

## 8 SYSTEM ANALYSIS

The analyses from the previous chapters point to a number of major findings—including notable issues, opportunities, and challenges—that together provide a framework for the OC Transit Vision effort.

- **The majority of existing OC Bus ridership is concentrated in a few key corridors.** Existing ridership is heavily concentrated in major corridors, almost all of which are in the northern part of the county.
- **OC Bus service is focused on the weekday commuter market.** OCTA offers much more service during weekday rush hours than mid-day, in evenings, on weekends, or to special events. Major destinations such as beaches, theme parks, and stadiums can be hard to access via transit during event times, and workers with non-traditional work schedules are not well served.
- **OC Bus service is focused on a select number of hubs, including destinations and connection points.** The network is organized around 30 rail stations, park-and-rides, and bus transfer centers, making multimodal access to these facilities very important.
- **OCTA has begun taking steps to address recent ridership declines.** While declining ridership continues to be a problem, OCTA has taken important steps to reallocate resources to where they can be most effective, and to better leverage existing resources by improving connectivity.
- **Limited funding has constrained ridership growth.** Whatever the reasons for OCTA's ridership decline, it is reasonable to believe that the agency could increase ridership by increasing and otherwise improving service; however, it has lacked the funds to do so.
- **Land uses and demographics in Orange County present both challenges and opportunities for effective transit service.** In many ways, Orange County is not a typical suburban area, and this is true in ways that support transit use: the county has concentrations of jobs and employment, a racially diverse population, and major destinations such as Disneyland. However, land uses are highly auto-oriented, both in their design as well as their distribution throughout the county.
- **The overall transportation network of Orange County presents both challenges and opportunities for effective transit service.** In the northern part of the county, there is a relatively well-connected street grid, and the wide streets throughout the county can make it easier for buses to operate efficiently. However, wide streets with few crossings limit pedestrian access, and roads that have limited connections to other roads lead to indirect pathways that are not conducive to transit.
- **Long-term trends offer a mixed message.** Cultural and demographic trends point toward higher ridership over time, but ridership has continued to decline for a variety of reasons including new technology-based alternatives to transit. Other technologies such as real-

- time arrival smartphone apps have benefitted transit, and transit could benefit from future automation of vehicles.
- **Increased transit use can support greenhouse gas reduction targets..** The transportation sector is the largest source of greenhouse gas emissions in California, and transit has an important role to play in reducing impacts from climate change.
  - **The future OC Streetcar and Bravo! lines provide a template for future ridership growth.** Recent efforts to improve the quality of transit in key corridors including Bravo! rapid bus service and the OC Streetcar are an important first step in the right direction.
  - **Key stakeholder interviews indicate shifting trends.** Interviews with representatives of diverse constituencies in the County found evidence of several of the trends described above, including shifting cultural norms, as well as clear direction on transit priorities including more off-peak service, more premium service, increased connectivity and adoption of new technologies.

