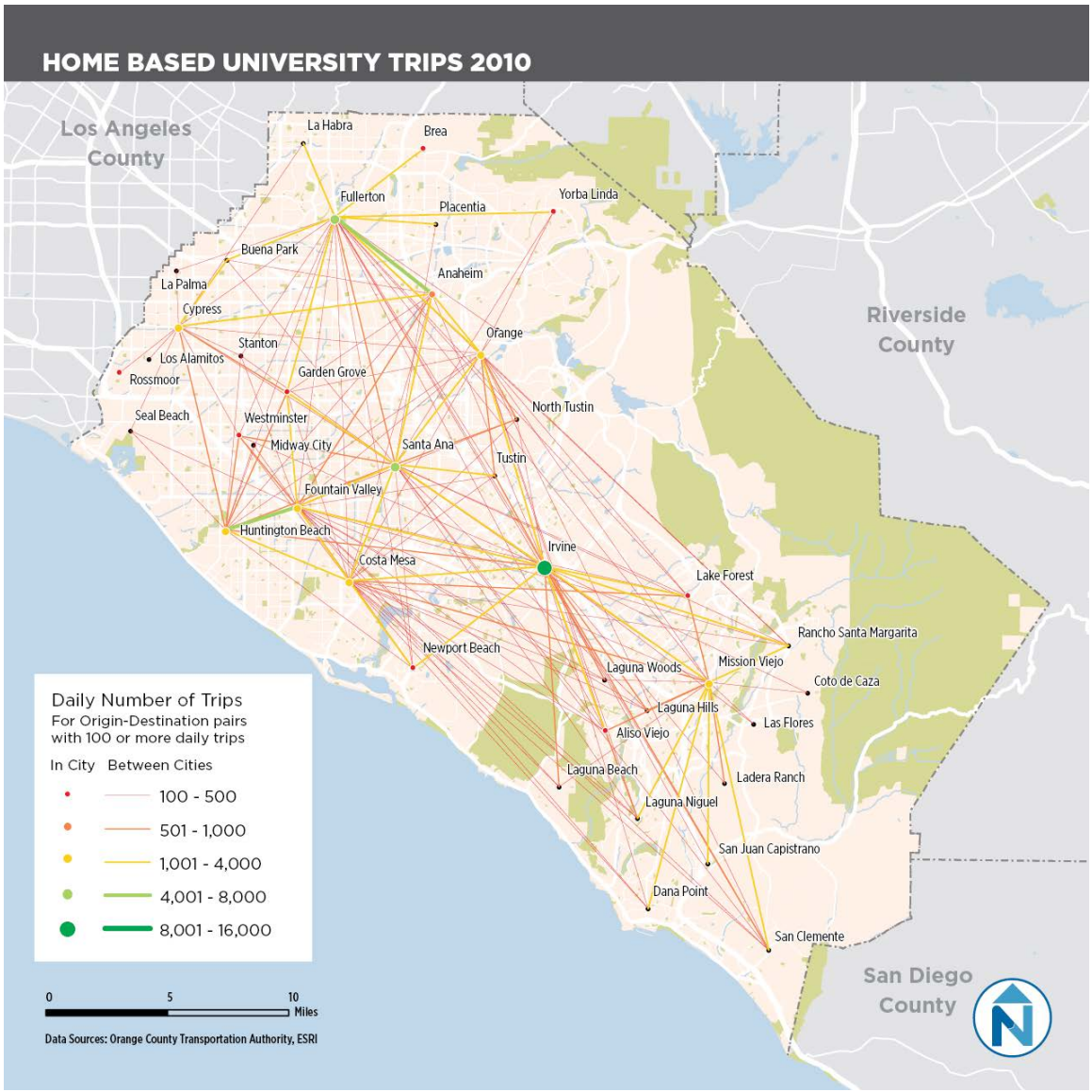


Figure 6-31 Existing Travel Flows: Home-Based School Trips

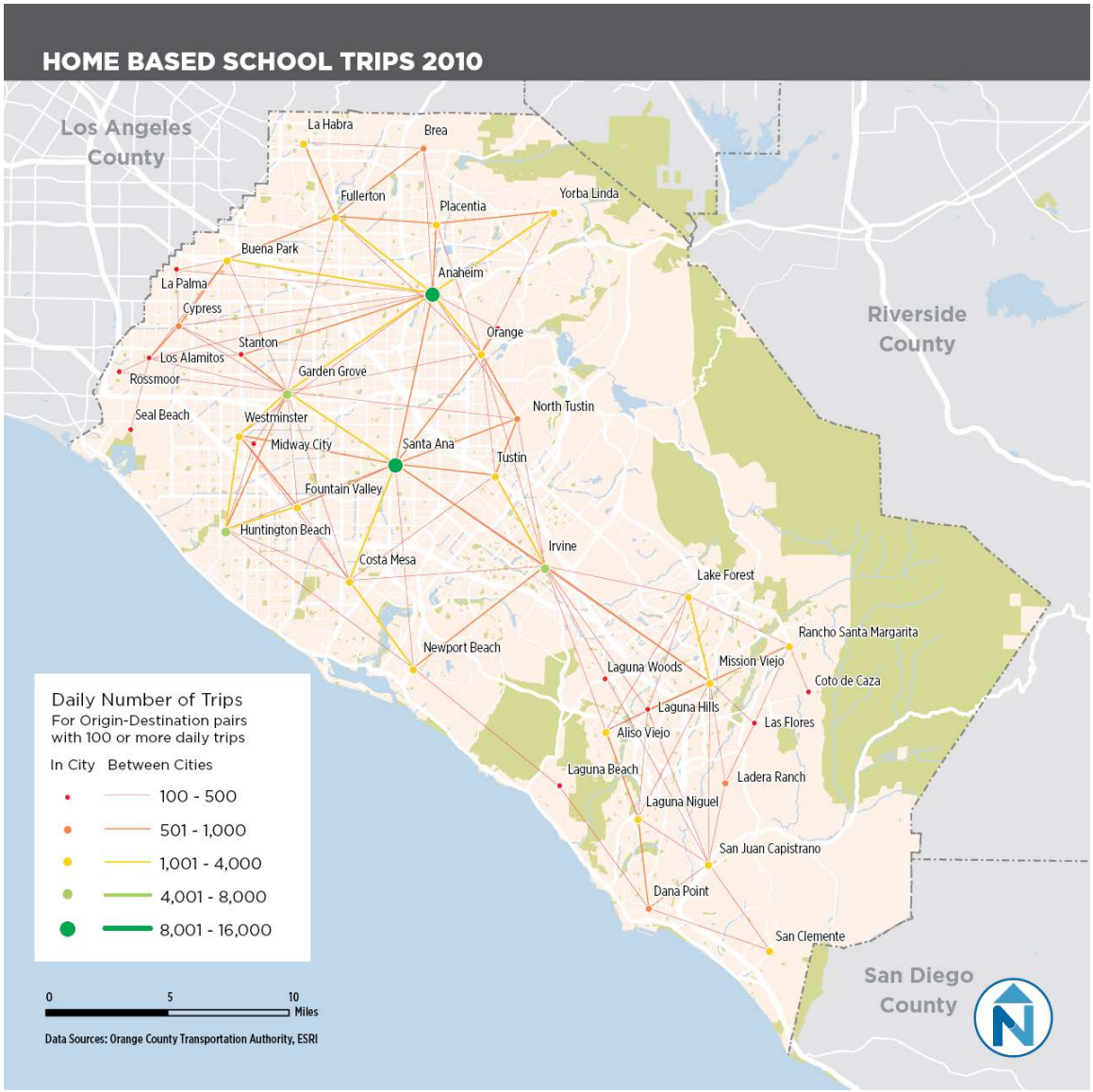


Figure 6-32 Existing Travel Flows: Home-Based Other Trips

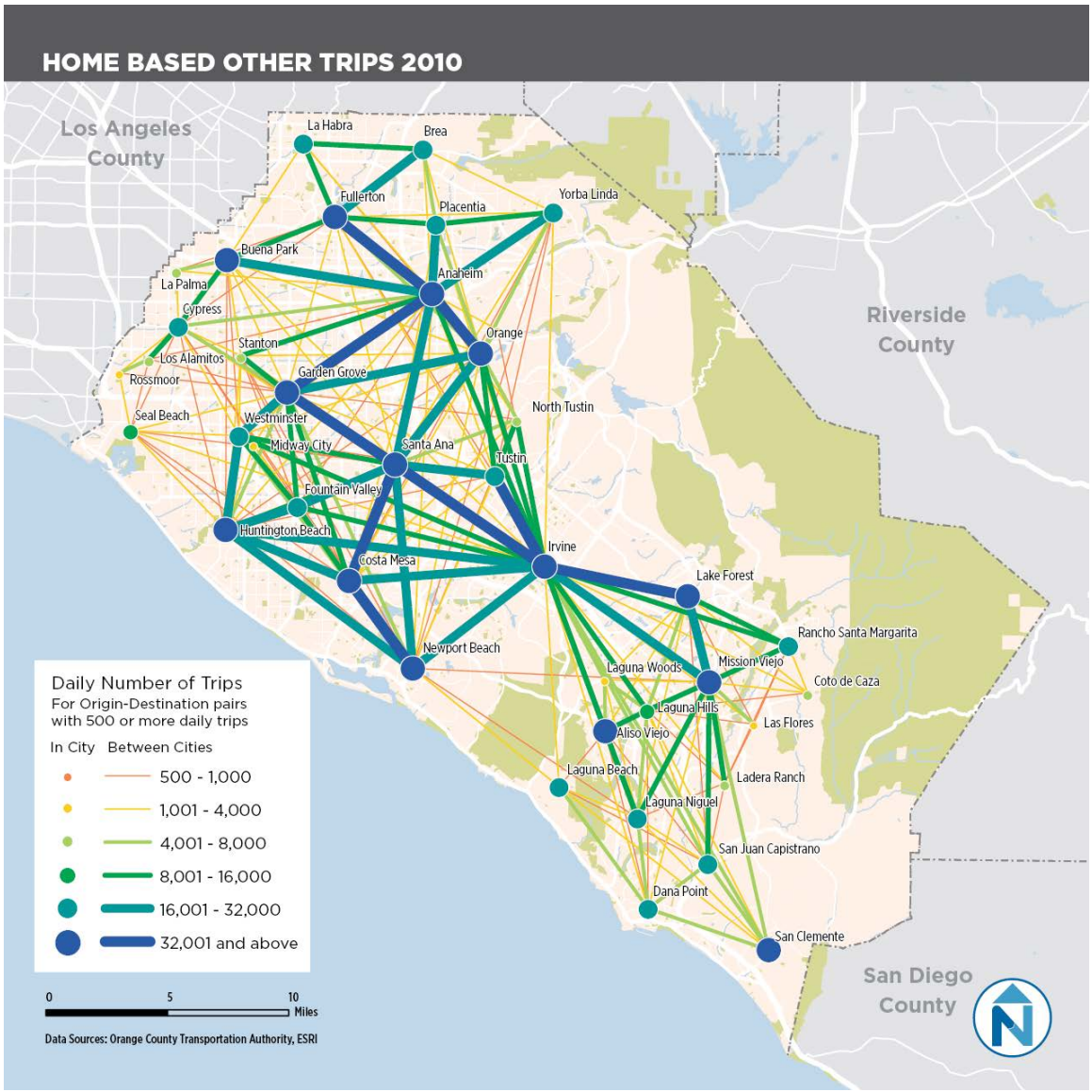


Figure 6-33 through Figure 6-34 show travel between non-residential origins and destinations. *Work-based other trips* are trips that begin or end at the workplace, but do not involve a trip home. *Other-based other trips* are trips that involve neither home nor the workplace at either end of the trip. Common trip purposes that fall within these