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# WHERE WE ARE TODAY

To plan effectively for the future, it is important to understand the current conditions of land use and transportation throughout our large and complex region. This chapter reviews those current conditions.

## THE SETTING

### HOW WE USE LAND TODAY

SCAG recognizes that decisions by local jurisdictions about how land is used can impact the regional transportation system, and decisions about regional transportation investments can impact land use. The agency also understands that most land use planning is typically conducted by local jurisdictions, while regional and state agencies often make major decisions about transportation investments.

This is why it is critical for the region to integrate strategies for our transportation system with strategies for how we use land. Only by doing this can we achieve sustainable growth and a high quality of life for our region. This first section of Chapter 2 offers an overview of how we use land in the SCAG region, and its relevance to improving our regional transportation system as we head toward 2040.

### CATEGORIZING LAND USE

Of the 38,000 square miles of total land in the SCAG region, only 21 percent is suitable for development. Of this limited developable land, more than half has already been fully developed. However, of the remaining developable land, only a small portion of it can be developed as sustainable transit-ready infill—meaning it can be reached via planned transit service and that it can readily access existing infrastructure (water resources, sewer facilities, etc.). According to regional land use data, only two percent of the total developable land in the region is located in High Quality Transit Areas (HQTAs), defined as areas within one-half mile of a well-serviced fixed guideway transit stop, and including bus transit corridors where buses pick up passengers every 15 minutes or less during peak commute hours. A more compact land development strategy is needed, which will be discussed in Chapter 5. Please note that this limited remaining land for future development does not account for potential reductions of developable acreage resulting from conservation efforts currently underway.

As the agency prepared the 2016 RTP/SCS, it needed to organize the many different types and classifications of land uses in the region for required technical analyses. The SCAG region is diverse and large, and the types and classifications of land use used by one jurisdiction often differ from those used by another. The result is that there are many different land use types and

classifications that SCAG must organize for its own analyses.

To accurately represent land uses throughout the region, SCAG aggregated information from jurisdictions and simplified the types and classifications of land use into a consolidated set of land use types. The agency then converted these consolidated land uses into 35 “Place Types” to reflect the diversity of land use planning. Descriptions, standards and graphic examples of each Place Type can be found in the Reference Documents section of the SCS Background Documentation Appendix. These Place Types were used in an urban setting design tool known as the Urban Footprint Scenario Planning Model (SPM), to demonstrate urban development in the Plan in terms of form, scale and function in the built environment.

SCAG then classified the Place Types into three Land Development Categories (LDCs). A table of how the 35 Place Types were categorized into the three LDCs can be found in the Reference Documents section of the SCS Background Documentation Appendix. The agency used these categories to describe the general conditions that exist and/or are likely to exist within a specific area. They reflect the varied conditions of buildings and roadways, transportation options, and the mix of housing and employment throughout the region. The three Land Development Categories that SCAG used are:

1. **Urban:** These areas are often found within and directly adjacent to moderate and high density urban centers. Nearly all urban growth in these areas would be considered infill or redevelopment. The majority of housing is multifamily and attached single-family (townhome), which tend to consume less water and energy than the larger types found in greater proportion in less urban locations. These areas are supported by high levels of regional and local transit service. They have well-connected street networks, and the mix and intensity of uses result in a highly walkable environment. These areas offer enhanced access and connectivity for people who choose not to drive or do not have access to a vehicle.
2. **Compact:** These areas are less dense than those in the Urban Land Development Category, but they are highly walkable with a rich mix of retail, commercial, residential and civic uses. These areas are most likely to occur as new growth on the urban edge, or as large-scale redevelopment. They have a rich mix of housing, from multifamily and attached single-family (townhome) to small- and medium-lot single-family homes. These areas are well served by regional

and local transit service, but they may not benefit from as much service as urban growth areas and are less likely to occur around major multimodal hubs. Streets in these areas are well connected and walkable, and destinations such as schools, shopping and entertainment areas can typically be reached by walking, biking, taking transit, or with a short auto trip.

3. **Standard:** These areas comprise the majority of separate-use, auto-oriented developments that have characterized the American suburban landscape for decades. Densities in these areas tend to be lower than those in the Compact Land Development Category, and they are generally not highly mixed. Medium- and larger-lot single-family homes comprise the majority of this development form. Standard areas are not typically well served by regional transit service, and most trips are made by automobile.

## NATURAL LANDS AND FARM LAND

Southern California is one of the most biodiverse areas on the planet, with an enormous wealth of natural habitats, and flora and fauna that include species that only exist in Southern California. Our iconic mountain ranges, chaparrals, numerous rivers and expansive deserts make up our regional identity. Additionally, Southern California has a rich agricultural history and continues to be a food producer for the rest of the country. However, issues such as infrastructure needs, continuing development pressure, climate change and limited financial resources present significant challenges in protecting and maintaining the quality and quantity our natural lands and farm lands.

A considerable amount of the region's natural lands, including some key habitat areas, are already protected.<sup>1</sup> Some areas, especially near the edge of existing urbanized areas, do not have plans for conservation and are susceptible to development. These include lands that are important and unique habitats and have high per-acre habitat values, such as riparian habitat (i.e., areas adjacent to bodies of water such as streams or rivers). These habitat types tend to have high per-acre habitat values—meaning these areas are home to a high number of species and serve as highly functional habitats. Some key habitat types are underrepresented within areas of the region already under protection.

Local land use decisions play a pivotal role in the future of some of the region's most valuable habitat and farm lands. Many local governments have taken

steps toward planning comprehensively for conserving natural lands and farm lands, while also meeting demands for growth. Across the region, transportation agencies and local governments have used tools, such as habitat conservation plans, to link land use decisions with comprehensive conservation plans in order to streamline development.

To support those and other comprehensive conservation planning efforts and to inform the local land use decision making process, SCAG has studied regional-scale habitat values (see [EXHIBIT 2.1](#)), developed a conservation framework and assembled a natural resource database.<sup>2</sup> Over the past several years, SCAG and regional partners such as county transportation commissions (CTCs), environmental organizations and local governments have supported natural land restoration, conservation and acquisition in ways that could contribute to reducing greenhouse gas emissions, streamlining projects and addressing climate change impacts to natural habitats. Please see the Natural & Farm Lands Appendix for additional details.

## SHIFTING HOUSING TYPES

In the postwar era that shaped the physical landscape and popular image of Southern California, most households consisted of parents with children—often residing on large suburban lots with single-family houses. But in the 21st century, the region is witnessing demographic shifts that are influencing housing choices. Today, 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 with an increased demand for smaller-lot single-family houses, as well as multifamily housing close to shopping, transit services and other amenities. Currently, 55 percent of the region's homes are detached single-family houses. Over the next 20 years, the region is projected to add another 1.5 million homes, and much of this increase will be homes on smaller lots and multifamily housing (33 percent single-family housing to 67 percent multifamily housing). Though new housing will tend to be multifamily housing, the region's overall housing stock will remain similar to the existing housing stock, with a breakdown of 49 percent single-family housing and 51 percent multifamily housing (see [FIGURE 2.1](#)).

## OUR HOUSING NEEDS

As a Council of Governments, SCAG is required by California housing law to

<sup>1</sup> O'Neill, T., & Bohannon, J. (2015). Conservation Framework and Assessment. SCAG.