### Ridership Concentrated

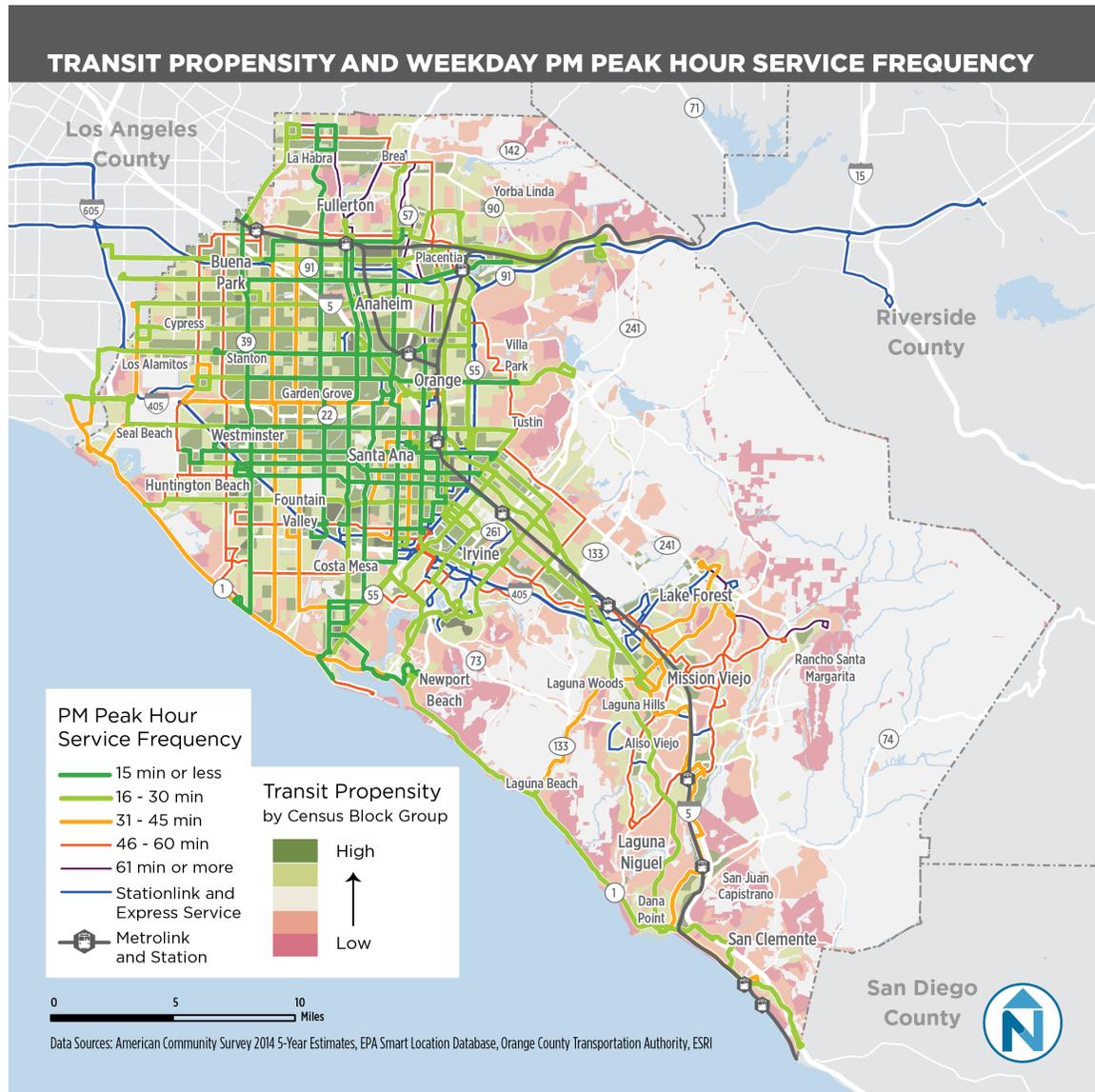
OC Bus service is heavily concentrated in a few corridors, and even more so after the recent 2016 Bus Service Plan restructuring. There are good reasons for this.

While ridership is partly a function of the level of service offered, it is notable that *so much* of OCTA's existing ridership is concentrated in a limited number of major corridors—approximately 75 percent of boardings are on just 19 routes, out of a total of 65 routes in the system. Moreover, fully one-quarter of ridership is in just three corridors: Harbor (Routes 43 and 543), Bristol/State College (Routes 57/57X), and 17<sup>th</sup>/Westminster (Routes 60 and 560). These three corridors, as well as nearly all major routes, are located in the northern part of the county, generally north of the 55 Freeway. South County is served by two major transit corridors: the Metrolink/Amtrak (LOSSAN) rail corridor, which has its busiest station in South County (at Irvine), and OC Bus Route 83.

While the transit propensity analysis in Chapter 6 shows pockets of high transit demand in South County—where there are large numbers of jobs, among other factors—most demonstrated demand for transit is in the northern part of the county, where important demographic indicators of a propensity toward transit use (most notably, lower incomes) are concentrated. The street network in South County is generally less conducive to both transit operations and pedestrian access than in the north.

The fact that transit demand is so concentrated in a few major corridors points the way toward a strategy of targeted investments to improve the quality of transit service where large numbers of people can benefit. This is the strategy OCTA has already begun to pursue, both through the OC Bus 360° effort as well as Bravo! service, the OC Streetcar, and this study.