categories include shopping, medical, and recreation. Key findings include the following:

- The highest concentration of work-based other trips are confined to two areas: the Fullerton-Anaheim-Orange corridor and a pentagonal zone composed of Irvine, Newport Beach, Costa Mesa, Santa Ana, and Tustin.
- The patterns of other-based other trips (those including neither home nor work) are similar to those of work-based other trips but at higher volumes.

Figure 6-33 Existing Travel Flows: Work-Based Other Trips

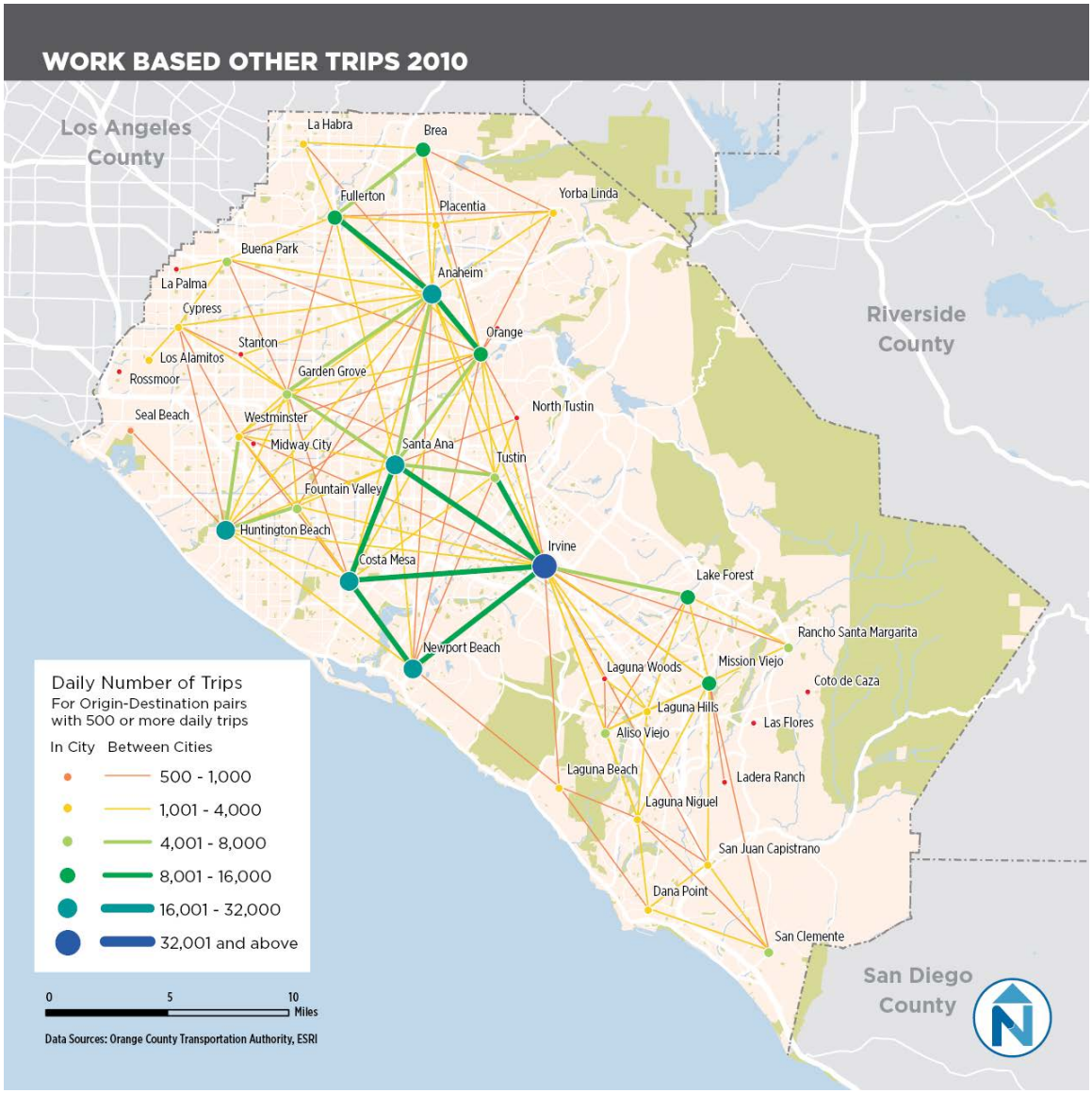
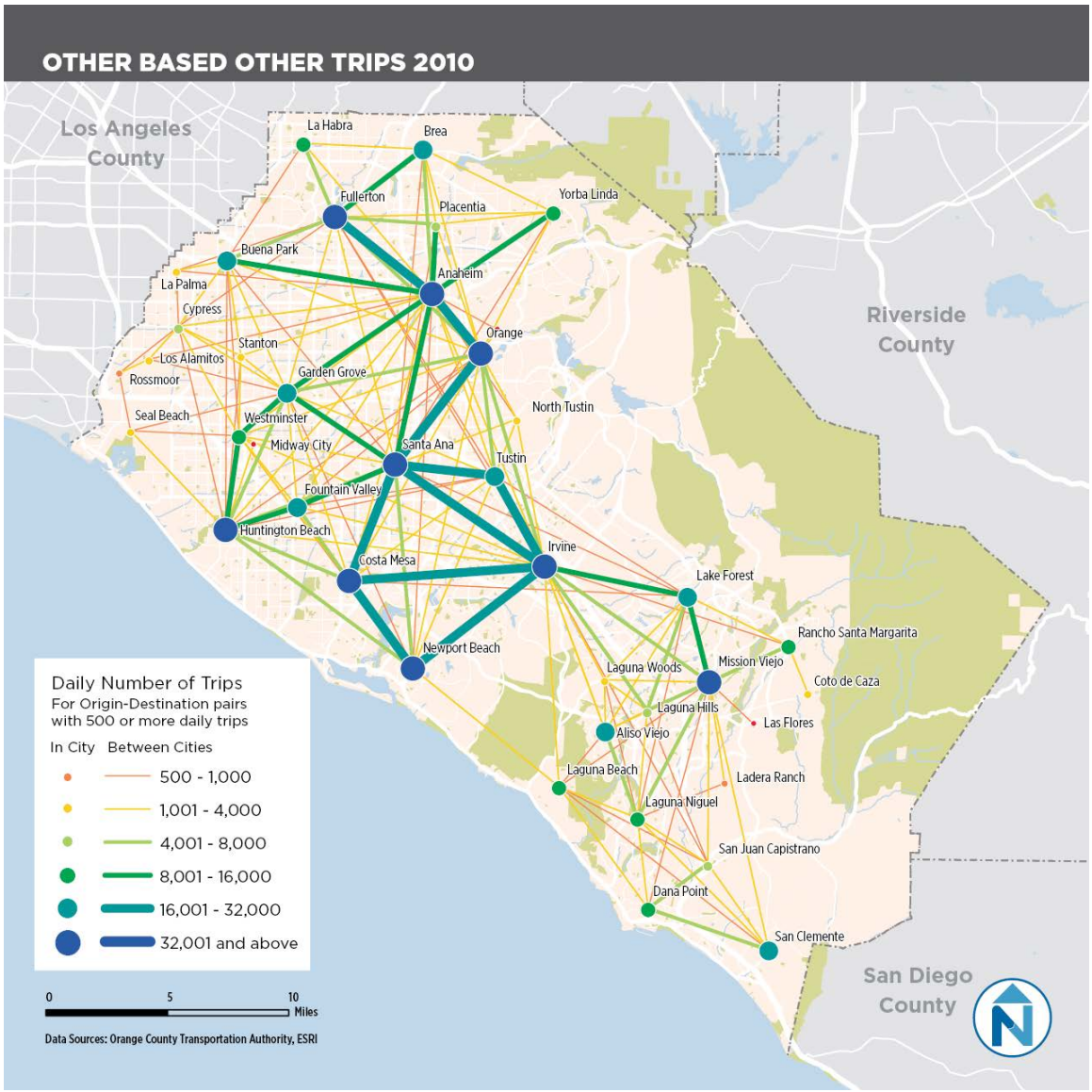


