FY 2018-19
CALTRANS SUSTAINABLE TRANSPORTATION PLANNING
SUSTAINABLE COMMUNITIES GRANT APPLICATION

PROJECT TITLE	Strategic Plan for Integrated Transportation in the Antelope Valley
PROJECT LOCATION (city and county)	Cities of Lancaster and Palmdale, and adjoining partners of Los Angeles County

	APPLICANT	**SUB-APPLICANT**	**SUB-APPLICANT**
Organization	Antelope Valley Transit Authority		
Mailing Address	42210 6th St. West		
City	Lancaster		
Zip Code	93534		
Executive Director/designee and title	Mr.☑ Ms.☐ Mrs.☐ Len Engel, Executive Director/CEO	Mr.☐ Ms.☐ Mrs.☐	Mr.☐ Ms.☐ Mrs.☐
E-mail Address	lengel@avta.com		
Contact Person and title	Mr.☑ Ms.☐ Mrs.☐ Len Engel, Executive Director/CEO	Mr.☐ Ms.☐ Mrs.☐	Mr.☐ Ms.☐ Mrs.☐
Contact E-mail Address	lengel@avta.com		
Phone Number	(661) 729-2206		

FUNDING INFORMATION
Use the Match Calculator to complete this section.
Match Calculator

Grant Funds Requested	**Local Match - Cash**	**Local Match - In-Kind**	**Total Project Cost**
$ 239,961	$ 16,414	$ 28,675	$ 285,050

Specific Source of Local Cash Match
(i.e., local transportation funds, local sales tax, special bond measures, etc.)

Local Cash Match source is Antelope Valley Transit Authority's local transportation funds

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LEGISLATIVE INFORMATION* Please list the legislative members in the project area. Attach additional pages if necessary.			
State Senator(s)		Assembly Member(s)	
Name(s)	District	Name(s)	District
Senator Scott Wilk	21	Assembly Member Tom Lackey	36
	-		-
	-		-
	-		-
	-		-
	-		-

***Use the following link to determine the legislators.**
http://findyourrep.legislature.ca.gov/ (search by address)

Please identify the best practices cited in the 2017 Regional Transportation Plan (RTP) Guidelines, Appendices K and L, that would be employed in the proposed transportation planning grant project. Select only those that apply and provide an explanation. For future grant cycles, this section may be considered for points and/or threshold requirements. For now, these items are for tracking and reporting purposes only and are not associated with points, and may not result in a higher score.

☑ Coordination with Other Planning Processes
Please explain how:

AVTA will coordinate with SCAG's RTP SCS staff, LACMTA, and Caltrans to assure mutual goals are addressed without duplication of effort. Planning efforts will utilize Complete Streets and Smart Mobility Framework to determine place-based strategies useful to integrating transportation into community development.

☑ Regional Travel Demand Modeling and Analysis
Please explain how:

Using criteria described in 2017 RTP Guidelines (Chapter 3), AVTA will strive to enhance the decision-making process by assisting the public and decision-makers in evaluating and identifying strategies which optimally address the transportation needs of their jurisdictions, including benefits and performance indicators.

☑ RTP Consultation and Coordination
Please explain how:

Using RTP Guidelines criteria, AVTA will provide a variety of multilingual community engagement opportunities, inviting all public and private stakeholders representing individuals, organizations, public agencies, business and industry, regulatory agencies (Air Quality), planning groups (SCAG and LACMTA), schools and elected officials.

☑ Integrating Ecological Considerations into Transportation Planning
Please explain how:

AVTA will coordinate with existing and developing ecological plans including the Antelope Valley Regional Conservation Investment Strategy and California Environmental Quality Act when conducting CEQA analysis to assure coordination in employing proven strategies for improved air quality and ecological conditions.

☑ RTP Financial Overview
Please explain how:

Prior to developing expansion strategies, AVTA will identify the condition and performance of existing transit networks and infrastructure, as well as determining the current and anticipated revenue sources and financing techniques available to fund the planned transportation strategies created as part of the planning process.

☑ RTP Modal Discussion
Please explain how:

AVTA will review and advance recommendations for improving "first and last mile" access using strategies outlined in SCAG 2016 RTP SCS-Walking and Bicycling and LACMTA Walking and Bicycling strategies. AVTA will provide recommendations to jurisdictions for integrating transportation into land-use policies and public space design.

☑ Transportation System Management and Operations
Please explain how:

AVTA will review existing transportation systems, identify temporal and spatial gaps in service delivery (as well as "first and last mile" access), review performance measures, determine strategies for improved access and expanded models, and develop updated, objectives-driven, performance-based approaches.

☑ Future of Transportation and New Technology
Please explain how:

Transitioning to all battery-electric fleet in 2018, AVTA will continue to identify new technologies and make recommendations for strategies that improve overall mobility, particularly through Mobility As A Service (MAAS) software, as well as coordination with Transportation Network Companies and Connected Vehicles.

☑ Sustainable Communities Strategy (SCS) Contents and Development
Please explain how:

This AVTA proposal reflects an MPO-level Sustainable Communities Strategies Plan in that, on a sub-regional basis, AVTA will include a review of existing transportation service and its integration in jurisdictional goals for health, housing, economic development, ecological conditions, land-use, and transportation-based development.

☑ Land Use and Transportation Strategies to Address Regional GHG Emissions
Please explain how:

The proposed plan includes strategies to reduce GHG emissions and integrate transportation in jurisdictional land-use policies. These strategies will include integration of "first and last mile" considerations and access to transportation in new public and private developments as well as support for AVTA's new "all electric" transit fleet.

☑ Adaptation of the Regional Transportation System to Climate Change
Please explain how:

AVTA is in the midst of converting its entire transit fleet to battery-electric (2018). Using Caltrans, Cal-Adapt, and other state and MPO guidance, the plan will include additional strategies to support reductions in greenhouse gases as well as strategies to forecast and mitigate impacts of climate change on transportation services.

☑ Performance Measures
Please explain how:

For its service region, AVTA will establish baselines in support of integrated transportation including, but not limited to, improved access in disadvantaged areas, active transportation connections, land-use policies, service and management efficiencies, service gaps, multi-modal access, and environmental and health conditions.

☑ Policies and Programs that Promote Health and Health Equity
Please explain how:

AVTA will provide educational opportunities for jurisdictions to learn how integrating transportation into many areas of their responsibility can promote good health and even improve health indicators. AVTA will use HEAT to plan for bike/walk paths. ITHIM will be used to state the overall health impact of integrating transportation into planning.

Please identify the Grant Program Overarching Objectives (Grant Application Guide, Page 4) that the proposed transportation planning grant project will address. Select all that apply and provide an explanation.

☑ Sustainability – Promote reliable and efficient mobility for people, goods, and services, while meeting the State's GHG emission reduction goals, preserving the State's natural and working lands, and preserving the unique character and livability of California's communities.

Please explain how:

AVTA's planning activity will leverage the successful conversion to a battery-electric fleet by identifying gaps in service and making recommendations that improve access and use of public transit. The plan will identify gaps and make recommendations to improve jurisdictional policy for land-use, health, economics, environment, and housing.

☑ Preservation – Preserve the transportation system through protecting and/or enhancing the environment, promoting energy conservation, improving the quality of life, and/or promoting consistency between transportation improvements and State and Local planning growth and economic development patterns.

Please explain how:

Converting to a battery-electric fleet in 2018, AVTA will use this plan to focus on additional energy conservation by recommending strategies to: develop bike/walk paths, enhance public transit access, increase access to transit for disadvantaged areas, integrate transportation into land-use policy, and coordinate with regional/state plans.

☑ Mobility – Increase the accessibility of the system and mobility of people and freight.

Please explain how:

With a focus on active transportation, AVTA will produce strategies that increase transit access opportunities while maintaining reduced environmental factors. Recommended strategies for multi-modal access, partnerships with private and neighboring public transportation, and technology-based mobility management will be developed.

☑ Safety – Increase the safety and/or security of the transportation system for motorized and active transportation users.

Please explain how:

AVTA's plan will study safety-related data and make recommendations to improve safety measures for current service, planned service, and any integrated development strategies for active transportation modes.

☑ Innovation – Promote the use of technology and innovative designs to improve the performance and social equity of our transportation system and provide sustainable transportation options.

Please explain how:

AVTA will evaluate the use of Mobility As A Service (MAAS) application software and make recommendations on its use to improve mobility options for connecting transportation services across modes to reach destinations outside the current local service area. The plan will also make recommendations for improved partnerships across modes.

☑ Economy – Support the economic vitality of the area (i.e. enables global competitiveness, enables increased productivity, improves efficiency, increases economic equity by enabling robust economic opportunities for individuals with barriers to employment and for Disadvantaged Business Enterprises, etc.).

Please explain how:

AVTA will include the integration of transportation into economic and housing strategies that will focus on disadvantaged areas within its local service area. Recommendations will include strategies for commuters, employment destinations, and access to public transit where service gaps may exist.

☑ Health **–** Decrease exposure to local pollution sources, reduce serious injuries and fatalities on the transportation system, and promote physical activity especially through transportation means.

Please explain how:

AVTA's plan will include strategies in safety, environment, economic, land-use, and health sectors. The plan also will address further reducing GHG, increasing active transportation, improving access to public transportation in disadvantaged areas, and developing policies that integrate transportation among jurisdictional responsibilities.

☑ Social Equity – All of these overarching objectives should promote transportation solutions that focus on and prioritize the needs of communities most affected by poverty, air pollution and climate change, and promote solutions that integrate community values with transportation safety and performance while encouraging greater than average public involvement in the transportation decision making process.

Please explain how:

AVTA's holistic response to planning community sustainability strategies for transportation includes mitigating accessibility, health, housing and economic hardships in disadvantaged areas. Strategies will be used to inform jurisdictions regarding the ways transportation can improve quality of life across the community spectrum.

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1. Project Description (100 words maximum) (15 points): Briefly summarize project.

AVTA, with Cities of Lancaster and Palmdale and County of Los Angeles, will develop a Strategic Plan for Integrated Transportation in the Antelope Valley to advance strategies and identify action steps that:

Improve health indicators by partnering with healthcare providers to integrate non-emergency medical transportation into regional healthcare planning and AVTA services.

Improve the communities's overall sustainability by identifying best practices and developing an implementation plan for Palmdale and Lancaster to integrate transportation into all aspects of jurisdictional planning and evaluation of proposed development projects.

Improve access to multi-modal transportation services especially in disadvantaged areas, while reducing green-house gases.

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2. Project Justification (Do not exceed the space provided.) (25 points): Describe the problems or deficiencies the project is attempting to address, as well as how the project will address the identified problems or deficiencies. Additionally, list the ramifications of not funding this project.

Antelope Valley Transit Authority was founded as a Joint Powers Authority between the Cities of Lancaster and Palmdale along with less urbanized area of Los Angeles County to address the north County region's public transportation needs. Using the State's Disadvantaged Areas Mapping Tool (See map and details in Scope of Work), Antelope Valley is seen as widely disadvantaged. Additionally, the Los Angeles County Department of Public Health's publication, Key Indicators of Health by Service Planning Area, January 2017 (see report in Data section), finds the Antelope Valley fares worse than other service planning areas in 35 of 107 (33%) of health-related indicators and has the highest rate of health-related mortality in the County.

Problem statements and deficiencies:

1) TRANSPORTATION PLANNING WITH HEALTHCARE PROVIDERS

Recidivism rates among patients is often related to lack of transportation to reach post-hospitalization treatments and ongoing appointments, leading to increased health-related mortality rates in the Antelope Valley. The AV's healthcare centers (hospitals, clinics, and medical centers) do not have a coordinated Healthcare Transportation Plan and Policy that integrates transportation with patient-care planning and healthcare facility development. Without a coordinated planning effort that can provide effective and efficient strategies addressing transportation needs across the healthcare service industry, health related mortality rates will continue to rise, particularly among those who are disadvantaged.

2) INTEGRATION OF TRANSPORTATION INTO REGIONAL AND JURISDICTIONAL LAND-USE PLANNING

Commercial and residential development within the Antelope Valley continues to be approved without transit or transportation related considerations, further exacerbating problems with greenhouse gas emissions, lack of access to employment centers, and costly post-development infrastructure requirements as growing populations demand access to public transportation. (See development maps.) As a Joint Powers Authority, the partnership between the City of Lancaster, City of Palmdale, and Los Angeles County shares goals and objectives for growing and sustaining transportation services for the region. Member jurisdictions cite lack of staff resources, in light of increased demands in this fast-paced growth environment, as the number one reason why there has been little effort to collaboratively integrate transportation into housing, economic development, environmental protection, health, and land-use policies. The result is unsustainable growth that requires post-development infrastructure which is considerably more expensive than it would be had integrated policies been in place. Further, diminishing transportation resources often leave developments, particularly those in disadvantaged neighborhoods, without access to public transit unless included in the developers' plans. This planning partnership will seek best practices and make recommendations for integrated policy development for the cities of Palmdale and Lancaster.

3) TRANSPORTATION SERVICE GROWTH AND SUSTAINABILITY

In 2016, AVTA's ridership growth began to challenge service capacity, requiring the organization to add additional service, including mid-day routes linking with Santa Clarita Transit and Metrolink's AV Line service. In 2018, the service provision is being further challenged with little ability to address service gaps, expand services into disadvantaged neighborhoods, and more effectively address "first and last mile" mobility needs. Strategic planning for system growth that can meet current and future demand is a top priority for AVTA. However, unlike prior planning endeavors, AVTA proposes to review existing conditions and recommend strategies that broaden the scope of potential mobility resources including coordination efforts between planning organizations, public/private partnerships, "first and last mile" active transportation opportunities, and inter-city connection potential. Without the development of growth strategies, AVTA will be unable to meet surging demand without compromising existing service.

OUTPUT: In collaboration with its JPA members and stakeholders, AVTA will identify specific strategies and action steps needed for our partners to integrate transportation into their policies and decision making processes. Utilizing significant and ongoing stakeholder and public engagement, the Plan will identify: new service options for non-emergency medical transportation; High Quality Transit Areas for development (as prescribed in SCAG 2016 RTP/SCS Chapter 5, Land-Use Strategies); best practices for jurisdictional integration of transportation into policy and decision-making processes; and sustainable growth strategies to meet the transit needs of disadvantaged residents. Without these planning efforts and their implementation, the entire transportation network which provides critical access to employment, healthcare, and essential services will be destabilized and unsustainable.

3. Grant Specific Objective (Do not exceed the space provided.) (30 points): Explain how the proposed project addresses the grant specific objective of the Sustainable Communities grant program: to encourage local and regional multimodal transportation and land use planning that furthers the region's RTP SCS (where applicable), contributes to the State's GHG reduction targets and other State goals, including but not limited to, the goals and best practices cited in the 2017 RTP Guidelines, addresses the needs of disadvantaged communities, and also assists in achieving the Caltrans Mission and Grant Program Overarching Objectives (Grant Application Guide, Page 4).

The proposed project is the development of a Strategic Plan for Integration of Transportation to: (1) integrate coordinated, non-emergency medical transportation into healthcare providers' and AVTA's service delivery; (2) integrate active and public transit/transportation into regional and jurisdictional policy development for land-use, housing, economic development, environmental justice, and public health; (3) in a sustainable and feasible manner, expand AVTA transit services to meet the needs of disadvantaged neighborhoods and employment centers. The proposed plan addresses the overarching objectives of the grant program in the following ways:

SUSTAINABILITY: By integrating non-emergency medical transportation into the service delivery plans of both AVTA and healthcare providers across the Antelope Valley, efficient and timely mobility options for patients will reduce recidivism rates for admissions and promote long-term gains in healthy-community indicators. Integrating active and public transit considerations into all aspects of jurisdictional planning promotes sustainability, particularly in land-use, economic development, and environmental sectors. This further reduces sprawl, greenhouse gas emissions, and costly post-development infrastructure requirements. Planning for AVTA service growth to better serve disadvantaged neighborhoods and employment centers strengthens community vibrancy and supports sustainability for the region.