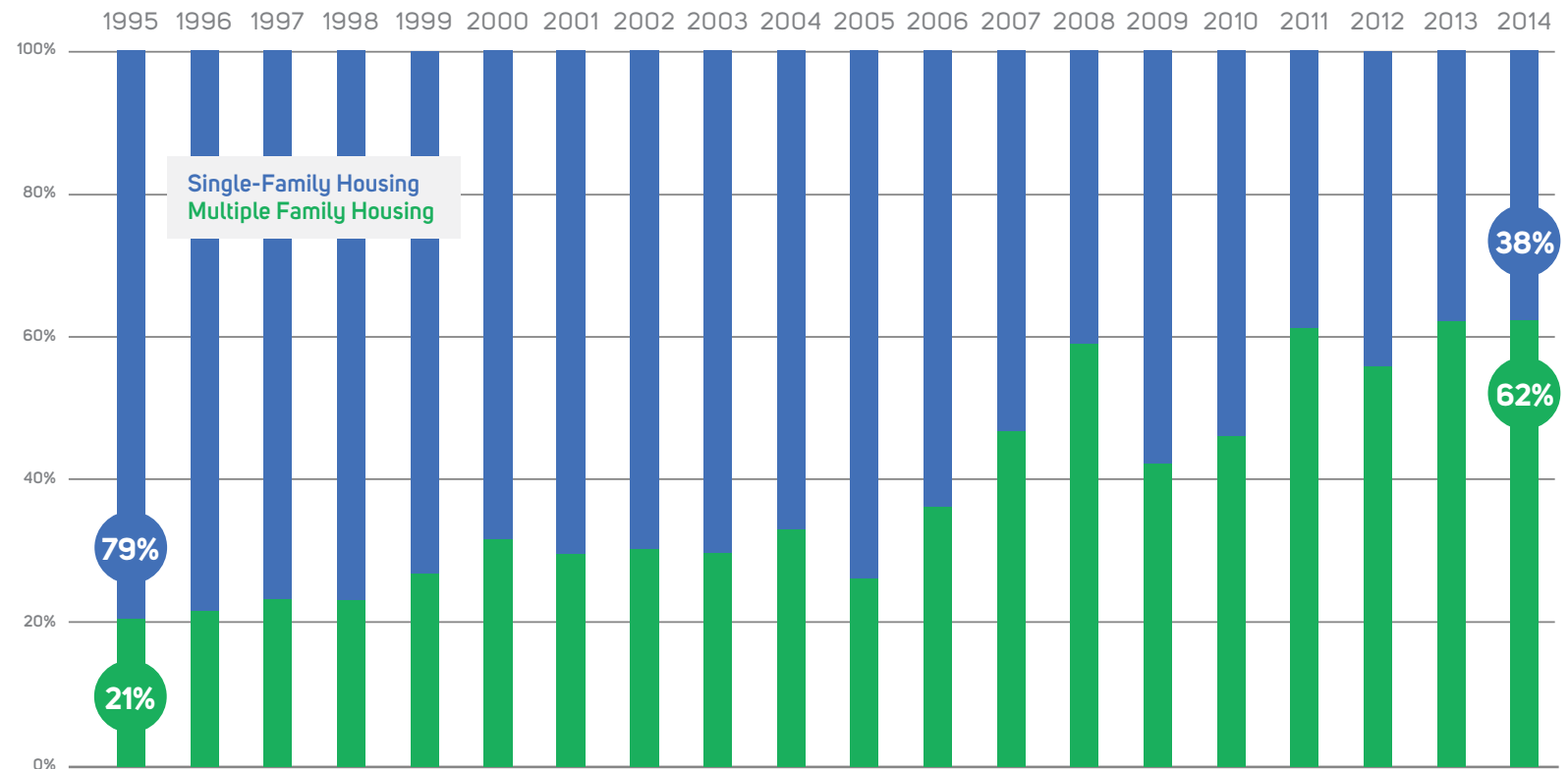
<sup>2</sup> These documents can be found at: <http://sustain.scag.ca.gov/Pages/LinksResources.aspx>.

conduct a Regional Housing Needs Assessment (RHNA) every eight years. This assessment determines future housing needs for every jurisdiction in a given region for a specific time period. This determination is referred to as the RHNA allocation, which represents projected housing needs for an eight-year period, as required by state law. For our region, the most recent RHNA allocation, also known as the fifth RHNA cycle, was adopted by the SCAG's Regional Council in October 2012 and it covers a projection period between January 2014 and October 2021. The RHNA allocation breaks down housing needs into four income categories: very low (less than 50 percent of the county's median income); low (50 to 80 percent of the median); moderate (80 to 120 percent); and above moderate (more than 120 percent). For the fifth RHNA cycle, the

regional RHNA allocation was 412,137 units, broken down as follows: 100,632 very low; 64,947 low; 72,053 moderate; and 174,505 above moderate.

However, although these housing units are planned and zoned for, available data sources indicate that the supply of affordable housing has not met needs, despite strong building activity for market rate housing. For example, during the last RHNA cycle (2006–2014), nearly 22,000 units were constructed using Low Income Housing Tax Credits (LIHTC), a rough benchmark in affordable housing building activity for households with very low income. This building activity represents about 12 percent of the 165,457 units in this category regionally. In contrast, more than 150,000 single-family homes, most likely

**FIGURE 2.1 SCAG REGION SHARE OF MULTIPLE/SINGLE BUILDING PERMITS ISSUED**



Source: U.S. Census Bureau, Security Pacific National Bank (Prior to 1987) and Construction Industry Research Board (1988 to present)  
Single-family housing units include detached, semi-detached, row house and town house units. Multifamily housing includes duplexes, 3-4 unit structures, and apartment type structures with five units or more.

## EXHIBIT 2.1 HABITAT VALUE



### Per-Acre Habitat Value

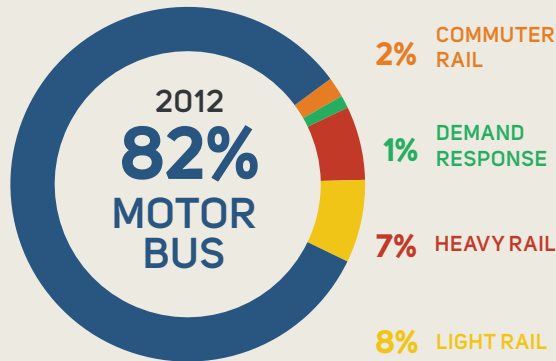


Habitat value refers to the numeric value of a site or area based on an assessment that takes into account species, habitat and functional relationship. The assessment tool aims to spatially capture biodiversity and complexity based on peer-reviewed informational data sets. Please see the Natural & Farm Lands Appendix for a more detailed description of the assessment used to develop the Habitat Value map.

# FOCUS TRANSIT

## Transit Trips by Mode

The share of bus trips in the region has decreased over time but buses still represent the majority of all transit modes.



## Public Transportation Benefits

Enhances personal mobility and access to opportunities.



Source: American Public Transportation Association

### REDUCES GASOLINE CONSUMPTION & GHG EMISSIONS

**10%–30%**

LESS GREENHOUSE GAS EMISSIONS per household

**4,000**

FEWER MILES DRIVEN reduced gas consumption

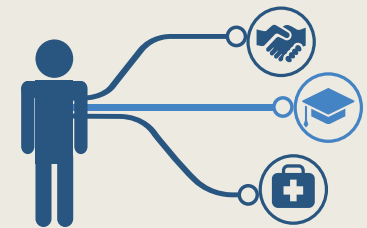
**\$4**

RETURN FOR EVERY \$1 INVESTED IN TRANSIT

**42%**

PROPERTY VALUES PERFORM BETTER WHEN NEAR TRANSIT

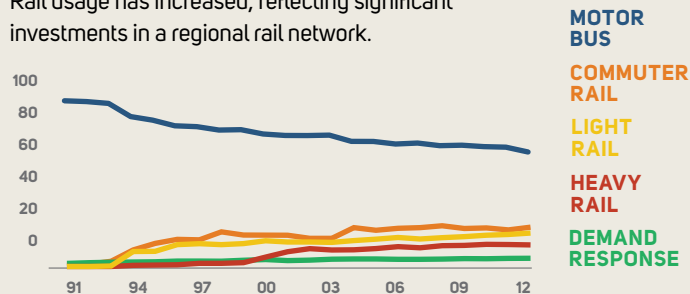
**PROVIDES ECONOMIC OPPORTUNITIES**



## Passenger Miles by Mode

(percent)

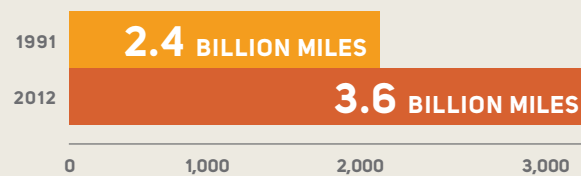
Rail usage has increased, reflecting significant investments in a regional rail network.



## Transit Passenger Miles

(millions)

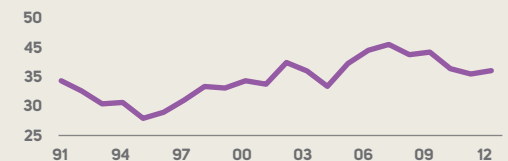
Transit use has increased over the last 20 years. In 2012, transit riders took 711 million trips, traveling more than 3.6 billion miles. Growth in passenger miles was driven by a 15% increase in average transit trip length.



## Transit Trips

(per capita)

Growth in transit use has not always kept up with population. The number of transit trips per person is about the same as it was 20 years ago.



suitable for the above moderate income category, representing more than 52 percent of the 293,547 above moderate units needed, were built over the same period. A similar trend can be seen in the first two years after the adoption of the fifth cycle RHNA (2013 and 2014), with barely 2,000 units of new construction reporting use of LIHTC while nearly 30,000 single-family units have been built during this time. No new construction using LIHTC was reported in 2014. Although LIHTC has historically been used in about one out of five new multifamily construction, this data suggests that market rate building activity is far stronger than building activity for very low income households and that the need for affordable housing continues to increase.

Within the housing elements of their General Plans, each jurisdiction in our region is required to show how it would accommodate its RHNA allocation for the designated period. This is accomplished through a sites and inventory analysis that evaluates zoning and land use policies. SCAG is tasked with providing the regional RHNA allocation, but housing elements are reviewed and approved by the California Department of Housing and Community Development. Since the fifth cycle adoption due date of October 2013, 84 percent of the region's jurisdictions have housing elements in compliance with state housing law. The next RHNA allocation for our region is anticipated to be adopted by SCAG in October 2020, with housing elements due by October 2021.

