THE 2020-2045 REGIONAL TRANSPORTATION PLAN/
SUSTAINABLE COMMUNITIES STRATEGY OF THE
SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

CONNECT SoCal

SCAG™
INNOVATING FOR A BETTER TOMORROW

ADOPTED ON
SEPTEMBER 3, 2020

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RESOLUTION NO. 20-621-1

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ADOPTED ON SEPTEMBER 3, 2020

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INNOVATING FOR A BETTER TOMORROW

CONNECT SoCal

OUR VISION

Southern California's
catalyst for a brighter future.

OUR MISSION

To foster innovative regional solutions that improve the lives of Southern Californians through inclusive **collaboration**, visionary **planning**, regional **advocacy**, information **sharing**, & promoting **best practices**.

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OUR CORE VALUES

- Be Open
- Lead By Example
- Make An Impact
- Be Courageous

RESOLUTION NO. 20-624-1

A RESOLUTION OF THE SOUTHERN CALIFORNIAASSOCIATION OF GOVERNMENTS (SCAG) ADOPTING THE 2020-2045 REGIONAL TRANSPORTATION PLAN/SUSTAINABLE COMMUNITIES STRATEGY (CONNECT SOCAL) PROGRAM ENVIRONMENTAL IMPACT REPORT (PEIR) ADDENDUM AND APPROVING CONNECT SOCAL IN ITS ENTIRETY

WHEREAS, the Southern California Association of Governments (SCAG) is a Joint Powers Agency established pursuant to California Government Code Section 6502 et seq.;

WHEREAS, SCAG is the designated Metropolitan Planning Organization (MPO) for the counties of Los Angeles, Riverside, San Bernardino, Ventura, Orange, and Imperial, pursuant to Title 23, United States Code Section 134(d);

WHEREAS, SCAG is responsible for maintaining a continuing, cooperative, and comprehensive transportation planning process which involves the preparation and update every four years of a Regional Transportation Plan (RTP) pursuant to Title 23, United States Code Section 134 et seq., Title 49, United States Code Section 5303 et seq., and Title 23, Code of Federal Regulations Section 450 et seq.;

WHEREAS, SCAG is the multi-county designated transportation planning agency under state law, and as such is responsible for preparing, adopting and updating every four years the RTP and Sustainable Communities Strategy (SCS) pursuant to Government Code Section 65080 et seq.;

WHEREAS, pursuant to Senate Bill 375 (Steinberg, 2008) as codified in Government Code Section 65080(b) et seq., SCAG prepared an SCS as a component of the RTP document that demonstrates how the region will meet its greenhouse gas (GHG) reduction targets as determined by the California Air Resources Board (ARB);

WHEREAS, ARB set the per capita GHG emission reduction targets from automobiles and light trucks for the SCAG region at 8% below 2005 per capita emissions levels by 2020 and 19% below 2005 per capita emissions levels by 2035;

WHEREAS, pursuant to Government Code Section 65080(b)(2)(B), the SCS must: (1) identify the general location of uses, residential densities, and building intensities within the region; (2) identify areas within the region sufficient to house all the population of the region, including all economic segments of the population, over the course of the planning period of the regional transportation plan taking into account net migration into the region, population growth, household formation and employment growth; (3) identify areas within the region sufficient to house an eight-year projection of the regional housing need for the region pursuant to Government Code Section 65584; (4) identify a transportation network to service the transportation needs of the region; (5) gather and consider the best practically available scientific information regarding resource areas and farmland in the region as defined in subdivisions (a) and (b) of Section 65080.01; and (6) consider the state housing goals specified in Sections 65580 and 65581, (7) set forth a forecasted development pattern for the region, which, when integrated with the transportation network, and other transportation measures and policies, will reduce the GHG emissions from automobiles and light trucks to achieve the GHG reduction targets approved by the state board, and (8) allow the RTP to comply with air quality conformity requirements under the federal Clean Air Act;

WHEREAS, through the continuing, comprehensive and coordinated transportation planning process in conformance with all applicable federal and state requirement, SCAG developed and prepared the 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy ("RTP/SCS," "Connect SoCal" or "Plan");

WHEREAS, Connect SoCal sets forth the long-range regional plan, policies and strategies for transportation improvements and regional growth throughout the SCAG region through the horizon year of 2045;

WHEREAS, Connect SoCal includes a regional growth forecast that was developed by working with local jurisdictions using the most recent land use plans and policies and planning assumptions;

WHEREAS, Connect SoCal includes a financial plan identifying the revenues committed, available or reasonably available to support the SCAG region's surface transportation investments. The financial plan was developed following basic principles including incorporation of county and local financial planning documents in the region where available, and utilization of published data sources to evaluate historical trends and augment local forecasts as needed;

WHEREAS, Connect SoCal includes a financially constrained plan and a strategic plan. The constrained plan includes transportation projects that have committed, available or reasonably available revenue sources, and thus are probable for implementation. The strategic plan is an illustrative list of additional transportation investments that the region would pursue if additional funding and regional commitment were secured; and such investments are potential candidates for inclusion in the constrained RTP/SCS through future amendments or updates. The strategic plan is provided for information purposes only and is not part of the financially constrained and conforming Connect SoCal;

WHEREAS, Connect SoCal includes a sustainable communities strategy which sets forth a forecasted development pattern for the region, which, when integrated with the transportation network, and other transportations measures and policies, if implemented, will reduce the GHG emissions from

automobiles and light trucks to achieve the regional GHG targets set by ARB for the SCAG region;

WHEREAS, Connect SoCal must comply with all applicable provisions of federal and state law including but not limited to:

(1) The Moving Ahead for Progress in the 21st Century Act (MAP-21, PL 112-141) and the metropolitan planning regulations at Title 23, United States Code Section 134 et seq., as was amended by the Fixing America's Surface Transportation Act (P.L. l 14-94, December 4, 2015);

(2) The metropolitan planning regulations at 23 C.F.R. Part 450, Subpart C;

(3) California Government Code Section 65080 et seq.; Public Utilities Code Section 130058 and 130059; and Public Utilities Code Section 44243.5;

(4) Sections 174 and 176(c) and (d) of the federal Clean Air Act [(42 U.S.C. §§7504 and 7506(c) and (d)] and U.S. Environmental Protection Agency (EPA) transportation conformity regulations, 40 C.F.R. Parts 51 and 93;

(5) Title VI of the 1964 Civil Rights Act and the Title VI assurance executed by the State pursuant to Title 23, United States Code Section 324;

(6) The Department of Transportation's Final Environmental Justice Strategy (60 Fed. Reg. 33896; June 29, 1995) enacted pursuant to Executive Order 12898, which seeks to avoid disproportionately high and adverse impacts on minority and low-income populations with respect to human health and the environment;

(7) Title II of the 1990 Americans with Disabilities Act (42 U.S.C. §§ 12101 et seq.) and its accompanying regulations (49 C.F.R. §§ 27, 37, and 38); and

(8) SB 375 (Steinberg, 2008) as codified in California Government Code §65080(b) et seq.;

WHEREAS, pursuant to the California Environmental Quality Act (CEQA) (Cal. Pub. Res. § 21000 et seq.) and CEQA Guidelines (Cal. Code Regs., Tit. 14, §15000 et seq.), SCAG, as the Lead Agency, prepared the Final Program Environmental Impact Report (PEIR) for Connect SoCal;

WHEREAS, SCAG has also prepared and adopted a Mitigation Monitoring and Reporting Program in compliance with Public Resources Code §21081.6 and CEQA Guidelines §15097;

WHEREAS, in non-attainment and maintenance areas for transportation-related criteria pollutants, the MPO, as well as the Federal Highways Administration (FHWA) and Federal Transit Administration (FTA), must make a transportation conformity determination on any updated or amended RTP in accordance with the federal Clean Air Act to ensure that federally supported highway and transit project activities conform to the purpose of the State Implementation Plan (SIP);

WHEREAS, transportation conformity is based upon a positive conformity finding with respect to the following tests: (1) regional emissions analysis, (2) timely implementation of Transportation Control Measures, (3) financial constraint, and (4) interagency consultation and public involvement;

WHEREAS, pursuant to Government Code §65080(b)(2)(F) and federal public participation requirements, including 23 C.F.R. §450.316(b)(l)(iv), SCAG must prepare the RTP/SCS by providing adequate public notice of public involvement activities and time for public review. On September 6, 2018, SCAG approved and adopted a Public Participation Plan, to serve as a guide for SCAG's public involvement process, including the public involvement process to be used for the Connect SoCal, and included an enhanced outreach program that incorporates the public participation requirements of SB 375 and adds strategies to better serve the underrepresented segments of the region;

WHEREAS, pursuant to Government Code §65080(b)(2)(F)(iii), during the summer 2019, SCAG held a series of RTP/SCS public workshops throughout the region, including residents, elected officials, representatives of public agencies, community organizations, and environmental, housing and business stakeholders;

WHEREAS, in accordance with the interagency consultation requirements, 40 C.F.R. §93.105, SCAG consulted with the respective transportation and air quality planning agencies, including but not limited to, extensive discussion of the Draft Connect SoCal Transportation Conformity Technical Report before the Transportation Conformity Working Group (a forum for implementing the interagency consultation requirements) throughout the RTP/SCS update process;

WHEREAS, the Transportation Conformity Technical Report contained in Connect SoCal makes a positive transportation conformity determination. Using the final motor vehicle emission budgets submitted by ARB and approved or found to be adequate by EPA, this conformity determination is based upon staff's analysis of the applicable transportation conformity tests;

WHEREAS, SCAG released the Draft Connect SoCal and the associated Draft Amendment No. 19-12 to the 2019 FTIP for a 60-day public review and comment period that began on November 14, 2019 and ended on January 24, 2020;

WHEREAS, SCAG followed the provisions of its adopted Public Participation Plan regarding public involvement activities for the Draft Connect SoCal and Draft PEIR. Public outreach efforts included publication of the Draft Connect SoCal and Draft PEIR on SCAG's website, distribution of public information materials, held three (3) duly-noticed public hearings (public hearings were video-conferenced to 5 regional offices in different counties), and 21 elected official briefings within the SCAG region to allow stakeholders, elected officials and the public to comment on the Draft Connect SoCal and the Draft PEIR;

WHEREAS, during the public review and comment period, SCAG received 107 verbal and written comment submissions on the Draft Connect SoCal;

WHEREAS, SCAG staff presented an overview of the comments received on the Draft Connect SoCal and Draft PEIR, and a proposed approach to the responses, to the Policy Committees and Regional Council on March 5, 2020;

WHEREAS, comment letters on the Draft Connect SoCal as well as staff responses were posted on the SCAG website on March 27, 2020, and included as part of the Final Connect SoCal, Public Participation and

Consultation Technical Report, Appendix 2-4. SCAG also notified all commenters of the availability of the comments and responses;

WHEREAS, on May 7, 2020, SCAG's three Policy Committees met and each recommended that the Regional Council approve Resolution No. 20-621-1 to certify the proposed Final PEIR and approve the proposed Final Connect SoCal for purposes of federal transportation conformity only;

WHEREAS, the Regional Council had the opportunity to review and consider the proposed Final Connect SoCal and its related technical reports in its entirety as well as the staff report related to the proposed Final Connect SoCal, as part of a public meeting held on May 7, 2020;

WHEREAS, on or about May 7, 2020, the Regional Council adopted Resolution No. 20-621-1 wherein it certified the Final PEIR and approved Connect SoCal for federal transportation conformity purposes only, and postponed for up to 120 days approval of Connect SoCal in its entirety and for all other purposes;

WHEREAS, on May 14, 2020, SCAG staff submitted Connect SoCal and 2019 FTIP Amendment No. 19-12 to FHWA and FTA for a final transportation conformity determination in accordance with the Federal Clean Air Act and EPA transportation conformity regulations, 40 C.F.R. Parts 51 and 93;

WHEREAS, on June 5, 2020, FHWA and FTA jointly determined that transportation conformity requirements have been met for Connect SoCal and 2019 FTIP Amendment No. 19-12;

WHEREAS, staff engaged with a diverse array of stakeholders to consider the impacts of COVID-19 on Connect SoCal;

WHEREAS, staff worked with local jurisdictions to restore entitlements and their phasing as conveyed by jurisdictions, and conducted technical analysis to quantify all differences within the SCS and locally-approved General Plans and quantify the increase (or decrease) in housing, jobs or population between Connect SoCal and each local General Plan;

WHEREAS, on July 2, 2020, staff presented to each of the three Policy Committees and the Regional Council, a progress report describing modifications to the SCS and associated modeling and analysis;

WHEREAS, SCAG has prepared an Addendum to the Connect SoCal PEIR (Addendum) to evaluate the technical refinements for Connect SoCal and address two comment letters from the Center of Biological Diversity (CBD) received on May 1, 2020 and May 6, 2020, wherein CBD requested expanded background information related to environmental setting, environmental impacts, and consideration of other mitigation measures;

WHEREAS, while SCAG is not obligated to respond to late comments (as the public review period occurred from December 9, 2019 to January 24, 2020), in the interest of providing as much information to the public as possible, SCAG has addressed CBD's comments and incorporated additional information;

WHEREAS, pursuant to CEQA Guidelines Section 15164(a), an Addendum may be prepared by the Lead Agency that prepared the original EIR if some changes or additions are necessary, but none of the conditions have occurred set forth under CEQA Guidelines Section 15162 requiring preparation of a Subsequent EIR;

WHEREAS, the Addendum reflects SCAG's clarification and addition of information requested by CBD and analysis of the technical refinements and concludes that the PEIR is sufficient for addressing the potential environmental impacts and mitigation measures for the Plan;

WHEREAS, based on CBD's comment letters, SCAG has refined the mitigation measures and has prepared a Revised Mitigation Monitoring and Reporting Program (MMRP);

WHEREAS, SCAG has prepared an Errata to the Final Connect SoCal PEIR and to the adopted Findings as the previously adopted Final PEIR incorrectly identified Growth Forecast Guiding Principles as Plan Principles;

WHEREAS, pursuant to SB 375, Connect SoCal includes the SCS which is required to meet GHG reduction targets from automobiles and light trucks for 2020 and 2035 as set by ARB;

WHEREAS, the SCS must identify areas within the region sufficient to house an eight-year projection of the regional housing need for the region pursuant to Section 65080(b)(2)(B)(iii);

WHEREAS, the Regional Housing Needs Assessment (RHNA) is mandated by state housing law as part of the periodic process of updating local housing elements contained in General Plans. The RHNA quantifies the need for housing by income categories within each jurisdiction over a specified eight-year period and requires that local jurisdictions make available sufficient zoned capacity to accommodate this need;

WHEREAS, the state Legislature intended that housing planning be coordinated and integrated with the regional transportation plan and SCS. To achieve this goal, the RHNA allocation plan shall allocate housing units within the region consistent with the development pattern included in the SCS (Govt. Code § 65584.04(m));

WHEREAS, as a result of stakeholder outreach, SCAG staff received requests to clarify the limits of SCAG's authority with respect to the TAZ-level growth forecast data used for Connect SoCal regional modeling purposes, and the relationship of such data with local jurisdictions' implementation of their respective RHNA housing allocations; and

WHEREAS, all legal prerequisites to the adoption of this Resolution have occurred.

NOW THEREFORE, BE IT RESOLVED, the Regional Council hereby adopts the Addendum to the Connect SoCal PEIR and approves Connect SoCal in its entirety.

BE IT FURTHER RESOLVED by the Regional Council that:

1. The Addendum to the Connect SoCal PEIR has been completed in compliance with CEQA.

2. Based on substantial evidence provided in the Addendum, the Final PEIR and other materials in the record, SCAG determines that the impacts of

the Plan fall within the analyses in the Final PEIR as the Plan has no new significant environmental impacts; no substantial increase in the severity of previously identified significant effects; no mitigation measures or alternatives previously found infeasible are now feasible; and no mitigation measures or alternatives which are considerably different from those in the Final PEIR that would substantially reduce significant effects are declined to be adopted. Thus, a subsequent or supplemental EIR is not required.

3. Some changes or additions are necessary to the PEIR, making an Addendum the appropriate CEQA document for Connect SoCal refinements (CEQA Guidelines 15164).

4. Pursuant to Public Resources Code section 21081.6, the Regional Council hereby adopts the Revised Mitigation and Monitoring and Reporting Program (MMRP) attached to this Resolution as Exhibit A and the Errata to the Findings of Fact, attached to this Resolution as Exhibit B.

5. In consideration of the certified Connect SoCal PEIR and the Addendum to the PEIR, the Regional Council hereby approves Connect SoCal and finds as follows:

a. Connect SoCal complies with all applicable federal and state requirements, including the metropolitan planning provisions as identified in the Code of Federal Regulations Title 23 Part 450 and Title 49, Part 613, and other state planning requirements as identified in California Government Code Section 65080. Specifically, Connect SoCal fully addresses the requirements relating to the development and content of metropolitan transportation plans as set forth in 23 C.F.R.§450.322 et seq., including issues relating to: identification of transportation facilities that function as an integrated metropolitan transportation system; operational and management strategies; safety and security; performance measures; environmental mitigation; the need for a financially constrained plan; consultation and public participation; and transportation conformity;

b. The SCS prepared as part of Connect SoCal complies with the emission reduction targets established by ARB and meets the requirements of SB 375 (Steinberg, 2008) as codified in Government Code §65080(b) et seq. by achieving GHG emission reductions at 8% below 2005 per capita emissions levels by 2020 and 19% below 2005 per capita emissions levels by 2035;

c. Connect SoCal's preferred land use scenario and corresponding forecast of population, household and employment growth is adopted at the jurisdictional level, and any corresponding sub-jurisdictional level data and/or maps are advisory only.

6. The Regional Council hereby directs staff to submit the SCS to ARB to review SCAG's determination that the SCS meets the regional GHG emission reduction targets;

7. The Regional Council hereby clarifies the limits of SCAG's authority with respect to the use of TAZ-level data and the relationship between the Connect SoCal growth forecast and local jurisdictions' implementation of their respective RHNA allocations as follows:

a. Pursuant to state planning law (SB 375), SCAG's 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), known as "Connect SoCal," is required to meet greenhouse gas emissions (GHG) reduction targets from automobiles and light trucks for 2020 and 2035 as set by the California Air Resources Board (CARB). With regard to implementation of the sustainable communities strategy (SCS), SB 375 specifically provides that nothing in the SCS shall be interpreted as superseding the exercise of the land use authority of cities and counties within the region. Further, SB 375 may not be interpreted to authorize the abrogation of any vested right whether created by statute or by common law, and may not require a city's or county's land use policies and regulations, including its general plan, to be consistent with such plan. (Cal. Govt. Code § 65080(b)(2)(K)).

b. The Regional Housing Needs Assessment (RHNA) is mandated by state housing law as part of the periodic process of updating local housing elements contained in General Plans. The RHNA quantifies the need for housing by income categories within each jurisdiction over a specified eight-year period and requires that local jurisdictions make available sufficient zoned capacity to accommodate this need.

c. SCAG's legislative platform reflects its support of consistency within state law regarding the sometimes competing demands contained within SB 375 and the RHNA[1].

d. The limits of SCAG's authority are reflected in the following Growth Forecast Guiding Principles contained in Connect SoCal, which are hereby clarified as follows (additions are in italics):

i. Connect SoCal will be adopted at the jurisdictional-level, and directly reflects the population, household and employment growth projections that have been reviewed and refined with feedback from local jurisdictions through SCAG's Bottom-Up Local Input and Envisioning Process. The growth forecast maintains these locally informed projected jurisdictional growth totals, meaning future growth is not reallocated from one local jurisdiction to another.

ii. Connect SoCal's growth forecast at the Transportation Analysis Zone (TAZ) level is controlled to not exceed the maximum density of local general plans as conveyed by jurisdictions, except in the case of existing entitlements and development agreements. TAZ-level growth projections are utilized by SCAG for regional modeling purposes and are not adopted as part of Connect SoCal nor included as part of the Forecasted

1 See SCAG 2020 Legislative Platform at: http://www.scag.ca.gov/programs/Documents/LegislativePriorities/SCAG-2020-legislative-platform-STATE.pdf

Regional Development Pattern. The Forecasted Regional Development Pattern for Connect SoCal reflects the policies and strategies of the Plan and includes existing entitlements and development agreements conveyed by jurisdictions, as depicted in the Connect SoCal Sustainable Communities Technical Report.

iii. For the purpose of determining consistency with Connect SoCal for California Environmental Quality Act (CEQA), grants or other opportunities, lead agencies such as local jurisdictions have the sole discretion in determining a local project's consistency; SCAG may also evaluate consistency for grants and other resource opportunities; consistency should be evaluated utilizing the goals and policies of Connect SoCal and its associated Program Environmental Impact Report (PEIR). However, TAZ-level growth projections for households, employment or population reflected in TAZ Maps may not be utilized to determine consistency or inconsistency with Connect SoCal2.

iv. TAZ-level data or any data at a geography smaller than the jurisdictional-level has been utilized to conduct required modeling analyses and is therefore advisory only and non-binding, given that sub-jurisdictional forecasts are not adopted as part of Connect SoCal. TAZ-level data may be used by jurisdictions in local planning as they deem appropriate, and Connect SoCal does not supersede or otherwise affect local jurisdiction authority or decisions on future development, including entitlements and development agreements. There is no obligation by a jurisdiction to change its land use policies, General Plan, or regulations to be consistent with Connect SoCal.

v. SCAG will maintain communication with agencies that use SCAG's subjurisdictional-level data to ensure that the "advisory and nonbinding" nature of the data is appropriately maintained.

e. TAZ-level growth forecast projections are used by SCAG staff for overall, regional-scale planning and modeling purposes in preparing Connect SoCal and to confirm data related to existing entitlements and development agreements. Given the scale at which their use is meaningful, these TAZ-level growth forecasts do not create any prescriptive or recommended cap or limit on the intra-jurisdictional locations of household/housing, employment or population within the boundaries of individual jurisdictions. SCAG is a regional planning organization and does not possess any land use authority, nor does it have enough information at the local level to constrain or otherwise affect individual projects and plans at an intra-jurisdictional scale.

f. The SCS was developed to comply with state greenhouse gas reduction requirements pursuant to SB 375, and is intended to serve as an advisory and elective planning vision for consideration by other stakeholders and implementing agencies, and local control of land use decision-making is not intended to be constrained or limited in any way by Connect SoCal.

g. In the event a project or plan located within a given TAZ boundary would exceed the projected growth as depicted within a TAZ Map utilized for overall, regional-scale modeling and forecasting, SCAG affirms that such TAZ Maps would not present a prescription, constraint or limit on household/housing, employment and population growth.

h. SCAG confirms that the Connect SoCal TAZ-level growth projections reflected in TAZ Maps do not constitute a prescriptive "pattern" of future development in Connect SoCal for General Plan or zoning code amendments (including intra-jurisdictional RHNA compliance and housing element updates), or for any individual project approval. The distribution and types of RHNA housing units allocated within each local jurisdiction continues to be fully and completely subject to local control and subject to other applicable laws, and not be constrained or affected by the TAZ-level growth projections.

i. SCAG recognizes that cities and counties will foreseeably update their housing elements as part of General Plans and amend zoning designations to accommodate the state-mandated RHNA sixth cycle allocation. For many cities and counties, the required RHNA General Plan and zoning changes may need to accommodate more housing units than reflected in the Connect SoCal's household and population growth projections for individual or combined TAZs within the jurisdiction ("Exceedances"). Given SCAG's use of TAZ-level growth projections for regional planning and modeling purposes, and the local jurisdictions' obligations to comply with state housing laws including RHNA, SCAG agrees that in the event of any Exceedances at the jurisdictional and/or intra-jurisdictional levels, such Exceedances may not be used to impede a local jurisdiction's compliance with the sixth cycle RHNA requirements, to assess impacts of a plan or project under CEQA, or affect eligibility for state funding.

j. Nothing in this Resolution creates any affirmative enforcement obligation by SCAG against any third party;

8. That the foregoing recitals are true and correct and incorporated herein by this reference; and

9. SCAG's Executive Director or his designee is authorized to make minor modifications, finalize and transmit the final Connect SoCal in its entirety, including but not limited to submittal to ARB.

2 "TAZ-level growth projections" refer to the disaggregation of the regional and jurisdictional population, household, employment growth forecasts developed as part of the final, adopted Connect SoCal, and is in contrast to other TAZ-level data such as locally envisioned growth projections (i.e., "local input") or the 2016 base-year TAZ-level data developed by SCAG. "TAZ Maps" refer to visualizations in a map format of the TAZ-level growth projections within a TAZ boundary, which may be created by SCAG, and such maps are not developed, included, contained, approved or adopted as part of Connect SoCal.

PASSED, APPROVED AND ADOPTED by the Regional Council of the Southern California Association of Governments at its regular meeting this 3rd day of September 2020.

Rex Richardson
President, SCAG
Council Member, City of Long Beach

Attested by:

Kome Ajise
Executive Director

Approved as to Form:

Justine Block
Acting Chief Counsel

WELCOME

MAKING CONNECTIONS

OUR REGION

Southern California is a region shaped by big dreams and big ideas. With an economy that continues to grow and thrive on the aspirations, courage and hard work of almost 19 million people, we are a region that retains and attracts people in search of opportunity and freedom. Our population is greater than all but four states. We are the 15th biggest economy in the world. Our geography spans more than 38,000 square miles, making us as large as the entire state of Indiana. The size and diversity of our region across a wide range of measures is extraordinary.

It is no surprise then that the infrastructure underlying the successful development of our region is huge. Our regional roadway network spans over 135,000 lane miles[1] — laid end-to-end, that is enough to circle the globe more than five times. We are home to the two largest container ports in the Western Hemisphere, the world's fourth busiest airport, and soon the world's longest light rail transit line, with the completion of the Regional Connector, which will connect transit lines from the Los Angeles Civic Center to the Financial District. Achieving this level of development has been a feat of engineering and ingenuity: tunneling under cities and across earthquake faults, scaling mountains and bridging rivers and canyons.

Our urban form also reflects extraordinary vision and leadership: the big ideas and persistence of community members seeking healthy and safe neighborhoods; civic leaders who through collaboration and compromise found a way to move initiatives forward; voters bold enough to tax themselves so that county transportation commissions—the region's implementing agencies—can fund and build critical transportation infrastructure projects. These collective efforts keep the region moving in an environmentally sustainable, economically efficient and socially equitable manner.

1 Caltrans Highway Performance Monitoring System (HPMS) Data (2017)

OUR PLAN

As the largest metropolitan planning organization in the country, the Southern California Association of Governments (SCAG) has worked collaboratively with transportation agencies across Southern California for the last fifty years to align and better connect transportation investments across the six-county region through the adoption of Regional Transportation Plans. The enactment of SB 375 in 2009 introduced a requirement to reduce greenhouse gas emissions, essentially codifying the integrated transportation and land use planning that our region had already initiated with the 2008 Regional Transportation Plan. Through our continuing efforts to better align transportation investments and land use decisions, we strive to improve mobility and reduce greenhouse gases not just by building new and bigger infrastructure, but also by bringing housing and jobs closer together, making commutes shorter and making it easier to get around without a car.

Guided by the leadership of the Regional Council, in 2012 SCAG adopted the region's first Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS)—a plan we now call Connect SoCal. As might be expected, the vision for that plan was big: we would build more than 20 miles of light rail, creating a rail backbone to serve the entire region; we would accommodate 51 percent of all future housing near major transit stations and corridors; we would replace gas taxes with mileage-based user fees to ensure a long-term sustainable funding mechanism that isn't eroded by rising fuel efficiency and construction costs.

By many metrics, we've succeeded in meeting these ambitious objectives, advancing the Core Vision of our plan. Between 2009 and today, our region has constructed 61 miles of rail, a number that will continue to grow as projects embraced through voter-approved initiatives come to fruition. We collaborated with the state to implement California's Active Transportation Program, bringing nearly $500 million to local agencies to complete critical mobility and safety projects. Our persistence in advocating for increased transportation revenue was rewarded with passage of Senate Bill 1, a funding bill that generates $52 billion statewide over the next 10 years to maintain and preserve our transportation infrastructure.

However, despite our progress, we only narrowly achieve our 2020 target for greenhouse gas emission reductions, the core metric by which our

region's sustainability is judged. Transit ridership is falling, despite billions of dollars in investment and increased development in station areas. Deaths from traffic collisions are rising. Housing costs are increasing, along with homelessness. We must do better.

OUR VISION

Connect SoCal was developed through a four-year planning process involving rigorous technical analysis, extensive stakeholder engagement and robust policy discussions with local elected leaders, who make up SCAG's policy committees and Regional Council. SCAG's leadership explored the challenges and barriers to the transformative change our region needs to address demographic and economic shifts, including an increasingly aging and economically inequitable society. Our analysis considered both the physical constraints and economic barriers of continuing to grow rapidly on the fringes of the region. Our policy committees reviewed and discussed emerging technologies and transportation innovations aimed at relieving congestion, while reducing emissions.

Through this extensive planning process, we discovered not just one technological advancement or signature transportation project to advance our goals and vision, but many. Reflecting the size and diversity of our region, Connect SoCal continues to aim toward transformative change by providing a clear vision for collective action. For example, the region has already committed significant resources to improve and expand the transit system. However, the solutions to transit ridership decline are not limited to what transit agencies can do. Rather, the solutions involve collective action regarding how we prioritize the use of streets and curb space, for people not cars; how our land use plans encourage more housing and jobs closer to each other and to transit; how we use technology to improve safety and provide meaningful choices to travelers; and how we price and manage use of the automobile.

We know that small changes can have a great impact. Taking the step of reforming how local jurisdictions permit accessory dwelling units, 2016's Senate Bill 1069 resulted in a dramatic statewide increase in construction permits for those units. Similarly, our 2018 transit ridership study with the University of California Los Angeles Institute of Transportation Studies found that if one out

WHY WE CALL IT CONNECT SOCAL

Connect SoCal charts a path toward a more mobile, sustainable and prosperous region by making connections between transportation networks, between planning strategies and between the people whose collaboration can improve the quality of life for Southern Californians

CORE VISION

Connect SoCal builds upon and expands land use and transportation strategies established over several planning cycles to increase mobility options and achieve a more sustainable growth pattern

KEY CONNECTIONS

To augment the Core Vision of the plan, Connect SoCal includes new initiatives at the intersection of land use, tranportation and technology to close the gap and reach our greenhouse gas reduction goals

of every four people (who rarely ride transit) took transit just twice a month, it would more than make up for the region's lost ridership. It has also been proven that every dollar spent on early preventive maintenance can save five to 10 times as much on pavement rehabilitation or replacement costs for our vast roadway network.

The transformative change we seek does not require a radical shift in course. Our critical mission is to complete the Core Vision of our decades-long planning efforts and continue to build on past plans and successes. We must enhance and build out the transit network as the backbone of a mobility system that allows people to move freely without the personal, social and environmental cost of a car. We have to create complete streets across our communities such that people are prioritized over vehicles. And we must maintain the system we have and expand where necessary to ensure useful life and efficiency. We will adopt policies to encourage emerging technologies and mobility innovations that support rather than hamper regional goals. We will locate housing, jobs and transit closer together in priority growth areas while preserving natural lands and open spaces.

To complete the "last mile" towards our sustainability goals, Connect SoCal builds upon this Core Vision for Southern California with regional initiatives, or Key Connections, that link the built environment and transportation system with policies, projects and programs that strengthen and enhance each other beyond what each would accomplish in isolation. For example, we will foster housing construction in transit rich areas by deregulating parking, promoting housing supportive infrastructure, and supporting innovative self-help financing districts. We will encourage regional coordination to incentivize shared mobility, as mobility services and new technologies gain mode share. We will ensure the safe and fluid movement of goods while committing to the broad deployment of zero- and near-zero emission technologies.

Altogether, the multimodal transportation projects and strategies included in Connect SoCal represent an investment of over $638 billion over the next 25 years. In addition to meeting our greenhouse gas reduction target, Connect SoCal will deliver significant benefits to the region with respect to mobility, safety, health outcomes, travel time reliability, air quality, economic productivity, environmental justice, and transportation asset condition. Technology will be integral to the solutions we need. The way we work, shop and travel has been transformed by a device that fits in our pockets. These

innovations point to the tremendous opportunity to shift travel behaviors through small changes: the potential to unlock the promise of our big sustainability vision with investments in access, connectivity and technology.

LET'S CONNECT SOCAL TOGETHER

The following pages of Connect SoCal provide further detail on the challenges facing our region, our shared goals and transportation and land use strategies, and how we intend to realize them. It is a compass, not a roadmap. It is a vision, not a guarantee. As has always been the case, the big dreams and big ideas that have shaped the landscape of Southern California will only be realized through hard work and collaboration. Let's Connect SoCal together!

Connect SoCal Plan Summary

CORE VISION	Connect SoCal builds upon and expands land use and transportation strategies established over several planning cycles to increase mobility options and achieve a more sustainable growth pattern. *Progress and next steps to advance the Core Vision can be found throughout Chapter 3*
KEY CONNECTIONS	To augment the Core Vision of the plan, Connect SoCal includes new initiatives at the intersection of land use, tranportation and technology to close the gap and reach our greenhouse gas reduction goals. *Key Connections can be found in Chapter 3*
FUNDING	$638.9 Billion
2035 GHG	19% Reduction Relative to 2005 Per Capita
ECONOMIC IMPACT	• 168,400 New Jobs Supported by Transportation Investments • 264,500 New Jobs Supported by Improved Competitiveness • $346 Million Saved Per Year in Healthcare Spending • $180 Million Saved Per Year on Air Pollution-Related Health Incidences • $1.00 Investment = $2.06 Benefit
PLAN BENEFITS	25.7% Decrease in time spent in traffic delay per capita 5.0% Decrease in daily miles driven per capita

CHAPTER 1

CHAPTER 1

ABOUT THE PLAN

WHAT IS CONNECT SOCAL?

As a metropolitan planning organization – the largest in the nation – SCAG is responsible for developing long-range transportation plans and a sustainability strategy for a vast and varied region. The centerpiece of that planning work is Connect SoCal, our 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). The plan charts a path toward a more mobile, sustainable and prosperous region by making key connections: between transportation networks, between planning strategies and between the people whose collaboration can make plans a reality.

SCAG is just one part of a large body of governments and public organizations that collectively plan, construct, operate and maintain the region's transportation system. SCAG's work helps facilitate implementation, but the agency does not directly implement or construct projects. The policies and strategies laid out in Connect SoCal materialize only in collaboration with local, county, state, federal and private partners.

Connect SoCal embodies a collective vision for the region's future, through the horizon year of 2045. It is developed with input from a wide range of constituents and stakeholders within the Counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura, including public agencies, community organizations, elected officials, tribal governments, the business community and the general public.

Connect SoCal is an important planning document for the region, allowing public agencies who implement transportation projects to do so in a coordinated manner, while qualifying for federal and state funding. The plan includes robust financial analysis that considers operations and maintenance costs to ensure our existing transportation system's reliability, longevity, resilience and cost effectiveness. In addition, Connect SoCal is supported by a combination of transportation and land use strategies that outline how the region can achieve California's greenhouse gas emission reduction goals and federal Clean Air Act requirements. The plan also strives to achieve broader regional objectives, such as the preservation of natural lands, improvement of public health, increased roadway safety, support for the region's vital goods movement industries and more efficient use of resources.

LAWS THAT GUIDE THE PLAN

Key laws and requirements that drive Connect SoCal include:

- **Developing a Regional Transportation Plan (RTP) -** SCAG is required by federal law to prepare and update a long-range RTP (23 U.S.C. §134 et seq.). The RTP must include, among other things: the identification of transportation facilities such as major roadways, transit, intermodal facilities and connectors that function as an integrated metropolitan system over at least a 20 year forecast period; a financial plan demonstrating how the RTP can be implemented with "reasonably available" resources and additional financial approaches; strategies to improve existing facilities and relieve vehicular congestion and maximize the safety and mobility of people and goods; and environmental mitigation activities. (23 U.S.C. §134 (i)(2)).
- **Keeping up with Clean Air Act Requirements -** With respect to air quality, most areas within the SCAG region have been designated as nonattainment or maintenance areas for one or more transportation-related criteria pollutants. Pursuant to the federal Clean Air Act, SCAG's 2020 RTP/SCS is required to meet all federal transportation conformity requirements, including regional emissions analysis, financial constraint, timely implementation of transportation control measures, and interagency consultation and public involvement (42 U.S.C. §7401 et seq.).
- **Monitoring System Performance -** With the passage of the 'Moving Ahead for Progress in the 21st Century' (MAP-21) federal transportation authorization legislation in 2012, transportation system performance planning and monitoring also became a federal mandate. This commitment to a national performance management and reporting system was further solidified with the passage of the subsequent federal transportation authorization package (the 'FAST Act') in 2015. SCAG has been a pioneer in the development and use of performance metrics to evaluate progress toward achieving regional goals before MAP-21/FAST Act became law, a practice that has only gained momentum in recent years. Starting with the 1998 RTP, SCAG has been using quantitative performance measures to evaluate how well the RTP may achieve the regional goals established in the plan.

- **Developing a Sustainable Communities Strategy -** California State law also imposes additional requirements. For example, state law specifies that, "The plan shall be action-oriented and pragmatic, considering both the short-term and long-term future" (Government Code §65080(a)). California Senate Bill 375, codified in 2008 in Government Code §65080 (b)(2)(B), also requires that the RTP include a sustainable communities strategy or "SCS", which outlines growth strategies for land use and transportation and help reduce the state's greenhouse gas emissions from cars and light duty trucks.
- **Hitting Specific Targets for Greenhouse Gas Reduction -** For the SCAG region, the California Air Resources Board (ARB) has set greenhouse gas reduction targets at eight percent below 2005 per capita emissions levels by 2020, and 19 percent below 2005 per capita emissions levels by 2035. As we will be discussed further in Chapter 3, the plan lays out a strategy for the region to meet these targets.

SCAG is committed to not only meeting its statutory requirements but also ensuring that Connect SoCal, as with the agency's prior RTPs, remains a living document that is rooted in strong analysis and evolves as the region's demographics, priorities and economy change.

GOALS & GUIDING PRINCIPLES

The goals of Connect SoCal fall into four core categories: economy, mobility, environment and healthy/complete communities. The plan explicitly lays out goals related to housing, transportation technologies, equity and resilience in order to adequately reflect the increasing importance of these topics in the region, and where possible the goals have been developed to link to potential performance measures and targets. The plan's guiding policies take these goals and focus them, creating a specific direction for plan investments.

Federal policy also requires that SCAG sets performance measures and targets in Connect SoCal. As required under MAP-21/FAST Act, in 2016 and 2017 the Federal Highway Administration (FHWA) issued national performance measures and guidelines for use in the setting of statewide and regional performance targets. The FHWA rule-making process established a four-year performance target setting and reporting cycle, with a two-year mid-term progress evaluation point. SCAG coordinated closely with State of California Department of

Connect SoCal Goals

1. Encourage regional economic prosperity and global competitiveness
2. Improve mobility, accessibility, reliability, and travel safety for people and goods
3. Enhance the preservation, security, and resilience of the regional transportation system
4. Increase person and goods movement and travel choices within the transportation system
5. Reduce greenhouse gas emissions and improve air quality
6. Support healthy and equitable communities
7. Adapt to a changing climate and support an integrated regional development pattern and transportation network
8. Leverage new transportation technologies and data-driven solutions that result in more efficient travel
9. Encourage development of diverse housing types in areas that are supported by multiple transportation options
10. Promote conservation of natural and agricultural lands and restoration of habitats

Connect SoCal Guiding Principles

1. Base transportation investments on adopted regional performance indicators and MAP-21/FAST Act regional targets
2. Place high priority for transportation funding in the region on projects and programs that improve mobility, accessibility, reliability and safety, and that preserve the existing transportation system
3. Assure that land use and growth strategies recognize local input, promote sustainable transportation options, and support equitable and adaptable communities
4. Encourage RTP/SCS investments and strategies that collectively result in reduced non-recurrent congestion and demand for single occupancy vehicle use, by leveraging new transportation technologies and expanding travel choices
5. Encourage transportation investments that will result in improved air quality and public health, and reduced greenhouse gas emissions
6. Monitor progress on all aspects of the Plan, including the timely implementation of projects, programs, and strategies
7. Regionally, transportation investments should reflect best-known science regarding climate change vulnerability, in order to design for long term resilience

Transportation (Caltrans) in the establishment of specific performance targets for the state and for our region in the various transportation performance areas established under MAP-21/FAST Act. These targets provide quantifiable objectives to achieve each measure during the performance period.

HOW THE PLAN WAS DEVELOPED

In preparing Connect SoCal, SCAG engaged with local, state and federal agency partners from the very beginning. Through many collaborative initiatives SCAG was able to better understand existing conditions in the region, building a foundation for planning how to accommodate growth and direct future transportation investments.

SCAG sought regular input from the Regional Council and Policy Committees while creating Connect SoCal. These groups of elected officials consist of representatives from county transportation commissions, tribal governments, as well as towns, cities and counties throughout the region.

The development process also involved working closely with local governments throughout the region to collect and compile data on land use and growth trends. This *"Bottom-Up Local Input and Envisioning Process,"* helped us get a clear picture of what's going on at the local level – and formed the basis for projections and strategies in Connect SoCal. Through this collaborative initiative, SCAG staff held one-on-one meetings with all of the region's 197 towns, cities and counties. In addition to seeking feedback on regional forecasts of population, household and employment growth, SCAG gathered data on land use, protected natural lands, farmland, flood areas and coastal inundation, regional bikeways, regional truck routes, planned major transit stops, high quality transit corridors, future transit priority areas and other local data. In addition to the jurisdictions themselves, the data came from county assessors' offices, county transportation commissions, and state and federal partners.

This local input process gave jurisdictions the opportunity to ask questions, understand data elements and seek technical support, as well as provide feedback on local data. The process was guided by the Connect SoCal Guidelines and Schedule that were adopted by the Regional Council in October 2017. Overall, 90 percent of jurisdictions provided feedback on one or more

data elements requested for local review. Collectively, these towns, cities and counties represent an estimated 94 percent of the region's residents.

SCAG staff also regularly convened a series of technical advisory groups that engaged local, state and federal agencies in the transportation and sustainable communities planning process. To more accurately understand future growth, SCAG engaged with expert demographers and economists to peer-review projections of population, households, and employment at the regional and county levels.

SCAG worked closely with each of the six county transportation commissions throughout 2018 to update the list of regionally significant transportation projects that was established in Connect SoCal's predecessor, the 2016 RTP/SCS. Each county transportation commission in turn worked with their partner transportation agencies (including applicable transit providers, rail operators, marine port and airport authorities and Caltrans District offices) to finalize a list of county-priority projects to submit to SCAG. This effort culminated in a comprehensive update to the list of programs and projects, which numbers in the thousands. SCAG worked collaboratively with key stakeholders to identify additional regional initiatives that go beyond county-level commitments and are intended to address challenges that are regional in nature.

To better coordinate with the State, Connect SoCal was developed to align with the California State Rail Plan, California Transportation Plan (CTP 2040), California Freight Mobility Plan (CFMP), California Aviation System Plan (CASP), and State Bicycle and Pedestrian Plan. SCAG is also actively participating in the update of the California Transportation Plan, CTP 2050, to coordinate and better align regional and statewide planning. The CTP is a long-range statewide level transportation plan that combines regional transportation and land-use plans to produce a unified multimodal strategy to achieve our collective vision of a lasting and well-integrated transportation system that benefits both people and goods over the next 25 years.

Throughout this process, SCAG staff has regularly convened technical advisory committees and topic-specific working groups, which bring together regional stakeholders to discuss the plan's development and provide technical expertise. There were seven formal Regional Planning Working Groups, including: Active Transportation, Environmental Justice, Mobility Innovations, Natural and Farm Land Conservation, Public Health, Sustainable Communities and Transportation Safety. These allow interested parties from across industries and sub-regions to have a direct pipeline into SCAG's planning process, and helped develop a vision for the future that promotes regional goals and sustainability while respecting local control. Some takeaways include: the importance of identifying common barriers to sustainable development, such as funding and 'NIMBYism'; the need for a balance of jobs and households in communities; the need for coordination and support on emerging transportation technologies; support for sustainable development solutions for existing suburban communities and the challenge of providing sufficient affordable housing.

To ensure that underrepresented voices were involved in the planning process, we also implemented a new grassroots outreach initiative to engage diverse constituencies across Southern California. SCAG partnered with 18 community-based organizations, or CBOs, from across the region. These organizations assisted with workshop and survey outreach as well as hosting local gatherings for community members to provide input on Connect SoCal. Using this strategy, we successfully broadened our outreach to traditionally underserved and underrepresented communities including:

- Children and youth
- Individuals with access and functional needs
- Low-income communities of color
- Older adults or retired people
- Populations with limited English proficiency
- Women and female-headed households

SCAG's 18 CBO partners represented constituents from Long Beach to Coachella Valley, Santa Clara River Valley to Orange County. Though their missions and areas of focus vary, each of these groups has a common commitment to creating a more equitable, sustainable, accessible and affordable Southern California.

Feedback received through our CBO partners was used to identify areas where the plan could be refined to meaningfully reflect the priorities and concerns of these traditionally underserved groups, particularly because they have historically been disproportionately burdened by the negative outcomes associated with existing and changing land use patterns and transportation policies. Highlights of what we heard from them include:

- Concerns about housing availability and affordability, limited

alternative transportation options, displacement and access to destinations, the effects of increased greenhouse gas emissions, and the risks associated with climate change

- A push for Connect SoCal to take into account the degree to which transportation and housing options vary between communities, and that having a limited range of travel options often increases residents' reliance on vehicles
- Pronounced support for strategies that create affordable housing, improve the existing transportation network, and expand mobility options that reduce the harmful impacts of displacement to historically marginalized neighborhoods

Overall, the communities surveyed agreed with the themes, policies and interventions proposed by Connect SoCal.

In developing a vision of future growth for Connect SoCal, SCAG also sought feedback from residents throughout the region through public engagement initiatives that featured 28 public workshops, an extensive advertisement campaign, a telephone town hall meeting and a widely distributed online survey. Public workshop attendees were asked to review four potential growth scenarios, each with a unique set of strategies. These included enhancing job centers, prioritizing connecting people to more transportation options, protecting natural lands and farmland areas and planning for our region's future resiliency from natural disasters. Local plans and policies, as conveyed through the local input process, were integrated into each of these scenarios, ensuring that they reflected an attainable future. The input we received included support for locating more growth near transit and job centers, desire to prioritize infill and redevelopment within existing cities to accommodate future growth and promote affordable housing, and concerns about overcrowding or gentrification within existing communities. Taken together, the feedback pointed to a need for Connect SoCal to envision a sustainable development pattern that respects and enhances the quality of life within local communities.

SCAG considered input gathered through the CBO engagement and public workshops to ensure Connect SoCal addresses challenges faced by our region's residents. Strategies, therefore, emphasize growth in areas rich with destinations and mobility options, promote diverse housing choices, leverage technology innovations, support implementation of sustainability policies and promote a green region. This more compact development pattern, combined with the identified transportation network improvements and strategies, results in improved pedestrian and bicycle access to community amenities, lowers average trip length and reduces Vehicle miles traveled. These outcomes not only reduce greenhouse gas emissions, but also support the development of more livable communities that provide lower-cost housing choices, conserve natural resources, offer transportation options and promote a better quality of life.

Connect SoCal will help residents thrive, providing better access to jobs, housing, schools, healthcare, recreation and everything in between. In our region's history, we've seen that small actions can build to extraordinary outcomes. With investments to improve our roadways, expand our transit system, multiply walking and bicycling amenities, protect natural lands and integrate new initiatives like road pricing — Connect SoCal works to address residents' challenges by promoting job accessibility, enabling shorter commutes, making communities safer and encouraging lower-cost housing developments.

The various components of Connect SoCal were reviewed by SCAG's Regional Council and Policy Committees in a series of meetings. At their Nov. 7, 2019 meeting the Regional Council authorized the release of Connect SoCal and its accompanying Technical Reports for public review and comment. This final version of Connect SoCal, which incorporates adjustments based on feedback received during the public review process, was presented to the Regional Council on May 7, 2020 and approved for federal transportation conformity purposes only. On September 3, the Regional Council adopted Connect SoCal in full after an additional 120-day outreach and technical refinement period.

HOW TO USE THIS PLAN

SCAG collaborated closely with a wide range of partners to develop Connect SoCal. It is our goal that Connect SoCal be used by the same constituents and stakeholders that worked with us to create it, as a trusted reference and guiding document for prioritizing transportation projects, encouraging behavior change and furthering regional strategies that can shape Southern California's transportation and land use development for years to come.

Use the Connect SoCal plan to:

- Understand the biggest trends and challenges in the region (Chapter 2)
- Review a comprehensive set of policies, strategies and tools to improve mobility and sustainability (Chapter 3)
- Evaluate the sources and structures of funding that will support executing the plan (Chapter 4)
- Refer to performance measures and ways of tracking our success in becoming a more mobile and sustainable region (Chapter 5)
- Identify new challenges that remain on our horizon (Chapter 6)

Connect SoCal is also supported by 20 technical reports that provide additional data and material on all topics and concepts covered in this plan. All citations used throughout the main book and technical reports conform to AP style.

Connect SoCal Technical Reports

Active Transportation
Aviation & Airport Ground Access
Congestion Management
Demographics & Growth Forecast
Economic & Job Creation Analysis
Emerging Technology
Environmental Justice
Goods Movement
Highways & Arterials
Natural & Farm Lands Conservation
Passenger Rail
Performance Measures
Project List
Public Health
Public Participation & Consultation
Sustainable Communities Strategy
Transit
Transportation Conformity Analysis
Transportation Finance
Transportation Safety & Security

CHAPTER 2

CHAPTER 2

SOCAL TODAY

MAJOR TRENDS, EXISTING CONDITIONS & CHALLENGES

MAJOR TRENDS

With more than 19 million people, 6 million households, and 8 million jobs, the SCAG region is among the most dynamic metropolitan areas in the world. It encompasses a uniquely diverse mix of industries, urban forms, transportation connectivity, agricultural resources and risks for natural disasters.

In order to plan for 2045 and identify how to best prepare for the uncertainty of the future, we must first understand how our region and its 197 local jurisdictions are changing, what challenges are currently in place and which are emerging.

DEMOGRAPHIC & POPULATION CHANGES

Southern California's most precious resource is our people. In order to understand how changes will impact them, Connect SoCal projects growth in employment, population, and households at the region, county, city, town and neighborhood levels. These projections take into account economic and demographic trends at the global and regional levels, as well as feedback reflecting on-the-ground conditions from SCAG's local partners, stakeholders and working groups. Overall, our population forecast reveals that we are embarking on a new era for Southern California, and in the wake of our recovery from the Great Recession, new and unprecedented demographic trends are beginning.

On a national level, population growth has slowed, with the US Census Bureau projecting a decrease in national annual growth rate from about 0.75 percent in 2016 to approximately 0.40 percent by the 2040s. In the SCAG region, annual growth is similarly slowing down, from about 0.85 percent in 2020 to about 0.45 percent by 2045. These changes are driven by declines in fertility, as women are having fewer children and are doing so later in life. This is exacerbated by high housing costs in economically vibrant mega-regions like Southern California.

While we are growing slower, we are also growing older. From 2000 to 2016, the region's median age increased from 32.3 to 35.8. By 2045, this number is expected to reach 39.7. Meanwhile, the youngest members of the Baby Boomer generation turned 55 in 2019. This will substantially change the ratio of working-age population to seniors in the future, placing stresses on social services such as healthcare, social security and pensions. As Baby Boomers enter their eighties and beyond, the region and nation are likely to experience a population decline, meaning that in order to create any future population growth, we will need to rely on migration. As such, many demographers have stressed the mutual dependence between the retirees and young immigrants who, together, will characterize a large portion of the region's future population. Future economic success will require effectively integrating new residents into the social and economic structures of Southern California. Similarly, education and workforce development will be even more important for younger generations since their labor will need to support a larger retiree population.

While net foreign immigration to the region has decreased from its highs in the early 1990s, Southern California is historically one of the country's most important immigrant gateways. Today, Southern California ranks behind only the Miami and San Jose regions in its share of foreign-born population. While roughly half of the region's foreign-born population is originally from Latin American countries, an increasing share of newly-arrived immigrants – now nearly 60 percent – are from Asian countries. Compared to the total population, immigrants are generally young or working age, which increases their importance to the regional economy. There are also clear-cut implications for transportation: new immigrants are more likely than their native-born counterparts to take transit, ride in carpools and utilize alternative modes of transportation.

Another "mega-trend" impacting the SCAG region is domestic migration. For most of the last thirty years, the SCAG region has lost more people to other states and regions than it has gained—in each year since 2014, an average of 91,000 more people have left the region for other parts of the country than the number of those who have arrived. While employment growth brings people to the region, high housing costs are often cited as a reason for leaving.

Hidden behind this trend is an exchange that has been referred to as California's "Brain Gain" – meaning that new residents moving to the region who come from other parts of the country ("domestic in-migrants") tend to have a higher education level than those who leave ("domestic out-migrants"). In 2017, 47 percent of the region's 321,000 domestic in-migrants had at least

a four-year degree, compared to 39 percent of the region's 429,000 domestic out-migrants (see the Demographics and Growth Forecast Technical Report). This is a trend which many regional economists believe is part of what it means to be a booming mega-region today. Many U.S. regions expend tremendous effort attracting the highly educated workforce that is moving to our region of its own accord. While this can be a great boost to the region's economy, it is also indicative of some of the challenges faced by middle-class families native to Southern California.

In addition to the region's aging and migration, Connect SoCal is heavily informed by trends surrounding the large cohort of Millennials — the generation born between years 1981 and 1996. Since most Millennials entered adulthood during the recession, difficulties in securing stable employment have caused many of them to lag behind previous generations in building lifetime wealth. During this time, Millennials were less likely than previous generations to form a family, move out of their parents' homes to form a household, or purchase their own homes. This has had the effect of increased demand and higher prices in the rental housing market, since many would-be homeowners lacked the income to buy. Since the Great Recession, the popular perception has been that Millennials prefer urban renting rather than suburban homeownership. This also accompanied a decline in vehicle miles traveled (VMT) during the same period. However, more recent travel survey data and economic research has shown that a large portion of this shift can be explained by the lower incomes Millennials had during the recession rather than a fundamental change in preferences. Thus, as the economy improves and Millennials age, we must be aware that their demonstrated preferences may have been a temporary delay rather than a lasting characteristic[1].

STRUCTURAL ECONOMIC CHANGES

The distribution of income and wealth in Southern California has been changing gradually; but in the long term, future impacts may be profound. Median incomes have increased in the SCAG region since the depths of the Great Recession, but when adjusted for inflation, the median household income in the SCAG region is below what it was in 1989 — validating some

1 Kurz, Christopher, Geng Li, and Daniel J. Vine (2018). "Are Millennials Different?," Finance and Economics Discussion Series 2018-080. Washington: Board of Governors of the Federal Reserve System

Changing Age Demographics in the Region







	POPULATION AGES UNDER 15	POPULATION AGES 15–64	POPULATION AGES 65 & OVER
2015	3.7M	12.6M	2.4M
2045	3.9M	14M	4.6M

BY 2045

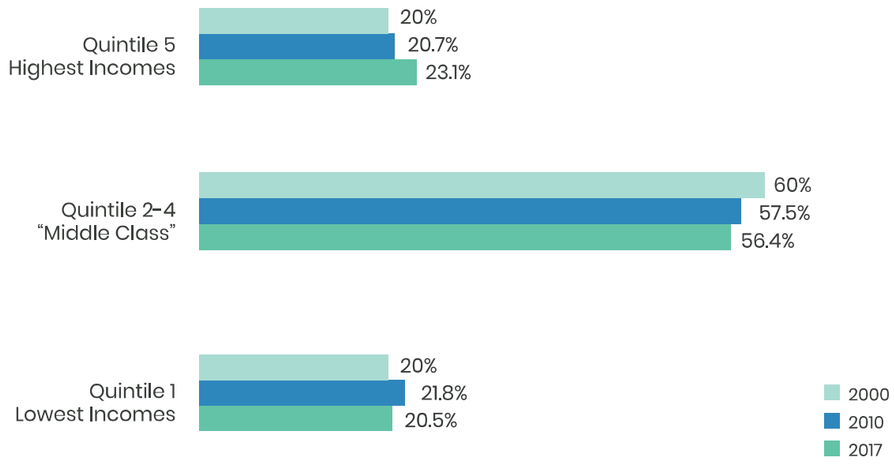
1 IN 5

PEOPLE WILL BE AGE 65+

claims that recovery has been uneven. Indeed, the middle class is measurably shrinking in Southern California. Since 2000, households in the middle income brackets have been declining - first as the recession turned some middle-class households into lower-income households, then as the recovery moved other middle-class households into the highest income group (see **FIGURE 2.1**). Using the "middle 60 percent" of the income distribution in the year 2000 to define the middle class, only 56.4 percent of households would fit that definition today. While the distribution of income remains a challenge, the region has experienced tremendous job growth since 2010, gaining 1.3 million jobs and cresting the pre-recession high of 8.1 million jobs reached in 2007. Meanwhile unemployment has dropped to lows not seen in several decades, from a high of 12.4 percent in 2010 to 4.3 percent in 2018.

Technological changes are also poised to make big impacts on our local economy, both by presenting new challenges and by creating new, previously infeasible solutions. While leaps in technology have always disrupted the established ways of getting things done, they are generally accompanied by increases in utility and productivity. New approaches to work have, for some, fostered a shift in the nature of employment away from full-time, long-term, stable jobs. Income sources like ridesourcing, short-term home rentals, and craft production enabled by new technology platforms can have the benefit of more efficiently matching consumers with products and services. But they can also remove important employment benefits and protections, as many of these positions are part-time or filled by independent contractors. Indeed, disruption by some technological platforms has caused serious concerns over displacing workers from stable, full-time jobs or from work altogether—a concern that is heightened when productivity gains are concentrated into smaller shares of the population. While workplace automation has already displaced some manufacturing jobs, services and knowledge-based employment are also increasingly being automated. An estimate of the potential impacts of automation on regional employment by 2045 suggests that construction, repair, transportation, food preparation, sales, social services and office support occupations show some of the highest likelihood of automation. Today these industries together employ over 3 million workers regionwide. **FIGURE 2.2** displays anticipated growth in these sectors, along with the projected number of jobs that will be automated based on three estimates – Brookings, Frey Osborne and Nesta. Looking at the logistics industry alone, changing trade paradigms and the emergence of new market-driven strategies and technologies (e.g., smaller urban fulfillment centers, increased competition for skilled labor, automation, etc.) will challenge the regional workforce. Trade-related jobs once offered few barriers to entry as well as upward career mobility to low- and semi-skilled workers, often allowing them to achieve security and middle-class incomes.

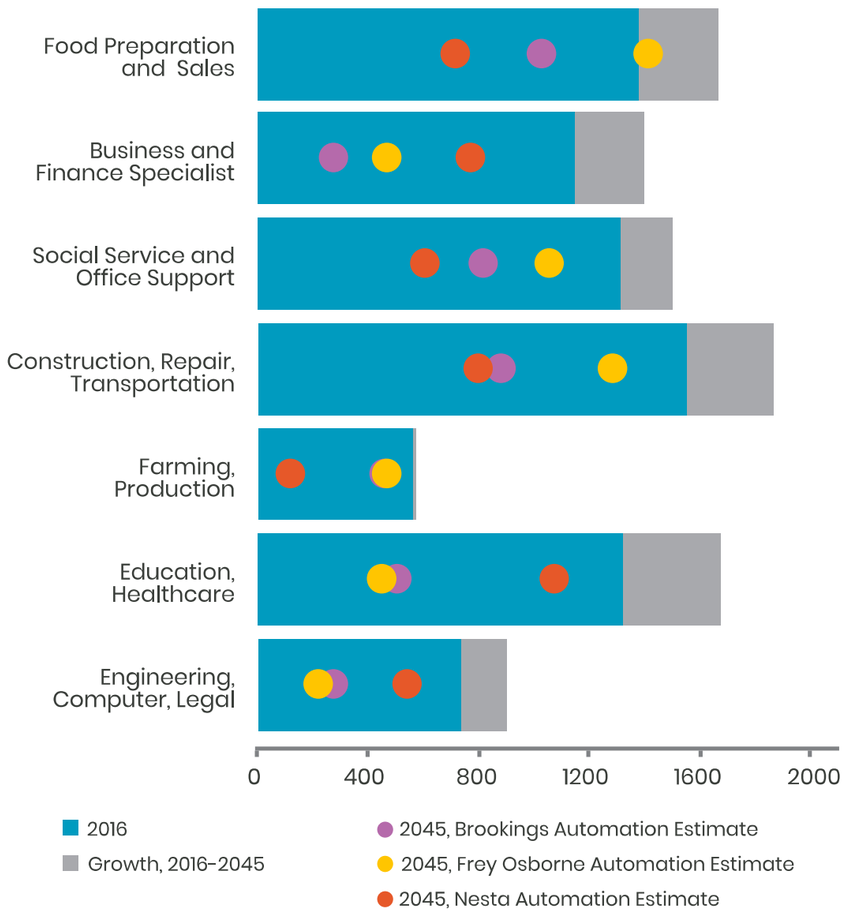
FIGURE 2.1 Income by Quintile



Source: United States Census Bureau and American Community Survey

In the years ahead, the region may face significant challenges from technology disruption by reducing opportunities for many regional workers who will not be able to close the skills gap to adequately compete for future jobs in that sphere. This has spurred increasingly popular policy discussions of universal basic income (UBI) as a potential solution to offset the negative impacts of job losses due to technology. Since employment is becoming less necessary for gains in overall economic productivity, UBI models have proposed redistributing the revenues from taxes on businesses utilizing these new platforms to area residents to ensure a minimum living standard without impacting the incentive to work.

FIGURE 2.2 Job Growth (in Thousands) and Automation Potential by Occupation, SCAG Region, 2016–2045



** Figure shows Connect SoCal's anticipated regional jobs and job growth alongside independent estimates of automation potential by occupation. Occupations are aggregations of 2-digit occupation codes covering 95% of regional jobs*
Source: SCAG, Muro, Maxim, and Whiton (2019, Brookings), Frey and Osborne (2017), and Bakhski et al. (2017, Nesta)

Another major economic shift is occurring among consumers, who are now spending less on products and goods than they are on services. Some of this can be correlated with the aging of the population, since older people are less likely to fill a home with goods and more likely to spend on healthcare. As services are generally not subject to local sales tax, this could be problematic for local city and county revenue streams - a major source of funding for public amenities as well as existing and future transportation infrastructure in Southern California.

GLOBALIZATION

As a global crossroads for the movement of people and things, Southern California depends heavily on transportation services for the health of our economy. As a crucial node in global supply chains with a massive volume of trade, as well as an enormous consumer market with extensive transportation infrastructure, it is highly important that SCAG's strategies for the region accommodate growing freight movement. Combined, the region's major trade hubs – including the Ports of Los Angeles and Long Beach, Los Angeles International Airport, and Calexico East – Mexicali II – handled more than $500 billion of goods in 2018. International containerized trade between the U.S. and Pacific Rim countries and bilateral trade with Mexico have been key factors that helped to drive the region's economy for decades. This has a direct impact on the region, as growth in international containerized trade continues to outpace growth in gross domestic product (GDP) nationally and globally (**FIGURE 2.3**).