PRESERVATION: In conjunction with state and COG level planning, AVTA's proposed planning project enhances quality of life throughout the region. Building a sustainable active and public transit system supports its preservation. The project focuses on coordinated planning with healthcare providers to improve access and reduce transportation redundancies. With jurisdictions, the plan will identify policies that promote and integrate active and public transit into the public approval process. Both objectives reduce greenhouse gas emissions. AVTA's capital improvement plan for a 100% battery-electric fleet in 2018 furthers state and regional plans for energy conservation and reduced emissions. Generally, the proposed plan promotes consistency, addresses local, state, and regional goals, and develops strategies that can be implemented through collaborative and coordinated efforts among stakeholders.

MOBILITY: Utilizing three strategies (defined in the introduction), AVTA intends to identify deficiencies and improve accessibility and mobility options for patients, persons living in disadvantaged neighborhoods, employers and employees in the region's employment centers, and the general public through policy development for land-use, environmental protection, and economic development. The plan will review and recommend strategies that promote reliable and efficient mobility that leverages public and private multi-modal opportunities such as prearranged transportation with TNCs as well as coordination with human services transportation providers, hospitals, and potential expansion of inter-city connectors like Metrolink, Greyhound, and Amtrak to include private shuttles, livery cars, and shared-ride services. AVTA will be reviewing active transportation opportunities including bike-sharing, bike/walking paths, and safe routes to schools and making recommendations for linkages to active transit termini, as well as recommendations for updating jurisdictional planning and policy decisions to integrate active transportation in future development.

SAFETY: As part of its efforts to integrate transportation into jurisdictional policy making, AVTA proposed plan will incorporate and promote mobility-related safety, particularly for active transportation planning and in development of land-use policy when considering transit stations, stops, and transfer facilities. These efforts will include the integration of multi-modal, active transportation pathways that encourage safety and link to public transit systems.

Grant Specific Objective (Continued - Do not exceed the space provided.)

INNOVATION: AVTA actively seeks to utilize cutting-edge best practices in its service delivery. The Strategic Plan for Integrated Transportation in the Antelope Valley will include strategies to further the current effort to electrify the entire vehicle fleet, as well as coordinate with the State, Southern California Association of Governments, and Los Angeles County Metropolitan Transit Authority to assure that implementation of new technologies can be effected across regions seamlessly. AVTA will be looking for strategies to address Mobility As A Service (MAAS) to improve overall mobility using phone-based technology that links information on all transportation modes and allows a rider to plan a real-time trip from the first mile to final destination including the purchase of fares, alternative modes, and transfer information for multi-jurisdictional trips. Coordination with neighboring and regional transportation providers will be essential in addressing MAAS and other inter-community services. Other best practices that will be reviewed are resource-sharing opportunities including bikes, rides, and vehicle sharing. Strategies for utilizing technology to affect community outreach and engagement, such as Geo-fencing, will be considered.

ECONOMY: The proposed plan will support the economic vitality and global competitiveness of the area by creating efficiencies and reducing redundancies in providing non-emergency medical transportation. The plan will address improved access to active and public transportation in disadvantaged neighborhoods and employment centers, thereby improving economic equity for individuals experiencing barriers to employment. An essential element guiding the proposed planning effort is the recognition that sufficient and sustainable transportation is a key consideration for businesses contemplating the Antelope Valley and planning for future economic development activities.

HEALTH: One of the most significant challenges faced in the Antelope Valley is the high incidence of chronic disease and preventable health-related mortality. The proposed plan will address integration of transportation in healthcare policy with a number of objectives: development of a non-emergency medical transportation system in coordination with healthcare stakeholders; improved access to transportation for disadvantaged neighborhoods, thereby improving access to healthcare, jobs, and support services; reduced exposure to local pollution by promoting use of active and public transit; and identification and reduction of transportation related redundancies and inefficiencies. Using the Caltrans-recommended Health Economic Assessment Tool (HEAT) to determine baselines and establish performance measures, AVTA will work with public and private healthcare professionals and stakeholders to determine planning and policy development strategies needed to integrate transportation into health industry driven decision-making. The Integrated Transportation and Health Impact Model will be used to measure current and potential performance in reaching shared public health goals where integrated transportation could have an impact.

SOCIAL EQUITY: The proposed plan will address State SCS Grant and RTP objectives across the AVTA service area with particular focus on disadvantaged areas (see attached graphic titled AVTA Disadvantaged Areas) so as to maximize service access, improve economic parity of resources, reduce health issues, further reduce pollutants and greenhouse gases, improve housing/transit balance, and integrate transportation into land-use policy. The community engagement activities will provide multi-language access, using locations and times that maximize the participation of persons living in disadvantaged areas and initiating strategies to maximize participation by those most affected by poverty, air pollution, and lack of access to transportation. AVTA will actively seek out a representative group of citizens (including those from disadvantaged neighborhoods or representing specific populations) and stakeholders to serve on a Community Advisory Board. This Board will be engaged in input and feedback activities throughout the planning and implementation processes and will provide ongoing insights and critical evaluation of performance in carrying out planning activities and implementation of strategies.

4. Project Management (30 points)
A. Scope of Work in required Microsoft Word format (15 points)
B. Project Timeline in required Microsoft Excel format (15 points)

See Scope of Work and Project Timeline samples and checklists for requirements (Grant Application Guide, Pages 48-54), also online at: http://www.dot.ca.gov/hq/tpp/grants.html

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Application Signature Page

If selected for funding, the information contained in this application will become the foundation of the contract with Caltrans.

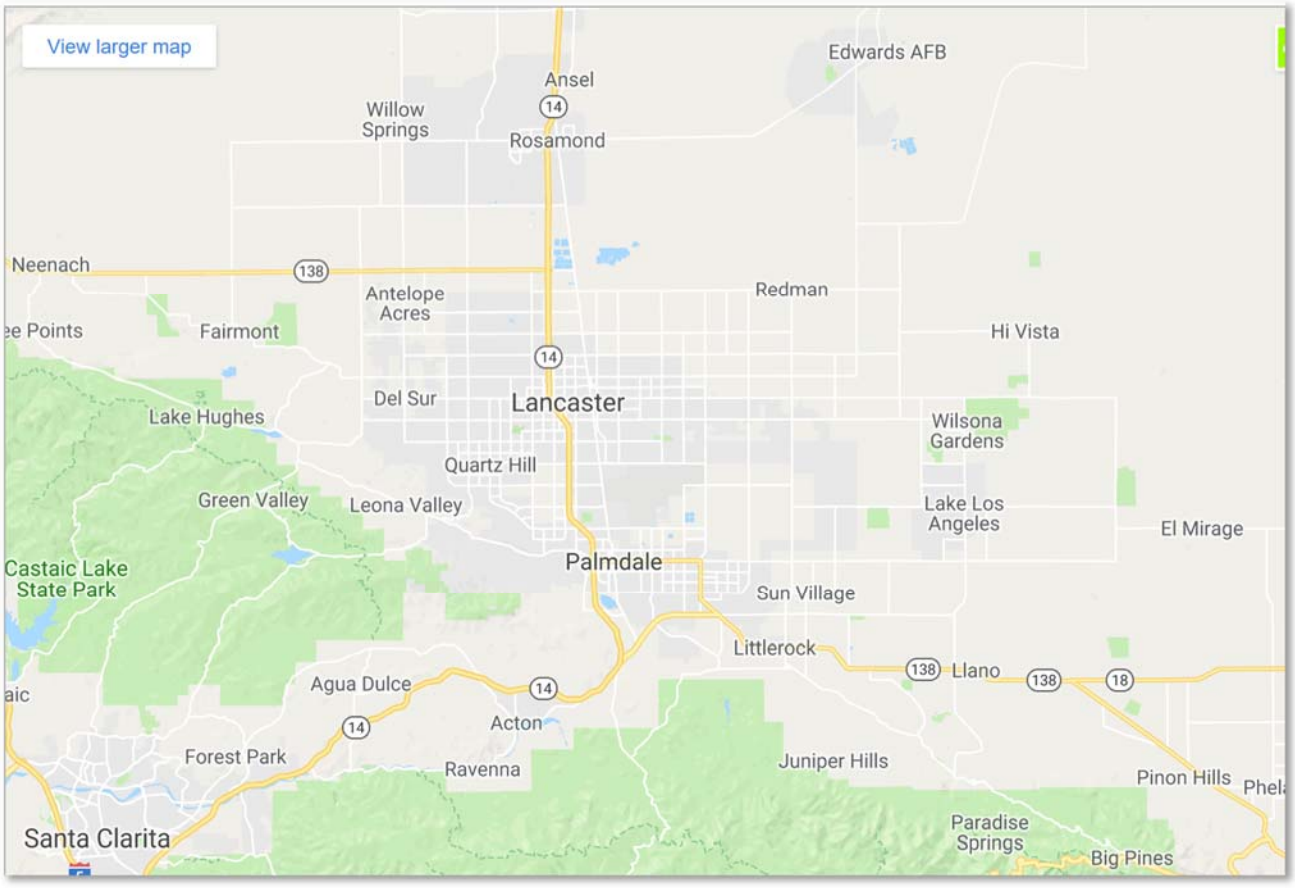
To the best of my knowledge, all information contained in this application is true and correct. If awarded a grant with Caltrans, I agree that I will adhere to the program guidelines.

	Len Engel
Signature of Authorized Official (Applicant)	*Print Name*
Executive Director / Chief Executive Officer	
Title	*Date*
	not applicable
Signature of Authorized Official (Sub-Applicant)	*Print Name*
not applicable	not applicable
Title	*Date*
	not applicable
Signature of Authorized Official (Sub-Applicant)	*Print Name*
not applicable	not applicable
Title	*Date*

STRATEGIC PLAN FOR INTEGRATING TRANSPORTATION IN THE ANTELOPE VALLEY

INTRODUCTION

Antelope Valley Transit Authority is a Joint Powers organization whose members include the City of Lancaster, the City of Palmdale, and the County of Los Angeles. Antelope Valley Transit Authority, with assistance from member jurisdictions, stakeholders, and local citizens, will prepare a strategies-based plan to advance coordinated transportation/mobility goals in the Antelope Valley.



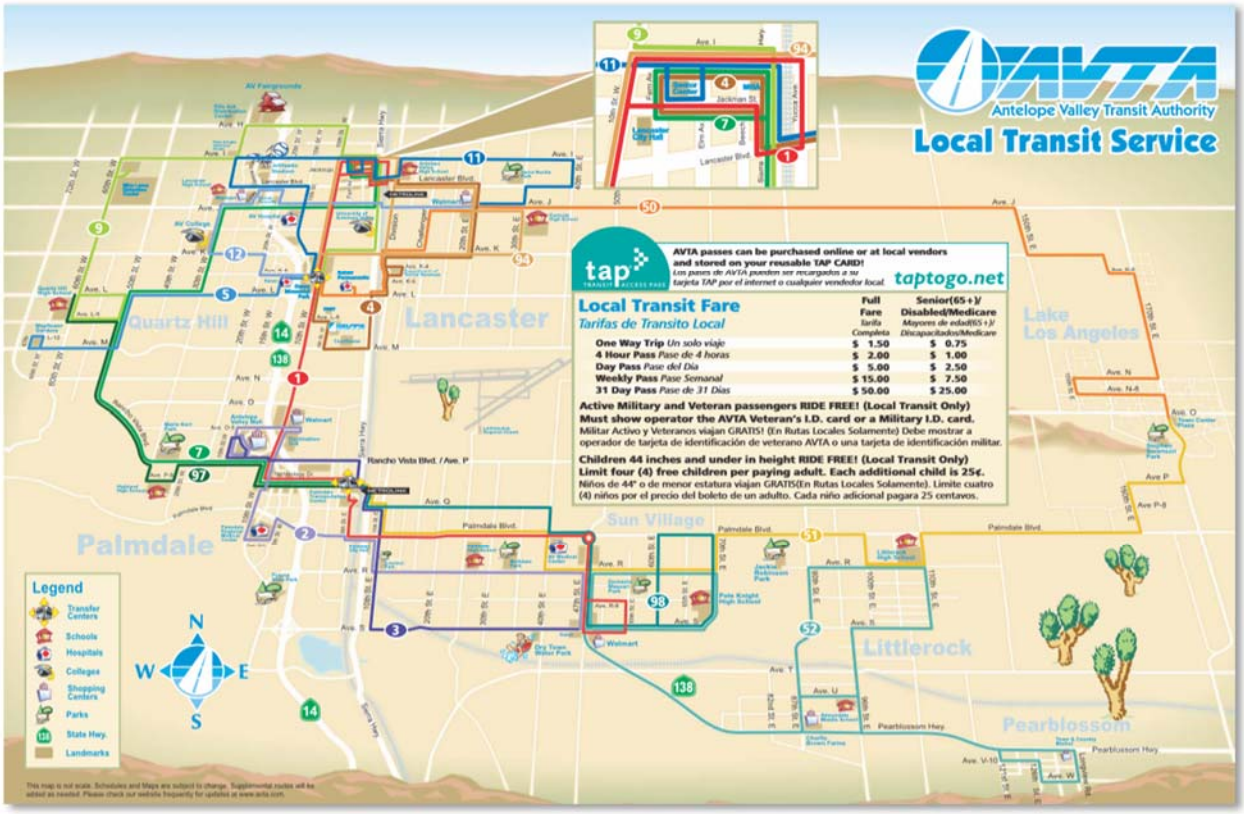
The proposed plan will examine data, determine feasibility and identify the best practices and necessary action steps and implementation activities for AVTA and its stakeholder/jurisdictional partners to: integrate coordinated, non-emergency medical transportation into healthcare providers' and AVTA's service delivery; integrate active and public transit/transportation into regional and jurisdictional policy development for

land-use, housing, economic development, environmental justice, and public health; and expand AVTA transit services to meet the needs of disadvantaged neighborhoods and employment centers in a sustainable and feasible manner.

This plan will include comprehensive and community-driven public engagement activities focusing on needs and advancing practical solutions linking transportation with community quality-of-life indicators including public health, housing, environmental justice, and economic security.

AVTA would expect to work closely with Caltrans' Division of Local Assistance for guidance and assistance in meeting specific program requirements and assuring the project is delivered in accordance with Federal and State requirements. AVTA would also work closely with the Division of Transportation Planning for assistance and feedback on Public Participation, research, input on planning documents, and project input from the Air Quality and Environment section as well as the Health in All Policies (HiAP) Task Force.

Failure to conduct this planning and in implementing project strategies may result in: continued recidivism and escalating negative health indicators; continued rapid housing and commercial development that does not take into consideration transportation and its related health and environmental impacts; and failure to adequately address transit needs of disadvantaged residents of the region, particularly with regards to their health, economic security and environmental justice.



DEMOGRAPHIC DATA and DATA FOR DISADVANTAGED COMMUNITIES

The Antelope Valley (AV) is located in northern Los Angeles County, California, and constitutes the western tip of the Mojave Desert. It is situated between the Tehachapi and the San Gabriel Mountains. Access to AV from the City of Los Angeles is from Interstate 5 to State Highway 14.

The SCAG 2016 RTP/SCS growth forecast for Lancaster anticipates population growth from the baseline in 2012 (158,300) to 2020 (167,400), and on to 2035 (195,800). The SCAG report also anticipates population growth for Palmdale from the baseline in 2012 (154,200) to 2020 (166,500), and on to 2035 (183,000). Current housing and commercial development reflect these changes and are likely to accelerate as 2020 forecasts are confirmed.

The Cities of Lancaster and Palmdale are the economic centers of the AV. Edwards Air Force Base is 37 miles northeast of Palmdale in Kern County. U. S. Air Force Plant 42 in northeast Palmdale is home to Lockheed Martin, Boeing, Northrop Grumman, and BAE Systems, among other aerospace-related companies. Both are major employment centers for the AV.