Figure 6-34 Existing Travel Flows: Other-Based Other Trips



Daily Trips by Mode

Figure 6-35 through Figure 6-36 present existing travel flows by mode:

- A majority of trips in Orange County are made by single-occupant vehicle (SOV). A dense web of such trips are made every day between destinations in the northern part of the county, and there are also a number of major origins and destinations with South County.
- The overall rate of high-occupancy vehicle (HOV) trips throughout the county is low.

Figure 6-35 Existing Travel Flows: Single-Occupant Vehicle (SOV)

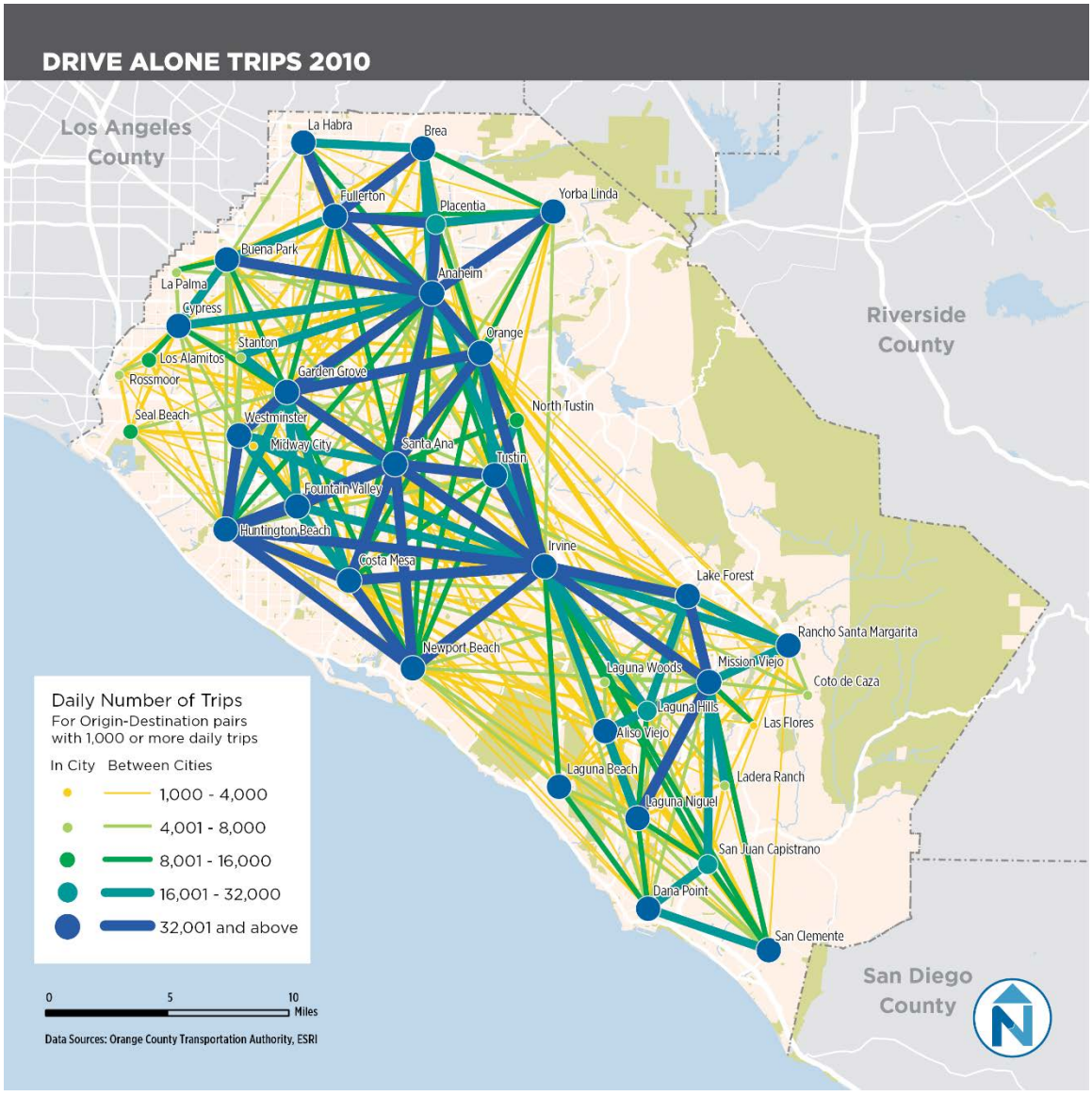
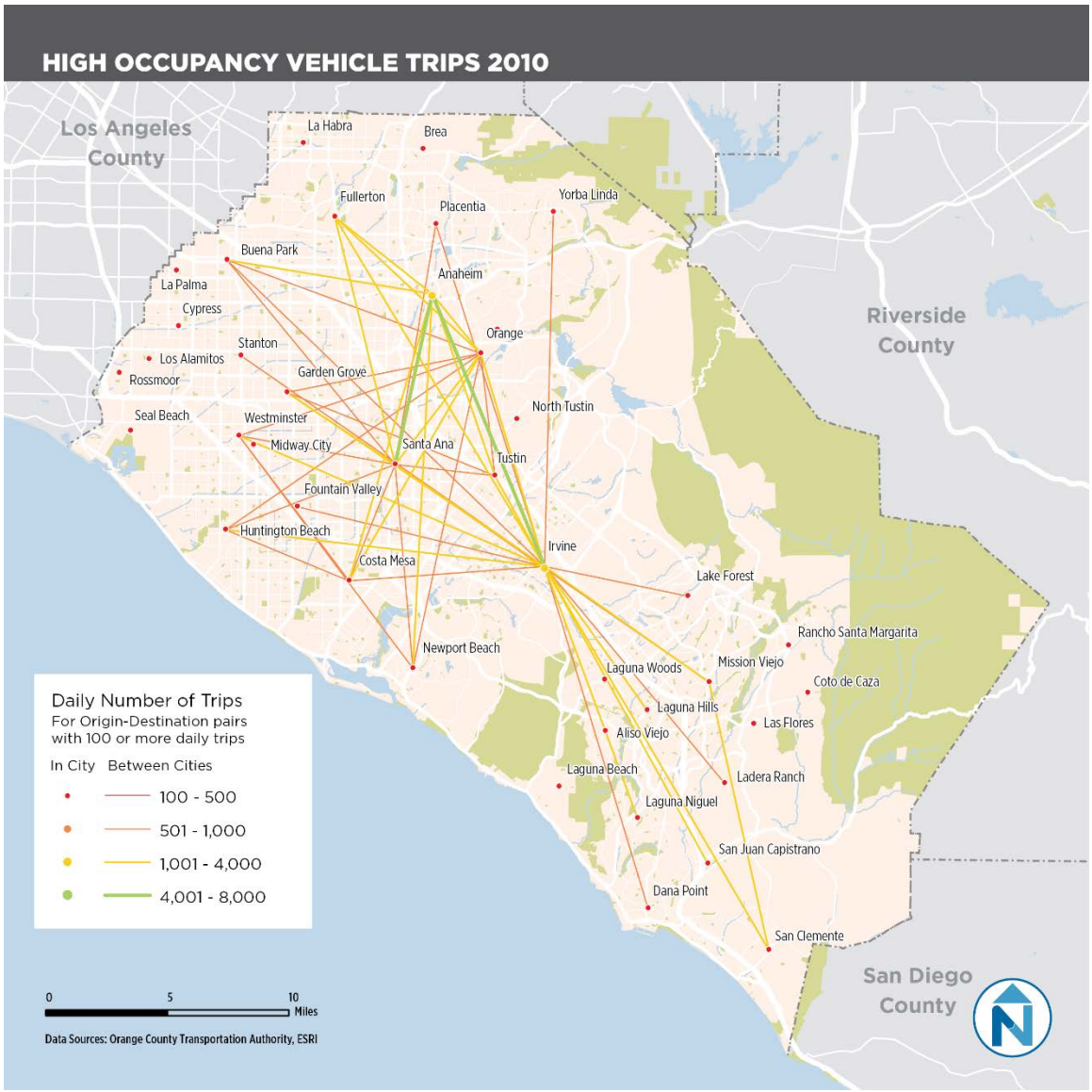