In part due to Southern California's global connectivity - specifically its linkages with Asian countries – the growth of the global middle class also impacts the job and housing markets in the region. The growth rate in the global middle class internationally is at an all-time high, with 140 million new middle-class people annually[2]. In the future, 88 percent of new middle-class residents expected between 2015 and 2030 will live in the Asia Pacific region. This is an approximately 250 percent increase in middle class residents in Asia compared to a modest increase of about six percent in North America. Sharp declines in manufacturing employment in the U.S. and the region indicate that traditional middle-class occupations are being filled by middle-class workers

2 Kharas, Homi. (2017) The unprecedented expansion of the global middle class: An update. Brookings, Global Economy & Development Working Paper 100. (February)

in other countries. One impact from both the growth in the middle class in Asia as well as rapid GDP increases in Asian countries, particularly China, is the relationship with the Southern California real estate market. While data on foreign investment in residential real estate are weak, the California Association of Realtors estimates between 5 and 10 percent of California's single-family housing stock is owned by foreign buyers, and 71 percent of foreign buyers in 2017 were from Asia[3]. An influx of foreign capital in Southern California real estate has the potential to exacerbate regional housing shortages, especially if investment properties are left unoccupied.

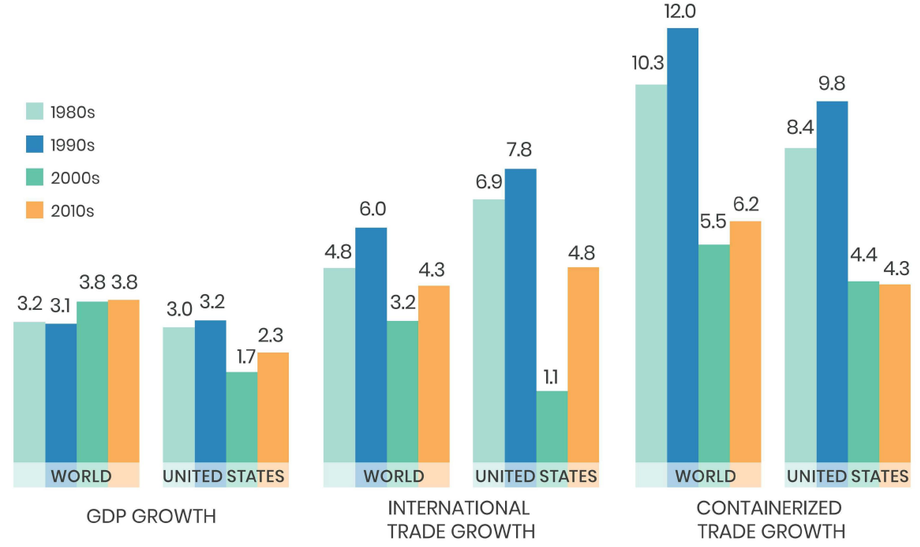
REGIONAL GROWTH

As our regional population and economy continue to grow, the physical footprint of development in our region is growing too. Though Southern California is seen by many as the embodiment of urban sprawl, the region has always challenged the notion of a crisp delineation between "urban" and "suburban." U.S. Census data have indicated that Los Angeles is the densest urbanized area in the United States. This may seem counterintuitive since much of Southern California's land use is characterized by fairly small-lot single-family homes that are spread across many square miles of the region. By contrast, urban areas that seem more compact like New York or Chicago have very dense cores but a lower level of development across their regions, since suburban and exurban land is often far more spread out in these locales. In Southern California, decades of lower-density development (particularly housing) has occurred farther from employment-rich areas, increasing congestion, automobile dependency, leapfrog development and air pollution, and limiting the effectiveness of public transit.

Recent growth trends show a push-and-pull between new single-family development in traditionally suburban or formerly rural areas and multi-family residential development in higher-density communities. Overall, it is clear that when new residents join our region, existing towns, cities and counties adapt to accommodate and attract growth. From 2006 to 2016, an additional 930,000 people called Southern California home. Riverside County had the largest share of population growth among the six counties in the SCAG region during this period, adding an additional 360,000 new residents (nearly 40 percent of the region's increase in population). Los Angeles County followed with the next largest share and experienced an increase of 190,000 residents (or 20 percent of the growth).

In meeting these new residents' demand for housing, the region also added about 400,000 units from 2006 to 2016 – 54 percent of which were multi-family units. Comparing to current conditions in 2016, 39 percent of the region's housing units are multi-family and 61 percent are single-family units. Looking at the distribution of these new housing units throughout the region, Riverside County and Los Angeles County again took the highest shares, together comprising two-thirds (66 percent) of Southern California's housing growth from 2006 to 2016. Riverside County added just under 100,000 new units, and Los Angeles County added an additional 164,000 housing units - with 90 percent

FIGURE 2.3 World & US Growth Rates of GDP, International Trade & Containerized Trade



Source: SCAG staff review and process international trade statistics from: U.S. Department of Transportation, Maritime Administration, U.S. Waterborne Foreign Container Trade by U.S. Customs Ports (1997 - 2017), World Development Indicators, World Bank. Update 08/28/2018, Bureau of Economic Analysis

3 Levin, Matt. (2018) "Data dig: Are foreign investors driving up real estate in your California neighborhood?" CalMatters. (March 7)

representing multi-family developments, largely occurring in denser areas that are well served by transit.

Part of Riverside County's expansion is due to new communities that began to emerge during the housing boom. Four additional cities have incorporated since 2006 (Wildomar, Menifee, Eastvale and Jurupa Valley), increasing the total number of local jurisdictions in the SCAG region to 197. Much of this new territory was previously vacant, very low density residential, or used for agricultural purposes. Many areas in Riverside and San Bernardino Counties were appealing for development due to the availability of lower priced land, which attracted new residents looking for larger or lower priced housing. Jobs, however, did not follow in proportion to housing unit growth in these communities. As a result, residents of the Inland Empire had to travel longer distances on average than other Southern Californians to reach their jobs. As wages are often higher in coastal counties than in inland counties, even for the same occupation, many residents also opted for a longer commute due to their preference for homes that were larger or lower-priced. Examining median commute distances for residents of these areas before and after the housing boom shows a sharp uptick from 2002 to 2012, followed by leveling off from 2012 to 2016 (as displayed in the Environmental Justice Technical Report).

From a regional perspective, incorporation of jurisdictions is often driven by an increase in housing density and the associated needs of residents for increased water, sewer, police, and other municipal services. Therefore, the acreage of incorporated towns and cities in our region provides a good indicator of overall regional development trends, as well as the expansion of growth into rural and agricultural areas. From 2006 to 2016, the amount of land within incorporated jurisdictions increased by over 144,000 acres—a 6 percent change during the 10-year period.

Moving towards the future, new housing production has accelerated since the recession with over 40,000 new units permitted each year from 2015 to 2018. While this is above the 15,000 annual permits in 2009 – a historic low for the region during the Great Recession – it is still below the average of 80,000 new units permitted annually during the housing boom from 2002 to 2006.

While the acceleration in new units since the Great Recession has been characterized by a higher share of multi-family units, there is concern that this trend may reverse absent policy intervention, as Millennials seek affordable ownership opportunities which are scarcer in the urban core and in the multi-family market. For example, 51 percent of all new housing unit permits issued in California for 2018 were for single-family dwellings, making 2018 the first year since 2011 that single-family housing permitting outpaced multi-family homes. The SCAG region's multi-family share of permits have begun to decline from their peak in 2015 (**FIGURE 2.4**). Connect SoCal projects a higher share in multi-family growth and seeks to provide more housing choices in both type and location, while being aware of the transportation, fiscal and environmental benefits of some aspects of denser living.

As our communities continue to expand, vital habitat lands face severe development pressure. The diverse natural and agricultural landscapes of Southern California are a valuable asset to the region and its residents. These lands support a robust economy, provide clean drinking water, protect the air and host countless recreation activities. The region's desert, mountain and coastal habitats have some of the highest concentrations of native plant and animal species on the planet. Southern California is part of the California Floristic Province, one of the planet's top twenty-five biodiversity hotspots[4]. Much of the SCAG region has a rich agricultural history, and crop sales continue to bring billions of dollars into our local economy.

LINKING FUTURE GROWTH WITH MORE TRANSPORTATION CHOICES

Planning for more housing and jobs near transit was a strategy incorporated in SCAG's first Regional Transportation Plan/Sustainable Community Strategy (RTP/SCS) in 2012 and carried forward in the 2016 RTP/SCS with a focus on areas that are well served by transit. Efforts to implement the previous SCSs have been evident both in recently adopted local plans, which increasingly reflect more SCS strategies such as infill development, as well as in the observed data on recent growth. Between 2008 and 2016, over 58 percent of household growth and 45 percent of employment growth occurred within future high quality transit areas (i.e. places within a half mile of a rail or bus rapid transit stops or bus stops/corridors that will have peak headways of 15 minutes or less) (**TABLE 2.1**).

4 Myers, N., Mittermeier, R. A., Mittermeier, C. G., Da Fonseca, G. A., & Kent, J. (2000). Biodiversity hotspots for conservation priorities. Nature, 403(6772), 853.

Previous RTP/SCS plans also identified increasingly sophisticated strategies to ensure the preservation of natural lands and farmland. As of 2016, over 70 local jurisdictions have conservation strategies in place, such as development impact fees. Between 2008 and 2016, 11 percent of household growth and 5 percent of employment growth occurred in constrained areas (**TABLE 2.1**). SCAG continues to support jurisdictions in implementing the SCS through the Sustainable Communities Program which provides resources for local planning efforts.

Since 2008, there has been a substantial concentration and share of growth in high quality transit areas (HQTAs), Transit Priority Areas (TPAs), Specific Plan Areas, job centers, Neighborhood Mobility Areas (NMAs) and Livable Corridors. These areas account for just under four percent of the region's land area but accommodate the lion's share of regional growth (**TABLE 2.1**). While these recent trends are largely the result of existing local policy, demographic trends and market demand, they underscore that in many ways the region is gradually moving towards a more sustainable development pattern. This new growth is supported by the completion of major transportation projects across the region as well as several major urban rail projects under construction such

FIGURE 2.4 Building Permit Activity & Household Size, SCAG Region, 2000-2018



**Population aged 25 and over*
Source: CA DOF and Construction Industry Research Board (CIRB). Single-family permits listed here utilize the CIRB definition, which includes attached duplexes and accessory dwelling units.

TABLE 2.1 Recent Growth Trends in SCAG Growth Priority Areas, 2008-2016

	Land Area		Share of Total Growth (2008-2016)		Annual Growth Rate (2008-2016)	
	Acres	Percent	Households	Employment	Households	Employment
SCAG Region Total	**24,717,287**				**0.42%**	**1.01%**
Priority Growth Areas Total	**975,234**	**3.9%**	**70.7%**	**74.6%**	**0.50%**	**1.07%**
High Quality Transit Areas (HQTA)[1]	592,286	2.4%	58.2%	45.2%	0.54%	0.85%
Transit Priority Areas (TPA)[2]	218,411	0.9%	33.9%	20.9%	0.65%	0.72%
Job Centers[3]	202,186	0.8%	24.2%	33.4%	0.90%	1.21%
Neighborhood Mobility Areas[4]	248,916	1.0%	37.4%	27.6%	0.54%	0.96%
Livable Corridors[5]	548,451	2.2%	49.6%	53.8%	0.50%	1.13%
Sphere of Influence[6]	146,017	0.6%	3.0%	2.6%	0.36%	1.31%
Absolute Constrained Areas[7]	**20,487,984**	**82.9%**	**11.4%**	**5.0%**	**0.50%**	**0.66%**
Variable Constrained Areas[8]	**17,924,688**	**72.5%**	**52.9%**	**44.9%**	**0.48%**	**1.26%**

Source: SCAG

Note: Priority Growth and Constrained areas extracted from 2045 plan year data of the final Connect SoCal, 2020-2045 RTP/SCS

1. *Generally a walkable transit village or corridor, consistent with the adopted RTP/SCS, and within 1/2-mile of a transit stop or a transit corridor with 15-minute or less service frequency during peak commute hours, excluding freeway transit corridors with no bus stops on the freeway alignment. Additional information is included in the Connect SoCal Sustainable Communities Strategy Technical Report.*
2. *An area within 1/2-mile of a major transit stop that is existing or planned including an existing rail transit station or bus rapid transit station or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during AM and PM peak commute periods.*
3. *Areas with significantly higher employment density than surrounding areas which capture density peaks and locally significant job centers throughout all six counties in the region.*
4. *Areas with high intersection density (generally >= 50 intersections/sqmi.), low to moderate traffic speeds, and robust residential retail connections that can support the use of Neighborhood Electric Vehicles or active transportation modes for short trips.*
5. *An arterial network subset of HQTAs based on level of transit service and land use planning efforts. Some additional arterials identified through corridor planning studies funded through the Sustainability Planning Grant program.*
6. *Spheres of Influence (outside of absolute and variable constrained areas) - Existing or planned service areas and within the planning boundary outside of an agency's legal boundary; data accessed by SCAG from each county's Local Agency Formation Commission (LAFCO) in 2016.*
7. *Including tribal lands, military, open space, conserved lands, sea level rise areas (2 feet) and farmlands in unincorporated areas*
8. *Including Wildland Urban Interface (WUI), grazing lands, farmlands in incorporated jurisdictions, 500 year flood plains, CalFire Very High Severity Fire Risk (state and local), and Natural Lands and Habitat Corridors (connectivity, habitat quality, habitat type layers).*

HOW WE TRAVEL TODAY (2016)

	ALL TRIPS	TO/FROM: WORK	TO/FROM: SCHOOL	OTHER
SINGLE OCCUPANCY VEHICLE	36.0%	70.7%	12.8%	31.2%
HIGH OCCUPANCY VEHICLE	51.7%	23.5%	61.8%	58.2%
TRANSIT	3.2%	2.7%	9.0%	1.6%
BIKE	1.3%	0.7%	2.5%	1.1%
WALK	7.8%	2.4%	13.8%	7.8%

Source: SCAG Activity Based Model

as the OC Streetcar, Metro Rail Regional Connector and Arrow/Redlands Rail. However, there is some very recent data that show increasing rates of single-family housing and vehicle travel, which suggests that in an improving economy the region may require stronger policy intervention and community-building in priority areas to ensure that sustainable trends continue. See Chapter 3's "Core Vision" and "Key Connections" for more highlights of recent progress and potential solutions for addressing the region's challenges.

TRANSPORTATION SYSTEM

The SCAG region is a place in motion with more ships, planes, trains, trucks, and automobiles carrying people and goods in, out, and around than anywhere else in the United States. It is also infamous for congestion, network gaps, and lack of adequate maintenance and preservation. By understanding how the current system is utilized, we can implement policies that help address these challenges while preserving and maintaining the system's longevity.

Our current transportation network is comprised of more than 9,000 miles of public transit (**EXHIBIT 2.1**), 5,000 miles of bikeways (**EXHIBIT 2.2**), over 135,000 lane miles of roadways and 94 miles of express lanes. The Port of Los Angeles and Port of Long Beach, which comprise the largest container complex in the U.S., is one of the many regional gateways that contribute to our expansive regional goods movement system (**EXHIBIT 2.4**). Our aviation system is one of the busiest in the world in terms of air passenger and cargo demand, with more than 110.2 million annual passengers and 3.14 million tons of cargo in 2017. All components of the system are providing economic stimulus throughout the region, while simultaneously connecting our homes to opportunities, including leisure.

Understanding the current infrastructure presents the question of how do Southern Californians utilize the transportation system. **PAGE 28** identifies the current mode choice for trip purposes throughout the SCAG region. Key takeaways include:

- According to SCAG's activity-based travel demand model (ABM), more than 71 million total unlinked daily trips are made throughout the region, and nearly one third of all trips are work related
- Of those 20 million daily work unlinked trips, nearly 40 percent are greater than 10 miles in distance and over 70 percent are completed by individuals driving alone in their vehicles. After that, carpooling is the second most popular option, followed distantly by walking, taking transit and bicycling
- Over two-thirds of all regional trips are non-work related; for these purposes, carpooling is the most popular means for residents to reach their destinations, including school, shopping, among many others
- Looking at school trips specifically, nearly 14 percent are made by walking and 9 percent of trips are made by transit

While the system supports a multitude of options for people and cargo to navigate the region, it is not immune to challenges of preservation, maintenance and accessibility. To ensure a more connected 2045, Southern California will need to address many of these obstacles.

PRESENT & FUTURE CHALLENGES

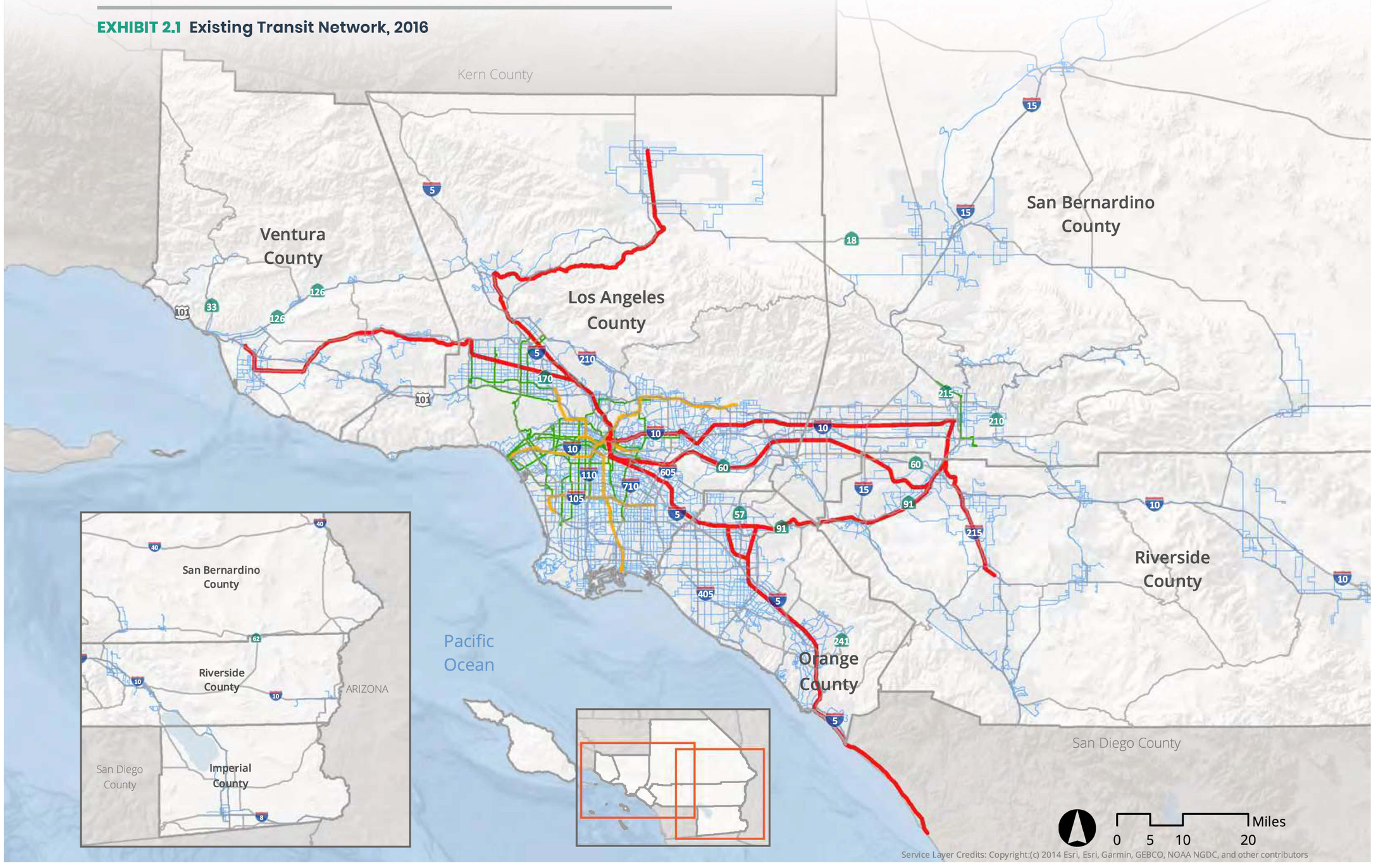
The region is experiencing a range of challenges and anticipating more, including the aging population, income inequality, traffic congestion and the high cost of housing. This section highlights several key land use and transportation challenges which are directly addressed in this plan; additional discussion is also available in the Technical Reports for Connect SoCal.

AFFORDABLE HOUSING

California is in the midst of a long-term structural housing shortage and affordability crisis. As of 2018, California ranks 49th of 50 states in the number of housing units per resident. With many strong indications, high demand for housing and short supply drives up rental and home prices throughout the state. Indeed, seven of the 10 most expensive housing markets in the United States are in California.

SCAG published a housing report in 2016, Mission Impossible: Meeting California's Housing Challenge, to review the causes and consequences of the housing crisis throughout the state and for the SCAG region. The housing crisis is a two-part problem – a shortage of housing and a lack of affordability. The shortage of housing is a lack of supply since there is not enough housing to meet population needs. Housing supply has not kept up with population growth. In comparison to the last few decades, housing building has significantly decreased.

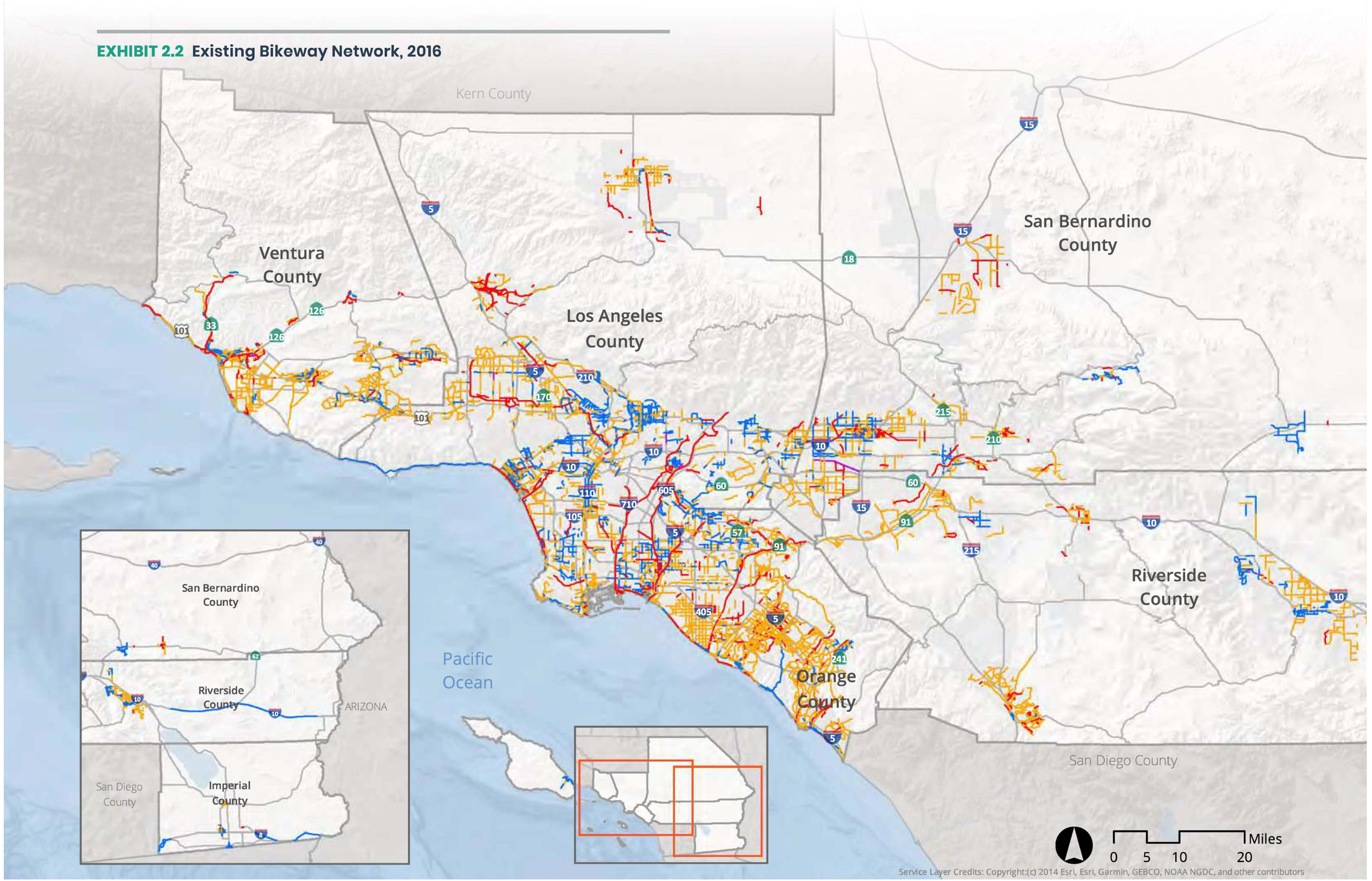
EXHIBIT 2.1 Existing Transit Network, 2016



County Boundaries
City Boundaries
Freeway
Metrolink (2016)
Urban Rail (2016)
Rapid Bus and Bus Rapid Transit (2016)
Bus Routes (2016)

Source: SCAG, 2019

EXHIBIT 2.2 Existing Bikeway Network, 2016

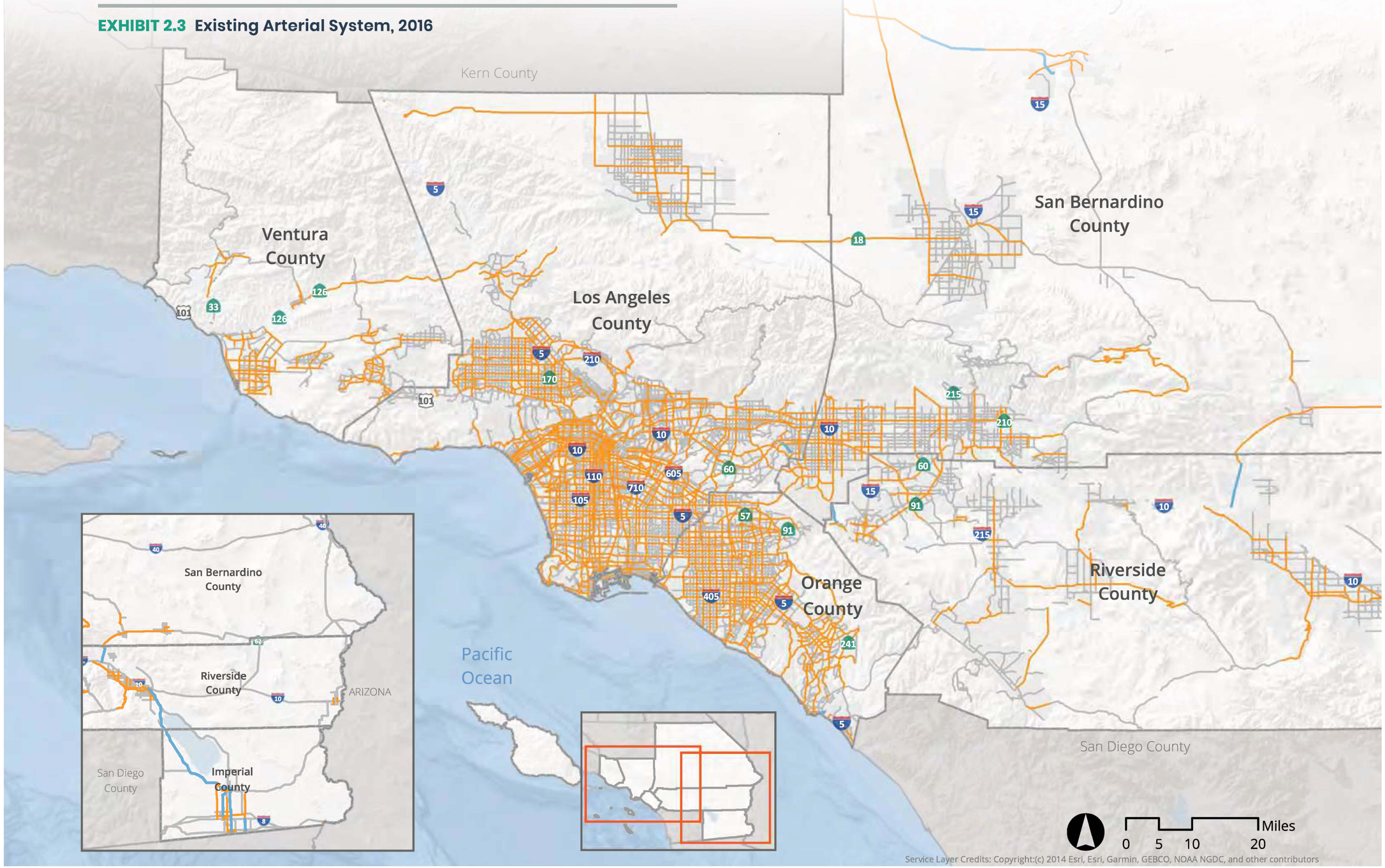


County Boundaries
City Boundaries
Freeway

Existing Bikeways
Class I
Class II
Class III
Class IV

Source: SCAG, 2019

EXHIBIT 2.3 Existing Arterial System, 2016



Expressway / Parkway Principal Arterial Minor Arterial

Source: SCAG, 2019

EXHIBIT 2.4 Existing Goods Movement System



Airport
Ports
Ports of Entry
Intermodal Facilities
Classification Facilities
Major Freight Highway Corridors
Main Line Rail
Alameda Corridor

Warehouses
>= 50,000 sq ft
< 50,000 sq ft

Source: SCAG 2019, CoStar Realty Information Inc.

FOCUS

REGIONAL AVIATION

AIRPORTS

7 COMMERCIAL AIRPORTS

7 GOVERNMENT/ MILITARY AIR FIELDS

30+ RELIEVER AND GENERAL AVIATION AIRPORTS

STATS

110.2 MILLION ANNUAL PASSENGERS IN 2017

200 Destinations,
50 Countries, 40 States

3.1 MILLION TONS OF AIR CARGO IN 2017

114 Destinations,
20+ Countries, 30+ States

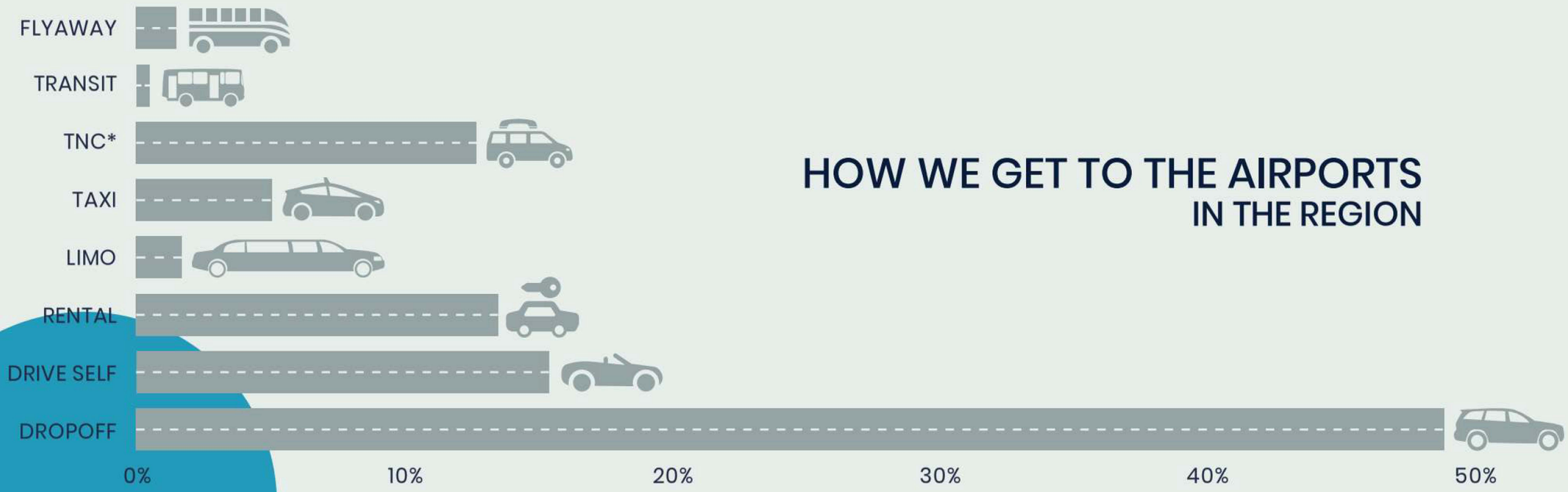
TRENDS

GENERAL AVIATION GREW AT AN ANNUAL GROWTH RATE OF **0.12%***

AIR CARGO GREW AT AN ANNUAL GROWTH RATE OF **4.6%***

*From 2012 to 2017

HOW WE GET TO THE AIRPORTS IN THE REGION



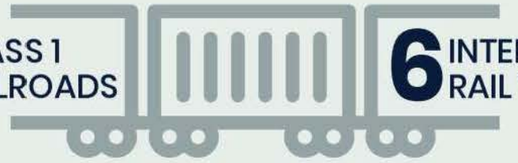
*Transportation Network Companies, such as Uber and Lyft

FOCUS
GOODS MOVEMENT

THE SCAG REGION HAD APPROXIMATELY

5,177 **MILES** of principal arterial roadway, including interstate, other freeway & expressway in 2018

2 CLASS 1 RAILROADS



6 INTERMODAL RAIL YARDS*

* Not including carload and automobile terminals

IN 2018, THE VALUE OF INTERNATIONAL TRADE THAT MOVED THROUGH THE SCAG REGION WAS OVER

$562 **BILLION** including total maritime and cross-border trade and air freight

$1.6 **BILLION****

cost of congestion to the trucking industry in the Los Angeles metropolitan region in 2016

**Source: ATRI

#1



SOUTHERN CALIFORNIA HAS THE LARGEST CONTAINER PORT COMPLEX IN THE UNITED STATES

9th largest container port complex in the world in 2018

NEARLY **1.2** BILLION sq. ft. of warehousing & distribution space



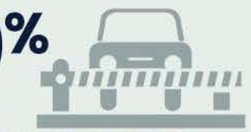
AND CLOSE TO **750** MILLION facilities >50k sq. ft. in size

Goods Movement dependent industries generated **2.9** MILLION JOBS



REGIONAL AIRPORTS HANDLED NEARLY **$122** BILLION in international air cargo in 2018

OVER **300%** GROWTH in **VEHICLE HOURS OF DELAY** per day at rail-highway grade crossings across the region by 2045



From 2010 to 2018, one unit was built for every 3.32 persons in the SCAG region which is a 47.5 percent decrease compared to the 1.74 persons per unit in 1970 to 1980. There are also many other contributors to the overall housing crisis including barriers caused by land use zoning that prevent new housing development and increasing building and other costs resulting from time delays, environmental litigation, lack of sufficient local funding mechanisms and community resistance to new housing, especially medium and high-density projects. The second problem, lack of affordability, is the mismatch of household incomes to the prices of housing that is available. **EXHIBIT 2.5** highlights SCAG's existing land use as of 2016. One underlying challenge is that middle income job growth has been severely deficient despite an otherwise strong recovery from the Great Recession.

Additionally, population and employment growth in metropolitan areas in California has slowed in recent years because wages cannot compensate for the high cost of housing. From 2000 to 2017, median gross rent and median home price have increased 25.5 percent and 55.7 percent, respectively, while median household income only increased by 2 percent. High housing costs often force residents to live further away from their workplace as affordable options are sparse near their place of work. In surveying the needs and concerns of residents in Southern California, affordable housing and homelessness were the top concerns. The California Legislative Analyst's Office found that for every 10 percent increase in a metropolitan area's median rent, there was a 4.5 percent increase in an individual's commute time[5]. High housing prices contribute to sprawl, add time to regular commutes, make food and healthcare less attainable by constraining household resources, and exacerbate the growing homelessness crisis.

The cumulative impacts of the housing shortage on individuals' everyday lives add up to a significant economic loss for our region. This is in spite of the fact that every dollar spent on new housing construction, including infill development, generates more than an additional dollar ($1.10) in total economic activity, and each job created through residential construction supports 1.4 additional jobs[6]. These challenges also present an opportunity, however: Increasing the supply of affordable housing would reduce poverty and homelessness, increase residents' economic mobility and educational attainment and improve health outcomes in vulnerable populations. Several studies that have analyzed the economic relationship between affordable housing and surrounding properties have found that affordable housing development has little to no impact on surrounding property values, and in some cases, surrounding property values have increased.

NATURAL LANDS

A range of local conservation plans, habitat conservation agencies and state/federal park designated areas provide protection for a significant amount of natural and farmland in the SCAG region. Many of these protected lands are in remote desert areas far from incorporated areas (**EXHIBIT 2.6**), leaving a substantial amount of land on the urban and suburban fringe susceptible to development. Protected areas tend to not be distributed evenly across habitat types, leaving some habitat types largely unprotected. Many of the high-biodiversity habitats that play a key role in the region's ecosystem are adjacent to urban and suburban communities and do not have protected status. Furthermore, many habitats, both protected and unprotected, are in need of restoration efforts such as non-native species removal, re-introduction of native species, erosion control and re-connecting fragmented areas.

FARM LAND LOST & AT-RISK

Like natural habitat lands, farm and grazing lands are at risk. According to the California Department of Conservation's most recent data, the SCAG region lost 21 percent of its farmland between 1984 (the year the farmland tracking began) and 2016. Major losses were seen in Los Angeles, San Bernardino and Orange counties, which respectively lost 55, 71 and 78 percent of their farmland (**TABLE 2.2**). This decline of agricultural land has implications for the economy and the environment, especially in the context of climate change. While many farming practices contribute to greenhouse gas (GHG) emissions, emissions from farmlands are far less than those from urban environments. Farm and grazing lands can also provide co-benefits such as wildlife habitats, flood control and groundwater recharge. Productive farm and range lands bring billions of dollars into Southern California's economy, creating jobs and providing food security. Converting these lands to urban development weakens this vital industry and the region's position in the U.S. economy.

5 Taylor, Mac. (2015). California's High Housing Costs: Causes and Consequences. California Legislative Analysts' Office. 17 March

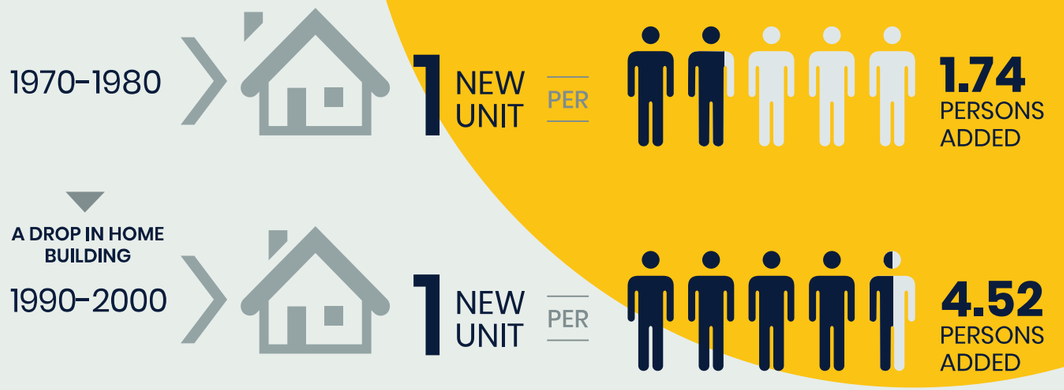
6 Center for Strategic Economic Research. (2014). The Economic Benefits of Housing in California. September.

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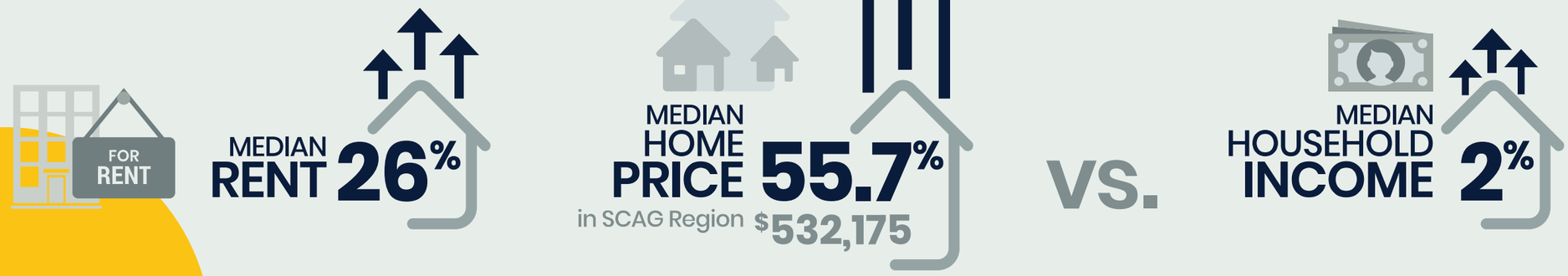
AFFORDABLE HOUSING

California is in the midst of a long-term structural housing shortage and affordability crisis. In 2016, SCAG published the report, *Mission Impossible: Meeting California's Housing Challenge*, to review the causes and consequences of the housing crisis throughout the state and for the SCAG region. It found that the lack of supply of housing is due to the fact that housing construction has not kept up with population growth. There are also many other contributors to the overall housing crisis including barriers caused by land use zoning that prevent new housing development and increasing building and other costs resulting from time delays, environmental litigation, lack of sufficient local funding mechanisms, and community resistance to new housing especially medium and high-density projects.

HOME BUILDING HAS NOT KEPT UP WITH POPULATION GROWTH

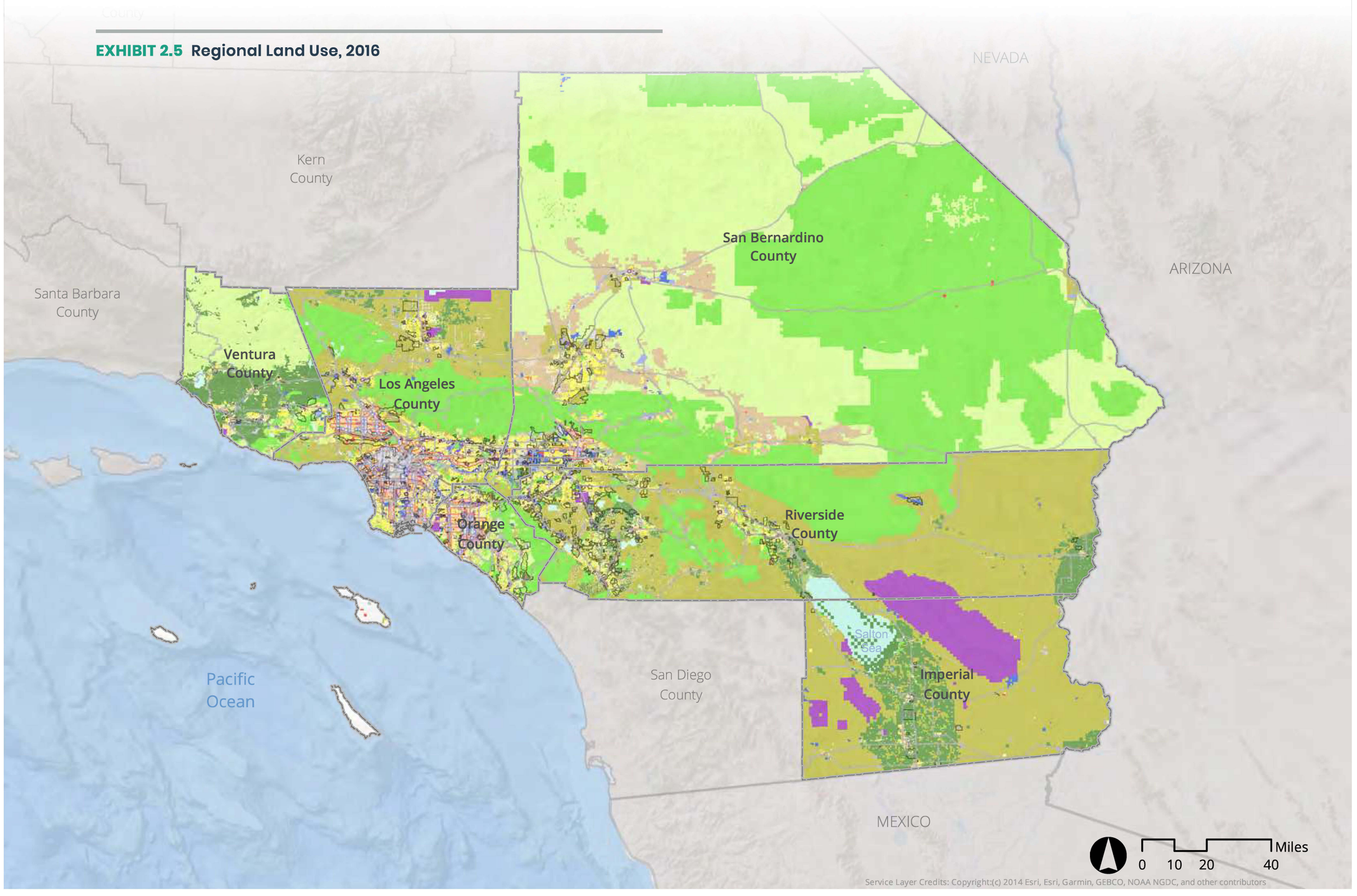


FROM 2000 TO 2017



Source: U.S. Census Bureau; Census 2000 Summary File 1, 2017 American Community Survey 1-Year Estimates, and SCAG's 2016 Mission Impossible? Meeting California's Housing Challenge Report.

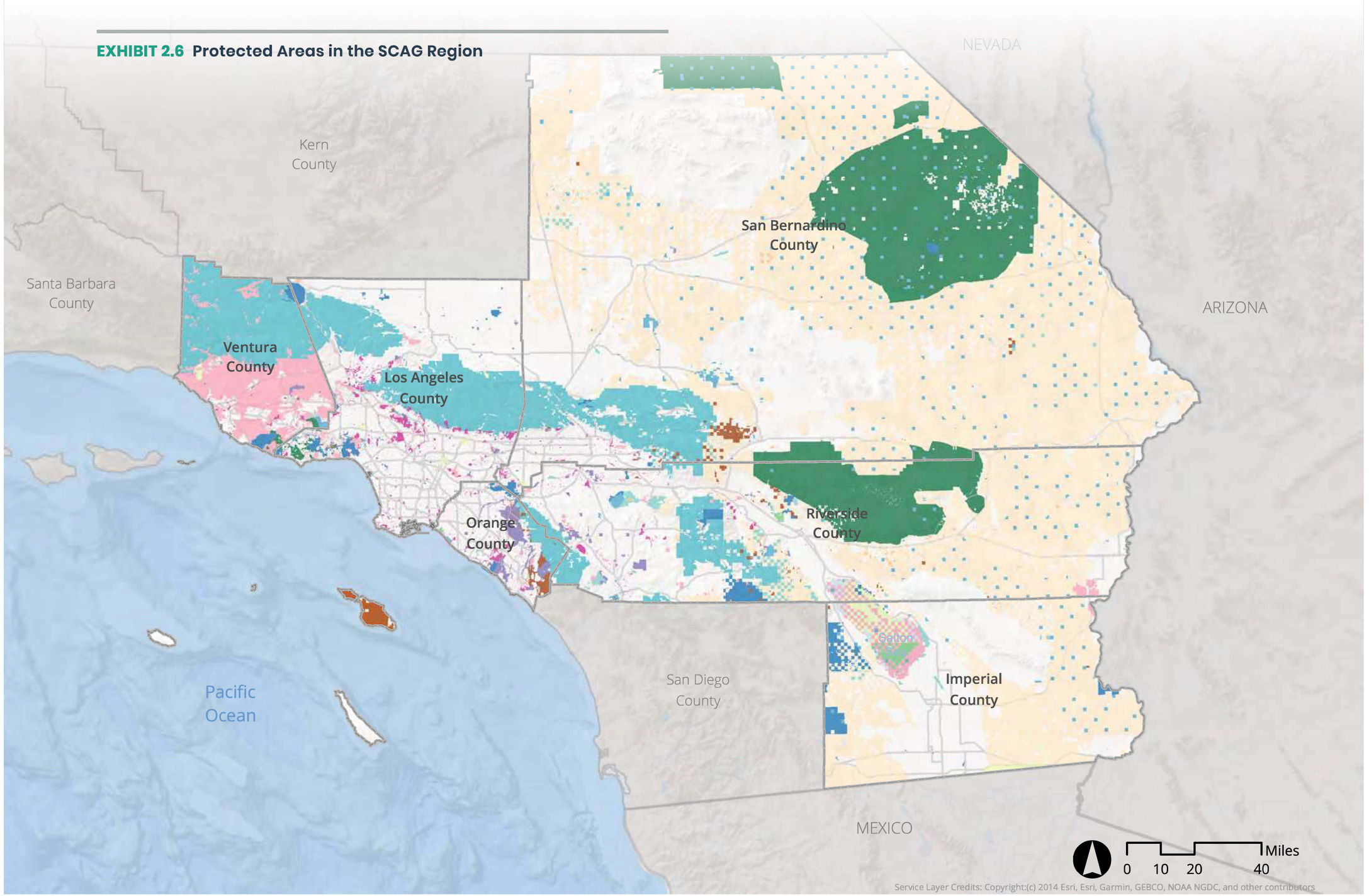
EXHIBIT 2.5 Regional Land Use, 2016



- Specific Plan
- TPA (2016)
- HQTA (2016)
- Single Family Residential
- Multi-Family Residential
- Mobile Homes and Trailer Parks
- Mixed Residential
- Rural Residential
- General Office
- Commercial and Services
- Facilities
- Education
- Military Installations
- Industrial
- Transportation, Communications, and Utilities
- Mixed Commercial and Industrial
- Mixed Residential and Commercial
- Open Space and Recreation
- Agriculture
- Vacant
- Water
- Specific Plan
- Under Construction
- Undevelopable
- Unknown

Source: SCAG, 2019

EXHIBIT 2.6 **Protected Areas in the SCAG Region**



US Forest Service
US Bureau of Land Management
National Park Service
US Fish and Wildlife Service
US Military/Defense
Other Federal
California Department of Parks and Recreation
California Department of Fish and Wildlife
Other State
County
City
Special District
Non Governmental Organization
Private
Conservation Easement

Source: SCAG, California Protected Areas Database, 2017; California Conservation Easement Database, 2016

As population continues to grow, vital habitat and farmlands face severe development pressure. In addition to their respective roles in biodiversity and food production, both natural areas and farmlands help reduce the impacts of climate change by capturing GHGs in the soil, plants, and trees instead of allowing them to concentrate in the atmosphere. Urban, suburban and even rural development on previously undeveloped land results in increased GHG emissions. The conservation of natural area and farmlands on the edges of urban and suburban development is an integral aspect of Connect SoCal as it incentivizes infill development and the concentration of different land uses. This makes it easier to travel shorter distances which reduces GHG emissions. Many counties, cities and conservation groups in Southern California have excelled in their work to protect these vulnerable lands, but few plans or policies have been enacted to preserve habitat and farmlands on a regional scale. With regional population increases, conservation decisions made now can safeguard the endurance of these lands, protecting threatened wildlife and the local agricultural economy, and reducing carbon emissions, while also contributing to a high quality of life for future generations.

TABLE 2.2 Farmland Loss by County in Acres, 1984-2016

County	1984	2016	Percent Change
Imperial	562,132	528,471	-6%
Los Angeles	60,877	27,390	-55%
Orange	26,535	5,715	-78%
Riverside	561,542	419,835	-25%
San Bernardino	69,575	20,293	-71%
Ventura	132,388	118,508	-10%
SCAG Region	**1,413,049**	**1,120,212**	**-21%**

Source: California Department of Conservation Farmland Mapping & Monitoring Program

TRANSPORTATION SAFETY

Traffic-related fatalities and serious injuries are a critical and preventable public health and equity issue in the region. Approximately 1,500 people die, more than 5,200 are severely injured, and 136,000 are injured on roadways throughout the SCAG region every year. Collisions are happening in every community in the region, from El Centro in Imperial County to Malibu in Los Angeles County. They are happening to people from all walks of life, to those who drive and to people who walk and bike. Approximately 90 percent of collisions are occurring in urban areas, with most taking place on local roads, not highways. Regionally, 65 percent of fatalities and serious injuries are occurring on less than 1.5 percent of the roadway network. Of particular concern are vulnerable groups such as children, older adults, and users of personal mobility devices such as e-scooters. These roadway users do not have the protections included in automobiles, and collisions involving them have higher fatality rates. Pedestrian and bicycle-related collisions have been steadily increasing since 2012, underscoring the importance of implementing infrastructure improvements that safely accommodate all modes, or reducing speed limits in some areas to reduce the likelihood or severity of higher speed collisions. Unsafe speed is the primary collision factor in the SCAG region, accounting for about 30 percent of collisions. At 50 miles per hour, a pedestrian has only 25 percent chance of survival if struck. In contrast, at about 25 miles per hour, if struck, a pedestrian has a 90 percent chance of survival.

Traffic-related fatalities and serious injuries have significant impacts on the lives of families, friends and community members. They also have economic and environmental impacts. Traffic collisions impact congestion, leading to emergency management costs and additional GHG emissions from bottlenecking. Increasing safety for pedestrians and bicyclists can make transit and active transportation more desirable, thereby motivating mode shifts and reducing GHG emissions. Policies, infrastructure and mode choice impact the safety of everyone who travels throughout the region. Providing a safe transportation network is essential for meeting SCAG's economic, housing, environmental, equity and public health goals, and will require optimizing the existing system to strategically incorporate complete streets while supporting a range of other safety strategies.

FOCUS

TRANSPORTATION SAFETY

#1

REASON FOR ALL COLLISIONS

UNSAFE SPEED

Fatal and Serious Injury collisions have increased in the region since 2012, underscoring the importance of re-evaluating our street designs and speed limits. Approximately 90 percent of collisions occur in urban areas, with most taking place on local roads, not highways. Unsafe speed is the primary collision factor in the SCAG region. About 30 percent of collisions are due to unsafe speed. At 50 miles per hour, a pedestrian has only 25 percent chance of survival if struck. In contrast, at about 25 miles per hour, if struck, a pedestrian has a 90 percent chance of survival.

65% OF FATALITIES & SERIOUS INJURIES ANNUALLY

OCCUR IN LESS THAN **1.5%** OF THE REGION'S ROADWAY NETWORK

ON ROADWAYS IN THE SCAG REGION

136,000 INJURED ANNUALLY

5,200 SEVERELY INJURED ANNUALLY

1,500 PEOPLE DIE ANNUALLY

Source: Statewide Integrated Traffic Records System (SWITRS), 2016

TRANSPORTATION SECURITY

Catastrophic events like earthquakes, floods, fires, hazardous material incidents, dam failures, civil unrest, transportation accidents, tsunamis and terrorism can occur at any given moment in the SCAG region. The state of California has experienced 323 state proclaimed emergencies and 267 federally proclaimed disasters since the year 1950. While the threat of disasters cannot be eliminated, effective planning can help minimize the impacts from disasters. Disaster incidents in the state were highest between 2000 and 2009 where 59 people died, and 885 people were injured. Despite a tripling of population between 1950 and 2017, the number of deaths resulting from disasters has remained within a relatively narrow range. The two most frequent disasters in the SCAG region are floods (160 incidents since 1950) and fires (138 incidents since 1950).

PUBLIC HEALTH

Across the SCAG region, transportation and land use decisions are shaping neighborhoods, while also influencing the health outcomes of residents. The way a community is designed impacts the likelihood that a person will bike or walk to school, work, or local shops; have access to healthy food or parks; and breathe air that is free of pollutants. Conditions in the places where people are born, live, learn, work and play affect a wide range of health risks and outcomes. These conditions are known as the Social Determinants of Health (SDOH) and they help explain why health outcomes (e.g., rates of asthma or diabetes) vary widely across the region. Depending on where you live in the region, your life expectancy could be as low as 68 years or as high as 93 years. To improve health outcomes and to reduce these inequities, it is critical for public health to be integrated into land use and transportation planning.

Public health outcomes in the 4-year period from 2012 to 2016, the base years of the 2016 RTP/SCS and Connect SoCal, have largely worsened or remained constant across the SCAG region, including asthma (13.8 percent), diabetes (8.9 percent), pre-diabetes (13.7 percent), high blood pressure (27.9 percent), heart disease (5.8 percent) and obesity (29.6 percent). The main chronic diseases accounting for deaths in the region are coronary heart disease, cerebrovascular disease (stroke), chronic lower respiratory disease and diabetes. Chronic diseases carry significant direct treatment-related costs and indirect costs. Healthcare expenditures continue to be a large burden on the regional economy, with $18.8 billion spent annually at the base year on just three chronic diseases: type 2 diabetes, high blood pressure, and heart disease. Reducing the prevalence of chronic disease through strategic transportation investments and land use strategies would benefit the region's health and the economy.

The aging of the region's population will also pose new public health challenges. Most senior citizens prefer to age in place rather than move into a smaller dwelling unit or group housing. With an aging population comes greater risks of health complications, and an increased need to plan for walkable and compact urban environments to support older adults choosing to age in place. Through the implementation of Connect SoCal, public health outcomes through transportation investments and land use strategies are expected to improve across each of SCAG's public health focus areas.

SYSTEM PRESERVATION & RESILIENCE

Maintaining the operational efficiency of our transportation system is crucial. Unfortunately, demand on the system has increased over the decades without significant maintenance reinvestment. This has greatly influenced the number of roadways and bridges that have fallen into an unacceptable state of disrepair. Indeed, many residents have expressed concern. One particular resident commented that "Southern California's roads are in horrible condition. There's no infrastructure to support planned development." Part of the challenge is to ensure that life cycle costs such as maintenance and preservation expenses, are considered and planned in the development of infrastructure projects. Until the passage of Senate Bill 1 (SB1) (2017), funding for preservation and improvement of our system was on a dramatic decline. SB 1 provides a much needed funding supplement for system preservation, but we must continue to weigh our options carefully in allocating and investing resources to maximize the productivity of our transportation system. **FIGURE 2.5** displays the conditions of distressed lane miles on the State Highway System. **FIGURE 2.6** reflects bridge conditions in the SCAG region.

ACCESS & MOBILITY

Reaching destinations in a timely manner is a top concern of Southern California residents. In 2016, average trip length to work was over 19 miles and

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PUBLIC HEALTH

Conditions in the places where people are born, live, learn, work, and play affect a wide range of health risks and outcomes. If a person lives in housing adjacent to a freeway or high traffic road, they may be more likely to develop asthma. If a person lives in a community with an abundance of bikeways, they may be more inclined to bike to work or school. These types of community conditions are known as the Social Determinants of Health (SDOH) and they help explain why health outcomes (e.g., rates of asthma or diabetes, lifespans, etc.) vary widely across the region. Social Determinants of Health are often the result of past transportation and land use planning and policy decisions, and they, along with economic opportunities, play a role in shaping these circumstances and influencing health outcomes.

Since the last plan was adopted, overall public health trends have continued to worsen or stay the same. SCAG analyzes health outcomes affected by the SDOH which include: accessibility to essential services; air quality; affordable housing; climate change; economic opportunity; safety; and physical activity.

$16.7 BILLION

ANNUAL COST OF TREATING CHRONIC DISEASES:

Heart disease,
high blood pressure
and diabetes.

CHRONIC DISEASES & INJURIES MAKE UP OVER 69% OF ALL CAUSES OF DEATH IN THE REGION:

14% (**+2%** increase since **2012**)
ASTHMA

13% (**+4%** increase since **2012**)
PRE-DIABETES

9% (existing rate **2016**)
DIABETES

29% (**+10%** increase since **2001**)
OBESITY

28% (**2016**)
HIGH BLOOD PRESSURE

6% (**2016**)
HEART DISEASE

Source: California Health Interview Survey (CHIS), 2012, 2016,
California Public Health Assessment Model (C-PHAM) for the $16.7 billion figure

14 miles by auto and transit respectively. Yet it took over twice as long by transit (69 min) to make the same trip compared to auto (31 min).

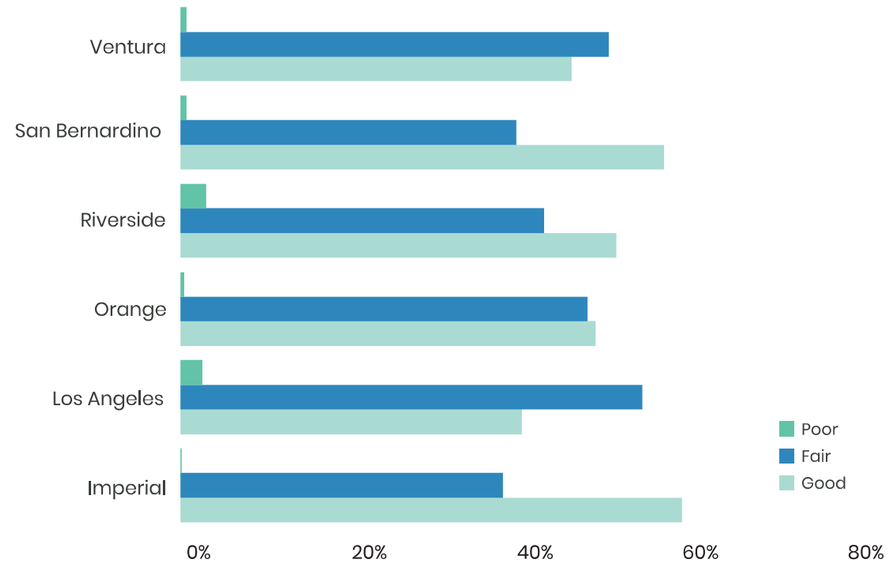
Examining Southern California's transportation system, it is clear that there are many causes of congestion and challenges for improving accessibility. Paramount among them is a dependence on personal vehicles in our region, which often shapes our built environment to be more suited to cars than people – reducing the attractiveness and viability of transit as an alternative means of getting around. Residents see a lack of transit options as a significant challenge and many express a desire, as one survey respondent put it, for more "...reliable transit outside of the Los Angeles downtown core."

An imbalance between jobs and housing in many areas presents challenges to access and mobility in Southern California due to the geography and urban sprawl of our region. Many residents continue to move farther and farther inland to reach lower priced housing. Additional factors impacting congestion on roadways and transit accessibility are natural impediments such as mountains and waterways and other challenges.

Another cause of congestion is gaps in the road network and bottlenecks where capacity is reduced at pinch points. SCAG identified the top 100 bottleneck locations in 2016 by annual hours of vehicle delay. Most bottlenecks are active in the morning and/or afternoon peak periods, and all are active at midday. The most active time for bottlenecks is the afternoon peak period. The top three ranked bottlenecks in the SCAG region are all located on the I-405. The top ranked bottleneck, where National Blvd. meets the Santa Monica Freeway (I-10) in Los Angeles, results in over 1.7 million annual hours of vehicle delay. Most bottlenecks are located in Los Angeles County, with 19 in Orange County, three in Riverside County and two in San Bernardino County. More discussion on bottlenecks is included in the Congestion Management Technical Report.