With increased Department of Defense contracts impacting Edwards AFB and Plant 42, it is expected that population growth and subsequent development will continue at a pace that exceeds the jurisdictions' ability to develop and implement growth policy.

Agriculture currently remains an economic driver for the area; however, as housing development continues and population grows, agricultural areas shrink and move further to the northwest and east.

Within the Antelope Valley and the AVTA service area, the California Disadvantaged Communities Mapping Tool reveal Lancaster, Palmdale and surrounding Los Angeles County include disadvantaged populations. See Figure 1.

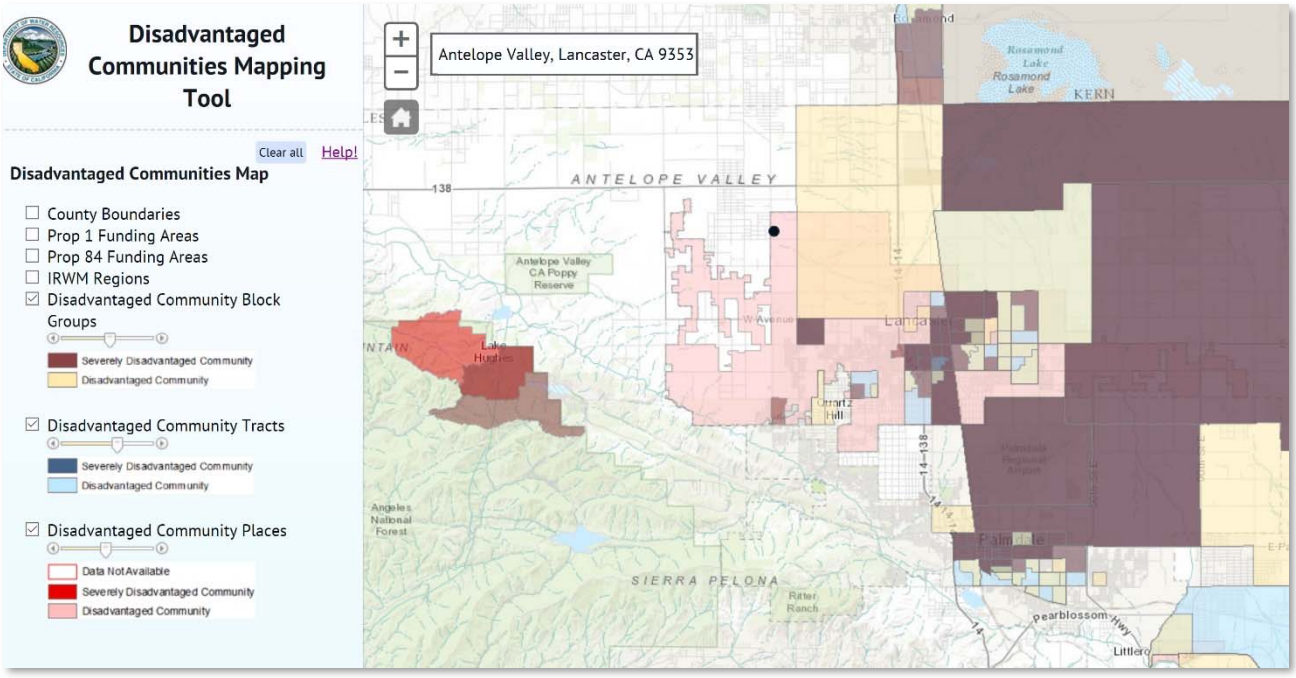


Figure 1 Palmdale and Lancaster CA Disadvantaged Community

Within the AVTA service area, a significant portion of the resident population lives in poverty. See Figure 2.

2015 Census Data indicates 38 percent of residents did not achieve a high school education.

Unemployment rates for April 2017 were 4.9 percent for Lancaster and 5.9 percent for Palmdale – a significant improvement over the last several years, but also an indicator that use of single occupancy vehicles to travel to work are growing faster than the ridership of the AVTA system.

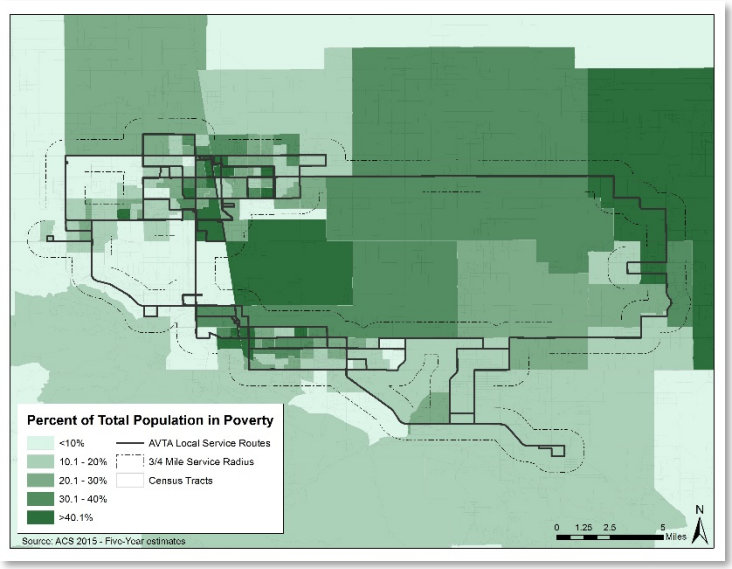
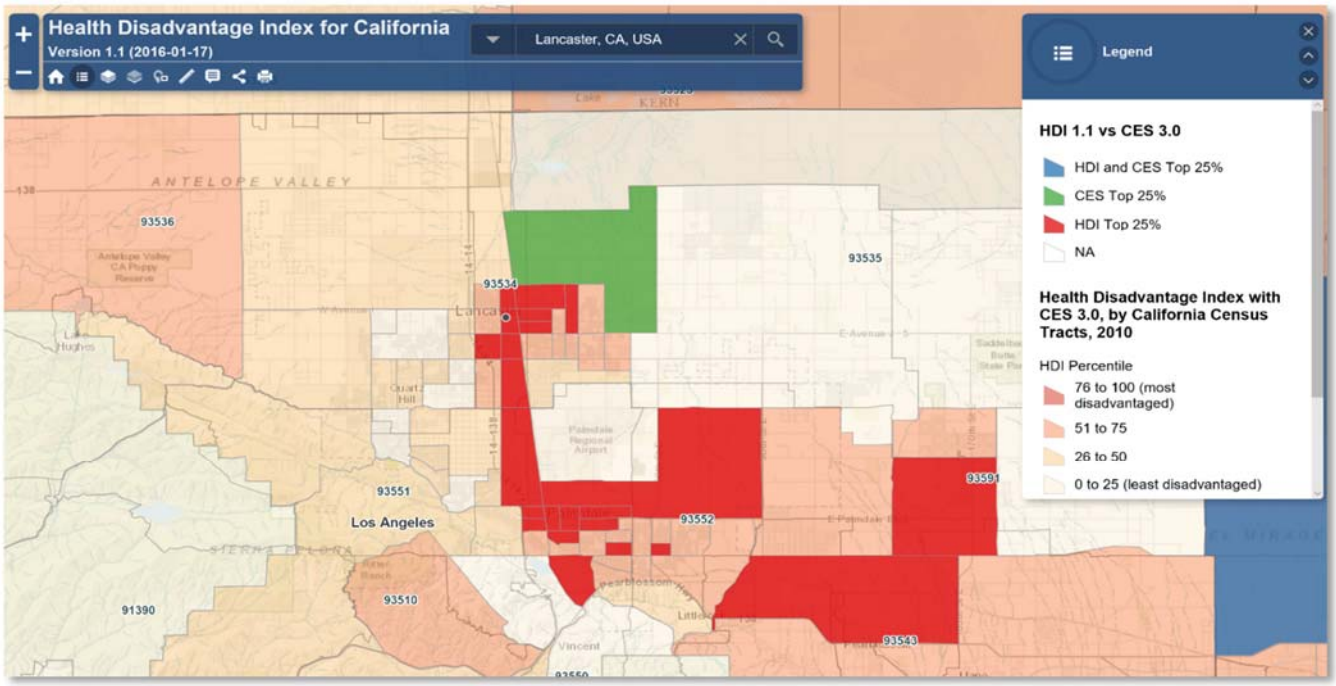


Figure 2 Percent of Total Population in Poverty (AVTA Service Area)

The Health Disadvantage Index for California reveals areas of both Lancaster and Palmdale are in the top 25 percent, least healthy, within the State. See Figure 3.

Figure 3 Health Disadvantage Index



INTEGRATING TRANSIT/TRANSPORTATION INTO HEALTH CARE PROVISION

In an effort to develop strategies for sustainability in the Antelope Valley, AVTA and its stakeholder partners from the healthcare industry have identified non-emergency medical transportation as a key element in reducing the number of persons who are readmitted to hospital or are unable to obtain follow-up care to treat or prevent chronic disease conditions which then become permanent and costly health issues.

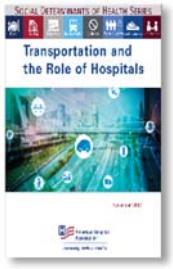
According to the Los Angeles County Department of Public Health's 2017 Key Indicators of Health report, the Antelope Valley fares worse than the other seven study regions in the County in 9 out of 10 health outcome indicators. The indicators are largely preventable/treatable, chronic disease conditions which require regular education, treatment, and support to manage. Transportation is a key factor in assuring that patients receive adequate care to avoid more dangerous and costly conditions. There are a number of healthcare facilities in the AV.

Antelope Valley Hospital, located in Lancaster, is a 420-bed hospital with one of 14 trauma centers in the County. With over 60 years of service to the community, AV Hospital has the second busiest Emergency Department in Southern California. Outpatient visits numbered over 164,000 in 2017. The hospital also discharged 19,658 admitted patients in 2017.

Palmdale Regional Medical Center opened in 2010 as Universal Health Systems' largest ever capital development investment. In 2017, the hospital had 79,026 outpatient visits. With 125 beds (final build-out capacity is 239 beds) the hospital discharged 9,509 patients who had been admitted in 2017.

Kaiser Permanente operates three medical offices; one in Palmdale and two in Lancaster. Kaiser physicians provide medical and behavioral health care to thousands of patients each year. In 2017, AVTA worked with Kaiser to establish a bus stop at the front door of one of their offices making it easier for patients to access and navigate transportation services to and from the facility.

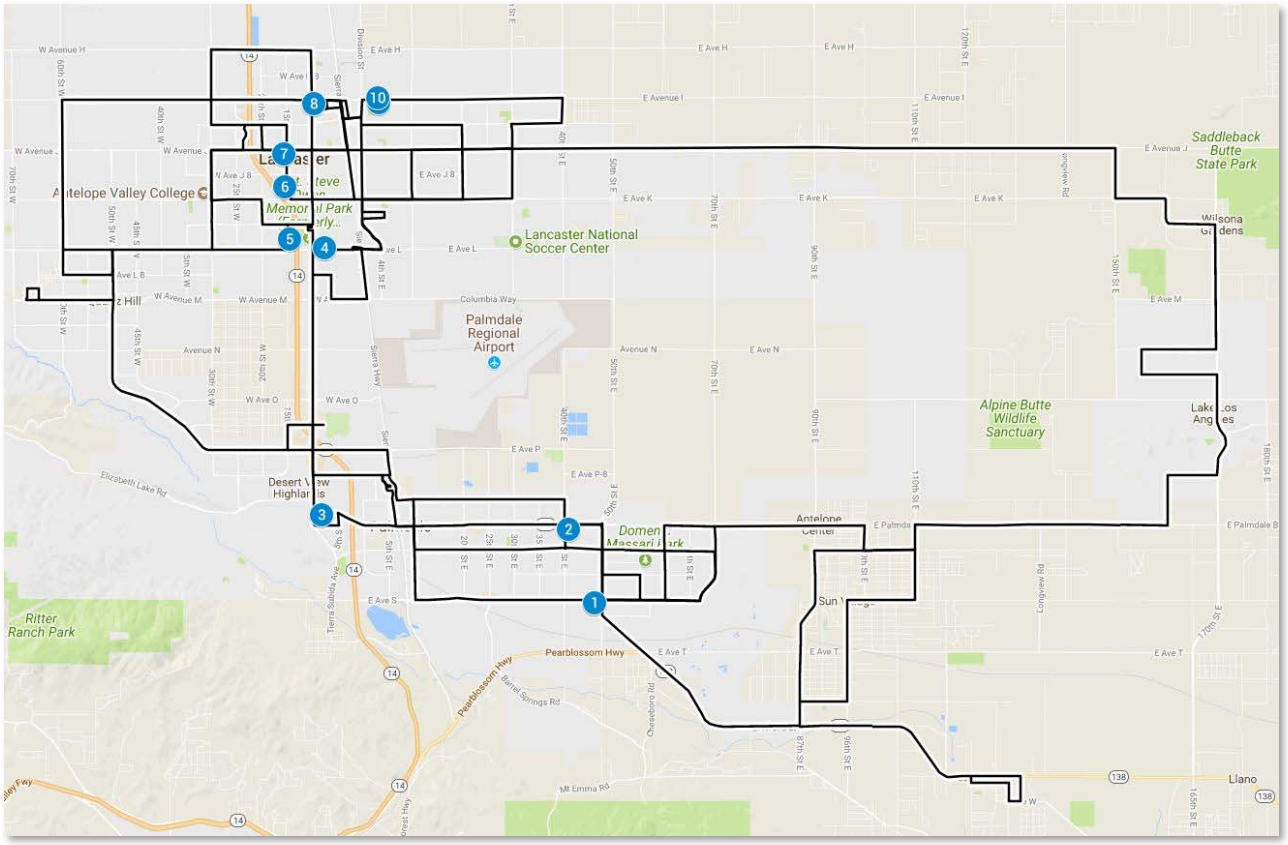
High Desert Regional Health Care (HDRHC) is a group of five clinics in the Antelope Valley area run by the Los Angeles County Department of Health Services (DHS) Ambulatory Care Network. HDRHC provides primary care for adults and children. Urgent Care, medical and surgical specialty clinics, outpatient surgery, and ancillary services are also available at HDRHC. Its patient base is represented through their health care coverage: 66% Medi-Cal, 23% uninsured, 7% Medicare, and 4% other, making the HDRHC the largest provider of health services to the AV's disadvantaged population.



The Health Research & Educational Trust's Social determinants of health series: Transportation and the role of hospitals, (2017, November) reported that:

"Transportation challenges affect urban and rural communities. Overall, individuals who are older, less educated, female, minority, or low income—or have a combination of these characteristics—are affected more by transportation barriers. Children, older adults and veterans are especially vulnerable to transportation barriers due to social isolation, comorbidities, and greater need for frequent clinician visits." The report recommends hospitals take a business view and "form partnerships with government agencies, health and social service providers, elected officials, transportation authorities, private transportation providers, volunteers and educational institutions in order to create new opportunities to address transportation issues."

While ACCESS transportation services will remain available to those who are qualified, AVTA will develop a plan in collaboration with its healthcare partners, a Community Advisory Committee, and an engaged public to plan for non-emergency medical transportation for those who do not qualify or for those who need transportation outside of ACCESS service hours. This plan will then be integrated into the planning and implementation of healthcare provider services and those provided by AVTA.