Figure 8-1 Transit Propensity and Weekday PM Peak Hour Service Frequency



## Service Highest on Weekdays

Like most large transit operators, OCTA operates substantially more service during weekday peak periods and midday on weekends than it does during evenings or all day on weekends. Similarly, OCTA provides only limited supplemental service to special events such as Angels games.

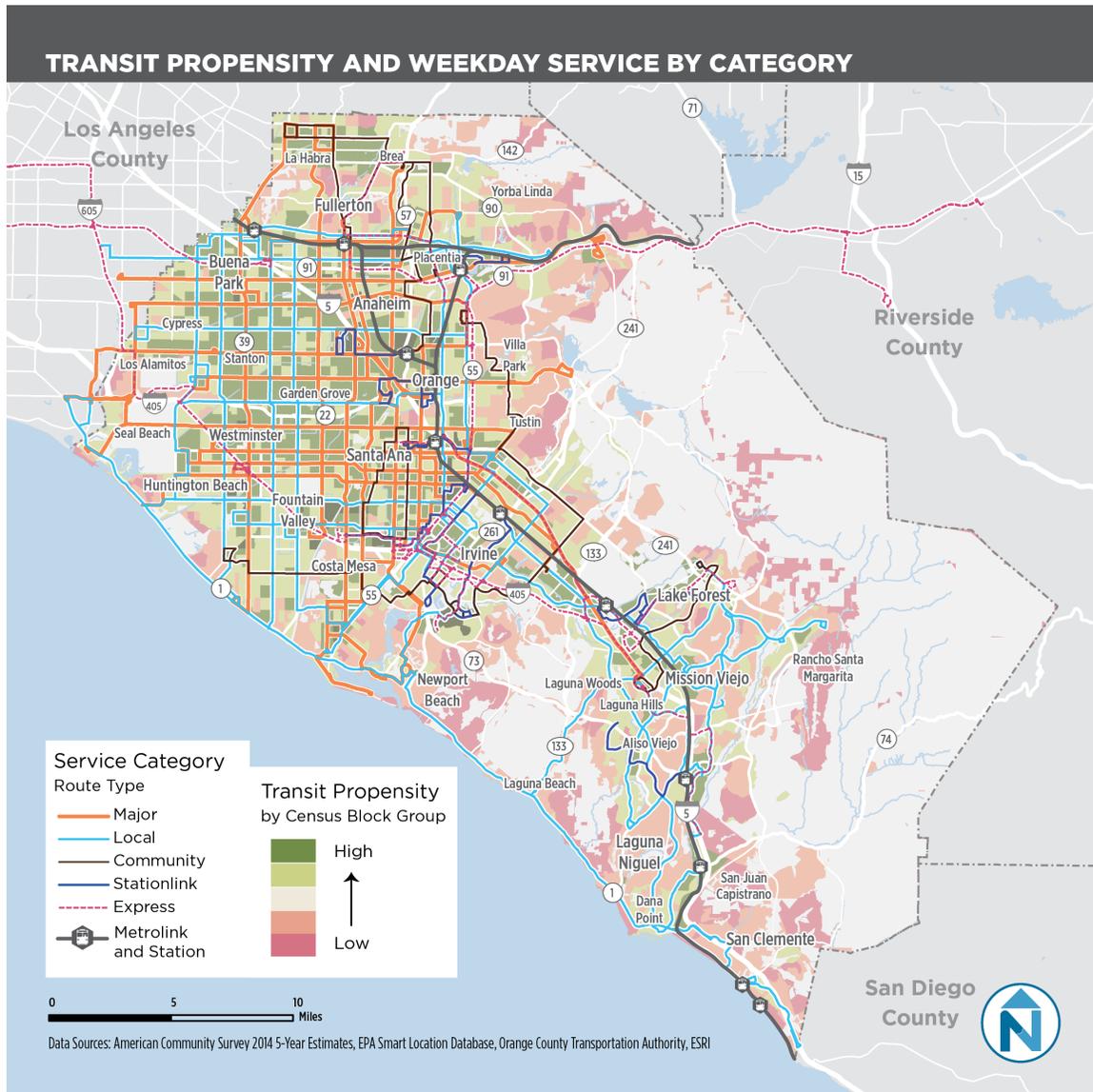
Again, there are good reasons for this: there is generally less transit demand during evenings and on weekends (although it may be increasing with time, as the job market changes), and service to special events can be expensive to operate. Orange County is unique, however, in the variety of weekend and recreational destinations it offers; in some areas, traffic on weekends can be heavier than on weekdays, which is an indicator of travel demand, if not specifically transit demand.