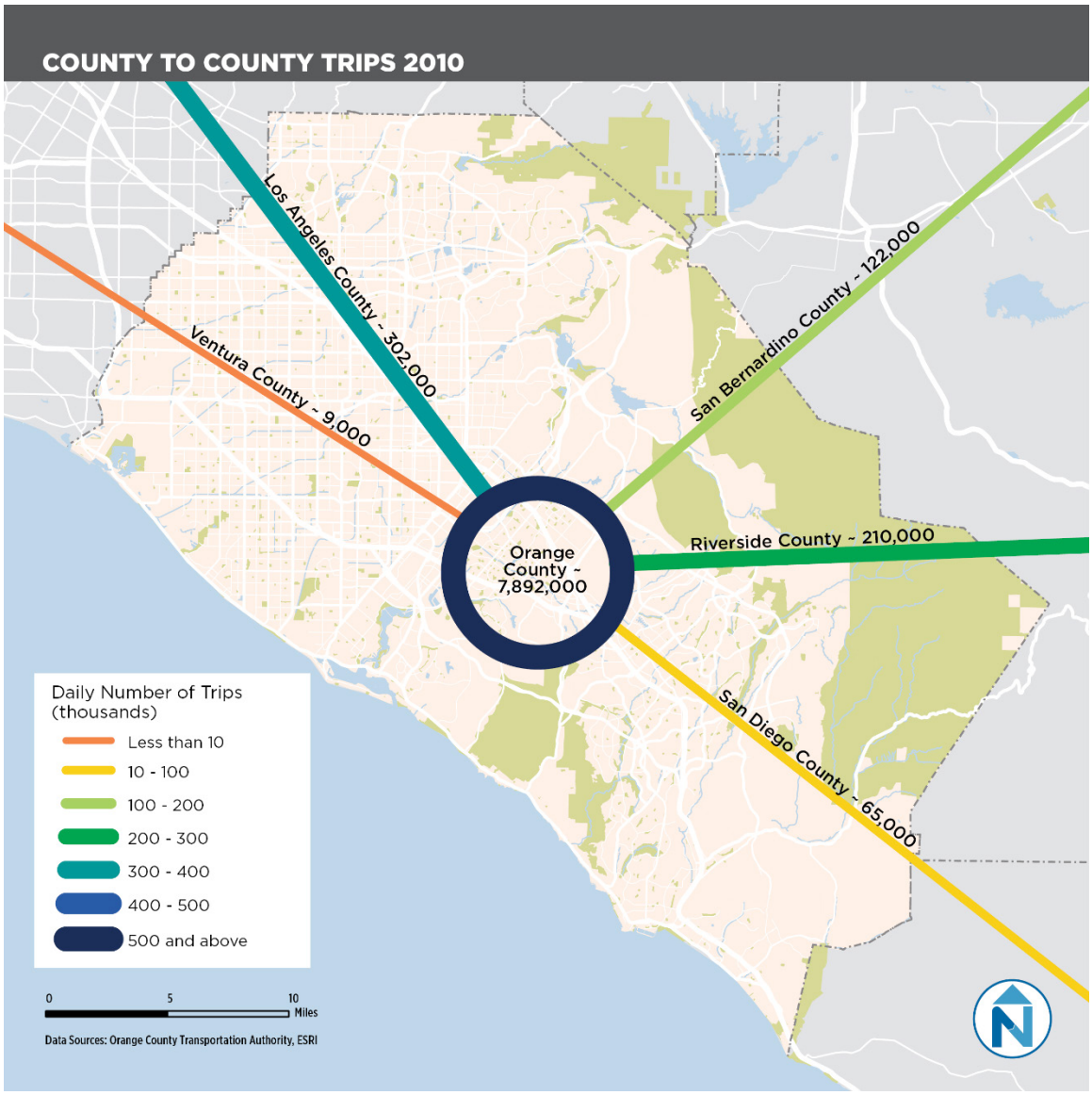
Figure 6-36 Existing Travel Flows: High Occupancy Vehicles (HOV)



Out of County Trips

Existing travel flows both within Orange County and between Orange County and other counties in Southern California are shown in Figure 6-37. The vast majority of trips including Orange County both begin and end within the county. However, there are significant numbers of trips made to and from neighboring counties. With more than 300,000 daily trips, Los Angeles County accounts for approximately 43 percent of travel to other counties in the region. Riverside County (30 percent) and San Bernardino County (17 percent) also generate a large number of daily trips.

Figure 6-37 Existing Travel Flows: Other Counties



Future Daily Trips

Figure 6-38 through Figure 6-39 show projected future weekday average trips, assuming the implementation of planned changes to the transportation network as well as projected population and employment growth.

- Future travel patterns for all trips by all modes are very similar to existing patterns, albeit with an increase in volumes. Most travel will continue to be within the northern part of the county, although large numbers of trips will be made within South County and between other parts of the county.
- Future travel flows between Orange County and other counties in Southern California are projected to increase by more than 37 percent to nearly 1 million daily trips. Trips between Orange County and Los Angeles County are projected to account for almost 70 percent of that increase. Daily trips between the two counties are predicted to increase in volume by more than 60 percent to almost half a million daily trips.