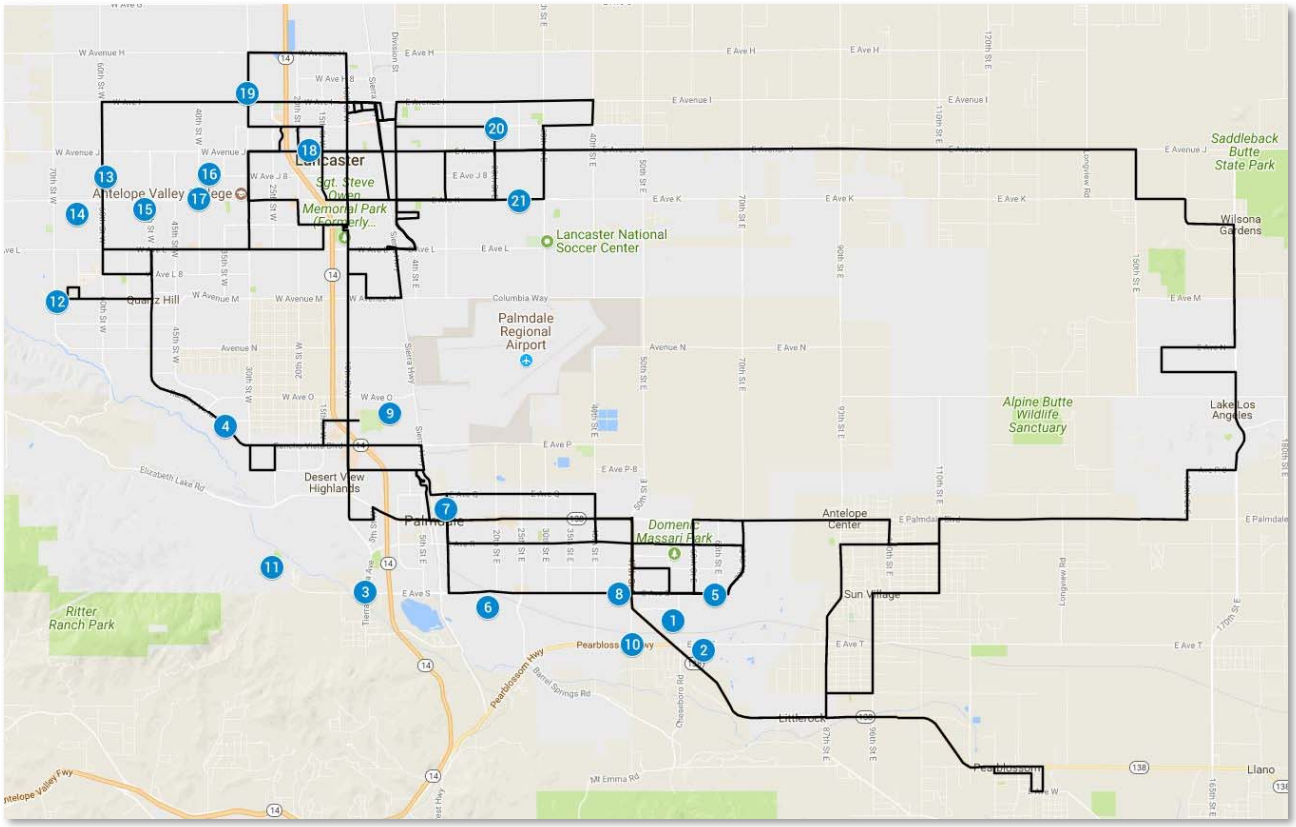


AVTA Service Routes and Health Care Facilities

1. AVTA's Service + Health Care Facilities:
    1. Kaiser Permanente Palmdale
    2. South Valley Health Care Clinic
    3. Palmdale Regional Medical Center
    4. Kaiser Permanente/Specialties
    5. Kaiser Permanente Lancaster
    6. High Desert Medical Group
    7. AV Hospital
    8. Antelope Valley Community Clinic
    9. VA Clinic
    10. High Desert Regional Health Center

INTEGRATING TRANSIT/TRANSPORTATION INTO JURISDICTIONAL PLANNING AND DEVELOPMENT POLICY

The Cities of Lancaster and Palmdale, both Joint Powers Members of AVTA are the largest and fastest growing communities in the AV. Development in the Palmdale-Lancaster areas has resulted in record growth in recent decades. In 1980, the U.S. Census counted approximately 60,000 residents. The population grew to 222,000 by the mid-1990s, and to 485,000 by 2010 — an eight-fold increase within 30 years. In 2018, the Cities of Palmdale and Lancaster have 21 housing (over 7,300 units) and commercial developments approved and expected to be constructed over the next three years. **None of these approved developments have integrated active or public transit into their plans.** Even those near an established AVTA service route have not consulted with City or AVTA officials to determine access points, pull-out locations for new stops, or "first and last" mile considerations for residents seeking to use public transportation.

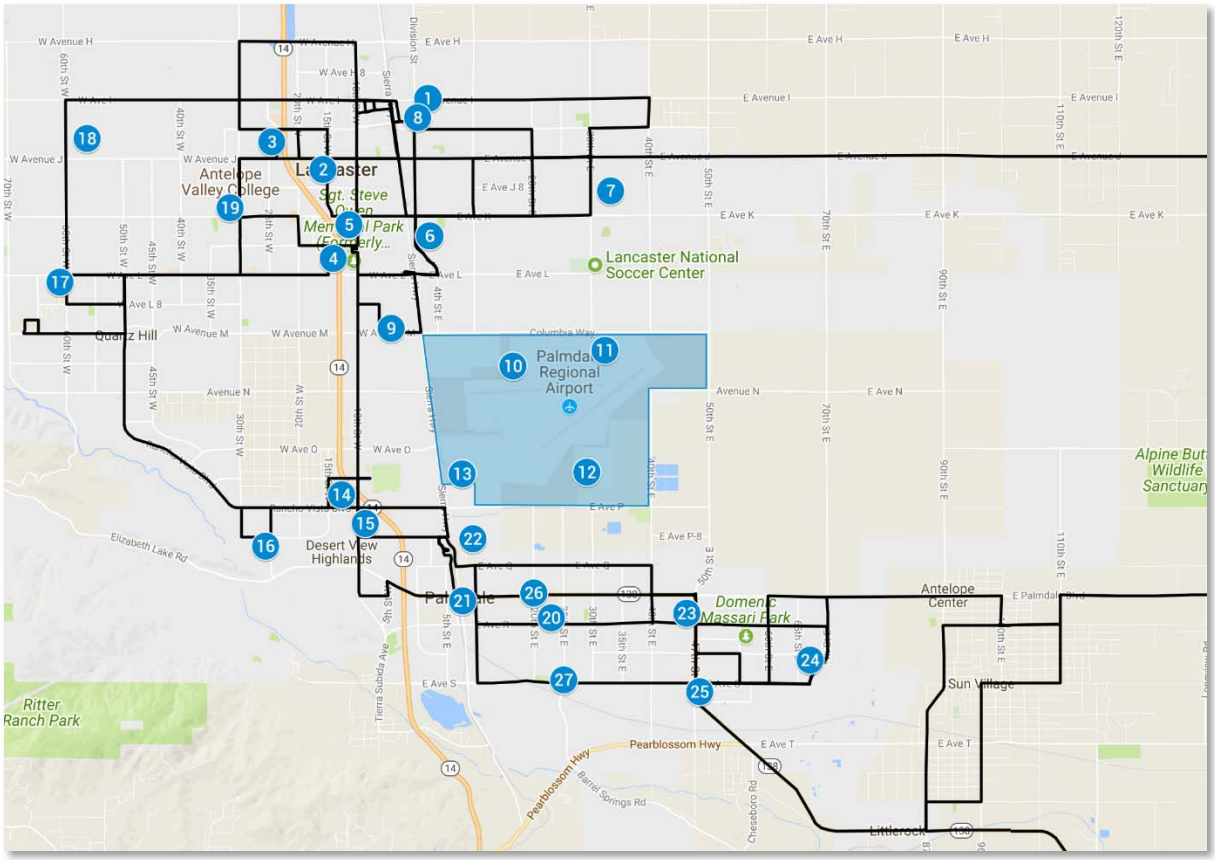


AVTA service route with approved development locations

2. AVTA's Service + Approved Developments:
    1. PA17-006, Kingman Dr. & 55th St E. Develop 165 SFR Lots on 40.6 acres
    2. PA17-008, 6150 East Ave T (79 units) Expand Joshua Mobile Home Park
    3. PA17-010, Tierra Subida & Avenue S, 40 Residential Lots and Commercial
    4. PA16-026, Rancho Vista Blvd. S/O Avenue O-8. 244 SFR's
    5. PA17-012, Avenue S & Siderno Dr. 2.3 Acres into 8 SF Lots
    6. PA17-022, High Vista Road & Zinnia Street. 42.69 Acres into 81 SF Lots
    7. PA17-030, 38547 10th St E. Apartment Complex
    8. PA16-017, 45th St E & Ave S. Develop 14.8 Acres into commercial possible healthcare offices
    9. PA16-021, East of Pevero Court. Re-subdivide 6.98 Acres into 20 SFR Lots
    10. Pearblossom & 47th St E. 121 units subdivision on 35.7 Acres
    11. Ave S & Parkwood Dr. 5,000 units subdivision on 1,000 acres.
    12. SE Corner of Avenue M & 70th St W. 97 units subdivision on 39.8 Acres
    13. Harris Homes. 106 units subdivision on 27 Acres
    14. Between K/K-8 and 60th/70th St W. 753 units subdivision on 237.25 Acres
    15. Ave K & 50th/53rd St W. 169 units subdivision on 40.4 Acres
    16. Ave J-8 & 37th St W. Subdivision of 18 single family lots
    17. Pacific Communities. 106 units subdivision on 52 Acres
    18. Medical office. Dr. Satey
    19. Copper Square Apartments. 204 units low income housing
    20. GJH Dev. Liberty Crossing. Lancaster Blvd & 20th St E. 98 units subdivision on 23 acres.
    21. Avenue K & 25th St E. 86 units subdivision on 22.5 Acres

AVTA will work in collaboration with the Cities of Lancaster and Palmdale to integrate active and public transit/transportation into land-use, housing, economic, and environmental policy development so as to promote use of active and public transit/transportation, reduce greenhouse gas emissions, improve health indicators, and provide greater access to transportation for disadvantaged neighborhoods and employment centers, as well as new developments. AVTA, with its jurisdictional members and stakeholders will review current conditions, identify best practices, and develop a set specific strategies and action items for jurisdictions to adopt and implement that provide for consistent policies between jurisdictions and across the AVTA service area.

Major Employment Centers and AVTA service



1. High Desert Regional Health Center
2. AV Hospital
3. Valley Central Way Mall
4. Kaiser Permanente Lancaster Offices
5. Lancaster Commerce Center
6. Los Angeles County Dept of Public Social Services
7. Eastside High School
8. AV High School
9. Michael Antonovich AV Court House
10. Boeing Palmdale*
11. Northrop Grunman*
12. NASA*
13. Lockheed Martin*
14. AV Mall
15. Palmdale Marketplace
16. Highland High School
17. Quartz Hill High School and SOAR Prep
18. AV State Prison and Mira Loma Detention Center
19. AV College
20. Palmdale High School
21. Palmdale City Hall
22. Palmdale School District

23. 47th Street Pavilion
24. Los Amigos School & Knight High School
25. The Place on 47th Street
26. Town Square Plaza
27. Avenue S & 25th Shopping

* These are all part of Air Force Plant 42

RESPONSIBLE PARTIES

The Antelope Valley Transit Authority will either conduct the study in-house or will engage the assistance of a qualified consultant (SOW lists both until a decision is made). AVTA has yet to identify a potential consultant; however, if outside assistance is desired, it will use its State-approved procurement procedures when selecting and hiring a firm. The grant amount requested represents funding required to complete the planning process. AVTA will work with Caltrans, Southern California Association of Governments, and the Los Angeles County Metropolitan Transportation Authority to coordinate efforts and reduce potential duplication of effort. AVTA and its Board of Directors are committed to providing the required local match in support of this effort.

OVERALL PROJECT OBJECTIVES

Objective 1: Plan to integrate coordinated, non-emergency medical transportation into healthcare providers' and AVTA's service delivery.

Objective 2: Plan to integrate active and public transit/transportation into regional and jurisdictional policy development for land-use, housing, economic development, environmental justice, and public health.

Objective 3: In a sustainable and feasible manner, plan to expand AVTA transit services to meet the needs of disadvantaged neighborhoods and employment centers, as well as new housing developments and commercial destinations.

Objective 4: Through public education, plan to enhance the JPA jurisdictions' understanding of the links between transportation and community sustainability, and how integrated transportation planning and governance can improve sustainability and quality of life for residents of the Antelope Valley.

SCOPE OF WORK

The Scope of Work (SOW) reflects preliminary planning for overall project work and outreach. Once the planning project is funded, it is expected that AVTA, its jurisdictional members and stakeholders will review the SOW and recommend changes and/or additional tasks as well as update responsible parties (once a determination regarding the contracting of a consultant is made).

Administrative tasks are outlined in Task 10 and represent the portion of the budget dedicated to the overall administration and fiscal management of the grant (budgeted at 4.91%). Project Initiation and Management (Task 1) are direct project expenses and, therefore, under a separate task heading.

There are three major elements within this planning effort to integrate transportation into regional planning and policy development: health-care (non-emergency medical transportation); local government (land-use, economic, and environment policy development and decision making); and AVTA service delivery (service expansion addressing disadvantaged areas). The scope of work consolidates efforts for some tasks i.e., review of literature, studies and plans and separates other tasks into three subtasks (one for each objective),

such as needs assessments where objectives will require a more specialized review and analysis and/or distinct plans, strategies and action items for implementation.

1. Project Initiation and Management

Task 1.1 Kick-off Meeting with Caltrans and project Transportation and Community Advisory Committee (TCAC)

- AVTA will facilitate a kick-off meeting with Caltrans staff and TCAC members to discuss grant procedures and project expectations, refine scope of work elements and timetables, and ascertain other project management activities relevant to the project including public outreach plans.
- *Responsible Party: AVTA*

Task 1.2 Procurement – Consultant

- Following its standard procurement policies, AVTA will, if determined advantageous, select and contract with consultant to assist AVTA in the development of the Plan.
- *Responsible Party: AVTA*

Task 1.3 Project Management

- AVTA will meet with its Transportation and Community Advisory Committees, Caltrans staff, a potential consultant, and other project stakeholders on a monthly basis to assure responsive, timely, and on-budget performance.
- *Responsible Party: AVTA/Consultant*

Task	Deliverable – Management Report #1
1.1	Meeting notes with revised scope of work and timetable
1.2	Procurement documents and contract
1.3	Monthly progress report with meeting notes

2. Review of industry literature and understanding of previously completed and ongoing transit and AVTA sustainable communities studies, as well as plans specific to integrating transportation into healthcare and community decision making

Task 2.1

- AVTA (and its potential consultant) will review and gain an understanding of industry literature and relevant plans and studies for the three AVTA jurisdictions (Palmdale, Lancaster, County of Los Angeles), Southern California Association of Governments, Los Angeles County Metropolitan Transportation Authority, and Caltrans as they relate to the Antelope Valley. The project team will determine which integrated transportation goals and objectives are already in place, which strategies have been developed to address them, and what progress has been made in implementing strategies. Regional, state, and federal resources will include but not be limited to:
  - Palmdale General Plan
  - Lancaster General Plan
  - Los Angeles County General Plan
  - SCAG RTP/SCS 2016
  - LACMTA RTP/SCS
  - Los Angeles County Department of Public Health Key Indicators of Health

- Caltrans 2017 RTP Guidelines
- Caltrans Active Transportation Program Tools
- Caltrans Integrated Transport & Health Impacts Model (ITHIM)
- Caltrans Complete Streets and Smart Mobility Framework
- Caltrans California Transportation Plan 2040 and CTRs for SR14 and SR 138
- Caltrans Climate Ready Transportation
- Caltrans Addressing Environmental Justice in Disadvantaged Communities
- Caltrans 2017 Climate Change Scoping Plan
- Caltrans Planning for Housing
- Transit Cooperative Research Program