TABLE 2.1 2012 HQTA

COUNTY	WITHIN HQTA			
	HOUSEHOLDS	%	EMPLOYMENT	%
Imperial	0	-	0	-
Los Angeles	1,552,900	48%	2,357,400	56%
Orange	173,500	17%	392,900	26%
Riverside	3,200	0.50%	24,500	4%
San Bernardino	17,200	3%	39,600	6%
Ventura	6,800	3%	22,400	7%
SCAG	1,753,600	30%	2,836,800	38%

## HIGH QUALITY TRANSIT AREAS (HQTAs) AND TRANSIT PRIORITY AREAS (TPAs)

The overall land use pattern detailed in the 2012 RTP/SCS reinforced the idea of focusing new housing and employment within the region's HQTAs. For planning purposes, an HQTA, as we have mentioned, is defined as an area within one-half mile of a well-serviced fixed guideway transit stop, and it includes bus transit corridors where buses pick up passengers every 15 minutes or less during peak commute hours. The 2012 RTP/SCS also identified Transit Priority Areas (TPAs), which are defined as locations where two or more high-frequency transit routes intersect. Currently, more than five million residents in the region live within HQTAs. These HQTAs currently accommodate 2.8 million jobs (see [TABLE 2.1](#)).

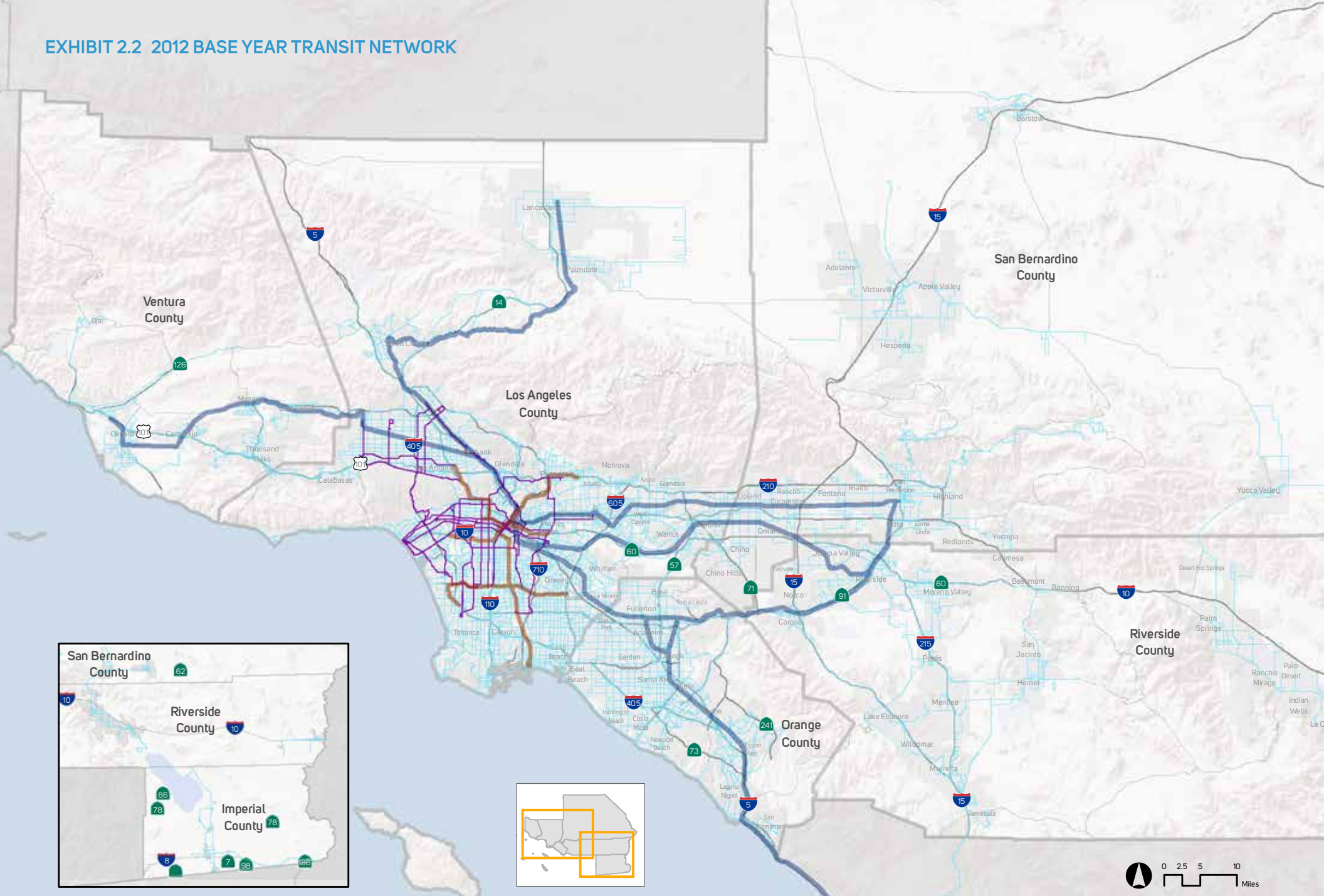
High density development could also produce high quality housing with consideration of urban design, construction and durability, and result in increased ridership on important public transit investments. Local jurisdictions throughout the region are applying more sophisticated planning practices in the specific plans and zoning codes that govern these areas in order to promote this kind of development. As housing density increases in cities and HQTAs, local governments are investing in pedestrian and bike infrastructure and reducing parking requirements to support people who choose not to have a car or cannot afford one. Local jurisdictions are also creating and retaining affordable housing near transit, helping to increase connectivity to employment opportunities and reducing reliance on automobile ownership.

The positive effects on real estate values, retail sales and property taxes, as well as the social benefits of developing within HQTAs are also well documented.<sup>3</sup> For example, less automobile-dependent settings, like HQTAs, spur volunteerism, social interaction and community engagement with more opportunities for face-to-face contact. Creating active places that are busy throughout the day and evening also improves safety and reduces crime rates within the surrounding neighborhood. Increased retail sales and easy transit accessibility translate into higher business profits, rent, commercial real estate values and government property taxes. Similarly, housing value premiums associated with being near a transit station (usually expressed as being within one-quarter to one-half mile of a station) average 17 percent to 30 percent higher than comparable properties located elsewhere.

<sup>3</sup> Center for Neighborhood Technology. (2013). The New Real Estate Mantra: Location Near Public Transportation. Washington, D.C.



EXHIBIT 2.2 2012 BASE YEAR TRANSIT NETWORK



— Bus   
 — Rapid Bus and Bus Rapid Transit   
 — Urban Rail   
 — Commuter Rail

(Source: SCAG)

HQTAs and TPAs are powerful examples of how integrating strategies for land use and transportation can help us achieve our long-term goals for greater mobility, a strong economy and sustainable growth. In the next section of this chapter, we will discuss the state of our overall transportation system today. That will help us set the stage for Chapter 5, where we will review our strategies, programs and projects for our transportation system and explain how we will integrate them with how we use land. Efficient use of our land is the basis for an efficient transportation system.

## HOW WE TRAVEL TODAY

### TRANSIT

Our regional transit system today is comprised of an extensive network of services provided by dozens of operators. This network includes fixed-route local bus lines, community circulators, express and rapid buses, Bus Rapid Transit (BRT), demand response,<sup>4</sup> light rail transit, heavy rail transit (subway) and commuter rail.<sup>5</sup> The region's providers of transit offer the second largest amount of service in the country, after that of the New York City metropolitan area (see [EXHIBIT 2.2](#)).

Transit plays an important role in Southern California's integrated transportation system. It provides an alternative to driving for many and provides mobility to people who do not have cars. The transit network is the region's largest non-automotive passenger transportation mode by trip volume, by a huge degree. Riders of transit took more than eight times as many trips as air travelers in FY2011-12 and nearly 267 times as many trips as passenger rail travelers.

Transit use provides external benefits to the region's transportation system, through investment, reduced traffic congestion and air pollution emissions reductions. The American Public Transportation Association (APTA) estimates that for every billion dollars invested in transit (as of 2007) about 36,000 jobs are created. This includes the direct purchasing power of transit agencies and

also the spending power of the employees of transit agencies.<sup>6</sup> Were this rate to have held constant into FY2011-12, transit spending in the SCAG region would have resulted in the creation or maintenance of roughly 150,000 jobs.

The Texas Transportation Institute (TII), in its annual Urban Mobility Report, estimates traffic congestion delay averted due to the use of the region's public transportation system. In 2011, using transit helped residents of the SCAG region avoid 10 hours of delay per person, and saved the region more than \$250 million in averted traffic delay costs.

Each of the region's residents take an average of 39 transit trips each year, at an operating and maintenance cost of \$3.46 per trip (this amount increases to roughly \$5.05 when both operations and capital expenditures are accounted for). Transit users typically pay 25 percent of the operating and maintenance cost of their travel, with the remaining 75 percent paid for by state and local public subsidies. Most capital expenditures are also funded with public subsidies, including a larger share of federal grants. Despite recent service cuts, the region's total combined capital and operations spending exceeded \$3.59 billion in FY2011-12.