Figure 6-38 Future Travel Flows: All Purposes and Modes

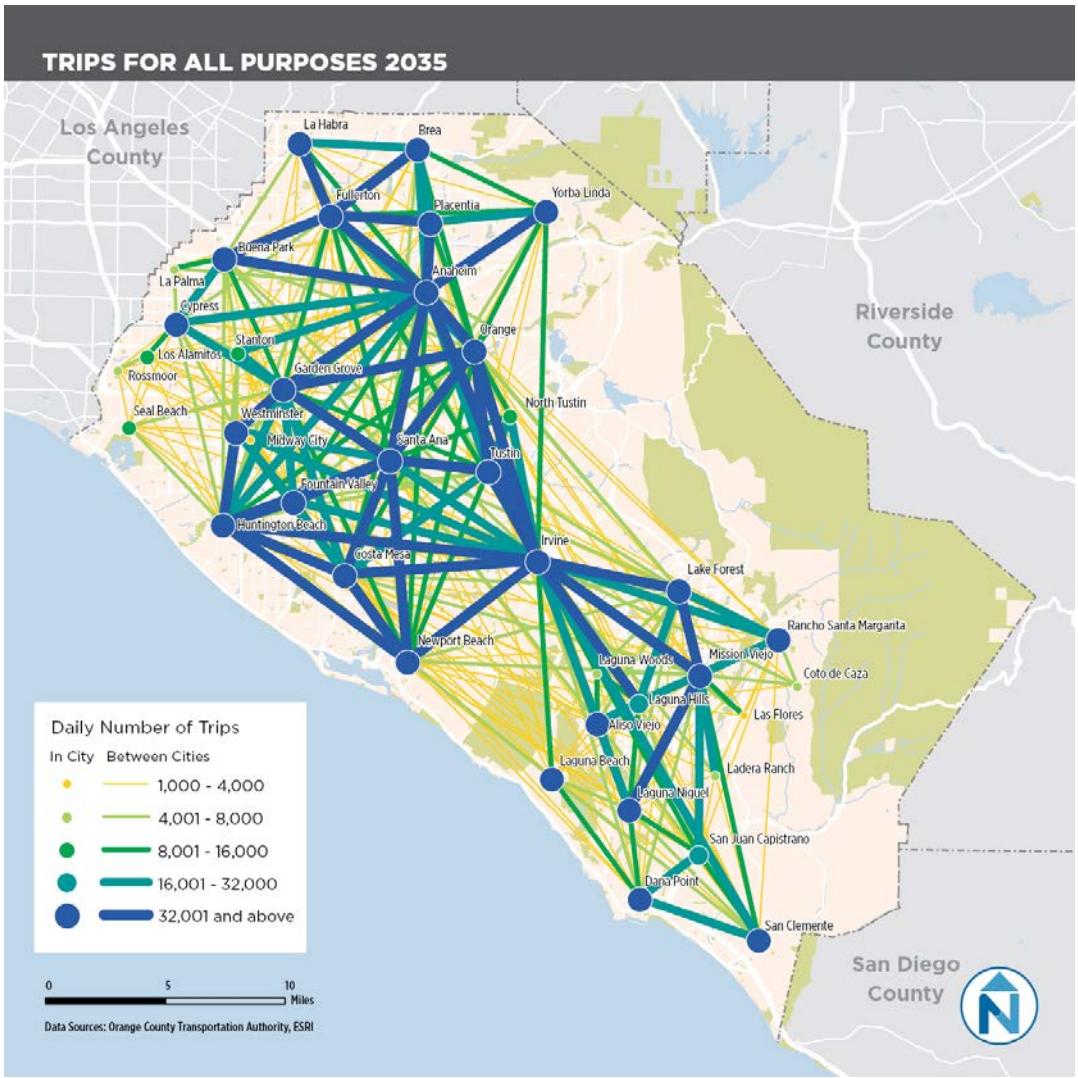
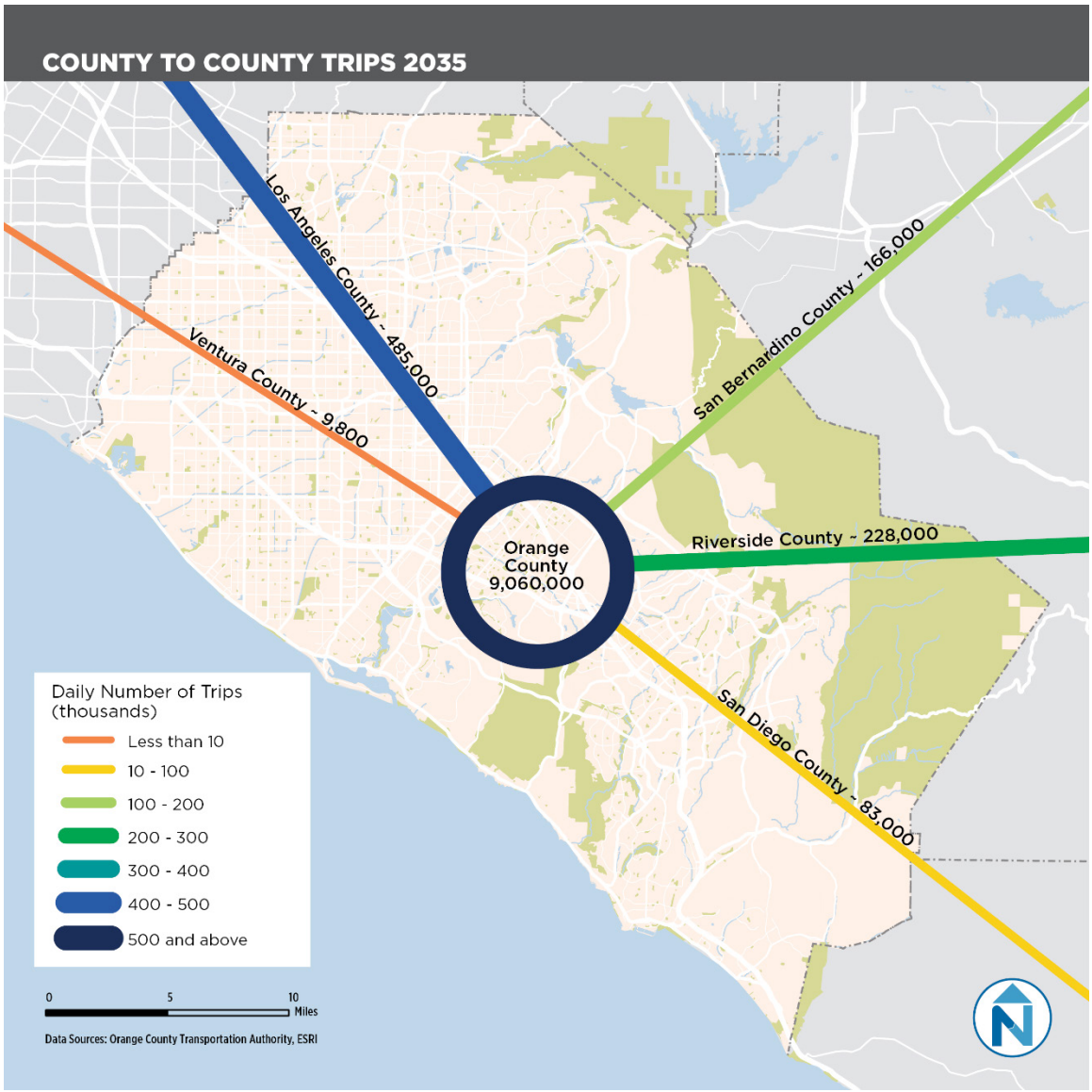


Figure 6-39 Future Travel Flows: Other Counties



Transit Propensity Analysis

Transit propensity is the likelihood that an individual will use transit for trips. It is based on a range of factors, from the quality of available transit service to surrounding land uses and individual demographic characteristics. To determine which factors were the most important predictors of transit use in Orange County, OCTA performed a regression analysis of 30 variables. The analysis determined that the following six factors best predict Orange County locations with a high concentration of people likely to use transit:

- Per-capita income
- Households making less than $45,000 per year
- Approach volumes at intersections (average daily traffic)
- Intersection density (intersections per square mile)
- Total employment (number of workers)
- Employment density (jobs per acre)

Additionally, the analysis established standardized coefficients that can be used to weight the factors relative to one another, as follows: per-capita income, 0.4; approach volumes, 0.25; employment density, 0.21; total employment, 0.13; household incomes, 0.12; and intersection density, .05.

Figure 6-40 through 6-45 map these factors in Orange County. Figure 6-46 shows an amalgamation of all six factors, indicating areas with the highest overall propensity for transit use. In the figures, darker green areas have the highest ridership potential, while dark red areas have the lowest ridership potential. Key findings include the following:

- Low per-capita incomes are particularly pronounced in the urban core of North/Central County north of the 55 freeway, in cities including Santa Ana, Anaheim, Orange, Garden Grove, Westminster and Buena Park. Higher-income areas are more prevalent to the east in areas including Yorba Linda, Anaheim Hills, Villa Park and parts of Tustin, along the coast in communities including Newport Beach and Laguna Beach, and in South County. There are pockets of lower incomes in South County including student housing at UC-Irvine and mobile home parks and retirement communities closer to I-5. Households with annual incomes below $45,000 follow similar patterns.
- Approach volumes at intersections are an indicator of major destinations and trip generators nearby. Areas with heavy traffic include those near job concentrations, as well as retail areas and major destinations such as theme parks. High approach volumes are particularly pronounced in the Irvine Business Complex and in Anaheim's Platinum Triangle and Resort areas.
- Intersection density is an indicator of both the connectedness of the street network and the presence of small blocks, which combine to reduce walking distances and foster walkable, transit-friendly neighborhoods. There does not appear to be a clear relationship between intersection density and the other variables mapped for this analysis. In addition to the North/Central County areas mentioned above and near freeway corridors in South County, areas with a high density of intersections include Downtown Huntington Beach, the Balboa Peninsula and Balboa Island, and Corona del Mar in Newport Beach, as well as residential parts of Irvine.
- The largest employment clusters, in terms of total numbers of jobs, are found at the Irvine Business Complex and, to a lesser extent, in the Resort area of Anaheim and at the Irvine

Spectrum. In addition to these areas, there are high employment densities in Downtown Santa Ana and near the Orange Crush interchange of SR-22, I-5 and SR-57.