OCTA is constrained by funding and limited in the amount of service it can provide, so the agency must choose wisely when allocating its resources. Nevertheless, there are a number of reasons additional off-peak service might prove worthwhile:

- Special event service and service to leisure destinations could attract new riders, who might then be more likely to use weekday service;
- Transit access for late-shift workers could provide new employment opportunities for Orange County residents; and
- Enabling a “car-free” or “car-light” lifestyle in Orange County would require more non-commute service to social and other non-work destinations.

Members of the millennial generation, in particular, might respond to more evening and weekend service. At a minimum, OCTA should explore opportunities to extend spans of frequent service by an hour or two after the PM peak period in order to facilitate more early-evening travel home from work or to restaurants and other destinations.

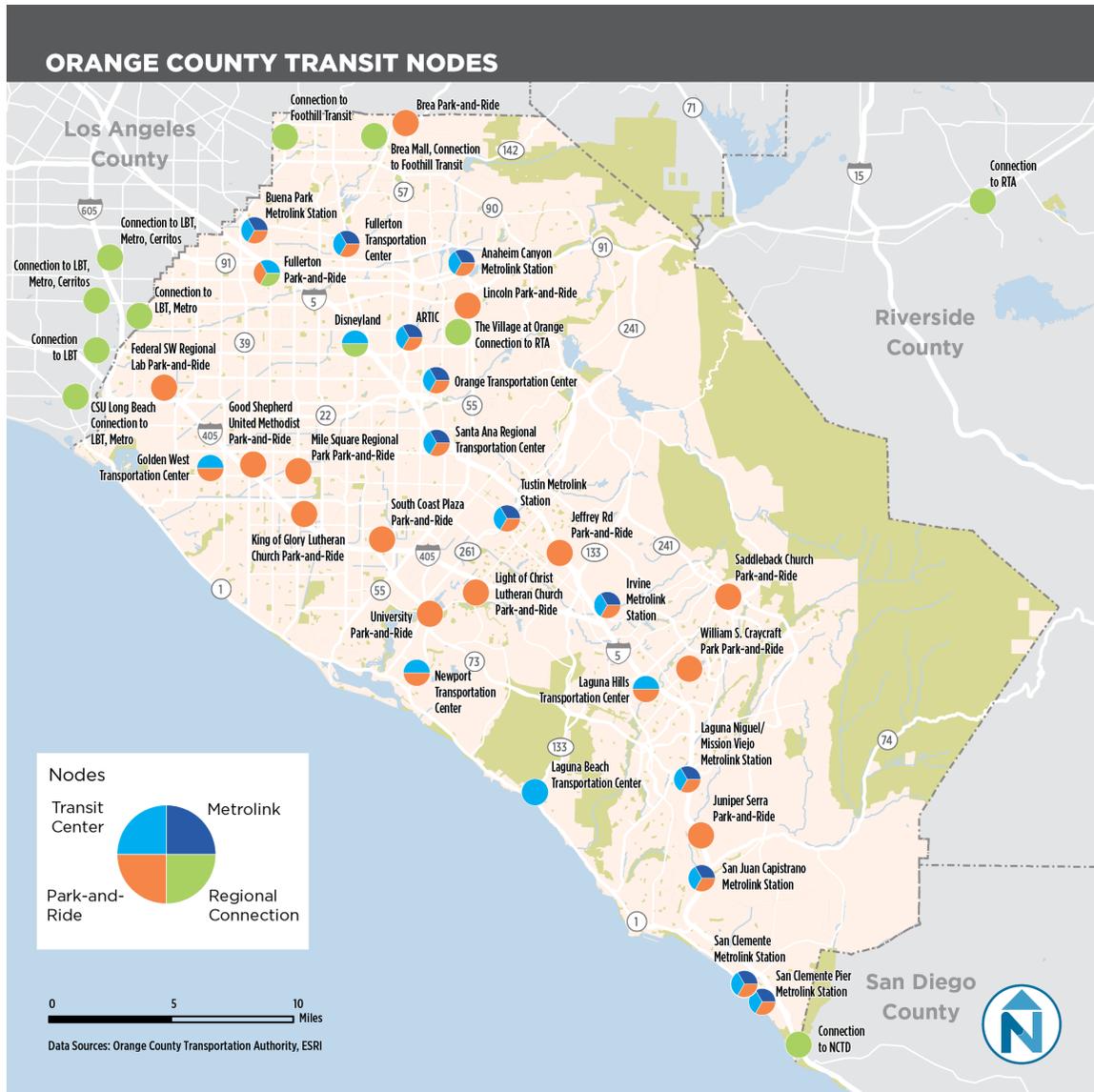
Figure 8-2 Transit Propensity and Weekday Service by Route Category