The past eight years have been tough economically for Southern California's transit agencies. Although bus service accounted for 82 percent of the region's transit trips in FY2011-12, the agencies that provide it have been hit particularly hard. Many have had to cut service. Total bus service provided by the Los Angeles County Metropolitan Transportation Authority (Metro) has declined by 10 percent, Orange County providers have cut bus service by 11 percent, and Los Angeles County Municipal Operators bus service has fallen by three percent.

These declines in service are tied to the Great Recession, as total ridership and per-capita ridership have stagnated. In FY2011-12, ridership of just under 711 million trips was up 1.7 percent compared with the prior year, but it represented a six percent decline from a pre-recession high of more than 750 million trips. The per-capita trip total of nearly 39 for FY2011-12 represents a loss of seven percent from the pre-recession high of more than 42 per-capita trips. Preliminary data for FY2014-15 show that total ridership and per capita ridership have continued to decline. Total transit trips are expected to fall below 700 million for the first time since FY2003-04.

<sup>4</sup> "Demand response" is defined as a transit mode comprised of passenger cars, vans or small buses operating in response to calls from passengers or their agents to the transit operator, who then dispatches a vehicle to pick up the passengers and transport them to their destinations.

<sup>5</sup> Commuter rail is discussed separately in more detail, along with intercity passenger rail such as Amtrak and CA High-Speed Train, as part of "Passenger Rail."

<sup>6</sup> American Public Transportation Association, 2009, "Job Impacts of Spending on Public Transportation: An Update." White Paper.

Since 1991, transit agencies in the region have provided about 13.22 billion transit trips. In that time, urban rail and commuter rail have grown from 1.3 percent of transit trips to 16.1 percent of trips in 2012. Bus trips have declined from 98.6 percent of trips to about 83 percent. Urban and commuter rail together supply 11.6 percent of all Vehicle Revenue Miles because the per vehicle capacity is much higher than that of buses. Urban and commuter rail services are 20.9 percent of all transit operating expenses in our region.

## PASSENGER RAIL

Southern California is served by an ever expanding passenger rail network, including intercity, commuter and freight services, and this network is expanding and improving in terms of capacity, efficiency and safety. Many capital, operational and safety improvements are underway and planned throughout this existing network, including transportation corridors currently not served by rail.

The region's passenger rail network, along with the number of passengers and service levels, has steadily grown since 1990, except for a dip during the Great Recession. In 1990, the only passenger rail service operating in the region was the Pacific Surfliner and Amtrak's long-distance trains such as the Coast Starlight and Southwest Chief. Metrolink began commuter rail service in October 1992, and it continues to expand its network and levels of service. The Pacific Surfliner, which carried 2.7 million passengers in FY2013-14, operates 11 daily round-trips between Los Angeles and San Diego, five round-trips between Los Angeles and Santa Barbara/Goleta, and two round-trips north to San Luis Obispo. The Pacific Surfliner is Amtrak's second busiest corridor, behind the Northeast Corridor between Washington, D.C. and Boston. The line's average speed is 46 miles per hour (mph).

The Southern California Regional Rail Authority (SCRRA), the operator of Metrolink, operates 165 weekday trains on seven lines and the system carried 11.7 million passengers in FY2013-14. Weekend service provides 34 trains on Saturdays and 28 on Sundays. Metrolink operates two round-trip express trains: one round-trip on the San Bernardino Line and one round-trip on the Antelope Valley Line (to Palmdale only). System-wide average speed is 37 mph.

Notable recent efforts include the first Metrolink e-ticketing program rollout in 2016. Also, the LOSSAN Rail Corridor (Los Angeles–San Diego–San Luis Obispo Rail Corridor) received a Cap-and-Trade Transit and Intercity Rail Capital Program grant in the spring of 2015 to re-establish a cooperative fare agreement with local connecting transit agencies for free transfers to and from the Pacific

Surfliner. This program had never been fully developed by Caltrans Division of Rail (DOR), and recently it had been discontinued.

These cooperative fare agreements and media efforts include effective marketing across passenger rail markets and transit riders. Metrolink has been successful with its special service trains for both Dodgers' and Angels' games and other special events. These types of services introduce passenger rail to the general public and can lead to new regular customers.

In July 2015, Metrolink started a pilot fare project on the Antelope Valley Line. It included a 25-percent reduction in fares (except for the weekend day pass) and allowed station-to-station travel for just \$2.00. Due to the success of this pilot program, on January 1, 2016 Metrolink implemented a \$3.00 station-to-station fare system-wide. (The \$2.00 station-to-station program was discontinued on the Antelope Valley Line, however the 25 percent fare reduction was extended to June 30, 2016.) Since 2012, Metrolink has offered its successful weekend pass, allowing unlimited travel throughout the entire Metrolink system on both Saturday and Sunday for just \$10.00. (The fare has since increased to \$10.00 per weekend day.) Monthly pass holders can take unlimited trips on the weekend.

The renaissance of rail travel in our region is exciting. However, significant challenges are keeping our commuter and intercity rail networks from realizing their full potential to help reduce highway congestion, and cut air pollution and lower greenhouse gas emissions. Among these challenges:

More than half of the commuter and intercity rail network operates on one track, some of which is owned by freight railroads that maintain priority for their own operations. Passenger trains are assigned "slots," meaning that they are allowed to move in a particular direction for a fixed time period. This results in the relatively slow average speeds noted above, reducing the incentive for commuters to use the train system (and instead prompting them to commute by car), as well as reducing the number of passenger trains that can serve our region.

One-track operations present other challenges. Even a minor delay can lead to a train losing its slot, thereby causing cascading delays throughout the network and throughout the day. Commuter and intercity rail networks in Chicago and on the East Coast have much higher service frequencies than we do in our region, mainly because they have fewer single-track segments and fewer conflicts with freight railroads. Our region has a large list of rail improvements either in the planning phases or which are ready for construction. These

improvements include adding double-tracking, sidings, station improvements and grade separations to increase speed and service levels. However, there is no dedicated long-term funding for commuter and intercity rail to move these projects forward.

## ACTIVE TRANSPORTATION

Our region has made steady progress in encouraging people to embrace active transportation, that is, human-powered transportation such as walking and biking. Across our region today, many people live and work in areas where trips are short enough to be completed by walking or biking. Walking and biking as a share of all trips is more than 18 percent in our most urban areas where there are abundant nearby destinations/land uses, yet still reaches 11 percent in rural areas where land uses are less diverse.<sup>7</sup> There is a strong relationship between land use and travel behavior. Land use characteristics play a key role in determining the conditions for and feasibility of walking and biking in a community, due to the sensitivity of these modes to trip length.

<sup>7</sup> California Department of Transportation (2012). California Household Travel Survey.

The regional bike network is expanding but remains fragmented. Nearly 500 additional miles of bikeways were built since SCAG's 2012 RTP/SCS, but only 3,919 miles of bikeways exist regionwide, of which 2,888 miles are bike paths/lanes (see [EXHIBIT 2.3](#)).

Walking represents nearly 17 percent of all trips in the SCAG region, with the largest share in Los Angeles County. It is how most transit riders reach their station. Most walk trips (83 percent) are less than one half mile; walkers are less likely to travel further because of a lack of pedestrian friendly infrastructure. Routes to stops and stations are often circuitous and/or obstructed, increasing the time it takes to complete a trip by transit and therefore making the choice to use transit less attractive. A study in Los Angeles County found that the most common barriers to station access on foot or bicycle include: long blocks, highway over/underpasses, concerns about safety and security, sidewalk maintenance, legibility/lack of signage and right-of-way constraints leading to limited space for safe walking and biking.<sup>8</sup> Currently, all six counties in the SCAG region are pursuing first/last mile solutions to make transit or border crossing stations more accommodating to active transportation. Their efforts are aided by the Federal Transit Administration (FTA), which has extended the "walk-shed" (the area encircling a destination point) from transit stations from a quarter mile to a half mile, enabling transit funding to be used for larger areas around transit stations.<sup>9</sup> The "bike-shed," as defined through FTA guidance, extends three miles in all directions from a station.

While the number of bicyclists and pedestrians is increasing, so are injuries and fatalities—although not as fast as the growth overall in active transportation. Nevertheless, injuries among those who bike and walk are increasing at a time when the total number of traffic-related injuries and fatalities is dropping regionwide. Improving safety will likely require pursuing innovative strategies (as described in the following sections) to reduce conflicts among bicyclists, pedestrians and automobiles. In 2015, the City of Los Angeles began its Vision Zero Campaign. Vision Zero is a road safety policy that promotes smart behaviors and roadway design that anticipates mistakes, so that collisions do not result in severe injury or death.

<sup>8</sup> Los Angeles County Metropolitan Transportation Authority (2014) First Last Mile Strategic Plan & Planning Guidelines.