Figure 6-40 Per-Capita Income

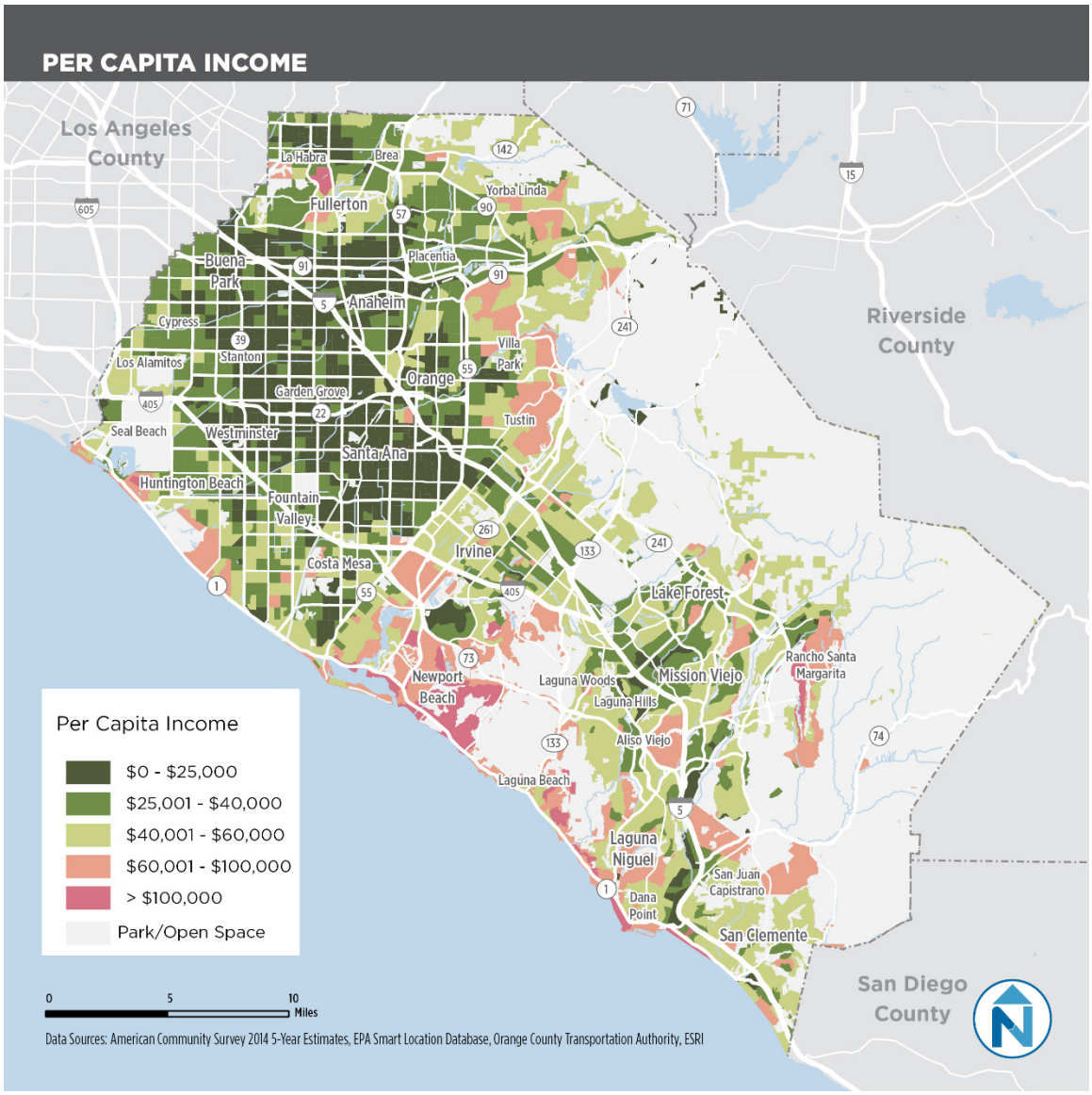


Figure 6-41 Annual Household Income Below $45,000

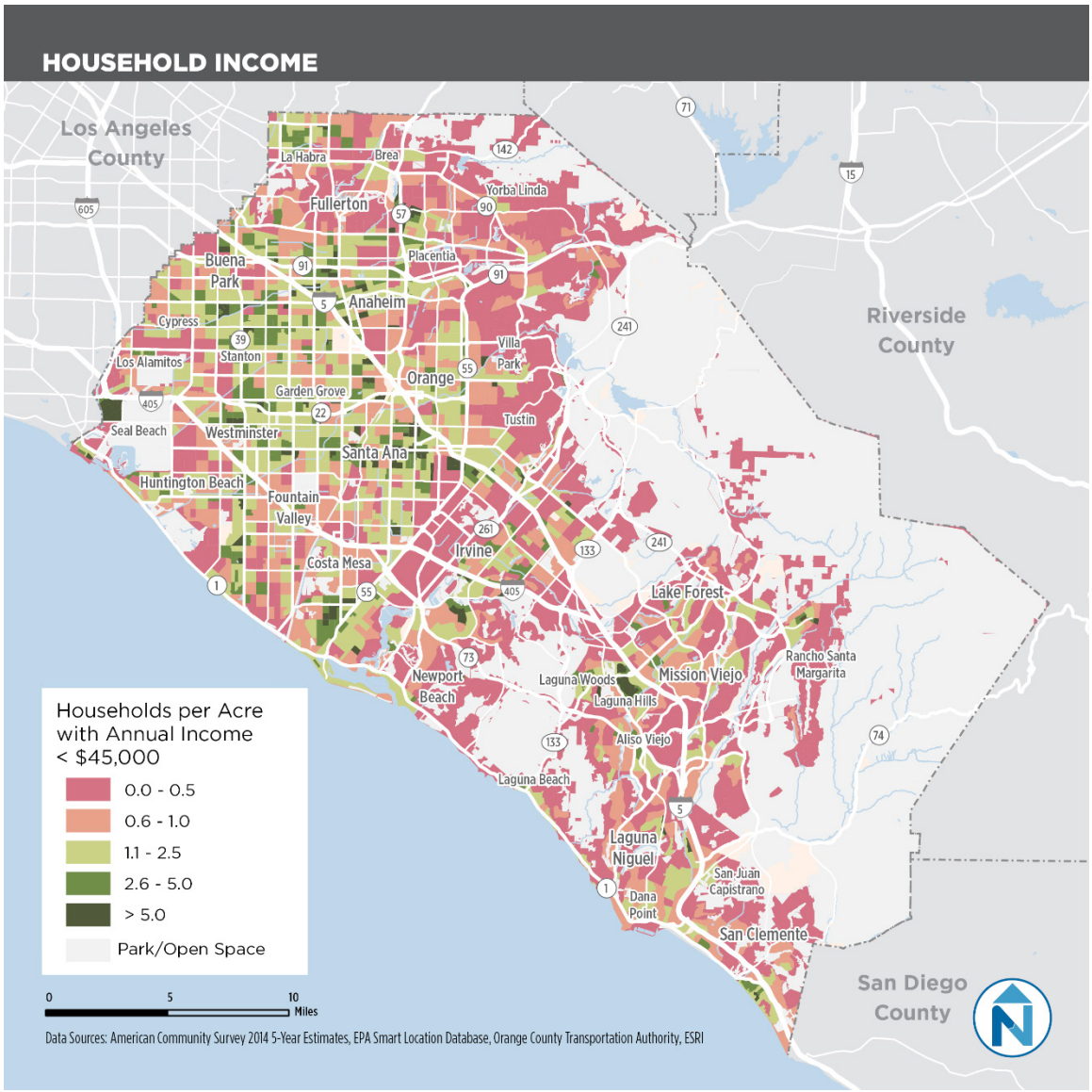


Figure 6-42 Approach Volumes at Intersections

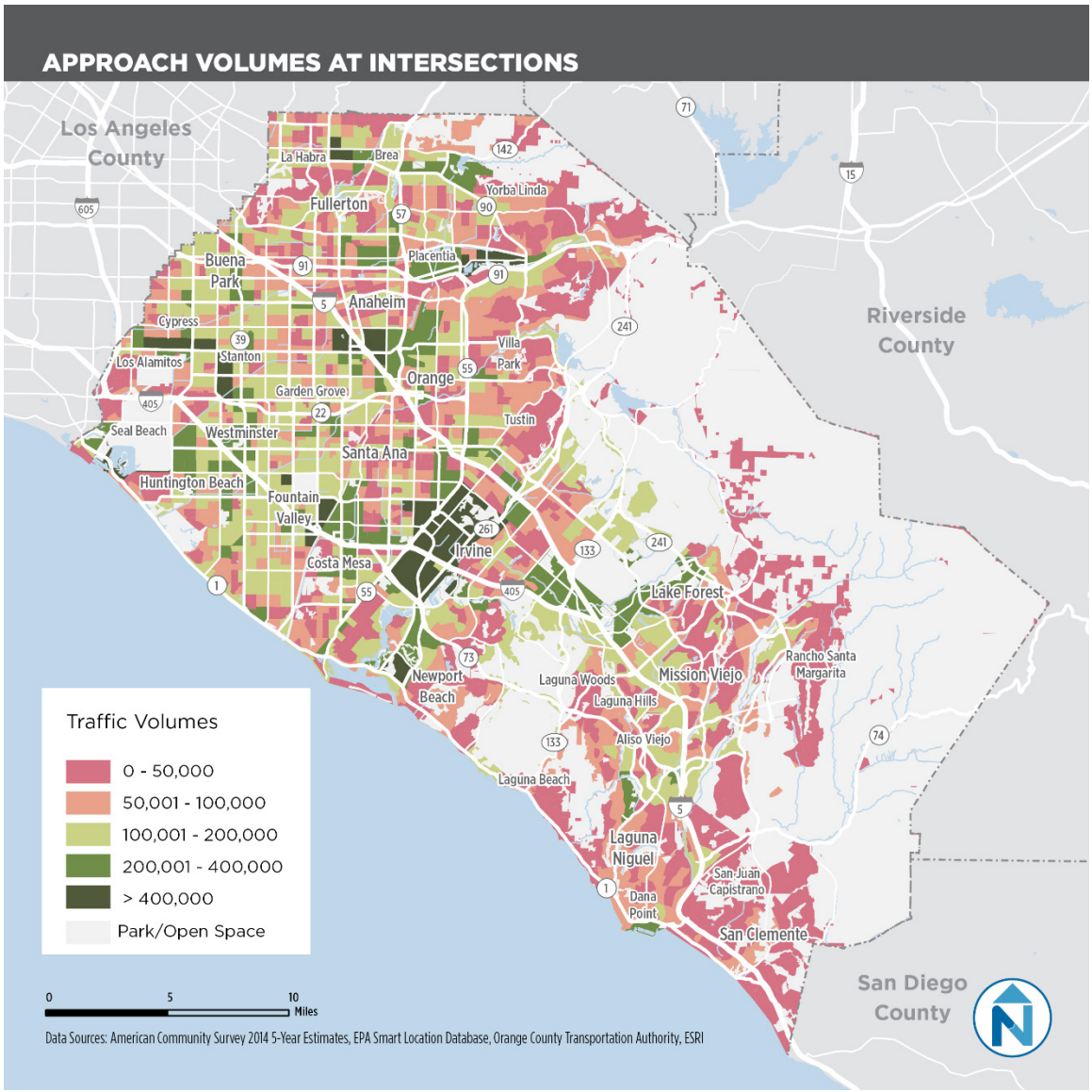