- AVTA (and its potential consultant) will review and gain an understanding of industry literature regarding integrating transit/transportation into healthcare planning and services.
- AVTA (and its potential consultant) will review and gain an understanding of industry literature regarding integrating transit/transportation into jurisdictional policy for land-use, economic, environmental, and public health.
- AVTA (and its potential consultant) will review and gain an understanding of industry literature regarding transit/transportation development into disadvantaged neighborhoods, employment centers, and expanded service areas.
- The literature review will inform AVTA, its stakeholders and Community and Transportation Advisory Councils on best practices, trends, techniques, and technologies which may be incorporated into planning and implementation.
- *Responsible Party – AVTA/Consultant*

Task	Deliverable – Technical Report #1 Existing Conditions
2.1	Summary of findings

3. Review and analyze existing conditions and establish baseline data for performance measures

Task 3.1

- AVTA/Consultant will, in collaboration with healthcare stakeholders, members of the Community Advisory Committee and the public, review and analyze existing conditions among healthcare providers and determine the current status of, need for, demand for, and feasibility of, non-emergency medical transportation.
- *Responsible Party – AVTA/Consultant*

Task 3.2

- AVTA/Consultant will review and analyze existing policy conditions among AVTA JPA members as they relate to transportation goals by reviewing policies, identifying gaps in policy, or determining a need for policy regarding:
    - Land-use;
    - Commercial and **housing development**;
    - Economic development;
    - **Active transportation** (e.g., walking and bike paths) infrastructure;
    - **Safety** – accidents, incidents, injuries, and fatalities involving pedestrians, public conveyances, and personal vehicles;
    - **Health equity**; and
    - **Environmental justice**
- *Responsible Party – AVTA/Consultant*

Task 3.3

- AVTA/Consultant will review the existing condition of AVTA services including, but not limited to:
    - Transportation **system management, operations, and performance;**
    - Gaps in transit/mobility service and programs that promote or support **health and environmental equity** (e.g., stop distances, access to active transportation modes, reliability of commuter access, etc.) and include ecological consideration;
    - Use of coordinated partnerships and **technologies that promote improved mobility options** and management (e.g., websites, Mobility As A Service apps, Memorandums Of Understanding with public and private entities, intercity connections, etc.);
    - **GHG emissions** data for the service area and reduction efforts;
    - **Safety** – accidents, incidents, injuries, and fatalities;
    - Ridership trends and forecasts; and
    - Need and demand analyses.
- *Responsible Party – AVTA/Consultant*

Task 3.4

- For the purposes of establishing baseline data for future performance measures, AVTA/consultant will develop current measurable data for transportation and sustainability indicators including, but not limited to:
    - Safety issues;
    - Points of access to active and public transportation at large and in disadvantaged areas;
    - Land-use policies;
    - Service and management efficiencies;
    - Service gaps;
    - Financial and cost-per performance indicators;
    - GHG emissions; and
    - Health benefit (using Integrated Transport & Health Impact Model – ITHIM).
- *Responsible Party – AVTA/Consultant*

Task	Deliverable – Technical Report #1 – Existing Conditions
3.1	Report on existing conditions for non-emergency medical transportation
3.2	Report on existing conditions for transit/transportation integrated policy among JPA members/jurisdictions: Lancaster, Palmdale, north LA County within AVTA's primary service area
3.3	Report on existing conditions of AVTA service delivery
3.4	Report on baseline data indicators for use in performance measures

4. Conduct comprehensive, multilingual public and stakeholder engagement

Task 4.1 Community Engagement Development

Task 4.1.1

- AVTA/Consultant will establish a **Community Advisory Committee** made up of healthcare stakeholders (e.g. local hospitals and clinics, First 5 California, Mental Health America, etc.), community members (including those from disadvantaged neighborhoods), and representatives from health-related population groups (health and social service providers, illness and disease related support groups, etc.) to provide input to and feedback on plan development with regards to non-emergency medical transportation. The Committee will meet with AVTA representatives on a regular basis to monitor progress and provide feedback as Plan elements are developed. The Committee may also meet with the AVTA Transportation Advisory Council (TAC) when common agendas allow for more efficient and effective use of time.

- *Responsible Party – AVTA/Consultant*

Task 4.1.2

- AVTA/Consultant will establish a **working group** of jurisdictional department heads and staff members (from departments where integration of transportation into policy and decision making is targeted) from the City of Palmdale, the City of Lancaster, and the County of Los Angeles, interested stakeholders, and members of the public. This working group will assist AVTA/Consultant in understanding the barriers and opportunities for the integration of active and public transit/transportation into jurisdictional policy and decision making. The working group will meet regularly to provide information, recommendations, and feedback as the Plan is developed.

- *Responsible Party – AVTA/Consultant*

Task 4.1.3

- AVTA/Consultant will prepare a public outreach plan to determine **trends, gaps in, barriers to, and satisfaction with** active and public transit/transportation that includes relationships to **healthcare, land-use, housing, economic, and environmental conditions**. Public engagement will include stakeholders, community members, community groups (including special needs populations), representatives from disadvantaged neighborhoods, and will use various methods to maximize public engagement participation. Public meetings will be held over the course of the Plan development and will introduce the public to, and solicit input on, the Plan objectives. Meetings also will be used to collect data, report findings, and solicit input on recommendations.

- *Responsible Party – AVTA/Consultant*

Task 4.2 Community Engagement Implementation

Task 4.2.1 AVTA/Consultant will:

- Using technology and face-to-face meetings, engage the public to ascertain transportation **needs and expectations** that will inform the planning process. Technology may include clicker response, modeling tools, maps, and “post-it” idea making;

- Develop on-line presence to house documents and reports and to solicit information and feedback from stakeholders and the public;
- Conduct outreach to users and potential user of AVTA's services;
- Conduct outreach regional stakeholders;
- Conduct outreach to community advocates for special needs groups, healthcare, education, and others;
- Conduct outreach and community workshops/meetings to gain input from the community at-large and **specifically from areas that are low-income or face hardships not found in other areas of the community; and**
- Conduct sector roundtables and/or interviews (e.g., business owners, non-profits, education, etc.)

- *Responsible Party – AVTA/Consultant*

Task 4.2.2 AVTA/Consultant will:

- Develop hard-copy and online survey tools for members of the public, stakeholders, potential and existing riders, community advocates and others as determined;
- Conduct surveys;
- Compile survey data; and
- Formulate survey report and post survey responses online

- *Responsible Party – AVTA/Consultant*

Task	Deliverable – Technical Report #2 Public Engagement
4.1.1	Community Advisory Group meeting agendas, minutes, and attendance records
4.1.2	Working Group meeting agendas, minutes, and attendance records
4.1.3	Public engagement meeting agendas, minutes, and attendance records
4.2.1	Community outreach findings
4.2.2	Community survey findings

5. Develop a needs assessment, based on present data and forecasts, including:

Task 5.1

- AVTA/Consultant will conduct an assessment of needs and demand for non-emergency medical transportation for persons not eligible for ACCESS transportation.

- *Responsible Party – AVTA/Consultant*

Task 5.2

- AVTA/Consultant will conduct an assessment of need for jurisdictional policy that integrates active and public transit/transportation into the decision-making process for land-use, public health, economic, and environmental considerations.

- *Responsible Party – AVTA/Consultant*

Task 5.3

- AVTA/Consultant will conduct a public transit needs assessment by identifying and describing:

- Gaps in **first-last mile, multimodal access** to active and public transportation resources (e.g., walk and bike paths, park-and-ride facilities, intercity connections, service area gaps, etc.);
- Gaps in **collaborative and/or coordinated partnerships/relationships** (i.e., healthcare, employers, human services providers and other transportation providers, etc.);
- Gaps in addressing **environmental justice and ecological conditions** as they pertain to transportation provision and planning;
- Gaps in **service provision** addressing mobility needs of multiple consumers (i.e., seniors, veterans, employees, students, etc.);
- Gaps in **intercity/regional connectivity;** and
- Gaps in **jurisdictional policy and ordinances** that support improved access to transportation (commercial and residential development ordinances and codes, land-use policies, environmental policies, etc.).

- *Responsible Party – AVTA/Consultant*

Task	Deliverable – Technical Report #3 Needs Assessment and Strategies
5.1	Needs assessment report for non-emergency medical transportation
5.2	Needs assessment report for integration of transportation in jurisdictional policy
5.3	Needs assessment report for active and public transit/transportation service delivery

6. Recommend strategies and performance measures

Task 6.1

- AVTA/consultant will formulate strategies and develop performance measures, with a focus on **disadvantaged areas**, to:
  - Provide non-emergency medical transportation in partnership with healthcare providers that results in improved health indicators (e.g., reduced admissions recidivism, reduction in missed appointments for post-discharge follow-up and treatment, etc.);
  - Assure support for integration of public transportation in jurisdictional policies and ordinances, including those that integrate transportation with **land-use** policy, **economic development**, and **commercial and housing development, and environmental justice;**
  - Improve **access to and use of public transportation;**
  - Support the Authority's GHG **emissions reduction** goals (e.g., complete transition to electric fleet, improve access and ridership numbers which reduce use of personal vehicles, etc.) and address potential challenges of **climate change**; and
  - **Coordinate and implement Southern California Association of Governments Regional Transportation Plan: Sustainable Communities Strategies** and state priorities. (e.g., increased active transportation, reduced exposure to pollutants, and improved access to transportation.)
- *Responsible Party – AVTA/Consultant*

Task	Deliverable – Technical Report #3 Needs Assessment and Strategies
6.1	Strategies and performance measures report

7. Develop draft and final Strategic Plan for Integrated Transportation

Task 7.1

- AVTA/Consultant will draft a Strategic Plan for Integrated Transportation that incorporates research, analysis, findings, and recommendations from prior tasks. The draft Plan will be provided to the TAC and project stakeholders for review and comment. Comments and change requests will be integrated into a final draft plan for AVTA executive staff approval. The project team will present the final Plan to the AVTA Board of Directors.
- *Responsible Party – AVTA/Consultant*

Task	Deliverable – Final Report
7.1	Draft and Final Report

8. Conduct symposium or series of educational opportunities

Task 8.1

- AVTA/Consultant will conduct educational opportunities for JPA jurisdictions on the relationship between transportation and community sustainability and the strategies which can be employed to achieve goals in transportation as they relate to public health, housing, economic security, environmental justice and ecological conditions. AVTA/Consultant will:
    - Develop public presentation plan;
    - Make presentation(s); and
    - Conduct post-presentation survey(s) to assess impact
- *Responsible Party – AVTA/Consultant*

Task	Deliverable – Educational Opportunity
8.1.	Presentation Plan and Presentation

9. Conduct "Next Steps" meeting(s) with AVTA and Jurisdictions

Task 9.1

- AVTA/Consultant will facilitate a "Next Steps" meeting(s) with Community Advisory Committee, Jurisdictional Working Group, AVTA's Transit Advisory Commission and AVTA board members to determine next steps in implementing the Plan. AVTA/consultant will:
    - Identify future funding opportunities for implementing identified and selected strategies
    - Document proposed next steps for each jurisdiction, stakeholder, committee, commission, and board;
    - Produce report on "Next Steps" commitments needed from each of the stakeholders; and

- Facilitate joint meetings.

- *Responsible Party – AVTA/Consultant*

Task	Deliverable – Next Steps
9.1	"Next Steps" Report

10. Administrative and Fiscal Management

Task 10.1 Monthly invoicing and match requirement

- AVTA will provide monthly invoicing to Caltrans, paying all subcontractors prior to submitting a request for reimbursement.

- *Responsible Party: AVTA*

Task 10.2 Local match provision

- AVTA will provide, at minimum, 11.47 percent in local match which shall be provided as a proportionate share of each invoice. Local match will be a combination of eligible AVTA local cash and third-party in-kind sources.

- *Responsible Party: AVTA*

Task 10.3 Reporting

Task 10.3.1

- AVTA will submit to Caltrans quarterly progress reports using the timeline and forms required by Caltrans.

- *Responsible Party - AVTA*

Task 10.3.2

- AVTA will prepare and provide Caltrans and its Los Angeles district office an electronic copy of all final reports. The Final Report will consist of an AVTA-approved "Strategic Plan to Integrate Transportation in the Antelope Valley" which incorporates findings, recommended strategies, and supporting materials.

- *Responsible Party – AVTA*

Task	Deliverable – Administrative and Fiscal Management Reports
10.1	Monthly invoices with accounting of project costs
10.2	Monthly accounting of local cash match and third-party in-kind match
10.3.1	Quarterly progress reports
10.3.2	Final report

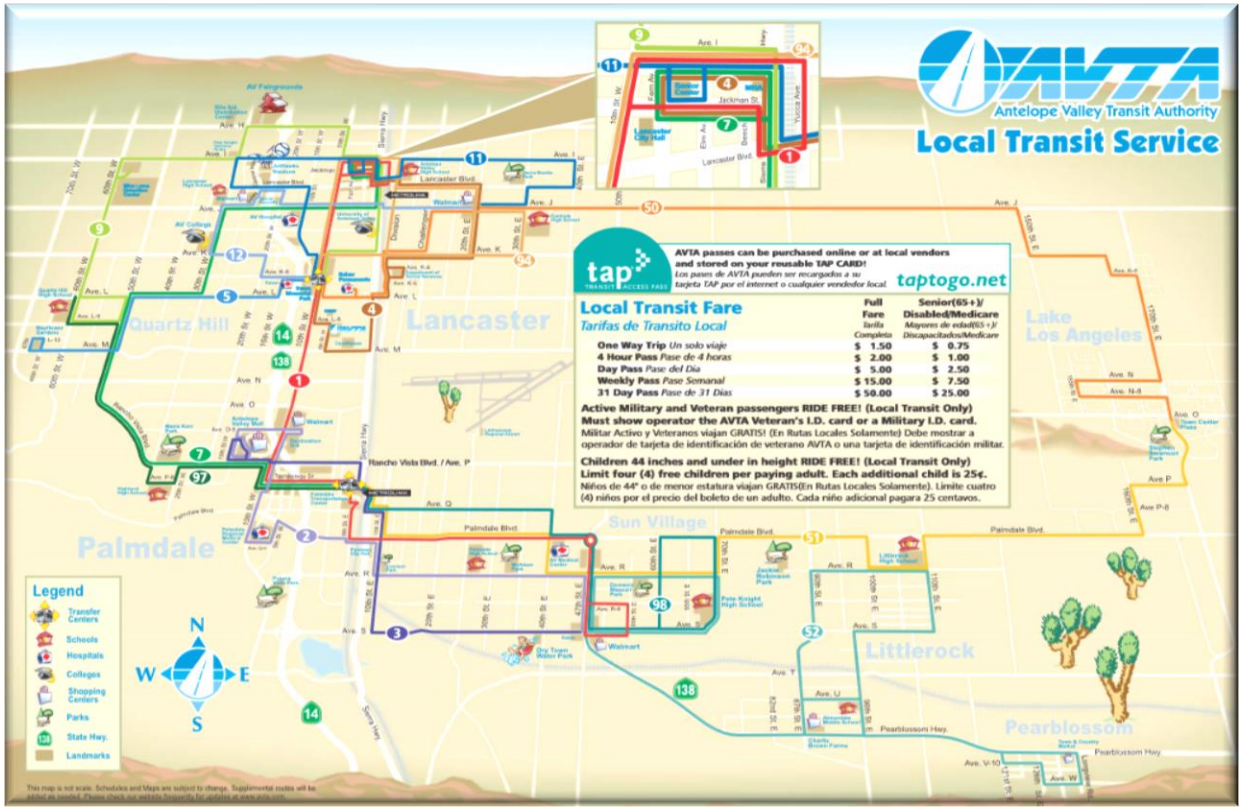
California Department of Transportation
Transportation Planning Grants
Fiscal Year 2018-19