<sup>9</sup> Department of Transportation (Friday, August 19, 2011): Final Policy Statement on the Eligibility of Pedestrian and Bicycle Improvements Under Federal Transit Law. Federal Register Volume 76, Number 161 Pages 52046-52053.

## HOW WE GET TO WORK



14%

CARPOOL



76%

DRIVE ALONE



5%

TRANSIT  
(Bus/Rail)

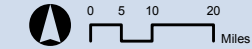
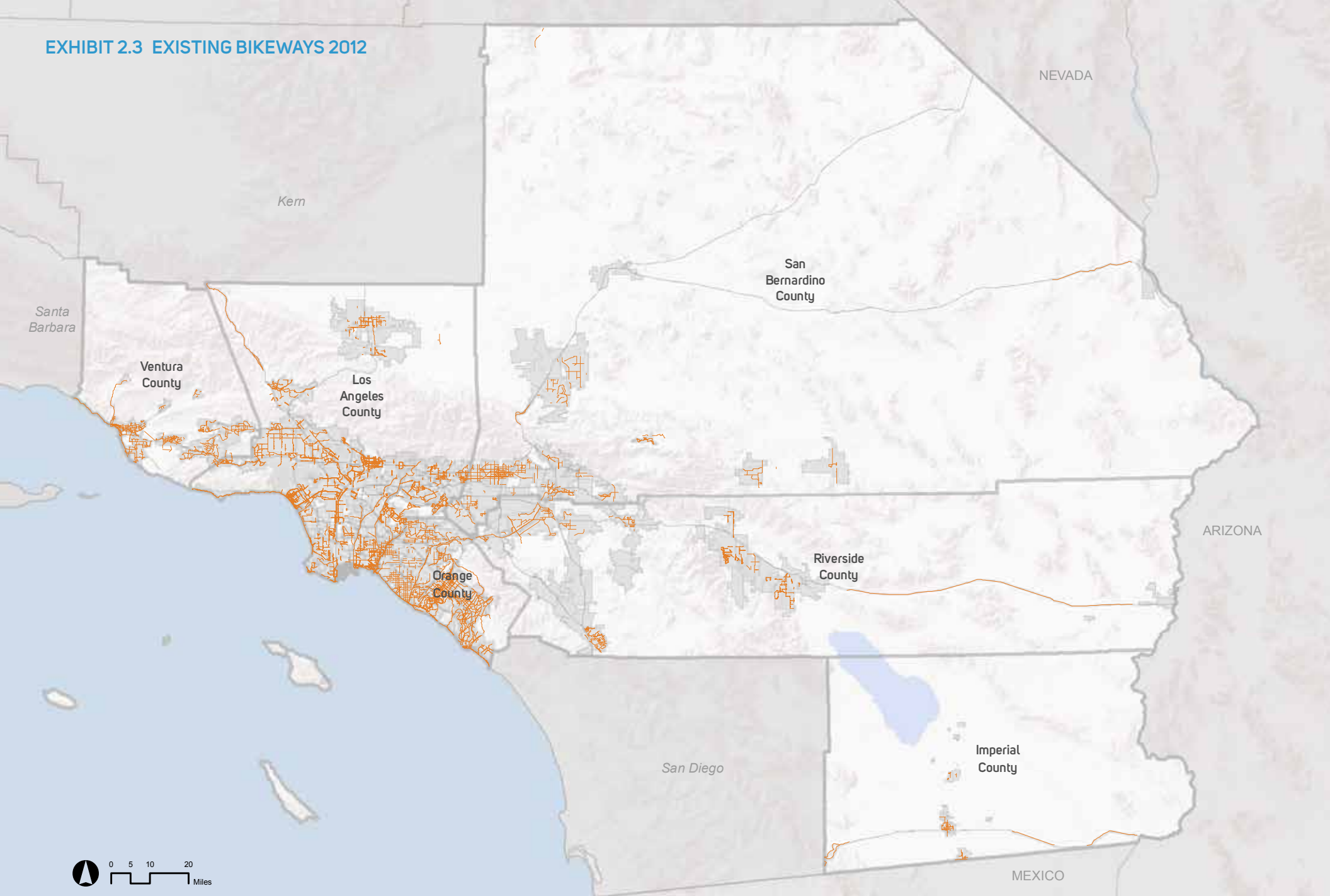


5%

NON-MOTORIZED  
(Walk/Bike)

Source: SCAG Regional Travel Demand Model

EXHIBIT 2.3 EXISTING BIKEWAYS 2012



 Bikeways

(Source: SCAG)

## HIGHWAYS AND ARTERIALS

Our region's highways and arterials continue to be the backbone of our overall transportation network, and they are vital to moving people and goods throughout the region. Across the Southern California region, our highway and arterial system covers about 70,000 roadway lane miles and accommodates 66 million trips per day. Our roadways are not only used by automobiles and freight trucks, they are also used for transit and for those who choose to walk, bike and use other forms of active transportation. According to SCAG's Regional Travel Demand Model (RTDM), more than nine out of 10 trips rely either entirely or in part on the highway and arterial system. Based on currently available data, there are 3.6 million person-hours of daily delay and 11.8 minutes of daily delay per capita along our region's highways and local arterials.

Maintaining the operational efficiency of our roadways is crucial if we are to maintain the mobility of our region. Unfortunately, traffic congestion continues to adversely affect our highway and arterial system every day. Although we have made improvements, the increasing travel demands that will come with a growing population in coming years will lead to increased congestion. This traffic congestion will not only make life difficult for commuters, it will also degrade our region's air quality and our overall quality of life. To address congestion and to improve our transportation network's efficiency, the region has been investing in Transportation Systems Management and Transportation Demand Management projects as described in the following sections.

## TRANSPORTATION SYSTEMS MANAGEMENT (TSM) AND TRANSPORTATION DEMAND MANAGEMENT (TDM)

For our regional transportation system to operate efficiently and smoothly, operators must manage the system effectively, as well as the demands placed on it. To do so, they implement TSM and TDM strategies.

TSM employs a series of techniques designed to maximize the capacity and efficiency of the existing transportation system and its facilities. One of these techniques deploys Intelligent Transportation Systems (ITS), which will be discussed below. TDM involves a variety of strategies to manage the demand placed on our roadway network and to reduce our dependence on driving alone. These include promoting ridesharing, value pricing,<sup>10</sup> telecommuting or alternative work schedules and alternative modes of travel such as transit, passenger rail and active transportation.

The common goals of TSM and TDM are to improve the productivity of our transportation system, reduce traffic congestion, improve air quality and reduce or eliminate the need to construct new and expensive transportation infrastructure.

### Transportation Systems Management (TSM)

A critical TSM technique is Intelligent Transportation Systems, or ITS, which makes use of advanced detection, communications and computing technologies to improve the safety and efficiency of our surface transportation network. These systems allow system operators and users to better manage and optimize the capacity of the region's transportation system. Data is collected about the status of our highways, traffic signals, transit vehicles, freight vehicles, passenger trains and shared-ride vehicles and is integrated in ways that improve the efficiency of the overall transportation system.