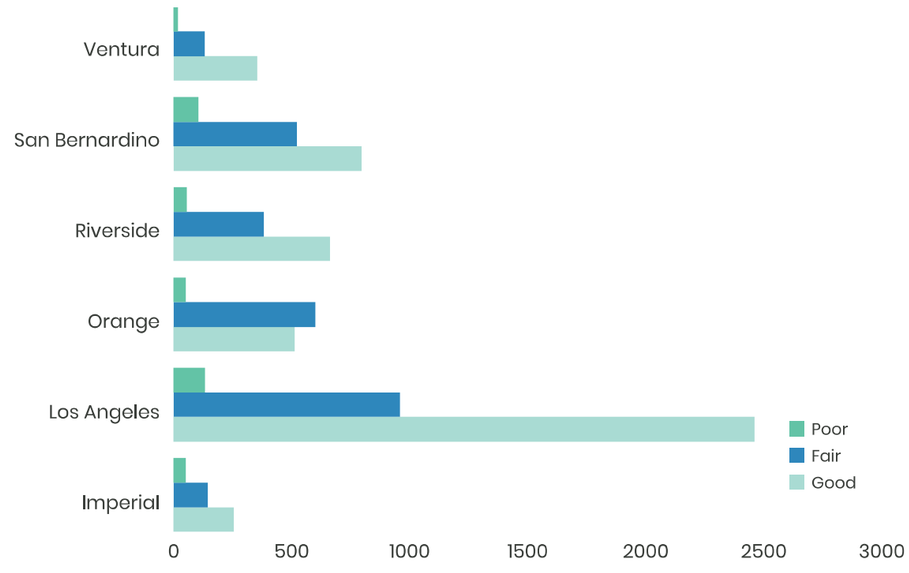
Access to opportunities such as jobs, schools and healthcare is critical to the well-being of all segments of our society. Equitable access to such opportunities still remain a challenges. Minority and low-income populations tend to live in areas that have relatively fewer opportunities and services. At the same time, they tend to be more dependent on public transportation, and/or walking or bicycling due to lower rates of auto ownership, which results in limiting their

FIGURE 2.5 Pavement Condition of State Highway System



Source: Caltrans Automated Pavement Condition Survey 2015-2016

FIGURE 2.6 Bridge Conditions in the SCAG Region, 2015



Source: FHWA Bridge Inventory

access to opportunities, thus putting them at a disadvantage relative to the general population.

FUNDING THE TRANSPORTATION SYSTEM

The cost of a multimodal transportation system that will serve the region's projected growth in population, employment, and demand for travel surpasses the projected revenues expected from existing sources including the gas tax, our historic source of transportation funding. The purchasing power of our gas tax revenues is decreasing and will continue a downward trajectory while transportation costs escalate, fuel efficiency improves, and the number of alternative-fuel vehicles continues to grow.

Despite the recent increase in state revenue through a state gas tax increase and other transportation fees with the passage of SB 1, state sources comprise a small share of total transportation revenues. Additionally, federal sources continue to dwindle as federal fuel tax rates have not been adjusted since 1993. To backfill limited state and federal gas tax revenues, our region has continued to rely on local revenues to meet transportation needs. In fact, 60 percent of the region's core revenues are from local sources. Eight sales tax measures have been adopted throughout the region since the 1980s; the burden of raising tax dollars has shifted significantly to local agencies.

Simultaneously, we need to explore innovative local programs that help meet the challenge of financing and maintaining the transportation system while reflecting the unique needs of the region. Efforts are underway to explore how we can transition from our current system based on fuel taxes to a more direct system based on user fees. In addition to generating revenues, user fees are among the most impactful VMT and GHG reduction strategies for the transportation sector. Yet perceptions about the fairness of user fees often raise public acceptability concerns. A sensible system of user fees can be designed with policies that address equity concerns.

PLANNING FOR DISRUPTION

Emerging technology has the potential to expand transportation choices and equity throughout the region. By providing more options for local and regional trips, emerging technologies may shift trips to less environmentally damaging modes, minimize negative environmental impacts associated with current vehicle use, increase system efficiency, improve safety, and reduce auto-related collisions and fatalities. However, realizing the potential benefits (and potential negative impacts) is dependent on the rate of technology development and adoption of a wide range of public and private sector innovations. Emerging transportation technologies pose numerous challenges and opportunities for the SCAG region, including:

- An uncertain pace of development and deployment
- Challenges obtaining data from the private sector
- The impact of Transportation Network Companies (TNCs) on transit and active transportation usage
- A lack of permanence in public/private service agreements
- High likelihood of new technology actually increasing VMT
- Finding a balance between regulation and innovation
- Avoiding inequities in accessing new transportation technologies

Emerging technologies vary widely when it comes to their effect on VMT, and therefore GHG emissions. Some of these technologies, such as alternative fuel vehicles, micro-mobility, bikesharing and microtransit, have a mitigating influence on GHG emissions. Others, such as ride-hailing and automated vehicles, will increase VMT and GHG emissions if their business models do not adapt[7] to eliminate or reduce single-passenger rides and "deadheading," where drivers drive with zero passengers. Therefore, it is vitally important to adopt strategies and policies that ensure pooled or shared rides.

MEETING FEDERAL AIR QUALITY STANDARDS

Although air quality has improved significantly over the past decades, the SCAG region still experiences among the worst air quality in the country. Almost the entire SCAG region fails to meet the health-based federal air quality standards for one or more transportation-related air pollutants. In addition to public health impacts from unhealthy air quality, the challenge of meeting health-based federal air quality standards has serious implications for the RTP/SCS, the Federal Transportation Improvement Program (FTIP) and transportation projects in the SCAG region.

7 San Francisco County Transportation Authority, TNCs and Congestion Final Report, October 2018.

A particularly pressing challenge is for the South Coast Region to meet the 2023 statutory deadline of attaining the 1997 ozone standard. Pursuant to the federal Clean Air Act (CAA), a Contingency Measure Plan was recently developed jointly by the South Coast Air Quality Management District (SCAQMD) and the California Air Resources Board (ARB) and subsequently submitted to the U.S. Environmental Protection Agency (EPA). The Contingency Measure Plan highlights the critical need for federal regulatory actions and/or funding to address emission sources under federal jurisdiction including aircraft, ships, trains and out-of-state trucks in order to meet the air quality standard. This is in addition to regulatory actions, programs and incentive funding SCAQMD and ARB have developed to achieve emission reductions.

If the U.S. EPA disapproves the air plan, a federal sanctions clock will be triggered which will lead to federal highway sanctions if the underlying deficiency cannot be resolved within 24 months. Highway sanctions restrict federal funding to transportation projects that expand highway capacity, nonexempt project development activities and any other projects that do not explicitly meet exemption criteria. If imposed, highway sanctions have the potential to impact billions of dollars of federal funding and tens of billions of dollars of important transportation projects in the SCAG region.

Transportation, especially the goods movement sectors, contributes to the overwhelming majority of air pollutant emissions causing ozone pollution. A comprehensive and coordinated regional solution including aggressive regulations, advancements in clean technologies, innovative solutions, and integrated land use and transportation planning from all levels of governments and all stakeholders will be required to achieve the needed emission reductions from the goods movement sectors.

Finally, the emission of air pollutants come from a wide range of sources and may be transported upwind. Therefore, a mitigation strategy should be in place to assist impacted communities, even if the emissions are not being locally produced.

MOVING TOWARDS SOLUTIONS

As this region continues to grow in age and population, and in an environment already experiencing significant challenges, it is crucial that land use and transportation strategies are integrated to achieve regional goals. Connect SoCal identifies a number of land use and transportation strategies that will provide residents more choices in how they can reach their destinations reliably and reduce congestion on roadways in our region through 2045 and beyond.

In the following chapter, Connect SoCal showcases an array of investments across all transportation modes and incorporates a range of best practices for increasing transportation choices, reducing dependence on personal automobiles, encouraging growth in walkable/mixed-use communities with ready access to transit infrastructure and employment opportunities, and improving air quality. More and varied housing types and employment opportunities are envisioned within and near job centers, transit stations, and walkable neighborhoods where goods and services are easily accessible via shorter trips.

Strategies in Connect SoCal also recognize the transformative potential of emerging technologies and mobility innovations to provide increased mobility, reduce harmful emissions, generate new revenue streams for regional reinvestment, and opportunities to affect land use to improve quality of life. While no one technology or innovation is likely to solve our regional challenges alone, the combination of and judicious application of their benefits for the region can positively change the way we live, work and travel in Southern California.

CHAPTER 3

CHAPTER 3

A PATH TO GREATER ACCESS, MOBILITY & SUSTAINABILITY

CORE VISION

Rooted in the 2008 and 2012 RTP/SCS plans, Connect SoCal's "Core Vision" centers on maintaining and better managing the transportation network we have for moving people and goods, while expanding mobility choices by locating housing, jobs and transit closer together and increasing investment in transit and complete streets. Examples of SCAG's Core Vision are embedded throughout this chapter in blue highlight boxes, and include progress made since the 2016 RTP/SCS. These highlights are presented alongside the narrative, which provides a more comprehensive overview of strategies planned to advance the region's core vision for mobility and sustainability. The Core Vision includes:

- SUSTAINABLE DEVELOPMENT
- SYSTEM PRESERVATION & RESILIENCE
- DEMAND & SYSTEM MANAGEMENT
- TRANSIT BACKBONE
- COMPLETE STREETS
- GOODS MOVEMENT

There is no one-size-fits-all solution for regional challenges. Instead, we must explore an integrated web of creative strategies to achieve the goals of Connect SoCal. In this chapter we will lay out clear policy guidance, action-oriented strategies and pragmatic tools that can be utilized to achieve a coordinated and balanced regional transportation system. This chapter also describes strategies to integrate the region's Forecasted Development Pattern with the transportation network to demonstrate reductions in greenhouse gas (GHG) emissions.

OUR VISION FOR A CONNECTED REGION

As the region's population increases, ages and diversifies, it is crucial that land use decisions and transportation investments made at the federal, state, regional and local levels are coordinated to be able to achieve Connect SoCal's regional goals. Developing compact centers with a robust mix of land uses, a range of building types and connected public spaces can strengthen the fabric of communities. Targeting rideshare and transportation demand management strategies near employment centers can reduce travel costs and improve air quality. Thoughtfully locating freight delivery facilities and logistics centers can reduce truck travel and the impact of goods movement on communities. While coordinating land-use and transportation strategies makes sense and can yield beneficial outcomes, implementation is difficult in a region where authority is divided among myriad agencies. This plan is not designed to dictate or supersede local actions and policies, but rather to lay out a path to achieving regional goals set by the Regional Council.

Our vision for the region incorporates a range of best practices for increasing transportation choices, reducing dependence on personal automobiles, further improving air quality and encouraging growth in walkable, mixed-use communities with ready access to transit infrastructure and employment. More and varied housing types and employment opportunities would be located in and near job centers, transit stations and walkable neighborhoods where goods and services are easily accessible via shorter trips. To support shorter trips, people would have the choice of using neighborhood bike networks, car share or micro-mobility services like shared bicycles or scooters. For longer commutes, people would have expanded regional transit services and more employer incentives to carpool or vanpool. Other longer trips

would be supported by on-demand services such as microtransit, carshare and citywide partnerships with ride hailing services. For those that choose to drive, hotspots of congestion would be less difficult to navigate due to cordon pricing, and using an electric vehicle will be easier thanks to an expanded regional charging network.

There are certainly inherent constraints to expansive regional growth, and areas that are susceptible to natural hazards and a changing climate must be recognized. Connect SoCal therefore emphasizes options that conserve important farmland, resource areas and habitat corridors, and de-prioritizes growth on lands that are vulnerable to wildfire, flooding and near term sea-level rise.

OUR APPROACH

Connect SoCal addresses regional challenges in several ways. A key, formative step is to develop a Regional Growth Forecast in collaboration with local jurisdictions, which helps SCAG identify opportunities and barriers to development. The plan forecasts the number of people, households and jobs (at the jurisdictional level) expected throughout SCAG's 191 cities and in unincorporated areas by 2045. This forecast helps the region understand in a very general sense where we expect growth and allows us to focus attention on areas experiencing change and increases in transportation needs. For additional details on growth forecast methodology, refer to the Demographics and Growth Forecast Technical Report.

The Regional Growth Forecast is then complemented by a set of strategies to guide integrated land use development decisions and transportation investments to achieve regional goals, called the Connect SoCal Growth Vision. The resulting Forecasted Development Pattern includes strategies to prioritize areas for new development, like near destinations and mobility options, and places enhanced conservation value on resource areas, key farm lands and areas vulnerable to natural hazards. However, Connect SoCal does not dictate or supersede local policies, actions or strategies – applying the Forecasted Development Pattern at the local level is the authority and responsibility of towns, cities and counties. The regional Forecasted Development Pattern identifies areas sufficient to house the region's population, including all economic segments of the population, through 2045. It takes into account

KEY CONNECTIONS

In this chapter, we also describe Connect SoCal's "Key Connections" in yellow highlight boxes. Key Connections augment the Core Vision of the plan to address trends and emerging challenges while "closing the gap" between what can be accomplished through intensification of core planning strategies alone, and what must be done to meet increasingly aggressive greenhouse gas reduction goals. These Key Connections lie at the intersection of land use, transportation and innovation, aiming to coalesce policy discussions and advance promising strategies for leveraging new technologies and partnerships to accelerate progress on regional planning goals. The Key Connections include:

- SMART CITIES & JOB CENTERS
- HOUSING SUPPORTIVE INFRASTRUCTURE
- GO ZONES
- ACCELERATED ELECTRIFICATION
- SHARED MOBILITY & MOBILITY AS A SERVICE



CORE VISION
SUSTAINABLE DEVELOPMENT

Through our continuing efforts to better align transportation investments and land use decisions, we strive to improve mobility and reduce greenhouse gases by bringing housing, jobs and transit closer together.

PROGRESS SINCE 2016

From 2008 to 2016, 71 percent of the region's household growth and 75 percent of the region's job growth occurred in Connect SoCal's priority growth areas. During this same period, only 11 percent of the region's household growth and 5 percent of the job growth occurred on constrained areas like prime farmland, and in areas vulnerable to rising seas.

PLANNING FOR 2045

From 2016 to 2045, 64 percent of new households and 74 percent of new jobs will occur in priority growth areas. During this same period, roughly 10 percent of new households and 9 percent of new jobs will occur in constrained areas.

SCAG's Sustainable Communities Program supports planning in local jurisdictions to advance the regional Growth Vision. In addition, new regional data tools, like the Regional Data Platform, will help local jurisdictions identify areas well suited for infill and redevelopment as well as natural and farm lands to be preserved. Studies and partnerships will also be pursued to establish a Regional Advanced Mitigation Program (RAMP), a strategic habitat and agricultural land conservation-planning program that identifies mitigation solutions for infrastructure projects early in the planning process.

net migration into the region, population growth, household formation and employment growth. Moreover, Connect SoCal identifies areas within the region sufficient to house near-term and long-term growth and support a diverse economy and workforce. For additional details on the Growth Vision and Forecasted Development Pattern, see the Sustainable Communities Strategy Technical Report.

Key investments are coupled with our Forecasted Development Pattern to optimize the regional transportation system and accommodate the increased service and infrastructure demands posed by land-use changes. Connect SoCal's transportation investments are financially constrained to reflect core and reasonably available revenues and are progressively integrated with projected land use patterns and coordinated across transportation modes to advance plan goals.

By integrating the Forecasted Development Pattern with a suite of financially constrained transportation investments, Connect SoCal can reach the regional target of reducing greenhouse gases, or GHGs, from autos and light-duty trucks by 8 percent per capita by 2020, and 19 percent by 2035 (compared to 2005 levels). Moreover, this integration can yield tangible outcomes that make our everyday travel needs easier when compared to a future without the plan — for example, the combined work trips made by carpooling, active transportation, and public transit increases by 3 percent and travel delay reduces by 26 percent per capita.

SUSTAINABLE COMMUNITIES STRATEGY

As part of the state's mandate to reduce per-capita GHG emissions from automobiles and light trucks, Connect SoCal presents strategies and tools that are consistent with local jurisdictions' land use policies and incorporate best practices for achieving the state-mandated reductions in GHG emissions at the regional level through reduced per-capita vehicle miles traveled (VMT).

These strategies identify how the SCAG region can implement Connect SoCal and achieve related GHG reductions. It is important to note that SCAG does not have a direct role in implementing the Sustainable Communities Strategy

—neither through decisions about what type of development goes where, nor what transportation projects are ultimately built. However, SCAG works to support local jurisdictions and partnerships by identifying ways to implement the Sustainable Communities Strategy (SCS) in a way that fits the vision and needs of each local community. Additionally, SCAG serves as a leader as well as a hub to convene stakeholders and to find ways to collaborate on broader regional initiatives. See the Sustainable Communities Strategy Technical Report for more details on GHG reduction and implementation of the SCS.

The following strategies are intended to be supportive of implementing the regional Sustainable Communities Strategy. Several are directly tied to supporting related GHG reductions while others support the broader goals of Connect SoCal:

Focus Growth Near Destinations & Mobility Options

- Emphasize land use patterns that facilitate multimodal access to work, educational and other destinations
- Focus on a regional jobs/housing balance to reduce commute times and distances and expand job opportunities near transit and along center-focused main streets
- Plan for growth near transit investments and support implementation of first/last mile strategies
- Promote the redevelopment of underperforming retail developments and other outmoded nonresidential uses
- Prioritize infill and redevelopment of underutilized land to accommodate new growth, increase amenities and connectivity in existing neighborhoods
- Encourage design and transportation options that reduce the reliance on and number of solo car trips (this could include mixed uses or locating and orienting close to existing destinations)
- Identify ways to "right size" parking requirements and promote alternative parking strategies (e.g. shared parking or smart parking)

Promote Diverse Housing Choices

- Preserve and rehabilitate affordable housing and prevent displacement
- Identify funding opportunities for new workforce and affordable housing development
- Create incentives and reduce regulatory barriers for building context-sensitive accessory dwelling units to increase housing supply
- Provide support to local jurisdictions to streamline and lessen barriers to housing development that supports reduction of greenhouse gas emissions

Leverage Technology Innovations

- Promote low emission technologies such as neighborhood electric vehicles, shared rides hailing, car sharing, bike sharing and scooters by providing supportive and safe infrastructure such as dedicated lanes, charging and parking/drop-off space
- Improve access to services through technology—such as telework and telemedicine as well as other incentives such as a "mobility wallet," an app-based system for storing transit and other multi-modal payments
- Identify ways to incorporate "micro-power grids" in communities, for example solar energy, hydrogen fuel cell power storage and power generation

Support Implementation of Sustainability Policies

- Pursue funding opportunities to support local sustainable development implementation projects that reduce greenhouse gas emissions
- Support statewide legislation that reduces barriers to new construction and that incentivizes development near transit corridors and stations
- Support local jurisdictions in the establishment of Enhanced Infrastructure Financing Districts (EIFDs), Community Revitalization and Investment Authorities (CRIAs), or other tax increment or value capture tools to finance sustainable infrastructure and development projects, including parks and open space
- Work with local jurisdictions/communities to identify opportunities and assess barriers to implement sustainability strategies
- Enhance partnerships with other planning organizations to promote resources and best practices in the SCAG region
- Continue to support long range planning efforts by local jurisdictions
- Provide educational opportunities to local decisions makers and staff on new tools, best practices and policies related to implementing the Sustainable Communities Strategy

Promote a Green Region

- Support development of local climate adaptation and hazard mitigation plans, as well as project implementation that improves community resiliency to climate change and natural hazards
- Support local policies for renewable energy production, reduction of urban heat islands and carbon sequestration
- Integrate local food production into the regional landscape
- Promote more resource efficient development focused on conservation, recycling and reclamation
- Preserve, enhance and restore regional wildlife connectivity
- Reduce consumption of resource areas, including agricultural land
- Identify ways to improve access to public park space

LAND USE TOOLS

CENTER FOCUSED PLACEMAKING

Creating dynamic, connected built environments that support multimodal mobility, reduced reliance on single-occupancy vehicles, and reduced GHG emissions is critical throughout the region. Center focused placemaking is an approach that supports attractive and functional places for Southern California residents to live, work and play, in urban, suburban and rural settings. Although center focused placemaking can be applied in a wide range of settings, priority must be placed, however, on urban and suburban infill, in existing/planned service areas and, for unincorporated county growth, within the planning boundary known as "Spheres of Influence" (SOI) where applicable and feasible.

Successful centers are typically human-scale, compact and pedestrian-oriented with a variety of housing types and ranges of affordability. For example, transit-oriented development (TOD) in Transit Priority Areas (TPAs) and high quality transit areas (HQTAs) within centers and nodes along corridors can play a pivotal role in supporting compact development that is less reliant on single-occupancy vehicles. Elements of center-focused placemaking can be implemented when transit service is neither existing nor planned. Center-focused placemaking includes smart locations and linkages, neighborhood patterns and design and green infrastructure and buildings. Some key elements are specified the Sustainable Communities Strategy Technical Report.

PRIORITY GROWTH AREAS

Priority Growth Areas (PGAs) follow the principles of center focused placemaking and are locations where many Connect SoCal strategies can be fully realized. Connect SoCal's PGAs—Job Centers, TPAs, HQTAs, Neighborhood Mobility Areas (NMAs), Livable Corridors and Spheres of Influence (SOIs)—account for only 4 percent of region's total land area, but implementation of SCAG's recommended growth strategies will help these areas accommodate 64 percent of forecasted household growth and 74 percent of forecasted employment growth between 2016 and 2045. This more compact form of regional development, if fully realized, can reduce travel distances, increase mobility options, improve access to workplaces, and conserve the region's resource areas.

Jurisdictions should continue to be sensitive to the possibility of gentrification and employ strategies to mitigate negative community impacts – particularly in PGAs. Although the region will see benefits from infill development, communities are encouraged to actively acknowledge and plan for potential impacts including displacement. Production and preservation of permanent affordable housing to complement infill strategies is essential to achieving equitable outcomes.

Exhibits for priority growth areas and growth constraints, spheres of influence, job centers, transit priority areas, high quality transit areas, and neighborhood mobility areas can be found at the end of this chapter (**EXHIBIT 3.4-3.10**). Following is a description of Connect SoCal's PGAs and their associated strategies.

JOB CENTERS

Job Centers are where regional strategies that support economic prosperity can be deployed in catalytic ways. Job Centers have been identified in all six counties in the SCAG region and represent areas that have a significantly higher employment density than surrounding areas. Employment growth and residential growth are prioritized in existing Job Centers in order to leverage existing density and infrastructure. However, it is recognized that capacity

for infrastructure or services may need to be evaluated before residential or employment population is increased in a given area. By encouraging regional growth and employing transportation strategies in the 70+ Job Centers throughout the region, Connect SoCal seeks to reinforce regional economic prosperity. SCAG's methodology to identify Job Centers is not all-inclusive and additional potential centers can be identified.

Job Centers represent areas with local employment peaks rather than simply places with the most jobs. Identified Job Centers are present in over 60 percent of the region's cities and contain about one-third of Southern California's jobs – but only cover less than 1 percent of the region's land area. These Job Centers range in size from over 250,000 jobs in the region's most urbanized areas, to roughly 1,500 jobs in rural areas – all with employment densities far higher than neighboring areas. When growth is concentrated in Job Centers, the length of vehicle trips for residents can be reduced.

TRANSIT PRIORITY AREAS

Transit Priority Areas (TPAs) are Priority Growth Areas that are within one half mile of existing or planned 'major' transit stops in the region. A 'major' transit stop is defined as a site containing an existing or planned rail or bus rapid transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods. TPAs are where TOD can be realized – where people can live, work and play in higher density, compact communities with ready access to a multitude of safe and convenient transportation alternatives.

Focusing regional growth in areas with planned or existing transit stops is key to achieving equity, economic, and environmental goals. Infill within TPAs can reinforce the assets of existing communities, efficiently leveraging existing infrastructure and potentially lessening impacts on natural and working lands. Growth within TPAs supports Connect SoCal's strategies for preserving natural lands and farmlands and alleviates development pressure in sensitive resource areas by promoting compact, focused infill development in established communities with access to high-quality transportation. Although TPAs comprise less than 1 percent of Southern California's land area, around 30 percent of new households are projected to occur within these transit rich areas.

HIGH QUALITY TRANSIT AREAS

High Quality Transit Areas (HQTAs) are corridor-focused Priority Growth Areas within one half mile of an existing or planned fixed guideway transit stop or a bus transit corridor where buses pick up passengers at a frequency of every 15 minutes (or less) during peak commuting hours. Freeway transit corridors with no bus stops on the freeway alignment do not have a directly associated HQTA. Like Transit Priority Areas, HQTAs are places where vibrant TOD can be realized and are a cornerstone of land use planning best practice in the SCAG region.

HQTAs represent under 3 percent of the region's acreage but are projected to be home to over 51 percent of new households between 2016 and 2045. Infrastructure investments that support walkable, compact communities that integrate land use and transportation planning for a better functioning built environment are essential within HQTAs. Active transportation and new developments should be context-sensitive, responding to the existing physical conditions of the surrounding area. Sensitively designed TODs can preserve existing development patterns and neighborhood character while providing a balance of modal and housing choices.

NEIGHBORHOOD MOBILITY AREAS

Neighborhood mobility area (NMAs) focus on creating, improving, restoring and enhancing safe and convenient connections to schools, shopping, services, places of worship, parks, greenways and other destinations. NMAs are Priority Growth Areas with robust residential to non-residential land use connections, high roadway intersection densities and low-to-moderate traffic speeds. NMAs can encourage safer, multimodal, short trips in existing and planned neighborhoods and reduce reliance on single occupancy vehicles. NMAs support the principles of center focused placemaking. Fundamental to neighborhood scale mobility in urban, suburban and rural settings is encouraging "walkability," active transportation and short, shared vehicular trips on a connected network through increased density, mixed land uses, neighborhood design, enhanced destination accessibility and reduced distance to transit.

From 2016 to 2045, nearly 29 percent of new households are projected to be located in NMAs. Although 38 percent of all trips made in the SCAG region are three miles or less, more than 78 percent of these short trips are made

by driving. Improving public health and reducing per-capita VMT, and GHG reductions relies on our region's ability to support safe and convenient short trips at the neighborhood scale—by foot, bicycle, micro-mobility devices and slow speed electric vehicles such as e-bikes, scooters, and neighborhood electric vehicles. Adopting and implementing Complete Streets policies supports safer neighborhood mobility and connected, economically dynamic communities. Targeting future growth in these areas has inherent benefits to Southern California residents – providing access to "walkable" and destination-rich neighborhoods to more people in the future.

LIVABLE CORRIDORS

The Livable Corridor strategy encourages local jurisdictions to plan and zone for increased density at nodes along key corridors, and to "redevelop" single-story under-performing retail with well-designed, higher density housing and employment centers. Growth at strategic nodes along key corridors, many of which are within HQTAs, will make transit a more convenient and viable option. The Livable Corridors strategy is comprised of three components that will encourage context sensitive density, improve retail performance, combat disinvestment, and improve fiscal outcomes for local communities:

- **Transit improvements:** Some corridors have been identified as candidates for on-street, dedicated lane Bus Rapid Transit (BRT) or semi-dedicated "BRT-lite" transit. Other corridors have the potential to support features that improve the user experience and bus performance, including enhanced bus shelters, real-time travel information, off-bus ticketing, all-door boarding and longer distances between stops to increase speeds.
- **Active transportation improvements:** Increased investments in Complete Streets within Livable Corridors and intersecting arterials are essential to support safe bicycling and walking. Investments should include protected lanes to encourage safe bicycling and lower speed mobility, improved pedestrian access and bicycle and micro-mobility parking.
- **Land use policies:** Mixed-use retail centers at key nodes along Livable Corridors are essential, as is increasing neighborhood-oriented retail at intersections, and flexible zoning that allows for the replacement of under-performing auto-oriented retail.

SPHERES OF INFLUENCE

Local Agency Formation Commissions, or LAFCos, are given the authority to determine SOIs for all local governmental agencies, and each county in the SCAG region has an associated LAFCo. An SOI is a planning boundary outside of a local agency's legal boundary (such as the city limit line) that designates the agency's probable future boundary and service area. The intent of an SOI is to promote the efficient, effective and equitable delivery of local and regional services for existing and future residents and to encourage a collaborative process between agencies. A city will periodically annex parcels in an SOI into the city limits to include new developments or areas with infrastructure needs. Some factors considered in an SOI designation focus on current and future land uses and the need and capacity for services.

Decisions made by LAFCos in the SCAG region can support the implementation of Connect SoCal goals related to infill development, GHG emissions reductions, and climate change resilience. Connect SoCal encourages future unincorporated county growth be prioritized within existing SOIs to discourage urban sprawl and the premature conversion of agricultural and natural lands, support alignment of policies across jurisdictions, and rehabilitate and utilize existing infrastructure. This strategy promotes growth in an efficient manner that limits sprawl and "leapfrog" development and minimizes costs to taxpayers. As a result, 4 percent of the region's future household growth will be located in SOIs outside of incorporated city boundaries from 2016 to 2045.

GREEN REGION

A sustainable, "green" region requires that the built environment and natural resource areas coexist in a well-balanced land use pattern that encourages mutual co-benefits. The quality and range of conservation, natural and agricultural areas present in the region can be reinforced and enhanced by a range of regional and local tools.

Paired with PGAs, Connect SoCal's conservation strategies consider the economic and ecological benefits of preserving natural areas and farmlands, while also maximizing their potential for GHG reduction. New housing and employment development is emphasized in PGAs such as Job Centers, TPAs, HQTAs and NMAs, and away from natural and farm lands on the edges of urban and suburban areas, to incentivize infill development and the concentration

of varied land uses. This emphasis on concentrated, compact growth makes it easier to travel shorter distances, which reduces per-capita greenhouse gas emissions. In addition, natural areas and farmlands have the capacity to absorb and store atmospheric carbon dioxide, preventing additional contributions of GHG emissions. Finally, natural lands conservation is imperative to protect communities from major hazards caused or exacerbated by climate change, such as wildfires and flooding.

Connect SoCal's land use strategies deemphasize development on agricultural lands in unincorporated counties, and in areas subject to future two-foot sea level rise. To further prioritize natural habitat areas and avoid impacts to the environment, Connect SoCal seeks to avoid growth in wetlands, wildlife corridors, biodiverse areas, wildfire prone areas and floodplains. These strategies were identified with guidance from stakeholders in SCAG's Natural and Farm LandsConservation Working Group as high priorities for conservation based on climate change vulnerability, water quality impacts, and decline of native species. In acknowledgement of this need for conservation and to address climate change's impacts, local and regional agencies throughout the region have worked to establish and/or implement a diverse set of policies, projects and plans to protect threatened natural areas and farmlands. See the Natural and Farm Lands Conservation Technical Report for successful examples and see the Sustainable Communities Strategy Technical Report for more detail on the use of these as land use strategies.

TRANSFER OF DEVELOPMENT RIGHTS

Transfer of Development Rights (TDR) is a market-based planning tool to support growth in locally identified "receiving districts" in lieu of growth in identified "sending districts." Receiving districts typically exhibit future infrastructure capacity to absorb development impacts, whereas sending districts often contain fragile habitats, productive agricultural lands, or other unique community features that a jurisdiction may seek to preserve. TDR can be an effective tool to achieve regional growth outcomes and conservation objectives by augmenting and leveraging available public funds and programs, providing permanent protections for important resources, and focusing development in areas that already have infrastructure capacity.

URBAN GREENING

Urban Greening is a multi-benefit land use strategy that improves the relationship between the built and natural environment. Greening can support reduction in GHG emissions by sequestering carbon and reduce VMT by making the environment more appealing for people who are bicycling and walking. Benefits within urban, suburban and rural settings include:

- Improved traffic calming and safety
- Increased active transportation
- Cooler street surfaces and communities
- Increased trail and greenway connectivity
- Improved water quality, groundwater recharge and watershed health
- Reduced urban runoff
- Reduced energy consumption and costs
- Expanded urban forest
- Provision of wildlife habitat and increased biodiversity
- Expanded recreation opportunities and beautification

Urban greening improvements are critical components of Complete Streets and offer a sustainable approach to transportation infrastructure implementation. Ultimately, urban greening can be applied at both the project and programmatic scale to achieve broader community benefits, and can help transform the built environment into enjoyable, healthy and connected places.

GREENBELTS & COMMUNITY SEPARATORS

Greenbelts and community separators can serve as contiguous areas between jurisdictions that support projected regional growth, promote land conservation, and avert unchecked urbanization. These areas can include farmland, floodplains, unique habitats, scenic corridors, viewsheds, or other resources considered valuable to communities. Incorporating greenbelts and community separators into planning initiatives can achieve regional benefits, such as reducing VMT, preserving contiguous spaces for active transportation, restoring severed wildlife corridors, preserving agrarian economies, and reducing costs for infrastructure maintenance. The use of TDR can also help identify and prioritize candidate areas for greenbelts and community separators.

KEY CONNECTIONS

HOUSING SUPPORTIVE INFRASTRUCTURE

BUILDING FOUNDATIONS FOR NEW HOUSING

The extraordinary cost of producing housing is a significant barrier to growth throughout Southern California, but also specifically, to achieving the level of infill and transit-oriented development anticipated in Connect SoCal. The Regional Housing Supportive Infrastructure strategy will help make it quicker for local jurisdictions to produce critically-needed housing. The costs of building parking, and sewer/water infrastructure through Development Fees can range from 10% to nearly 25% of construction costs. By implementing tax-increment finance districts, jurisdictions can plan and implement housing supportive infrastructure. With the increase in use of ridesourcing, right-sizing parking strategies, enabled by technology, can reduce the overall cost of housing construction in Connect SoCal's Priority Growth Areas.

PROMISING PRACTICES

Affordable Housing Sustainable Communities Program
Projects across Southern California's cities have successfully competed for funding offered through the Strategic Growth Council for construction of affordable housing and supporting infrastructure in areas that are well served by transit and offer promising opportunities for neighborhood scale mobility.

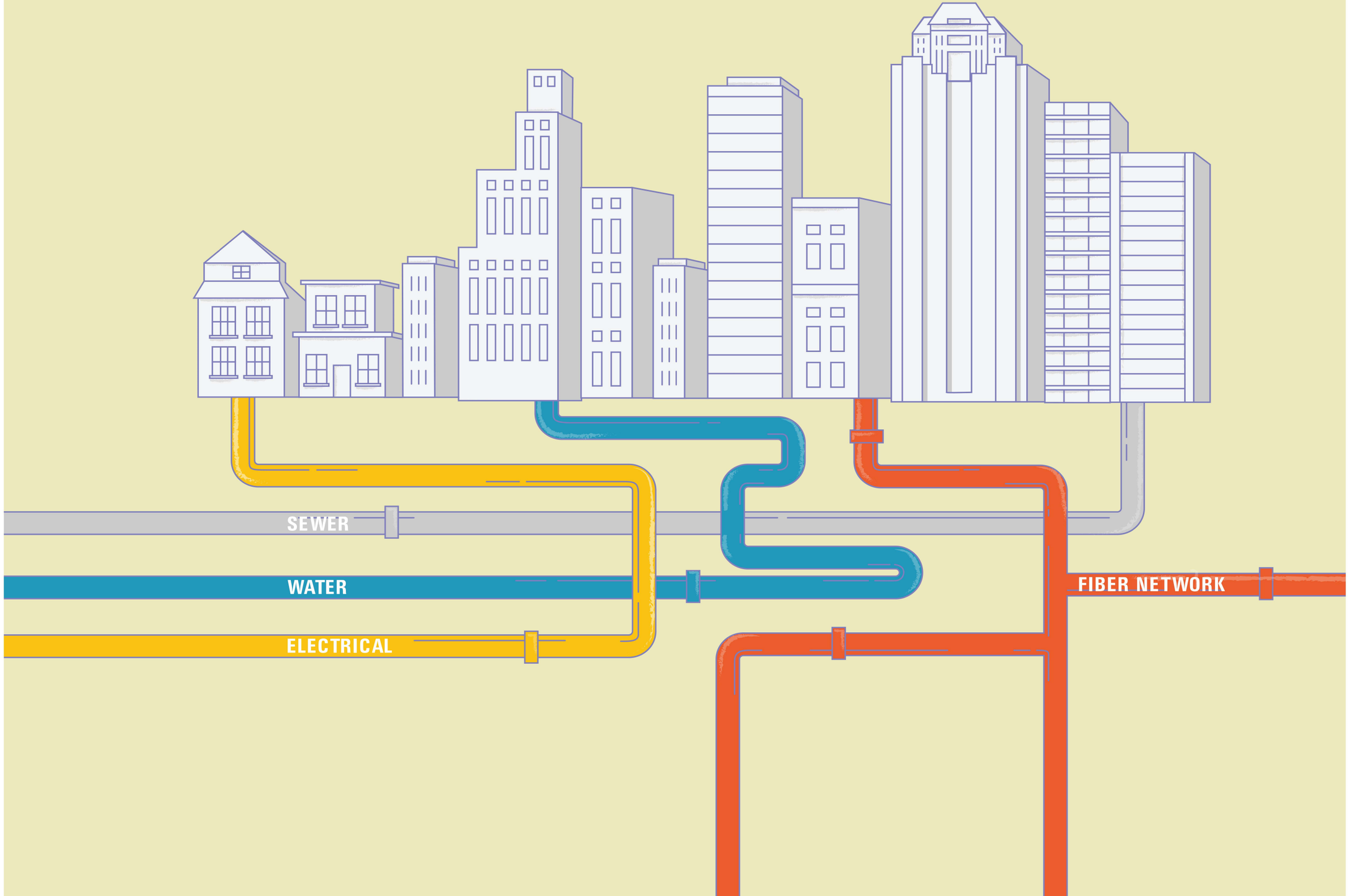
Metro Joint Development Program
LA Metro collaborates with developers to build affordable, transit-oriented housing on Metro-owned properties.

Placentia Enhanced Infrastructure Financing District (EIFD)
Placentia's EIFD will support the neighborhoods surrounding an upcoming Metrolink station by implementing streetscape, sewer and water infrastructure improvements through value capture – paving the way for economic development and reducing the cost of housing construction in this transit oriented locale.

PLANNING FOR 2045

Through legislative and planning efforts, SCAG will advance the vision for accelerated development within transit-oriented communities. Opportunities to be explored and advanced to realize this outcome include:

- **Local Financing Planning Support** – Expand activities to support local agencies in establishing self-help tax-increment financing districts.
- **Parking Requirements Reform** – Support local planning efforts to reduce or eliminate parking requirement to realize potential construction costs savings ranging from $20,000 for surface parking, $50,000 for garages and structures, and $80,000 per space for underground spaces.
- **Local Government Planning Support Grants Program** – Leverage resources allocated to SCAG through AB 101 to support local activities that stimulate development near transit and in priority growth areas.


SEWER
WATER
ELECTRICAL
FIBER NETWORK

REGIONAL ADVANCE MITIGATION

To promote the conservation of natural and agricultural lands and restoration of habitats, Connect SoCal includes a new Regional Advance Mitigation Program (RAMP) initiative that will establish or supplement regional conservation and mitigation banks and other approaches to more effectively address impacts for projects that support reduction of per-capita vehicle miles traveled. The initiative will also support long term management and stewardship of mitigated properties.

Transportation, land use and other development projects and programs are often required to reduce their impacts on the environment through mitigation measures. Habitat preservation and restoration is a leading mitigation method, especially for significant transportation projects. Implementing agencies can directly preserve land through acquisitions or they can pay into "mitigation banks" (for wetlands) or "conservation banks" (for listed species) where a qualified land trust, joint powers authority, or governmental agency acquires and manages lands for conservation and restoration. Advance mitigation uses a science-based approach to anticipate and identify mitigation needs for multiple development projects, early in the planning process. By avoiding piecemeal mitigation for individual projects, and by doing so in advance of impacts, this method prioritizes sites with the highest ecological benefits and provide mitigation efficiencies to transportation, land use and other development projects. Advance mitigation can reduce project cost escalations and delays.

Regional advance mitigation planning takes this concept further and establishes inventories of anticipated impacts from transportation projects across the region and an assessment of the region's sensitive habitats and the conservation actions needed to protect them. As ecological habitats and other conservation elements do not routinely line up with jurisdictional borders, designation of conservation sites can span multiple jurisdictions. In 2017, the California Department of Fish and Wildlife created the Regional Conservation Investment Strategy (RCIS) program to encourage regional approaches for advance mitigation and conservation. The program is a voluntary, non-regulatory conservation assessment and strategy to benefit species and habitats of concern and to provide a more efficient and effective approaches to mitigation and conservation. An RCIS can be used as the basis for advance mitigation and have the benefit of streamlining.

CLIMATE ADAPTATION & MITIGATION

Embedded in Connect SoCal's growth and conservation strategies is an understanding that climate adaptation and mitigation is critical to supporting an integrated regional development pattern and transportation network. Climate change mitigation means reducing or sequestering GHGs, whereas adaptation is preparing for the known impacts of climate change. The greater the mitigation effort is in the near-term, the less adaptation will be needed in the long-term.

Climate change adaptation planning has become more pressing with each passing year, as the region experiences extreme climate-related events more frequently, such as the destruction of homes and infrastructure, travel congestion, air quality degradation from wildfires, inland flooding, mudslides from torrential rainstorms, coastal flooding from sea level rise, and urban heat island effects from unusually high temperatures. These events have become persistent reminders to local governments, residents, workers and businesses that systematic adaptation and resiliency planning must become a high priority. Since climate stressors also do not follow jurisdictional boundaries, effective management of and adaptation to risks posed by climate change will require cross-jurisdictional coordination and collaboration.

TRANSPORTATION STRATEGIES

The strategies for land use are integrated with transportation strategies to achieve Connect SoCal's regional goals. Similar to the Growth Vision and Land Use Tools, the transportation strategies build on the Core Vision established during previous planning cycles and are augmented by Key Connection strategies. Progress made in accomplishing the Core Vision and work that lies ahead in realizing Key Connections are highlighted throughout this section. In addition, this section also describes the broader set of transportation strategies being pursued across the region to achieve a coordinated and balanced transportation system, highlighting areas where we've made significant progress and opportunities to expand activities to yield an even greater benefit.

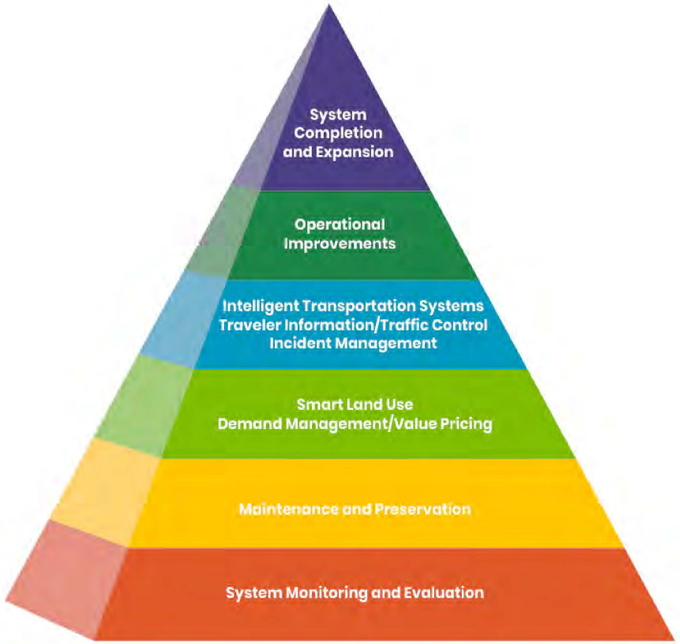
The transportation strategies described in this section are divided into two broad categories: Preserving and Optimizing our current and future system and Capital Improvements by mode for Completing Our System.

In all, Connect SoCal includes $638.9 billion in transportation system investments through 2045.

PRESERVE & OPTIMIZE OUR CURRENT SYSTEM

Millions of residents rely on our regional transportation system every day. Preserving and maintaining our existing, aging infrastructure assets is fundamental to mitigate growing pressures on the overburdened transportation infrastructure. Consistent with the overarching guiding principles of the System Management Pyramid as depicted in **FIGURE 3.1**, a top priority is to maintain and preserve the transportation infrastructure through a "Fix it First" principle. Funding provided by Senate Bill 1 offers an opportunity to strategically reinvest in the transportation network to realize an improvement in the conditions of the existing system.

FIGURE 3.1 System Management Pyramid



Source: Caltrans

CORE VISION
SYSTEM PRESERVATION & RESILIENCE

"Fix it First" has been a guiding principle for prioritizing transportation funding in the RTP for the last decade. The cost of rebuilding roadways is eight times more than preventative maintenance. Preservation of the transportation system can extend the pavement life in a cost effective manner and can also improve safety.

PROGRESS SINCE 2016

Passage of Senate Bill 1 (SB 1) in California in 2017 provides much needed infusion of funding to address these challenges. More specifically, SB 1 is expected to generate over $52 billion statewide over the next 10 years dedicated primarily to Road Maintenance and Rehabilitation. Most of the new sources that make up SB 1 are indexed to California Consumer Price Index so that the funds keep pace with inflation moving forward. Many roadway improvement/rehabilitation projects, including bridge improvement have been programmed.

PLANNING FOR 2045

Given the magnitude of our need and to enhance resilience in light of climate change, Connect SoCal continues to prioritize funding for system preservation. The plan includes $68 billion towards preservation, operation and resiliency needs of the state highway system, and $47.5 billion towards preservation, operation and resiliency needs of the regionally significant local streets and roads.

SCAG will continue to collaborate with federal, state and local partners to monitor the conditions of transportation assets and pursue new research and partnerships to ensure plan resources are deployed to address the region's greatest vulnerabilities.

A key strategy for system preservation is to include preventative maintenance of roadways as part of project costs and work plans. According to Caltrans' Automated Pavement Condition Survey Report, this strategy of prioritizing routine preventative maintenance to address surface damage on the system is significantly cheaper and more effective compared to major rehabilitation or reconstruction of a majorly damaged road. The timeframe to perform preventative maintenance can be days, while construction of a new roadway can take years, causing more increased inconvenience and congestion on the network as residents use alternate routes not built for such demand. Connect SoCal allocates approximately $68 billion towards state highway over the plan period to ensure a well maintained and resilient system for generations to come.

MANAGE CONGESTION

Connect SoCal also seeks to optimize the existing transportation system to meet increased demand levels through the use of innovative strategies that leverage the existing transportation infrastructure. The following section discusses transportation strategies to help support preservation and optimization of infrastructure. Physical solutions can include reversible lanes and policy solutions can include congestion pricing concept along with other solutions.

CONGESTION MANAGEMENT PROCESS

The Congestion Management Process (CMP) aims to provide effective management of the regional transportation system through monitoring and maintenance, demand reduction, analysis of local land use decisions, operational management strategies and strategic capacity enhancements. Federal regulations require the development, establishment and implementation of a CMP. Consistent with federal requirements, SCAG implements, monitors and evaluates these actions as part of Connect SoCal. These eight actions are as follows:

- Develop Regional Objectives for Congestion Management
- Define CMP Network
- Develop Multimodal Performance
- Collect Data/Monitor System Performance
- Analyze Congestion Problems and Needs
- Identify and Assess Strategies
- Program and Implement Strategies
- Evaluate Strategy Effectiveness

The CMP requires that roadway projects that significantly increase the capacity for single-occupancy Vehicles (SOVs) be addressed through a CMP. It should provide appropriate analysis of reasonable, multimodal travel demand reduction and operational management strategies for the corridor. If alternative strategies are neither practical nor feasible, appropriate management strategies must be considered for roadway capacity improvement projects that would increase SOV capacity. For more details of this process are included in the 2019 FTIP.

CONGESTION PRICING

Consistent with the mobility pyramid, SCAG's planning efforts have focused on integrating pricing strategies to optimize operation, improve travel time reliability and offer travelers greater choices.

In 2013, SCAG conducted the Express Travel Choices Study, which reviewed a variety of congestion pricing options and their potential applicability to the SCAG region based on mobility, economic and equity impacts. Three promising strategies were identified as noted below, two of which were incorporated into the 2016 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS).

1. Develop a network of express lanes, that connects to existing express lanes in order to accommodate growing inter-county travel
2. Establish a mileage-based user fee to generate a funding source for aging infrastructure and construction of other travel options
3. Develop Cordon/Area Pricing which involves charging a variable or fixed fee to drive into or within a highly congested area

A cordon/area pricing strategy required additional analysis to identify the most promising geographic area and system design for initial testing. Accordingly, SCAG has been engaged in detailed analyses of this concept since the 2016 RTP/SCS.

SCAG examined the potential application of cordon/area pricing in Southern California through its Mobility Go Zone and Pricing Feasibility Study. The study

showed that a Westside Go Zone would reduce VMT by 21 percent and vehicle hours traveled (VHT) by 24 percent during peak travel times, saving $4 million annually in reduced GHG emissions and generating a net average of $69.2 million annually in revenues, which would go directly toward transportation improvements, pedestrian amenities and economic development.

SCAG also estimated a 22 percent reduction in single-occupancy vehicles entering the area and an increase in transit trips and bike/walk trips by nine and seven percent, respectively during peak periods. SCAG urged the creation of a pilot project to more deeply test the potential of Mobility Go Zones in reducing congestion and improving air quality.

Bolstered by recent decisions in New York City to move forward with implementing a congestion pricing program by 2021, further studies of cordon/area pricing along with other forms of congestion pricing, are being evaluated by major metropolitan areas throughout the country. Los Angeles is no exception with recent announcements by Metro to evaluate congestion pricing and other user fee strategies.

Connect SoCal assumes the implementation of a local road charge program in the form of mileage-based user fees regionally, which can be adjusted by time-of-day at major activity centers. For analysis, SCAG assumes congestion pricing (peak period charges) in parts of Los Angeles, along with increases in parking pricing at major job centers as a part of the regional job centers strategy.

Overall, the implementation of user-fees and pricing strategies can be structured to increase equity and mobility, and preserve the transportation system, while reducing environmental impacts. Additionally, California's and other states' road charge pilots to date have had high levels of participant satisfaction- even on the issue of user privacy, and surveys show that support for such fees has been steadily increasing.

Because mileage-based user fees are directly linked to system usage, they can more easily address the actual cost of driving and direct funding towards repair and maintenance of the system in accordance with usage, regardless of fuel purchases. Using differential pricing, fees can be balanced to compensate for the lost revenue from alternative fuel penetration and increasing fuel efficiency, while still providing incentives that encourage the adoption of cleaner vehicles,

CORE VISION
DEMAND & SYSTEM MANAGEMENT



Better managing the existing transportation system through demand management strategies and Intelligent Transportation Systems (ITS) yields significant mobility benefits in a cost-effective manner.

PROGRESS SINCE 2016

The I-210 Integrated Corridor Management Pilot, a first of its kind in Southern California, integrates management and operation of the freeway with nearby arterials and local transit using real-time monitoring of travel conditions, and improved corridor-wide collaboration to re-direct vehicles during congestion causing incidents.

The California Road Charge Pilot Program is a statewide effort to test the functionality, complexity and feasibility of a road charge system for transportation funding. The pilot demonstrated the feasibility for a variety of technologies to facilitate mileage reporting methods and data collection. Coupled with carefully designed incentives, a road charge is a powerful tool for reducing congestion and supporting our sustainability goals.

In 2018, the Metro board signaled a major change in direction for the former I-710 North capacity project by approving an alternative that focuses on TDM/TSM strategies in this corridor.

PLANNING FOR 2045

Connect SoCal increases investment and strengthens policy levers to optimize system performance while realizing greenhouse gas reduction, quickly and efficiently.

New strategies resulting from SCAG's TDM Strategic Plan provide an objectives-driven, performance-based process to identify and promote TDM strategies and programs across the region. SCAG will pursue implementation of these strategies in coordination with regional and local partners.

SCAG will pursue research and planning as autonomous vehicles emerge in the market, transforming system management opportunities.

KEY CONNECTIONS
GO ZONES

CLAIMING BACK TIME FROM YOUR COMMUTE

Go Zones are geographic areas where a suite of mobility service options are provided together with incentives to reduce dependency on personal automobiles. This expanded mobility ecosystem can include increased transit, bike share, enhanced active transportation infrastructure and incentives—such as a fee on solo driving during peak traffic periods. Incentives would encourage the use of shared modes or shift less time sensitive trips to off-peak times. Revenues collected from the fee would be used to fund local transportation improvements and support sustainability goals by contributing to reductions in GHG emissions. Go Zones can be designed with policies and discounts that address equity concerns and promote mobility options for commuters of various income levels.

PROMISING PRACTICES

100 Hours
Public engagement campaign to turn traffic hot spots into models of mobility

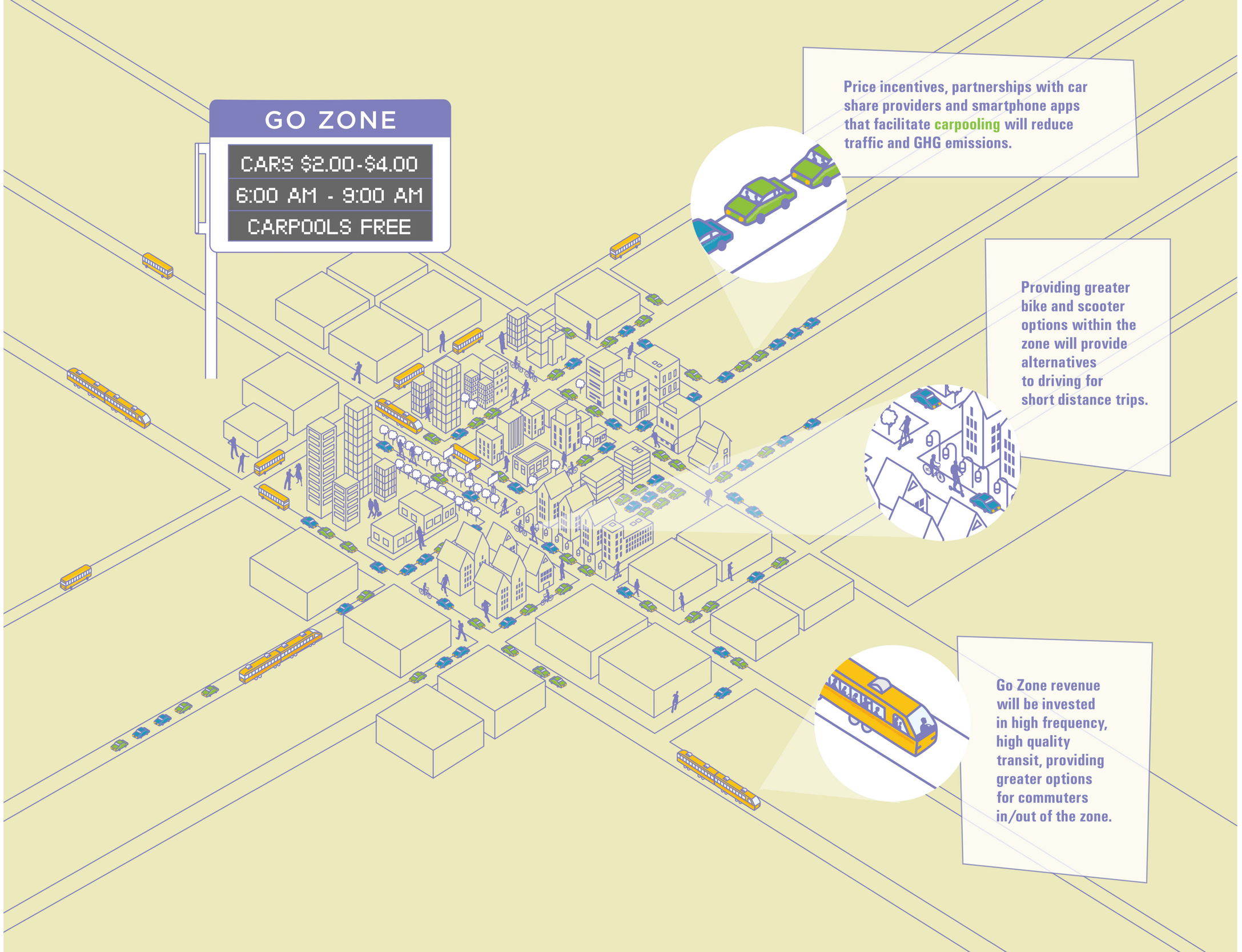
SCAG Mobility Go Zone & Pricing Feasibility Study
The Mobility Go Zone & Pricing Feasibility Study evaluates congestion pricing and the range of impacts on traffic volumes, transit ridership, air quality and availability of funds for transportation programs.

Evaluating parts of the Cities of Los Angeles and Santa Monica, the study estimates a 21% to 22% decrease in VMT and 24% decrease in VHT within the study area during peak periods. Transit usage and bicycling/walking trips increase by 9% and 7%, respectively. Annual average net revenue of $69.2 million would be generated to offer additional resources for local reinvestment.

PLANNING FOR 2045

To foster adoption of Go Zones envisioned by Connect SoCal, SCAG will pursue research and partnerships, including:

- **SCAG Mobility Innovations & Incentives Pilot Program** – design and conduct pilot tests to further assess equity impacts and likely changes in travel behavior
- **Joint MPO Road Usage Charge & Incentive Program Pilot Tests** – develop and test a common core road usage charge and incentive pilot
- **Metro Traffic Reduction Study** – SCAG will partner with Metro to analyze and identify a place or places where congestion pricing can be tested along with a package of mobility improvements


GO ZONE
CARS $2.00-$4.00
6:00 AM - 9:00 AM
CARPOOLS FREE
Price incentives, partnerships with car share providers and smartphone apps that facilitate carpooling will reduce traffic and GHG emissions.
Providing greater bike and scooter options within the zone will provide alternatives to driving for short distance trips.
Go Zone revenue will be invested in high frequency, high quality transit, providing greater options for commuters in/out of the zone.

and protecting user privacy. Additionally, differential pricing can be structured to encourage the use of more sustainable modes of transportation.

A mileage-based system can also assuage environmental justice concerns inherent in the regressive gas tax. Environmental justice was a focus of the California Road Charge Pilot Program, and 73 percent of participants reported that they thought user fees were fairer than a gas tax. Looking forward, alternative fuel technologies are likely to remain expensive compared to conventional vehicles, and it is likely that low-income residents will be paying a higher proportion of transportation taxes through continued purchase of gasoline. Linking fees more directly with system usage would reduce the burden on disadvantaged residents and could even be structured to enhance overall mobility.

TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) is a set of strategies that aims to reduce the demand for roadway travel, particularly from SOVs. TDM investments can reduce congestion and shift trips from SOVs to other modes in ways that often cost significantly less than roadway or transit capital expansion projects. TDM strategies add transportation choices that improve sustainability, public health and the quality of life by reducing congestion, air pollution and GHG emissions. When transit ridership, carpooling, bicycling and walking increase, the efficiency of the entire transportation system improves, bringing many benefits to the region. These benefits can justify relatively modest public expenditures on effectively implemented TDM programs. Connect SoCal allocates $7.3 billion through 2045 to implement TDM strategies throughout the region. There are three primary goals of this program:

- Reduce the number of SOV trips and per capita VMT through ridesharing (which includes carpooling and vanpooling) and providing first/last mile services to and from transit
- Redistribute or eliminate vehicle trips during peak demand periods by supporting telecommuting and alternative work schedules
- Reduce the number of SOV trips through use of other modes such as transit, rail, bicycling, and walking, or other micro-mobility modes

In 2018, SCAG initiated a study to develop a TDM Strategic Plan to identify ways in which SCAG and its regional partners can expand the effectiveness and use of TDM strategies to achieve regional goals. The resulting recommendations address knowledge sharing, policy and regulation, partnership, and TDM programming and performance measurement, and are included in more detail in the Congestion Management Technical Report and the TDM Strategic Plan.

TRANSPORTATION SYSTEMS MANAGEMENT

Transportation Systems Management (TSM) employs a series of techniques designed to maximize the capacity and efficiency of the existing transportation system. Effective TSM strategies reduce traffic congestion, improve air quality and reduce or eliminate the need to construct new and expensive transportation infrastructure. Many TSM strategies seek to optimize the operation of the existing transportation system through use of Intelligent Transportation Systems (ITS). For example, advanced technologies can anticipate changing traffic conditions and inform drivers about driving conditions on a real-time basis so that drivers can make more informed decisions. SCAG recently updated the Regional ITS Architecture which identifies a significant number of planned ITS projects, including those related to connected vehicle applications, transit signal priority, emergency response, express lanes and goods movement.

Examples of TSM strategies include Corridor System Management Plans (CSMPs) and system management initiatives (e.g., variable speed limits, signal synchronization, ramp metering, etc.), High Occupancy Toll (HOT) lanes, collision avoidance systems, universal transit fare cards and improved data collection.

COMPLETING OUR SYSTEM

Strategies for improving and expanding the many modes of transportation that make up the regional network must be integrated closely with our strategies for how we use land. The success of transit, passenger rail, walking, bicycling and other forms of active transportation, our highways and arterials, the efficient movement of goods and our regional airport system all depend on a close relationship with how our region uses land and how we grow. This is particularly true when it comes to improving and building a transit system that can best serve people in communities throughout our region. It is the first transportation category for which numerous strategies are reviewed.

TRANSIT

The Southern California vision for transportation and transit was developed via a cooperative, comprehensive and continuing process where local agencies work with their county transportation commission and with SCAG to identify a program of projects that will deliver a local vision of increased mobility and accessibility, and support Connect SoCal goals including congestion reduction and sustainability. Transit serves as both a key component of local, regional and state efforts to combat climate change and reduce congestion, and as a critical social service. It is a way of providing mobility for individuals who cannot provide it for themselves, especially those who do not have access to automobiles, are very poor, recent immigrants, and the elderly and disabled. It also can provide an alternative to SOVs and could serve as the backbone of a multimodal transportation system with an integrated trip planning and payment system, as part of the MaaS concept.

Since 1991, the region has spent over $77 billion on transit (in 2016 dollars). This trend is expected to continue, as the combined costs for transit capital projects and operations and maintenance (O&M) total nearly half of the investments in Connect SoCal. The plan includes significant investment across all transit modes, with $66.8 billion toward transit capital projects and $173.9 billion for transit O&M. **TABLE 3.1** displays selected major transit capital projects included in Connect SoCal, while the map in **EXHIBIT 3.1** displays the 2045 plan transit network.

When these planned transit projects are completed, the region will have a greatly expanded urban rail network, including multiple Metro Rail extensions and the first urban rail services in Orange County (OC Streetcar) and San Bernardino County (Redlands Rail/Arrow). New bus rapid transit and rapid bus routes will be implemented across Los Angeles, Orange, Riverside and San Bernardino Counties. Riverside County will extend Metrolink to San Jacinto/Hemet and San Bernardino County will connect via Metrolink to Ontario International Airport.

Other ongoing regional efforts may result in changes to the transit investments in Connect SoCal. SCAG will monitor these efforts and adjust Connect SoCal accordingly through a future amendment, if needed. These efforts include Metro's Twenty-Eight by '28 Initiative, which seeks to complete 28 major projects approved by the Metro Board by the 2028 Summer Olympic and Paralympic

CORE VISION
TRANSIT BACKBONE

Expanding the transit network and fostering development in transit-oriented communities is central to the region's plan for meeting mobility and sustainability goals while continuing to grow the regional economy.

PROGRESS SINCE 2016

Major urban rail projects under construction:

- Metro Rail Regional Connector and Crenshaw/LAX lines
- OC Streetcar
- Arrow / Redlands Rail

Metrolink achieved record ridership levels in fiscal year 2018-2019, almost 12 million annual boardings.

Regional agencies have committed to major bus system redesigns including OC Bus 360 and the Metro NextGen Bus Study.

Microtransit pilots and partnerships with Transportation Network Companies are being implemented to provide additional options connecting to fixed route transit and rail.

PLANNING FOR 2045

Connect SoCal builds upon extensive local investment in the transit and rail network by increasing resources for frequent and reliable bus service and closing gaps in the fixed guideway system.

Regional collaboration to implement Metrolink's Southern California Optimized Rail Expansion (SCORE) and complete the Link Union Station (LinkUS) to transform Los Angeles Union Station from a "stub-end" station, to a "run-through" will reduce rail travel times across the system and allow one-seat rides to many more destinations.