## Connectivity at Hubs

The fixed-route transit system in Orange County is organized around more than 30 major transit hubs, ranging from Metrolink stations to park-and-rides and bus transfer centers (see Figure 8-3). These function in different ways: some facilitate connections between transit routes, while others (such as park-and-rides) are primarily intermodal. In all cases, connectivity both between and to these major nodes are important.

Figure 8-3 Orange County Transit Hubs



One focus of this study is first-/last-mile access to transit hubs. *First-/last-mile* refers to the common case of origins and destinations that are relatively close to transit stops, but not so close that they can be accessed easily by walking. Expanding first-/last-mile opportunities using options such as shuttle service and accommodations for transportation network companies (such as Uber and Lyft) leverages existing assets to expand the reach of the transit system and is a relatively cost-effective strategy for increasing transit use.

Pedestrian access to transit hubs can be improved in many ways, from direct investments in improvements such as new crosswalks to more long-term changes in land use policies and patterns to make Orange County more pedestrian-friendly. Pedestrian access to transit stops is a problem throughout Orange County, but targeted investments in the half-mile around major transit hubs could reap outsized benefits.

### Addressing Ridership Decline

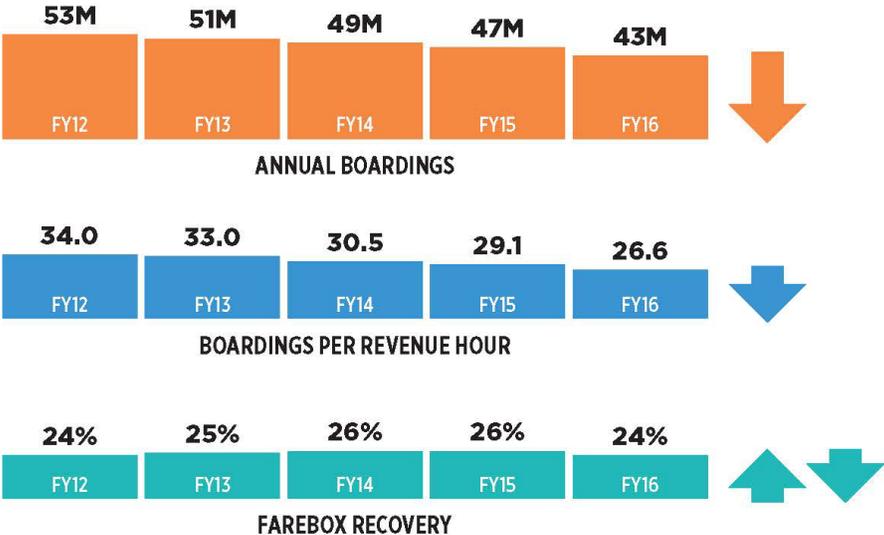
OCTA’s decline in ridership over the past few years has been a focus of the agency’s attention. Over the past five years, annual OC Bus ridership has decreased by about 10 million boardings. System productivity has also decreased from 34 passengers per revenue hour to 27 passengers per revenue hour. The 2016 Bus Service Plan route network restructuring was designed to increase ridership, and the agency has formed a task force to research potential causes and solutions to address the decline.