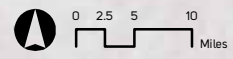
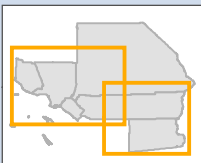
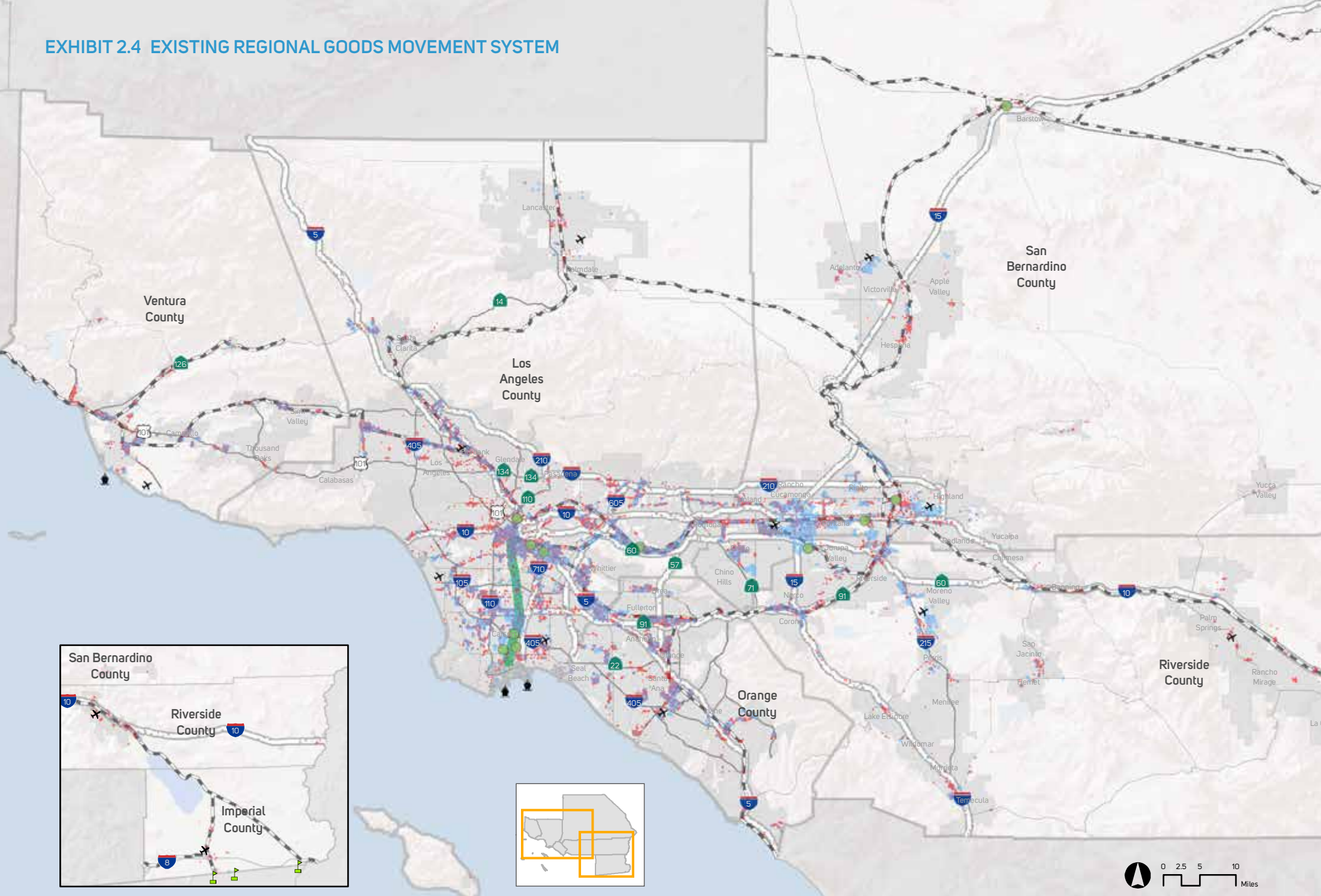
SCAG has a critical role to play in the development and management of ITS in the region. As the region's Metropolitan Planning Organization, SCAG is charged with developing and maintaining the Southern California Regional ITS Architecture. This architecture is the regional planning tool for ensuring a cooperative process to prioritize and deploy ITS technologies and for identifying critical data connections between institutional stakeholders (e.g., connecting two transit operators). This architecture helps the region deploy ITS systems that are truly integrated. Stakeholders are able to share information among many agencies in consistent and compatible formats to achieve improved safety and efficiency. SCAG works closely with the CTCs, local governments and Caltrans Districts to update and maintain the regional architecture and assure the use of required systems, engineering requirements and applicable standards—which is required when federal funds are used on ITS projects.

The Southern California highway system has an extensive ITS system that covers most of the urbanized portion of our region. Loop detectors in the pavement and video cameras provide information on speed and volume, and identify congestion and incidents that are fed to Caltrans/California Highway Patrol (CHP) Transportation Management Centers (TMCs). Arterial ITS systems are in place throughout the region as well. Local arterial systems include advanced signal synchronization capabilities to increase the flow of traffic and also to detect and respond to changes in traffic volume or direction of travel and manage incidents. Like the highway network, these systems include loop and video detection and also rely on wireless data such as that provided by Google.

Most medium- to large-scale, fixed-route and Dial-a-Ride operators in our region have implemented transit ITS components. These include automatic

<sup>10</sup> Value pricing is a user fee applied during peak demand periods on congested roadways to improve the reliability and efficiency of the transportation system and provide travelers with greater choices.

# EXHIBIT 2.4 EXISTING REGIONAL GOODS MOVEMENT SYSTEM



- Ports
- Intermodal Facilities
- Major Freight Highway Corridors
- Alameda Corridor
- >= 50,000 sq ft
- Ports of Entry
- Major Airports
- Main Line Rail Network
- < 50,000 sq ft

(Source: SCAG, CoStar Realty Information Inc.)

vehicle location (AVL) and transit signal priority (TSP) systems. Automatic vehicle location systems have greatly increased the effectiveness of real-time scheduling information, increasing convenience for transit passengers. TSP gives transit vehicles signal priority to improve passenger throughput and bus speed. The TSP system is an integral part of Metro's Rapid Bus program, which has 20 routes. Santa Monica's Big Blue Bus, Culver City Bus and Torrance Transit are others that employ TSP systems as well. Using a combination of hard-wired loop technology and wireless technology, they reduce travel times by up to 25 percent.

### Transportation Demand Management (TDM)

Our region employs an array of TDM strategies to better manage the demand placed on our roadway network by reducing the number of people who drive alone as well as encouraging them to use alternative modes. As a consequence, these strategies have helped reduce air pollution and greenhouse gas emissions. These strategies include promoting carpooling and vanpooling; biking and walking; car sharing and bike sharing; telecommuting; flexible work schedules; and intelligent parking, among other strategies. The region has a long history of investing in a comprehensive High-Occupancy Vehicle (HOV) or carpool lane system, supported by investments in park-and-ride facilities, rideshare matching and vanpooling services. A 2014 national study of employers by the Families and Work Institute and the Society for Human Resource Management showed that employers are becoming more willing to provide employees with flexible work arrangements and more choices in managing work time, without loss of pay. As Baby Boomers continue to retire in increasing numbers and are replaced by younger, more tech-savvy workers, and as employers continue to embrace technology and remote access capabilities, we expect to see increases in the percentage of workers who telecommute or have flexible work schedules.

A significant amount of travel in the region is still by people who choose to drive alone (42 percent of all trips and nearly 76 percent of work trips). So, the challenge of getting individuals to seek alternative modes of travel remains.

### GOODS MOVEMENT

Our region's transportation network for moving goods, referred to as our "goods movement" system, relies today on multiple modes of transportation and complex infrastructure. Whether carrying imported goods from the ports to regional distribution centers, supplying materials for local manufacturers, or delivering consumer goods to residents, our goods movement system sustains regional industries and consumer needs every day. This system includes deep-water marine ports, international border crossings, Class I rail lines, interstate

highways, state routes and local connector roads, air cargo facilities, intermodal facilities, and distribution and warehousing centers. **EXHIBIT 2.4** depicts our region's multimodal goods movement system.

### Major Elements of the Goods Movement System:

- **Seaports (Ports of Los Angeles, Long Beach and Hueneme):** Serving as the largest container port complex in the U.S., the Ports of Los Angeles and Long Beach (together called the San Pedro Bay Ports) handled about 117 million metric tons of imports and exports in 2014—for a total value of about \$395.7 billion.<sup>11</sup> The Port of Hueneme in Ventura County specializes in the import and export of automobiles, fresh fruit and produce and serves as the primary support facility for the offshore oil industry. In 2014, two-way trade activities through the Port of Hueneme were valued at nearly \$9.2 billion and generated \$1.1 billion in economic activities in the immediate region.<sup>12</sup>
- **Land Ports:** The international border crossings in Imperial County are busy commercial land ports, and they were responsible for more than \$8 billion in imports and \$6 billion in exports in 2014. This cross-border commerce was driven by the maquiladora trade, as well as the movement of agricultural products.<sup>13</sup>
- **Air Cargo Facilities:** The region is home to numerous air cargo facilities, including Los Angeles International Airport (LAX) and Ontario International Airport (ONT). Together they handled more than 99 percent of the region's air cargo, valued at more than \$96 billion,<sup>14</sup> in 2014.
- **Highways and Local Roads:** Our region has more than 70,000 roadway lane miles.<sup>15</sup> Sections of Interstate 710, Interstate 605, State Route 60 and State Route 91 carry the highest volumes of truck traffic in the region and averaged more than 25,000 trucks per day in 2013. Other major components of the regional highway network also serve significant numbers of trucks. These include Interstates 5, 10, 15 and 210. More than 20,000 trucks per day travel on some sections.

<sup>11</sup> American Association of Port Authorities and U.S. Trade Online, U.S. Census.

<sup>12</sup> U.S. Trade Online, U.S. Census and Port of Hueneme.

<sup>13</sup> The term maquiladora refers to a manufacturing operation in Mexico. The majority of them are located along the US border and within the Foreign Trade Zones (FTZs) to capitalize on duty-free and tariff-free provisions for assembly and material processing.

<sup>14</sup> U.S. Trade Online, U.S. Census.

<sup>15</sup> Highway Performance Monitoring System, California Department of Transportation, <http://www.dot.ca.gov/hq/tsip/hpms/>.