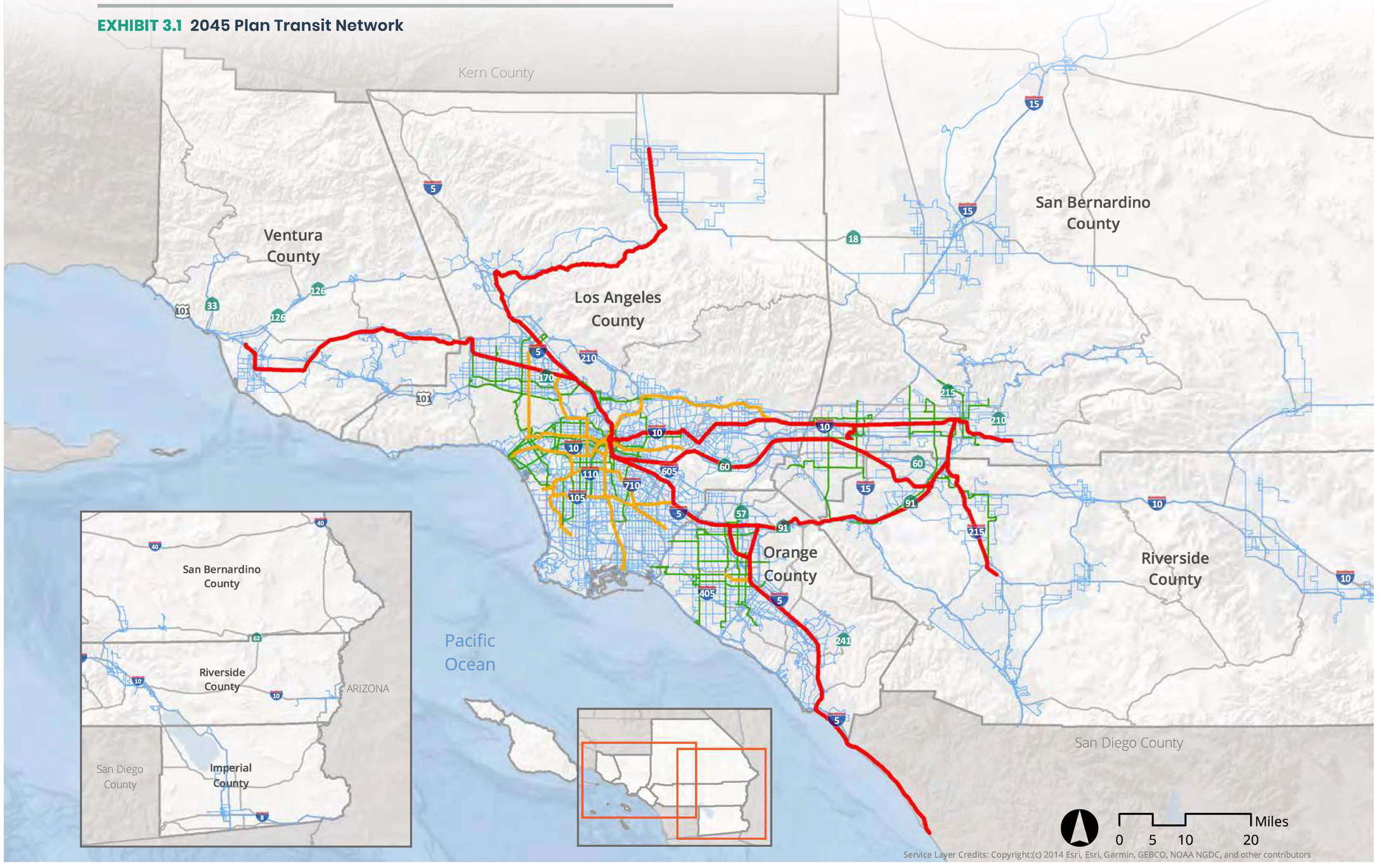
SCAG-supported plans and pilot projects to address first-last mile challenges will be essential to improving the transit experience and expanding access to jobs and destinations.

TABLE 3.1 Selected Transit Capital Projects

County	Project
Los Angeles	Airport Metro Connector
Los Angeles	BRT Connector – Orange/Red Line to Gold Line
Los Angeles	Crenshaw/LAX Transit Corridor
Los Angeles	Historic Los Angeles Streetcar
Los Angeles	East San Fernando Valley Transit Corridor
Los Angeles	Gold Line Eastside Extension Phase 2 to South El Monte
Los Angeles	Gold Line Foothill Extension – Azusa to Claremont
Los Angeles	Green Line Extension to Torrance
Los Angeles	LAX Automated People Mover
Los Angeles	North San Fernando Valley Transit Corridor
Los Angeles	Orange Line BRT Improvements
Los Angeles	Purple Line Westside Subway Extension to La Cienega, Century City, Westwood
Los Angeles	Regional Connector
Los Angeles	Sepulveda Pass Transit Corridor (Phase 2)
Los Angeles	Vermont Transit Corridor
Los Angeles	West Santa Ana Branch Transit Corridor
Los Angeles	Green Line Extension to Norwalk/Santa Fe Springs Metrolink Station
Los Angeles	Red Line Extension to Hollywood Burbank Airport
Los Angeles	Slauson Light Rail – Crenshaw/LAX Transit Corridor to Blue Line
Orange	OC Streetcar
Orange	OC Transit Vision
Riverside	Coachella Valley Quick Bus
Riverside	Rapid Commuter Corridor from Perris to San Jacinto
Riverside	RapidLink Service – Riverside, Moreno Valley, Perris
San Bernardino	Redlands Passenger Rail
San Bernardino	West Valley Connector Phase 1
San Bernardino	Gold Line Extension to Montclair
San Bernardino	Passenger Rail Service from San Bernardino Metrolink Line to Ontario Airport

Source: SCAG

EXHIBIT 3.1 2045 Plan Transit Network



Metrolink (2045) Urban Rail (2045) Rapid Bus and Bus Rapid Transit (2045) Bus Routes (2045)

Note: Planned project alignments shown on this map are not intended to represent preferred alternatives where local planning and environmental processes are still ongoing. Maps provided in future updates to Connect SoCal will reflect locally preferred alternatives, once they are formally adopted by the local lead agency.

Source: SCAG, 2019

Games. Additionally, Metro's NextGen Bus Study seeks to redesign the bus network to be more relevant and attractive to the residents of Los Angeles County. Finally, the California Air Resources Board (ARB) Innovative Clean Transit Rule requires that transit agencies convert to Zero Emissions Bus Fleets with bus rollout plans due from larger transit operators in June 2020.

Transit agencies are also piloting improvements using emerging technologies and innovations. Metro is in the process of upgrading its TAP card program regional system and unified payment across multi-modal programs. Metro's TAP system now integrates transit and bike share, with the potential for future integration of Express Lanes and electric vehicle car share, forming the foundation for a regional MaaS system. The system also allows for providing incentives and cross-program discounts. At the state level, the California State Transportation Agency is leading an initiative called the California Integrated Travel Project (Cal-ITP) to facilitate multimodal trip planning and payment to support state goals of increasing transit ridership, reaching environmental targets, lowering costs, creating efficiencies, improving customer experience and promoting equity. Current efforts focus on incentivizing statewide trip planning and fare payment standards and other integrated travel improvements over time. A future phase will involve a multi-agency pilot of integrated travel planning and fare payment.

In the SCAG region, several operators are piloting microtransit services, which typically involve smaller vehicles, flexible routing, on-demand dispatch and public-private partnerships. Research has shown that microtransit services are not very productive, carrying on average three to five passenger trips per vehicle per hour. Microtransit therefore may be best suited to serve lower-demand areas, acting as part of an array of services that include fixed route transit, TNCs, and other shared mobility services. Agencies conducting microtransit pilots in the SCAG region include OCTA (OC Flex), the City of Los Angeles Department of Transportation (LANow), LA Metro (Mobility on Demand pilot with Via), and Anaheim Transit Network (Free Ride Around the Neighborhood). Data and results from these pilot projects will inform future planning for microtransit in the region.

Over the last 10 years, one of the leading new mobility practices has been ridesourcing. This practice marries the taxi model with mobile and GPS applications to provide on-demand point-to-point service. Use of these TNC services, particularly those offered by Uber and Lyft, has grown exponentially and as the TNC business model evolves, the impacts will be felt across Southern California. One of the ways that transit providers or local jurisdictions are responding to that growth is by partnering with Uber, Lyft, and other companies to provide first/last mile services or replace low performing bus routes. Examples within the SCAG region include Go Monrovia, a partnership between the City of Monrovia and Lyft that provides subsidized rides including discounted rides to/from the Foothill Gold Line station, and a partnership between the City of San Clemente and Lyft in South Orange County in an area where OCTA discontinued two bus routes.

With respect to connected and automated vehicle applications, a new generation of transit navigation aids is emerging. Many private and public sector parties are currently testing automated passenger vehicles and trucks, and the capabilities range from driver assist to fully automated operations. Automated transit systems are still in the research phase and are supported by the FTA's Office of Research, Demonstration and Innovation and a five-year Strategic Transit Automation Research Plan. Automated services may be tested in closed environments such as university and hospital campuses through the horizon of Connect SoCal and may enter into service in open environments before 2045. SCAG's recently updated Regional ITS Architecture identifies planned projects such as connected vehicle applications, integrated corridor management and transit signal priority expansion.

PASSENGER RAIL

The 2020 Connect SoCal vision for passenger rail in the SCAG region consists of four main elements:

Grow Ridership: Although ridership on commuter and intercity rail services has steadily grown over the last two decades, there is still tremendous potential to significantly increase ridership in the region.

Provide More Frequent and New Services: Providing more frequent rail service will attract new riders to passenger rail. Currently, commuter rail service in Southern California is much less frequent than commuter rail services elsewhere in the nation. There are also several unserved passenger rail markets that would greatly benefit from the establishment of new rail service.

Improve Connectivity: While progress has been made in connecting passenger rail services to other existing transit in our region, more needs to be done to coordinate schedules and connections. Also, more progress must be made in first/last mile connections to rail stations, and station area planning and transit oriented development.

Secure Funding: New funding opportunities have been created since the 2016 Connect SoCal, such as the first dedicated source for rail operations at the state level. However, passenger rail funding in the region is still incremental in nature and to grow ridership via increased service levels, more long-term state and federal financing needs to be identified.

Several strategies in Connect SoCal are designed to increase rail ridership in our region by making rail travel more attractive as an alternative to commuting alone by car. These strategies address three distinct rail markets and the carriers can serve multiple travel markets:

- Metrolink – Commuter Rail
- Amtrak – Intercity Rail
- California High-Speed Rail and Southern California to Las Vegas – Interregional Rail

First, the Metrolink Southern California Optimized Rail Expansion (SCORE) program expands the capacity of the commuter rail system to ensure more regular and frequent service throughout the entire day. Capital investments for SCORE include construction of:

- Construction of additional tracks (e.g., sidings, double track, triple track and quadruple track segments)
- Improved signaling
- Expanded and lower emissions fleets
- Upgraded and enlarged maintenance facilities
- Grade crossing treatments and separations
- Fencing and safety features
- Features to support readiness for quiet zones
- Required asset rehabilitation to sustain capacity

SCORE includes the Link Union Station (Link US) project, which will transform the region's largest multi-modal transportation hub at Los Angeles Union Station by extending rail tracks over the US–101 freeway. With Link US, SCORE will greatly improve regional rail by providing through service at Union Station, reducing rail travel times in our region and allowing "one-seat ride" opportunities to many more destinations.

Second, the Los Angeles-San Diego-San Luis Obispo (LOSSAN) Rail Corridor Strategic Implementation Plan lays out a long-range vision for customer and capital improvements that increase the speed and quality of service. The latest LOSSAN Rail Corridor Agency Business Plan (FY 2018–19 to FY 2019–20) highlights several significant strategies for improvement such as train monitoring, train and connecting bus schedule adjustments, improved connectivity with local transit services, equipment and crew utilization, response to service disruptions and service planning. The LOSSAN plan calls for improvements along the corridor to provide more service, including 13 daily round trips between Los Angeles and San Diego, six round trips between Goleta and Los Angeles and three round trips between San Luis Obispo and Los Angeles.

Third, voters approved in 2008 the Proposition 1A bond measure providing $9.95 billion for the California High-Speed Rail project. Phase 1 will connect San Francisco to Los Angeles and Anaheim at speeds of up to 220 miles per hour, completing the trip within two hours and forty minutes. Segments in the SCAG region connect the Central Valley to Palmdale, Hollywood Burbank Airport, Los Angeles Union Station, and Anaheim. As described in the 2018 Business Plan and 2020 Draft Business Plan, Phase 1 will begin service in 2033.

In 2012, the Regional Council entered into a memorandum of understanding (MOU) with the California High-Speed Rail Authority (CHSRA), Metrolink, San Diego Association of Governments (SANDAG), Metro, Riverside County Transportation Commission (RCTC), and the City of Anaheim to include Phase 1 in the 2012 RTP/SCS and commit $500 million in Prop. 1A funds to early investments in Southern California's existing passenger rail system. The funding agreement for the Rosecrans/Marquardt grade separation project to receive $76.7 million in Prop. 1A funds was executed in 2018. In September 2019, the CHSRA, Metro and the California State Transportation Agency (CalSTA) executed an MOU which established a commitment for these agencies to work together cooperatively to execute a full funding agreement for the remaining $423.3 million for the LINK US project.

Finally, the Southern California to Las Vegas high-speed rail project was environmentally cleared under XpressWest and the Federal Railroad Administration (FRA) issued a record of decision on July 8, 2011. XpressWest is now in the process of planning, constructing and operating this service, which is expected to be privately financed.

ACTIVE TRANSPORTATION

With its temperate climate and wide array of stunning natural and built environments, the SCAG region holds great potential for active transportation initiatives. Walking (inclusive of people using personal mobility devices) and bicycling are accessible forms of transportation for people of all ages, abilities and socioeconomic backgrounds. Communities that are built to support walking and bicycling trips tend to be healthier and are safer for people using all modes of transportation. Likewise, the implementation of infrastructure and development of plans and programs increases the number of people walking and bicycling and decreases the number of people driving. This will improve health outcomes and reduce GHG emissions in the region.

Connect SoCal is expected to increase the number of daily active transportation trips by more than two million, increasing the mode share from 7.8 percent in 2016 to 10 percent by 2045. In order to achieve these outcomes, planned future investments are nearly doubled from $12.9 billion in the 2016 RTP/SCS to $22.5 billion in Connect SoCal. The active transportation investments in Connect SoCal are allocated across a range of active transportation strategies that address planning, policy making and implementation for both short and regional trips. Additionally, they are designed to improve environmental justice outcomes and enhance the safety and comfort of people walking and bicycling.

Since the adoption of the 2016 RTP/SCS planning efforts throughout the region have expanded significantly. Nearly 80 percent of the cities in the SCAG region now have completed some sort of active transportation plan, bringing the regional total to more than 300 pedestrian, bicycle and safe routes to schools plans. This is a 40 percent increase from 2016. Likewise, every county in the SCAG region now has a county-wide pedestrian, bicycle and/or active transportation plan (ATP) or is in the process of completing one. Some of these include the Imperial County Active Transportation Plan (2019) and Pedestrian Master Plan currently in progress, the Los Angeles County Active Transportation Strategic Plan (2016), Orange County's OC Active (2018), the Western Riverside Council of Governments Active Transportation Plan, the San Bernardino Non-Motorized Transportation Plan (2018) and the Ventura County Regional Bikeway Wayfinding Plan (2017). Through Connect SoCal, SCAG's Sustainable Communities Program and other statewide funding sources, additional planning funding will be available to continue this progress and to plan for more active communities across the region.

In addition to development of a robust set of plans, the region has seen significant positive changes to our built environment as active transportation projects have been implemented. Almost 500 bikeway miles have been built in the region since the 2016 RTP/SCS. These efforts are dispersed across the region, with a focus on projects that improve active transportation mode share and safety for disadvantaged communities. SCAG has worked closely with impacted communities and partnered with community-based organizations to ensure that plans and projects are designed to best address the issues that people walking and bicycling in each community face. Some noteworthy active transportation projects initiated or implemented since 2016 include:

Coachella Valley Link: A multi-use trail in the Coachella Valley which is expected to facilitate more than 3 million active transportation trips per year by 2035.

El Centro 8th Street ATP Project: The El Centro 8th Street ATP-funded project is significant in part due to the positive impact of a Go Human demonstration project. The partnership allowed the City to showcase potential improvements and solicit community feedback and support, which helped see the project to implementation.

Venice Boulevard Great Streets: Mar Vista's Venice Boulevard Great Streets project enhanced pedestrian and bicycle safety, and promoted place-making through community art installations. The one-year evaluation report highlights how infrastructure investments, such as new signalized crossing locations and protected bike lanes, resulted in an 11 percent increase of active transportation users, a 75 percent reduction of collisions at its busiest intersection and a decrease in bicyclist injuries, all while supporting the same traffic volumes and promoting a vibrant downtown core.

Connect SoCal includes a wide variety of infrastructure projects that will support short and regional active transportation trips. These strategies will

reduce automobile vehicle miles traveled by increasing the number of trips accomplished by walking, bicycling and the use of micro-mobility devices. These strategies include building physical infrastructure such as local and regional bikeways, sidewalk and safe routes to schools pedestrian improvements, regional greenways and first-last mile connections to transit. In addition to reducing vehicle miles traveled, these strategies will improve air quality and public health by reducing emissions and increasing levels of physical activity. Finally, they will have a positive economic impact on the region by reducing transportation and healthcare costs.

Since the 2016 RTP/SCS there has been a significant change in technology and the way that it influences travel behavior. The growth in popularity of micro-mobility in the past few years necessitated the inclusion of strategies in Connect SoCal to address shared mobility infrastructure and regulation frameworks to ensure that new technologies can be used safely and responsibly. These strategies range from incentives for the purchase of e-bikes, to the distribution of private micro-mobility devices that help ensure access for low-income communities. While it is expected that many of these devices will be provided through the private sector, they will still use public streets and will likely increase demand for separated facilities that are safe for all ages and abilities. Local jurisdictions will likely be tasked with the regulation of these devices and will need to manage the locations where they will be stored and where they can be ridden.

New technology also has the potential to provide local partners with more and better travel behavior data. SCAG and member jurisdictions should support the procurement and development of new data sources for active transportation. This will include the collection of pedestrian, bicycle and micro-mobility volume data, as well as the integration of large data sets. Local cities, county agencies, public health departments and other stakeholders will all benefit from better data sets that provide information on traffic stress, accurate collision rates and information on the types of people using these modes. In addition, zoning codes and general plan elements should be updated when appropriate to support short trips and end-of-trip facilities such as bicycle parking.

Recent developments regarding micro-mobility and personal e-bikes and scooters have shown that new shared mobility benefits from the same programmatic and infrastructure improvements as traditional active transportation. Complete streets, which are planned, designed, operated and

CORE VISION
COMPLETE STREETS



Creating “complete streets” that are safe and inviting to all roadway users is critical to increasing mobility choices, reducing traffic fatalities and serious injuries and meeting greenhouse gas reduction targets.

PROGRESS SINCE 2016

In December 2018, the City of Santa Ana opened its first protected bikeway, or cycletrack. The project, funded by OC Go (Orange County Measure M), features a 6-foot wide bikeway protected from vehicle traffic by a landscaped median. About 55 percent of the surrounding community doesn’t have access to a car. Santa Ana has been awarded about $45 million in grant funding for projects like this one that improve safety for people walking and biking.

In the City of Los Angeles, the Mobility Plan 2035 advances the complete streets concept beyond a single project by prioritizing multi-modal networks including a Bicycle Enhanced Network, Transit Enhanced Network, Vehicle Enhanced Network and Pedestrian Enhanced Districts.

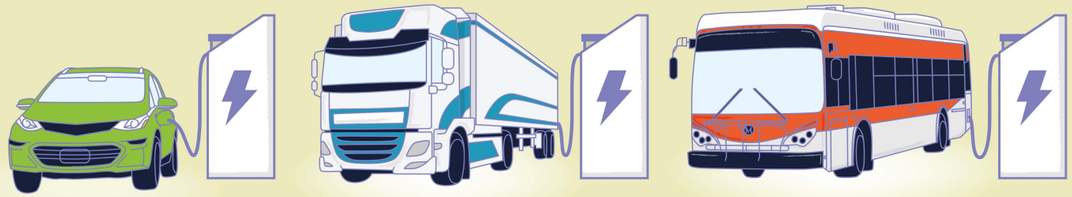
PLANNING FOR 2045

Connect SoCal invests in local streets and arterials and anticipates continued success in securing grant funds for regionally significant projects through programs like the California Active Transportation Program (ATP).

By expanding complete streets concepts to accommodate and optimize new technologies and micro-mobility devices, first-last mile connections to transit and curbside management strategies, the region will achieve even greater mode shift and reductions in VMT. SCAG champions Complete Streets policy implementation throughout the region with the Go Human campaign and a range of planning resources, including the Regional High Injury Network. Specific strategies and actions related to Complete Streets are detailed in the Active Transportation Technical Report.

KEY CONNECTIONS

ACCELERATED ELECTRIFICATION



CLEAN VEHICLES, CLEANER AIR

The Accelerated Electrification strategy offers a holistic and coordinated approach to de-carbonizing or electrifying passenger vehicles, transit and goods movement vehicles. Through greater coordination and deeper collaboration, this strategy aims to go beyond benefits achieved through state mandates alone. In the light-duty sector, Connect SoCal plans for greater incentives to increase sales of electric vehicles and strategies to increase the availability of charging infrastructure. Electric vehicles (EVs) currently make up only seven percent of new car sales, but the growth is healthy: In 2013 EVs made up just 2.4 percent of all new car sales statewide. For transit, in 2018 the California Air Resources Board voted to mandate purchases of electric buses. We can facilitate that process by working with transit agencies to ensure adequate charging stations and electricity rates. In the goods movement sector, the goal is to achieve a zero-emissions system, fostering early adoption of near-zero-emissions technologies.

PROMISING PRACTICES

LACI- Los Angeles Cleantech Incubator
Public private partnership among local, regional, and state stakeholders to accelerate transportation electrification and zero emissions goods movement in SCAG region.

SCAG PEV Atlas & Clean Cities Coalition Outreach
Five Department of Energy certified coalitions advance alternative fuels and fuel technologies in the region by building partnerships, creating tools and disseminating resources from the National Laboratories. Successful coalition initiatives across the region include SCAG's Plug-in Electric Vehicle Atlas, the AltCar Expo, and the deployment of thousands of municipal alternative fuel vehicles.

Regional Transit Agency Electric Buses
Sunline Transit, Foothill Transit pioneered the purchase of hydrogen and battery electric busses

PLANNING FOR 2045

Connect SoCal aims to align and catalyze investments to decarbonize the transportation system. Opportunities to be explored and advanced through studies and regional planning include:

- **Regional EV Charging Station & Vehicle Rebate Programs**
  Provides financial incentives for local communities to install charging stations & for individuals to purchase EVs
- **EV Charging Station Streamlining**
  Working with member agencies to streamline the process of permitting and installing new charging stations.
- **Innovative Clean Transit Rule**
  Facilitating the transition of transit fleets in the region to 100 percent electric vehicles.

maintained for safe, convenient, and comfortable travel and access for users of all ages and abilities, will support people who are walking, bicycling, and using micro-mobility devices. A variety of engagement strategies will need to be implemented alongside infrastructure components to support active transportation, in whatever form it takes. This engagement can take the form of Safe Routes to School programs designed to encourage students to walk and bicycle to school, SCAG's Go Human advertising campaigns to encourage the public to walk and bicycle more, or the demonstration of possible new infrastructure to get communities excited about changing their streets.

TRANSPORTATION SAFETY

Connect SoCal prioritizes the safety and mobility of the region's residents, including drivers and passengers, transit riders, pedestrians, and bicyclists. To adhere to MAP-21/FAST Act performance measures requirement, SCAG adopted its annual regional safety targets in February 2020. For the year 2020, SCAG is aiming to reduce fatalities by a minimum of 3.03 percent and serious injuries by a minimum of 1.5 percent. To enhance safety in the region, SCAG anticipates providing cities with resources to develop safety plans and help achieve the safety targets.

SCAG's safety strategies are largely grounded in the State's Strategic Highway Safety Plan (SHSP), which helps member agencies interested in pursuing safety initiatives and strategies at the local level. SCAG outlines detailed strategies and actions that local jurisdictions and county transportation commissions can undertake to enhance safety in our region in the Transportation Safety and Security Report. The strategies are supportive of the Strategic Highway Safety Plan and include:

1. Reduce Aggressive Driving and Speeding
2. Improve Safety for Aging Populations:
3. Improve Bicyclist Safety
4. Improve Commercial Vehicles Safety
5. Ensure Drivers are Licensed
6. Improve Emergency Response Services
7. Leverage Emerging Technologies
8. Reduce Impaired Driving Fatalities
9. Reduce Distracted Driving
10. Improve Safety at Intersections
11. Reduce the Occurrence of Lane Departure Fatalities
12. Improve Motorcycle Safety
13. Improve Occupant Protection by Increased Use of Seat Belts and Child Safety Seats
14. Improve Pedestrian Safety
15. Improve Work Zone Safety
16. Improve Safety for Young Drivers

To achieve regional safety targets SCAG will:

- Develop and maintain a High Injury Network (HIN) mapping tool to support planning efforts related to transportation safety by our local partners
- Work with local jurisdictions to provide active transportation safety education opportunities through its Go Human campaign
- Continue to represent Southern California on the California SHSP Steering Committee, the California Walk Bike Technical Advisory Committee, the Active Transportation Program Technical Advisory Committee and active transportation emphasis areas
- Support regional safety efforts including the development of Vision Zero policies and plans
- Support bicycle and pedestrian safety as part of SCAG's Sustainable Communities Program
- Analyze shared use of sidewalks between different modes (bicyclists, pedestrian's e-scooters) and the impacts on personal safety (e.g. dockless devices blocking foot traffic or other conflicts when riding near pedestrians)
- Advocate for funding strategies that reflect unique local needs

HIGHWAY & ARTERIAL NETWORK

Southern California's highway and arterial system functions as the backbone of the larger transportation network. Most trips in our region are still made on our highways and arterials. The network provides access to employment, health, social and educational services among others. Yet, expansion of our highways

and arterials has slowed down over the past decade. Building new roads is no longer accepted as the only solution to our congestion challenges, partly due to lack of funding and challenging environmental and community concerns. However, given that critical gaps and congestion choke points still exist in the system, improvements beyond those that are operational in nature still need to be considered. Connect SoCal includes capital improvements that will address the choke points and gaps in the system, to ensure the system is operating optimally and provides adequate and equitable access to opportunities.

SCAG works with partner implementing agencies to prioritize projects that preserve and optimize the existing highway and arterial network. A sample of major committed projects included in Connect SoCal are highlighted in **EXHIBIT 3.2** and **TABLE 3.2**. Projects include interchange improvements, auxiliary lanes, general purpose lanes, carpool lanes, toll lanes and Express/HOT lanes. The complete list of projects can be found in the Project List Technical Report. In addition to the financially constrained list (projects for which funds are identified in the plan) of projects, the Project List Technical Report also contains an unconstrained list of projects, also known as strategic projects, for illustrative purpose. Strategic projects are those projects that the region believes merits future consideration for inclusion in the financially constrained plan as the funding becomes available and the consensus for the projects are further developed through future studies.

Our region boasts one of the most comprehensive High Occupancy Vehicle (HOV) Lane systems in the nation. However, there are still gaps in the system that we must continue to close. As part of Connect SoCal, strategic HOV gap closures, direct highway-to-highway HOV connectors, and HOV direct access ramps need to be built to complete the system.

Our region's arterials and local road system accounts for more than 80 percent of the total road network and they carry a majority of overall traffic. A number of arterials run parallel to major highways and can provide alternatives to them. Beyond motor vehicles, our arterials serve transit and active transportation. As part of Complete Streets initiatives, improvements such as bicycle lanes, sidewalks, lighting, landscaping, and ADA compliant measures are shifting focus on arterials towards considering multiple users – while also providing a greater sense of place.

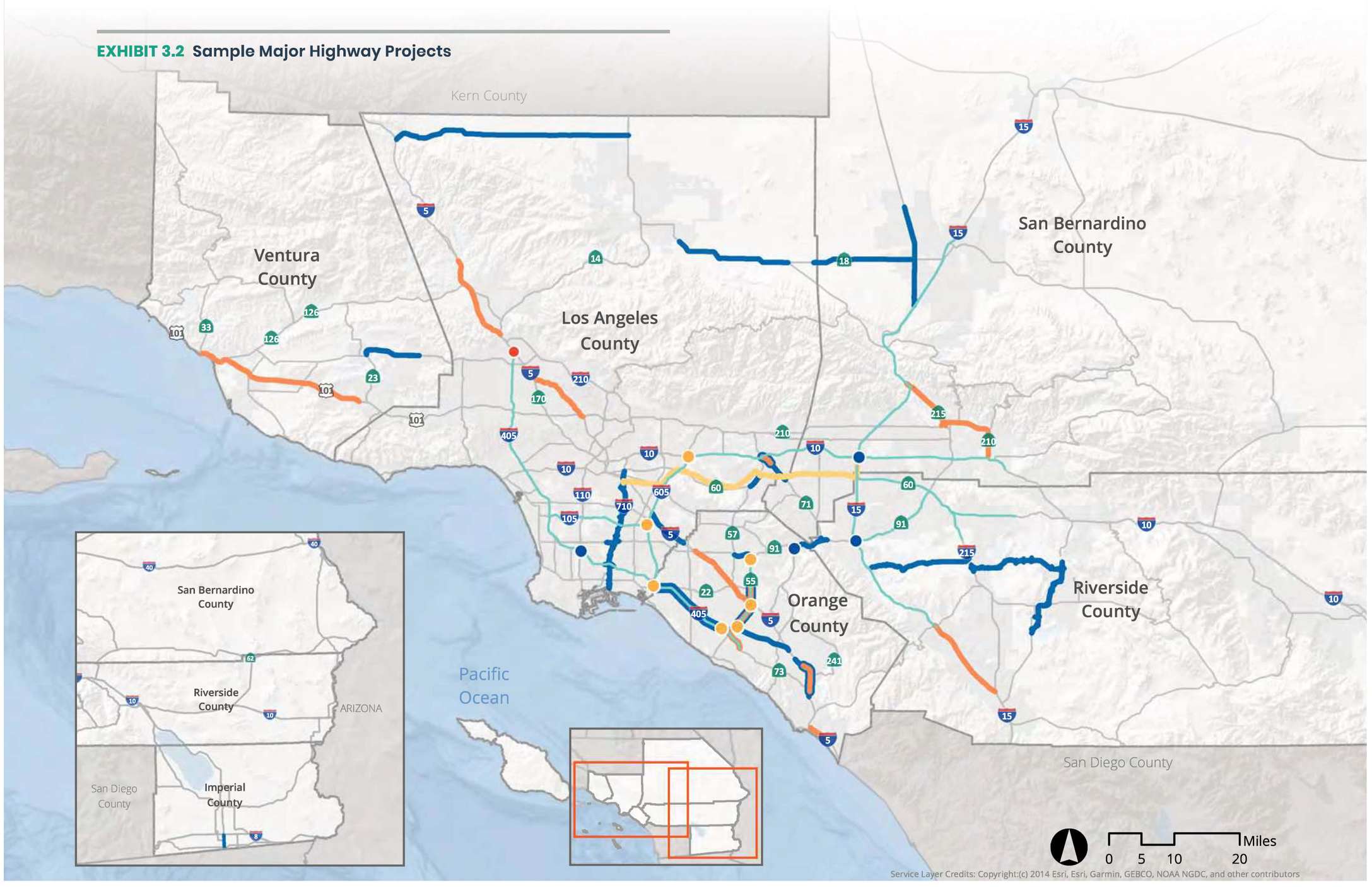
The Highway and Arterial improvements in Connect SoCal are guided by the following framework and guiding principles:

- Protect and preserve what we have first, supporting 'Fix it First' principle, including the consideration of life cycle costs beyond construction
- Support continued system preservation funding and augment as necessary
- Focus on achieving maximum productivity through strategic investments in system management and demand management
- Focus on adding capacity primarily (but not exclusively) to:
  - Close gaps in the system
  - Improve access where needed
- Support policies and system improvements that will encourage the seamless operation of our roadway network from a user perspective
- Consider safety in all roadway improvement projects
- Assure that any new roadway capacity project is developed with consideration and incorporation of congestion management strategies, including demand management measures, operational improvements, transit and ITS.
- Focus on addressing non-recurring congestion with new technology
- Implement Complete Streets consistent with California's Complete Streets Act

REGIONAL EXPRESS LANE NETWORK

Consistent with the system management pyramid, the regional express lane network integrates congestion pricing to optimize existing capacity on freeways and offer users greater travel time reliability and choices. Express lanes when appropriately priced to reflect demand can outperform non-priced lanes in terms of throughput, especially during congested periods. Express lanes operate on the principle of congestion pricing – when more vehicles are using those lanes, the price increases accordingly to manage congestion in the lanes. Express lanes and toll roads generate revenues that fund construction and operation of the facilities, and can relieve air pollution and GHG emissions associated with congestion.

EXHIBIT 3.2 Sample Major Highway Projects



- Planned HOV Connectors
- Planned HOT Direct Connector
- Planned HOV-to-HOT Direct Connector Conversion
- Planned Mixed Flow Lanes
- Planned HOV Lanes
- Planned Express Lanes
- Planned Freight Corridor

Source: SCAG, 2019

TABLE 3.2 Sample Highway Projects

	County	Route	Description	Completion Year	Project Cost ($1,000's)
MIXED-FLOW LANES	Imperial	SR-111	Widen and improve to six-lane freeway with interchanges at Heber, McCabe, and Jasper and overpass at Chick Rd.	2030	$999,136
	Los Angeles	SR-57/SR-60	Route 57/60 Confluence Chokepoint Relief Program.	2026	$300,000
	Los Angeles	I-710	Add one mixed-flow lane in each direction between Shoreline Dr and SR-91 and between I-105 and SR-60, plus add 2 truck lanes between Willow St and Del Amo Blvd.	2035	$5,941,000
	Orange	SR-55	Add one mixed-flow lane in each direction and fix chokepoints from I-405 to I-5 and add one auxiliary lane in each direction between select on/off ramps and operational improvements through project limits.	2025	$410,907
	Orange	SR-91	Add eastbound mixed-flow lane from SR-57 to SR-55, add one westbound mixed-flow lane from Kraemer to State College, improve interchanges and merging from Lakeview to Raymond, and auxiliary lanes in certain segments.	2030	$456,190
	Orange	I-405	Add one mixed-flow lane in each direction from I-5 to SR-55 and southbound auxiliary lane from SR-133 to Irvine Center Drive.	2034	$323,600
	Orange	I-405	Add one mixed-flow lane in each direction, convert existing HOV lane to HOT lane, add one additional HOT lane in each direction from SR-73 to I-605.	2026	$1,900,000
	Ventura	SR-118	Add one lane each direction from RT-23 to Tapo Canyon Rd.	2031	$216,463

TABLE 3.2 Sample Highway Projects - Continued

	County	Route	Description	Completion Year	Project Cost ($1,000's)
EXPRESS LANES	Los Angeles	I-405	Add I-405 Express Lanes from I-105 to I-110.	2028	$71,560
	Los Angeles	I-405	Add I-405 Express Lanes from I-110 to LA/Orange County Line.	2028	$110,390
	Los Angeles	I-105	Add I-105 Express Lane from I-405 to Studebaker.	2027	$520,900
	Los Angeles	I-405	Sepulveda Pass (Ph 1) ExpressLanes.	2027	$260,000
	Los Angeles	I-10	Add I-10 Express Lanes from I-605 to LA/San Bernardino County Line.	2028	$196,840
	Los Angeles	I-405	Add I-405 Express Lanes from I-10 to I-105.	2028	$70,880
	Los Angeles	I-605	I-605 Express Lanes from I-105 to Orange County Line.	2031	$100,850
	RIVERSIDE	I-15	Add two Express Lanes in each direction from Cajalco Rd to SR-74.	2027	$544,000
	San Bernardino	I-15	Add two Express Lanes in each direction from I-215 to US-395	2040	$687,994
	San Bernardino	I-15	Add one Express Lane in each direction from US-395 to High Desert Corridor (Segment 5)	2045	$194,662
	San Bernardino	I-10	Implement 2 Express Lanes from I-10/I-15 interchange to California St. and 1 Express Lane from California St. to Ford St.	2024	$1,214,607
	Los Angeles	SR-71	Add one HOV lane and one mixed-flow lane from Rt-10 to SB County Line.	2028	$326,392
	Riverside	I-15	Add one HOV lane in each direction from SR-74 to I-15/I-215 interchange.	2039	$375,664
	San Bernardino	I-215	Add one HOV lane in each direction from SR-210 to I-15.	2035	$249,151
	Ventura	US-101	Add one HOV lane in each direction from LA/VEN County Line to SR-33.	2040	$700,000

The regional express lane network included in Connect SoCal builds on the successful implementation of the I-10 and I-110 Express Lanes in Los Angeles County and the recent extension of the SR-91 Express Lanes between Orange and Riverside Counties. Additional efforts underway include planned express lanes on the I-105 in Los Angeles County, the I-15 in Riverside County, the I-15 and the I-10 in San Bernardino County and the I-405 in Orange County and Los Angeles County. **EXHIBIT 3.3** displays the segments in the proposed regional express lane network.

GOODS MOVEMENT

Global supply chains are interconnected, and changes in one area have subsequent and far-reaching ripple effects on transportation networks. This is especially true in the SCAG region, which serves as the premier trade gateway for the U.S.

Since the 2016 RTP/SCS, several new paradigms have emerged that are reshaping the way the region addresses goods movement issues. E-commerce has been a core driver affecting all aspects of regional goods movement by facilitating increased cargo volumes, fostering both the development and turnover of industrial establishments, changing consumer habits, causing shifts in labor forces, and paving the way for new technologies in logistics. The region is also positioning itself to address the challenges that will be brought by new technologies like automation and its corollary impacts on the regional goods movement workforce. Balancing traditional goods movement concerns and opportunities with emerging challenges, SCAG has developed key strategies to realize a regional vison that maintains regional economic competitiveness, promotes job creation and retention, increases freight mobility and safety, and mitigates environmental impacts. Specific details of goods movement challenges and strategies can be found in the Goods Movement Technical Report.

Infrastructure Investments to Improve Freight Mobility

Capturing the benefits that accompany goods movement means ensuring that regional businesses have access to and increased mobility on key goods movement corridors and networks. Improving efficiency on the transportation system will help contain the rising costs of goods and services that may be passed on to consumers. Connect SoCal identifies a significant number of infrastructure investments to assure that the region continues to be the leading trade gateway in the U.S. It does this by supporting physical improvements in the marine terminals, highways, intermodal terminals, railroad mainlines, access routes, airports and international land border crossings that make up the goods movement network.

Last-Mile Freight

Last-mile delivery represents the final leg for goods to reach customers. These deliveries happen in complex environments, including high-density regional locations, involve sophisticated interactions among physical infrastructure and often compete for limited public space with other modes. Ensuring that freight is properly included in policy considerations and street design necessitates tailored and nuanced strategies involving multidisciplinary approaches as identified in Connect SoCal.

Workforce Development

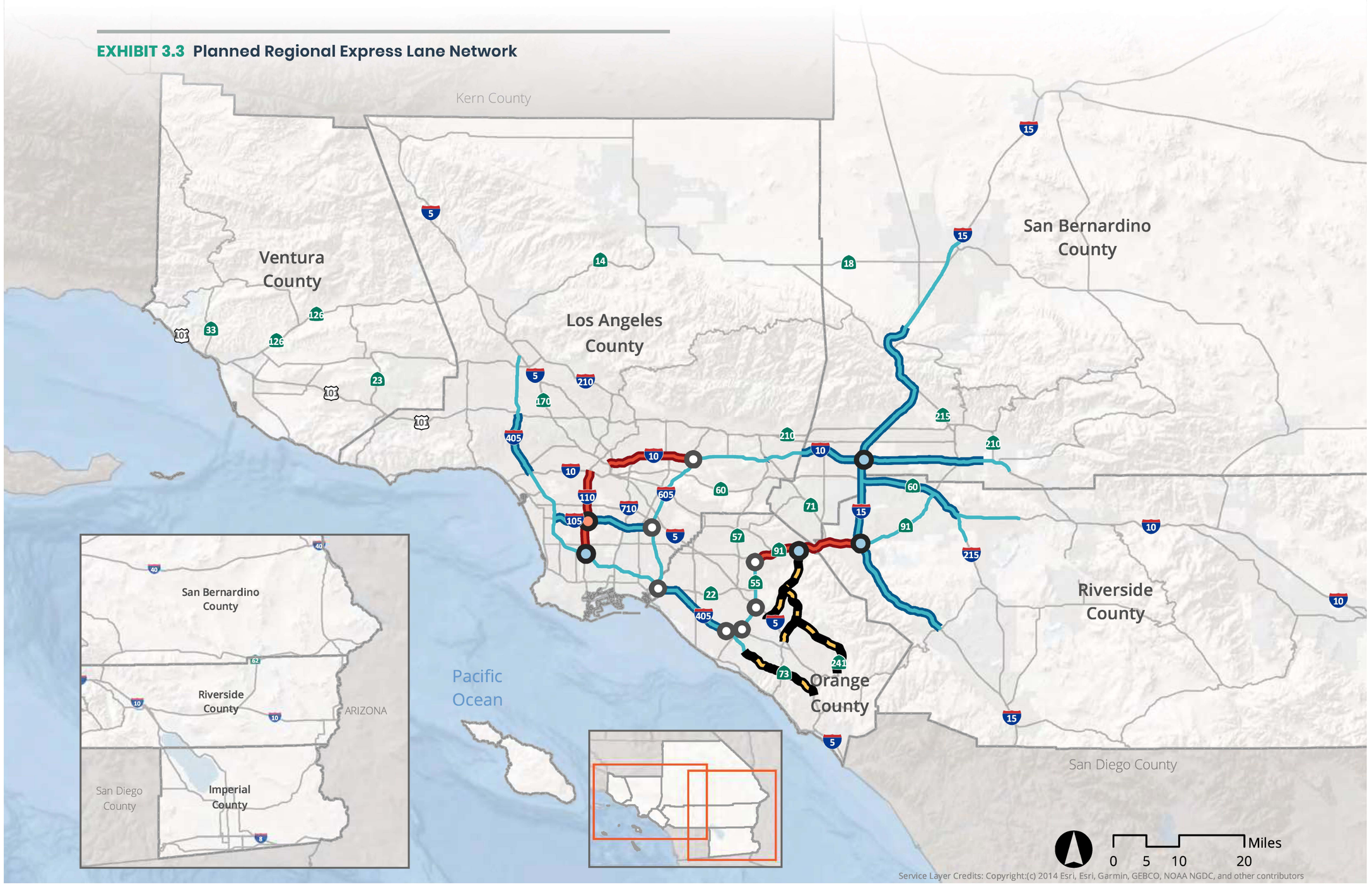
Changing supply chains, automation and new technologies, and increasingly competitive wages from other sectors, will place growing pressure on goods movement related businesses to find qualified workers without raising costs and ensure the availability of jobs that have traditionally provided well-paying jobs to lower-skilled workers. Connect SoCal supports regional programs that raise awareness of the issue, reposition the image of goods movement jobs to accurately reflect career mobility for goods movement jobs, promote increased participation by younger workers and improve access for workers.

Truck Bottleneck Relief Strategy

In 2016, California had the third-highest cost of truck congestion behind Texas and Florida at nearly $5.1 billion and five of the top 100 truck bottlenecks in the nation. With driver wages and fuel costs representing more than 50 percent of total motor carrier costs, truck congestion has major impacts on the bottom line of the trucking industry. Truck bottlenecks are also emission “hot spots” that generally have significantly degraded localized air quality because of increased idling. Connect SoCal identifies 48 truck bottlenecks in the region and allocates an estimated $5 billion toward strategies that relieve them, such as:

- Ramp metering
- Extending merging lanes
- Improving ramps and interchanges
- Adding auxiliary lanes

EXHIBIT 3.3 Planned Regional Express Lane Network



Existing Express Lanes

Existing Toll Roads

Planned Express Lane Network

Planned Dual-Lane Segments

Existing Express Lane Direct Connector

Planned Express Lane Direct Connector

Planned HOV-to-Express Lane Direct Connector Conversion

Source: SCAG, 2019



CORE VISION
GOODS MOVEMENT

The efficient movement of goods is critical to a strong economy and improves quality of life in the SCAG region by providing jobs and access to markets through trade. However, increased volumes of goods moving across the transportation system contribute to greater congestion, safety concerns and harmful emissions. It is critical to integrate land use decisions and technological advancements to minimize environmental and health impacts while fostering continued growth in trade and commerce.

PROGRESS SINCE 2016

Adoption of the Clean Air Action Plan Update in 2017. Since inception in 2006, the Ports have reduced air pollution from harbor trucks alone by more than 90 percent.

Selection of a Locally Preferred Alternative for the I-710 South Recirculated Draft EIR/Supplemental Draft EIS.

Twenty-five regional grade separations have been completed and opened to traffic, reducing delays and emissions from idling vehicles, and addressing noise and safety concerns.

Near completion of the Gerald Desmond Bridge (completion 2020).

Expansion of the international POE in Calexico.

PLANNING FOR 2045

Connect SoCal includes expanded railyards, additional mainline railroad tracks, grade separations, improved port terminals and truck bottleneck relief projects, including dedicated truck lanes.

Connect SoCal addresses drivers of change such as e-commerce, new technologies, shifts in trade policies, last-mile delivery and the move to a near-zero and zero-emissions system.

Industrial Warehouse & Distribution Centers

Southern California is home to the largest industrial warehouse cluster in the nation, with well over 1.2 billion square feet of industrial space. SCAG will continue efforts to provide the most updated data on industrial warehouse building square footage and conduct further analyses to better reflect changes in industrial land uses, truck industry service types, and equipment usage for truck terminals due to e-commerce. This includes consideration of new area sub-category classifications such as seaport and air cargo terminals, and rail intermodal and classification yards. By further understanding industrial facilities, SCAG will be more equipped to explore strategies that support the effective integration between goods movement needs and regional land use patterns.

Goods Movement Environmental Strategy

Much of the SCAG region (and nearly all of the urbanized area in the region) does not meet federal ozone and fine particulate air quality standards, and goods movement is a major source of greenhouse gas emissions. With growing demand to quickly deliver goods to consumers, the region will need to aggressively pursue the reduction of freight emissions that contributes to regional air pollution problems and localized “hot spots” that have adverse health impacts. Connect SoCal proposes an environmental strategy to address the air quality impacts of goods movement, while also allowing for the efficient and safe movement of goods throughout the region. A critical component of this strategy is the integration of advanced technologies that have benefits such as air quality improvements, energy security and economic growth opportunities. Connect SoCal articulates a process to accelerate the development and deployment of effective technologies, along with key action steps, to help the region reduce dangerous pollutants as much as possible. While this plan focuses on getting cleaner vehicles on the road quickly, this must be done with full life-cycle consideration of production, use and disposal impacts. This plan reaffirms zero and near-zero emission technologies as a priority, describes progress to date, and outlines a framework and key action steps to reach that goal. The process, framework, and action steps can be found in the Goods Movement Technical Report.

AVIATION

SCAG, by definition, is primarily a regional surface transportation planning agency. Therefore, SCAG is focused on air passenger and cargo activity from the perspective of how the traffic coming and going from the airports affects the region's roads, highways, and transit systems, and how to improve ground transportation access to the airports. On a basic level, SCAG maintains an updated list of airport ground access improvements. However, SCAG has and will continue to play a role in terms of aviation systems research, planning and analysis, as well as encouraging collaboration and communication amongst the region's aviation stakeholders.

In order to best plan for and assess the impacts of air passenger and cargo activity on the region's surface transportation system, SCAG takes a comprehensive, collaborative and empirical analytical approach to regional transportation planning. **TABLE 3.3** summarizes passenger and air cargo demand in 2045 at each of the current and future commercial airports within the SCAG region. These forecasts were developed through a collaborative process working with each of the airports individually as well as collectively through the Aviation Technical Advisory committee (ATAC). The estimated future demand at each of the airports informs the transportation improvement needs.

Work with Airports & Transportation Agencies on Airport Ground Access Projects

The airports in the SCAG region are currently working with federal, state, and local transportation agencies, and private partners, to improve airport ground access and infrastructure. SCAG maintains an updated list of the various airport ground access improvement projects and works with the airports to assist with data collection and assist with agency coordination.

Currently, Los Angeles World Airports (LAWA) is completing the Landside Access Modernization Program (LAMP) project and is in the planning and environmental phases for the Airfield and Terminal Modernization (ATM) program. Both the LAMP and ATM projects address ground access and airport modernization at LAX. The LAMP project will include the Automated People Mover, two Intermodal Transportation Facilities, a Consolidated Rental Car Facility and a series of comprehensive roadway improvements designed to alleviate traffic congestion in and around the airport.

Hollywood Burbank Airport has recently completed transit and rail infrastructure projects to improve ground access, including the Regional Intermodal Transit Center (RITC), and is currently in the planning process for a new airport terminal. While Burbank is currently the only airport with direct rail access to the airport, the City of Ontario and the San Bernardino County Transportation Authority have formally initiated the planning process for new Metrolink connections to the Ontario International Airport.

TABLE 3.3 SCAG Region Airport Passenger Forecast for 2020–2045

Major SCAG Region Airports	2017 (Base Year) Actual Activity (in millions)	2045 (Horizon Year) Projection (in millions)
Total SCAG Region	110.17	197.14
Burbank	4.74	9
Imperial	0.012	0.3
Los Angeles	84.56	127
Long Beach	3.783	5.5
Ontario	4.552	33
Oxnard	0	0.3
Palmdale	0	1.82
Palm Springs	2.1	5
Riverside	0	0.61
San Bernardino	0	1.81
Orange County	10.423	12.5
So Cal Logistics	0	0.3

Source: The airport activity numbers for 2017 and the airport forecast numbers for 2045 were obtained from the airports.

Effective Analysis & Planning

Rigorous data collection, research and analysis is critical for effective regional planning, including planning for ground access to and from the region's airports. The ongoing development of the SCAG region's surface transportation system, especially as it relates to the airports in the face of growing air passenger and cargo demand, will require that all key partners maintain and have access to quality data on aviation passenger and cargo trends.

Much of that research and analysis will continue to be provided by the aviation and transportation stakeholders in the region in the form of data, activity reports, passenger surveys and other agency-initiated reports, studies and working groups. However, in addition to the agency-led efforts, the SCAG Aviation Program will begin designing and initiating studies (e.g. air passenger surveys, airline airport choice studies) that will help inform airport and transportation planners in the region. To this end, in order to ensure that there is not unnecessarily overlap and that the research represents the interests and goals of the aviation stakeholders, SCAG will continue a comprehensive and collaborative planning approach by working with the airports, transportation commissions and agencies, state agencies, federal agencies and other aviation and transportation stakeholders.

The data collection and analysis for the different research projects will be open, transparent and collaborative processes. At the core of the SCAG Aviation Program's efforts will be to continue to facilitate effective research, analysis, and planning through information sharing and open communication.

Ongoing Communication & Collaboration Between Airports, Transportation Agencies & Government

The SCAG Aviation Program will act as a facilitator of working relationships and discourse between aviation and transportation planning agencies and officials in the region. Although SCAG has no regulatory, planning, or operational authority over the airports, as a metropolitan planning organization, SCAG is encouraged by federal statute to consult and collaborate with transportation stakeholders, including airport officials. In an effort to encourage effective planning for the coming growth in air passenger and cargo demand, the SCAG Aviation Program has provided and will continue to provide a critical collaborative planning function. Whether it is through the ATAC, attendance at conferences and working group meetings, and meeting with airports and government agencies, the SCAG Aviation Program will continue to play a critical role in building bridges and partnerships across the region.

TECHNOLOGICAL INNOVATIONS & EMERGING TECHNOLOGY

Emerging technologies in transportation and mobility are primarily developed and advanced by the private sector, and it is important that public agencies monitor the development of such innovations. Emerging technology in transportation and mobility are themes threaded throughout Connect SoCal. SCAG has completed wide-ranging analysis of recent and emerging technologies principally associated with light-duty vehicles that could potentially impact travel behavior and location choices in the region over the next 25 years. However, these new technologies will have diverse impacts, affecting everything from goods movement to transit.

Connect SoCal recognizes that many of these new technologies provide consumer solutions and have been embraced by the public as evidenced by the proliferation of smartphones, mobile banking, navigational apps and social networking. Emerging technology such as ride-hailing, carshare, e-bike and e-scooters provide more choices, including a range of affordable mobility options for travelers. Some niche ride-hailing companies also serve special markets such as children, healthcare transportation and concierge service for elderly customers. Improvements in regional mobility will therefore likely be derived from how technology is used, rather than from any individual technological development.

By providing more options for local and regional trips, emerging technologies may shift trips to less environmentally damaging modes, minimize negative environmental externalities associated with current vehicle use, increase system efficiency, improve safety, and reduce auto-related collisions and fatalities. Moreover, strategies to harness the benefits of emerging technologies to advance Connect SoCal goals are viewed through the lens of improving health, safety, and equity and mobility outcomes for all the region's residents.

To stay informed on emerging technologies as they develop, SCAG regularly communicates with institutions of higher learning, metropolitan planning organizations from around the country, county transportation commissions, local jurisdictions, economic development entities and chambers of commerce.

SCAG has prepared a set of recommended policies that are included in the Connect SoCal Emerging Technology Technical Report. Those policies represent examples that SCAG could help local jurisdictions to adopt. The policies would need to be studied and customized to fit local context. In addition to recommended policies, Connect SoCal proposes programs that encourage the deployment of selected technologies to improve mobility and reduce GHGs. These programs support the Key Connections strategies 'Accelerated Electrification' and 'Shared Mobility and Mobility as a Service (MaaS)'.

PROTECTING THE ENVIRONMENT

Integrating the many transportation and land use strategies discussed in this chapter will help protect the region's natural environment—in numerous ways. SCAG has been committed to this integration, as well as protecting the environment, for years. However, environmental protection is now a major requirement of Moving Ahead for Progress in the 21st Century Act (MAP-21/FAST Act). Pursuant to Section 23 U.S. Code Section 134, "a long-range transportation plan shall include a discussion of types of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan." Connect SoCal also considers and is consistent with the provisions of the Fixing America's Surface Transportation Act (FAST Act). As part of the planning process, MPOs "shall consult, as appropriate, with State and local agencies responsible for land use management, natural resources, environmental protection, conservation and historic preservation concerning the development of the transportation plan." They also must consider, if available, "state conservation plans or maps" and "inventories of natural or historic resources."

ENVIRONMENTAL MITIGATION PROGRAM

Connect SoCal includes an environmental mitigation program that links transportation planning to the environment. Building on its strong commitment to the environment as demonstrated in the previously conducted 2016 RTP/SCS, SCAG's mitigation program is intended to function as a resource for lead agencies to consider in identifying mitigation measures to reduce impacts anticipated to result from future projects as deemed applicable and feasible by such agencies. This mitigation discussion also utilizes documents created by federal, state and local agencies to guide environmental planning for transportation projects.

Connect SoCal in some aspects acts as a "self-mitigating" plan in certain impact areas, in that its policies and strategies lead to improved environmental outcomes for air quality, GHG emissions, public health, congestion and other indicators, while accommodating existing and projected population growth, among other key environmental indicators compared to the No Project Alternative (Trend Scenario). Nevertheless, the implementation of plan programs, policies and strategies may lead to additional environmental impacts compared to existing conditions.

As a public agency in California, SCAG also fulfills mitigation requirements by preparing a Program Environmental Impact Report (PEIR), pursuant to the California Environmental Quality Act (CEQA). The PEIR evaluates potential environmental impacts of Connect SoCal when compared with existing conditions and proposes measures at the program level to mitigate impacts to the maximum extent feasible for those resource areas that would be affected by the plan.

MITIGATION MEASURES

SCAG is responsible for developing a plan to monitor mitigation activities to track progress on implementation of these measures at the regional level. SCAG's mitigation is consistent with the general role played by a metropolitan planning organization, including developing and sharing information, collaborating with partners and developing regional policies.

Senate Bill 375 states that nothing in a SCS supersedes the land use authority of cities and counties and that cities and counties are not required to change their land use policies and regulations, including their general plans, to be consistent with the SCS or an alternative planning strategy (Government Code Section 65080(b)(2)(K)). Cities and counties have plenary authority to regulate land use through their police powers granted by the California Constitution, art. XI, §7, and under several statutes, including the local planning law (Government Code Sections 65100-65763), the zoning law (Government Code Sections 65800-65912), and the Subdivision Map Act (Government Code Sections 66410-66499.37). SCAG has no concurrent authority/jurisdiction to implement mitigation related to land use plans and projects.

KEY CONNECTIONS

SMART CITIES & JOB CENTERS

BIG DATA & VIRTUAL INFRASTRUCTURE

Smart Cities connect people, vehicles and infrastructure, allowing them to communicate in “real-time” through regional telecommunications networks. The Smart Cities and Job Centers strategy aims to catalyze investments across sectors to make “virtual access” a cost-effective and reliable option for all types of trips, expanding the air quality, congestion and VMT reduction benefits the region already realizes through teleworking. While Smart Cities strategies can be deployed universally, virtual access is particularly beneficial in rural communities where destinations are far apart.

Connect SoCal specifically envisions intensified deployment in sub-regional job centers to encourage more growth of both jobs and housing in areas with already high employment density. The Smart Cities and Job Centers strategy enables this by using integrated information and communication technologies to improve the efficiency and performance of the transportation system. It incorporates transit demand management (TDM) measures that encourage carpooling and transit, and parking strategies that reduce the cost to build new employment facilities within job centers. Also, this strategy builds upon promising trends in “co-working” to promote alternatives for long-distance commuters who prefer not to telecommute. Strengthening these locally significant employment centers allows the region to capitalize on the economic and mobility benefits of compact development, where housing and jobs are closer together.

PROMISING PRACTICES

South Bay Fiber Network
Development of a regional broadband fiber-optic network to support improved management of transportation systems and transportation demand management.

SCAG Future Communities Pilot Program
Partnership with the Mobile Source Air Pollution Reduction Review Committee to provide local technical assistance grants supporting data and technology solutions to reduce VMT through enhanced city services and mobility programs.

PLANNING FOR 2045

To replace vehicle trips with virtual access and realize greenhouse gas reductions savings through the deployment of “smart” technologies, SCAG will continue to research and advance Smart Cities strategies including by:

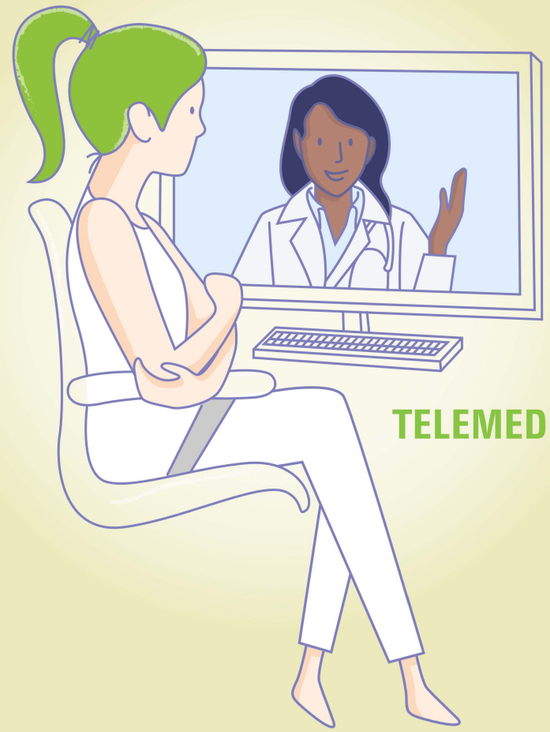
- Seeking funding and partners to continue to the Future Communities Pilot Program.
- Expanding research on the Future of Work to increase understanding and advance strategies where technology can substitute for physical trips (via strategies like telecommuting, telemedicine, online learning, e-commerce, and e-government).
- Collaborating with the Inland Empire Regional Broadband Consortium, California Emerging Technology Fund, and others on a Transportation Broadband Strategies Study to help reduce VMT and greenhouse gas emissions.



TELEWORKING



E-GOVERNMENT



TELEMEDICINE

TECHNOLOGY IS CHANGING THE FUTURE OF WORK (AND HELPING REDUCE VEHICLE TRIPS)

KEY CONNECTIONS

SHARED MOBILITY & MOBILITY AS A SERVICE

THE RIGHT TOOL FOR THE JOB

The future of transportation, like so many aspects of living in our region, will be shaped by technology and the ability to customize our choices. The rise of shared mobility and mobility as a service will allow residents to choose how to travel, depending on the time, distance or goal of their trip. "Shared mobility" refers to a broad range of transportation options, such as rental e-scooters and e-bikes, ridesourcing services like Uber and Lyft, and on-demand app-based transit connections provided by vans and shuttles. "Mobility as a service," or MaaS, allows travelers to research and compare different transportation options from one screen and plan their trip accordingly. MaaS will also allow the traveler to book and pay for different segments of a multi-modal trip with one click. This will make it increasingly critical that dense urban areas manage their curb space smartly, in order to ensure safe access for low-speed modes, ridesourcing providers, parking and local deliveries.

PROMISING PRACTICES

TAP Card Integration
You can pay fares on 25 different regional transit systems with just one "Transit Access Pass" (TAP) card

Metro Bike Share / TAP Card Integration
Your TAP card gives you to access 1,500 bikes at over 150 stations across LA County

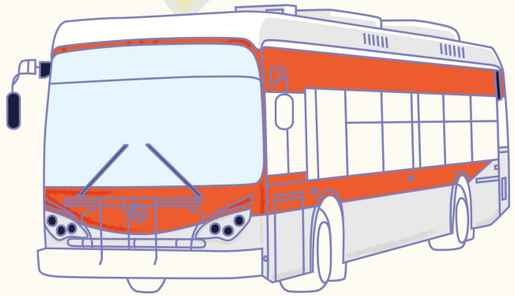
LA Metro Carsharing Integration
Dedicated carsharing spaces are available at 25 Metro stations in LA County

PLANNING FOR 2045

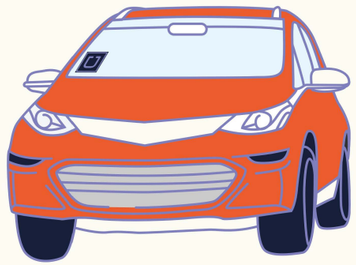
Through regional planning and collaboration, SCAG will advance the vision of shared and seamless travel through MaaS as an alternative to driving alone. Programs to be explored and advanced to realize this outcome through partnership and collaboration could include:

- **GoMonrovia** – City-subsidized ridesharing trips take residents to city's downtown and Metro Gold Line station
- **California Integrated Travel Project (Cal-ITP)** – facilitate multi-modal trip planning and payment to support state goals of increasing transit ridership, reaching environmental targets, lowering costs, creating efficiencies, improving customer experience and promoting equity.
- **Micro-Mobility Pilot Programs** – Developing local regulations helps ensure safety, accessibility, access to data and accountability for new modes of travel
- **Regional Microtransit Pilot Projects** – Testing on-demand transit across the region: OCTA - OC Flex, LADOT - LANow, Anaheim Transit Network - Free Rides Around the Neighborhood, and Metro – Via.

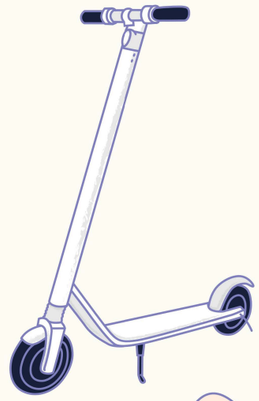




WHICH OPTION WOULD WORK BEST FOR ME TODAY?