A variety of additional factors have reduced ridership. Bus fares have increased as much as 60 percent since 2008, while service hours have decreased 14 percent. Rising employment means more people can afford a car, while plummeting gas prices mean people can afford to drive further and more frequently. A new state law allows undocumented immigrants to obtain a driver’s license. Most recent transportation capital investments in the county have focused on reducing auto commute time.

What is clear from industry research is that while there are many possible causes of ridership decline, one thing that is proven to increase ridership is increased service. OCTA has been limited in its ability to improve service due to funding constraints, so the agency has turned to the next best thing: making more cost-effective use of existing resources by allocating service to areas of high demand, and exploring creative alternatives to traditional fixed-route service in areas with lower demand.

The agency has also sought to better leverage its existing assets by focusing on connectivity, including first-/last-mile connections to Metrolink stations and other hubs. Finally, OCTA is investing in higher-quality service in its highest-demand corridors, introducing Bravo! rapid bus service, advancing the OC Streetcar, and funding the OC Transit Vision as well as other efforts, such as the Central Harbor Boulevard study.

Figure 8-4 Ridership Trends



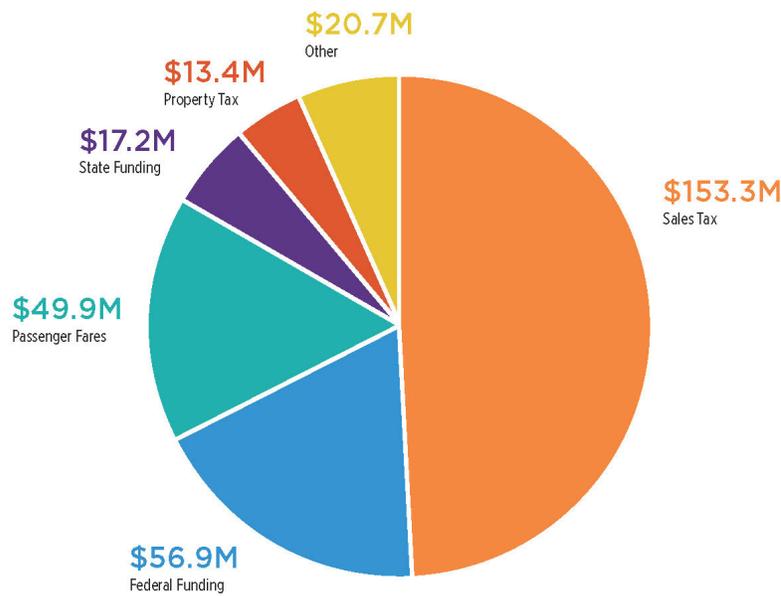
## Funding Constraints

While OCTA has worked diligently to make better use of available resources, limited funding has constrained the agency's ability to grow service and to avoid fare increases (see Figure 8-5).

In the transit business, capital and operating funds typically come from different sources. Limited funding has constrained OCTA's ability to grow service and avoid fare increases. Federal funding has remained static, local sales tax has underperformed projections, and OCTA has raised fares to keep pace with increased costs.

Pursuing capital projects and grants that reduce long-term operating costs may be an easier way to improve transit service than securing additional operating revenues.