Figure 6-43 Intersection Density

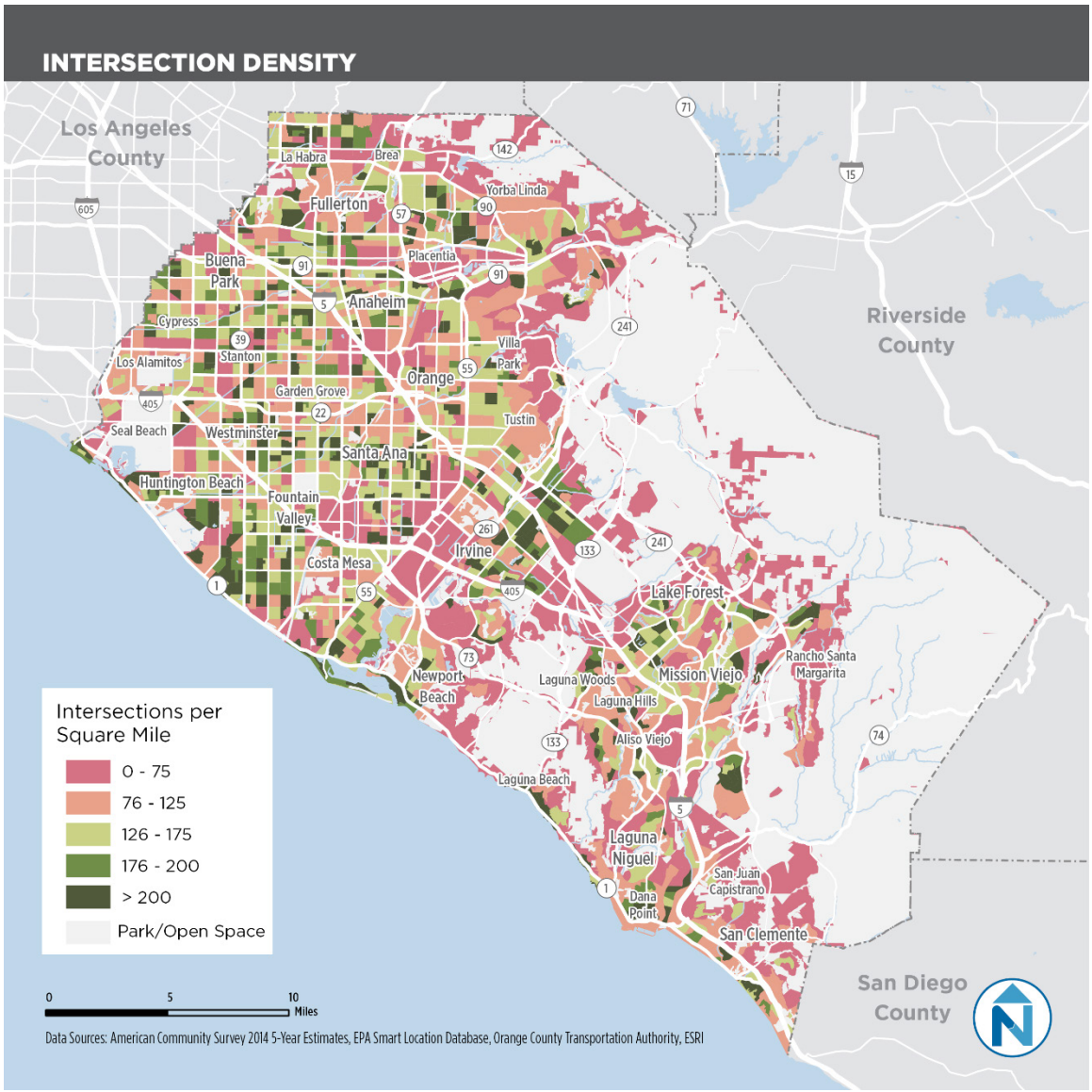


Figure 6-44 Total Employment (Number of Workers)

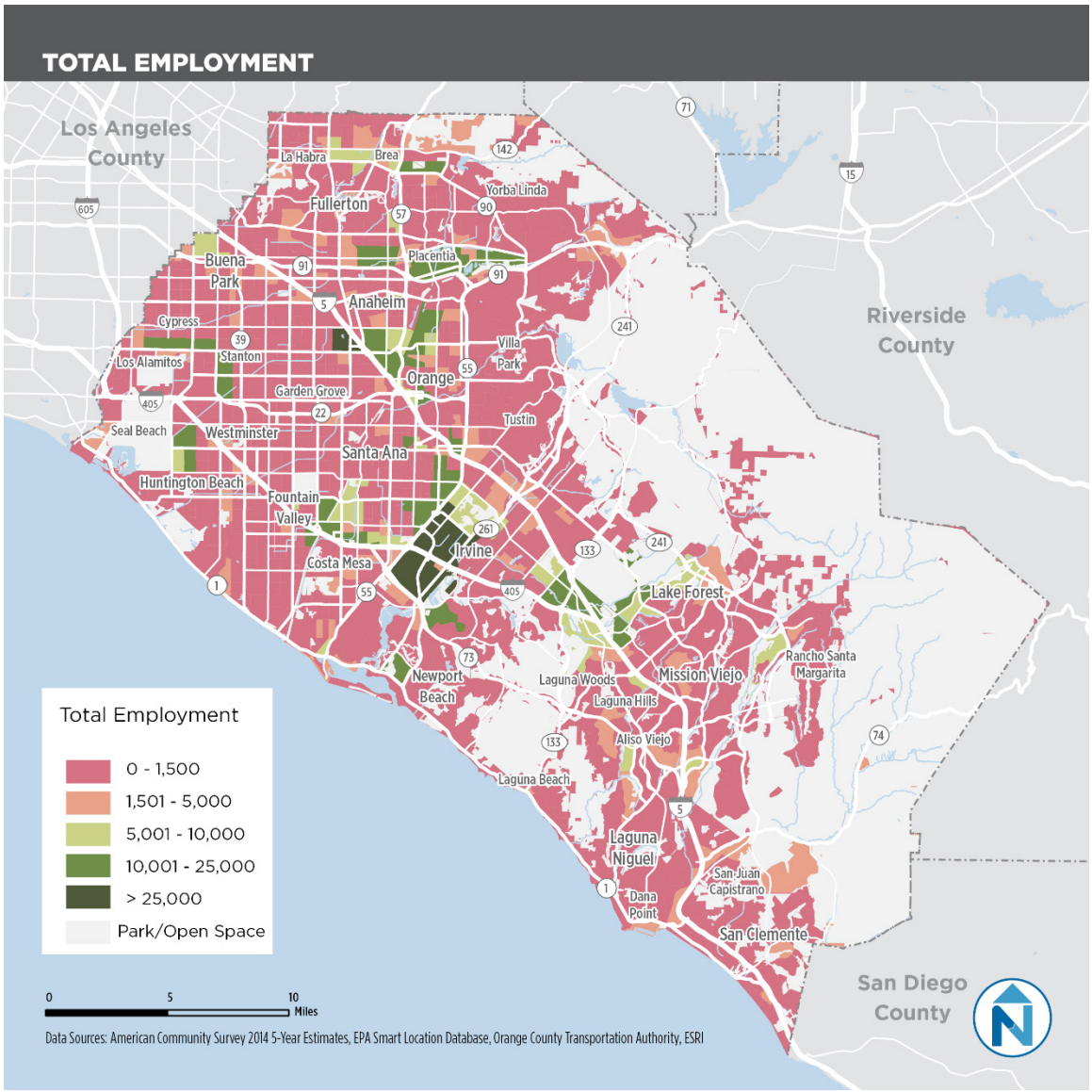


Figure 6-45 Employment Density (Jobs per Acre)