With respect to the transportation projects in Connect SoCal, these projects are to be implemented by Caltrans, county transportation commissions, local transit agencies, and local governments (i.e., cities and counties), and not SCAG. Transportation project implementation and land use development decisions are subject to their own environmental review process and are expected to implement project-specific mitigation measures to minimize environmental impacts, as SCAG has no authority/jurisdiction to require these agencies to implement projects nor their mitigation measures.

For the Connect SoCal PEIR, SCAG has taken a performance standards-based mitigation approach that includes:

- SCAG's program level mitigation measures
- Project-level mitigation measures which are within responsibility, authority, and/or jurisdiction of project-implementing agency or other public agency serving as lead agency under CEQA in subsequent project- and site- specific design, CEQA review, and decision-making processes, to meet the performance standards for each of the CEQA resource categories.

Program level mitigation measures have been identified and will be undertaken by SCAG, to offset any identified potentially significant adverse programmatic-level environmental effects. Such measures include public awareness and outreach, agency coordination and feasibility studies.

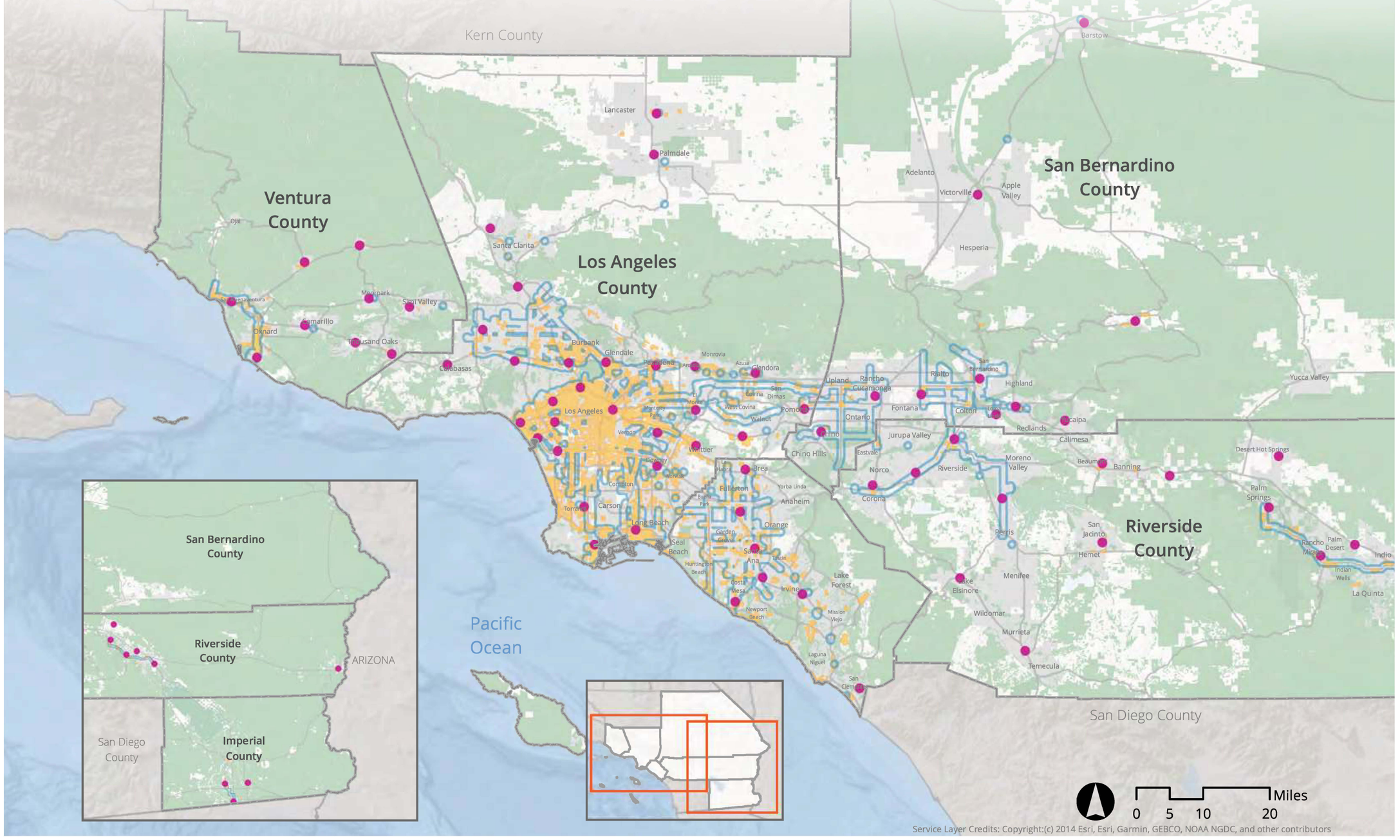
Project level mitigation measures have been identified that "can and should where applicable and feasible" be undertaken by lead agencies that implement transportation projects or projects influenced by land use development patterns. Such measures may include: local safety measures, transportation demand management system, compliance with air management district regulations and others.

The Connect SoCal PEIR identifies program and project-level mitigation measures for the following resource categories:

- Aesthetics
- Agriculture and forestry resources
- Air quality; Biological resources
- Cultural resources
- Energy
- Geology and soils
- Greenhouse gas emissions and climate change
- Hazards and hazardous materials
- Hydrology and water quality
- Land use and planning
- Mineral resources
- Noise
- Population, housing and employment
- Public services
- Recreation
- Transportation, traffic and safety
- Tribal cultural resources
- Utilities and service systems
- Wildfire

For a complete list of mitigation measures and its approach, refer to the Connect SoCal PEIR located at the Connect SoCal website.

EXHIBIT 3.4 Priority Growth Areas & Growth Constraints



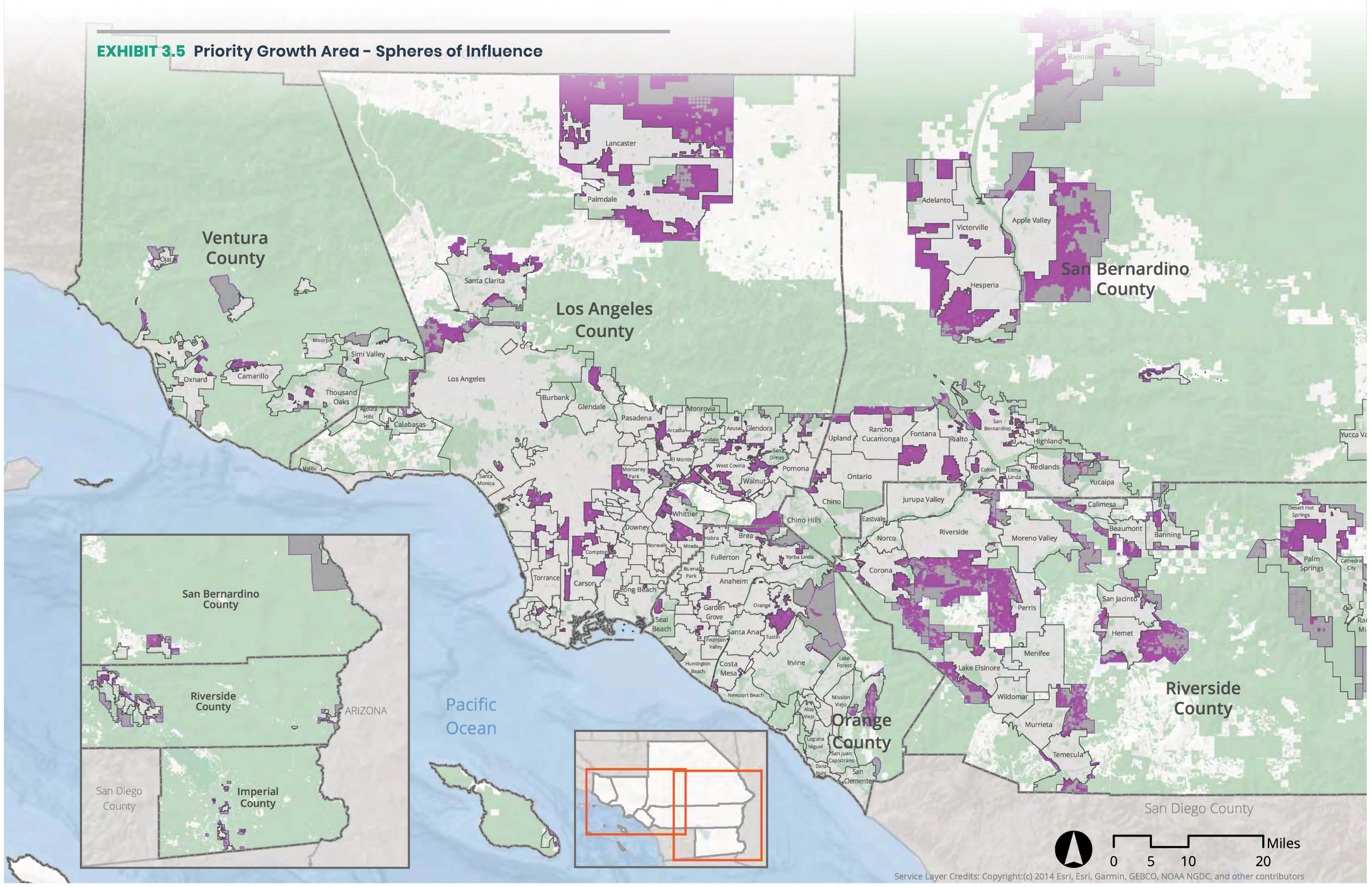
Priority Growth Areas vs. Regional Growth Constraints

- Job Center
- High Quality Transit Area
- Neighborhood Mobility Areas
- Regional Growth Constraints

Note: SCAG used locally informed data elements to determine Regional Growth Constraints including the absolute constraint areas shown in the map such as Tribal lands, Conserved Land and others. See the Sustainable Communities Strategy Technical Report for more details on these and the variable constraints used in plan development.

Source: CalBRACE, California Department of Conservation, CPAD, CCED, County Transportation Commissions, NOAA Coastal Services Center, SCAG, 2019

EXHIBIT 3.5 Priority Growth Area - Spheres of Influence

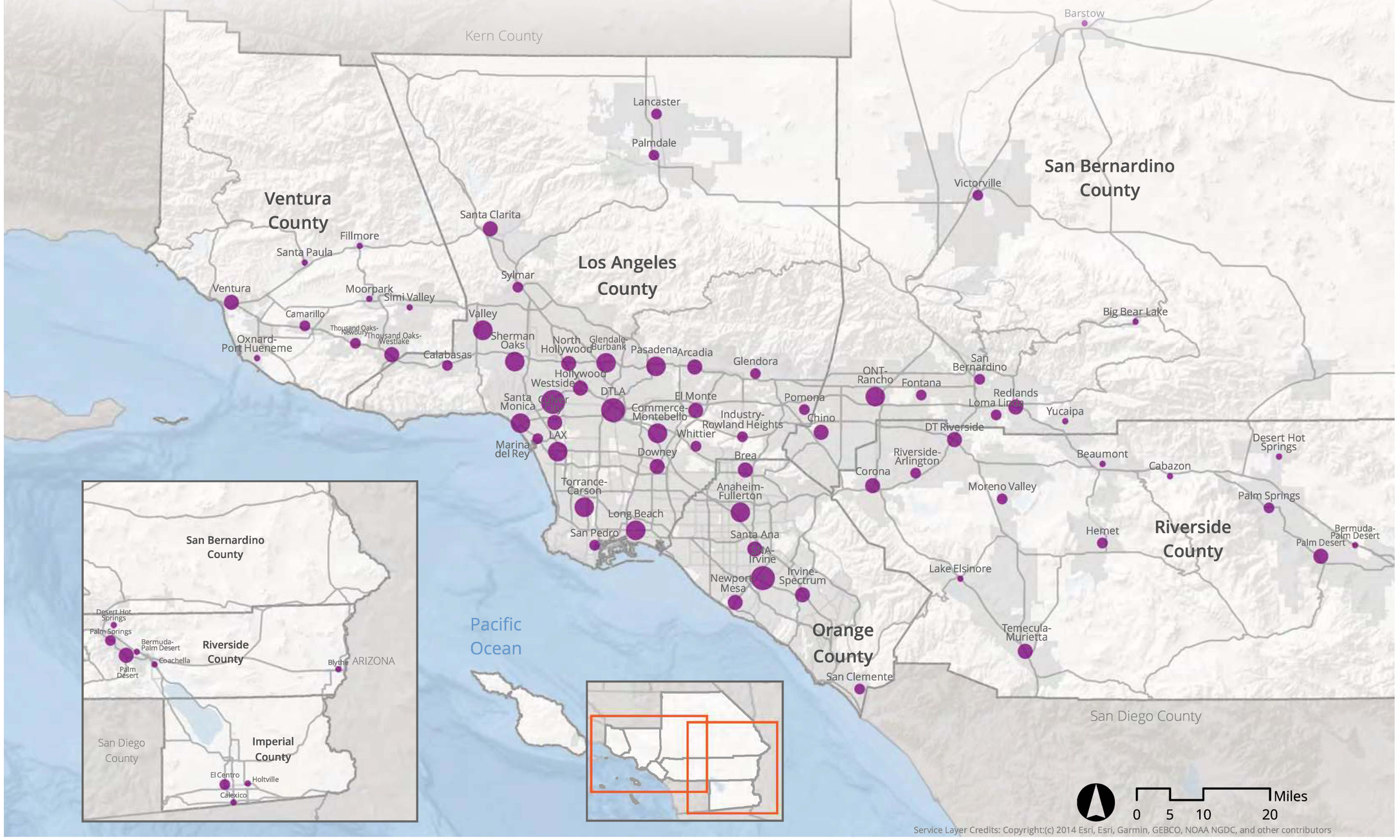


County Boundaries
City Boundaries
Sphere of Influence
Regional Growth Constraints

Source: Counties and local jurisdictions LAFCO in SCAG region, 2018

Note: SCAG used locally informed data elements to determine Regional Growth Constraints including the absolute constraint areas shown in the map such as Tribal lands, Conserved Land and others. See the Sustainable Communities Strategy Technical Report for more details on these and the variable constraints used in plan development.

EXHIBIT 3.6 Priority Growth Area - Job Centers



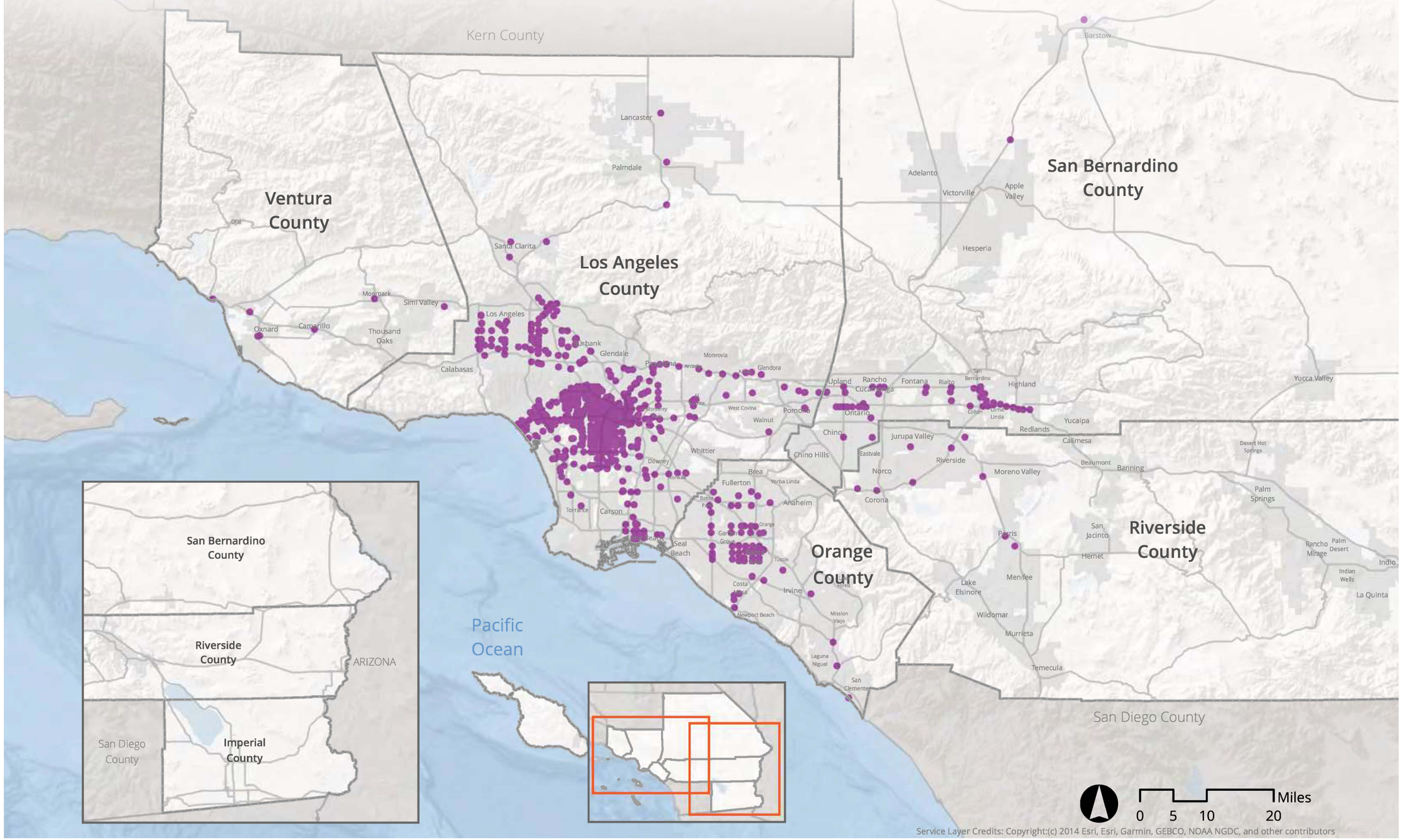
SCAG Region Proposed 2020 RTP/SCS Job Centers (Total Employment)

- Less than 10,001 (17)
- 10,001 - 25,000 (22)
- 25,001 - 50,000 (19)
- 50,001 - 150,000 (11)
- More than 150,000 (3)

Source: SCAG, 2019

Notes:
(1) Centers are areas with denser employment than their surroundings.
(2) Dots represent the total employment in each center, not center boundaries.
(3) Names are intended to be illustrative and may not reflect all the jurisdictions in which a center fully lies.

EXHIBIT 3.7 **Priority Growth Area - Transit Priority Areas**



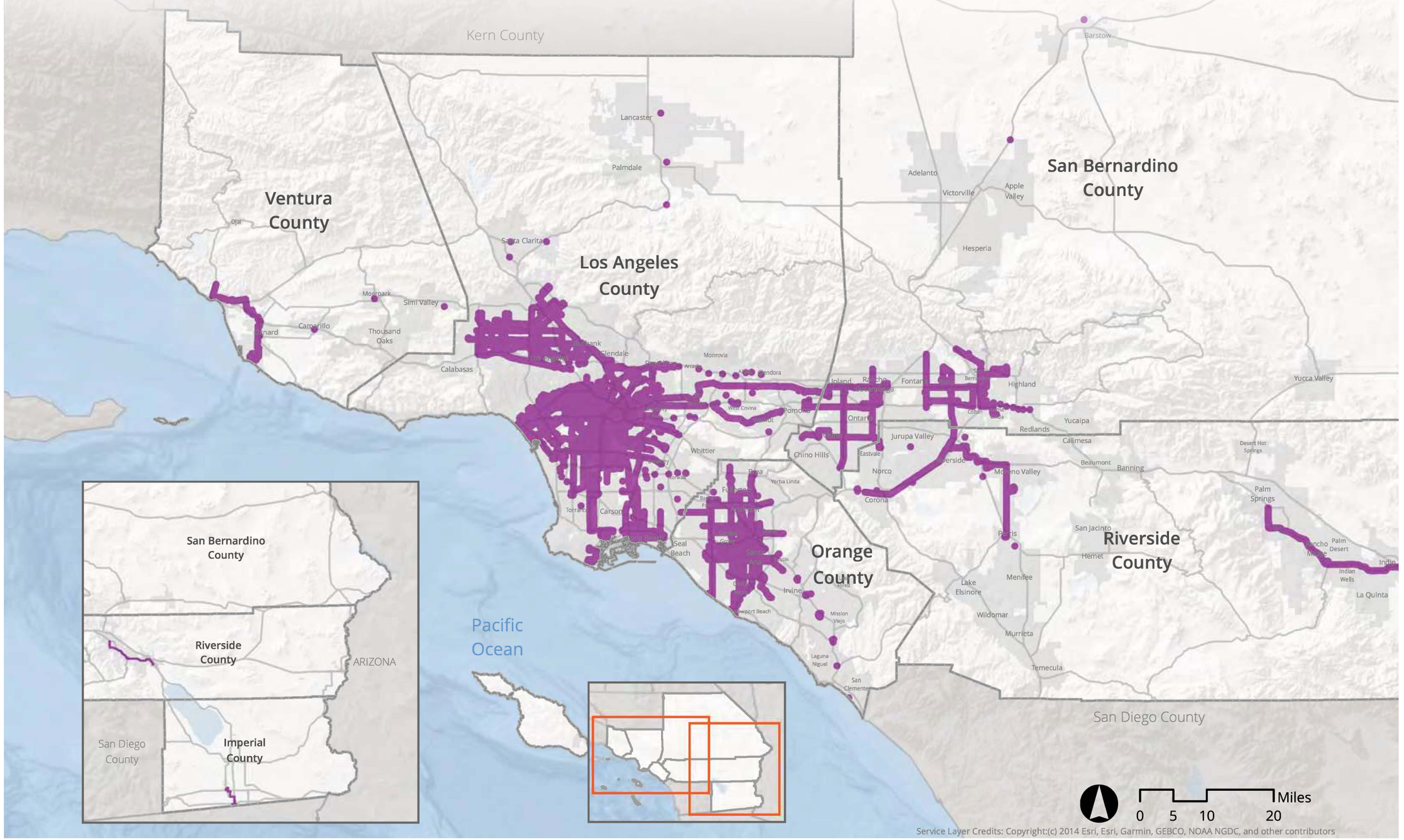
Transit Priority Areas (2045)

TPA

Source: County Transportation Commissions, SCAG, 2019

Note: Transit priority area (TPA) refers to an area within one-half mile of a major transit stop that is existing or planned. SCAG identifies major transit stops and transit priority areas using the methodology described in the Transit Technical Report. Major transit stops are extracted from 2045 plan year data of Connect SoCal.

EXHIBIT 3.8 Priority Growth Area - High Quality Transit Areas



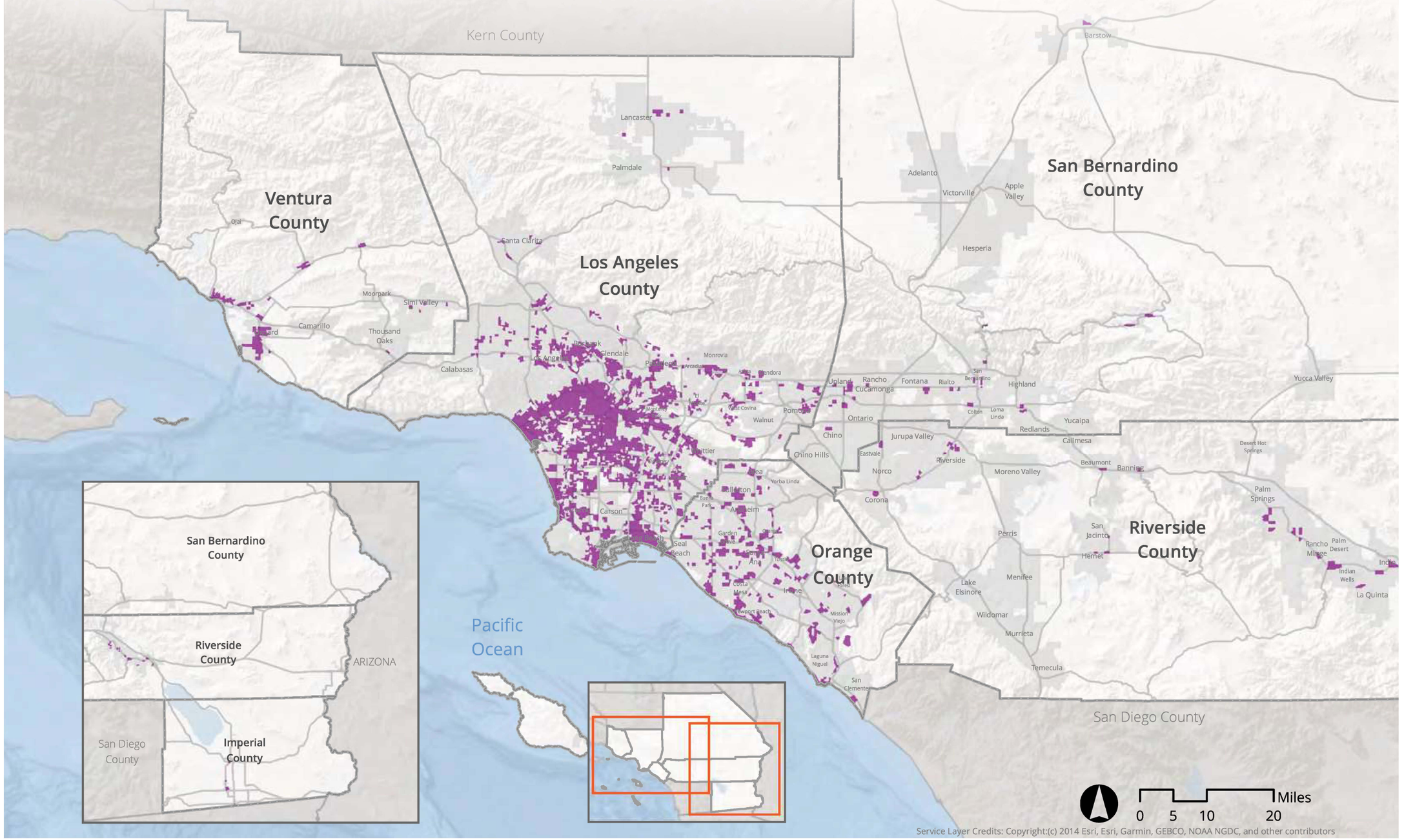
High Quality Transit Areas (2045)

HQTA

Source: County Transportation Commissions, SCAG, 2019

Note: SCAG's High Quality Transit Area (HQTA) is within one-half mile from major transit stops and high quality transit corridors (HQTC). SCAG identifies major transit stops and HQTCs using the methodology described in the Transit Technical Report. Major transit stops and HQTCs are extracted from 2045 plan year data of Connect SoCal.

EXHIBIT 3.9 Priority Growth Area - Neighborhood Mobility Areas



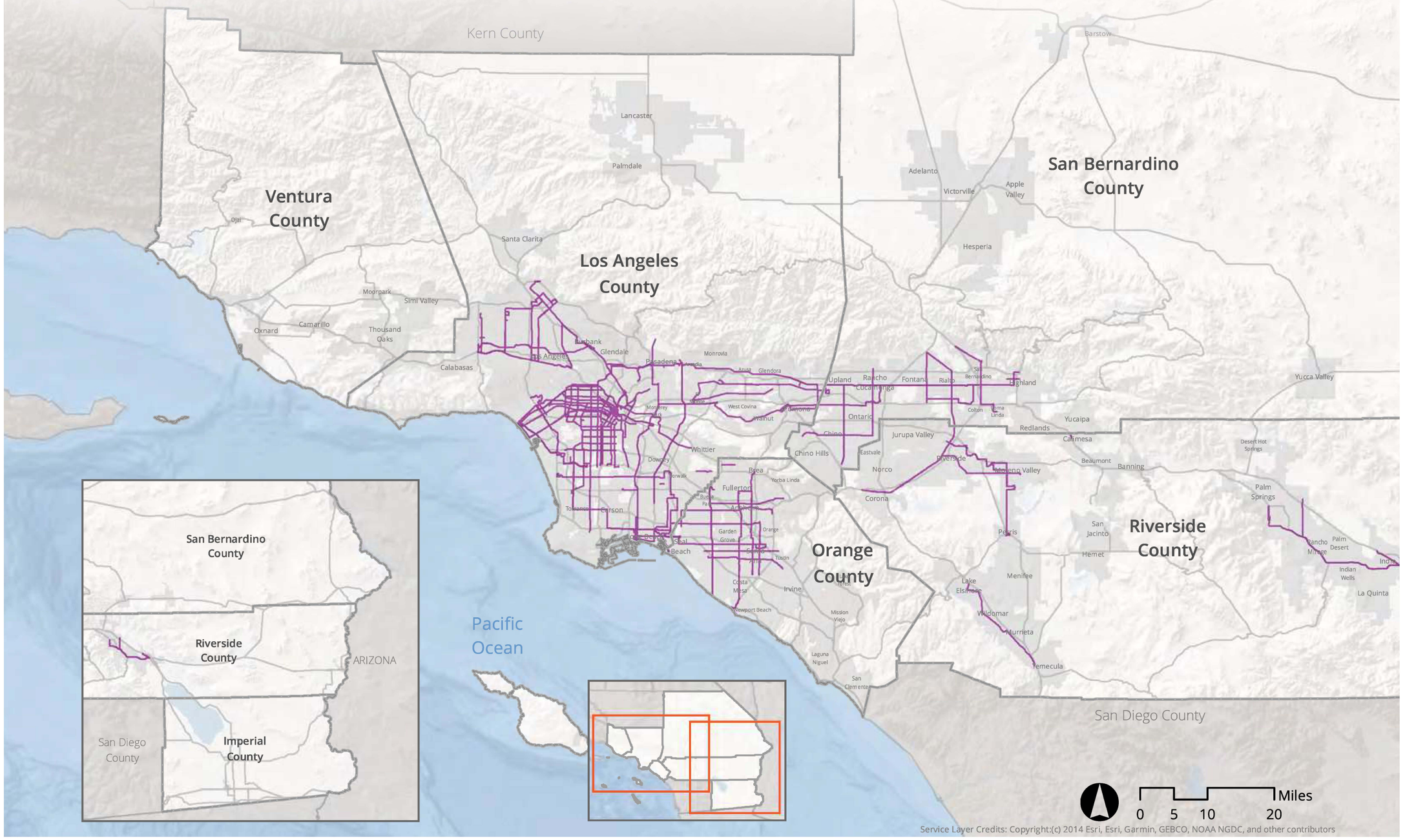
Neighborhood Mobility Areas (NMA)

NMA

Source: SCAG, 2019

Note: Neighborhood Mobility Areas (NMA) were identified by analyzing and assigning z-scores four measures at the Tier 2 TAZ level, and subsequently summing the z-scores. TAZs that scored at the 80th percentile or higher for the composite score were considered NMAs.

EXHIBIT 3.10 Priority Growth Area - Livable Corridors



Livable Corridors

Livable Corridors

Source: SCAG, 2019

CHAPTER 4

CHAPTER 4

PAYING OUR WAY FORWARD

In accordance with federal fiscal constraint requirements (23 U.S.C. § 134(i)(2)(E)), this chapter and a more detailed Transportation Finance Technical Report identify how much money SCAG reasonably expects will be available to support our region's surface transportation investments, ensuring that there is sufficient revenue available to support expenditures identified in Connect SoCal. SCAG has secured the necessary resources to support transportation investments detailed in past Plans, and our current financial plan will continue to meet the necessary milestones to implement Connect SoCal.

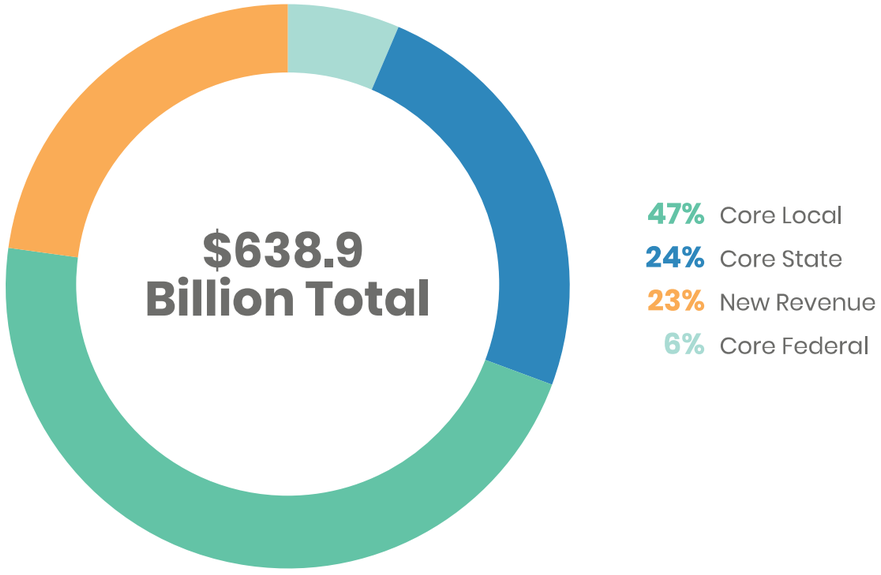
The financially constrained Connect SoCal includes both a "traditional" core revenue forecast comprised of existing local, state, and federal sources and more innovative but reasonably available sources of revenue to implement a program of improvements that keeps people and goods moving. The financial plan further documents progress made since past RTPs and describes steps we can take to obtain needed revenues to implement the region's transportation vision.

The SCAG region's financially constrained Connect SoCal plan includes revenues from both core and reasonably available revenue sources, which together total $638.9 billion from FY2020-21 through FY2044-45, as illustrated in **FIGURE 4.1**. For core sources, the Plan is funded 60 percent by local sources, 32 percent by state sources and 8 percent by federal sources.

As shown in **FIGURE 4.2**, capital projects total $287.3 billion in nominal dollars. Operating and maintenance (O&M) costs total $316 billion, while debt service obligations total $35.6 billion. Transit-related costs comprise the largest share of O&M costs for the region, totaling $173.9 billion.

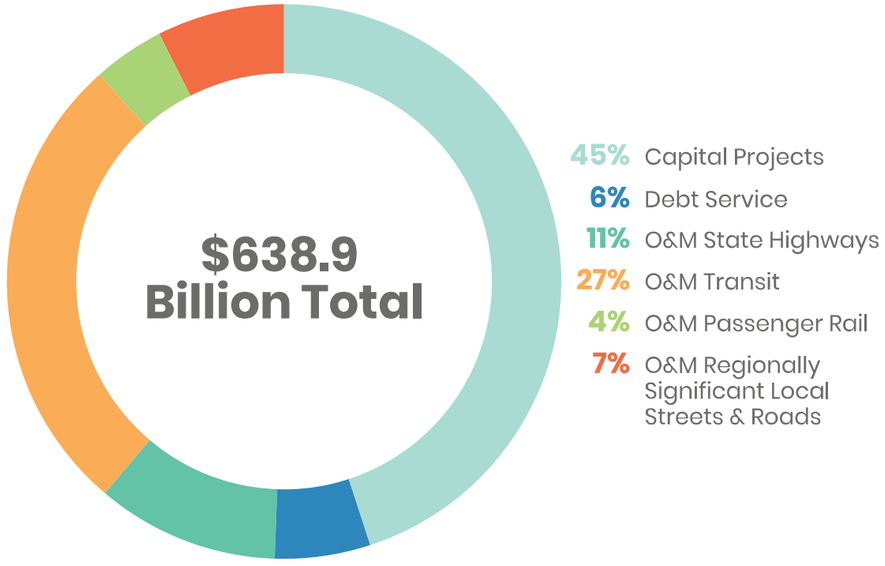
The financial plan highlights the importance of finding new and pioneering ways to pay for transportation, including an ever-expanding backlog of projects necessary to preserve our existing transportation system. Nationally, we continue to face an insolvency crisis with the Federal Highway Trust Fund (HTF), which is funded by excise taxes on fuel. The federal gas tax remains unchanged since 1993, and fuel tax receipts have declined precipitously as fuel efficiency

FIGURE 4.1 FY2021–FY2045 RTP/SCS Revenues, in Nominal Dollars



Note: Numbers may not sum to total due to rounding; Source: SCAG Revenue Model 2020

FIGURE 4.2 FY2021–FY2045 RTP/SCS Expenditures, in Nominal Dollars



Note: Numbers may not sum to total due to rounding; Source: SCAG Revenue Model 2020

has increased. California's passage of the Road Repair and Accountability Act of 2017 (Senate Bill 1) provides a significant influx of new state revenue through a state gas tax increase and other transportation fees, yet only a fraction of our needs is funded through state sources.

Our region continues to rely heavily on local sources of tax revenue. Eight sales tax measures in the region are the key reason that local sources generate 60 percent of core revenues for transportation improvements. Ventura County is the only county in the SCAG region without a sales tax. Our region's success in providing local sources of transportation funding also increases our ability to secure federal and state funding that requires local contribution.

It is vital that we find new ways to make transportation funding more sustainable in the long-term, and efforts are underway to explore how we can transition from our current system, based on fuel taxes, to a more direct system of user fees linked to how people travel. User fees can support our infrastructure needs and promote a more balanced transportation system by encouraging residents and visitors to consider their travel choices. User fees can be structured and implemented to advance environmental, economic and equity goals, including reducing congestion and vehicle miles traveled (VMT), while encouraging active transportation and transit ridership.

In our region, numerous policy and technical studies have been conducted on the subject, and more work is planned to examine and demonstrate the viability of user fee systems, including toll networks, mileage-based user fees to replace fuel taxes, and congestion pricing zones that levy fees based on time-of-day and congestion levels. Connect SoCal includes these user fee based financial strategies to support system management, preservation and resilience, and to contribute to the region's greenhouse gas reduction goals. SCAG further considers the potential equity concerns that accompany pricing policies and assumes mitigation measures such as the establishment of a mobility equity fund to provide resources that can increase access for environmental justice communities.

ECONOMIC OUTLOOK & KEY FINANCIAL ASSUMPTIONS

SCAG's financial model reflects historical growth trends and reasonable future expectations for key revenue sources, which are described below. These include:

- Inflation
- Construction cost increases
- Retail sales growth
- Fuel consumption
- Status of the Federal Highway Trust Fund
- Status of the State Highway Account
- Local sales tax measures
- Transit operating and maintenance (O&M) costs
- Multimodal system preservation and maintenance

INFLATION

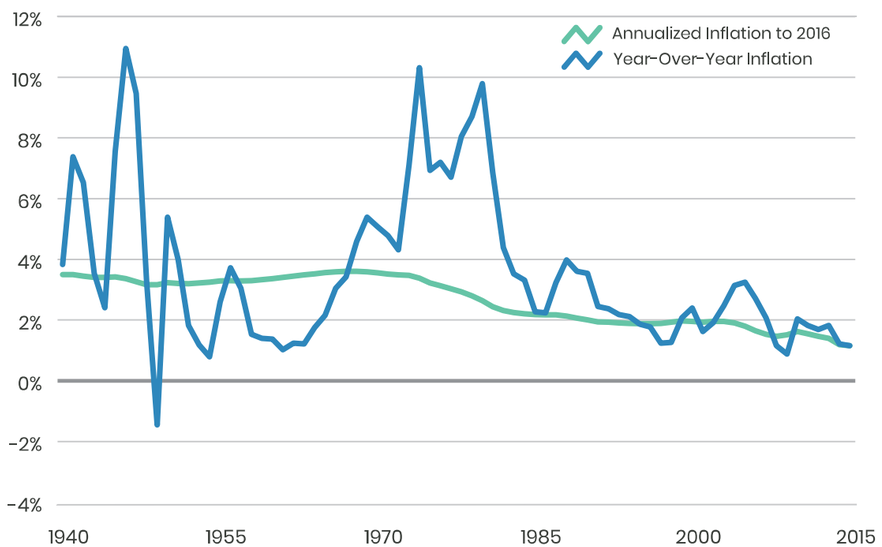
Inflation can have a profound impact over the long-term time horizon of the Plan. SCAG's revenue model accounts for historical inflation trends, as measured by the Gross Domestic Product (GDP) Price Deflator.

FIGURE 4.3 shows the trends in inflation by the GDP Price Deflator. Although inflation rates have varied considerably over time, they have generally trended between two and 4 percent. Accordingly, a 2.2 percent inflation rate is used to adjust constant dollar (revenue) forecasts into nominal (or year-of-expenditure) dollars.

CONSTRUCTION COST INCREASES

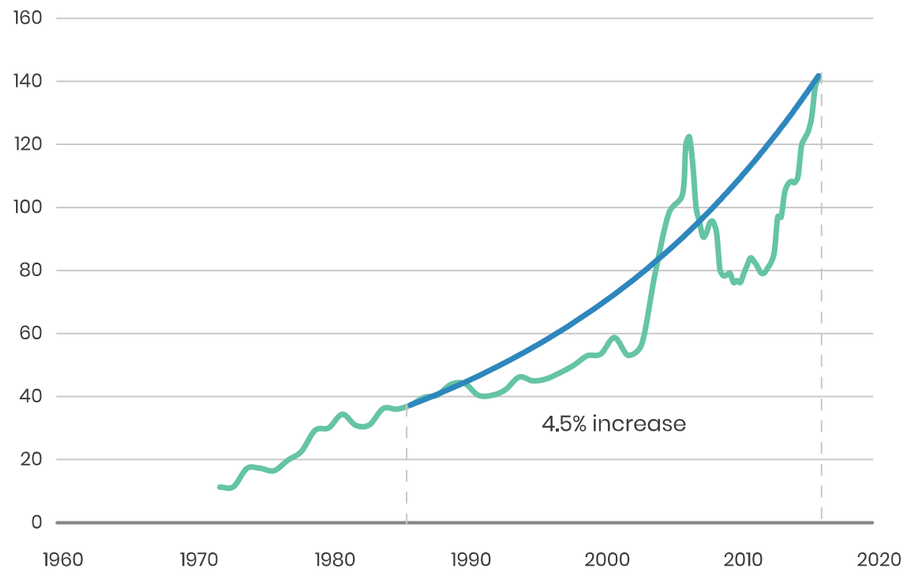
The rise in construction costs can further erode the purchasing power of transportation revenues. **FIGURE 4.4** shows the increase and decline in California highway construction costs since the early 1970s, which is well above general inflation. The financial plan uses a 4.5 percent annual inflation factor to estimate future and nominal (or year-of-expenditure) costs.

FIGURE 4.3 Historical Inflation Trends, Annual Inflation



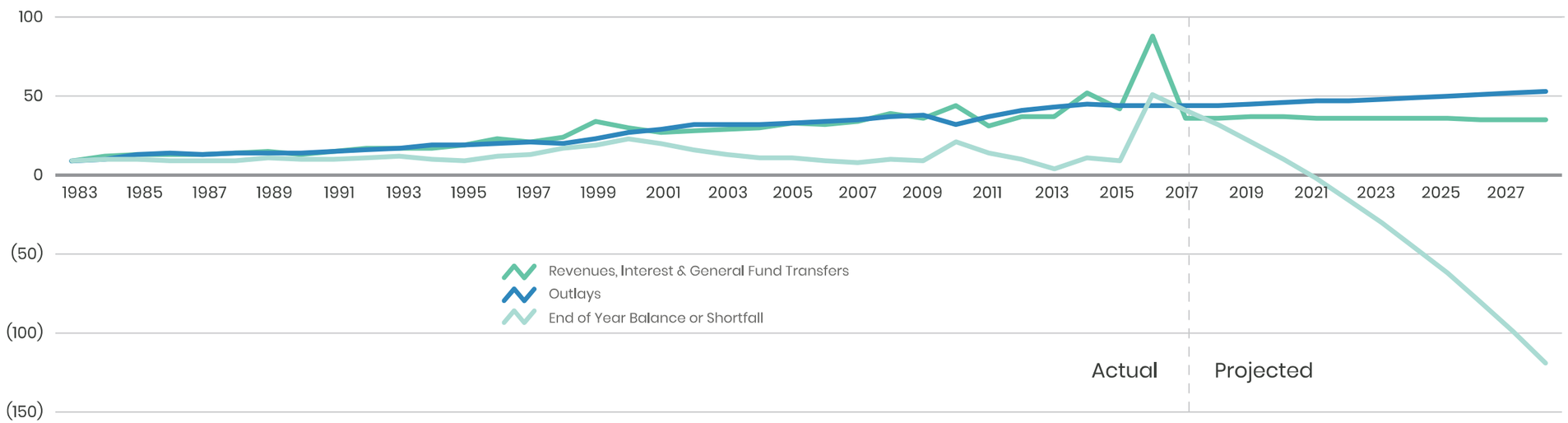
Source: Office of Management and Budget, Budget of the United States Government, Fiscal Year 2019 Budget (FY2019)

FIGURE 4.4 Growth in Highway Capital Costs, Index Value



Source: California Department of Transportation

FIGURE 4.5 Status of the Federal Highway Trust Fund, $ Billions



Source: Congressional Budget Office and Federal Highway Administration

RETAIL SALES GROWTH

Changes in personal consumption patterns and overall population are the main contributors to the growth in retail sales. Over the 30-year period from FY1985-86 to FY2015-16, statewide retail sales grew by 1.5 percent in real terms (when the effects of inflation are eliminated). The financial plan assumes retail sales growth in the SCAG region ranging from -0.1 percent to 3.2 percent in real terms consistent with historical trends.

FUEL CONSUMPTION

Excise taxes on gasoline and diesel fuels are the basis of most federal and state transportation funding sources. Since these taxes are based on cents-per-gallon purchased, they depend on fuel consumption. Though changes in regional vehicle miles traveled will continue to play a role during the Plan period, increases in conventional fuel efficiency and the adoption of alternative fuel vehicles will reduce overall fuel consumption. The financial plan assumes that increases in vehicle fuel efficiency will reduce fuel consumption by 1 percent per year during the Plan period. Recently passed state legislation, Senate Bill 1, increased state fuel tax rates and will index these taxes to inflation in future years using the California Consumer Price Index (CPI). The combination of assumptions about declining fuel consumption and increasing excise tax rates leads to modest growth in the revenue sources funded by state fuel taxes in real terms.

STATUS OF THE FEDERAL HIGHWAY TRUST FUND

The Federal Highway Trust Fund (HTF) provides federal highway and transit funding from a nationally imposed 18.3 cent-per-gallon gasoline excise tax. Since 2008, the HTF has failed to meet its obligations and has required the United States Congress to make transfers from the General Fund to keep it solvent. The negative balances shown on **FIGURE 4.5** illustrate the projected inability of the HTF to pay its obligations into the highway account.

At the time of the Connect SoCal plan, nearly a decade has passed without substantive Congressional agreement on a long-term solution to provide adequate funding for the HTF and address the present, long-term structural deficiency that exists in funding the HTF. Although the financial plan assumes that Congress will reach agreement on reauthorizing federal spending for transportation programs over the plan horizon, the core revenues available from the HTF are expected to decline due to increasing fuel efficiency and other factors.

STATUS OF THE STATE HIGHWAY ACCOUNT

The passage of California's Senate Bill 1 (SB 1) created a significant source of ongoing state transportation funding described in **TABLE 4.1**. SB 1 increased the gas excise tax from 18 cents per gallon to 47.3 cents per gallon (as of July 1, 2019), and further indexed the gas tax to inflation going forward. Prior to passage of SB 1, the effective state gas excise tax rate of 18 cents per gallon remained unadjusted for more than 20 years. SB 1 additionally instituted per vehicle fees pegged to vehicle value to raise revenue for various transportation system improvements. It also enacted an annual fee on zero-emission vehicles (ZEVs). Most of these fees are indexed to the CPI. However, these fees do not completely address the erosion of purchasing power as construction costs are rising faster than the general inflation rate.

Gas tax revenues remain the primary source of funding for the State Highway Operation and Protection Program (SHOPP), which funds projects to maintain the state highway system. As shown in **FIGURE 4.6**, previous levels of funding have been considerably less than actual needs. Statewide, the 2018 Ten-Year SHOPP Plan identifies $85.8 billion in statewide needs, while available funding is only $44.9 billion. While SB 1 provides a key down payment, rising construction costs could undermine efforts to bring our highway assets back to a state of good repair.

LOCAL SALES TAX MEASURES

The SCAG region continues to rely heavily on local sales tax measures for the timely delivery of transportation projects. While most counties impose a 0.5 percent sales tax to fund transportation projects, Los Angeles County effectively imposes a permanent 2 percent sales tax (a combination of four 0.5 percent sales taxes—Proposition A, Proposition C, Measure R, and Measure M) as Measure M increases from 0.5 to 1 percent upon the expiration of Measure R.

Riverside County's Measure A also expires in 2039. Measure I in San Bernardino County expires in 2040, followed by Orange County's Measure M in 2041. Measure D in Imperial County expires in 2050. Ventura County is the only county in the region without a dedicated sales tax for transportation.

TRANSIT OPERATING & MAINTENANCE COSTS

Future transit O&M costs depend on a variety of factors, such as future revenue-miles of service, labor contracts and the age of rolling stock. Over the last decade, these O&M costs grew by up to 5 percent annually, depending on the transit operator.

For Connect SoCal, transit O&M costs are estimated based upon historical increases. The regional average increase (3.3 percent) is used for most operators. For Los Angeles County, the financial plan relies on detailed forecasts from the county transportation commission. These forecasts are consistent with historical data.

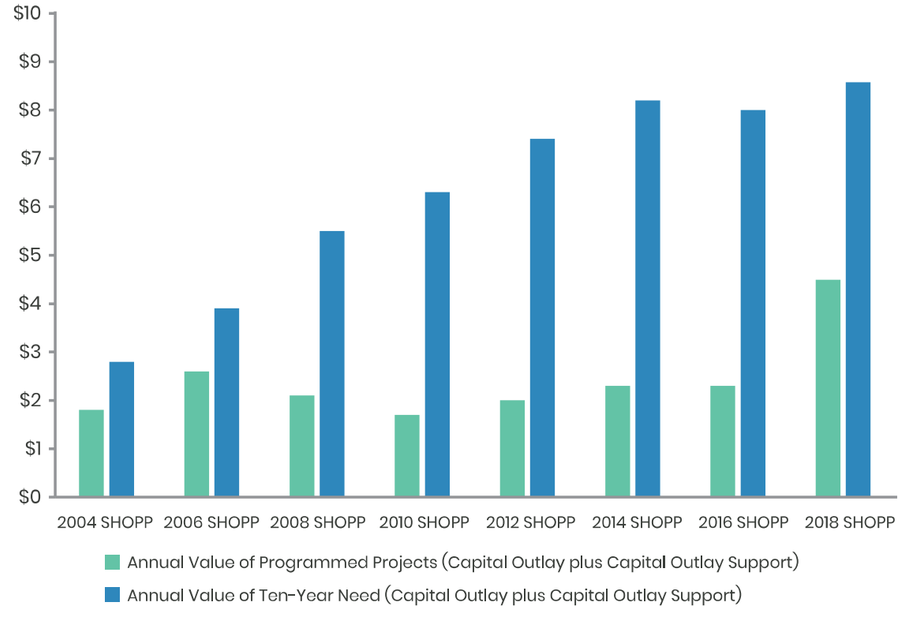
MULTIMODAL SYSTEM PRESERVATION & MAINTENANCE

TABLE 4.2 summarizes the total system preservation and maintenance needs assumed in Connect SoCal to bring transit, regionally significant local streets and roads, and the State Highway System to a state of good repair.

TABLE 4.1 California SB 1 Fees & Funding Programs

Fee	Description	Amount	Uses
Gas Tax	A per gallon excise tax on gasoline purchases	47.3 cents, indexed to the California CPI	Road Maintenance and Rehabilitation
Diesel Tax	A per gallon excise tax on diesel purchases	41.75 cents, indexed to the California CPI	Trade Corridor Enhancement Road Maintenance and Rehabilitation
Diesel Sales Tax	Percentage sales tax on diesel purchases	5.75%	Transit Improvements
Transportation Improvement Fee	An annual per-vehicle fee that varies according to the vehicle value	$25-$175 per vehicle, per year. Not adjusted for inflation	Road Maintenance and Rehabilitation Congested Corridors Program Transit Improvements
Zero Emissions Vehicle (ZEV) Registration Fee	An annual per-vehicle fee on all ZEVs	$100 per year, indexed to the California CPI	Road Maintenance and Rehabilitation

FIGURE 4.6 Status of the State Highway Operation & Protection Program (SHOPP), Billions



Source: California Department of Transportation

REVENUE & EXPENDITURE CATEGORIES

CORE & REASONABLY AVAILABLE REVENUES

The Connect SoCal financial plan includes two types of revenue forecasts. Both are included in the financially constrained plan:

- Core revenues
- Reasonably available revenues

The core revenues identified are existing transportation funding sources projected to FY2044-45. The core revenue forecast does not include any future increases in state or federal gas excise tax rates (other than those described previously related to SB 1 or adoptions of new tax measures). These revenues provide a benchmark from which additional funding can be identified.

Federal guidelines additionally permit the inclusion in the financial plan of revenues that are reasonably available. Further, the Plan includes strategies for ensuring the availability of these sources. The region's reasonably available revenues include new sources of transportation funding likely to materialize within the Connect SoCal timeframe. These sources include:

- Adjustments to the existing federal gas tax rate
- Replacement of existing state and federal gas excise taxes with more direct mileage-based user fees
- Federal credit assistance and bond proceeds
- Private investment participation
- A local road charge program
- Value capture strategies
- A per-mile charge for Transportation Network Companies (e.g. Uber and Lyft)

TABLE 4.2 Multimodal System Preservation & Maintenance Needs, in Nominal Dollars, Billions

System	State of Good Repair Needs Included in Estimate	Estimated State of Good Repair Cost
Transit	O&M Existing Service; O&M Service Expansion; O&M Major New Service; Preservation	$173.9
Passenger Rail	O&M Existing Service; O&M Service Expansion; O&M Major New Service; Preservation	$26.6
Regionally Significant Local Streets and Roads*	Pavement; Essential Components; Bridges; Goods Movement Corridors; Active Transportation Safety Improvements	$47.5
State Highways	Bridges, Pavement, Roadside; Mobility, Collision Reduction; Mandates, Facilities; Emergency Response	$68.0
	Total	**$316.0**

Note: Numbers may not sum to total due to rounding
** Includes $4.8 billion for active transportation & $5 billion GM arterial*

EXPENDITURE CATEGORIES

Transportation expenditures in the SCAG region are summarized into three main categories:

- Capital costs for transit, state highways, and local streets and roads (including regionally significant arterials). This category includes programmatic investments in transportation demand management (TDM), transportation system management, etc.
- Operating and maintenance costs for transit, state highways and local streets and roads (including regionally significant arterials)
- Debt service payments (for current and anticipated bond issuances)

CORE REVENUES

SCAG's regional core revenue model forecasts transportation revenues over the entire Connect SoCal time horizon. The revenue model is comprehensive and provides data by county and funding source. The revenue forecast was developed using the following framework:

- Incorporate financial planning documents developed by local county transportation commissions and transit operators in the region, where available
- Ensure consistency with both local and state planning documents
- Utilize published data sources to evaluate historical trends
- Conduct sensitivity testing of assumptions to augment local forecasts, as needed

The region's revenue forecast horizon for the financial plan is FY2020-21 through FY2044-45. **TABLE 4.3** shows these core revenues in five-year increments by county.

TABLE 4.3 Core Revenue Forecast FY2021–FY2045, in Nominal Dollars, Billions

County	FY2021–FY2025	FY2026–FY2030	FY2031–FY2035	FY2036–FY2040	FY2041–FY2045	Total
Imperial	$0.4	$0.5	$0.6	$0.7	$0.9	$3.1
Los Angeles	$47.3	$53.8	$63.9	$73.7	$83.6	$322.1
Orange	$11.4	$13.2	$15.9	$19.3	$20.4	$80.3
Riverside	$5.9	$6.4	$7.4	$8.2	$8.4	$36.3
San Bernardino	$5.6	$6.5	$7.5	$8.7	$8.4	$36.8
Ventura	$2.1	$2.4	$2.8	$3.3	$3.9	$14.5
Total	**$72.6**	**$82.9**	**$98.1**	**$114.0**	**$125.5**	**$493.1**

Note: Numbers may not sum to total due to rounding

As shown in **FIGURE 4.7**, the majority of revenues in the SCAG region come from local sources (60 percent). The share of state sources has increased since the last RTP from 11 percent share of core revenues to 32 percent as a result of the passage of SB 1.

FIGURE 4.8 shows the breakdown of revenues by county. With four local sales tax measures, Los Angeles County accounts for 65 percent of the funding available in the SCAG region. This includes revenues from the passage of Measure M since the adoption of the 2016 Connect SoCal.

Local sales taxes provide the largest single source of local funding, as shown in **FIGURE 4.9**. These taxes account for more than half (57 percent) of local sources in the plan.

As shown in **FIGURE 4.10**, the State Highway Operations and Protection Program (SHOPP), the Highway User Tax Account (HUTA), the Road Maintenance and Rehabilitation Account (RMRA), and the State Transit Assistance fund (STA) account for the bulk of the state funding available.

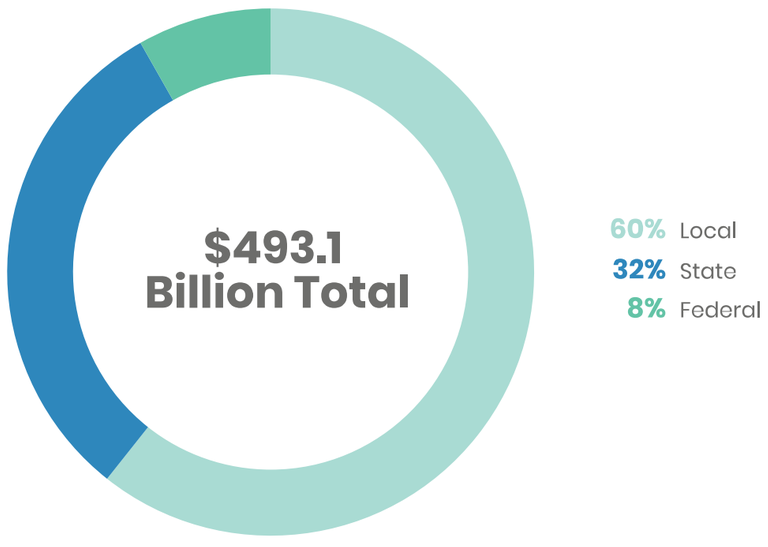
As shown in **FIGURE 4.11**, federal sources are expected to comprise a small portion of overall transportation funds ($41.1 billion or eight percent share of core revenues). This is consistent with past RTPs. Federal Transit Administration (FTA) funds account for 61 percent of federal funding in the SCAG region. The financial plan also assumes that Congestion Mitigation and Air Quality funding will decline over the life of the Plan due to the region achieving attainment for a number of criteria pollutants and reducing the severity level of others.

REASONABLY AVAILABLE REVENUES

There are several new funding sources that are reasonably expected to be available for Connect SoCal. The following guiding principles were used for identifying reasonably available revenues:

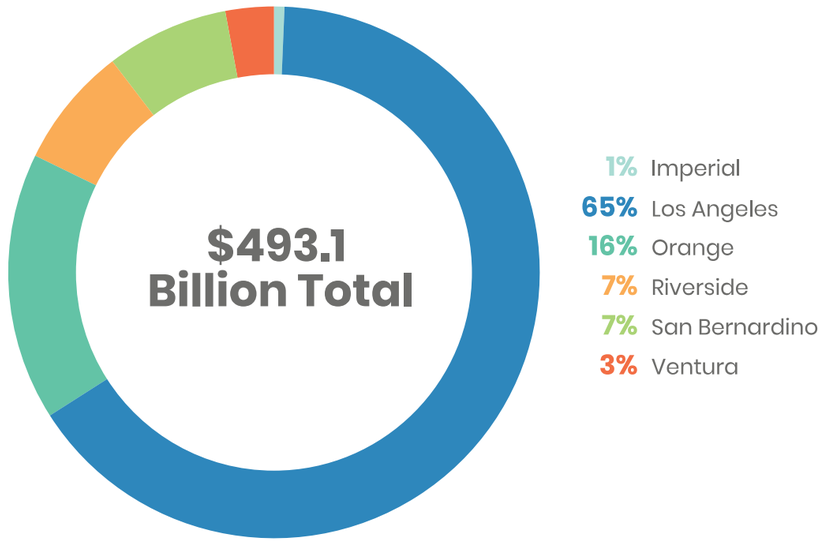
- Establish a user fee-based system that better reflects the true cost of transportation, provides firewall protection for transportation funds and ensures an equitable distribution of costs and benefits
- Promote national and state programs that include return-to-source

FIGURE 4.7 Core Revenues, in Nominal Dollars



Note: Numbers may not sum to total due to rounding; Source: SCAG Revenue Model 2020

FIGURE 4.8 Core Revenues by County, in Nominal Dollars



Note: Numbers may not sum to total due to rounding; Source: SCAG Revenue Model 2020

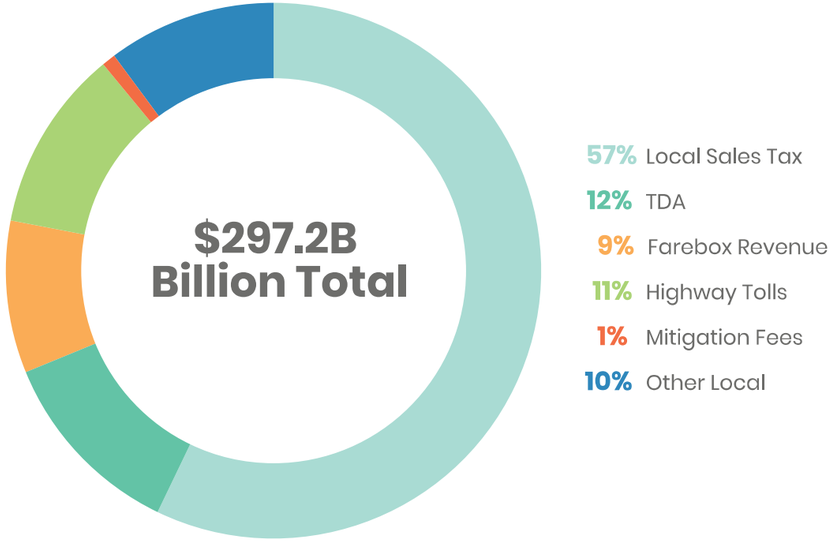
guarantees, while maintaining flexibility to reward regions that continue to commit substantial local resources

- Leverage locally available funding with innovative financing tools (e.g., tax credits and expansion of the Transportation Infrastructure Finance and Innovation Act [TIFIA]) to attract private capital and accelerate project delivery
- Promote local funding strategies that maximize the value of public assets while improving mobility, sustainability, and resilience

TABLE 4.4 identifies seven categories of funding sources that are reasonably available and are included in the financially constrained plan. These sources were identified because of their potential for revenue generation, historical precedence, and the likelihood of their implementation within the time frame of Connect SoCal. For each funding source, SCAG has examined the policy and legal context of implementation and has prepared an estimate of the potential revenues generated.