# FOCUS

# GOODS MOVEMENT

## THE SCAG REGION IS THE LARGEST INTERNATIONAL GATEWAY IN THE U.S.

supported by AIRPORTS, LAND PORTS OF ENTRY, SEAPORTS, RAILWAYS, HIGHWAYS and WAREHOUSE & DISTRIBUTION CENTERS



REGIONAL AIRPORTS  
HANDLED NEARLY  
**\$96 BILLION**  
IN INTERNATIONAL AIR CARGO IN 2014

**#1** SOUTHERN CALIFORNIA has the **LARGEST CONTAINER PORT COMPLEX** in the UNITED STATES

**#9** and has the **NINTH LARGEST CONTAINER PORT COMPLEX** in the WORLD

SOUTHERN CALIFORNIA HAS

**3,747 MILES**  
OF HIGHWAYS  
(that is 41% of all the highway road miles in California)

**2** CLASS 1 RAILROADS **6** INTERMODAL RAIL YARDS\*\*

\*\* Not including carload and automobile terminals

CLOSE TO  
**1.2 BILLION SQ. FT.**  
OF WAREHOUSING & DISTRIBUTION SPACE

CLOSE TO  
**750 MILLION SQ. FT.**  
ARE FACILITIES >50K SQ. FT. IN SIZE

(2014)

In 2014, the VALUE OF INTERNATIONAL TRADE that moved through the SCAG region was over

**\$515 BILLION**  
includes maritime and cross-border trade and air freight

In 2014, Goods Movement dependent industries generated

**2.9 MILLION**



## HOW CAN WE GROW WITH LESS IMPACT?

**\$2.6 BILLION**



COST OF WASTED LABOR HOURS & FUEL from Truck Congestion on Highways



ANNUAL COST OF AIR POLLUTION in the SCAG region is at least

**\$14.6 BILLION**



**371% GROWTH**



in VEHICLE HOURS OF DELAY per day at rail-highway grade crossings across the region by 2040

These roads carry a mix of cargo loads, including local, domestic and international. The arterial roadway system also plays a critical role in goods movement, providing first/last mile connections to regional ports, manufacturing facilities, intermodal terminals, warehousing and distribution centers, and retail outlets.

- **Class I Railroads:** Critical to the growth of the region's economy, the Burlington Northern Santa Fe Railway (BNSF) and Union Pacific (UP) carry international and domestic cargo to and from distant parts of the country. The BNSF mainline operates on the Transcontinental Line (and San Bernardino Subdivision). The UP operates on the Coast Line, Saugus Line through Santa Clarita, Alhambra and Los Angeles Subdivisions and Yuma Subdivision to El Paso. Both railroads operate on the Alameda Corridor, which connects directly to the San Pedro Bay Ports. The San Pedro Bay Ports also provide several on-dock rail terminals, along with the six major intermodal terminals operated by the BNSF and UP.
- **Warehouse and Distribution Centers:** The SCAG region is home to one of the largest clusters of logistics activity in North America. In 2014, the region had close to 1.2 billion square feet of facility space for warehousing, distribution, cold storage and truck terminals.<sup>16</sup> Nearly 750 million square feet of this space, in 4,900 buildings, were facilities larger than 50,000 square feet. An estimated ten percent of the occupied warehouse space served port-related uses, while the remaining 90 percent supported domestic shippers.<sup>17</sup> Many of these warehouses are clustered along key goods movement corridors. Port-related warehousing is concentrated in the Gateway Cities subregion, while national and regional distribution facilities tend to be located in the Inland Empire.

### Key Goods Movement Functions and Markets

Our region's goods movement system serves a wide range of markets including international, domestic and local trade. Although the international trade market has a significant presence in the region, most freight activities are generated by local businesses moving goods to local customers and supporting national domestic trade. These businesses are sometimes referred to as "goods movement-dependent industries." In 2014, these industries, including manufacturing, wholesale and retail trade, construction, and warehousing, employed nearly three million people throughout the region and

contributed \$291 billion to the regional gross domestic product (GDP). These industries are anticipated to grow substantially, with manufacturing projected to increase its GDP contribution 130 percent by 2040 and wholesale trade growing 144 percent.<sup>18</sup>

### Growth of E-Commerce and Goods Movement

The retail industry provided nearly \$30 billion in wages and salaries for the region in 2014.<sup>19</sup> This industry includes a wide variety of subsectors such as motor vehicles, furniture, electronics and appliances, building materials, health and personal care products, clothing, sporting goods, and books. One of the most notable changes in the retail industry is the strong growth in e-commerce sales. E-commerce sales for U.S. retailers totaled \$261 billion in 2013, an increase of 13.6 percent from 2012. Total retail sales increased by 3.8 percent in the same period. Within the e-commerce sales merchandise category, clothing and clothing accessories had the largest sales at \$40 billion, followed by electronics and appliances at nearly \$23 billion. E-commerce provides consumers with a broad range of shopping options, including the ability to compare product prices instantaneously from mobile devices and to opt for home delivery or store pick-up of merchandise. Simultaneously, e-commerce has changed how traditional distribution centers and retail outlets are operating to meet customer demand. Distribution centers in the past delivered bulk size goods to their customers or vendors. Because e-commerce orders tend to be smaller in size (i.e., a single item order as compared to a bulk-case order), many retailers and distribution center/warehouse operators are upgrading their facilities, or developing new facilities, to meet surging e-commerce orders. These changes are also generally characterized by the use of smaller trucks and integrator delivery vans (such as UPS, FedEx and DHL) due to overnight or two-day delivery requirements of e-commerce customers.

### Same-Day Delivery Demands

Consumers are increasingly demanding quicker fulfillment of their orders. More recent developments include same-day delivery options. To meet the same-day delivery promise, distribution or fulfillment center proximity to population centers becomes critical. This is exemplified by large-scale e-commerce fulfillment center developments at the periphery of urban population centers. At the same time, small to medium size buildings that are narrow, but with ample loading doors and docks in urban cores, have also been attractive as they provide even quicker access to dense population centers than those in the outskirts. Additionally, retailers are increasingly using products available

<sup>16</sup> CoStar Realty Information, Inc. www.costar.com, based on November 2014 data downloads.

<sup>17</sup> Industrial Warehousing in the SCAG Region Study, SCAG, based on the Avison-Young methodology for port-related and non-port related warehousing needs.

<sup>18</sup> REMI TranSight SCAG, CA, USv3.6.5.

<sup>19</sup> Regional Economic Model Inc. TranSight SCAG, CA, US v3.6.5.

at their stores to fulfill e-commerce orders. Parcel hubs, delivery centers and accessibility to local streets and highways throughout the region will continue to be critical to e-commerce growth.<sup>20 21 22</sup>

<sup>20</sup> E-commerce Evolutions – Element 4: Distribution and Fulfillment Centers, NAIOP, May 2015, <http://www.naiop.org/en/E-Library/Business-Trends/Distribution-and-Fulfillment-Centers.aspx>.

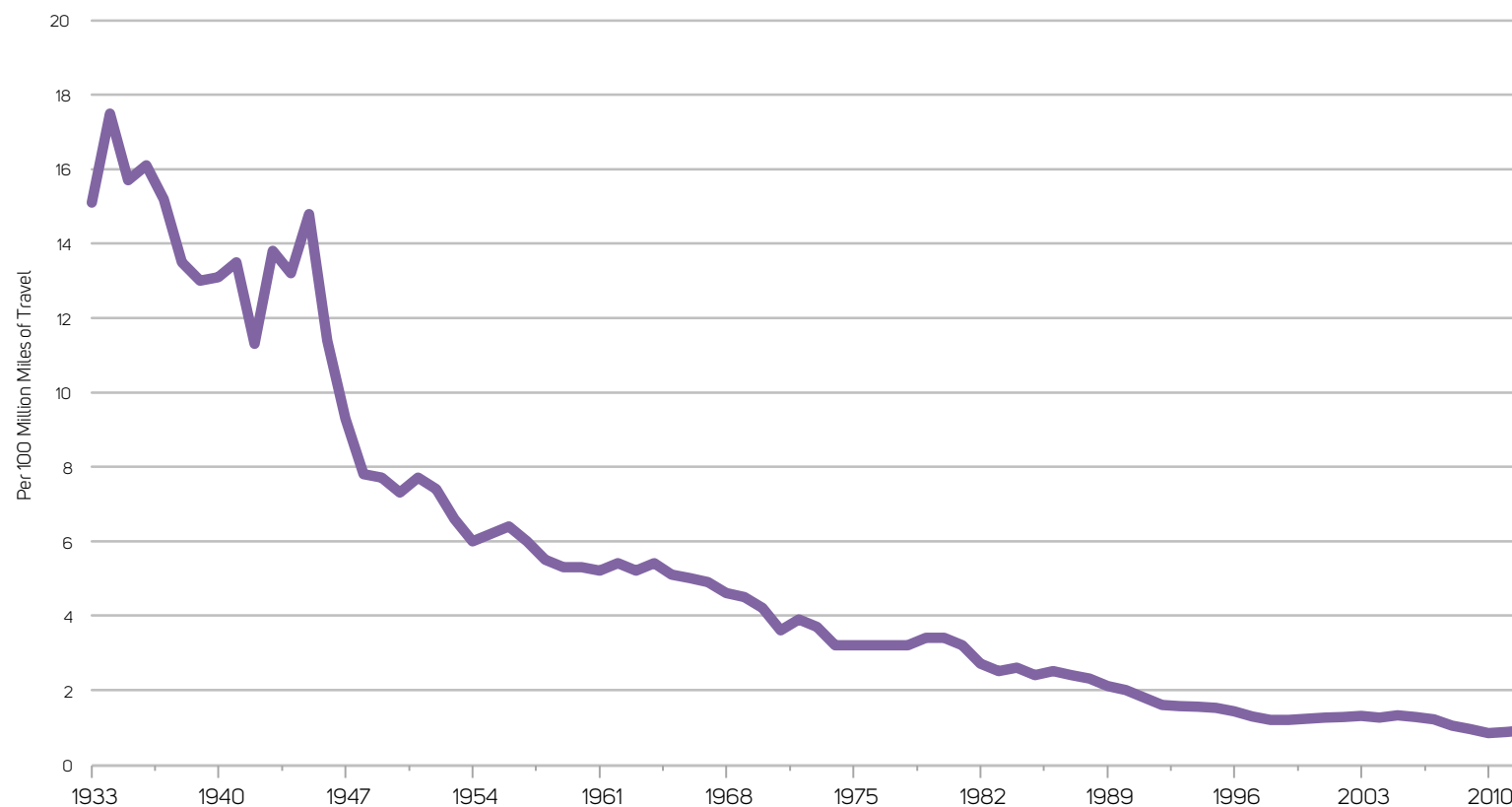
<sup>21</sup> Retailers must overcome logistics lag for same-day delivery, Kris Bjornson, JLL, April 2014, <http://www.joneslanglasalleblog.com/investor/retailers-must-overcome-logistics-lag-for-same-day-delivery/>.