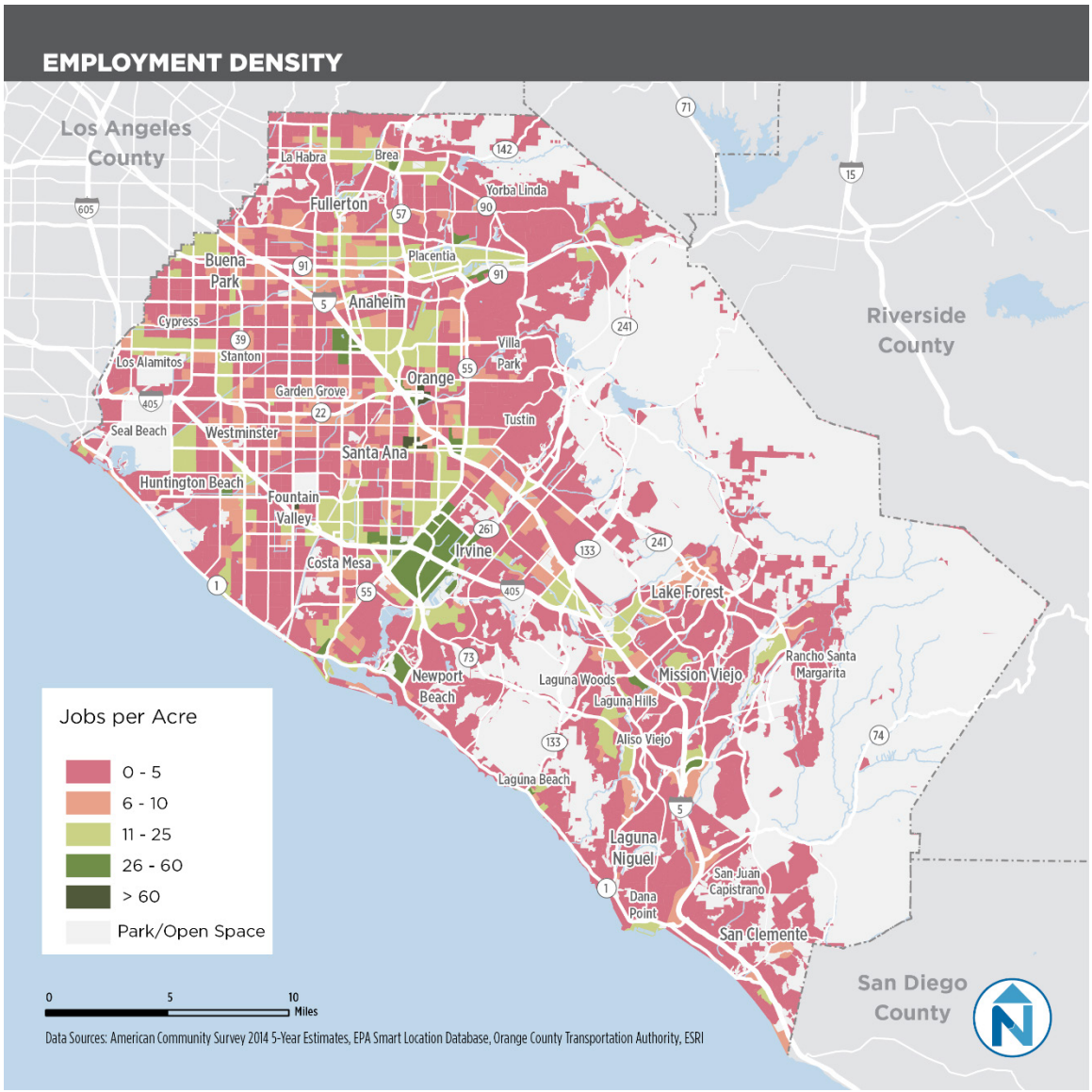
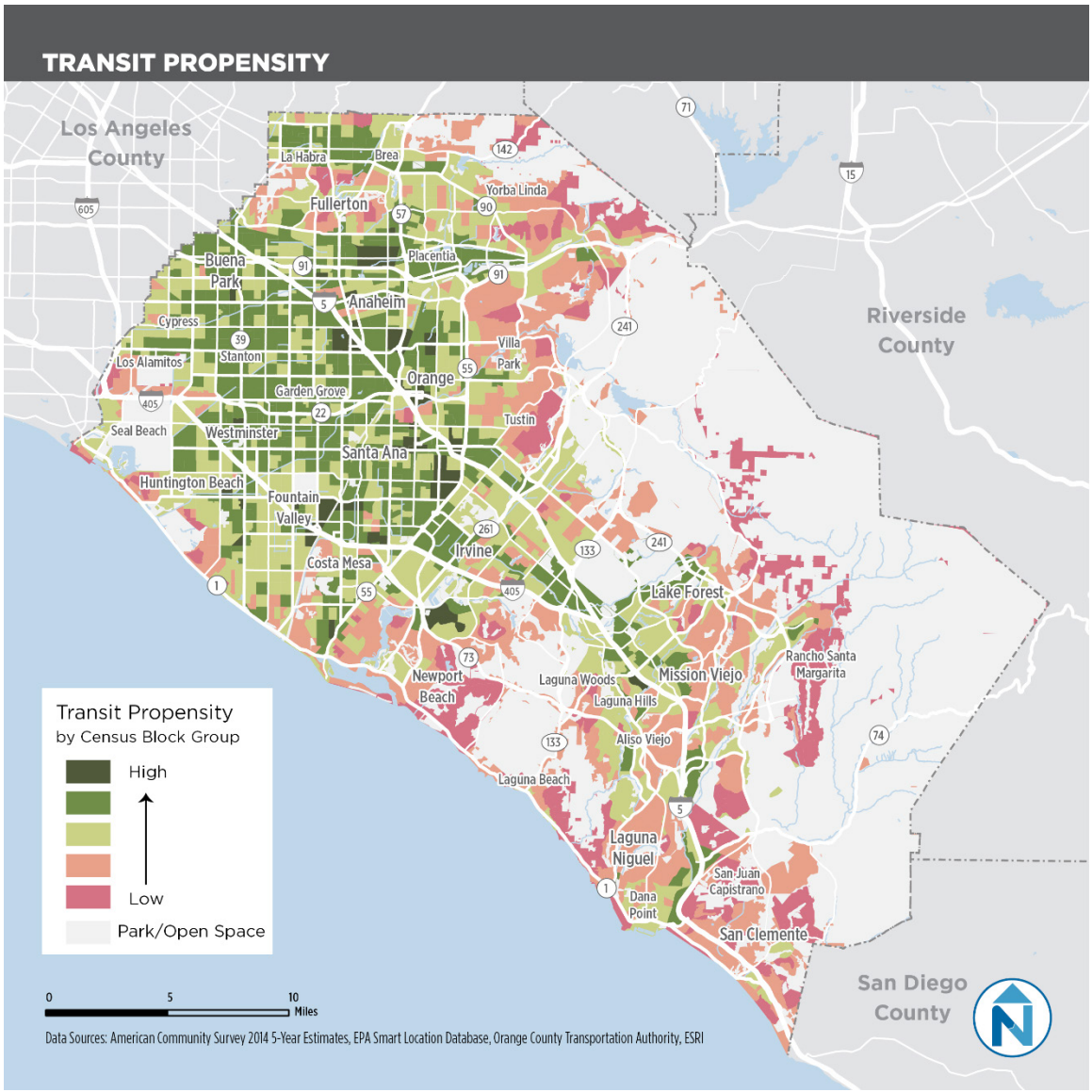


Figure 6-46 combines and weights the six factors to reveal the areas of the county with the highest overall propensity for transit use. Key findings include the following:

- Most areas of high and medium-high transit propensity are located in the urban core of North/Central County, most notably in Santa Ana and Anaheim. There are, however, areas of relatively high propensity throughout Irvine and in South County along the I-5 corridor.
- The methodology includes two separate measures of income, household income and per-capita income, and it weights per-capita income most heavily. Lower-income individuals and households are highly concentrated in the urban core of North/Central County: In much of the area north and west of the 55 and north of the 405, per-capita incomes are less than $25,000 annually.
- As with income, two of the six factors included in the analysis are related to employment, and the largest concentration of jobs in Orange County is at the Irvine Business Complex. However, unlike areas north of the 55, it is not a major source of existing ridership, due most likely to the types of jobs found here—higher-income white-collar office employment, rather than lower-income service sector job—as well as heavily auto-oriented patterns of land use and street design. Put most simply, the Business Complex is a massive office park in the style of a suburban office park or campus rather than a more walkable traditional central business district.
- Areas with lower transit propensity—to the east, along the coast, and in South County—are marked by higher incomes and auto-oriented patterns of design.

Figure 6-46 Transit Propensity



SUMMARY

In developing recommendations for high-capacity transit corridors in Orange County, an understanding of both current and future demand for transit throughout the County will be essential. The analysis in this chapter first considered which factors of the built environment are typically most important in determining transit demand—the "6 Ds" including Destinations, Distance, Density, Diversity, Design, and Demand Management. It then assessed unique conditions of Orange County including current and future land uses, population and employment density, major trip generators, demographic characteristics of the population, and overall travel patterns, culminating in a "transit propensity analysis" based on the factors OCTA has determined to be the greatest predictors of individual propensity toward transit use, and where these factors are found within Orange County. The findings of this analysis are addressed in greater detail in Chapter 8. In short, there are areas of relatively high demand for transit throughout the county, particularly in the northern part of the county.