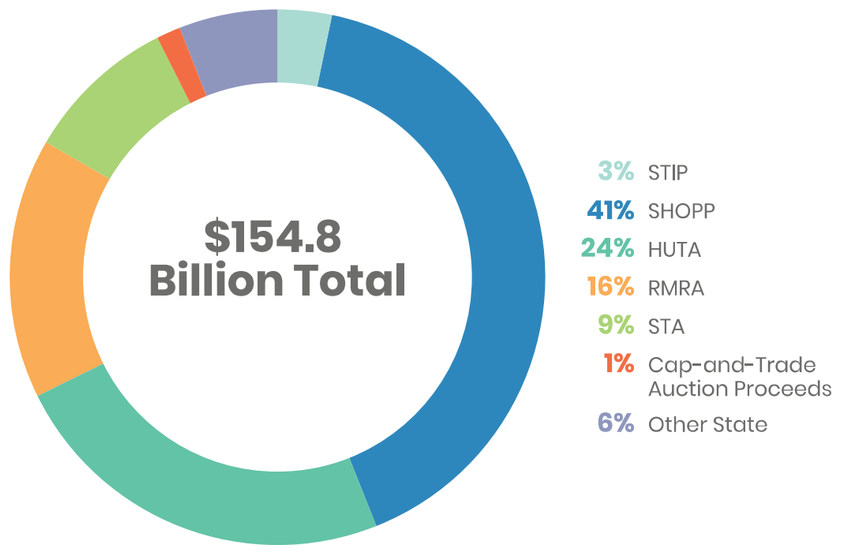
The implementation of road user charges, in particular, will require further collaboration with the California State Transportation Agency, the California Transportation Commission, Caltrans, business, and other key parties on the California Road Charge Pilot Program to address key implementation factors such as: technology and associated privacy issues, cost of implementation and administrative methods for fee collection/revenue allocation, and potential equity concerns. Equity concerns can be addressed through enhanced transportation alternatives for transit dependent populations, and discounts for impacted low-income populations. Connect SoCal assumes the establishment of a Mobility Equity Fund to cover the cost of rebates, credits, or discounts for general mobility expenses including user fees/tolls, parking charges, transit fares and new mobility options. Additional documentation of funding sources included in the financial plan are provided in the Transportation Finance Technical Report.

FIGURE 4.9 Core Revenues, Local Sources, in Nominal Dollars



Note: Numbers may not sum to total due to rounding; Source: SCAG Revenue Model 2020

FIGURE 4.10 Core Revenues, State Sources, in Nominal Dollars



Note: Numbers may not sum to total due to rounding; Source: SCAG Revenue Model 2020

ASSUMPTIONS BY REVENUE SOURCE

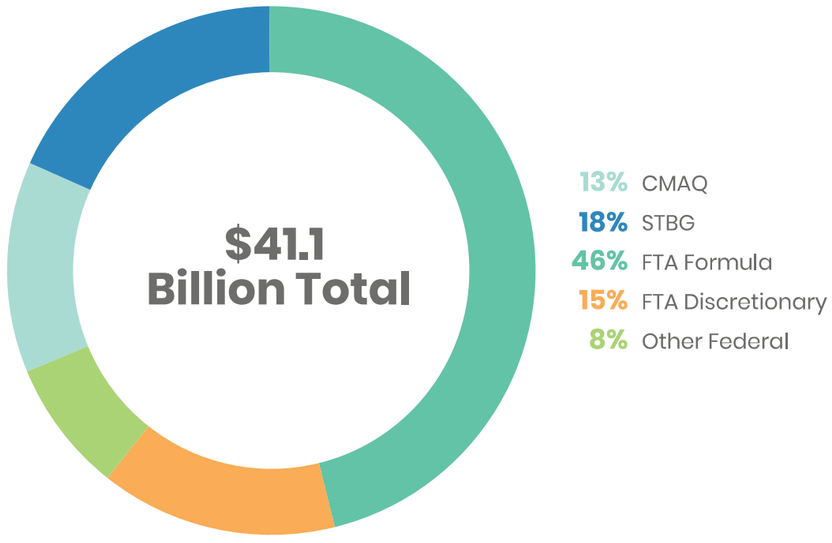
TABLE 4.5 describes the specific revenue assumptions used for the financially constrained 2020 Connect SoCal. A more detailed discussion of revenue sources is included in the Transportation Finance Technical Report.

SUMMARY OF REVENUE SOURCES & EXPENDITURES

TABLE 4.6.1 presents the SCAG region's revenue forecast by source in five-year increments, from FY2020-21 through FY2044-45.

This is followed by **TABLE 4.6.2**, which provides details of the region's expenditures by category in five-year increments.

FIGURE 4.11 Core Revenues, Federal Sources, in Nominal Dollars



Note: Numbers may not sum to total due to rounding; Source: SCAG Revenue Model 2020

TABLE 4.4 New Revenue Sources & Innovative Financing Strategies, in Nominal Dollars, Billions

Revenue Source	Description	Amount	Actions to Ensure Availability	Responsible Party(ies)
Federal Gas Excise Tax Adjustment to Maintain Historical Purchasing Power	Additional $0.10 per gallon gasoline tax imposed at the federal level starting in 2025 to 2029—indexed to maintain purchasing power.	$2.7	Requires action of Congress. Strategy is consistent with recommendations from two national commissions to move immediately with augmenting fuel tax resources through conventional Highway Trust Fund mechanisms.	Congress
Mileage-Based User Fee (Replacement)	Mileage-based user fees would be implemented to replace gas taxes—estimated at about $0.025 (in 2019 dollars) per mile starting in 2030 and indexed to maintain purchasing power.	$42.7 (est. increment only)	Requires state enabling legislation and action of Congress. In 2017, California succesfully conducted a legislatively-mandated pilot program to study the feasibility of a road charge as a replacement to the gas tax, and is currently pursuing next-step studies. The FAST Act establishes the Surface Transportation System Funding Alternatives program, which provides grants to states to demonstrate alternative user-based revenue mechanisms that could maintain the long-term solvency of the Trust Fund.	State Legislature, Congress
Federal Credit Assistance; Other Bond Proceeds	TIFIA/RRIF credit assistance and other bond financing , pledging new local funding (e.g., mileage-based road charge program funding) to help finance specific initiaitives including SCORE.	$2.2	Issuance of debt and TIFIA/RRIF credit agreement terms subject to County Transportation Commissions' respective board policies, and potentially the Southern California Regional Rail Authority (SCRRA).	County Transportation Commissions and USDOT Build America Bureau; other potential parties include SCRRA.
Private Investment	XpressWest, to construct and operate high-speed rail service from the Victor Valley to Las Vegas along the I-15 corridor. Revenue estimate would cover construction costs for the San Bernardino County portion only. This category of funding also assumes private funding for SCAG-region portion of California High-Speed Rail Phase 1; various freight related initiatives.	$12.7	Contingent upon financing efforts by XpressWest and necessary approvals. Similarly, contingent upon private financing for California High-Speed Rail. For freight investments, contigent upon private entities in the region, including freight railroads.	XpressWest; private partners; freight railroads as may be applicable.

TABLE 4.4 New Revenue Sources & Innovative Financing Strategies, in Nominal Dollars, Billions – Continued

Revenue Source	Description	Amount	Actions to Ensure Availability	Responsible Party(ies)
Local Road Charge Program	Local road charge program assumes a $0.015 (in 2019 dollars) per mile charge throughout the region that can be implemented on a county basis. This can be adjusted by time-of-day and location with congestion pricing and/or parking pricing at major activity centers. For analysis, also assumed congestion pricing (peak period charges) in parts of Los Angeles County, along with increases in parking pricing at major job centers as a part of the regional job centers strategy.	$77.8	Requires state enabling legislation for at least two components--mileage-based user fees and congestion pricing. Parking pricing would be subject to local policies.	MPO, CTCs, Caltrans, and FHWA as may be applicable; local jurisdictions.
Value Capture Strategies	Assumed the use of EIFDs and tax increment financing (TIF) to support investment in transit supportive housing infrastructure needs.	$3.0	Pursue necessary approvals for district formation and TIF.	Local jurisdictions
Transportation Network Company (TNC) Mileage-Based Fee	User fees on TNC mileage —estimated at about $0.05 (in 2019 dollars) per mile starting in 2021.	$4.7	Requires state enabling legislation to implement at local level. Currently being explored by LA Metro and a similar measure was approved by voters in San Francisco in 2019.	MPO, CTCs, California Public Utilities Commission, State Legislature

TABLE 4.5 Summary of Revenue Sources

4.5.1 Core & Reasonably Available Revenue Projections—Local Core Revenue Sources, in Nominal Dollars, Billions

Revenue Source	Revenue Projection Assumptions	Revenue Estimate
Local Option Sales Tax Measures	**Description:** Locally imposed ½ percent sales tax in four counties (Imperial, Orange, Riverside, and San Bernardino). Permanent 2 percent sales tax in Los Angeles County (combination of two permanent ½ percent sales taxes, Measure R through 2039, and Measure M, which will increase from 1/2 percent to 1 percent upon the expiration of Measure R). Measure D in Imperial County expires in 2050; Measure M in Orange County expires in 2041; Measure A in Riverside County expires in 2039; and Measure D in San Bernardino County expires in 2040. **Assumptions:** Sales taxes grow consistent with county transportation commission forecasts and historical trends.	$169.8
Transportation Development Act (TDA)—Local Transportation Fund	**Description:** The Local Transportation Fund (LTF) is derived from a ¼ cent sales tax on retail sales statewide. Funds are returned to the county of generation and used mostly for transit operations and transit capital expenses. **Assumptions:** Same sales tax growth rate as used for local option sales tax measures.	$34.7
Transit Farebox Revenue	**Description:** Transit fares collected by transit operators in the SCAG region. **Assumptions:** Farebox revenues increase consistent with historic trends, planned system expansions, and operator forecasts.	$27.3
Highway Tolls	**Description:** Revenues generated from toll roads operated by the Transportation Corridor Agencies (TCA), from the SR-91 Express Lanes operated by the Orange County Transportation Authority (OCTA) and Riverside County Transportation Commission (RCTC), and from the MetroExpress Lanes along I-10 and I-110 in Los Angeles County. **Assumptions:** Toll revenues grow consistent with county transportation commission forecasts and historical trends.	$32.7
Mitigation Fees	**Description:** Revenues generated from development impact fees. The revenue forecast includes fees from the Transportation Corridor Agencies (TCA) development impact fee program, San Bernardino County's development impact fee program and Riverside County's Transportation Uniform Mitigation Fee (TUMF) for both the Coachella Valley and Western Riverside County. **Assumptions:** The financial forecast is consistent with revenue forecasts from TCA, Coachella Valley Council of Governments, Western Riverside Council of Governments, and the San Bernardino County Transportation Commission (SBCTA).	$2.5
Other Local Sources	**Description:** Includes local revenue sources such as general funds, transit advertising and auxiliary revenues, lease revenues and interest and investment earnings from reserve funds. For Los Angeles County, interest income from Propositions A and C and Measure R are included under this source. Income from financing is also included, while principal and interest payments are included as part of debt service. **Assumptions:** Revenues are based on financial data from transit operators and local county transportation commissions.	$30.2
	Local Subtotal	**$297.2**

Note: Numbers may not sum to total due to rounding

TABLE 4.5 Summary of Revenue Sources - Continued

4.5.2 Core & Reasonably Available Revenue Projections—State Revenue Sources, in Nominal Dollars, Billions

Revenue Source	Revenue Projection Assumptions	Revenue Estimate
State Transportation Improvement Program (STIP)	**Description:** The STIP is a five-year capital improvement program that provides funding from the State Highway Account (SHA) for projects that increase the capacity of the transportation system. The SHA is funded through a combination of state gas excise tax, the Federal Highway Trust Fund, and truck weight fees. The STIP may include projects on state highways, local roads, intercity rail, or public transit systems. The Regional Transportation Planning Agencies (RTPAs) propose 75 percent of STIP funding for regional transportation projects in Regional Transportation Improvement Programs (RTIPs). Caltrans proposes 25 percent of STIP funding for interregional transportation projects in the Interregional Transportation Improvement Program (ITIP). **Assumptions:** Funds are based upon the 2020 STIP Fund Estimate, 2020 STIP Commission Staff Recommendations, February 28, 2020. Fuel consumption declines in real terms by 1 percent due to increasing fuel efficiency.	$5.1
State Highway Operation and Protection Plan (SHOPP)	**Description:** Funds state highway maintenance and operations projects. **Assumptions:** Short-term revenues are based on overlapping 2016 and 2018 SHOPP programs. Long-term forecasts are consistent with STIP forecasts and assume decline in fuel consumption. As with the HUTA and STA, a portion of SHOPP revenues are indexed due to passage of SB 1, which offsets the effect of the increase in fuel efficiency.	$63.0
Highway Users Tax Account (HUTA)	**Description:** Gas tax revenue apportionments distributed via the HUTA to counties and cities in the region. **Assumptions:** The forecast is based on current funding levels reported by the State Controller. Future funding declines with fuel consumption using assumptions consistent with other sources.	$36.7
Road Maintenance and Rehabilitation Account (RMRA)	**Description:** The RMRA was established by SB 1 and is funded by new diesel and gas excise taxes, a transportation improvement fee, and electric vehicle fee. Although the RMRA also provides SHOPP funding, for purposes of the 2020 RTP/SCS financial plan, it only reflects the portion directed to counties and cities. **Assumptions:** SB 1 indexes the sources for RMRA, offsetting the decline due to fuel efficiency.	$24.3
State Transit Assistance Fund (STA)	**Description:** The STA is funded by diesel sales taxes and the transportation improvement fee established under SB 1. SB 1 also created a State of Good Repair Program associated with the STA, which for purposes of this financial plan are included in the STA figures. **Assumptions:** The forecast is based on current funding levels reported by the State Controller. Future funding declines with fuel consumption but is offset by SB 1 indexing using assumptions consistent with other sources.	$14.2
Cap-and-Trade Auction Proceeds	**Description:** The Global Warming Solutions Act of 2006 (AB 32) established the goal of reducing greenhouse gas (GHG) emissions statewide to 1990 levels by 2020. In order to help achieve this goal, the California Air Resources Board (ARB) adopted a regulation to establish a cap-and-trade program that places a "cap" on the aggregate GHG emissions from entities responsible for roughly 85 percent of the state's GHG emissions. As part of the cap-and-trade program, ARB conducts quarterly auctions where it sells emission allowances. Revenues from the sale of these allowances fund projects that support the goals of AB 32, including transit and rail investments. Funds associated with non-transportation and High-Speed Rail are not included in this amount. **Assumptions:** The forecast is based on current funding levels reported by the State Controller for the Low Carbon Transit Operations Program and award lists as reported by Caltrans. Given the uncertainty about future allowance prices, annual growth is assumed to be flat and is assumed to end after 2030.	$2.2
Other State Sources	**Description:** Other state sources include remaining SB 1 competitive program awards; the Active Transportation Program (ATP); and other miscellaneous state grant apportionments for the SCAG region. **Assumptions:** Short-term revenues are based on actual apportionments. Future Active Transportation Program funding declines with fuel consumption using assumptions consistent with other sources.	$9.2
	State Subtotal	**$154.8**

Note: Numbers may not sum to total due to rounding

TABLE 4.5 Summary of Revenue Sources - Continued

4.5.3 Core & Reasonably Available Revenue Projections—Federal Core Revenue Sources, in Nominal Dollars, Billions		
Revenue Source	**Revenue Projection Assumptions**	**Revenue Estimate**
FHWA Non-Discretionary Congestion Mitigation and Air Quality (CMAQ) Program	**Description:** Program to reduce traffic congestion and improve air quality in non-attainment areas. **Assumptions:** Short-term revenues are based upon the Caltrans apportionment estimates. Long-term revenues assume that fuel consumption declines by 1 percent (in real terms) annually. CMAQ funding is assumed to be reduced by 25 percent in 2027, an additional 25 percent in 2032, and an additional 25 percent in 2037 due to improved air quality.	$5.3
FHWA Non-Discretionary Surface Transportation Block Grant (STBG)	**Description:** Projects eligible for STBG funds include rehabilitation and new construction on any highways included in the National Highway System (NHS) and Interstate Highways (including bridges). Also, transit capital projects, as well as intracity and intercity bus terminals and facilities, are eligible. **Assumptions:** Short-term revenues are based upon the Caltrans apportionment estimates. Long-term revenues assume that fuel consumption declines by 1 percent (in real terms) annually.	$7.5
FTA Formula Programs 5307 Urbanized Area Formula, 5310 Enhanced Mobility of Seniors and Individuals with Disabilities Formula, 5311 Rural Formula, 5337 State of Good Repair Formula, and 5339 Bus and Bus Facilities Formula	**Description:** This includes a number of FTA programs distributed by formula. 5307 is distributed to state urbanized areas with a formula based upon population, population density, number of low-income individuals, and transit revenue and passenger miles of service. Program funds capital projects, planning, job access and reverse commute projects, and operations costs under certain circumstances. 5310 funds are allocated by formula to states for projects providing enhanced mobility to seniors and persons with disabilities. 5311 provides capital, planning, and operating assistance to states to support public transportation in rural areas with populations less than 50,000. 5337 is distributed based on revenue and route miles and provides funds for repairing and upgrading rail transit systems, high-intensity bus systems that use High-Occupancy Vehicle (HOV) lanes, including bus rapid transit (BRT). 5339 provides capital funding to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities. **Assumptions:** Formula funds are assumed to decline in proportion with the Federal Highway Trust Fund. As with the FHWA sources, fuel consumption declines by 1 percent (in real terms) annually.	$19.0
FTA Non-Formula Program 5309 Fixed Guideway Capital Investment Grants ("New Starts")	**Description:** Provides grants for new fixed-guideways or extensions to fixed guideways (projects that operate on a separate right-of-way exclusively for public transportation, or that include a rail or a catenary system), bus rapid transit projects operating in mixed traffic that represent a substantial investment in the corridor, and projects that improve capacity on an existing fixed-guideway system. **Assumptions:** Operators are assumed to receive FTA discretionary funds in rough proportion to what they have received historically. As with the FHWA sources, fuel consumption declines by 1 percent (in real terms) annually.	$6.0
Other Federal Sources	**Description:** Includes other federal programs, such as Transportation Investment Generating Economic Recovery (TIGER) competitive grant program, Highway Safety Improvement Program, Federal Safe Routes to School, Highway Bridge Program, and earmarks. **Assumptions:** Short-term revenues are based on actual apportionments. Long-term revenues assumes a 1 percent (in real terms) annual decline in fuel consumption as used for other federal funding sources.	$3.3
	Federal Subtotal	**$41.1**

Note: Numbers may not sum to total due to rounding

TABLE 4.5 Summary of Revenue Sources – Continued

4.5.4 Core & Reasonably Available Revenue Projections—Innovative Financing and New Revenue Sources, in Nominal Dollars, Billions

Revenue Source	Revenue Projection Assumptions	Revenue Estimate
Federal Gas Excise Tax Adjustment	**Description:** Additional 10-cents-per-gallon gasoline tax imposed by the federal government starting in 2025 through 2029. **Assumptions:** Forecast consistent with historical tax rate adjustments for federal gas taxes.	$2.7
Mileage-Based User Fee (Replacement)	**Description:** Mileage-based user fees would be implemented to replace existing gas taxes (state and federal) by 2030. **Assumptions:** It is assumed that a national mileage-based user fee system would be established during the latter years of the RTP/SCS. An estimated $0.025 per mile (in 2019 dollars) is assumed starting in 2030 to replace existing gas tax revenues, indexed to maintain purchasing power.	$42.7 (est. increment only)
Federal Credit Assistance; Other Bond Proceeds	**Description:** Credit assistance/debt financing is assumed to facilitate construction of regional initiatives, pledging new regional/local funding via road charge program. **Assumptions:** It is assumed that some credit assistance in the form of TIFIA/RRIF will be needed to facilitate implementation of key regional initiatives. Assumed aggregate level debt service using an interest rate of 2.2 percent over 35 years.	$2.2
Private Investment	**Description:** XpressWest, to construct and operate high-speed rail service from Victor Valley to Las Vegas along the I-15 corridor; assumes private sector investment contribution for California High-Speed Rail Phase 1; also includes freight initiatives. **Assumptions:** Revenue estimate reflects only the San Bernardino County segment costs for XpressWest; SCAG-region segment for California-High Speed Rail Phase 1.	$12.7
Local Road Charge Program	**Description:** Local road charge program assumes a per mile charge across the region that can be implemented on a county basis. This can be adjusted by time-of-day and location with congestion pricing and parking pricing at major activity centers. For analysis, also assumed congestion pricing in parts of Los Angeles County, along with increases in parking pricing at major job centers throughout the region as a part of the regional job centers strategy. **Assumptions:** Assumes a charge of $0.015 per mile (in 2019 dollars) starting in 2030; peak period congestion charges in parts of Los Angeles County; some increases in parking costs assumed starting in 2025 at regional job centers.	$77.8
Value Capture Strategies	**Description:** Formation of EIFDs and use of tax increment financing for transit supportive housing related infrastructure. **Assumptions:** Based on recent EIFD/tax increment financing studies to fund improved water and sewer infrastructure in Transit Priority Areas	$3.0
Transportation Network Company (TNC) Mileage-Based Fee	**Description:** User fees on TNC mileage **Assumptions:** Estimated at about $0.05 (in 2019 dollars) per mile starting in 2021	$4.7
	New Revenue Source Subtotal	**$145.7**

Note: Numbers may not sum to total due to rounding

TABLE 4.6.1 FY2021–FY2045 RTP/SCS Revenues, in Nominal Dollars, Billions

Revenue Sources		FY2021 – FY2025	FY2026 – FY2030	FY2031 – FY2035	FY2036 – FY2040	FY2041 – FY2045	Total
Local	Sales Tax	$28.4	$34.3	$41.4	$48.9	$51.5	$204.5
	– Local Option Sales Tax Measures	$23.6	$28.7	$34.7	$40.9	$42.0	$169.8
	– Transportation Development Act (TDA)—Local Transportation Fund	$4.8	$5.7	$6.7	$8.0	$9.5	$34.7
	Transit Farebox Revenue	$3.5	$4.4	$5.2	$6.4	$7.8	$27.3
	Highway Tolls (in core revenue forecast)	$3.4	$4.5	$6.0	$8.0	$10.7	$32.7
	Mitigation Fees	$0.4	$0.4	$0.5	$0.5	$0.6	$2.5
	Other Local Sources	$6.5	$5.4	$7.3	$6.6	$4.3	$30.2
	Local Total	$42.2	$49.1	$60.5	$70.6	$74.9	$297.2
State	State Transportation Improvement Program (STIP)	$1.3	$0.7	$0.9	$1.0	$1.2	$5.1
	– Regional Transportation Improvement Program (RTIP)	$1.1	$0.5	$0.6	$0.7	$0.9	$3.8
	– Interregional Transportation Improvement Program (ITIP)	$0.1	$0.2	$0.2	$0.3	$0.3	$1.2
	State Highway Operation and Protection Plan (SHOPP)	$8.5	$10.2	$12.2	$14.6	$17.5	$63.0
	Highway Users Tax Account (HUTA)	$5.1	$6.0	$7.1	$8.4	$10.0	$36.7
	Road Maintenance and Rehabilitation Account (RMRA)	$3.1	$3.8	$4.7	$5.7	$7.0	$24.3
	State Transit Assistance Fund (STA)	$1.9	$2.3	$2.8	$3.3	$3.9	$14.2
	Cap-and-Trade Auction Proceeds	$1.1	$1.1	$0.0	$0.0	$0.0	$2.2
	Other State Sources	$1.6	$1.6	$1.8	$2.0	$2.2	$9.2
	State Total	$22.6	$25.8	$29.5	$35.1	$41.9	$154.8

Note: Numbers may not sum to total due to rounding

TABLE 4.6.1 FY2021–FY2045 RTP/SCS Revenues, in Nominal Dollars, Billions - Continued

Revenue Sources		FY2021 – FY2025	FY2026 – FY2030	FY2031 – FY2035	FY2036 – FY2040	FY2041 – FY2045	Total
Federal	Federal Transit	$4.4	$4.7	$5.0	$5.3	$5.6	$25.0
	– Federal Transit Formula	$3.4	$3.6	$3.8	$4.0	$4.2	$19.0
	– Federal Transit Non-Formula	$1.1	$1.1	$1.2	$1.3	$1.3	$6.0
	Federal Highway & Other	$3.4	$3.3	$3.2	$3.1	$3.2	$16.1
	– Congestion Mitigation and Air Quality (CMAQ)	$1.5	$1.3	$1.0	$0.8	$0.8	$5.3
	– Surface Transportation Block Grant (STBG)	$1.3	$1.4	$1.5	$1.6	$1.7	$7.5
	– Other Federal Sources	$0.5	$0.6	$0.7	$0.7	$0.8	$3.3
	Federal Total	$7.8	$8.0	$8.1	$8.4	$8.8	$41.1
New	Federal Gas Excise Tax Adjustment	$0.6	$2.1	$0.0	$0.0	$0.0	$2.7
	Mileage-Based User Fee (Replacement)	$0.0	$1.6	$10.4	$13.7	$16.9	$42.7
	Federal Credit Assistance; Other Bond Proceeds	$0.0	$2.2	$0.0	$0.0	$0.0	$2.2
	Private Equity Participation	$3.2	$0.0	$2.1	$4.2	$3.2	$12.7
	Local Road Charge Program	$0.2	$5.8	$21.0	$23.8	$26.9	$77.8
	Enhanced Infrastructure Financing District	$0.0	$0.8	$0.8	$0.8	$0.8	$3.0
	TNC Fee	$0.7	$0.8	$0.9	$1.1	$1.2	$4.7
	New Revenue Total	$4.7	$13.3	$35.1	$43.5	$49.1	$145.7
	Revenue Total	**$77.3**	**$96.2**	**$133.2**	**$157.6**	**$174.6**	**$638.9**

Note: Numbers may not sum to total due to rounding

TABLE 4.6.2 FY2021–FY2045 RTP/SCS Expenditures, in Nominal Dollars, Billions

RTP Costs	FY2021 – FY2025	FY2026 – FY2030	FY2031 – FY2035	FY2036 – FY2040	FY2041 – FY2045	Total
Capital Projects and Other Programs	$36.2	$44.6	$68.0	$70.9	$67.6	$287.3
Arterials	$7.1	$4.7	$4.2	$4.1	$0.7	$20.7
Goods Movement (including Grade Separations)	$4.8	$9.3	$9.6	$22.7	$19.6	$66.0
High-Occupancy Vehicle/Express Lanes	$0.9	$3.2	$3.3	$3.4	$2.6	$13.4
Mixed-Flow and Interchange Improvements	$2.7	$1.7	$1.7	$1.4	$2.8	$10.3
Transportation System Management (including ITS)	$1.4	$1.4	$3.3	$3.9	$3.7	$13.7
Transit	$10.9	$13.9	$20.4	$13.5	$8.1	$66.8
Passenger Rail	$4.6	$6.5	$14.5	$9.3	$18.4	$53.3
Active Transportation	$1.6	$2.3	$4.2	$4.9	$4.6	$17.7
Transportation Demand Management	$0.7	$0.2	$2.4	$2.4	$1.7	$7.3
Other**	$1.5	$1.5	$4.3	$5.4	$5.4	$18.1
Operations and Maintenance	$35.9	$44.9	$57.4	$77.8	$100.0	$316.0
State Highways	$8.5	$10.2	$12.2	$17.1	$20.0	$68.0
Transit	$20.5	$24.9	$31.8	$41.2	$55.4	$173.9
Passenger Rail	$2.0	$2.7	$4.3	$7.5	$10.1	$26.6
Regionally Significant Local Streets and Roads*	$4.8	$7.1	$9.1	$12.0	$14.4	$47.5
Debt Service	$5.2	$6.6	$7.8	$8.9	$7.0	$35.6
Cost Total	**$77.3**	**$96.2**	**$133.2**	**$157.6**	**$174.6**	**$638.9**

Note: Numbers may not sum to total due to rounding
** Includes $4.8 billion for active transportation in addition to capital project investment level of $17.7 billion for a total of $22.5 billion for active transportation improvements*
*** Includes Safety, Pooled Incentives, Mobility Equity Fund, Regional PEV Charger Program, and Others*

CHAPTER 5

CHAPTER 5

MEASURING OUR PROGRESS

CONNECT SOCAL & PERFORMANCE-BASED PLANNING

SCAG has been incorporating performance measures into its Regional Transportation Plan (RTP) evaluation process since development of the 1998 Plan. For the 2004 RTP, SCAG developed a set of measurable outcomes that were based upon the principle of sustainability, which includes environmental preservation, linking transportation and land use and focusing on how the region meets its critical system preservation needs. Connect SoCal builds upon the sustainability goals established in previous RTP cycles, reflecting the ever-evolving needs and priorities of our region. The performance measures developed in support of Connect SoCal are focused on a set of outcomes that aim to continue to strengthen land-use and transportation connections, enhance the health of our region's residents, reduce greenhouse gas (GHG) emissions, and ameliorate the consequential effects of climate change.

Implementation of the strategies, programs and projects identified in Connect SoCal will help to secure a safe, efficient, sustainable and prosperous future for our region. To demonstrate the effectiveness of Connect SoCal toward achieving our regional goals and desired outcomes, SCAG conducted a 'Plan' vs 'No Plan' (or 'Baseline') analysis, which compares how the region would perform with and without implementation of the Plan. The conclusions of that analysis are the focus of this chapter. More details on the Connect SoCal performance analysis and its results may be found in the Performance Measures Technical Report.

Implementation of the Plan would result in a regional transportation system that provides improved travel conditions and better air quality, while also ensuring an equitable distribution of benefits among the various communities that comprise the SCAG region. With Connect SoCal, trips to work, schools and other key destinations would be faster and more efficient. Connect SoCal improves the integration of multiple transportation modes, leading to an increase in carpooling, demand for transit and use of active transportation (bicycle and pedestrian) modes for work trips and for other trips made throughout the day.

Analysis conducted by SCAG found that, in comparison to the 2045 Baseline, Connect SoCal will:

- Increase the combined percentage of work trips made by carpooling, active transportation, and public transit by 3 percent, with a commensurate reduction in the number of commuters traveling by single-occupancy vehicle
- Reduce vehicle miles traveled per capita by 5 percent and vehicle hours traveled per capita by 9 percent (for automobiles and light/medium-duty trucks) as a result of more efficient land use strategies and improved regional transit service
- Increase transit use for work trips by 2 percent, as a result of improved transit service and more transit-oriented, mixed-use development
- Reduce travel delay per capita by 26 percent
- Reduce heavy-duty truck delay by 24 percent
- Create more than 264,500 new jobs annually, due to an increased level of economic competitiveness throughout the region, and improved regional economic performance. This more competitive economic environment would be the result of an improved regional transportation system and reduced levels of congestion
- Reduce greenfield development by 29 percent. Conservation of open space, agricultural lands, and other rural land uses may be achieved by focusing new residential and commercial development in higher density areas that are already equipped with the requisite urban infrastructure.

Note, the above transportation performance results do not include off-model adjustments and are therefore considered to be conservative estimates of Connect SoCal performance.

Connect SoCal also focuses on improving public health outcomes in the SCAG region. Some key performance results include a reduction in our regional obesity rate and a reduction in the share of our population that suffers from pathologies related to lack of regular physical activity, such as hypertension and type 2 diabetes. The total annual healthcare costs for respiratory disease will be reduced under the Plan by more than 5 percent compared to the Baseline. Implementation of Connect SoCal would provide more than $346 million in healthcare cost savings per year as a result of reductions in several chronic diseases and would bring significant benefits for the regional economy. When looking specifically at air-pollution related health incidences, the region is expected to save over $180 million in healthcare expenditures annually. These

public health improvements are the result of Connect SoCal investments in active transportation, more walkable and bikeable communities and improved regional air quality.

PERFORMANCE GOALS & REQUIREMENTS

The Connect SoCal performance measurement process provides a means for determining how well the program of investments included in the Plan correspond to the overall goals and desired vision for the future of the SCAG region. As part of the development of Connect SoCal, a set of 10 high level goals for the Plan were adopted. The goals are intentionally general in nature, and the Connect SoCal performance measures are not intended to correspond specifically to each of the Plan goals. However, they are complementary, with most of the performance measures supporting multiple goals. While the Connect SoCal goals are visionary in nature, the performance outcomes provide a more specific framework to guide the region toward achievement of the higher level goals. Performance measures, in turn, are the quantitatively defined variables used to assess progress within each of the outcome categories.

Performance measures are also used to ensure that the Plan meets all federal and state mandates. These requirements will be discussed in detail in a subsequent section of this chapter.

PERFORMANCE OUTCOMES & MEASURES

Senate Bill 375 (SB 375) provided a strong regulatory foundation for addressing the daunting challenges presented by climate change. The ambitious GHG reduction goals and associated sustainability planning requirements mandated by SB 375 served to further fortify SCAG's already firm commitment to the monitoring of regional GHG emissions reductions and achievement of regional sustainability objectives, as well as promoting the integration of transportation and land use planning.

The Connect SoCal performance measures are focused on specific outcomes that will serve to strengthen the land-use transportation connections in the SCAG region and enhance the physical health of our region's residents, while also facilitating attainment of GHG emissions reduction goals and ameliorating the consequential impacts of climate change. The set of outcomes and performance measures used to evaluate various scenarios for Connect SoCal are presented in the Performance Measures Technical Report.

USES OF PERFORMANCE MEASURES

The Connect SoCal performance measures serve to gauge progress toward meeting the goals and objectives for our region as outlined in the Plan, as well to ensure that the region meets state requirements for reducing GHG emissions and planning for a more sustainable future. The results of SCAG's performance analysis and assessment process allow us to conclude that implementation of the integrated program of projects, strategies and policy recommendations of Connect SoCal will result in significant benefits to our region, not only in respect to the transportation-related objectives of improved mobility and accessibility; but also for better air quality, stimulated regional economic activity and job creation, community and environmental sustainability, social equity, and environmental justice.

Performance monitoring is an invaluable tool to facilitate linkage of the regional goals and desired outcomes identified in Connect SoCal with actual performance at the implementation level. The monitoring of local and regional progress is key to understanding which projects, programs, and strategies are proving successful in meeting our regional goals and which ones may require modification or reconsideration. Ultimately, progress toward our regional objectives is made through implementation at the local level.

Ongoing performance monitoring serves to guide future planning efforts and support local and regional transportation system investment decision-making. The assessment of regional performance over time allows us to set meaningful performance targets and milestones so that progress and setbacks may be effectively evaluated and addressed in a timely manner. On-going performance monitoring also helps to identify emerging trends in the region that may need to be accounted for in our interim planning activities, as well as to inform development of the next RTP/Sustainable Communities Strategy (SCS).

CONNECT SOCAL PERFORMANCE OUTCOMES

This section summarizes how well the Connect SoCal program of transportation improvement projects, land use strategies and sustainable communities policy recommendations are expected to perform when fully implemented. The performance of the Plan is assessed through the modeling of several discretely defined outcome scenarios. The modeling outputs are then compared, using standardized performance measures, to quantify differences in the model results between various scenarios.

Three planning scenarios are referenced in Connect SoCal: Base Year, Baseline and Plan.

- **Base Year** represents existing conditions in the SCAG region as of 2016. This includes our regional transportation system, land use patterns and socio-economic characteristics (households and employment). The year 2016 was selected as the 'Base Year' for this analysis because it is the year of the most recent available data for all variables related to Connect SoCal performance outcomes.
- **Baseline** represents the future regional transportation system that will result from the continuation of current programs, including projects currently under construction or undergoing right-of-way acquisition, those transportation plans and projects programmed and committed to in the 2019 Federal Transportation Improvement Program (FTIP), and/or transportation projects that have already received environmental clearance.
- **Plan** represents future conditions in 2045 wherein the transportation investments, policy recommendations and strategies identified in Connect SoCal are fully implemented.

The Base Year, Baseline and Plan scenarios discussed in this chapter were developed to help evaluate the performance of the strategies, programs and projects presented in Connect SoCal and to meet various state and federal requirements.

TABLE 5.1 presents the Connect SoCal performance outcomes and the associated measures used to forecast Plan performance. The table also includes specific performance results for both the Baseline and the Plan.

PERFORMANCE OUTCOME CATEGORIES

The Connect SoCal performance monitoring program is based upon performance goals, outcomes and measures. As discussed previously, the goals refer to high level regional objectives for the Plan. The performance goals correlate to how we envision the future of the SCAG region and what planning priorities need to be emphasized through the Plan to achieve that vision. Connect SoCal includes 10 overall performance goals as presented in the Performance Measures Technical Report.

For Connect SoCal, eight outcome categories have been designated, each representing a primary performance focus area for the Plan. These performance outcome categories include:

1. Location Efficiency
2. Mobility and Accessibility
3. Safety and Public Health
4. Environmental Quality
5. Economic Opportunity
6. Investment Effectiveness
7. Transportation System Sustainability
8. Environmental Justice

An additional set of performance measures to be used for SCAG's on-going regional monitoring effort are described and discussed in the Connect SoCal Performance Measures Technical Report. The next section of this chapter defines these categories and introduces the specific measures used to evaluate the performance of Connect SoCal.

CONNECT SOCAL
PERFORMANCE PROFILE

LOCATION EFFICIENCY

High Quality Transit Area Household Growth Share

45.2% Baseline

51.2% Plan

6.0% ↑

High Quality Transit Area Employment Growth Share

44.8% Baseline

59.7% Plan

14.9% ↑

Rural Land Consumption

100 sq. miles Baseline

71 sq. miles Plan

29.2% ↓

LESS TIME SPENT DRIVING

Daily Miles Driven per capita

21.8 mi Baseline

20.7 mi Plan

5.0% ↓

Daily Traffic Delay per capita

11.3 mins Baseline

8.4 mins Plan

25.7% ↓

Heavy Duty Truck Delay Highway

186,276 hrs Baseline

144,744 hrs Plan

22.3% ↓

Heavy Duty Truck Delay Arterial

32,027 hrs Baseline

23,492 hrs Plan

26.6% ↓

IMPROVED AIR QUALITY

Reactive Organic Gas Emissions

46.5 tons Baseline

44.1 tons Plan

5.3% ↓

Carbon Monoxide Emissions

325.8 tons Baseline

307.3 tons Plan

5.7% ↓

$PM_{2.5}$ Emissions

12.9 tons Baseline

12.4 tons Plan

4.1% ↓

GHG Reductions

YEAR	TARGET	PLAN
2020	8%	8%
2035	19%	19%

ECONOMIC OPPORTUNITY

Benefit/Cost Ratio



$1.00 INVESTMENT = $2.06 BENEFIT

$346 Million

Saved in Annual Healthcare Expenditure

264,500

Annual New Jobs Supported By Improved Competitiveness

168,400

Annual New Jobs Supported By Transportation Investments

CONNECT SOCAL
PERFORMANCE RESULTS

Daily Vehicle Miles Traveled (VMT)*
per capita

2016 BASE YEAR	2045 BASELINE	2045 PLAN
23.2 MILES	21.8 MILES	20.7 MILES

Baseline to Plan Comparison −5.0%

Base Year to Plan Comparison −10.8%

Daily Minutes of Person Delay
per capita

2016 BASE YEAR	2045 BASELINE	2045 PLAN
10.5 MINUTES	11.3 MINUTES	8.4 MINUTES

Baseline to Plan Comparison −25.7%

Base Year to Plan Comparison −20.0%

	2016 BASE YEAR	2045 BASELINE	2045 PLAN	
IMPERIAL COUNTY				
DAILY VMT *per capita*	30.7 MILES	32.6 MILES	32.4 MILES	
DAILY DELAY *per capita*	3.3 MINUTES	12.1 MINUTES	8.1 MINUTES	
LOS ANGELES COUNTY				
DAILY VMT *per capita*	22.2 MILES	20.4 MILES	19.2 MILES	
DAILY DELAY *per capita*	13.4 MINUTES	13.4 MINUTES	10.5 MINUTES	
ORANGE COUNTY				
DAILY VMT *per capita*	24.1 MILES	22.9 MILES	22.3 MILES	
DAILY DELAY *per capita*	10.0 MINUTES	11.0 MINUTES	8.0 MINUTES	
RIVERSIDE COUNTY				
DAILY VMT *per capita*	23.0 MILES	21.6 MILES	20.6 MILES	
DAILY DELAY *per capita*	5.6 MINUTES	8.4 MINUTES	5.4 MINUTES	
SAN BERNARDINO COUNTY				
DAILY VMT *per capita*	26.1 MILES	25.6 MILES	24.5 MILES	
DAILY DELAY *per capita*	5.4 MINUTES	8.3 MINUTES	5.2 MINUTES	
VENTURA COUNTY				
DAILY VMT *per capita*	22.3 MILES	21.0 MILES	19.6 MILES	
DAILY DELAY *per capita*	5.6 MINUTES	6.1 MINUTES	3.4 MINUTES	

Note: Base Year: 2016 Existing Conditions, Baseline: Continuation of current trends without Plan, Plan: Full implementation of Connect SoCal
*VMT per capita refers to automobiles & light trucks only

TABLE 5.1 Connect SoCal Performance Measures & Results

Outcome Group	Performance Measure	Definition	Objective	Category	2045 Performance Results		
					Baseline	Connect SoCal	Trend
Location Efficiency	Share of regional household growth occurring in HQTAs	Percent of the region's total household growth occurring within HQTAs	Improvement (increase) over Baseline	Percent of households located in HQTAs	45.2%	51.2%	↑
	Share of regional employment growth occurring in HQTAs	Percent of the region's total employment growth occurring within HQTAs	Improvement (increase) over Baseline	Percent of jobs located in HQTAs	44.8%	59.7%	↑
	Land consumption	Total acreage of greenfield or otherwise rural land uses converted to urban use	Improvement (decrease) over Baseline	Greenfield land consumed	100 sq miles	71 sq miles	↓
	VMT per capita	Daily vehicle miles driven per person	Improvement (decrease) over Baseline	Automobiles and light-duty trucks	21.8 miles	20.7 miles	↓
	Average distance traveled	Average daily distance traveled for work and non-work trips (in miles)	Improvement (decrease) over Baseline	Work Trips	17.9 miles	17.7 miles	↓
				Non-Work Trips	5.8 miles	5.7 miles	↓
	Percent of trips less than 3 miles	Percentage of work and non-work trips which are less than 3 miles in length	Improvement (increase) over Baseline	Work Trips	14.0%	14.3%	↑
				Non-Work Trips	40.5%	41.4%	↑
	Work trip length distribution	Statistical distribution of work trip length	Improvement (increase in share of short trip lengths) over Baseline	Trip Length: 10 miles or less	42.3%	42.4%	↑
				Trip Length: 25 miles or less	76.6%	76.6%	↔

TABLE 5.1 Connect SoCal Performance Measures & Results - Continued

Outcome Group	Performance Measure	Definition	Objective	Category	2045 Performance Results		
					Baseline	Connect SoCal	Trend
Mobility & Accessibility	Person delay per capita	Average minutes of delay experienced per capita due to traffic congestion	Improvement (decrease) over Baseline	Daily minutes of delay per capita	11.3 mins	8.4 mins	↓
	Person hours of delay by facility type	Excess travel time resulting from the difference between a reference speed and actual speed	Improvement (decrease) over Baseline	Highway	1,648,575 hrs	1,224,572 hrs	↓
				HOV	127,650 hrs	31,740 hrs	↓
				Arterial	2,006,711 hrs	1,523,701 hrs	↓
	Truck delay by facility type	Excess travel time for heavy duty trucks resulting from the difference between a reference speed and actual speed	Improvement (decrease) over Baseline	Highway	186,276 hrs	144,744 hrs	↓
				Arterial	32,027 hrs	23,492 hrs	↓
	Travel time distribution by mode	Percentage of PM peak period trips completed within 45 minutes by travel mode	Improvement (increase) over Baseline	Transit Trips	46.70%	47.20%	↑
				HOV Trips	78.30%	83.90%	↑
				SOV Trips	80.10%	85.40%	↑
	Transit mode share	Percentage of trips that use transit (work and all trips)	Improvement (increase) over Baseline	All Trips	3.60%	4.90%	↑
				Work Trips	4.00%	6.10%	↑
	Mean commute time	Average travel time to work (all modes)	Improvement (decrease) over Baseline	Average commute time (minutes)	32.1	30.2	↓

TABLE 5.1 Connect SoCal Performance Measures & Results - Continued

Outcome Group	Performance Measure	Definition	Objective	Category	2045 Performance Results		
					Baseline	Connect SoCal	Trend
Safety & Public Health	Vehicle collision rate by severity	Collision rate per 100 million vehicle miles traveled	Improvement (decrease)	Fatality rate	N/A	0.12	N/A
				Serious injury rate	N/A	1.97	N/A
	Air pollution-related health measures	Annual air pollution-related respiratory disease incidence and cost	Improvement (decrease) over Baseline	Pollution-related respiratory health incidences	192,400	182,200	↓
				Pollution-related respiratory health costs	$3.34 billion	$3.16 billion	↓
	Physical activity-related health measures	Health incidences and costs related to lack of physical activity and/or obesity	Improvement (decrease) over Baseline	Daily per capita walking	5.8 mins	6.7 mins	↑
				Daily per capita biking	0.5 mins	0.7 mins	↑
				Daily per capita driving	48.4 mins	43.2 mins	↓
				Obesity rate	30.30%	30.10%	↓
				Hypertension rate	26.40%	26.30%	↓
				Cardiovascular disease rate	4.37%	4.36%	↓
				Diabetes (type 2) rate	8.10%	7.90%	↓
	Active transportation mode share*	Percentage of trips using either walking or biking (by trip type)	Improvement (increase) over Baseline	Walk share (work trips)	2.70%	3.00%	↑
				Bike share (work trips)	1.00%	1.20%	↑
				Walk share (non-work trips)	9.10%	10.10%	↑
				Bike share (non-work trips)	1.80%	2.30%	↑
				Walk share (all trips)	7.80%	8.70%	↑
				Bike share (all trips)	1.70%	2.10%	↑

**Values do not include off-model adjustment factors, see "Active Transportation Mode Share" section for additional details.*

TABLE 5.1 Connect SoCal Performance Measures & Results - Continued

Outcome Group	Performance Measure	Definition	Objective	Category	2045 Performance Results		
					Baseline	Connect SoCal	Trend
Environmental Quality	Greenhouse gas (GHG) emissions reduction	Percent reduction in per capita GHG emissions (from 2005 levels)	Meet state and regional GHG reduction targets	2020	N/A	8%	N/A
				2035	N/A	19%	N/A
	Criteria pollutant emissions	ROG, CO, NOx, PM10, and PM2.5 emissions (tons per day)	Meet federal air quality conformity requirements	Reactive organic gases (ROG)	46.5 tons	44.1 tons	↓
				Carbon monoxide (CO)	325.8 tons	307.3 tons	↓
				Oxides of nitrogen (NOx)	82.9 tons	79.5 tons	↓
				Particulate matter (PM10)	31.7 tons	30.4 tons	↓
				Particulate matter (PM2.5)	12.9 tons	12.4 tons	↓
	Non-SOV mode share	Percentage of trips using a travel mode other than single occupancy vehicle (SOV)	Improvement (increase) over Baseline	All Trips	62.8%	64.9%	↑
				Work Trips	30.9%	33.3%	↑
Economic Opportunity	New jobs supported by improved economic competitiveness	Number of new jobs supported by improved regional economic competitiveness	Improvement (increase) over Baseline	Annual number of new jobs generated by Connect SoCal	N/A	264,500	N/A
	New jobs supported by transportation system investments	Number of new jobs supported by Connect SoCal transportation system investments	Improvement (increase) over Baseline	Annual number of new jobs generated by Connect SoCal	N/A	168,400	N/A

** Comparative figures shown for Criteria Pollutant Emissions are for the 2016 Base Year*

TABLE 5.1 Connect SoCal Performance Measures & Results - Continued

Outcome Group	Performance Measure	Definition	Objective	Category	2045 Performance Results		
					Baseline	Connect SoCal	Trend
Investment Effectiveness	Transportation system investment benefit/cost ratio	Ratio of monetized user and social benefits relative to transportation system investment expenditures	Benefit/cost ratio greater than 1.0	Benefit ratio per $1 investment	N/A	2.06	N/A
Transportation System Sustainability	Cost per capita to preserve the regional multimodal transportation system in current state of good repair	Annual cost per capita required to preserve the regional multimodal transportation system to current conditions	Improvement (decrease) over Baseline	Cost per capita (per year)	N/A	$562	N/A
Environmental Justice	See Table 5.5: Connect SoCal Environmental Justice Performance Measures		Meet federal Environmental Justice requirements: No unaddressed disproportinately high and adverse effects on low income or minority communities				

Source: SCAG

CONNECT SOCAL PERFORMANCE OUTCOMES

OUTCOME 1: LOCATION EFFICIENCY

The 'Location Efficiency' performance outcome reflects how improved coordination of land use and transportation planning affects the movement of people and goods throughout the SCAG region. This outcome has seven associated performance measures to assess progress provided by Connect SoCal toward achieving our Location Efficiency objectives:

- Share of Household Growth in High Quality Transit Areas
- Share of Employment Growth in High Quality Transit Areas
- Land Consumption
- Vehicle Miles Traveled per Capita
- Average Distance Traveled
- Percent of Trips Less than Three Miles
- Work Trip Length Distribution

The following is a summary of the Location Efficiency performance measures:

SHARE OF HOUSEHOLD GROWTH IN HIGH QUALITY TRANSIT AREAS

By 2045, the share of new households located within designated High Quality Transit Areas (HQTAs) is projected to increase by 6 percent between the Baseline (45.2 percent) and Connect SoCal (51.2 percent).

SHARE OF EMPLOYMENT GROWTH IN HIGH QUALITY TRANSIT AREAS

Growth in the share of new regional employment located within HQTAs is projected to increase by 15.3 percent between the Baseline (44.8 percent) and Connect SoCal (60.1 percent) by 2045.

LAND CONSUMPTION

The land consumption metric is used to assess the amount of previously agricultural or otherwise undeveloped land that has changed from rural to more intensive development. 'Greenfield' land consumption refers to new urban development occurring on land that has not previously been developed, or otherwise impacted by, urbanized use, including agricultural lands, forests, deserts and other open spaces. Rural land consumption under Connect SoCal would be substantially less (71 square miles) than under the Baseline (100 square miles).

VEHICLE MILES TRAVELED PER CAPITA

Vehicle miles traveled (VMT) per capita is an essential metric used for monitoring the impact of population and economic growth on our regional transportation system. VMT measures the total number of miles traveled by motor vehicles within the SCAG region. Increases in VMT may impact traffic congestion, air quality and the overall quality of life in our region. As a region with an ever-growing population and a vibrant economy, it is expected that more people will be making use of our regional transportation system to get to their places of employment and to engage in other daily economic, service, and entertainment activities. The challenge is to identify effective solutions to balance our regional mobility needs with the imperative to address the consequential impacts of climate change.

The monitoring of VMT per capita (for automobiles and light trucks) became even more important with the passage of SB 375, which led to state-mandated reduction targets for regional GHG emissions. According to the U.S. Environmental Protection Agency (U.S. EPA), the transportation sector produces about 30 percent of all GHG emissions, with automobiles contributing approximately 60 percent of transportation sector emissions.

SB 375 engendered the passage of several subsequent legislative measures for purposes of implementing its GHG reduction mandate. SB 743, passed in 2013, directed the Governor's Office of Planning and Research (OPR) to identify a new metric for assessing California Environmental Quality Act (CEQA) transportation impacts that would serve to promote achievement of statewide GHG reduction goals. Ultimately, VMT was selected as the most viable of several alternatives evaluated to replace the previously used 'Level of Service' (LOS) methodology,

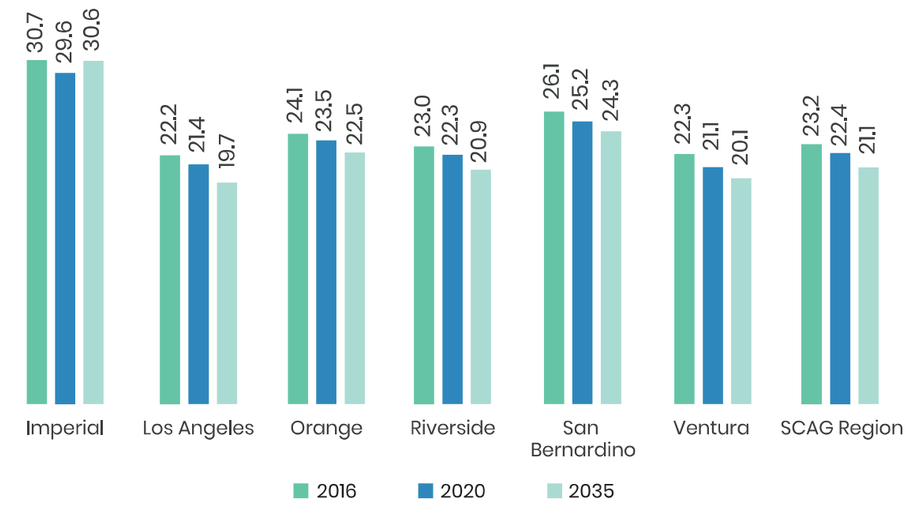
which focused exclusively on vehicle delay. Replacing the LOS methodology with a VMT-based assessment metric satisfies the SB 743 objectives of reducing GHG emissions, promoting mixed-use and infill development, and encouraging the provision of active transportation infrastructure. The new VMT-based CEQA transportation impact assessment requirement will take effect statewide on July 1, 2020, further elevating the importance of monitoring VMT at the regional and local levels. Connect SoCal has not taken any credits in regard to potential per capita VMT reduction through SB 743 implementation. By monitoring progress in reducing per capita VMT through implementation of the various transportation investments and land use strategies outlined in Connect SoCal, we are better able to accurately gauge progress toward achieving our regional GHG emissions reduction goals.

Daily per capita VMT in the SCAG region is projected to decrease in 2045 from 21.8 miles under the Baseline to 20.7 miles with Connect SoCal. **FIGURE 5.1** shows per capita VMT by county.

AVERAGE DISTANCE TRAVELED

In 2045, the average distance traveled one-way for work trips in the SCAG region is projected to decrease slightly from 17.9 miles under the Baseline to 17.7 miles with Connect SoCal. The average distance traveled one-way for non-work trips in 2045 is also projected to decrease, from 5.8 miles to 5.7 miles.

FIGURE 5.1 Daily Vehicle Miles Traveled (VMT) per Capita by County



Source: SCAG Regional Travel Demand Model

PERCENT OF TRIPS LESS THAN THREE MILES

The majority of trips in Southern California are made by people driving alone in their vehicles. As trip lengths become shorter, particularly to within a few miles, people become more amenable to the use of transit, bicycling, walking or using other travel modes instead of driving alone. By 2045, the share of work trips less than three miles in length is projected to increase from 14 percent to 14.3 percent; and from 40.5 percent to 41.4 percent for non-work trips. Land use strategies that emphasize location efficiency, investments in active transportation, and transit system enhancements contribute to achieving these results.

WORK TRIP LENGTH DISTRIBUTION

A primary objective of Connect SoCal is the reduction of commuting distances in the SCAG region. The share of work trips under 25 miles one-way is projected to remain unchanged at 76.6 percent. However, a subset of this group, the share of work trips less than 10 miles in length one-way, is expected to increase slightly from 42.3 percent to 42.4 percent.

OUTCOME 2: MOBILITY & ACCESSIBILITY

The 'Mobility and Accessibility' outcome is defined as the ability to reach desired destinations with relative ease and within a reasonable time, using available transportation choices. This section discusses the mobility and accessibility performance measures for Connect SoCal.

MOBILITY

Mobility performance measures are based on the metric of travel delay. Delay is defined as the difference between an actual travel time and the expected travel time at a reference speed for a specified mode. Travel delay is measured in vehicle-hours of delay, from which person-hours of delay is derived. The measures used to evaluate alternatives for the mobility outcome include:

- Person Delay per Capita
- Person Hours of Delay by Facility Type

- Truck Delay by Facility Type

PERSON DELAY PER CAPITA

FIGURE 5.2 shows daily minutes of delay experienced per capita for each of the six counties, and for the entire SCAG region. Normalizing delay by the number of people living in an area provides insight as to how well the region is mitigating traffic congestion within the context of increasing population growth. Daily minutes of delay per capita would be expected to increase by 2045 in all six counties of the region under Baseline conditions. However, implementation of Connect SoCal would reduce delay substantially, to about 20 percent below 2016 levels and about 26 percent below the Baseline.

PERSON-HOURS OF DELAY BY FACILITY TYPE

Travel delay is also assessed by comparing the number of person-hours of delay experienced on different facility types. The person-hours of delay by facility type metric differentiates the amount of delay experienced by commuters traveling on mixed flow lanes, carpools using high-occupancy vehicle (HOV) lanes, and on our arterial roadways. As shown in **FIGURE 5.3**, person delay experienced on the mixed flow lanes of our highways would improve upon Baseline conditions with Connect SoCal by approximately 26 percent, while delay on HOV facilities will be reduced even more significantly, by more than 75 percent. Delay on arterial roadways in the SCAG region would be reduced by about 24 percent between the Baseline and the Plan.

TRUCK DELAY BY FACILITY TYPE

The Truck Delay by Facility Type performance measure estimates average daily delay experienced by heavy-duty trucks on freeways and arterials in the SCAG region. Connect SoCal includes significant investments in transportation system improvements to facilitate goods movement. **FIGURE 5.4** summarizes heavy duty truck delay projections for freeways and on major arterials in the SCAG region for the Base Year, Baseline, and Connect SoCal.

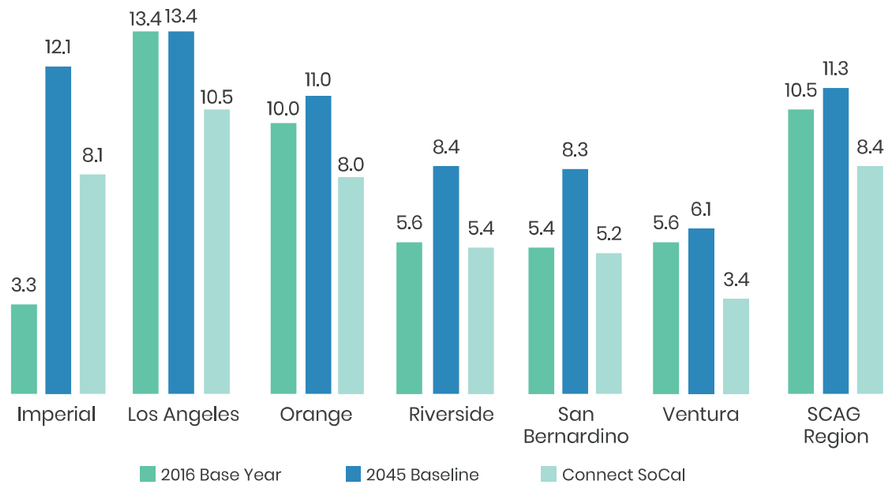
Connect SoCal will reduce heavy-duty truck delay on both our regional freeways and arterial highways as compared to 2045 Baseline projections by 22 percent and 27 percent, respectively. However, truck delay under the Plan will still be expected to be above 2016 levels due to projected growth in regional economic activity and the associated increased demand for freight movement by truck.

HIGHWAY NON-RECURRENT DELAY

Another measure for delay that is useful for ongoing performance monitoring, but is not readily modeled, is non-recurrent delay. Recurrent delay is the expected daily traffic congestion that occurs as a result of there being too many vehicles being on the road at the same time. Non-recurrent delay refers to unexpected conditions of excessive traffic congestion caused by vehicle collisions, adverse weather, special events or other atypical incidents.

Non-recurrent delay may be mitigated or reduced by improving incident response times, implementation of traveler information systems, and deployment of other intelligent transportation technologies, such as traffic signal coordination and highway ramp metering systems. Dynamic travel information technologies providing real-time information about unexpected delays allow travelers to make better-informed decisions regarding the availability of transportation alternatives, including transit. Non-recurrent delay as an ongoing regional monitoring measure is discussed in greater detail in the Connect SoCal Performance Measures Technical Report.

FIGURE 5.2 Daily Person Delay per Capita by County, Minutes



Source: SCAG Regional Travel Demand Model

FIGURE 5.5 shows the relative proportion of freeway congestion experienced in each county that is caused by non-recurrent events. Please note that data for Imperial County is not currently available for this metric.

ACCESSIBILITY

The 'Accessibility' outcome is used to evaluate how well the regional transportation system performs in providing access to various types of opportunities. Opportunities may include jobs, education, medical care, recreation, shopping, or any other activities that may help enhance a person's quality of life. For Connect SoCal, accessibility is assessed by the distribution of trips by mode and by travel time.

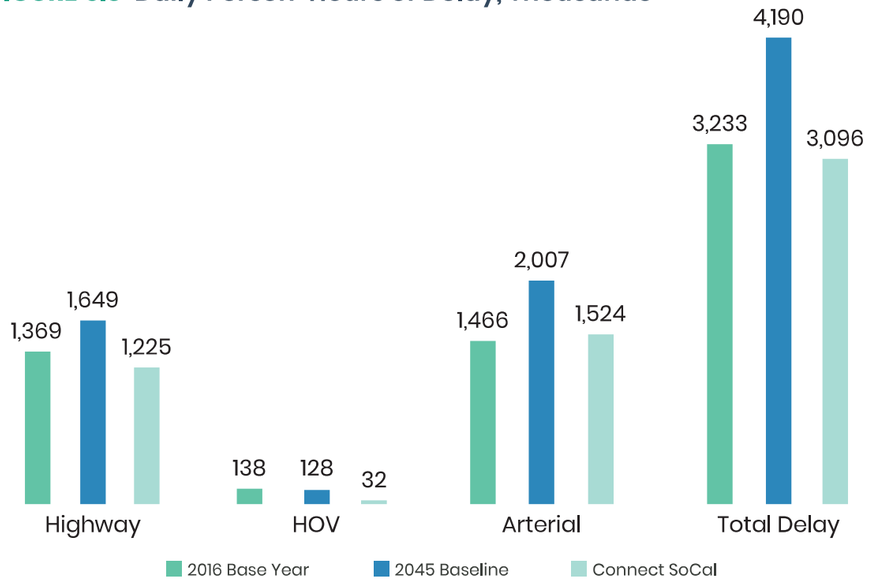
A useful metric for evaluating accessibility is to determine the percentage of peak period work trips that are completed within 45 minutes in comparison with the 2045 Baseline and the 2016 Base Year scenarios. Peak commute periods are those times during the weekday when travel demand on regional roadways reaches its highest levels. Peak periods typically occur twice daily, first during the morning commute when people are traveling to their workplaces, and again in the late afternoon when people are returning home from work.

FIGURE 5.6 shows the results of the accessibility analysis conducted for the afternoon (PM) peak period. In all cases, Connect SoCal improves performance for the share of work trips in the SCAG region completed within 45 minutes. In support of the accessibility performance analysis for Connect SoCal, travel time distribution tables are prepared for transit, single-occupant vehicle (SOV) and HOV travel modes, for both work and non-work trips. The results of these mode specific accessibility analyses may be found in the Connect SoCal Performance Measures Technical Report.