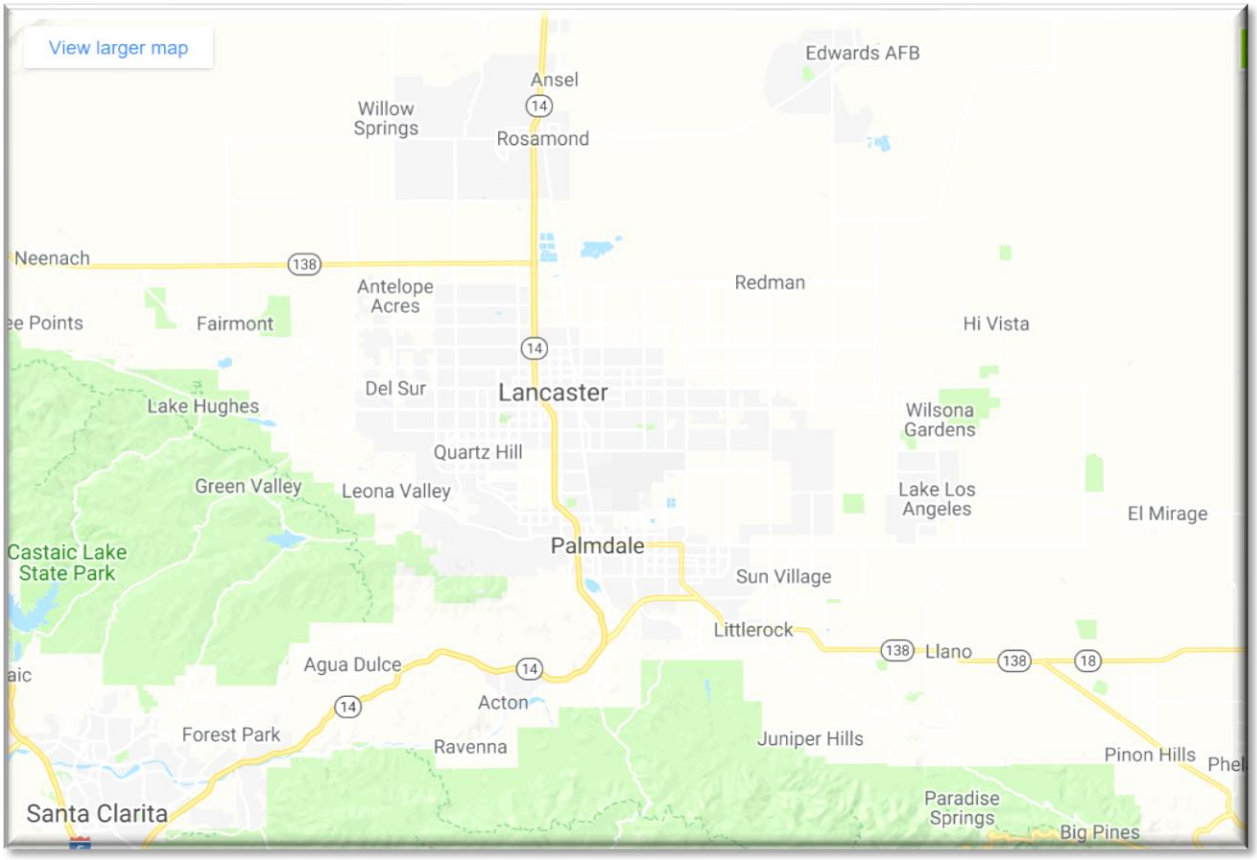
ANTELOPE VALLEY TRANSIT AUTHORITY PROJECT TIMELINE

	Project Title	Strategic Plan for Integrated Transportation in the Antelope Valley					Grantee	Antelope Valley Transit Authority
		Fund Source					Fiscal Year 2018/19	FY 2019/20	FY 2020/21	
Task Number		Responsible Party	Total Cost	Grant Amount	Local Cash Match	Local In-Kind Match	J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J	Deliverable
1	***PROJECT INITIATION & UPDATES***							
1.1	Hold kick-off meeting with Caltrans	AVTA	$1,090	$965	$125			Meeting notes and revised SOW
1.2	Procure Consultant	AVTA	$3,000		$2,541	$459		Procurement documents
1.3	Hold monthly meetings with Caltrans, TAC, and AVTA staff	AVTA/Consultant	$7,960	$7,047	$798	$115		Monthly meeting minutes
2	***REVIEW OF LITERATURE, STUDIES & PLANS***							
2.1	Review of Literature, Studies and Plans	AVTA/Consultant	$29,000	$23,903	$5,097			Summary of findings
3	***EXISTING CONDITIONS & BASE-LINE DATA***							
3.1	Review and analyze existing conditions among healthcare providers of non-emergency medical transportation	AVTA/Consultant	$12,000	$10,624		$1,376		Existing Conditions Healthcare report
3.2	Review and analyze existing JPA member land-use, housing and other policy conditions	AVTA/Consultant	$12,000	$10,624		$1,376		Existing Conditions jurisdictional policy members report
3.3	Review and analyze existing AVTA public transit systems conditions	AVTA/Consultant	$12,000	$10,624		$1,376		Existing Conditions AVTA transit report
3.4	Develop baseline data for future performance measures	AVTA/Consultant	$12,000	$10,624		$1,376		Base-line data report
4	***COMMUNITY ENGAGEMENT***							
4.1.1	Establish and meet with Community Advisory Commission	AVTA/Consultant	$4,000	$3,541		$459		Meeting agendas, minutes, attendance
4.1.2	Establish and meet with Jurisdictional Work Group	AVTA/Consultant	$7,000	$6,197		$803		Meeting agendas, minutes, attendance
4.1.3	Develop community engagement plan	AVTA/Consultant	$5,000	$4,427		$574		Meeting agendas, minutes, attendance
4.2.1	Conduct community engagement	AVTA/Consultant	$26,000	$23,018		$2,982		Community engagement findings report
4.2.2	Conduct community surveys	AVTA/Consultant	$12,000	$10,624		$1,376		Community survey findings report
5	***NEEDS ASSESSMENT***							
5.1	Develop needs assessment for non-emergency medical transportation	AVTA/Consultant	$11,000	$9,738		$1,262		Needs assessment report
5.2	Develop needs assessment for jurisdictional policy that integrates transportation into decision making	AVTA/Consultant	$11,000	$9,738		$1,262		Needs assessment report
5.3	Develop Needs Assessment for AVTA services and JPA Member entities	AVTA/Consultant	$11,000	$9,738		$1,262		Needs assessment report
6	***STRATEGIES & PERFORMANCE MEASURES***							
6.1	Develop Strategies and performance Measures	AVTA/Consultant	$38,000	$33,641		$4,359		Strategies and performance report
7	***STRATEGIC PLAN***							
7.1	Produce Strategic Plan for Integrated Transportation	AVTA/Consultant	$47,000	$41,609		$5,391		Draft and final reports
8	***SYMPOSIUM***							
8.1	Hold Symposium / Educational Opportunities for JPA members	AVTA/Consultant	$12,000	$10,624		$1,376		Presentation plan and presentation materials
9	***NEXT STEPS MEETING***							
9.1	Hold next steps meeting with AVTA, TAC, JPA members, & Caltrans	AVTA/Consultant	$3,000	$2,656		$344		Next Steps Report
10	***ADMINISTRATIVE & FISCAL MANAGEMENT***							
10.1	Provide monthly invoices to Caltrans	AVTA	$1,200		$1,062	$138		Monthly invoices
10.2	Assign proportionate share of local match with each invoice	AVTA	$1,090		$965	$125		Monthly accounting report
10.3.1	Provide quarterly reports to Caltrans	AVTA/Consultant	$4,710		$4,055	$655		Quarterly progress reports
10.3.2	Provide final report to Caltrans and TAC	AVTA/Consultant	$2,000		$1,771	$229		Final report
	TOTALS		$285,050	$239,961	$16,414	$28,675		

Reimbursement of indirect costs is allowable upon approval of an Indirect Cost Allocation Plan for each year of project activities.
Provide rate if indirect costs are included in the project budget. Approved Indirect Cost Rate: _____%

Note: Each task must contain a grant amount and a local cash match amount. Local cash match must be proportionally distributed by the same percentage throughout each task. Local in-kind match needs to be indicated where in-kind services will be used. Please review the grant program section that you are applying to for details on local match requirements. The project timeline must be consistant with the scope of work.


AVTA
Antelope Valley Transit Authority
Local Transit Service
tap
taptogo.net
Local Transit Fare
Tarifas de Transito Local
Full Fare
Senior(65+)/ Disabled/Medicare
One Way Trip Un solo viaje $ 1.50 $ 0.75
4 Hour Pass Pase de 4 horas $ 2.00 $ 1.00
Day Pass Pase del Dia $ 5.00 $ 2.50
Weekly Pass Pase Semanal $ 15.00 $ 7.50
31 Day Pass Pase de 31 Dias $ 50.00 $ 25.00
Active Military and Veteran passengers RIDE FREE! (Local Transit Only)
Must show operator the AVTA Veteran's I.D. card or a Military I.D. card.
Children 44 inches and under in height RIDE FREE! (Local Transit Only)
Limit four (4) free children per paying adult. Each additional child is 25¢.
Legend
Lancaster
Palmdale
Quartz Hill
Sun Village
Littlerock
Pearblossom
Lake Los Angeles


View larger map
Edwards AFB
Ansel
Willow Springs
Rosamond
Neenach
Antelope Acres
Redman
Fairmont
Hi Vista
Del Sur
Lancaster
Lake Hughes
Wilsona Gardens
Quartz Hill
Green Valley
Leona Valley
Lake Los Angeles
El Mirage
Castaic Lake State Park
Palmdale
Sun Village
Littlerock
Llano
Agua Dulce
Acton
Forest Park
Ravenna
Juniper Hills
Pinon Hills
Santa Clarita
Paradise Springs
Big Pines

SCAG
INNOVATING FOR A BETTER TOMORROW

SOUTHERN CALIFORNIA
ASSOCIATION OF GOVERNMENTS
900 Wilshire Blvd., Ste. 1700
Los Angeles, CA 90017
T: (213) 236-1800
www.scag.ca.gov

February 1, 2018

Mr. Malcolm Dougherty
Director
California Department of Transportation
1120 N Street, MS 49
Sacramento, CA 95814

RE: Caltrans – FY 2019 Sustainable Communities Grants
Antelope Valley Transit Authority
Sustainable Communities Strategies Plan

Dear Mr. Dougherty:

On behalf of the Southern California Association of Governments (SCAG), I would like to offer this letter of support for the Antelope Valley Transit Authority's (AVTA) application the California Department of Transportation's (Caltrans) FY 2019 Sustainable Communities Grants for funding for the development and preparation of a Sustainable Communities Strategies Plan.

Despite significant population growth and associated air quality concerns, the North County portion of the County of Los Angeles is the only subregion within SCAG's coverage area that has yet to develop a coordinated plan integrating transportation with land use, housing, health, economic development, and air quality. The Antelope Valley has a history of challenges regarding public health and economic development that are attributable to air quality. Furthermore, the jobs and housing imbalance that currently exists in the Antelope Valley has resulted in some of the longest commutes in Southern California. There is a clear need for a sustainable strategy that links transportation with other key life and development factors.

AVTA is doing what it can to alleviate these air quality concerns. As a leader in the SCAG region, AVTA has committed to transitioning to a 100% battery-electric fleet. This transition, which is forecasted to be completed this year, will significantly reduce greenhouse gases (GHG), reliance on fossil fuels, vehicle miles traveled, roadway use, and congestion.

This grant will support AVTA's efforts to partner with its three jurisdictional members—the Cities of Lancaster and Palmdale and the County of Los Angeles—to develop a valley-wide transportation and land use blueprint. Among the envisioned strategies is an innovative public transportation solution to enhance

non-emergency access to Antelope Valley healthcare facilities and hospitals as well as an alternative fuel vanpool program linking population centers with key employment centers.

As a project that is consistent with the policies and goals set forth in the adopted 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), especially as they pertain to congestion management, transportation options, environmental quality, and air quality, we support this project and respectfully request that Caltrans give full and fair consideration to this important proposal.

SCAG looks forward to working with AVTA. I would like to thank you in advance for your consideration of their application.

Sincerely,

Hasan Ikhrata
Executive Director

PALMDALE

a place to call home

February 5, 2018

38300 Sierra Highway

Palmdale, CA 93550-4798

Tel: 661/267-5100

Fax: 661/267-5122

TDD: 661/267-5167

Mr. Len Engel, Executive Director/CEO
Antelope Valley Transit Authority
42210 6th Street West
Lancaster, CA 93534

RE: Antelope Valley Transit Authority (AVTA) Sustainable Community Strategies for Transportation Proposal

Dear Mr. Engel:

As a Joint Power Agreement member of the Antelope Valley Transit Authority (AVTA), the City of Palmdale is pleased to support the AVTA application for SB 1 Sustainable Community Strategies funds.

The City of Palmdale, along with its AVTA partner jurisdictions, believes that sustainable community strategies must include the integration of transportation into a broad sector of community development areas including land-use, public health, environmental justice, economic development, and housing.

With continued, fast-paced growth in the housing and commercial sectors, the City of Palmdale recognizes that development policies must be updated to address critical environmental and public health needs that are central to the community's sustainability. Developing a plan for Sustainable Community Strategies that link transportation to development will further these and other goals to integrate active transportation, improve environmental and public health conditions, and increase mobility options for disadvantaged persons and neighborhoods facing hardship.

Additionally, the City of Palmdale supports the efforts of AVTA to provide needed transportation services to health care facilities as they work to address issues of patient recidivism and the County's highest health-related mortality rate. The AVTA service area is populated by a significantly high-risk population where disadvantaged neighborhoods show much higher incidents of chronic and often preventable disease, illness, and health related mortality. Lack of transportation for follow up medical appointments, treatments, and medications often is cited as one of the top reasons patients are readmitted to hospitals. By working with health care providers in the Antelope Valley, AVTA and its members will seek sustainable transportation solutions to improve health indicators across the valley.

The City strongly recommends Caltrans award the requested SB 1 SCS funds to AVTA as the award will produce needed planning to further our commitments toward reducing greenhouse gasses, improving public health, and increasing access to housing and transportation across the region.

Sincerely,

James Purtee
City Manager

cc: Palmdale Mayor and City Council

lancaster ca
it's positively clear

January 31, 2018

Len Engel, Executive Director/CEO
Antelope Valley Transit Authority
42210 6th Street West
Lancaster, CA 93534

RE: Antelope Valley Transit Authority (AVTA) Sustainable Community Strategies for Transportation Proposal

Dear Mr. Engel:

The City of Lancaster is pleased to support the Antelope Valley Transit Authority's application for SB-1 Sustainable Communities Strategies funding.

Over the past decade, the City of Lancaster has regularly updated its General Plan and Zoning Code – along with other planning documents that include the Lancaster Design Guidelines, the Master Plan of Trails and Bikeways, the Downtown Specific Plan, and vision plans for selected areas. These updates have been performed with the goal of making Lancaster a more sustainable, livable, enjoyable, walkable, bikeable, and valuable community. As such, the 2030 General Plan defines a set of Transit Village Planning Areas surrounding the Downtown core, and directs that new zoning standards be prepared for these areas to implement more walkable, mixed-use, development patterns.

The City is interested in broadening its vision to include integrated transportation in its land-use, public health, air quality, economic development, environmental justice, and housing goals beyond its downtown core. In collaboration with AVTA and its other Joint Powers members, we are committed to a planning process that includes significant and meaningful public engagement and achieves the highest level of mobility possible with particular emphasis on the disadvantaged areas of the service area.

Please accept this letter as a formal recognition of the City of Lancaster's strong support of AVTA's application for SB-1 Sustainable Communities Strategies funding. We look forward to continued partnering and collaboration in achieving our mutual goal of establishing a greener community. Should you have any questions, please contact me at (661) 723-6133.