Figure 8-5 Bus and Paratransit Revenues



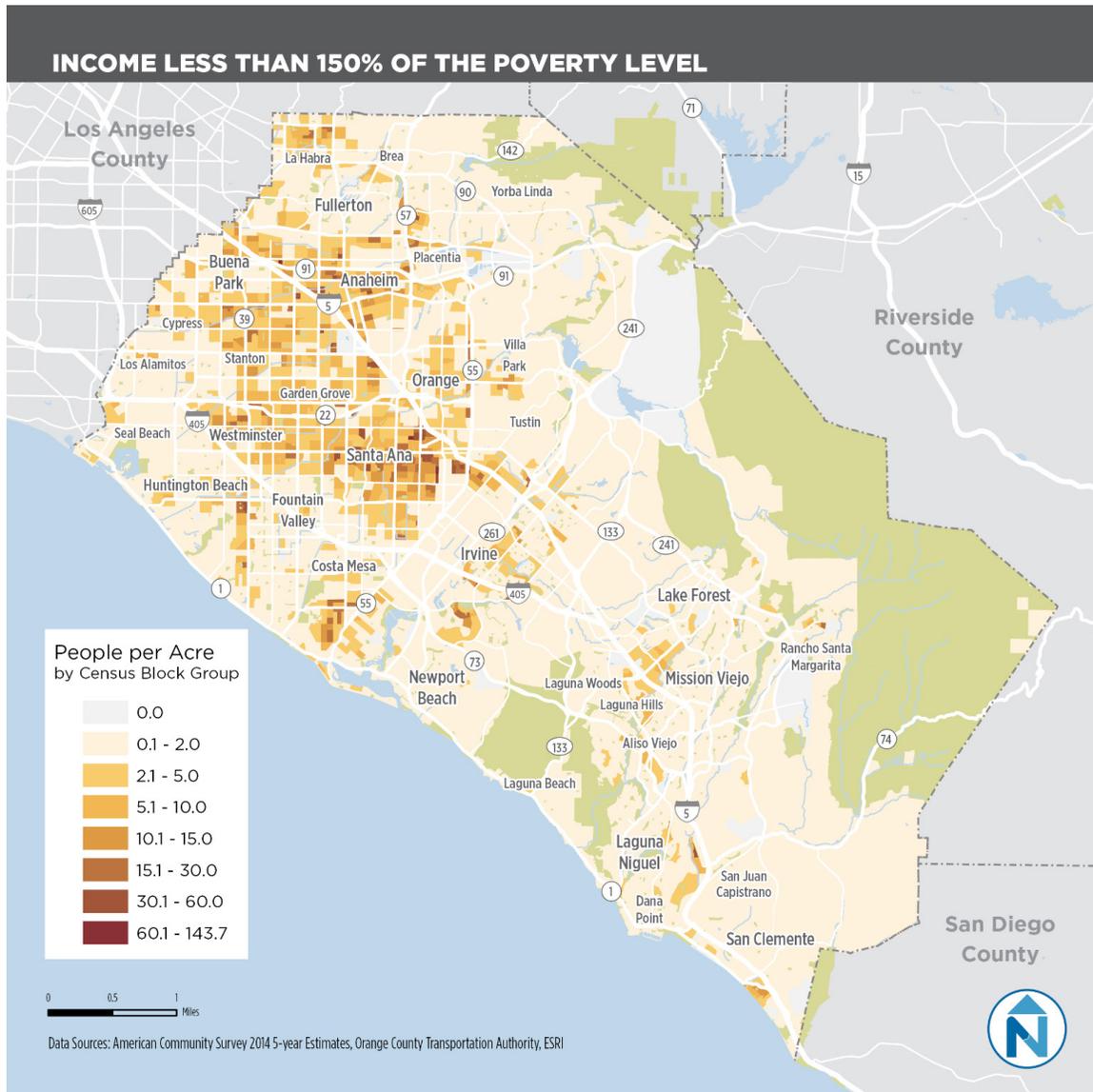
## Land Use and Demographics

Orange County is no longer its stereotype (if it ever was). Parts of the county—generally in the north—are much more urban than typical suburban areas, ranging from population density to demographic composition of the population, much of which is low-income and non-white. There are also an unusually large number of major destinations for a suburban area, ranging from job centers to stadiums and arenas, theme parks, and the county’s world-famous beaches. As a result, roadways are heavily congested seven days a week, and many nights as well.



Transit, however, has struggled to attract patrons, particularly in recent years. While there are many possible reasons for this, the most obvious is the general auto-orientation of the built environment of Orange County. This manifests itself in a variety of ways, ranging from the transportation network itself (addressed below) to the building and building complexes that it connects. Even in the denser, more urban parts of Orange County, single-family homes are much more common than apartment buildings (which, where they exist, are often designed to be reached by car rather than on foot), retail shops tend to be located in strip malls and shopping centers with large parking lots fronting the street, and offices are located in office parks scattered throughout the county rather than clustered in a central business district. In South County in particular, land uses are highly segregated, with homes some distance away from businesses and other uses. While these conditions may be desirable in some ways, they are not conducive to effective transit service.