TRANSIT MODE SHARE

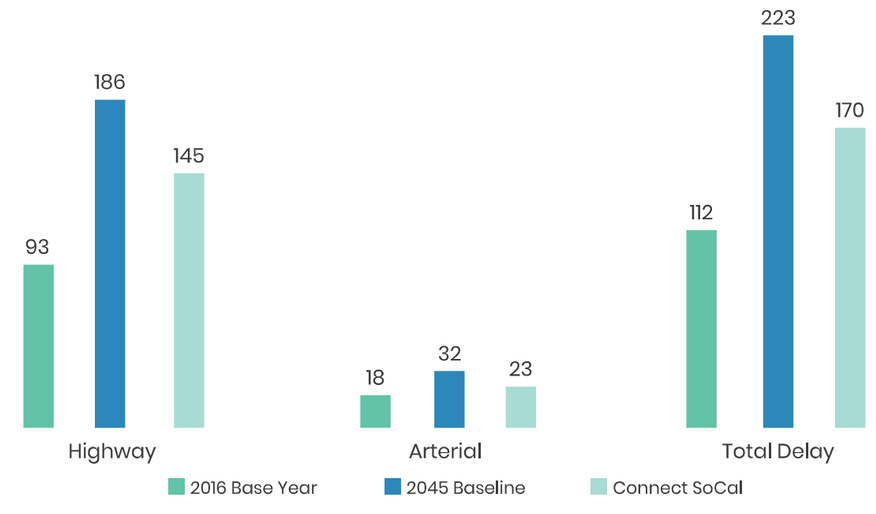
The Transit Mode Share performance measure reports the share of work trips, and all trips that use transit. This metric helps identify how effectively the transit improvements and strategies proposed in Connect SoCal work toward providing better and more diverse commuting options for the travelers. Ideally, with better and more reliable transit service, more commuters will

FIGURE 5.3 Daily Person-Hours of Delay, Thousands



Source: SCAG Regional Travel Demand Model

FIGURE 5.4 Daily Heavy-Duty Truck Hours of Delay by Facility Type, Thousands



Source: SCAG Regional Travel Demand Model

choose transit over driving alone, facilitating reduction of VMT and regional GHG emissions. **TABLE 5.2** shows transit mode shares by county. These 2045 projections are for work trips and for all trips under Connect SoCal.

ACTIVE TRANSPORTATION MODE SHARE

The Active Transportation Mode Share performance measure reports the share of work trips, and all trips that use active transportation (walking, bicycling, and other human-powered transportation) using the SCAG Activity-Based Model (ABM). Due to the general lack of data collected regarding active transportation infrastructure, SCAG conducted an additional "off-model" analysis for Connect SoCal. This analysis takes into account Safe Routes to School safety enhancements, first-last mile improvements, pedestrian infrastructure improvements, and bike share and micro-mobility. While the ABM shows active transportation mode share of 8.7 percent for walking (all trips) and 2.1 percent for bicycling (all trips), the most accurate Connect SoCal mode share estimate includes an addition of 1.3 percent for walking (all trips) and 0.4 percent for bicycling (all trips) for a total of 10 percent walking mode share (all trips) and 2.5 percent bicycling mode share (all trips). Additional details on the active transportation off-model analysis can be found in the Active Transportation Technical Report.

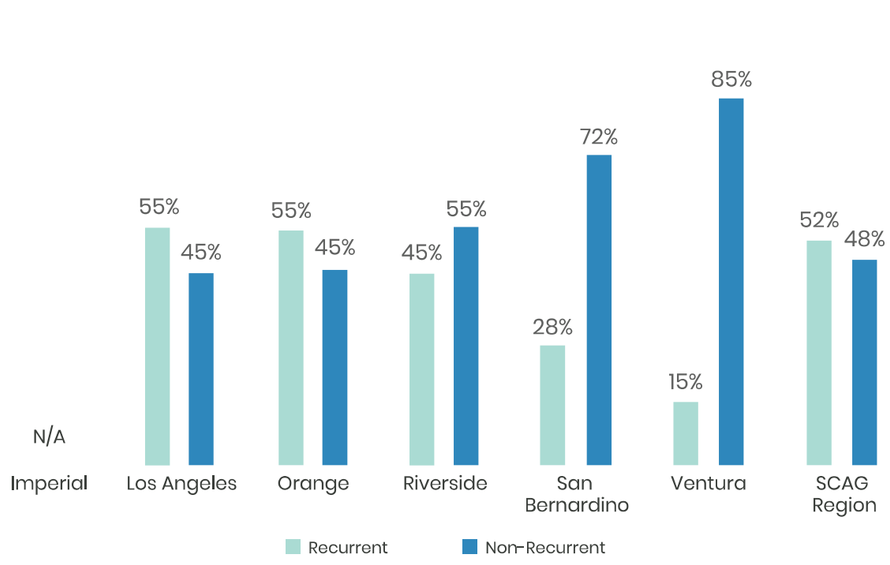
MEAN COMMUTE TIME

Mean commute time is a new performance metric introduced for Connect SoCal. This measure reports the average time it takes for a commuter in the SCAG region to get to work by various travel modes. In 2045, the mean commute time by automobile in the region will improve from 30.6 minutes under the Baseline to 27.8 minutes with Connect SoCal. For transit, the average commute time will decrease from about 71 minutes under the Baseline to 70 minutes under the Plan.

OUTCOME 3: SAFETY & PUBLIC HEALTH

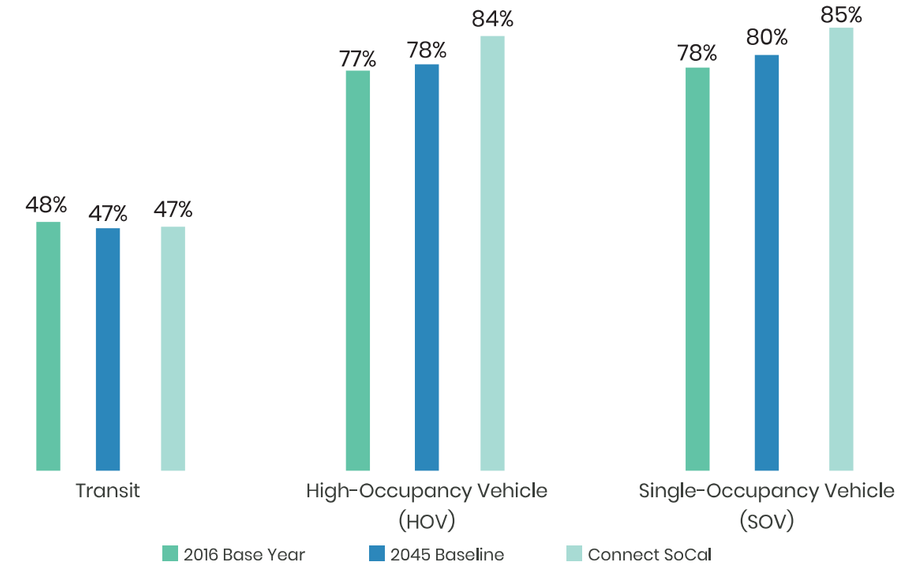
Connect SoCal includes several performance measures to evaluate the 'Safety and Public Health' outcome. The totality of impacts of regional transportation improvements on safety and public health are not easily modeled. However, the assessment of the number and severity of collisions occurring on our roadways

FIGURE 5.5 Non-Recurrent Congestion Share by County



Source: SCAG Regional Travel Demand Model

FIGURE 5.6 Work Trips Completed within 45 Minutes, PM Peak Period



Source: SCAG Regional Travel Demand Model

provides a useful means for monitoring the relative safety of the regional transportation system. The total number and rate of fatalities and of serious injuries resulting from collisions are the primary performance measures used to assess safety. It should be noted, however, that this methodology does not account for safety improvements specific to individual transportation modes. For purposes of ongoing regional performance monitoring, this measure is reported over time and by mode (including for active transportation modes). Please see the Connect SoCal Transportation Safety and Security Technical Report for more detailed analysis on regional safety performance and trends.

Connect SoCal seeks to improve the integration of transportation and land use planning with the recognition that our regional multimodal transportation system generates a wide range of impacts that significantly affect public health and quality of life. To assess public health outcomes of the Plan, SCAG consolidated several health-related performance measures. Please see the Public Health Technical Report for an analysis on Plan performance related to health outcomes. SCAG models several specific health-related metrics to evaluate how the Plan affects the public health outcome. These measures include:

- Incidences of air pollution-related respiratory illness
- Healthcare expenditures related to air pollution-related illnesses
- Mode share walking and bicycling
- Reduced rates of chronic disease and obesity due to improvements in physical activity
- Healthcare expenditures related to hypertension, heart disease, and type 2 diabetes for adults ages 18-65

Air quality significantly impacts public health in the SCAG region, as the amount of air pollutants released into the atmosphere is highly correlated to respiratory health issues, including asthma. There are four common criteria air pollutants that are monitored in the SCAG region in accordance with federal air quality regulations. These air pollutants include ozone, particulate matter (PM10 and PM2.5), carbon monoxide (CO), and nitrogen dioxide (NO2). These pollutants require careful monitoring because of their known adverse effects on human health. While children, older citizens and persons with existing respiratory illnesses are most vulnerable to the effects of air pollutants, the health impacts of long-term exposure are a concern for everyone in the region.

Airborne particulate matter comes in all sizes, however particles smaller than 10 micrometers in diameter are considered the most dangerous to human health because they are small enough to be absorbed into the lungs. High levels of carbon monoxide are also considered a health hazard, especially for people with compromised respiratory or coronary function, as CO is known to reduce the flow of oxygen through the human body. Long-term exposure to high levels of nitrogen dioxide, which is produced primarily through the burning of fossil fuels, may cause a narrowing of the bronchial airways, resulting in chronic wheezing or aggravation of asthma symptoms. For more detailed information regarding the performance of the criteria pollutant measures, please see the Connect SoCal Performance Measures Technical Report.

Improved opportunities for daily physical activity and adoption of healthy lifestyle choices are also quite relevant to the discussion of public health in the SCAG region. Connect SoCal improves physical activity-related public health outcomes through the promotion of more efficient and better coordinated land use and transportation planning. By increasing the share of shorter trips, more

TABLE 5.2 Transit Mode Share: 2045, Connect SoCal

County	Work Trips	All Trips
Imperial County	0.7%	1.4%
Los Angeles County	9.8%	7.0%
Orange County	2.2%	2.6%
Riverside County	1.2%	2.1%
San Bernardino County	1.7%	2.4%
Ventura County	2.0%	2.1%
SCAG Region	6.1%	4.9%

Source: SCAG Regional Travel Demand Model

opportunities are provided for use of active transportation. With development of an enhanced active transportation network, first/last mile improvements, Safe Routes to School projects and improved regional bikeway infrastructure, opportunities for healthy lifestyle choices are increased. Connect SoCal also improves access to natural lands, open space and parks, thereby increasing opportunities for physical activity and adoption of healthy lifestyle choices.

The linkage between obesity and chronic disease has been well documented. Providing the appropriate community design and infrastructure to support a more active lifestyle is an important first step toward promoting healthy communities in the SCAG region. Implementation of Connect SoCal is expected to contribute to a 15 percent increase in daily minutes walking per person and an increase in daily minutes of bicycling per capita of about 40 percent. This increase in daily physical activity would improve health outcomes related to obesity, hypertension, heart disease and type 2 diabetes. For a more detailed discussion of the Plan's public health implications, please see the Connect SoCal Public Health Technical Report.

As the health benefits associated with an active lifestyle have become increasingly recognized over recent years, there has been growing support for improving the walkability and bikeability of the communities where we live and work. To promote active lifestyle choices, the Plan evaluates mode share for both walking and bicycling. Connect SoCal increases the mode share for walking from 7.8 percent under the Baseline to 8.7 percent. For bicycling, the share increases from 1.7 percent under the Baseline to 2.1 percent with Connect SoCal.

OUTCOME 4: ENVIRONMENTAL QUALITY

The 'Environmental Quality' performance outcome is assessed in terms of criteria air pollutant and GHG emissions. Based on the modeling results of SCAG's activity-based Regional Transportation Demand Model (RTDM), emissions are estimated using the California Air Resources Board (ARB) Emission Factors (EMFAC) model. Criteria air pollutant emissions are reported in detail as part of the Connect SoCal Transportation Conformity Analysis Technical Report. The impact of air quality on public health is discussed in the Safety and Public Health section of this chapter and monitoring of regional GHG emissions is further discussed in the Connect SoCal Performance Measures Technical Report. A new 'Environmental Quality' outcome performance measure introduced for Connect SoCal is mode share for travel other than driving alone in a motor vehicle (non-SOV mode share). This metric is also supportive of federal MAP-21/FAST Act performance management and reporting requirements.

OUTCOME 5: ECONOMIC OPPORTUNITY

Performance measures used to quantify the 'Economic Opportunity' outcome include the number of new jobs created due to an improved level of economic competitiveness in the SCAG region occurring as a result of Connect SoCal regional transportation system investments. This improved regional economic climate would result in the creation of approximately 264,500 new jobs generated annually over a wide range of employment sectors. In addition, an average of 168,400 new jobs would be generated each year directly through Connect SoCal transportation system construction and operations expenditures. Through implementation of the strategic investments contained in Connect SoCal, the SCAG region will save over $346 million each year in healthcare expenditures associated with high blood pressure, heart disease and type 2 diabetes. These health cost savings may result in new economic activity due to increased disposable income.

The continued strength of the Southern California economy depends on a modern, well maintained regional multimodal transportation system. Goods movement, freight logistics and distribution, tourism, manufacturing and other primary employment sectors are key job generators for all six counties in the SCAG region, and each is very much dependent upon the availability of efficient, high quality transportation infrastructure. The robust investments in our regional transportation system provided through Connect SoCal will serve not only to improve mobility for people and goods throughout our region, but will also ensure the sustained health and vigor of our regional economy, fortifying Southern California's pivotal position within the state, national and global economies for generations to come. Additional economic co-benefits derived through Connect SoCal are referenced in the Economic and Job Creation Analysis Technical Report.

OUTCOME 6: INVESTMENT EFFECTIVENESS

The 'Investment Effectiveness' performance outcome evaluates the degree to which the Plan's transportation system expenditures generate direct benefits to residents of the SCAG region in relation to the amount invested.

The benefit/cost ratio is the quantitative measure used to assess the 'Investment Effectiveness' outcome, as it compares the incremental benefits generated by Connect SoCal expenditures with the incremental costs of regional transportation system capital investments. The benefits are categorized into several categories, including:

- Travel time savings resulting from reduced travel delay
- Air quality improvements
- Safety improvements
- Reductions in vehicle operating costs

For these categories, travel delay and air quality models are used to estimate the benefits generated by Connect SoCal as compared with the Baseline. Many of these benefits are a function of reductions in travel distance (vehicle miles traveled) and in travel time (vehicle hours traveled).

To estimate the Connect SoCal benefit/cost ratio, the benefits generated for each category are converted into dollars and added together. These monetized benefits are then divided by the total incremental costs of the Plan's regional transportation system investments to produce a ratio.

The investments provided in Connect SoCal would provide a return of $2.06 for every dollar invested. For this analysis, all benefits and costs are expressed in 2016 dollars. Benefits are estimated over the Connect SoCal planning period from 2020 through 2045. The user benefits are estimated using the California Benefit/Cost (Cal-B/C) framework and incorporate SCAG Regional Transportation Demand Model (RTDM) outputs. The costs include incremental capital expenditures over the entire 25-year Connect SoCal planning horizon.

OUTCOME 7: TRANSPORTATION SYSTEM SUSTAINABILITY

A regional transportation system may be considered 'sustainable' if it maintains its overall performance over time in an equitable manner with minimal impact to the environment, while not compromising future transportation needs. Essentially, sustainability refers to how decisions made today impact future generations. One of the performance measures used to evaluate transportation system sustainability is the total inflation-adjusted cost per capita to maintain our existing regional multimodal transportation system in a state of good repair. Connect SoCal provides two additional measures to support preservation of our existing transportation system infrastructure: state highway system pavement condition and local roadways pavement condition.

Connect SoCal is committed to maintaining a sustainable transportation system by allocating a total of more than $316 billion toward maintaining and operating the system in a state of good repair. This amounts to an average annual per capita investment of about $562 per person for each year of the Plan. More details on the 'Transportation System Sustainability' performance measures and analysis results are presented in the Connect SoCal Chapter 4 (Paying our Way Forward) and the Performance Measures Technical Report.

OUTCOME 8: ENVIRONMENTAL JUSTICE

Environmental Justice (EJ) is a federal and state requirement designed to ensure the fair treatment and meaningful involvement of all people and communities in the regional planning process regardless of race, color, national origin, or income. SCAG conducted a comprehensive EJ community outreach process and prepared a wide-ranging analysis during the development of Connect SoCal. A separate set of performance measures were developed for use in the EJ analysis and these measures are described later in this chapter.

The results of SCAG's comprehensive EJ analysis and community outreach process are presented in detail in the Connect SoCal Environmental Justice Technical Report.

CONNECT SOCAL CO-BENEFITS

Connect SoCal provides substantial regional benefits and cost savings that extend beyond the performance variables used to evaluate the Plan. The more focused and compact land use patterns promoted by Connect SoCal serve to reduce the need for significant capital investments. Since most new development would be directed into areas where urban infrastructure already exists, there will not be as much need to extend or build new local roads, water and sewer systems and parks, although existing infrastructure may require enhancement. There will also be savings in operations and maintenance (O&M) costs. O&M costs include the on-going municipal expenditures required to operate and maintain the urban infrastructure needed to serve new residential growth.

The Connect SoCal land use strategies also reduce average household costs associated with driving and residential energy and water use. A land use configuration that features more mixed-use/walkable and urban infill development accommodates a higher proportion of growth in more energy-efficient housing types such as townhomes, apartments and smaller single-family homes, as well as more compact and energy efficient commercial buildings.

As California continues to experience constraints on water supplies due to periodic drought conditions throughout the state, which are likely to become more prevalent as we continue to encounter the challenges presented by climate change, there is a need to do what is possible to reduce residential water use. Residential water use is a function of both indoor and outdoor water needs, with outdoor use (landscape irrigation) accounting for much of the difference among housing types. Because homes with larger yards require more water for landscape irrigation, lot size is generally highly correlated with a household's overall water consumption. Therefore, a prevailing land use configuration with a greater proportion of large lot single-family homes will typically consume more water than one that features compact and urban infill development, which includes attached and multi-family homes.

TABLE 5.3 presents some of the supplemental co-benefits provided by Connect SoCal.

MEETING STATE & FEDERAL PLANNING REQUIREMENTS

In addition to meeting the ambitious regional goals and performance outcomes discussed in previous sections of this chapter, Connect SoCal prioritizes the attainment of all applicable federal and state performance requirements. As presented in depth in the Transportation Conformity Analysis Technical Report, Connect SoCal meets all federal provisions for transportation conformity as defined under the federal Clean Air Act (CAA). Cleaner fuels and emergent vehicle technologies will help to significantly reduce many of the pollutants that contribute to smog and other airborne contaminants that impact public health in the SCAG region.

TRANSPORTATION CONFORMITY

Pursuant to the CAA, the U.S. EPA establishes and regularly updates the National Ambient Air Quality Standards (NAAQS), along with a set of planning and reporting requirements for designated criteria air pollutants. To comply with CAA requirements for achieving NAAQS, the ARB periodically prepares a State Implementation Plan (SIP) for each federally designated 'non-attainment' area (an area that does not meet NAAQS for one or more criteria pollutants), and 'maintenance' area (a previously designated non-attainment area that now meets NAAQS) within the State of California. The SIP provides a comprehensive plan of action for how an area will work toward achieving attainment and maintenance of NAAQS. Development of the SIP requires the collaboration of all applicable local air agencies and the ARB, working cooperatively with federal, state, and local agencies, including MPOs.

Demonstration of transportation conformity is required under the CAA to ensure that federally supported highway and transit project activities conform to, or are consistent with, the purpose of the applicable SIP. Conformity for the purpose of the SIP means that transportation activities including regional transportation plans, transportation improvement programs and transportation projects will not cause new air quality violations, worsen existing air quality violations, or delay timely attainment of the relevant NAAQS. Air quality conformity regulations apply to areas designated by the U.S. EPA as being in non-attainment or maintenance for the following transportation

TABLE 5.3 Connect SoCal Co-Benefits

Benefit Category	Comparative Benefit Performance			
	2045 Baseline	Connect SoCal	Savings	% Savings
Local Infrastructure and Services Costs: Capital, operations, and maintenance costs to support new growth: 2016-2045	$40.3 billion	$36.4 billion	$3.9 billion	9.7%
Household Costs: Annual transportation and home energy/water use: 2045	$13,953	$13,272	$681	4.9%
Land Consumption: New (greenfield) land consumed to accommodate new growth: 2016-2045	100 square miles	71 square miles	29 square miles	29.2%
Building Energy Use: Residential and commercial buildings: Cumulative 2016-2045 (British Thermal Units)	15,546 trillion	15,396 trillion	150 trillion	0.9%
Building Energy Costs: Residential and commercial buildings: Cumulative 2016-2045	$671.4 billion	$666.4 billion	$5.0 billion	0.7%
Building Water Use: Residential and commercial buildings: Cumulative 2016-2045 (Acre Feet)	89.7 million	88.1 million	1.6 million	1.8%
Building Water Costs: Residential and commercial buildings: Cumulative 2016-2045	$122.5 billion	$120.4 billion	$2.2 billion	1.8%
Total Annual Vehicle Miles Traveled (VMT): 2045	483.5 million	459.1 million	24.4 million	5.0%

Source: SCAG Scenario Planning Model

related criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO2), ozone, and particulate matter (PM2.5 and PM10).

Under the U.S. Department of Transportation Metropolitan Planning Regulations and the U.S. EPA's Transportation Conformity Regulations, Connect SoCal is required to pass the following four conformity tests in order to demonstrate transportation conformity:

- Regional Emissions Analysis
- Timely Implementation of Transportation Control Measures
- Financial Constraint
- Interagency Consultation and Public Involvement

The Regional Council adopts the initial Connect SoCal transportation conformity determination, while the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) approve the final transportation conformity determination.

CONFORMITY ANALYSIS & FINDINGS

As documented in the Transportation Conformity Analysis Technical Report, Connect SoCal meets all federal transportation conformity requirements and therefore demonstrates transportation conformity. The findings associated with the conformity tests are described in detail in the Connect SoCal Transportation Conformity Analysis Technical Report.

GREENHOUSE GAS EMISSIONS REDUCTION

Although transportation conformity is a federal requirement and the reduction of GHG emissions is a state mandate, both requirements are highly interrelated. First, each of the Connect SoCal policies, strategies, programs and projects that contribute to meeting federal transportation conformity requirements are the same policies, strategies, programs and projects that support achievement of state GHG emissions reduction targets. Secondly, although transportation conformity addresses emissions of federally designated criteria pollutants and their precursors, these pollutants originate from the same source as GHG emissions: the combustion of fossil fuels in motor vehicles.

Plans and strategies that result in the reduction or elimination of the use of fossil fuels in motor vehicles serve to help Connect SoCal meet both federal transportation conformity requirements and state GHG emission reduction targets. In addition, the regional emissions analysis conducted to ensure transportation conformity and the analysis employed for evaluating GHG emissions reduction performance use the same regional transportation model and the same ARB EMFAC model. There is now greater awareness of the need for more concerted efforts at the federal, state and local levels to integrate the SIP development process with planning activities to address climate change. As a result, transportation conformity and GHG emissions reduction efforts will become even more interconnected and more mutually supportive.

As discussed throughout Connect SoCal, SB 375 requires SCAG to incorporate into its RTP a Sustainable Communities Strategy (SCS) to reduce per capita GHG emissions through integrated transportation, land use, housing and environmental planning.

SB 375 required the ARB to set per capita GHG emission reduction targets from passenger vehicles for each of the state's 18 MPOs. These regional targets were updated by the ARB in 2018 to ensure consistency with the more stringent statewide reduction goals subsequently introduced by the California legislature and the Governor's office. For the SCAG region, the updated targets are 8 percent below 2005 per capita emissions levels by 2020 (this value is unchanged from the previous 2020 ARB target), and 19 percent below 2005 per capita emissions levels by 2035. This revised 2035 target is significantly higher than the previous ARB target of 13 percent for the SCAG region.

Analysis of SCAG's ability to meet SB 375 targets relies on data outputs from SCAG's activity based model as well as supplemental off-model analysis. **TABLE 5.4** provides a simplified calculation overview of the performance of the plan related to GHG emissions reductions.

The Connect SoCal SCS has been found to meet state targets for reducing GHG emissions from cars and light trucks. Connect SoCal achieves per capita GHG emission reductions relative to 2005 levels of 8 percent in 2020, and 19 percent in 2035, thereby meeting the GHG reduction targets established by the ARB for the SCAG region. For the 2020 target, this achievement is based on modeled results as observed data is not yet available to confirm achievement. For more detailed information and analysis on the performance of Connect SoCal in regard to criteria air pollutant emissions and GHG reduction targets in the SCAG

region, please see the Transportation Conformity Analysis Technical Report and the Sustainable Communities Strategy Technical Report.

FEDERAL PERFORMANCE MANAGEMENT REQUIREMENTS

In July 2012, the 'Moving Ahead for Progress in the 21st Century' (MAP-21) federal transportation authorization legislation was signed into law. MAP-21 was widely considered to be a groundbreaking achievement in that it provided a legislative foundation for the establishment of a national performance-based transportation planning program, which was continued with the subsequent federal authorization program, the 'Fixing America's Surface Transportation' (FAST) Act, in December 2015.

MAP-21/FAST Act requires states and MPOs to establish performance targets focused on outcomes supportive of seven key national transportation goals related to transportation investment efficiency. These national performance goals include: 1) transportation system safety, 2) transportation infrastructure condition, 3) congestion reduction, 4) system reliability, 5) freight movement and economic vitality, 6) environmental sustainability and 7) reduced project delivery delay.

To provide a quantitative basis for evaluating progress toward achieving these seven national performance goals, MAP-21/FAST Act also tasked FHWA with the development of a corresponding set of performance measures and targets. The performance measures provide a standardized quantitative metric for monitoring progress toward meeting each of the national goals. Performance targets establish quantitative thresholds by which the measures may be interpreted as having made acceptable progress toward achieving a specific performance goal.

As required by MAP-21/FAST Act, FHWA established national performance measures and guidelines for the setting of statewide and regional performance targets. As provided for in the federal rulemaking, SCAG coordinated closely with Caltrans in the establishment of specific performance targets for the state and for our region in the various transportation performance areas established under MAP-21/FAST Act.

GHG Reduction Targets for the SCAG Region

	2020	2035
ARB Target	8%	19%
Connect SoCal	8%*	19%
% Difference	0%	0%

Percent Reduction Relative to 2005 Levels (per capita)

**Observed data is not yet available. Achievement is based on modeled results and does not include off-model adjustment factors.*

FHWA established rules for implementing transportation system performance management planning at a national level. Rulemaking in support of MAP-21/FAST Act has provided performance management and target-setting guidance through three performance management (PM) packages:

- Transportation System Safety
- Pavement and Bridge Condition (National Highway System)
- National Highway System, Freight Movement, and CMAQ Program Performance

In addition to the three performance management packages, federal performance measures and reporting requirements were established for Transit Asset Management (TAM) and Transit Safety. Performance metrics for TAM focus on the maintenance of our regional transit system in a state of good repair. Transit assets to be monitored under this provision include:

1. Non-revenue support equipment and maintenance vehicles
2. Transit vehicles (rolling stock)
3. Rail infrastructure including tracks, signals, and guidance systems
4. Transit facilities including stations, parking structures and administrative offices

Transit safety performance monitoring is focused on assessment of the number of transit incidents resulting in fatalities or serious injuries, and on transit system reliability.

Each of the federal Performance Management packages features a corresponding set of specific performance measures for which statewide and regional performance targets must be set and reported to FHWA. A comprehensive MAP-21/FAST Act System Performance Report is included in the Connect SoCal Performance Measures Technical Report. The System Performance Report provides details regarding MAP-21/FAST Act performance measures and the associated statewide and regional targets for each of the federal performance management packages.

ENVIRONMENTAL JUSTICE

Environmental Justice (EJ) is a federal and state mandate designed to help ensure social equity in the transportation planning and decision-making process, with the goal of protecting minority and low-income communities from incurring a disproportionate share of adverse impacts produced by regional transportation projects and plans. SCAG's EJ program includes two essential elements: public outreach and technical analysis. Specifically, it is SCAG's role to ensure that when transportation system investment decisions are being

TABLE 5.4 2035 Greenhouse Gas Emission Reduction Calculation

Modeled Greenhouse Gas Emissions	
This calculation reflects transportation investments, pricing strategies, transportation demand management strategies and land use strategies.	-14.89%
Baseline Adjustment	
Tele-Medicine and E-Commerce	-0.35%
Off-Model Greenhouse Gas Emissions	
Induced Demand	0.56%
Electric Vehicle Strategies	-1.76%
Emerging Technology (e.g. carshare and bikeshare)	-0.78%
Job Center and Commute Strategies (e.g. co-working)	-1.21%
Multimodal Strategies (e.g. Safe Routes to School)	-0.70%
TOTAL GREENHOUSE GAS EMISSIONS	-19.12%

made, low-income and minority communities have adequate opportunity to participate in the decision-making process and receive an equitable distribution of benefits, while not bearing a disproportionate share of burdens.

As such, SCAG adheres to all federal and state EJ directives. All public agencies that use federal funding must make EJ part of their mission and adhere to three fundamental EJ principles:

- To avoid, minimize or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process
- To prevent the denial of, reduction in or significant delay in the receipt of benefits by minority and low-income populations

Public outreach to EJ stakeholders and the EJ technical analysis conducted in support of Connect SoCal is described in detail in the Environmental Justice Technical Report. The Technical Report also provides a review of federal and state legislation pertaining to EJ, SCAG policies related to EJ, outreach efforts in communities throughout the region, SCAG's efforts to identify affected communities and an 'EJ Toolbox" which provides recommended practices and approaches that local jurisdictions and community organizations may use to guide further discussion on the identification of EJ solutions and mitigations.

In the development of the EJ analysis, SCAG identified 18 performance measures to analyze existing EJ parameters in the region and to address any potential adverse impacts that Connect SoCal may impose upon the various EJ communities throughout the region. SCAG also examined potential impacts at various geographic levels, and specifically employed a community-based approach for Connect SoCal based on guidance received from community stakeholders. A brief description of the EJ performance measures is provided in this section.

TABLE 5.5 (at the end of this section) presents the Connect SoCal Environmental Justice performance measures.

ENVIRONMENTAL JUSTICE PERFORMANCE MEASURES

A critical element in the development of Connect SoCal is the completion of a comprehensive EJ analysis. SCAG also conducted an extensive EJ outreach program with regional EJ stakeholders to maximize participation of all communities that may be affected by the development and implementation of Connect SoCal. SCAG established a separate set of performance measures to evaluate Connect SoCal impacts on designated EJ communities throughout the region.

The Connect SoCal EJ analysis includes a set of topical areas of inquiry designed to evaluate various social equity concerns. Each of the Connect SoCal EJ performance measures are described below. The 18 EJ performance measures are categorized into four EJ-focused questions as requested by stakeholders to make the performance areas more relatable. These four relatable questions are: 1) How will this impact quality of life; 2) how will this impact health and safety; 3) how will this impact the commute; and 4) how will this impact transportation costs? For more information regarding the SCAG EJ program and the detailed results of the Connect SoCal EJ analysis, please see the Environmental Justice Technical Report.

HOW WILL THIS IMPACT QUALITY OF LIFE?

1. **Jobs-Housing Balance:** An imbalance between employment and housing in a community is a key contributor to local traffic congestion. These types of origin/destination disparities may also be considered impediments to EJ. From an economic standpoint, transportation and driving are expensive; workers without a car or cannot afford a vehicle have to live close to their jobs where they have access to transit or are able to walk or bike to their jobs. This metric seeks to identify any significant differences in commute distances, job-to-work ratios, and jobs-housing ratios among various income levels, between coastal counties and inland counties, and over time.
2. **Neighborhood Change & Displacement:** The integration and coordination of transportation and land use planning is recognized as a key strategy for reducing VMT, air pollution and GHG emissions, while also increasing opportunities for physical activity. However, there

are some equity concerns regarding some 'smart growth' strategies as they relate to housing affordability, specifically in as it relates to Transit-Oriented Development (TOD). The concentration of new growth in central cities and towns to limit sprawl may lead to higher household costs. In some cases where improved transit service has spurred significant new TOD, the result has been that people with low and average incomes are no longer able to afford to buy or rent homes in or near the new developments. In response to these concerns, SCAG developed a methodology to model and monitor demographic trends occurring in and around new transit-oriented communities. This measure examines historical demographic and housing trends for areas surrounding rail and transit stations. With this methodology, demographic changes may be tracked over time in key growth areas. The results will help SCAG and our regional partners better understand demographic shifts that have occurred due to development of TOD along transit lines.

3. **Accessibility to Employment & Services:** Accessibility to key destinations is vital for social and economic interactions. As a performance metric, accessibility is evaluated by the spatial distribution of potential destinations, the ease of reaching each destination by various transportation modes and the magnitude, quality and character of the activities at the destination sites. Travel costs are central: the lower the costs of travel, in terms of time and money, the more places may be reached within a specific budget – that is, the greater the accessibility. The number of destination choices that people have is equally crucial: the more destinations and the more varied the destinations, the higher the level of accessibility. This metric analyzes the share of employment and shopping destinations reachable within 30 minutes by automobile or 45 minutes by transit during evening peak periods to determine the accessibility of services in EJ communities
4. **Accessibility to Parks & Schools:** Accessibility to parks is defined as the percentage of park acreage that may be reached within 30 minutes of travel time by automobile or 45 minutes by transit. In support of the Connect SoCal EJ assessment, analysis was conducted to evaluate accessibility to the San Gabriel National Monument. SCAG's accessibility analysis seeks to determine how the Plan improves residents' ability to access parks within a designated travel time and distance. This analysis is discussed in greater detail in the Connect SoCal Environmental Justice Technical Report.

HOW WILL THIS IMPACT HEALTH & SAFETY?

5. **Active Transportation Hazards:** Encouraging a healthier, more active lifestyle in all our communities is one of the featured goals of Connect SoCal. Making walking and bicycling safer and more convenient transportation options is key to attracting more people to choose these healthy alternatives. Bicycling or walking along roadways near motor vehicles is often perceived as dangerous and reducing hazards in the pedestrian and cycling environment is a primary strategy toward achieving our goal of promoting healthier, more active communities. The 'Active Transportation Hazards' performance measure evaluates incidences of motor vehicle collisions involving bicyclists and pedestrians in our communities, with the goal of promoting an improved environment for active transportation users and encouraging more residents to make the choice to walk or bicycle in their communities. As with other EJ performance measures, this indicator will be used to identify patterns of active transportation hazards and potential risk disparities among the various communities in the SCAG region. For more information on active transportation safety, please see the Active Transportation Technical Report.
6. **Climate Vulnerability:** The 'Climate Vulnerability' performance measure seeks to identify disparities in vulnerability to the impacts of climate change among the various communities in the SCAG region. Of specific interest for this analysis is relative risk for sea level rise and wildfires. It is understood that climate change will impact different regions in different ways. In Southern California, we may expect a general trend toward warmer temperatures, less precipitation and higher sea levels along our coasts. This combination of climatic changes will likely result in increased wildfire danger, particularly in the foothill areas, where our cities adjoin our local mountains. Due to rapidly melting polar ice caps, a steady rise in global sea levels is expected. This may impact the coastal regions of Southern California. This measure will allow SCAG to obtain a better understanding of how these anticipated changes in our local climate may impact our more

vulnerable communities.

7. **Public Health Impacts:** The 'Public Health Impacts' metric seeks to assess the potential disparity among communities in the SCAG region of public health issues that may be associated with local exposure to toxic substances and to transportation infrastructure. Like the Active Transportation Hazards measure, inclusion of this analysis is intended to advance the regional goal of fostering healthier lifestyle choices in our communities. It is a priority of Connect SoCal to provide for more and better opportunities for healthy lifestyle choices throughout the region. For more information on public health, please see the Public Health Technical Report.
8. **Aviation Noise Impacts:** The SCAG region supports the nation's largest regional airport system, in terms of the number of airports and overall aircraft operating within a complex airspace environment. The aviation system includes seven airports with commercial passenger service: Los Angeles International (LAX), Hollywood/Burbank, John Wayne (Orange County), Long Beach, Ontario, Palm Springs, and Imperial. In addition, there are four large reliever airports located in the Inland Empire and in North Los Angeles County, including San Bernardino International Airport, March Inland Port, Southern California Logistics Airport, and Palmdale Airport.
The regional aviation system also includes more than 30 general aviation and reliever airports, several private-use and government airports, and 14 public use airports not included in the national airport system – for a total of more than 60 airports in the region. The primary aviation planning challenge in the SCAG region is striking a balance between the aviation capacity needs of Southern California and maintaining the quality of life for people living near airports. This performance measure provides a descriptive analysis of aviation noise in terms of trends in passenger demand and aircraft operations.
9. **Roadway Noise Impacts:** The SCAG region has an extensive roadway system, with nearly 24,000 centerline miles or over 73,000 lane miles of regionally significant roadways. It also includes one of the country's most extensive HOV systems and a growing network of high-occupancy toll (HOT) lanes. The region also has a vast network of arterials and other local roadways, and the noise generated by these facilities may cause significant environmental concerns. Noise associated with highway traffic depends on multiple factors including traffic volumes, vehicle speed, vehicle fleet mix (cars, trucks) and the location of the highway relative to schools, daycare facilities, parks and other sensitive receptors. This performance measure assesses transportation-related noise impacts by examining how the program of projects included in Connect SoCal may affect roadway noise levels, and by determining the population groups that may potentially be most impacted by increased levels of roadway noise.
10. **Emissions Impact Analysis:** The EJ emissions impact analysis seeks to identify areas in the region that generate a disproportionate share of air pollutant emissions as a result of Connect SoCal. This analysis also includes a breakdown of demographics for those affected areas.
11. **Impacts Along Freeways & High-Traffic Roadways:** Exposure to air pollutants is an EJ issue due to the disproportionate share of minority and low-income populations living near heavily traveled corridors, particularly freeways and port and logistics activities. Exposure to unhealthy air is estimated to result in approximately 5,000 premature deaths annually in the SCAG region, as well as 140,000 incidents of asthma and symptoms of respiratory distress. More than half of all Americans exposed to PM2.5 levels that exceed the national standard live in the SCAG region. This performance metric examines the potential impact of Connect SoCal on the generation of particulate matter and ozone emissions in areas near freeways and other highly traveled corridors.

HOW WILL THIS IMPACT THE COMMUTE?

12. **Travel Time Savings & Travel Distance Savings:** SCAG assessed the distribution of both travel time and travel distance savings that result from the implementation of Connect SoCal, through the analysis of demographic and mode share data for each Transportation Analysis Zone (TAZ) in the region. With this input, travel time and distance savings estimates were developed for various income and ethnic groups for transit trips (bus and rail) and for automobile trips.
13. **Rail-Related Impacts:** Freight rail emissions are estimated to account for 5 percent of all NOx emissions and 4 percent of all particulate matter emissions generated by regional goods movement activities. When compared with all regional particulate matter and NOx sources, the contributions by freight rail emissions is even lower. However,

environmental pollution from locomotives, rail yards and other rail facilities must be considered, as concentrations of rail activities may contribute to localized air pollution. In support of this outcome, SCAG conducted an extensive analysis of potential impacts to EJ communities adjacent to railroads and rail facilities and of rail-related impacts to designated sensitive receptors. For more detailed information regarding the SCAG regional rail system, please see the Goods Movement Technical Report.

HOW WILL THIS IMPACT TRANSPORTATION COSTS?

14. **Share of Transportation System Usage:** SCAG analyzed the use of various transportation modes by race/ethnicity and by income group, with the objective of identifying transportation mode share consistencies among various ethnicity groups and income levels in the SCAG region.
15. **Connect SoCal Revenue Sources & Tax Burdens:** Various types of transportation improvement revenue sources (taxes on income, property, sales and fuel) may impose disproportionate burdens on low-income and minority populations. Sales and gasoline taxes, which are currently the primary sources of funding for the region's transportation system, were evaluated for the purposes of this analysis. The amount of taxes paid was broken down to demonstrate how tax burdens fall on various demographic and income groups. As with previous RTP EJ assessments, the Connect SoCal EJ analysis examined in detail the incidence, distribution and relative burden of taxation.
16. **Connect SoCal Investments:** The strategies that public agencies pursue to invest in transportation systems present potential impacts on EJ. Transportation investment strategies and policies determine the number and quality of transportation choices that are available to low-income and minority communities. An investment analysis that reveals a disproportionate allocation of resources for high quality transit projects, for example, may indicate a pattern of discrimination.
17. **Geographic Distribution of Transportation Investments:** This metric examines where Connect SoCal transportation investments are planned throughout the region. Building upon the community-based approach used in SCAG's overall EJ process, a summary of investments for areas with high concentrations of minority and/or low-income populations is compiled for Connect SoCal highway, transit and active transportation investments.
18. **Mileage-Based User Fee Impacts:** This analysis is based on a potential transportation improvement financing strategy which would implement a user fee based on VMT. If implemented, the VMT user fee would replace the current gasoline tax and is estimated to cost about 2.5 cents (2019 value) per mile and would be indexed to maintain its purchasing power starting in 2030. Implementation of this financing strategy would require action by both the California State Legislature and the U.S. Congress. This performance measure evaluates the potential land use impacts that may result from implementation of such a fee.

SUMMARY OF PLAN PERFORMANCE

The comprehensive program of transportation system improvement projects, regional sustainability strategies and land use-transportation coordination policies proposed by Connect SoCal serve to advance the regional goals. Performance outcomes and performance measures are the tools used by SCAG to evaluate how well the Plan performs toward achieving those objectives.

Common elements among the various Connect SoCal outcomes and performance metrics are a unified commitment to the strengthening of the transportation-land use connection, the promotion of sustainable land use policies throughout the region, and the reduction of GHG emissions that contribute to climate change. Connect SoCal strengthens the transportation-land use connection through its focus on orienting new housing and job growth in areas served by high quality transit, and into other infill areas where urban infrastructure already exists. This more compact and sustainable land use pattern, combined with the transportation network improvements and strategies identified in Connect SoCal, will result in an improved pedestrian and bicycle environment, access to more community amenities, shorter average trip lengths, reduced VMT and better regional air quality.

The Connect SoCal performance outcomes and measures also support the development of more livable communities that provide housing choices for all income levels, encourage conservation of our natural resources, offer more

and better transportation options and promote an improved quality of life for residents of the SCAG region.

The overall objective of Connect SoCal is to provide a means to transform the SCAG region in accordance with the vision provided by our constituent communities and jurisdictions. Among the performance outcome areas where Connect SoCal demonstrates significant transformative capacity is in Location Efficiency. As discussed earlier in this chapter, Location Efficiency refers to improvements in the coordination of land use and transportation planning and decision-making to promote development of more sustainable communities throughout the region that are less dependent on SOV travel and reduce regional VMT and GHG emissions. Focusing new residential and commercial development in HQTAs serves this outcome by situating employment centers and new housing closer to reliable transit options, thereby providing viable alternatives to driving alone to the workplace and to other destinations. HQTAs also foster the mixing of both employment and housing, further enhancing opportunities to reduce commute times and distances.

Under the 2045 Baseline scenario, just over 45.2 percent of new households would be located in HQTAs. With Connect SoCal, the share of new households in HQTAs increases by six percent to 51.2 percent. The share of employment in HQTAs, increases even more dramatically going from 44.8 percent under the Baseline to nearly 60 percent with the Plan, an increase of more than 15 percent. With more people living and working within locations proximal to efficient and convenient transit options, traffic congestion on our freeways and arterial roadways will be reduced accordingly. Another substantial Location Efficiency improvement provided by Connect SoCal is in the reduction of urban sprawl into the rural periphery of our region. Under the Baseline, urbanization would consume 100 square miles of previously rural areas. Connect SoCal reduces this expansion to only 71 square miles, a reduction of 29 percent. The preservation of rural and agricultural lands on the periphery of our region will allow future generations to enjoy the grandeur of our deserts and the rich harvests of our local farmlands.

VMT per capita is another performance area where Connect SoCal excels. Under the Baseline, SCAG region residents would drive an average of 21.8 miles per day. Connect SoCal would reduce this figure to 20.7 miles per day. While one mile per day doesn't seem like very much, when considering the SCAG region is expected to be home to 22.5 million people by 2045, that decrease of one mile in per capita VMT becomes quite meaningful.

Another area where Connect SoCal demonstrates significant strength is in the reduction of travel delay. Person hours of delay experienced on the mixed flow lanes of our highways is expected to decrease by 26 percent in comparison to the 2045 Baseline projection, while delay on our arterial roadways will decrease by 24 percent. Traffic congestion is a significant quality of life issue in the SCAG region and these reductions in travel delay on our roadways will result in less time spent stuck in traffic, more time available to use for more satisfying activities, and therefore less stress for residents of the SCAG region.

TABLE 5.5 Environmental Justice Performance Measures

Performance Measure	Definition	Performance Target	Summary of Impacts
Jobs/housing balance	Comparison of median earnings for intra-county vs inter-county commuters for each county; analysis of relative housing affordability and jobs throughout the region	Establish existing conditions to evaluate future performance (not a Connect SoCal performance measure)	Higher wage workers tend to commute longer distances than lower wage workers. Coastal counties have a substantial concentration of low-wage jobs, but lack an adequate number of affordable rental units, while inland counties have a substantial concentration of affordable rental units and workers relative to the number of low-wage jobs. Connect SoCal will improve jobs/housing balance throughout the region, particularly in inland counties.
Neighborhood change and displacement	Examination of historical and projected demographic and housing trends for areas surrounding rail transit stations	Establish existing conditions to evaluate future performance (not a Connect SoCal performance metric)	New light rail stations may increase neighborhood outflow rates by up to ten percent. However, most observed moves were for middle and upper income groups. Project-based analysis provides a better understanding of local neighborhood dynamics and helps ensure equitable access to the benefits of improved infrastructure. Regional neighborhood analysis identified several communities that have experienced persistent change over recent decades, however, they are not disproportionately located in EJ communities.
Accessibility to employment and services	Share of employment and shopping destinations reachable within 30 minutes by automobile or 45 minutes by transit during evening peak period	No unaddressed disproportionately high adverse effects for low income or minority communities	Connect SoCal will improve the number of accessible destinations within 45 minutes of travel and within short distances for low income and minority communities both by auto and transit.
Accessibility to parks and educational facilities	Share of park acreage reachable within 30 minutes by automobile or 45 minutes by transit during evening peak period	No unaddressed disproportionately high adverse effects for low income or minority communities	Connect SoCal will improve the number of destinations accessible within 45 minutes of travel and short distances for low income and minority communities both by auto and transit.
Active transportation hazards	Analysis of population by demographic group for areas that experience highest rates of bicycle and pedestrian collisions	Establish existing conditions to evaluate future performance	Analysis indicates that low-income and minority communities tend to incur a higher rate of bicycle and pedestrian risk. Improvements in active transportation infrastructure and complete streets measures, such as those proposed in Connect SoCal, have been shown to reduce hazards to cyclists and pedestrians.

TABLE 5.5 Environmental Justice Performance Measures - Continued

Performance Measure	Definition	Performance Target	Summary of Impacts
Climate vulnerability	Population analysis by demographic group for areas potentially impacted by substandard housing, sea level rise, wildfire risk, or extreme heat effects related to climate change	Establish existing conditions to evaluate future performance (not a Connect SoCal performance metric)	Minority and low-income populations are at greater risk for experiencing negative impacts of climate change, including extreme heat and flooding. These communities have fewer resources to ameliorate climate consequences.
Public health analysis	Summary of historical emissions and health data for areas with high concentrations of minority and low income population	Establish existing conditions to evaluate future performance (not a Connect SoCal performance metric)	Air quality is generally improving throughout the SCAG region, however some areas not showing improvement feature higher proportions of minority and low income population. When examining regional public health performance, areas with the highest concentrations of minority and low-income population often incur some of the highest risks.
Aviation noise impacts	Descriptive analysis of aviation noise in terms of trends in passenger demand and aircraft operations	Establish existing conditions to evaluate future performance	Airport noise impacts affecting adjacent communities have been reduced through enhanced FAA noise certification standards, improved technology implemented by aircraft and engine manufacturers, investments by U.S. airlines in newer, quieter aircraft, and mandates by the FAA and the U.S. Congress to retire older, noisier aircraft. However, aviation noise levels and impacts willl continue to be monitored for minority and low-income communities located near airports.
Roadway noise impacts	Comparison of Plan and Baseline scenarios, identification of areas that are low performing due to Connect SoCal investments; breakdown of population for impacted areas by ethnicity and income	No unaddressed disproportionately high adverse effects for low income or minority communities	Connect SoCal will reduce roadway noise impacts at the regional level, but does not specifically improve impacts for disadvantaged communities.
Emissions impact analysis	Comparison of Plan and Baseline scenarios; identification of areas that are lower performing as a result of the Plan, including a breakdown of demographics for those areas	No unaddressed disproportionately high adverse effects for low income or minority communities	Connect SoCal will result in reductions in vehicle carbon monoxide and particulate matter emissions, providing air quality benefits to minority and low-income households and to communities with a high concentration of minority and low income population.

TABLE 5.5 Environmental Justice Performance Measures - Continued

Performance Measure	Definition	Performance Target	Summary of Impacts
Impacts along freeways and highly traveled corridors	Comparison of Plan and Baseline scenarios and demographic analysis of communities in close proximity to freeways and highly traveled corridors	No unaddressed disproportionately high adverse effects for low income or minority communities	Connect SoCal will result in an overall reduction in emissions in areas located near highly traveled roadways, which tend to have a higher concentration of minority and low-income groups than the region as a whole.
Travel time and travel distance savings	Assessment of comparative benefits received as a result of Connect SoCal investments by demographic group in terms of travel time and travel distance savings	No unaddressed disproportionately high adverse effects for low income or minority communities	Connect SoCal travel time and distance savings for low-income households and minority communities are proportionate to each group's usage of the transportation system.
Rail-related impacts	Breakdown of population by demographic group for areas in close proximity to rail corridors and planned grade separations	No unaddressed disproportionately high adverse effects for low income or minority communities	Minority and low income communities in areas adjacent to railroad grade separation projects do not demonstrate improvement.
Share of transportation system usage	Comparison of transportation system usage by mode for low income and minority households relative to each group's regional population share	No unaddressed disproportionately high adverse effects for low income or minority communities	Low-income and minority groups show a higher usage of transit and active transportation modes and positions these communities to benefit from the investments in Connect SoCal.
Connect SoCal revenue sources in terms of tax burdens	Proportion of Connect SoCal revenue sources (taxable sales, income, and gasoline taxes) generated from low income and minority populations	No unaddressed disproportionately high adverse effects for low income or minority communities	Households in poverty would not contribute disproportionately to the overall funding of Connect SoCal. Minority households would not pay a higher proportion of taxes to fund the Plan than their relative representation in the SCAG region as a whole.
Connect SoCal investments	Analysis of Connect SoCal investments by mode (bus, HOV lanes, commuter/high speed rail, highways/arterials, and light/heavy rail transit)	No unaddressed disproportionately high adverse effects for low income or minority communities	The share of Connect SoCal transportation investments serving low-income and minority communities outpaces the relative share of financial burden on those groups.

TABLE 5.5 **Environmental Justice Performance Measures - Continued**

Performance Measure	Definition	Performance Target	Summary of Impacts
Geographic distribution of Connect SoCal transportation investments	Evaluation of Connect SoCal transit, roadway, and active transportation infrastructure investments in various communities throughout the region	No unaddressed disproportionately high adverse effects for low income or minority communities	Connect SoCal transportation infrastructure investments are distributed throughout the region in proportion to population density.
Mileage-Based User Fee impacts	Examination of potential impacts from implementation of a mileage-based user fee on low income households in the region	No unaddressed disproportionately high adverse effects for low income or minority communities	No disproportionate impact is found. Analysis indicates that a mileage-based user fee would be less regressive and more equitable to low-income residents than the current gasoline tax. Low income households currently pay more per mile in gasoline tax than their higher earning counterparts due to lower adoption rates of new (more fuel efficient) vehicles. With a mileage-based user fee system, all households will pay in proportion to their usage of the transportation system.

Source: SCAG

CHAPTER 6

CHAPTER 6

LOOKING AHEAD

LOOKING AHEAD

Connect SoCal has presented a suite of valuable regional strategies and catalytic transportation investments reflecting our aspirations for a healthier, safer, more resilient and economically vibrant region. In particular, Connect SoCal introduces the Key Connections which are packages of strategies that lie at the intersection of land use, transportation and innovation. These strategies depend on broad inter-agency partnerships, and will position the region to deliver sustained performance in meeting the plan's objectives. Our air can be cleaner to breathe, our streets can be safer to navigate, and our resources can be preserved and restored when we directly confront our challenges and take decisive action. Real progress can be made towards sustainable results over the next 25 years if cities and counties are equipped with sufficient resources and practical tools. SCAG will help forge partnerships beyond jurisdictional boundaries for over 20 million people so we can achieve our regional goals.

There is always more to accomplish in Southern California – much more than what a single regional transportation plan can articulate. Although Connect SoCal helps our region advance towards a more sustainable future, additional needs remain, and this Chapter seeks to illuminate new challenges that are on our horizon.

A REGIONAL RESILIENCE FRAMEWORK

The challenges our region will face in meeting ambitious goals over the next 25 years and beyond are increasingly difficult to predict, as the recent COVID-19 pandemic has proven. Disruptions to the region from our changing climate, natural hazards, technology, the global economy and other external forces will be significant in the near- and long-term. These disruptions may be acute shocks that are sudden such as earthquakes, or chronic stresses such as high unemployment or housing insecurity. It is critical that we recognize the likelihood of disruption and strengthen our collective resolve to become an even more resilient and prepared region. Disruptions will impact to varying degrees our region's public health, vulnerable populations, economy, natural resources, built environment, transportation system, housing and water supplies, utility infrastructure and emergency services.

To better anticipate a wide range of potential futures and strengthen the resilience and preparedness of the region, a collaborative exploratory scenario planning process will be initiated to augment the traditional Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) planning process. This process will not be focused on achieving predetermined outcomes or targets. Rather, it will explore pressing issues and potential near- and long-term disruptions to Southern California, such as earthquakes, extreme weather, drought, wildfires, pandemics and economic shocks. This exploration will be expansive and help identify pathways for developing future regional and local plans, including those addressing resilience, emergency preparedness and health equity.

A framework and approach will help define "regional resilience" and identify specific strategies to reduce vulnerabilities, thus allowing the region to further adapt, withstand and respond to disruption. Specifically, the approach will consider the potential degree of disruption to the region that could result from land based, atmospheric, public health and geologic natural hazards. Opportunities for being better prepared for climate change and public health impacts may be prioritized, and implementation tools will be established.

Connect SoCal recognizes that a resilient and prepared region requires that the transportation system, built environment and natural resource areas coexist in a well-balanced land use pattern. Further, it recognizes that when well-coordinated, these components can result in multiple benefits, including greenhouse gas (GHG) emissions reductions, improved health, equity and conservation. Accordingly, the framework will be developed to maximize the implementation of Connect SoCal's regional strategies and investments that support resilience.

SCAG recognizes that disruptions and their impacts may be borne differently by people depending on demographics and location. Crafting a regional resilience framework and approach therefore requires the meaningful engagement of diverse stakeholders from throughout the region. To better reach and engage a broader cross section of residents – particularly when physical distancing may make traditional outreach more challenging – SCAG intends to develop, expand and deepen partnerships with Community Based Organizations (CBOs). Partnering with CBOs can support equitable and resilient regional outcomes.

IDENTIFYING & FULFILLING HOUSING NEEDS

Connect SoCal's strategies and investments seek to support expanded housing choices for all income levels in areas with a range of transportation choices and economic opportunities. For instance, land use strategies such as prioritizing growth in Job Centers are intended to reduce commute distances and times, and regional initiatives focused on supportive infrastructure for housing in

these areas seek to incentivize infill housing production. However, as prices have soared in areas closest to employment centers, high housing costs have lengthened commutes and growth has been pushed to distant locales that often have important natural resources meriting conservation.

Moreover, since 1990, new home construction in the region has on average been at much lower levels than the decades before and vacancy rates have declined. The cost of building housing has been increasing and the risk of displacement has amplified. Production of affordable housing in particular has also remained well below the region's needs during a critical time. Overcrowded households and the burdens of housing costs have increased as a result of low supply and increased demand.

Cost-burdened households with limited transit options who reside further from Connect SoCal's Priority Growth Areas (PGAs) such as Jobs Centers, Transit Priority Areas (TPAs) and High Quality Transit Areas (HQTAs) are more likely to acquire an automobile, drive longer distances, and drive more often. Accordingly, a comprehensive approach is needed to expedite the production of housing in and near PGAs and in other areas with multiple mobility options. Investigating opportunities and barriers to producing units of all types for households of all ages, sizes and income levels is critical.

A Regional Housing Strategy Framework should be developed that places enhanced value on infill opportunities within Connect SoCal's identified and potential future PGAs such as Job Centers, TPAs, HQTAs, Neighborhood Mobility Areas and Livable Corridors. Strategies to preserve existing affordable housing and avert displacement will be essential. This effort should balance housing production strategies well supported by multiple transportation options with the conservation of natural and agricultural lands and restoration of habitats. The "Housing Supportive Infrastructure" Key Connections strategy, discussed in Chapter 3, will be a starting point to coordinate policies and investments across different agencies involving innovations in technology, planning and financial tools.

Finally, it is important to note that recent legislation has increased funding to support local planning for housing. Specifically, under Assembly Bill 101 (AB 101) (2019) legislation, SCAG is eligible for approximately $47 million from the California Department of Housing and Community Development (HCD). These funds will be used to develop a Regional Housing Strategy Framework and provide planning resources, grants and services to jurisdictions to implement their 6th cycle Regional Housing Needs Assessment (RHNA) allocation, which is supportive of Connect SoCal goals and policies. In addition, depending on their population size, local jurisdictions are eligible to receive between $65,000 and $1.5 million individually through AB 101 funding to develop and implement their 6th cycle housing element. Collectively, SCAG jurisdictions are eligible for up to $50 million based on this direct funding resource. SCAG is promoting coordination among these funding opportunities to accelerate housing production throughout the region.

PLANNING FOR TECHNOLOGY & MOBILITY SERVICES

Given existing land use patterns and our maturing transportation system, expanding transportation capacity and infrastructure to serve exurban areas is ever more expensive to build and maintain. Accordingly, it is essential to ensure we are getting the most productivity out of our existing built areas and transportation system through system optimization strategies. These strategies can be facilitated by new technology and mobility innovations that are fundamentally transforming the way people travel.

Connect SoCal provides a number of policies and recommendations to support and facilitate the three revolutions of transportation — electrification, sharing and automation — and ensure that these transformative innovations support, rather than hinder, our regional goals. For example, research suggests that Transportation Network Companies (TNCs) contribute to increased congestion, vehicle miles traveled (VMT) and therefore GHG emissions. Various studies report that between 43 percent and 61 percent of TNC trips substitute for transit, walk or bike travel, or would not have been made at all. The University of Kentucky found that Uber and Lyft decrease rail ridership by 1.3 percent per year and bus ridership by 1.7 percent per year. These impacts could be dwarfed by the increased VMT that may occur in a future where privately owned automated vehicles are the primary means of travel. More discussion is provided in the Emerging Technology Technical Report.

Through additional policy discussions and planning efforts, SCAG will build upon Connect SoCal recommendations and develop a regional framework for technology and mobility services to ensure that the power of technology and innovation is harnessed to improve mobility, accessibility and sustainability in Southern California. This framework should be built on a foundation of guiding principles, data and analysis, to provide a blueprint for integrated policies, practices and programs. SCAG will develop work plans in partnership with various jurisdictions to implement innovative strategies aligned with the "Smart Cities and Job Centers," "Go Zones," "Accelerated Electrification" and "Shared Mobility and Mobility as a Service" Key Connections described in Chapter 3.

Through its Emerging Technologies Committee, SCAG will develop a set of guiding principles to inform decision-making processes related to new technologies in transportation. Guiding principles provide for the objective evaluation of technology to ensure outcomes are consistent with shared priorities, including congestion reduction, efficient use of land and public rights-of-way, equity, open data, labor, seamless connectivity and safety. Additionally, in order to enhance SCAG's understanding of emerging technology, staff will build on its Future Mobility Research Program in collaboration with the other large metropolitan planning organizations in California.

SCAG will also continue research efforts to understand travel behavior in response to incentives including pricing and other transportation demand management strategies. SCAG will engage with regional stakeholders to ensure local components of the Regional Intelligent Transportation Systems (ITS) Architecture are updated with the latest national standards, implement planned ITS investments, and to identify key actions for local jurisdictions to prepare for a connected and automated future. Through its ongoing Future Communities Initiative, SCAG will continue to ensure that public agencies in Southern California lead the nation with respect to efficiency, innovation and transparency through improvements in data collection, analysis and technology.

GLOSSARY

A

AASHTO American Association of State Highway and Transportation Officials – A nonprofit, non-partisan association representing highway and transportation departments in the 50 states, the District of Columbia and Puerto Rico.

AB 32 Assembly Bill 32 – Signed into law on September 26, 2006, it requires that the state's global warming emissions be reduced to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on global warming emissions that will be phased in starting in 2012 in addition to other measures. In order to effectively implement the cap, AB 32 directs the California Air Resources Board (ARB) to develop appropriate regulations and establish a mandatory reporting system to track and monitor global warming emissions levels. Please also see "ARB – California Air Resource Board."

AB 169 Assembly Bill 169 – Provides for the sixteen federally recognized tribes in the SCAG region to join the SCAG Joint Powers Authority (JPA) to participate in the Southern California Association of Governments by voting at the SCAG General Assembly.

AB 398 Assembly Bill 398 – In 2017, California Governor Jerry Brown signed Assembly Bill 398 (Eduardo Garcia, Chapter 135, Statutes of 2017) to extend the state's cap-and-trade program to 2030. Cap and trade is a key part of California's plan to reduce greenhouse gas emissions 40 percent below 1990 levels by 2030. The enacted bill makes design changes to the post-2020 carbon market, such as including a price ceiling, price containment points, additional limits to the number and location of offset credits, limits on who can set greenhouse gas emission requirements, and specifics on industry assistance factors.

AB 617 Assembly Bill 617 – In 2017, California Governor Jerry Brown signed Assembly Bill 617 (C. Garcia, Chapter 136, Statutes of 2017) to develop a new community focused program to more effectively reduce exposure to air pollution and preserve public health. AB 617 is a companion bill to AB 398 that extends California's cap-and-trade program for greenhouse gas emissions. The most significant criteria and toxics air quality legislation passed in California in the last three decades, AB 617 directs the California Air Resources Board (ARB) and all local air districts throughout California to take measures to protect communities disproportionally impacted by air pollution.

There are five central components to the AB 617 mandate:

- Community-level air monitoring
- A state strategy and community specific emission reduction plans
- Accelerated review of retrofit pollution control technologies on industrial facilities subject to Cap-and-Trade
- Enhanced emission reporting requirements
- Increased penalty provisions for polluters

Additionally, ARB may direct additional grant funding to communities determined to have the highest air pollution burden.

AB 744 Assembly Bill 744 – Allows a developer that is requesting a density bonus and including 100% affordable rental units in the development to also request that the city or county reduce the minimum parking requirements for the development. To qualify, the development would have to be either within half a mile of a major transit stop, a seniors-only development with access to transit, or a development that serves special-needs individuals and has access to transit. For mixed-income developments within a half mile of a major transit stop that include the maximum number of very low- or low-income units under Density Bonus Law, the parking requirement cannot exceed 0.5 per bedroom.

ABM Activity-Based Model is based on the principle that travel demand is derived from people's daily activity patterns. ABMs predict when and where activities are conducted, for how long, and the travel choices made to complete them.

Absolute Constrained Areas Include tribal lands, military, open space, conserved lands, sea level rise areas (2 feet) and farmlands in unincorporated areas. These areas were identified during the scenario development process to be used during the modeling process to redirect jurisdictional growth into other areas. These are intended to be regional guidelines and do not supersede existing regulations or protections or local land use policy.

ACE Alameda Corridor East is a 35-mile corridor extending through the San Gabriel Valley between East Los Angeles and Pomona and connecting the Alameda Corridor to the transcontinental railroad network.