Sincerely,

Mark V. Bozigian
City Manager

MVB:aw

cc: Lancaster City Council

COUNTY OF LOS ANGELES
Public Health

LOS ANGELES COUNTY HEALTH AGENCY

BARBARA FERRER, Ph.D., M.P.H., M.Ed.
Director

JEFFREY D. GUNZENHAUSER, M.D., M.P.H.
Interim Health Officer

CYNTHIA A. HARDING, M.P.H.
Chief Deputy Director

DEBORAH DAVENPORT, R.N., P.H.N., M.S.
Director, Community Health Services

FRANK ALVAREZ, M.D., M.P.H.
SPA 1 & 2 Area Health Officer, Community Health Services
26415 Carl Boyer Drive, #160
Santa Clarita, CA 91350
TEL (661) 287-7054 • FAX (661) 255-5531

www.publichealth.lacounty.gov

February 5, 2018

To: Len Engel, Executive Director/CEO
Antelope Valley Transit Authority
42210 6th Street West, Lancaster, CA 93534

RE: Antelope Valley Transit Authority (AVTA) Sustainable Community Strategies for Transportation Proposal

Dear Mr. Engel:

It is with pleasure that the Area Health Office for Service Planning Area 1 & 2 of the Los Angeles County Department of Public Health - Community Health Services writes in support the Antelope Valley Transit Authority (AVTA's) application for SB-1 funds to develop strategies toward a more sustainable and active community.

Our departmental mission is to protect health, prevent disease, and promote health and well-being for all residents in Los Angeles County. We believe that this mission could not be accomplished without community involvement, services, and partnerships. We support AVTA's approach to integrate transportation into all aspects of the community, particularly health and wellness initiatives, which aligns with the goals and efforts of our organization.

Transportation is a *major* factor that contributes to poor community health outcomes. The Antelope Valley (AV) has a great need among disadvantaged community members who are low-income, suffer from preventable chronic conditions, and do not have ready access to safe means of active and public transportation options. Lack of accessible and reliable transportation imposes a challenge to access healthcare services, which is crucial in addressing the health needs of our AV community. Due to the wide geographic span of the region, many residents live in isolated neighborhoods and are required to travel up to 20 miles to access grocery stores, medical facilities, and other pertinent establishments. Improved mobility options for this area is paramount to its sustainability as a large, regional community.

Therefore, we highly recommend CalTrans fully fund AVTA's request for SB-1 funds.

We look forward to participating in public and stakeholder meetings on this topic and helping to identify transportation strategies that will have a positive impact on the health and wellbeing of the area. Should you have any further questions, please don't hesitate to contact me at (661) 287-7054.

Sincerely,

Frank Alvarez, MD, MPH
Area Health Officer
Service Planning Areas (SPAs) 1 & 2
Antelope/Santa Clarita/San Fernando Valleys

CC: Barbara Ferrer

ANTELOPE VALLEY BOARD OF TRADE

Letter from Board of Trade in support of AVTA SB-1 application

Len Engel, Executive Director/CEO
Antelope Valley Transit Authority
42210 6th Street West
Lancaster, CA 93534

RE: Antelope Valley Transit Authority (AVTA) Sustainable Community Strategies for Transportation Proposal

Dear Mr. Engel:

With a membership of over 200 area business leaders, the Antelope Valley Board of Trade works collectively to support businesses in the region. As a principal proponent in the development of Metrolink, the Board of Trade understands the value of public transit in supporting employees and businesses both here and in neighboring communities. Among its many impact priorities, the Board of Trade also is engaged in promoting clean air and water quality. As such, the AV Board of Trade shares AVTA's interest and concerns for transportation and air quality in the region.

The Authority's conversion to an all-electric transit fleet, and the integration of transportation in land-use planning, policy development, and health care will have positive and cascading impacts on the overall economic, environmental, and personal health of our communities; making them more sustainable.

Caltrans' SB-1 Sustainable Community Strategies funding is essential to the success of this significant planning effort. Without funding, health indicators will continue to decline and development will continue without focus on inclusionary transportation resources, making it much costlier for the taxpayer to develop in the future. With full funding, the region can move forward in developing solid strategies that support sustainability in this fast-paced growth environment.

As AVTA embarks on this important planning endeavor, it has the full support of the AV Board of Trade. Our members will be encouraged to participate in the community engagement activities to assure that the interests of businesses and business leaders are represented and that short and long-term goals for both organizations are achieved.

Sincerely,

Anna Lee Buehn
Executive Director
Antelope Valley Board of Trade

Ed Knudson
President
Antelope Valley Board of Trade

Antelope Valley Community Clinic

January 30, 2018

Len Engel, Executive Director/CEO
Antelope Valley Transit Authority
42210 6th Street West
Lancaster, CA 93534

RE: Antelope Valley Transit Authority (AVTA) Sustainable Community Strategies for Transportation Proposal

Dear Mr. Engel:

Antelope Valley Community Clinic is pleased to support the Antelope Valley Transit Authority (AVTA's) application for SB-1 Community Sustainability Strategies funds to develop strategies toward a more sustainable and active community.

Our mission is to enhance the well-being of the community by providing comprehensive, high-quality health care services including prevention and health education with special emphasis on the medically underserved and low-income populations.

In 2017, the Clinic's Palmdale and Lancaster locations provided nearly 95,000 patient visits to more than 26,000 patients. 85% of our patients live below the federal poverty level and 51% are Hispanic. On average, this data indicates a single patient with very little means will need to visit the clinic on 4 occasions during the year – most likely without adequate transportation.

Our clients, because they are often low-income, live in disadvantaged neighborhoods and have no reliable transportation, experience high rates of missed treatments and therapies as well as necessary office visits and medications critical to their health and well-being.

Along with other health care providers in the Valley, AV Community Clinic recognizes that the most effective and efficient way to address health related transportation problems is to do so collaboratively and in coordination with AVTA.

AV Community Clinic appreciates AVTA's efforts to developing strategies and plans that integrate transportation into all aspects of the community and, in particular, to do so with health care providers. We are committed to working with your organization to assure efforts are community driven, patient oriented and informed by professionals who are working each day to sustain health services in the Valley.

We therefore, support your application and highly recommend Caltrans fully fund AVTA's request for SB-1 Sustainable Community Strategies funds. If you should have any additional questions please contact me at 661.942.2391 ext. 463 or via email at jcook@avclinic.org

Sincerely,

James A. Cook
Founder and CEO

ANTELOPE VALLEY
HOSPITAL
A facility of Antelope Valley Healthcare District

February 9, 2018

Mr. Len Engel
Executive Director/CEO
Antelope Valley Transit Authority
42210 6th Street West
Lancaster, CA. 93534

Dear Len,

Antelope Valley Hospital (AVH) is very pleased to support the Antelope Valley Transit Authority's application for SB-1 funds to develop transportation strategies toward a more sustainable community.

As a leading healthcare organization in the Antelope Valley, AVH is constantly reminded of the critical need among our patients for affordable, safe, and accessible transportation, particularly after being discharged from the hospital or emergency room. Industry literature makes it very clear that a leading cause of return admissions to hospitals and clinics is failure to receive prescribed follow-up care and treatment due to lack of transportation. Additionally, we know that poor air quality, long commute times, lack of infrastructure for walking and biking, along with other economic and environmental factors play a significant role in the escalating incidents of chronic disease and health-related mortality rates.

In an effort to reduce patient recidivism and improve overall health indicators, AVH is interested in working with AVTA to ensure patients have access to transportation service for follow up appointments with doctors, pharmacies, therapies and other treatments necessary to manage illness and recovery and avoid preventable readmissions. Without adequate affordable and accessible transportation, our communities cannot be sustained.

With so much at stake, Antelope Valley Hospital strongly supports AVTA in its endeavors and recommends that Caltrans fully fund its request to better address the integrated transportation needs of its service area communities. If funds are awarded to AVTA, the Hospital will play an active, participatory role in public meetings on this topic and looks forward to working with stakeholders across the region to address this critical issue.

Sincerely,

Mike

Michael L. Wall
Chief Executive Officer

Antelope Valley Air Quality Management District
43301 Division St., Suite 206
Lancaster, CA 93535-4649
661.723.8070

In reply, please refer to AV0218/013

February 5, 2018

Len Engel, Executive Director/CEO
Antelope Valley Transit Authority
42210 6th Street West
Lancaster, CA 93534

RE: Antelope Valley Transit Authority (AVTA) Sustainable Community Strategies for Transportation Proposal

Dear Mr. Engel:

The Antelope Valley Air Quality Management District (District) is pleased to support the Antelope Valley Transit Authority's application for SB-1 funds to develop transportation strategies toward a more sustainable community.

The District works in partnership with the local communities to achieve and preserve a healthful environment through effective air quality programs by promoting community and individual responsibility for air quality. While the District does not have regulatory authority over mobile sources of air pollution, it has implemented grant programs in an effort to incentivize the reduction of vehicular pollution in the region through cleaner vehicle replacement programs.

Antelope Valley Transit Authority has provided a community model for reducing vehicular pollution in its current transition to a 100% battery electric fleet. While highly laudable, our regional air quality needs require additional efforts including strategies for increasing ridership of public transit and, thereby, reducing the number of personal vehicles utilized on a daily basis.

Additionally, it is recognized that without adequate infrastructure that supports alternative modes of transportation, such as biking and walking, people will continue to choose the convenience of a vehicle to reach destinations that might also be reached using public transit. Housing and land-use policies are also critical in establishing development that provides safe, useful access to public transportation. Without planning for changes in development policy in Lancaster and in Palmdale, development

will continue without any focus on sustainability. Integrating transit into development policy helps to assure that the region continues to meet is goals for reduced green-house gasses and better air quality, thereby improving the health of our residents.

Strategies to address these health and environmental factors, as well as economic and housing issues, are addressed in AVTA's Sustainable Community Strategies for Transportation proposal. The District supports and recommends AVTA's Sustainable Community Strategies for Transportation proposal be fully funded through Caltrans' SB-1 competitive grant process.

Sincerely,

Bret Banks
Executive Director

HIGH DESERT MEDICAL GROUP
HDMG
HERITAGE HEALTH CARE

An Affiliate of Heritage Provider Network

January 29, 2018

Len Engel, Executive Director/CEO
Antelope Valley Transit Authority
42210 6th Street West
Lancaster, CA 93534

RE: Antelope Valley Transit Authority (AVTA) Sustainable Community Strategies for Transportation Proposal

Dear Mr. Engel:

High Desert Medical Group (HDMG) and Heritage Health Care are pleased to support the Antelope Valley Transit Authority (AVTA's) application for SB-1 Community Sustainability Strategies funds to develop strategies toward a more sustainable and active community.

Through our primary, specialty, and urgent care services along with our clinical and health education programs our mission is to provide our members with the highest quality healthcare experience in both our Lancaster and Palmdale facilities. For most of our patients, good health and well-being are dependent on their ability to adhere to their physician's orders for treatment, therapies, medications, and follow-up appointments. Without adequate, accessible, and affordable transportation, patients are unable to commit to their own health care and may be forced to rely on urgent or emergency room visits to address otherwise preventable conditions that are now more detrimental to their ongoing recovery or stabilization.

HDMG recognizes that a coordinated and collaborative planning effort between health care providers and AVTA will go a long way in addressing health indicators, including health related mortality, that continue to spiral downward in the Antelope Valley. AVTA's approach to integrate transportation into all aspects of the community, particularly health and wellness initiatives, is in line with the goals and efforts of our organization.

We therefore, highly recommend Caltrans fully fund AVTA's request for SB-1 Sustainable Community Strategies funds and look forward to participating in public and stakeholder meetings on this topic.

Rafael Gonzalez, M.S., C.P.G
Administrator

High Desert Medical Group
43839 North 15th Street West,
Lancaster, CA 93534
661.945.5984

Heritage Health Care
38209 47th Street East, Suite C,
Palmdale, CA 93552
661.951.3100

KAISER PERMANENTE®

February 2, 2018

Len Engel, Executive Director/CEO
Antelope Valley Transit Authority
42210 6th Street West
Lancaster, CA 93534

RE: Antelope Valley Transit Authority (AVTA) Sustainable Community Strategies for Transportation Proposal

Dear Mr. Engel:

Kaiser Permanente is pleased to support the Antelope Valley Transit Authority's application for SB-1 funds to develop strategies toward a more sustainable community.

As the nation's largest nonprofit, integrated health care system, Kaiser Permanente has a social mission to provide high-quality, affordable health care services and to improve the health of our members and the communities we serve. We recognize that promotion of good health extends beyond the doctor's office and the hospital. Our community health work focuses on addressing the social determinants of health, transportation being one of them.

As would be expected, we see a greater need among disadvantaged community members who are low-income and who are living in neighborhoods where air quality and other environmental factors exacerbate health problems like pulmonary and heart diseases. These communities often lack ready-access to safe means of active and public transportation options, often a barrier to accessing healthcare.

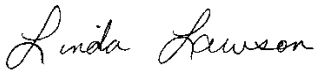
Many of our patients share that reliable, affordable transportation is a factor in their ability to follow up with prescribed treatment programs and appointments, furthering the challenges of addressing their health issues.

We look forward to working with AVTA on its plans for non-emergency medical transportation that will assure patient access and improve overall health as we have done in the past by placing an AVTA bus stop at the doors of our Kaiser Permanente Antelope Valley Medical Offices.

AVTA's holistic approach to integrating transportation into all aspects of the community, particularly health and wellness initiatives, is in line with the goals and efforts of our organization. We, therefore, highly recommend Caltrans fully fund AVTA's request for SB-1 Sustainable Community Strategies funds.

We look forward to helping to identify transportation strategies that will have a positive impact on the health and wellbeing of the area.

Sincerely,



Linda Lawson, RN MSN, CAO
Chief Administrative Officer
Kaiser Permanente Antelope Valley

The following documents are part of the Antelope Valley Transit Authority application's supporting data.

SCAG 2016 RTP/SCS Chapter 5: Integrating Transportation into Land-Use Planning Strategies presents the regional COG's research and recommendations regarding the integration of transportation into land-use planning including: livable corridors, active transportation, neighborhood mobility areas, conservation strategies, congestion management, maximizing use of existing systems, and new growth.

The document will inform the proposed planning efforts for the integration of transportation into planning and policy development across member jurisdictions. Utilizing the research and recommendations found in this study will help create a foundation on which the jurisdictions may find common principles that guide sustainable planning & design for transit oriented-development across the Antelope Valley.

Transportation and the Role of Hospitals – American Hospital Association, 2017
This study examines how hospitals and health systems can address patients' transportation needs and improve the health of their communities by implementing a variety of strategies, including: understanding and assessing the impact of transportation on public health; supporting policy and infrastructure programs aimed to improve transportation access and to create safer, healthier transportation options; investing resources in understanding patients' transportation needs; and providing direct transportation services through community partnerships.

This document will be a guiding resource in furthering partnerships with healthcare providers to plan for and implement the most efficient, sustainable transportation systems for patients not eligible for existing non-emergency medical transportation and support the integration of transportation into healthcare planning and policy development.

National Center for Mobility Management - Transportation to Healthcare Destinations
This document outlines the connections between transportation and healthcare, providing context and suggestions that will enable transportation providers to engage in conversations with healthcare agencies and make the case for more collaboration between the two sectors.

05

CHAPTER 5 HIGHLIGHTS

THE ROAD TO GREATER MOBILITY & SUSTAINABLE GROWTH

At the beginning of Chapter 1, we reviewed several themes that resonate throughout the 2016 RTP/SCS. The first of these was: "Integrating strategies for land use and transportation." This is SCAG's overarching strategy for achieving its goals of regional economic development, maximized mobility and accessibility for all people and goods in our region, safe and reliable travel, a sustainable regional transportation system, a protected natural environment, health for our residents, and more.