Figure 8-6 Locations of Low-Income Individuals



## Transportation Infrastructure

Just as the population and built form of Orange County are in some ways more urban than a typical suburban area, the county’s transportation network has certain characteristics of a more urban area. In the older, northern part of the county, some of which predates World War II and much of which dates back to the decades immediately after, there is a relatively well-connected street network. Arterial streets follow a grid pattern with major streets every half-mile, and the smaller neighborhood streets within these half-mile squares are generally more interconnected and direct than in newer areas, with their curving streets and cul-de-sacs. As a result, pedestrian pathways are relatively direct, and buses can run in a straight line, with regular connections to crossing routes.

Those arterials, however, tend to be very wide—often seven or eight lanes, including turn lanes—and have crosswalks only at major streets. Traffic signals are timed to favor traffic on the main street itself rather than crossing traffic or pedestrians, resulting in both out-of-direction travel and long waits to cross the street. While this configuration can actually benefit transit operations in a very narrow sense—buses encounter less congestion and fewer red lights—it discourages transit use, as pedestrian access to bus stops is limited.

In South County, where streets tend to be indirect and disconnected, both buses and pedestrians are challenged. Walking along main streets in Orange County, pedestrians are likely to be surrounded by cars, parking lots, and sound walls, and may feel both uncomfortable and unsafe. This encourages people to drive rather than to walk, take transit, or ride a bike, and further compounds the cycle of auto-oriented transportation and land use patterns.



## Long-Term Trends

Whether or not OCTA ridership—and indeed, transit use nationally—will grow over the long-term is very much an open question. There are indicators pointing in both directions. The recent trend has been negative, for a variety of reasons discussed in this document ranging from low gas prices to service availability. But looking ahead, there are positive cultural and demographic signs, such as the travel preferences of Millennials, the aging of the population, the growth of infill development (and relatedly, the lack of available space for continued roadway expansions) and as technological trends such as autonomous vehicles that could reduce transit agencies' costs.

At the same time, some new technologies represent a threat to transit ridership, most notably transportation network companies (TNCs). So far, TNCs have worked both at odds with and in partnership with transit agencies, sometimes providing services that duplicate transit routes and sometimes providing critical first-/last-mile connections or service where OCTA does not operate. OCTA is currently exploring opportunities for additional win-win scenarios with TNCs.

The pace of both cultural and technological change has accelerated in recent years, and this is not likely to be reversed soon. Transit agencies such as OCTA will need to learn to adapt, and to remain nimble and flexible in their thinking.



Rising  
Unemployment



Young People  
Driving Less



Plummeting  
Gas Prices



Trend Towards  
Urban Living



Increase in  
Registered Vehicles



Diversifying and  
Aging Population



Technology  
Solutions



Shared Mobility



Autonomous  
Vehicles

## Greenhouse Gas Reduction

In Orange County, in Southern California, and statewide—especially on the state and regional levels—reduction in greenhouse gas (GHG) emissions has become a policy imperative and major initiative. In California, the transportation sector is responsible for the largest share of GHG emissions, owing largely to high rates of single-occupancy vehicle (SOV) travel. For this reason, transit has an important role to play in mitigating impacts from climate change. It can only perform this function, however, by improving service to grow ridership. Improving access to transit by active transportation modes such as walking and cycling can help to increase ridership and further reduce GHG emissions.



## High-Capacity Transit Corridors

A primary focus of the OC Transit Vision is to identify potential high-capacity and rapid transit corridors. While there are no existing urban rail corridors in Orange County (as opposed to regional rail like Metrolink and Amtrak), there are Bravo! rapid bus lines and the OC Streetcar will soon operate in Santa Ana and Garden Grove. Light rail will also be included in this effort, as will full-featured bus rapid transit with bus-only lanes.

OCTA's approach to improving its highest-demand transit corridors has demonstrated certain characteristics that will prove useful in the OC Transit Vision process. First, OCTA recognizes that the mode selected for a corridor should be based on the specific context of the corridor—the agency has shown flexibility by advancing bus solutions in some cases and rail in others. It has also taken a practical approach, scaling cost to available resources as well as potential demand. OCTA has focused on areas with the highest potential demand, resisting the urge to make investments that may have more political than technical merit. Finally, the agency has worked in close partnership with cities to ensure that the needs of local residents and workers are met.

Figure 8-7 Route 43/543 High-Capacity Transit Corridor in Orange County