<sup>22</sup> Same-day delivery is transforming the CRE industry, Kris Bjornson, JLL, June 2015, [http://www.joneslanglasalleblog.com/investor/same-day-delivery-is-transforming-the-cre-industry/?utm\\_source=us-retail-ecom&utm\\_medium=jll-website&utm\\_campaign=featured-post](http://www.joneslanglasalleblog.com/investor/same-day-delivery-is-transforming-the-cre-industry/?utm_source=us-retail-ecom&utm_medium=jll-website&utm_campaign=featured-post).

## STATE OF SAFETY

The safety of people and goods is one of the most important considerations in developing, maintaining and operating our diverse transportation system. Throughout California, the rate of fatal and injury collisions on highways has declined dramatically since the California Highway Patrol began keeping such data in the 1930s (see [FIGURE 2.2](#)). California has led the nation in roadway safety for many of the past 20 years. Only recently have roadways nationally become as safe as those in California. California's most recently recorded mileage death rate (MDR)—defined as fatalities per 100 million vehicle miles traveled (VMT)—was 0.91, while the MDR within the SCAG region was slightly lower at 0.83. Both MDRs for the state and SCAG region are lower than the national MDR of 1.09.

**FIGURE 2.2 MAKING OUR ROADWAYS SAFER: CALIFORNIA MILEAGE DEATH RATE (1933–2012)**



Our region has an extensive transportation system, with more than 70,000 lane miles of highway and arterial lanes and 3,900 miles of bikeways. As of 2014, the region had 14.9 million licensed drivers and 11.8 million registered vehicles. As of 2012 (the most recent year that data was available), more than 1,300 people died and 121,000 were injured (of which 6,800 were considered severe) in traffic collisions in the region.

In 2012 President Obama signed into law MAP-21, the Moving Ahead for Progress in the 21st Century Act, which funded surface transportation programs

and required states to develop Strategic Highway Safety Plans (SHSPs).<sup>23</sup> The California Department of Transportation (Caltrans) responded by developing an updated SHSP through a participatory process. Throughout 2014, Caltrans conducted an extensive outreach effort to more than 50 agencies and organizations throughout the state—including SCAG—to gather feedback on improving the overall SHSP. This effort led to the release of the final California SHSP in 2015. California’s ultimate goal is to reach zero deaths on our highways—a concept known as “Toward Zero Deaths” (TZD). Specifically, California aims to achieve a three percent per year reduction for the number

<sup>23</sup> In December 2015, the Fixing America’s Surface Transportation Act, or “FAST Act,” was signed into law, which authorizes funding for surface transportation programs. SCAG expects to work with Caltrans to monitor the rulemaking process to implement FAST Act provisions.

## Map of Airports

# 12

EXISTING & PLANNED  
COMMERCIAL  
AIRPORTS SERVING  
THE SCAG REGION



- ① Oxnard
- ② Palmdale
- ③ Burbank Bob Hope
- ④ Los Angeles International
- ⑤ Long Beach
- ⑥ Southern California Logistics
- ⑦ San Bernardino International
- ⑧ Ontario International
- ⑨ John Wayne
- ⑩ March Inland Port
- ⑪ Palm Springs International
- ⑫ Imperial County

## AIRLINE PASSENGER VOLUME

71 MILLION  
IN 1994

91 MILLION  
IN 2014

and rate of fatalities and a 1.5 percent per year reduction for the number and rate of severe injuries. Although the SHSP and previous California SHSPs set various actions that state agencies can take to reduce fatalities, there are complementary strategies that local governments can pursue, such as Vision Zero initiatives. For additional details regarding strategies, please see the Safety & Security Appendix.

As we continue to work to improve safety for motorists, we also must tackle the alarming fatality rates of those who use other modes of transportation. Safety is a priority for all modes of transportation, and improving safety for people who walk and bike is critical. Based on currently available data, about 27 percent of all traffic-related fatalities in our region involved pedestrians and five percent of traffic-related fatalities involved bicyclists, according to data from the Statewide Integrated Traffic Records System (SWITRS).

### AVIATION AND GROUND ACCESS

The SCAG region is one of the busiest and most diverse commercial aviation regions in the world. In 2014, more than 60 airlines offered scheduled service to one or more of our region's airports, providing more than 1,200 daily commercial departures—one every 70 seconds. These departing flights travel all over the United States and to every corner of the globe; a total of 169 destinations in 37 countries had non-stop service from our region in 2014. Our airports also play a critical role in the region's goods movement network, and they impact the operations of our ground transportation network as well. The passengers arriving at or departing from our airports generate more than 200,000 daily trips on our region's ground transportation system.

Passenger and cargo air travel in the region is supported by a multiple airport system that spans six counties. There are seven commercial airports with scheduled passenger service, five additional facilities with the infrastructure to accommodate scheduled service, seven active military air fields and more than forty general aviation airports. Worldwide, few other regions have as many commercial airports within a comparable geographic area, making Southern California one of the world's most complex aviation systems.

In 2014, the airports in our region handled more than 1.5 million aircraft operations (take-offs and landings), nearly 800,000 of which were commercial operations. In the face of this huge number of air travelers and aircraft, our airports work efficiently. Flights to our region arrive on schedule more than 80 percent of the time. Thanks to favorable weather conditions, lengthy tarmac

delays that occur in other regions are virtually unheard of here. The size of the regional market for air travel and the absence of a single dominant air carrier in the region result in healthy competition among airlines, so air travelers enjoy some of the lowest average airfares in the country.

Air travel is an important contributor to the region's economic activity. Nearly half of the air travel in the region consists of visitors from other parts of the country and the world traveling here to conduct business, enjoy a vacation or visit friends and relatives. About one-third of air travel to the region is business related. Therefore, any passenger who arrives at or departs from an airport in our region is good for the region as a whole. Spending by passengers who used our airports to visit the region in 2012 contributed nearly \$27.4 billion to the regional economy. The money spent by visitors on meals, lodging, entertainment, transportation and other purchases supported nearly 275,000 jobs.

As with other modes of transportation, the demand for air travel was impacted heavily by the recession that began in 2007. In 2014, the airports in our region served 91.2 million total passengers, surpassing the previous peaks of 89.4 million in 2007 and 88.7 million in 2000.

The demand for air cargo was even more sharply impacted by the recessions of 2001 and 2007. The 2.4 million metric tons of cargo transported through the airports in our region in 2014 remained ten percent below the pre-recession peak of 2.7 million metric tons in each year from 2004–2006 and five percent below year 2000 levels.

In addition to its commercial airports, the SCAG region is also home to a large general aviation (GA) system. Included in this segment are airports serving non-commercial corporate jets, single engine planes, helicopters, emergency and firefighting operations, and flight training activity. General aviation airport facilities also act as relievers to commercial airports and provide diversionary locations for commercial planes that require emergency landings.

There are more than 40 general aviation airports in the SCAG region, and they are as diverse in size and market area as the commercial facilities. Van Nuys Airport (VNY), the second busiest general aviation facility in the United States, serves several important functions for the region, including serving as the base for many corporate jets. As of May 2015, Van Nuys Airport began offering U.S. Customs and Border Protection services for international general aviation flights to benefit business travelers and reduce airspace congestion.

## CONCLUSION

Today we face numerous challenges on the road toward greater mobility, a stronger economy and sustainable growth that maintains a high quality of life regionwide. In the Chapter 3, we'll review some of these challenges.