Active Transportation A mode of transportation that includes human powered transportation and low-speed electronic assist devices. Examples include but are not limited to: walking (includes any person walking, skateboarding and using a wheelchair or other personal mobility device), use of a bicycle, electric bicycle (e-bike), tricycle, scooter, skates, push scooter, trailer and hand cart.

ADA Americans with Disabilities Act of 1990 – Guarantees equal opportunity for individuals with disabilities in public accommodations, employment, transportation, state and local government services, and telecommunications. It prescribes federal transportation requirements for transportation providers.

ADU Accessory Dwelling Units – A room or set of rooms in a single-family home (and in a single-family zone) that has been designated or configured to be used as a separate dwelling unit, and has been established by a permit.

Advance Mitigation A science-based approach to identify mitigation opportunities early in the planning process prior to project design and permitting phases to support regional conservation priorities.

Affordable Housing Units Housing that is affordable to households earning 80% or less of the county median income.

Agricultural Lands Land designated for farming; specifically the production of crops and rearing of animals to provide food and other products.

AHSC Affordable Housing and Sustainable Communities – A state grant program from the Greenhouse Gas Reduction Fund that addresses land-use, housing, transportation, and land preservation projects to support infill and compact development to reduce greenhouse gas emissions.

AJR 40 Assembly Joint Resolution No. 40 – Introduced on August 23, 2007, the resolution calls upon the governor to declare a state of emergency in respect to the air quality health crisis in the South Coast Air Quality Basin related to emissions of PM2.5, and to direct steps necessary to address the emergency.

Antelope Valley AQMD Antelope Valley Air Quality Management District – The air pollution control agency with the primary responsibility for the control of non-vehicular sources of air pollution throughout the Antelope Valley within the northern part of Los Angeles County.. The District boundaries start on the south just outside of Acton, north to the Kern County line, east to the San Bernardino County line, and west to the Quail Lake area. The AVAQMD is located within the Mojave Desert air basin.

AQMP Air Quality Management Plan – Regional plan for air quality improvement in compliance with federal and state air quality planning requirements including attaining applicable federal and state ambient air quality standards.

ARB California Air Resources Board – California state agency responsible for attaining and maintaining healthy air quality through setting and enforcing emissions standards, conducting research, monitoring air quality, providing education and outreach, and overseeing/assisting local air quality districts within California. The ARB is also responsible for implementing AB 32 and establishing regional greenhouse gas emission reduction targets for automobile and light trucks under SB 375. ARB is a part of the California Environmental Protection Agency, an organization which reports directly to the Governor's Office in the Executive Branch of California State Government.

ATIS Advanced Traveler Information Systems – Technology used to provide travelers with information, both pre-trip and in-vehicle, so they can better utilize the transportation system.

ATMS Advanced Transportation Management Systems – Technology used to improve the operations of the transportation network.

ATP Active Transportation Program – The ATP was created by Senate Bill 99 and Assembly Bill 101, and expanded by Senate Bill 1 to encourage increased use of active modes of transportation. The ATP is a program designed for cities, counties and regional government organizations to apply for funding to further active transportation planning and implementation in the State.

Automated Vehicle U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA) has defined five increasing levels of vehicle automation at five levels:

- Level 0. No-Automation: The driver is in complete and sole control and performs all driving tasks.
- Level 1. Driver Assistance: Vehicle is controlled by the driver, but some driving assist features may be included in the vehicle design.
- Level 2. Partial Automation: Vehicle has combined automated functions,

like acceleration and steering, but the driver must remain engaged with the driving task and monitor the operating environment at all times.

- Level 3. Conditional Automation: Driver is a necessity, but is able to cede the performance of driving tasks to the vehicle. However the driver must be ready to take control of the vehicle at all times when noticed.
- Level 4. High Automation: The vehicle is capable of performing all driving functions under certain conditions, and within certain operating environments. The driver may or not have the ability to control the vehicle.
- Level 5. Full Automation: The vehicle is capable of performing all driving functions under all conditions. The driver may or may not have the ability to control the vehicle.

Autonomous Vehicle Vehicles in which operation of the vehicle occurs without direct driver input to control the steering, acceleration and braking and are designed so that the driver is not expected to constantly the roadway while operating in automated- driving mode.

B

Baseline Defined in the US EPA's Transportation Conformity Regulations, the Baseline is the future transportation system that will result from current programs, including the following (except that exempt projects listed in §93.126 and projects exempt from regional emissions analysis as listed in §93.127 need not be explicitly considered):

- All in-place regionally significant highway and transit facilities, services and activities
- All ongoing travel demand management or transportation system management activities
- Completion of all regionally significant projects, regardless of funding source, which are currently under construction or are undergoing right-of-way acquisition (except for hardship acquisition and protective buying); come from the first year of the previously conforming transportation plan and/or TIP; or have completed the NEPA process

For Connect SoCal, the Baseline is based upon the adopted 2019 FTIP.

Base Year The year that is used in the RTP/SCS performance analysis as a reference point for current conditions. For Connect SoCal, the base year is 2016.

BEV Battery Electric Vehicle – An electric drive vehicle powertrain that is powered by an on-board battery. A BEV is a sub-class of Plug-in Electric Vehicle (PEV).

Bike Share A service that provides users with on-demand access to bicycles at a variety of pick-up and drop-off locations for one-way (point-to-point) or roundtrip travel. Bike sharing fleets are commonly deployed in a network within a metropolitan region, city, neighborhood, employment center and/or university campus.

Bikeway Common term for any designated bicycle facility, such as a bicycle path, bicycle lane, bicycle route, sharrow, bicycle boulevard or cycle-track.

BNSF Burlington Northern and Santa Fe Railway Company

BRT Bus Rapid Transit – Bus transit service that seeks to reduce travel time through measures such as traffic signal priority, automatic vehicle location, dedicated bus lanes, limited-stop service and faster fare collection policies

Bus A transit mode comprised of rubber-tired passenger vehicles operating on fixed routes and schedules over roadways.

C

CAA Federal Clean Air Act – The federal law that authorized the United States Environmental Protection Agency (EPA) to establish national ambient air quality standards (NAAQS) to limit levels of pollutants in the air. EPA has promulgated such standards for six criteria pollutants: sulfur dioxide (SO2), nitrogen dioxide (NO2), carbon monoxide (CO), ozone, lead, and particulate matter (PM10). All areas of the United States must maintain ambient levels of these pollutants below the ceilings established by the NAAQS; any area that does not meet these standards is a "nonattainment" area. States must develop State Implementation Plans (SIPs) to explain how they will comply with the CAA.

The last major change in the law, the Clean Air Act Amendments of 1990, was enacted by Congress in 1990. Legislation passed since then has made several minor changes. The Clean Air Act, like other laws enacted by Congress, was incorporated into the United States Code as Title 42, Chapter 85. The House of

Representatives maintains a current version of the U.S. Code, which includes Clean Air Act changes enacted since 1990.

Cal B/C Model California Life-Cycle Benefit/Cost Analysis Model (Cal-B/C) – Was developed for the California Department of Transportation (Caltrans) as a tool for benefit-cost analysis of highway and transit projects. It is an Excel (spreadsheet) application structured to analyze several types of transportation improvement projects in a corridor where there already exists a highway facility or a transit service (the base case).

CalBRACE CalBRACE is a project of the California Department of Public Health (CDPH) to enhance CDPH's capability to plan for and reduce health risks associated with climate change. CalBRACE provides local health departments and its partners with tools (e.g. climate change and health indicator narratives and data) to better understand the people and places in their jurisdictions that are more susceptible to adverse health impacts associated with climate change, specifically extreme heat, wildfire, sea level rise, drought, and poor air quality. The assessment data can be used to screen and prioritize where to focus deeper analysis and plan for public health actions to increase resilience.

Caltrans California Department of Transportation – State agency responsible for the design, construction, maintenance, and operation of the California State Highway System, as well as that portion of the Interstate Highway System within the state's boundaries.

Cap-and-Trade is a market based regulation that is designed to reduce greenhouse gases (GHGs) from multiple sources. Cap-and-trade sets a firm limit or cap on GHGs and minimize the compliance costs of achieving California's AB 32 goals. The cap will decline approximately 3 percent each year beginning in 2013. Trading creates incentives to reduce GHGs below allowable levels through investments in clean technologies. With a carbon market, a price on carbon is established for GHGs. Market forces spur technological innovation and investments in clean energy.

Carbon Sequestration The ability for natural elements such as forests, soils and oceans to store carbon instead of releasing it into the atmosphere, preventing GHG Emissions.

Car Share An integrated network of passenger vehicles available for short-term rental in heavily urbanized areas. Car share can take the form of return systems in which a vehicle must be returned to the parking space from which it was rented. Alternatively, it can take the form of point-to-point systems in which the car can be returned to another space, or left anywhere within a pre-determined geographic zone. Peer-to-peer car sharing is an app based system that allows people to rent out their own private vehicles, and is return based.

CB Commuter Bus – Fixed-route bus systems that are primarily connecting outlying areas with a central city through bus service that operates with at least five miles of continuous closed-door service. This service typically operates using motorcoaches (aka over-the-road buses), and usually features peak scheduling, multiple-trip tickets, and multiple stops in outlying areas with limited stops in the central city.

CBO Community Based Organization – Public or private non-profit group that work at a local-level to address community needs.

CEHD Community, Economic and Human Development Committee – A SCAG committee that studies the problems, programs, and other matters which pertain to the regional issues of community, economic and human development, and growth. This committee reviews projects, plans, and programs of regional significance for consistency and conformity with applicable regional plans.

CEQA California Environmental Quality Act – State law providing certain environmental protections that apply to all state-funded transportation projects.

CHSRA California High-Speed Rail Authority – Agency responsible for planning, designing, constructing, and operating a state-of-the-art high-speed train system in California.

CIP Capital Improvement Program – Long-range strategic plan that identifies capital projects; provides a planning schedule and financing options.

Class I Railroad Rail carrier with operating revenues equal to or above $447,621,226.

Climate Change Adaptation The Process of adjusting to actual or expected climate change and its effects, in order to moderate or avoid harm. Adaptation addresses the impacts but not the causes of climate change.

Climate Change Mitigation Consists of actions to limit the magnitude of climate change and its related effects. Mitigation addresses the cause of climate change.

CMAQ Congestion Mitigation and Air Quality Program – Federal program initiated by the Intermodal Surface Transportation Efficiency Act of 1991 to provide funding for surface transportation and other related projects that contribute to air quality improvements and reduce congestion.

CMP Congestion Management Program – Established by Proposition 111 in 1990, each county is required to develop and adopt a CMP that includes highway and roadway system monitoring, multimodal system performance analysis, transportation demand management program, land-use analysis program, and local conformance.

CO Carbon Monoxide – A colorless, odorless, poisonous gas formed when carbon in fuels is not burned completely and can be harmful when inhaled in large amounts. The greatest sources of CO to outdoor air are cars, trucks and other vehicles or machinery that burn fossil fuels. A variety of items in your home such as unvented kerosene and gas space heaters, leaking chimneys and furnaces, and gas stoves also release CO and can affect air quality indoors. CO is one of six "criteria air pollutants" for which the U.S. EPA set national standards pursuant to CAA.

COG Council of Governments – Under state law, a single or multi-county council created by a joint powers agreement.

Complete Communities Suburban communities that provide a mix of land uses in strategic growth areas, wherein most daily needs can be met within a short distance of home. Complete communities provide residents with the opportunity to support their local area and run daily errands by walking or bicycling rather than traveling by automobile.

Complete Streets Streets designed and operated to enable safe access for all roadway users of all ages and abilities, including pedestrians, bicyclists, motorists and transit riders. Complete Streets strategies can include traffic calming, bicycle priority streets (bicycle boulevards) and pedestrian connectivity to increase physical activity, improve connectivity to the regional bikeway/greenway networks, local businesses and parks.

Community Separator A parcel of undeveloped land, sometimes in the form of open space, separating two or more urban areas under different municipal jurisdictions, which has been designated to provide a permanent low-density area preserving the communal integrity of the two municipalities.

Congestion (Cordon Area) Pricing A system of surcharging users/drivers a fee to operate in designated areas, roads or highway corridors as part of a demand management strategy to relieve traffic congestion within that area.

Connected/Automated Vehicles Refers to the interrelated nature of connectivity and automation in new vehicle technology. Connected vehicles are vehicles that use any of a number of different communication technologies to communicate with the driver, other cars on the road (vehicle-to-vehicle [V2V]), roadside infrastructure (vehicle-to- infrastructure [V2I]) and the "Cloud" to improved safety, user experience and collision avoidance. Please also see "automated vehicles."

Conservation Easement A voluntary agreement landowner and a land trust or government agency that permanently limits uses of the land in order to protect its conservation values.

Constant Dollars Dollars expended/received in a specific year adjusted for inflation/deflation relative to another time period.

Constrained Projects Constrained are projects that have funding whether committed or reasonably available.

Corridor In planning, a broad geographical band that follows a general directional flow or connects major sources of trips. It may contain a number of streets and highways, as well as transit lines and routes.

CR Commuter Rail – A transit mode that is an electric or diesel propelled railway for urban passenger train service consisting of local short distance travel operating between a central city and adjacent suburbs. Service must be operated on a regular basis by or under contract with a transit operator for the purpose of transporting passengers within urbanized areas (UZAs), or between urbanized areas and outlying areas. Such rail service, using either locomotive hauled or self-propelled railroad passenger cars, is generally characterized by multi-trip tickets, specific station to station fares, railroad employment practices, and usually only one or two stations in a central

business district. Commuter Rail does not include heavy rail rapid transit, or light rail /streetcar transit service, or intercity rail service.

CRIA Community Revitalization and Investment Authorities - Community Revitalization and Investment Authorities (CRIA) were enacted into law by Assembly Bill 2, which authorized the revitalization of disadvantaged communities through planning and financing infrastructure improvements and upgrades; economic development activities; and affordable housing via tax increment financing.

CSMP Corridor System Management Plans.

CTC California Transportation Commission – eleven voting members and two non- voting ex-officio members. Nine of the members are appointed by the Governor, one is appointed by the Senate Rules Committee, and one is appointed by the Speaker of the Assembly, to oversee and administer state and federal transportation funds and provide oversight on project delivery.

CTIPS California Transportation Improvement Program System – A project programming database system used to efficiently and effectively develop and manage various transportation programming documents as required under state and federal law.

CTP California Transportation Plan – A statewide, long-range transportation policy plan that provides for the movement of people, goods, services, and information. The CTP offers a blueprint to guide future transportation decisions and investments.

CVO Commercial Vehicle Operations – Management of commercial vehicle activities through ITS.

D

Demand Response A transit mode comprised of non-fixed route or fixed-schedule automobiles, vans or small buses that operate in response to calls from passengers or their agents to the transit operator, who then dispatches a vehicle to pick up and transport passengers to their destinations.

Development Impact Fee A fee imposed by a local government on a new or proposed development project, to pay for the costs of providing public services to the new development.

Displacement The process that occurs when the increasing property values brought about through gentrification drive out the existing residents and business operators, and attract a new and different demographic population to an area. Please also see Gentrification.

E

EIFD Enhanced Infrastructure Financing District – Senate Bill 628 authorizes the creation of a governmental entity known as an EIFD. One or more of these districts may be created within a city or county to finance the construction or rehabilitation of a wide variety of public infrastructure and private facilities by using property tax increment of consenting taxing agencies (cities, counties, special districts, but not schools).

EIR Environmental Impact Report – An informational document, required under CEQA, which will inform public agency decision-makers and the public generally of the significant environmental effects of a project, possible ways to minimize significant effects, and reasonable alternatives to the project.

EIS Environmental Impact Statement (federal) – National Environmental Policy Act (NEPA) requirement for assessing the environmental impacts of federal actions that may have a significant impact on the human environment.

EJ Environmental Justice – The concept of Environmental Justice is about equal and fair access to a healthy environment, with the goal of protecting

minority and low-income communities from incurring disproportionate negative environmental impacts.

EJA Environmental Justice Area – The area is created using SCAG's transportation analysis zones (TAZ), which are similar to census block groups that have a higher concentration of minority population or low-income households than is seen in the region as a whole.

EMFAC Model The Emission Factors model is a computer model developed by the ARB for estimating emission rates and emissions for on-road mobile sources operating in California. Upon approved by the U.S. Environmental Protection Agency, EMFAC model is required to be used for regional transportation conformity determination in California.

EPA The United States Environmental Protection Agency – Federal agency established to develop and enforce regulations that implement environmental laws enacted by Congress to protect human health and safeguard the natural environment.

E-scooter An e-scooter is an electric powered two-wheeled device that has handlebars, a floorboard designed to be stood upon when riding, and is sized to accommodate most adults. The e-scooter travel on level ground up to about 15mph.

EV Electric Vehicle – A vehicle fully or partially powered by an electric engine. In common use it is synonymous with Plug-In Electric Vehicle (PEV), however hydrogen fuel cell vehicles are also electric vehicles.

EV Charging Station A location where a vehicle can be parked and the electric storage or battery can be recharged. EV charging stations can be private or publicly accessible and can be free to the user or used for a fee

Executive Order B-30-15 Signed by Governor Brown on April 29, 2015, which establishes a California Greenhouse Gas (GHG) reduction target of 40 percent below 1990 levels by 2030.

Express Lane A High-Occupancy Vehicle lane that single-occupant drivers can pay to drive in, also referred to as "High Occupancy Toll Lanes."

F

FAA Federal Aviation Administration – Federal agency responsible for issuing and enforcing safety regulations and minimum standards, managing air space and air traffic, and building and maintaining air navigation facilities.

FAST Act Fixing America's Surface Transportation Act (H.R. 22) – Signed into law by President Obama on December 4, 2016. FAST Act funds surface transportation programs at over $305 billion for five years through 2020.

FCV Fuel Cell Vehicle – Electric vehicles that are powered by hydrogen fuel cells.

FHWA Federal Highway Administration – Federal agency responsible for administering the Federal-Aid Highway Program, which provides federal financial assistance to the states to construct and improve the National Highway System, urban and rural roads, and bridges.

First-Last Mile Strategies designed to increase transit usage by making it more convenient and safe to walk or bicycle to and from transit stations. Strategies include wayfinding, bikeways, station amenities, new crosswalks, sidewalk improvements, shared mobility services and bike share.

Form Based Code A means of regulating land development to achieve a specific urban form. Form based codes foster predictable built results and a high-quality public realm by using physical form (rather than separation of uses) as the organizing principle, with a lesser focus on land use through municipal regulations.

FRA Federal Railroad Administration – Federal agency created to promulgate and enforce rail safety regulations, administer railroad assistance programs, conduct research and development in support of improved railroad safety and national rail transportation policy, and consolidate government support of rail transportation activities.

FTA Federal Transit Administration – The federal agency responsible for administering federal transit funds and assisting in the planning and establishment of area wide urban mass transportation systems. As opposed to FHWA funding, most FTA funds are allocated directly to local agencies, rather than to Caltrans.

FTIP Federal Transportation Improvement Program – A six-year comprehensive listing of transportation projects proposed for federal funding, that require a federal action, or are regionally significant, and are within the planning area of an MPO, the last two years are for informational purposes only.

FTZ Foreign Trade Zones.

FY Fiscal Year – The twelve-month period on which the budget is planned. The state fiscal year begins July 1 and ends June 30 of the following year. The federal fiscal year begins October 1 and ends September 30 of the following year.

G

Gentrification while holding many definitions, is commonly understood as a change process in historically low-income communities that results in rising real estate values coupled with shifts in the economic, social, and cultural demographics and feel of the communities. Please also see Displacement.

GGRF Greenhouse Gas Reduction Funds – administered by state and local agencies for a variety of greenhouse gas (GHG) emission reductions programs, including energy efficiency, public transit, low-carbon transportation and affordable housing.

GHG Greenhouse Gases – Components of the atmosphere that contribute to the greenhouse effect. The principal greenhouse gases that enter the atmosphere because of human activities are carbon dioxide, methane, nitrous oxide, and fluorinated gases.

GIS Geographic Information System – Mapping software that links information about where things are with information about what things are like. GIS allows users to examine relationships between features distributed unevenly over space, seeking patterns that may not be apparent without using advanced techniques of query, selection, analysis, and display.

GNP Gross National Product – An estimate of the total value of goods and services produced in any specified country in a given year. GNP can be measured as a total amount or an amount per capita.

Grade Crossing A crossing or intersection of highways, railroad tracks, other guideways, or pedestrian walks, or combinations of these at the same level or grade.

Greenbelt Land surrounding or neighboring areas that is designated as largely undeveloped, wild or agricultural.

Greenfield Also known as "raw land," land that is privately owned, lacks urban services, has not been previously developed, and is located at the fringe of existing urban areas.

GRP Gross Regional Product.

H

Habitat Connectivity The degree to which the landscape facilitates animal movement and other ecological flows.

HCP Habitat Conservation Plan – Established under Section 10 of the federal Endangered Species Act to allow development to proceed while protecting endangered species. A federal Habitat Conservation Plan is typically accompanied by a state Natural Communities Conservation Plan or NCCP.

HDT Heavy-Duty Truck – Truck with a gross vehicle weight of 8,500 pounds or more.

Health Equity SCAG has adopted the California Department of Public Health, Office of Health Equity (OHE) definition to define health equity as "efforts to ensure that all people have full and equal access to opportunities that enable them to lead healthy lives." Determinants of equity are, "social, economic, geographic, political, and physical environmental conditions that lead to the creation of a fair and just society."

Healthy Cities A movement that promotes comprehensive, systematic policy and planning for health by addressing the social, economic and environmental determinants of health. Healthy Cities emphasizes the need to address inequality in health, urban poverty and participatory governance.

Heavy Rail A transit mode that is an electric railway with the capacity for a heavy volume of traffic. It is characterized by high speed and rapid

acceleration passenger rail cars operating singly or in multi-car trains on fixed rails, separate rights-of-way (ROW) from which all other vehicular and foot traffic are excluded, sophisticated signaling, and raised platform loading.

HIA Health Impact Assessment – A tool that can help communities, decision makers, and practitioners make choices that improve public health through community design.

HiAP Health in All Policies – HiAP is a collaborative strategy that aims to improve public health outcomes by including health considerations in the decision-making process across sectors and policy areas. HiAP addresses the social determinants of health by encouraging transportation practitioners to work with nontraditional partners who have expertise related to public health outcomes, such as city and county public health departments.

HIN High Injury Network – A High Injury Network include stretches of roadways where the highest concentrations of collisions occur on the transportation network.

Home-Based Work Trips Trips that go between home and work, either directly or with an intermediate stop. Home-based work trips include telecommuting, working at home, and non-motorized transportation work trips.

HOT Lane High-Occupancy Toll Lane – An HOV lane that single-occupant drivers can pay to drive in, also referred to as "Express Lanes."

Household A household consists of all the people who occupy a housing unit. A household includes the related family members and all the unrelated people, if any, such as lodgers, foster children, wards, or employees who share the housing unit. A person living alone in a housing unit, or a group of unrelated people sharing a housing unit such as partners or roomers, is also counted as a household.

HOV Lane High-Occupancy Vehicle Lane – A lane restricted to vehicles with two (and in some cases three) or more occupants to encourage carpooling. Vehicles include automobiles, vans, buses, and taxis.

HQTA High Quality Transit Areas – Generally a walkable transit village or corridor, consistent with the adopted RTP/SCS, and is within one half-mile of a well- serviced transit stop or a transit corridor with 15-minute or less service frequency during peak commute hours. Freeway transit corridors with no bus stops on the freeway alignment do not have a directly associated HQTA. The definition that SCAG has been using for the HQTA is based on the language in SB375 which defines:

- Major Transit Stop: A site containing an existing rail or bus rapid transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods (CA Public Resource Code Section 21064.3). SCAG's methodology for identifying major transit stops is included as an appendix to the Transit Technical Report.
- High-Quality Transit Corridor (HQTC): A corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours (CA Public Resource Code Section 21155(b)). SCAG's methodology for identifying HQTCs is included as an appendix to the Transit Technical Report.

HSIP Highway Safety Improvement Program – A core Federal-aid program with the purpose to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned roads and roads on tribal land.

HSR High-Speed Rail – Intercity passenger rail service that is reasonably expected to reach speeds of at least 110 mile per hour.

HTF Highway Trust Fund – The Federal HTF is a transportation fund in the United States that received money from a federal fuel tax of 18.4 cents per gallon on gasoline and 24.4 cents per gallon from diesel fuel and related excise taxes.

HUD U.S. Department of Housing and Urban Development – Federal agency charged with increasing homeownership, supporting community development, and increasing access to affordable housing free from discrimination.

HUTA Highway Users Tax Account – Formerly known as the California Highway Users Tax Fund, HUTA is a trust fund comprised of revenues collected from taxes imposed by California on motor vehicle fuels for use in motor vehicles upon public streets and highways. The HUTA is dedicated to fund transportation improvements.

I

ICE Internal Combustion Engine – Refers traditional vehicle engines that are powered by the burning of fuel sources, including gasoline, diesel, and natural gas.

ICTC Imperial County Transportation Commission – Agency responsible for planning and funding countywide transportation improvements and administering the county's transportation sales tax revenues.

IGR Intergovernmental Review Process – The review of documents by several governmental agencies to ensure consistency of regionally significant local plans, projects, and programs with SCAG's adopted regional plans.

Inclusionary Zoning Municipal or county planning ordinances that require a given share of new construction to be affordable by people with low to moderate incomes.

Infill New development on vacant, underutilized or undeveloped land within an existing community that is enclosed by other types of development.

Infrastructure The basic facilities, equipment, services, and installations needed for the growth and functioning of a community. This may refer to transportation infrastructure such as rail stations or roadways, as well as other civic infrastructure such as electrical and water systems.

In-Lieu Fee (Environment) An in-lieu fee is one type of mitigation that can be used to compensate for unavoidable environmental impacts that would affect open space, culturally significant land, agricultural and forestry land, wetlands or other environmentally sensitive areas. Such fees are typically pooled and distributed to build off-site mitigation areas.

In-Lieu Fee (Housing) A fee typically applied when affordable housing cannot be provided "on-site" of a new development. These fees are typically paid into a housing trust fund and used (often along with other local funding sources) to finance affordable housing to be developed "off-site".

ITIP Interregional Transportation Improvement Program – The portion of the STIP that includes projects selected by Caltrans (25 percent of STIP funds).

ITS Intelligent Transportation Systems – Systems that use modern detection, communications and computing technology to collect data on system operations and performance, communicate that information to system managers and users, and use that information to manage and adjust the transportation system to respond to changing operating conditions, congestion, or accidents. ITS technology can be applied to arterials, freeways, transit, trucks, and private vehicles. ITS include Advanced Traveler Information Systems (ATIS), Advanced Public Transit Systems (APTS), Advanced Traffic Management Systems (ATMS), Advanced Vehicle Control Systems (AVCS), and Commercial Vehicle Operations (CVO).

J

JPA Joint Powers Authority – Two or more agencies that enter into a cooperative agreement to jointly wield powers that are common to them. JPAs are a vehicle for the cooperative use of existing governmental powers to finance and provide infrastructure and/or services in a cost-efficient manner.

L

LACMTA Los Angeles County Metropolitan Transportation Authority, also referred to as "Metro" – Agency responsible for planning and funding countywide transportation improvements, administering the county's transportation sales tax revenues, and operating bus and rail transit service.

LAFCo Local Agency Formation Commission - Regional service planning agencies of the State of California that exercise regulatory and planning powers. LAFCos regulatory powers are outlined in California Government Code Sections 56375 and 56133.

LAWA or LAX Los Angeles World Airports – Aviation authority of the City of Los Angeles. LAWA owns and operates Los Angeles International (LAX), Ontario International, Van Nuys, and Palmdale Airports.

LCVs Longer-Combination Vehicles – Includes tractor-trailer combinations with two or more trailers that weigh more than 80,000 pounds.

LID Low Impact Development – A land planning and engineering design approach to manage storm water runoff as part of green infrastructure.

LID emphasizes conservation and use of on-site natural features to protect water quality.

LIHTC Low Income Housing Credit – A federal program created under the Tax Reform Act of 1986, which gives incentives for the utilization of private equity in the development of affordable housing.

Livable Communities Any location in which people choose to live may be viewed as "livable." However, communities that contain a healthy mix of homes, shops, workplaces, schools, parks, and civic institutions coupled with a variety of transportation choices, give residents greater access to life's daily essentials and offer higher quality of life to a wider range of residents.

Livable Corridors Arterial roadways where local jurisdictions may plan for a combination of the following elements: high-quality bus frequency; higher density residential and employment at key intersections; and increased active transportation through dedicated bikeways. Most, but not all Livable Corridors would be located within HQTAs. Livable Corridor land-use strategies include development of mixed use retail centers at key nodes along corridors, increasing neighborhood-oriented retail at more intersections, applying a "Complete Streets" approach to roadway improvements and zoning that allows for the replacement of underperforming auto- oriented strip retail between nodes with higher density residential and employment.

LTF Local Transportation Fund – A fund which receives TDA revenues.

M

MaaS Mobility as a Service – Please see "Shared Mobility Services."

MAP Million Annual Passengers – Used to quantify airport activity.

MAP-21 Moving Ahead for Progress in the 21st Century – Signed into law by President Obama on July 6, 2012. Funding surface transportation programs at over $105 billion for fiscal years (FY) 2013 and 2014, MAP-21 was the first long-term highway authorization enacted since 2005. To allow more time for development and consideration of a long-term reauthorization of surface transportation programs, Congress has enacted short term extensions of the expiring law, MAP-21.

Market Incentives Measures designed to encourage certain actions or behaviors. These include inducements for the use of carpools, buses, and other HOVs in place of single-occupant automobile travel. Examples include HOV lanes, preferential parking, and financial incentives.

MDAB Mojave Desert Air Basin – Area defined by state law as comprising the desert portions of Los Angeles, Kern, Riverside, and San Bernardino Counties.

MDAQMD Mojave Desert Air Quality Management District – Stretched out over almost 20,000 square miles of California's vast desert expanse, the Mojave Desert Air Quality Management District is geographically the second largest of the state's 35 air districts. As the air pollution control agency for San Bernardino County's High Desert and Riverside County's Palo Verde Valley, the District has primary responsibility for regulating stationary sources of air pollution located within its jurisdictional boundaries. The District implements air quality programs required by state and federal mandates, enforces rules and regulations based on air pollution laws and educates businesses and residents about their role in protecting air quality and the risks of air pollution.

Measure A Revenues generated from Riverside County's local half-cent sales tax.

Measure D Revenues generated from Imperial County's local half-cent sales tax.

Measure I Revenues generated from San Bernardino County's local half-cent sales tax.

Measure M Revenues generated from Orange County's local half-cent sales tax. Also refers to Los Angeles County's local half cent sales tax which was authorized in 2018.

Measure R Revenues generated from Los Angeles County's local half-cent sales tax. Los Angeles County has three permanent local sales taxes (Proposition A, Proposition C, and Measure M) and one temporary local sales tax (Measure R).

Metrolink Regional commuter rail system connecting Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties and operated by SCRRA.

Micro-mobility Personal vehicles which typically are designed to carry one passenger. Devices include but are not limited to bicycles, electronic bicycles (e-bikes) and electronic scooters (e-scooters). Micro-mobility is often linked to bike and scooter sharing.

Mills Act A state law allowing cities to enter into contracts with the owners of historic structures. Such contracts require a reduction of property taxes in exchange for the continued preservation of the property.

Mitigation Measure A measure designed to minimize a project's significant environmental impacts.

Mixed Flow Traffic movement having autos, trucks, buses, and motorcycles sharing traffic lanes.

Mixed Use Development A type of urban development that blends residential, commercial, cultural, institutional or industrial uses, where those functions are physically and functionally integrated, and that provides pedestrian connections.

Mode Split The proportion of total person trips using various specified modes of transportation.

Mode A particular form of travel (e.g., walking, traveling by automobile, traveling by bus, or traveling by train).

Model A mathematical description of a real-life situation that uses data on past and present conditions to make a projection.

MPO Metropolitan Planning Organization – A federally required planning body responsible for transportation planning and project selection in a region.

MSHCP Multiple Species Habitat Conservation Plans – A comprehensive, multi-jurisdictional Habitat Conservation Plan (HCP) designed to preserve a network of habitat and open space, protecting biodiversity and enhancing the region's quality of life. MSHCPs are often implemented with the assistance of federal and state wildlife agencies.

MTS Metropolitan Transportation System – Regional network of roadways and transit corridors.

Multi-Family Residential Multi-family units are attached residences, apartments, condominiums, and townhouses. Multi-family residences are usually served by all utilities, are on paved streets, and are provided with or have access to all urban facilities such as schools, parks, police and fire stations. Senior citizen apartment buildings are included in these classes. Also included are off-campus university owned housing and off-campus fraternity/sorority houses.

Multimodal A mixture of the several modes of transportation, such as transit, highways, non-motorized, etc.

N

NAAQS National Ambient Air Quality Standards – The federal Clean Air Act requires US EPA to set National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants. These common air pollutants can harm human health and the environment, and cause property damage. Please see "CAA-Federal Clean Air Act" for more information on NAAQS.

Natural Lands Biologically diverse landscapes such as forested and mountainous areas, shrub lands, deserts and other ecosystems which contain habitat that supports wildlife and vegetation.

NCCP Natural Community Conservation Plan – A program that takes a broad-based ecosystem approach to planning for the protection and perpetuation of biological diversity. It is broader in its orientation and objectives than the California and Federal Endangered Species Acts, as these laws are designed to identify and protect individual species that have already declined in number significantly.

NEPA National Environmental Protection Act – Federal environmental law that applies to all projects funded with federal funds or requiring review by a federal agency.

New Markets Tax Credit The New Markets Tax Credit (NMTC) Program incentivizes business and real estate investment in low-income communities via a federal tax credit.

New Mobility The integration of various forms of transportation services into a single service accessible on demand. Please also see "Shared Mobility Services."

NGV Natural Gas Vehicle – Vehicles that are powered by internal combustion engines that burn compressed or liquid natural gas.

NIMBY Not in My Backyard – The phenomenon where people oppose the location of a development perceived as undesirable (e.g. landfill, freeway expansion) in their own neighborhood, but raise no objections of similar developments elsewhere.

NIMS National Incident Management System – Nationwide template that enables all government, private-sector, and non-governmental organizations to work together during a domestic incident.

NMAs Neighborhood Mobility Areas Areas with a high number of intersections, low observed travel speed, high mix of uses and high accessibility to "everyday" destinations. These are areas where complete streets and sustainability policies support and encourage replacing or reducing single and multi-occupant automobile use with walking, bicycling, skateboarding and slow speed electric vehicles (such as e-bikes, scooters, senior mobility devices and neighborhood electric vehicles). Please also see "Complete Streets."

Nominal Dollars Actual dollars expended/received in a specific year without adjustments for inflation/deflation.

Non-Reportable TCM The following de minimis committed TCMs are defined in the Final 2019 FTIP Guidelines as non-reportable TCMs for the purpose of TCM timely implementation reporting:

- Bus/shuttle/paratransit fleet expansion projects with fewer than 5 vehicles
- Bus stop improvement projects
- Bicycle facility less than 1 mile and pedestrian facility less than 1/4 mile
- Intelligent transportation systems/control system computerization projects with fewer than 3 traffic signals
- Changeable message sign projects with fewer than 5 signs
- Bike parking facilities, new or expansion, with nine or fewer bike lockers/slots
- Expansion of bus station/shelter/transfer facilities with nine or fewer bike lockers/slots
- Rail station expansion with addition of nine or fewer bike lockers/slots.

NOx Nitrogen oxides – A group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. NOx is a major component of ozone and smog. NOx also can be a major component of particle air pollution.

NTD National Transit Database – The Federal Transit Administration's (FTA) national database for transit statistics.

O

O&M Operations and Maintenance – The range of activities and services provided by the transportation system and for the upkeep and preservation of the existing system.

OCS Overhead Catenary System - A type of wayside power where vehicles may connect to and draw power from overhead wires.

OCTA Orange County Transportation Authority – Agency responsible for planning and funding countywide transportation improvements, administering the county's transportation sales tax revenues, and operating bus transit service.

OEM Original Equipment Manufacturer

OHE Office of Health Equity - OHE is a program within the CDPH focused on providing a leadership role to reduce health and mental health disparities to vulnerable communities. OHE has moved forward with the implementation of Portrait of Promise: The California Statewide Plan to Promote Health and Mental Health Equity. Example action items include advancing climate change and health equity research, supporting the Cal BRACE Framework through additional research, and publishing new reports such as Safeguarding California: Implementation Action Plan – Public Health Sector Plan.

Open Space Generally understood as any area of land or water which, for whatever reason, is not developed for urbanized uses and which therefore enhances residents' quality of life. Each county and city in California must

adopt an open space element as part of its general plan. The element is a statement of local planning policies focusing on the use of unimproved land or water for: 1) the preservation or managed production of natural resources, 2) outdoor recreation, and 3) the promotion of public health and safety. Therefore, open space will be defined by each jurisdiction based on their own unique resources and environment.

OWP Overall Work Program – SCAG develops an OWP annually, describing proposed transportation planning activities for the upcoming fiscal year, including those required by federal and state law.

P

Parking Subsidy The difference between the out-of-pocket amount paid by an employer on a regular basis in order to secure the availability of an employee parking space not owned by the employer and the price, if any, charged to an employee for use of that space.

PCI Pavement Condition Index – A numerical index between 0 and 100 which is used to indicate the general condition of a pavement.

PEIR Program Environmental Impact Report – An information document that analyzes and discloses potential environmental effects of large-scale plans or programs in accordance with provisions of the California Environmental Quality Act (CEQA).

PeMS Freeway Performance Measurement System – A service provided by the University of California, Berkeley, to collect historical and real-time freeway data from freeways in the state of California in order to compute freeway performance measures.

Person Trip A trip made by a person by any mode or combination of modes for any purpose.

PEV Plug-in Electric Vehicle – Refers to all vehicles that can be plugged into an external source of electricity in order to recharge an on-board battery which will provide some or all power to an electric engine.

PGA Priority Growth Area – Designated areas prioritized for new development based on established criteria (e.g. infrastructure, location, market).

PHEV Plug-in Hybrid Electric Vehicle – A vehicle powertrain that combines an electric engine with a traditional internal combustion engine. The two engines can operate in parallel with the electric engine operating at certain speeds, or the engines can operate sequentially, with all power being provided by the electric engine until the battery power is exhausted.

PM2.5 Particulate matter with diameters that are generally 2.5 micrometers and smaller – A mixture of fine inhalable solid particles and liquid droplets found in the air 2.5 micrometers or less in size (A micrometer is one-millionth of a meter. The average human hair is about 70 micrometers in diameter). These fine particles result from fuel combustion from motor vehicles, power generation, and industrial facilities, as well as from residential fireplaces and wood stoves.

PM10 Particulate matter with diameters that are generally 10 micrometers and smaller – A mixture of inhalable solid particles and liquid droplets found in the air 10 micrometers or less in size (A micrometer is one-millionth of a meter. The average human hair is about 70 micrometers in diameter). These coarse particles are generally emitted from sources such as vehicles traveling on unpaved roads, materials handling, and crushing and grinding operations, as well as windblown dust.

PMD LA/Palmdale Regional Airport – Regional airport located in Palmdale.

PMT Passenger Miles Traveled – The cumulative sum of the distances ridden by each public transportation passenger.

POE Port of Entry.

POLA Port of Los Angeles.

POLB Port of Long Beach.

PPP Public-Private Partnership – Contractual agreements formed between a public agency and private-sector entity that allow for greater private-sector participation in the delivery of transportation projects.

PRC Peer Review Committee – An "informal" committee of technical experts usually organized and invited to review and comment on various technical issues and processes used in the planning process.

Proposition 1A Passed by voters in 2006, Proposition 1A protects transportation funding for traffic congestion relief projects, safety improvements, and local streets and roads. It also prohibits the state sales tax on motor vehicle fuels from being used for any purpose other than transportation improvements and authorizes loans of these funds only in the case of severe state fiscal hardship.

Proposition 1B Highway Safety, Traffic Reduction, Air Quality, and Port Security State of California – Passed in November 2006, Proposition 1B provides $19.9 billion to fund state and local transportation improvement projects to relieve congestion, improve movement of goods, improve air quality, and enhance safety and security of the transportation system.

Proposition A Revenues generated from Los Angeles County's local half-cent sales tax. Los Angeles County has three permanent local sales taxes (Propositions A and C; and Measure M) and one temporary local sales tax (Measure R).

Proposition C Revenues generated from Los Angeles County's local half-cent sales tax. Los Angeles County has three permanent local sales taxes (Propositions A and C; and Measure M) and one temporary local sales tax (Measure R).

PTA Public Transportation Account – The major state transportation account for mass transportation purposes. Revenues include a portion of the sales tax on gasoline and diesel fuels.

Public Transportation As defined in the Federal Transit Act, "Transportation by a conveyance that provides regular and continuing general or special transportation to the public, but does not include school bus, charter, or intercity bus transportation or intercity passenger rail transportation provided by the entity described in chapter 243 (Amtrak or a successor to such entity)."

PUC Public Utilities Commission – Regulates privately owned telecommunications, electric, natural gas, water, railroad, rail transit, and passenger transportation companies.

R

RAMP Regional Advance Mitigation Program – Advance mitigation is a science-based approach to identify mitigation opportunities to support regional conservation priorities. By considering mitigation development early in the regional planning process prior to design and permitting phases, proponents can identify higher-quality mitigation opportunities.

Rapid Bus A bus rapid transit (BRT) type service operated by Metro with vehicles branded as "Rapid" and painted red, operating in mixed traffic environments, serving fewer stops than local bus service, and with transit signal priority where available. Other transit operators, including Culver CityBus, Santa Monica's Big Blue Bus and Torrance Transit, also operate Rapid lines.

RBN Regional Bikeway Network – A system of regionally interconnected bikeways linking cities and counties in the SCAG region.

RC Regional Council – Conducts the affairs of SCAG; implements the General Assembly's policy decisions; acts upon policy recommendations from SCAG policy committees and external agencies; appoints committees to study specific problems; and amends, decreases or increases the proposed budget to be reported to the General Assembly.

RCIS Regional Conservation Investment Strategy – A voluntary, non-regulatory, and non-binding conservation assessment that includes information and analyses and establishes biological goals and objectives that may be used as a basis to provide advance mitigation through the development of credits or to inform other conservation investments.

RCP Regional Comprehensive Plan (RCP) – Developed by SCAG, the RCP is a vision of how Southern California can balance resource conservation, economic vitality, and quality of life. It will serve as a blueprint to approach growth and infrastructure challenges in an integrated and comprehensive way.

RCTC Riverside County Transportation Commission – Agency responsible for planning and funding countywide transportation improvements and administering the county's transportation sales tax revenues.

Rent Stabilization A practice which allows landlords a reasonable rate of return on their investments while setting maximum rates for annual rent increases to protect tenants.

Resilience The capacity of infrastructure, communities and their related systems to mitigate, adapt or positively respond to chronic and acute stresses, transforming in ways that restore, maintain and even improve their essential functions.

RGN Regional Greenway Network – A regional system of bikeways physically separate from traffic. It makes use of riverbeds and under-utilized utility corridors. It is part of the Regional Bikeway Network (RBN).

RHNA Regional Housing Needs Assessment – Quantifies and allocates the determination of housing need during specified planning periods at various income categories for each city and county in the region, in accordance with state housing law. Cities and counties then address this need through the process of updating the housing elements of local General Plans.

Ride-hailing A generic term to describe booking rides and paying for car service through a smartphone app with a transportation network company (TNC) such as Uber or Lyft. The term "ridesharing" has been used to describe TNCs, but it has been widely argued to be inaccurate, and hence the ride-hailing term was introduced.

Rideshare Please see "Ride-hailing."

RMRA Road Maintenance and Rehabilitation Account – Funds related to the Road Maintenance and Rehabilitation Program, collected via fuel taxes and vehicle fees established by SB 1, are deposited in the RMRA. Cities and counties receiving RMRA funds must comply with relevant federal and state laws, regulations, policies and procedures. RMRA funds are also referred to as "SB 1 funds". Please also see "SB 1."

ROG Reactive Organic Gas – Organic gases emitted from a variety of sources, including motor vehicles, chemical plants, refineries, factories, consumer, commercial products, and other industrial sources. Ozone, the main component of smog, is formed from the reaction of VOCs and NOx in the presence of heat and sunlight.

RSTIS Regionally Significant Transportation Investment Study – Involves identifying all reasonable transportation options, their costs, and their environmental impacts. RSTIS projects are generally highway or transit improvements that have a significant impact on the capacity, traffic flow, level of service, or mode share at the transportation corridor or sub-area level.

RTMS Regional Transportation Monitoring System – Internet-based transportation monitoring system. The RTMS will be the source for real-time and historical transportation data collected from local, regional, and private data sources.

RTP Regional Transportation Plan (RTP) – Federally required 20-year plan prepared by metropolitan planning organizations and updated every four years. Includes projections of population growth and travel demand, along with a specific list of proposed projects to be funded.

RTSS Regional Transit Security Strategy – Strategy for the region with specific goals and objectives related to the prevention, detection, response, and recovery of transit security issues.

S

Safe Routes to School Part of a nationwide/region-wide program to increase students walking or biking to school. Includes engineering, educational and enforcement activities. Funded through the State Active Transportation Program (ATP).

SANDAG San Diego Association of Governments.

SB 1 Senate Bill 1 – Known as the Road Repair and Accountability Act of 2017, SB 1 established fuel taxes and vehicle fees that will generate new funding for roadways, including up to $1.5 billion per year allocated directly to counties and cities for local road maintenance, safety improvements and complete streets improvements (e.g. bicycle and pedestrian facilities).

SB 45 Senate Bill 45 (Chapter 622, Statutes of 1997, Kopp) – Established the current STIP process and shifted control of decision-making from the state to the regional level.

SB 226 (Simitian) Implements changes to the California Environmental Quality Act (CEQA) by authorizing limited CEQA review for urban infill projects, creating a new statutory exemption for rooftop and parking lot solar energy projects and establishing that greenhouse gas emissions at a project or cumulative level do not disqualify the use of categorical exemptions if the project complies with certain regulations and requirements.

SB 375 Senate Bill 375 (Chapter 728, Steinberg) – Established to implement the state's greenhouse gas (GHG) emission-reduction goals, as set forth by AB 32, in the sector of cars and light trucks. This mandate requires the California Air Resources Board to determine per capita GHG emission-reduction targets for each metropolitan planning organization (MPO) in the state at two points in the future—2020 and 2035. In turn, each MPO must prepare a Sustainable Communities Strategy (SCS) that demonstrates how the region will meet its GHG reduction target through integrated land use, housing, and transportation planning.

SB 535 Senate Bill 535 (Chapter 830, De León) – Established that a quarter of the proceeds from the Greenhouse Gas Reduction Fund must also go to projects that provide a benefit to disadvantaged communities. A minimum of 10 percent of the funds must be for projects located within those communities. The legislation gives the California Environmental Protection Agency responsibility for identifying those communities.

SB 743 (Steinberg, 2013) Made several changes to the California Environmental Quality Act (CEQA) for projects located in areas served by transit. SB 743 proposes to eliminate auto delay, level of services, and other similar measures of vehicular capacity or traffic congestion as a basis for determining significant impacts. It also creates a new exemption for certain projects that are consistent with a Specific Plan, and eliminates the need to evaluate aesthetic and parking impacts of a project in some circumstances.

SBCTA San Bernardino County Transportation Authority – The council of governments and transportation planning agency for San Bernardino County. SBCTA is responsible for cooperative regional planning and developing an efficient multimodal transportation system countywide.

SBD San Bernardino International Airport – International airport located in San Bernardino.

SCAB South Coast Air Basin – Comprises the non–Antelope Valley portion of Los Angeles County, Orange County, western Riverside County, and the non-desert portion of San Bernardino County.

SCAG Southern California Association of Governments – The metropolitan planning organization (MPO) for six counties including Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura.

SCAQMD South Coast Air Quality Management District – The air pollution control agency for all of Orange County and the urbanized portions of Los Angeles, Riverside, and San Bernardino Counties in Southern California. This area of 10,743 square miles is home to over 16.8 million people–about half the population of the whole state of California. It is the second most populated urban area in the United States and one of the smoggiest. South Coast AQMD is responsible for controlling emissions primarily from stationary sources of air pollution within its jurisdiction. These can include anything from large power plants and refineries to the corner gas station.

SCCAB South Central Coast Air Basin – Comprises San Luis Obispo, Santa Barbara, and Ventura Counties.

SCS Sustainable Communities Strategy – As part of SB 375, which was established to implement the state's greenhouse gas (GHG) emission-reduction goals, as set forth by AB 32, each California metropolitan planning organization (MPO) is required to prepare a SCS as part of their regional transportation plan. The mandate requires the California Air Resources Board to determine per capita GHG emission-reduction targets for each MPO in the state at two points in the future – 2020 and 2035. In turn, each MPO must prepare a SCS that demonstrates how the region will meet its GHG through integrated land use, housing and transportation planning.

Scooter Share Scooter sharing allows individuals access to scooters by joining an organization that maintains a fleet of scooters at various locations. Scooter sharing models can include a variety of motorized and non-motorized scooter types. The scooter service provider typically provides gasoline or charge (in the case of motorized scooters), maintenance, and may include parking as part of the service. Users typically pay a fee each time they use a scooter. Trips can be roundtrip or one way.

SDOH Social Determinants of Health – Includes the circumstances in which people are born, grow up, live, work, play, and age. Economic opportunities,

government policies, and the built environment all play a role in shaping these circumstances and influencing public health outcomes.

SED Socioeconomic Data – Population, employment and housing forecast.

SGC The Strategic Growth Council is a state agency tasked with encouraging the development of sustainable communities.

SHA State Highway Account – The major state transportation account for highway purposes. Revenues include the state excise taxes on gasoline and diesel fuel and truck weight fees.

Shared Mobility Services Refers to a wide variety of new mobility services and encompasses bike share, scooters, car share, app-based transit services, and ride-hailing. This term refers to the way in which these modes are offered as services brokered by a mobile application, and each vehicle is shared amongst multiple users. Another common term used to describe this type of transportation service is Mobility as a Service (MaaS).

Shared Parking A tool in parking management which allows different land uses with different periods of parking demand to share a common parking facility and thereby limit the need to provide additional parking. Shared parking policies do not treat the parking supply as individual units specific to particular businesses or uses, but rather emphasize the efficient use of the parking supply by including as many spaces as possible in a common pool of shared, publicly available spaces.

SHOPP State Highway Operation and Protection Program – A four-year capital improvement program for rehabilitation, safety, and operational improvements on state highways.

SHSP Strategic Highway Safety Plan – A statewide, coordinated safety plan that provides a comprehensive framework for reducing fatalities and severe injuries to motorists, pedestrians, and bicyclists on all public roads. SHSP goals and objectives are data-driven and results are measured. Actions designed to achieve the objectives are developed by hundreds of safety stakeholders from the five E's of highway safety: engineering, education, enforcement and emergency medical services and equipment. In California, Caltrans coordinates the effort to develop the plan.

Single-Family Residential These residential areas are typically made up of detached dwellings, where each structure houses a single family, located in an urban or suburban setting. These single family residences are usually served by all utilities, are on paved streets, and are provided with or have access to all urban facilities such as schools, parks, police, and fire stations. Single family residential neighborhoods are normally large contiguous areas of residential lots. Some areas have subdivisions or tracts of homes with similar size or architectural design. In these areas the roofs may be similar in shape or color when viewed on the aerial photo. Typically, single family lots contain landscaped front and back yards, one driveway, and one walkway either to the sidewalk or to the driveway. Some lots may have swimming pools in the back yards. High or low density is determined by the size of the lot on which the residence is located. If an area is under construction, and the residential lots or pads are easily identifiable, then the area can be properly mapped.

SIP State Implementation Plan – Comprehensive state plan that describes how an area will attain national ambient air quality standards. Transportation conformity requires that transportation activities including regional transportation plans, programs, and projects are consistent with the goals and objectives of the applicable SIP.

Small-Lot Development A practice that allows for the subdivision of lots located within existing multifamily and commercial zones to develop fee simple housing. Typically small lot developments are not required to be part of a homeowner's association, thus reducing the cost for home buyers.

Smart City A designation given to a city that incorporates information and communication technologies to enhance the quality and performance of public services, consumption, waste and overall costs.

Smart Growth Principles The following principles developed by the Smart Growth Network, a partnership of government, business, and civic organizations created in 1996:

- Mix land uses
- Take advantage of compact building design
- Create a range of housing opportunities and choices
- Create walkable neighborhoods
- Foster distinctive, attractive communities with a strong sense of place
- Preserve open space, farmland, natural beauty, and

critical environmental areas
- Strengthen and direct development towards existing communities
- Provide a variety of transportation choices
- Make development decisions predictable, fair, and cost effective
- Encourage community and stakeholder collaboration in development decisions

Smart Parking Smart parking management techniques include real-time identification of open parking spaces, active wayfinding, adaptive pricing, and consumer facing apps for information and payment of parking. These management techniques pertain to on-street as well as public off-street parking.

Social Equity Equal opportunity in a safe and healthy environment.

SOI Sphere of Influence – A planning boundary outside of an agency's legal boundary (e.g. city limit) that designates the agency's probable future boundary and service area.

SOV Single-Occupant Vehicle – Privately operated vehicle that contains only one driver or occupant.

SOx Sulfur oxide – Any of several compounds of sulfur and oxygen, formed from burning fuels such as coal and oil.

SPA Specific Plan Areas – An SPA is created for an established area when the countywide zoning regulations do not adequately address local concerns. The SPA allows uses, regulations and standards that would not be allowed under countywide regulations.

SPB Ports San Pedro Bay Ports.

SRTS Safe Routes to School – Part of a nationwide/region-wide program to increase students walking or biking to school. Includes engineering, educational and enforcement activities. Funded through the State Active Transportation Program (ATP).

SSAB Salton Sea Air Basin – Comprises the Coachella Valley portion of Riverside County and all of Imperial County.

STA State Transit Assistance – State funding program for mass transit operations and capital projects. Current law requires that STA receive 50 percent of PTA revenues.

STBG Surface Transportation Block Grant – Established by California state statute utilizing federal Surface Transportation Program funds. Approximately 76 percent of the state's STBG funds must be obligated on projects located within the 11 urbanized areas of California with populations of 200,000 or more.

STIP State Transportation Improvement Program – A five-year capital outlay plan that includes the cost and schedule estimates for all transportation projects funded with any amount of state funds. The STIP is approved and adopted by the CTC and is the combined result of the ITIP and the RTIP.

STP Surface Transportation Program – Provides flexible funding that may be used by states and localities for projects on any federal-aid highway, bridge projects on any public road, transit capital projects, and intracity and intercity bus terminals and facilities. A portion of funds reserved for rural areas may be spent on rural minor collectors.

Strategic Projects/Plan Strategic projects are unfunded projects that are showcased in case future funding is available.

Sustainability The practice of analyzing and accounting for the impact of decisions, policies, strategies and development projects on the Economy, the Environment and Social Equity (commonly referred to as the three E's). In the 2017 Agency Strategic Plan, SCAG adopted the following objective: "Cultivate dynamic knowledge of the major challenges and opportunities relevant to sustainability and quality of life in the region."

SWITRS Statewide Integrated Traffic Records System - A database that serves as a means to collect and process data gathered from a collision scene.

T

TAP Transit Access Pass – A form of electronic ticketing payment method used in most public transit services within Los Angeles County.

TAM Transit Asset Management – A business model that prioritizes funding based on the actual condition of transit assets in order to achieve or maintain transit networks in a state of good repair.

TAZ Traffic Analysis Zone – Zone system used in travel demand forecasting.

TC Transportation Committee – Committee used to study problems, programs, and other matters which pertain to the regional issues of mobility, air quality, transportation control measures, and communications.

TCM Transportation Control Measure – Defined in the US EPA's Transportation Conformity Regulations, TCM is any measure that is specifically identified and committed to in the applicable SIP, including a substitute or additional TCM that is incorporated into the applicable SIP through the process established in CAA section 176(c)(8), that is either one of the types listed in CAA section 108, or any other measure for the purpose of reducing emissions or concentrations of air pollutants from transportation sources by reducing vehicle use or changing traffic flow or congestion conditions. Vehicle technology-based, fuel-based, and maintenance-based measures which control the emissions from vehicles under fixed traffic conditions are not TCMs.

TCWG Transportation Conformity Working Group – A forum to support federally mandated interagency consultation to help improve air quality and maintain transportation conformity in the SCAG region. Membership of the TCWG includes federal (US EPA, FHWA, FTA), state (ARB, Caltrans), regional (Air Quality Management Districts, SCAG), and sub-regional (County Transportation Commissions) agencies and other stakeholders.

TDA Transportation Development Act – State law enacted in 1971 that provided a 0.25 percent sales tax on all retail sales in each county for transit, bicycle, and pedestrian purposes. In non-urban areas, funds may be used for streets and roads under certain conditions.

TDM Transportation Demand Management – Strategies that result in more efficient use of transportation resources, such as ridesharing, telecommuting, park-and-ride programs, pedestrian improvements, and alternative work schedules.

TDR Transfer of Development Rights – A market-based planning tool to support growth in locally identified "receiving districts" in lieu of growth in identified "sending districts".

TEU Twenty-Foot Equivalent Unit, a measure of shipping container capacity.

TIFIA Transportation Infrastructure Finance and Innovation Act of 1998 – Established a new federal credit program under which the US DOT may provide three forms of credit assistance—secured (direct) loans, loan guarantees, and standby lines of credit—for surface transportation projects of national or regional significance. The program's fundamental goal is to leverage federal funds by attracting substantial private and other non-federal co-investment in critical improvements to the nation's surface transportation system. Sponsors may include state departments of transportation, transit operators, special authorities, local governments, and private entities.

TMA Transportation Management Area – An area designated by the Secretary of Transportation, having an urbanized area population of over 200,000, or upon special request from the Governor and the MPO designated for the area.

TNC Transportation Network Companies – This is the technical term for ride-hailing companies used by the California Public Utilities Commission in order to create a new class of mobility provider distinguished from taxi companies and limousines.

TOD Transit-Oriented Development – A planning strategy that explicitly links land- use and transportation by focusing mixed housing, employment, and commercial growth around bus and rail stations (usually within ½ mile). TODs can reduce the number and length of vehicle trips by encouraging more bicycle/pedestrian and transit use and can support transit investments by creating the density around stations to boost ridership.

TP&D Transportation Planning and Development Account – A state transit trust fund that is the funding source for the STA program.

TPA Transit Priority Areas - An area within half a mile of a major transit stop that is existing or planned.

TSM Transportation Systems Management – A set of techniques used to increase the capacity of a segment of transportation infrastructure without increasing its physical size. Most often, these techniques are used in the context of roadways, and techniques include coordinated traffic signals and ramp meters.

TSP Transit Signal Priority – A set of operational improvements that use technology to facilitate the movement of transit vehicles and reduce their dwell time at traffic signals by holding green lights longer or shortening red lights. TSP may be implemented at individual intersections or across corridors or entire street systems. Objectives of TSP include improved schedule adherence and improved transit travel time efficiency while minimizing impacts to normal traffic operations.

TSWG Transportation Safety Working Group – Advises the operating organizations on transportation safety matters associated with the transfer or shipment of hazardous materials.

TUMF Transportation Uniform Mitigation Fee – Ordinance enacted by the Riverside County Board of Supervisors and cities to impose a fee on new development to fund related transportation improvements.

U

Unconstrained Plan Same as Strategic Projects/Plan.

Union Station Los Angeles Union Station is the main railway station in Los Angeles.

UP Union Pacific Railroad.

UPT Unlinked Passenger Trips - The number of passengers who board public transportation vehicles. Passengers are counted each time they board vehicles no matter how many vehicles they use to travel from their origin to their destination.

Urban Areas Urban Areas in the SCAG region represent densely developed territory, and encompass residential, commercial and other non-residential urban land uses where population is concentrated over 2,500 people in a given locale.

Urban Greening Grant Program A grant program that competitively distributes grants statewide to projects that make the built environment more sustainable and effective in creating healthy and vibrant communities. The program funds establishing and enhancing parks and open space, using natural solutions to improving air and water quality and reducing energy consumption, and creating more walkable and bikeable trails.

Urban Growth Boundary A regional boundary that seeks to contain outward urban expansion by limiting development outside of the boundary, while focusing new growth within the boundary. Urban growth boundaries lead to the preservation of natural and agricultural lands, redevelopment and infill in existing communities, and optimization of existing infrastructure and transportation investments.

Urban Heat Island/ Heat Island Effect An urban or metropolitan area that is significantly warmer than surrounding rural areas due to human activities. Its main cause is the modification of land surfaces.

US DOT U.S. Department of Transportation – Federal agency responsible for the development of transportation policies and programs that contribute to providing fast, safe, efficient, and convenient transportation at the lowest cost consistent with those and other national objectives, including the efficient use and conservation of the resources of the United States. US DOT is comprised of ten operating administrations, including FHWA, FTA, FAA and FRA.

V

Variable Constrained Areas Include Wildland Urban Interface (WUI), grazing lands, farmlands in incorporated jurisdictions, 500 year flood plains, CalFire Very High Severity Fire Risk (state and local), and Natural Lands Conservation Areas (connectivity, habitat quality, habitat type layers). These areas were identified during the scenario development process to be used during the modeling process to redirect jurisdictional growth into other areas when feasible. These are intended to be regional guidelines and do not supersede existing regulations or protections or local land use policy.

VCAPCD Ventura County Air Pollution Control District – The air pollution control agency with the primary responsibility for the control of non-vehicular sources of air pollution in Ventura County. The District provides a full range of air pollution control activities, including permitting, facility inspection, air quality attainment planning, rulemaking, air quality monitoring, and incentive programs. The District shares responsibility with the California Air Resources Board for ensuring that all state and federal air quality standards are achieved

and maintained within Ventura County. The VCAPCD is located within the South Central Coast Air Basin.

VCTC Ventura County Transportation Commission – Agency responsible for planning and funding countywide transportation improvements.

Vehicle Hours of Delay The travel time spent on the highway due to congestion. Delay is estimated as the difference between vehicle hours traveled at a specified free- flow speed and vehicle hours traveled at a congested speed.

Vehicle Revenue Hours The hours that a public transportation vehicle actually travels while in revenue service. Vehicle revenue hours include layover/recovery time, but exclude deadheading, operator training, vehicle maintenance testing, and school bus and charter services.

VHDD Vehicle Hours of Daily Delay – Hours of delay attributed to congestion for vehicles each day.

Vision Zero Policy A multi-national road traffic safety project that aims to achieve a highway system with no fatalities or serious injuries in road traffic. The policy was started in Sweden and was approved by their parliament in 1997. Since then, various countries (including the United States) have adopted the policy.

VMT Vehicle Miles Traveled – On roadways, a measurement of the total miles traveled by all vehicles in the area for a specified time period. It is calculated by the number of vehicles times the miles traveled in a given area or on a given roadway during the time period. In transit, the number of vehicle miles operated on a given route or line or network during a specified time period.

VRM Vehicle Revenue Miles – The miles that a public transportation vehicle actually travels while in revenue service. Vehicle revenue miles include layover/recovery time, but exclude deadheading, operator training, vehicle maintenance testing, and school bus and charter services.

Z

ZEV Zero Emissions Vehicles – Vehicles that produce no tailpipe emissions of criteria pollutants. Generally, ZEVs feature electric powertrains. Technically, ZEVs are still responsible for some greenhouse gas emissions, as the GHG content from the electricity generation must be accounted for. ZEVs include battery electric vehicles (BEV), plug-in electric hybrids (PHEV) when powered by the electric engine, and hydrogen fuel cell vehicles (FCV).

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