INTEGRATING TRANSPORTATION AND LAND USE PLANNING: THE KEY TO ACHIEVING OUR GOALS

By integrating our strategies for transportation with our strategies for using land—in other words, considering in tandem how we grow and how we get around—we can build the communities that we want. Planning that does not strive for this close integration can result in sprawling suburbs connected haphazardly to poorly managed highways and isolated communities that lack easy access to public transportation connecting people from home to work, school and other destinations. Precious resources are squandered: time, energy, money, productivity, clean air and good health, among others.

As the region's transportation planning agency, SCAG has long promoted the concept of integrating transportation planning and land use planning. Since 2002, with the Southern California Compass and Shared Growth Vision for the region and the subsequent Compass Blueprint program (now the Sustainability Planning Grant Program), SCAG has promoted integrated planning tools for local governments that want their residents to have more mobility options, make their communities more livable, increase prosperity among all people and strive for sustainability. Subsequent policies adopted at the regional level in 2004, 2008 and 2012 have supported and advanced the integration of transportation and land use planning.

With the passage of Senate Bill 375 in 2008, the State of California formalized the idea of integrating planning statewide when the California Air Resources Board (ARB) set regional targets for reducing greenhouse gas emissions and required every Metropolitan Planning Organization (MPO) in the state to develop an SCS that charted a course toward reduced emissions and a more sustainable future. A central tenet of the SCS requirement is for MPOs to integrate land use and transportation planning.

Here is one example: High Quality Transit Areas (HQTAs) are places where people live in compact communities and have ready access to a multitude of safe and convenient transportation alternatives to driving alone—including walking and biking, taking the bus, light rail, commuter rail, the subway and/or shared mobility options. Along high quality bus corridors, for instance, a bus arrives at least every 15 minutes. Residential and commercial development is integrated with plans for transit, active transportation and other alternatives to driving alone.

The integrated strategies, programs and projects reviewed in this chapter are designed to improve a region with very specific changes underway: Over the next 25 years, our region's population is projected to grow by more than 20 percent, from about 18 million people to more than 22 million people. Diverse households will reside in all types of communities, including urban centers, cities, towns, suburban neighborhoods and rural areas. Much of the region will continue to be populated by households living in detached single-family dwellings located in lower-density suburban areas. However, 67 percent of new residences will be higher density multifamily housing, built as infill development within HQTAs. Households will demand more direct and easier access to jobs, schools, shopping, healthcare and entertainment, especially as Millennials mature and seniors grow in number. Concurrently, our Southern California region will remain a vital gateway for goods and services, an international center for innovation in numerous industries and a place that offers its residents a high standard of living. We know that our future growth will add new pressures to our transportation system and to our communities. However, through long-term planning that integrates strategies for transportation and land use, we can ensure that our region grows in ways that enhance our mobility, sustainability and quality of life.

OUR STRATEGIES FOR TRANSPORTATION AND LAND USE

In the discussion that follows, transportation and land use strategies are grouped separately, but it will nevertheless become clear how closely they are related to one another. The section that follows is the heart of the 2016 RTP/SCS, and by the end of the chapter our region's course toward a more mobile and sustainable future should be evident.

Serving as an MPO, Regional Transportation Planning Agency and Council of Governments, SCAG has an essential responsibility to develop an RTP/SCS that is dedicated to detailing recommended regional transportation investments and strategies. The agency has developed these transportation strategies in the context of how we are projected to grow and live as a region in coming decades. In this chapter we will first review regional strategies for growth and land use and then move into a comprehensive review of the agency's plans for the region's multi-faceted transportation system.

LAND USE STRATEGIES

The land use strategies included in this Plan are built on a foundation of contributions from communities, cities, counties and other local agencies across our region. The land use patterns reviewed here, for example, are based on local general plans as well as input from local governments. For this Plan update, SCAG was committed to preserving the growth forecasts provided by local jurisdictions at the jurisdictional level.

At the same time, Senate Bill 375 requires that SCAG, as the region's MPO, strive to develop a vision of regional development patterns that integrate with and support planned transportation investments. As part of that mandate, an overall land use pattern has been developed that respects local control, but also incorporates best practices for achieving state-mandated reductions in greenhouse gas emissions through decreases in per capita vehicle miles traveled (VMT) regionally.

2016 RTP/SCS LAND USE POLICIES

The 2016 RTP/SCS reaffirms the 2008 Advisory Land Use Policies that were incorporated into the 2012 RTP/SCS. These foundational policies, which have guided the development of this Plan's strategies for land use, are:

- Identify regional strategic areas for infill and investment
- Structure the plan on a three-tiered system of centers development[1]
- Develop "Complete Communities"
- Develop nodes on a corridor
- Plan for additional housing and jobs near transit
- Plan for changing demand in types of housing
- Continue to protect stable, existing single-family areas
- Ensure adequate access to open space and preservation of habitat
- Incorporate local input and feedback on future growth.

2016 RTP/SCS LAND USE STRATEGIES

For this Plan, land use strategies are described in this section.

[1] Complete language: "Identify strategic centers based on a three-tiered system of existing, planned and potential relative to transportation infrastructure. This strategy more effectively integrates land use planning and transportation investment." A more detailed description of these strategies and policies can be found on pps. 90–92 of the SCAG 2008 Regional Transportation Plan, adopted in May 2008.

Reflect The Changing Population And Demands

The SCAG region, home to about 18.3 million people in 2012, currently features 5.9 million households and 7.4 million jobs. By 2040, the Plan projects that these figures will increase by 3.8 million people, with nearly 1.5 million more homes and 2.4 million more jobs. HQTAs will account for three percent of regional total land, but will accommodate 46 percent and 55 percent of future household and employment growth respectively between 2012 and 2040. The 2016 RTP/SCS land use pattern contains sufficient residential capacity to accommodate the region's future growth, including the eight-year regional housing need, as shown in TABLE 5.1. The land use pattern accommodates about 530,000 additional households in the SCAG region by 2020 and 1.5 million more households by 2040. The land use pattern also encourages improvement in the jobs-housing balance by accommodating 1.1 million more jobs by 2020 and about 2.4 million more jobs by 2040.

This 2016 RTP/SCS reflects a continuation of the shift in demographics and household demand since 2012. This shift is apparent in the land use development pattern, which assumes a significant increase in small-lot, single-family and multifamily housing that will mostly occur in infill locations near bus corridors and other transit infrastructure. In some cases, the land use pattern assumes that more of these housing types will be built than currently anticipated in local General Plans. This shift in housing type—especially the switch from large-lot to small-lot single-family homes—is already occurring as developers respond to new demands. In 2008, 45 percent of all housing units were multifamily homes. From 2012 through 2040, the Plan projects that 66 percent of the 1.5 million new homes expected to be built in the SCAG region will be multifamily units, reflecting demographic shifts and anticipated market demand. This will result in an increase of multifamily units in the region to 49 percent of all housing units in the region.

Combating Gentrification and Displacement

The 2012 RTP/SCS discussed strategies to combat gentrification and displacement, a continuing challenge that we discussed in Chapter 3. Jurisdictions in the SCAG region should continue to be sensitive to the possibility of gentrification and work to employ strategies to mitigate its potential negative community impacts. Generally, the SCAG region will benefit from higher-density infill development, which means that neighborhoods will be adding to the local housing stock rather than maintaining the current stock and simply changing the residential population. In addition, local jurisdictions are encouraged to pursue the production of permanent affordable housing through deed restrictions or development by non-profit developers, which will ensure that some units will remain affordable to lower-income households. SCAG will

work with local jurisdictions and community stakeholders to seek resources and provide assistance to address possible gentrification impacts of new development on existing communities and vulnerable populations.

Focus New Growth Around Transit

The 2016 RTP/SCS overall land use pattern reinforces the trend of focusing new housing and employment in the region's HQTAs (see EXHIBIT 5.1). While maintaining jurisdictional totals, the overall land use pattern moves new development from areas outside of HQTAs into these areas. SCAG incorporated land use plans provided by local jurisdictions into this pattern. While many residents and employees within half a mile of a transit stop or corridor can walk or bike to transit, not all of these areas are targeted for new growth and/or land use changes. The 2016 RTP/SCS assumes that 46 percent of new housing and 55 percent of new employment locations developed between 2012 and 2040 will be located within HQTAs, which comprise only three percent of the total land area in the SCAG region. Since adoption of the 2012 RTP/SCS, jurisdictions have referenced HQTAs in their planning documents and have positioned themselves to compete for California's Cap-and-Trade auction proceeds to support Transit Oriented Development (TOD) and active transportation infrastructure.

HQTAs are a cornerstone of land use planning best practice in the SCAG region because they concentrate roadway repair investments, leverage transit and active transportation investments, reduce regional life cycle infrastructure costs, improve accessibility, avoid greenfield development, create local jobs, and have the potential to improve public health and housing affordability. Here, households have expanded transportation choices with ready access to a multitude of safe and convenient transportation alternatives to driving alone—including walking and biking, taking the bus, light rail, commuter rail, the subway and/or shared mobility options. Households have more direct and easier access to jobs, schools, shopping, healthcare and entertainment, especially as Millennials form households and the senior population increases. Moreover, focusing future growth in HQTAs can provide expanded housing choices that nimbly respond to trends and market demands, encourage adaptive reuse of existing structures, revitalize main streets and increase Complete Street investments.

Additional local policies that ensure that development in HQTAs achieve the intended reductions in VMT and greenhouse gas emissions include:

TABLE 5.1 REGIONAL HOUSING NEEDS ASSESSMENT, ADOPTED 2012

Projection period 2014–2021

COUNTY	NUMBER OF VERY LOW INCOME HOUSEHOLDS	NUMBER OF LOW INCOME HOUSEHOLDS	NUMBER OF MODERATE INCOME HOUSEHOLDS	NUMBER OF ABOVE MODERATE INCOME HOUSEHOLDS	TOTAL
Imperial	4,194	2,553	2,546	7,258	16,551
Los Angeles	45,672	27,469	30,043	76,697	179,881
Orange	8,734	6,246	6,971	16,015	37,966
Riverside	24,117	16,319	18,459	42,479	101,374
San Bernardino	13,399	9,265	10,490	24,053	57,207
Ventura	4,516	3,095	3,544	8,003	19,158
SCAG	100,632	64,947	72,053	174,505	412,137

EXHIBIT 5.1 HIGH QUALITY TRANSIT AREAS IN THE SCAG REGION FOR 2040 PLAN

High Quality Transit Areas (including rail stations and qualifying bus corridors, see glossary for definition)

- 2012 Base Year
- 2040 Plan (Note: 2040 Plan Rail Station Alternatives shown as ⊙)

(Source: SCAG)

- Affordable housing requirements
- Reduced parking requirements
- Adaptive reuse of existing structures
- Density bonuses tied to family housing units such as three- and four-bedroom units
- Mixed-use development standards that include local serving retail
- Increased Complete Streets investments around HQTAs. Complete Streets are streets designed, funded and operated to enable safe access for roadway users of all ages and abilities, including pedestrians, bicyclists, motorists and transit riders.

The State of California is also trying to encourage growth around transit with the passage of Senate Bill 743 (SB 743), which seeks to facilitate transit-oriented projects in existing urbanized areas. The bill creates a new exemption from CEQA for certain projects that are residential or employment centers or mixed-used projects located within a Transit Priority Area (TPA), a part of a specific plan with a certified EIR and consistent with the SCS or APS.

Transit Oriented Development, HQTAs and Local Air Quality Impacts

The 2016 RTP/SCS recognizes guidance from the 2005 ARB air quality manual, which recommends limiting the siting of sensitive uses within 500 feet of highways and urban roads carrying more than 100,000 vehicles per day. This ARB guidance is carefully applied in areas that support Transit Oriented Development. Less than 10 percent of HQTAs planned in the 2016 RTP/SCS would fall within 500 feet of highways and highly traveled corridors, according to geographic information system (GIS) analyses. While density is increased in some areas of HQTAs, growth remains constant in areas within 500 feet of highways and urban roads to reflect local input, thereby balancing the growth distribution.

Plan for Growth Around Livable Corridors

The Livable Corridors strategy seeks to revitalize commercial strips through integrated transportation and land use planning that results in increased economic activity and improved mobility options. Since 2006, SCAG has provided technical assistance for 19 planning efforts along arterial roadway corridors. These corridor planning studies focused on providing a better understanding of how corridors function along their entire length. Subsequent research has distinguished the retail density and the specific kinds of retail needed to make these neighborhood nodes destinations for walking and biking.

From a land use perspective, Livable Corridors strategies include a special emphasis on fostering collaboration between neighboring jurisdictions to encourage better planning for various land uses, corridor branding, roadway improvements and focusing retail into attractive nodes along a corridor.

Livable Corridors Network

SCAG identified 2,980 miles of Livable Corridors along arterial roadways discussed in corridor planning studies funded through the Sustainability Planning Grant program and along enhanced bus transit corridors identified by regional partners. However, the land use strategies proposed in the 2016 RTP/SCS are not tied to a specific corridor. Livable Corridors are predominately a subset of the HQTAs, however 154 miles are not designated as HQTAs. These miles were identified in Sustainability Planning Grant projects and are proposed for active transportation improvements and the land use planning strategies described below.

Livable Corridors Strategies

The Livable Corridors concept combines three different components into a single planning concept to model the VMT and greenhouse gas emission reduction benefits:

- **Transit improvements:** The associated county transportation commissions (CTCs) have identified some of these corridors for on-street, dedicated lane Bus Rapid Transit (BRT) or semi-dedicated BRT-light. The remaining corridors have the potential to support other features that improve bus performance. These other features include enhanced bus shelters, real-time travel information, off-bus ticketing, all door boarding and longer distances between stops to improve speed and reliability.
- **Active transportation improvements:** Livable Corridors should include increased investments in Complete Streets to make these corridors and the intersecting arterials safe for biking and walking.
- **Land use policies:** Livable Corridor strategies include the development of mixed-use retail centers at key nodes along the corridors, increasing neighborhood-oriented retail at more intersections and zoning that allows for the replacement of under-performing auto-oriented strip retail between nodes with higher density residential and employment. These strategies will allow more context sensitive density, improve retail performance, combat blight and improve fiscal outcomes for local communities.

Provide More Options For Short Trips

Thirty-eight percent of all trips in the SCAG region are less than three miles. The 2016 RTP/SCS includes land use strategies, Complete Streets integration and a set of state and local policies to encourage the use of alternative modes of transportation for short trips in new and existing Neighborhood Mobility Areas (NMAs) and Complete Communities. In addition to the active transportation strategies that will be discussed below, land use strategies include pursuing local policies that encourage replacing motor vehicle use with Neighborhood Electric Vehicle (NEV) use. NEVs are a federally designated class of passenger vehicle rated for use on roads with posted speed limits of 35 miles per hour or less.

Neighborhood Mobility Areas

NMAs have a high intersection density, low to moderate traffic speeds and robust residential retail connections. These areas are suburban in nature, but can support slightly higher density in targeted locations. The land use strategies include shifting retail growth from large centralized retail strip malls to smaller distributed centers throughout an NMA. This strategy has shown to improve the use of active transportation or NEVs for short trips. Steps needed to support NEV use include providing state and regional incentives for purchases, local planning for charging stations, designating a local network of low speed roadways and adopting local regulations that allow smaller NEV parking stalls. NMAs are applicable in a wide range of settings in the SCAG region. The strategies associated with this concept are intended to provide sustainable transportation options for residents of the region who do not have convenient access to high-frequency transit options.

Complete Communities

Development of "complete communities" can provide households with a range of mobility options to complete short trips. The 2016 RTP/SCS supports the creation of these mixed-use districts through a concentration of activities with housing, employment, and a mix of retail and services, located in close proximity to each other. Focusing a mix of land uses in strategic growth areas creates complete communities wherein most daily needs can be met within a short distance of home, providing residents with the opportunity to patronize their local area and run daily errands by walking or cycling rather than traveling by automobile.

Support Local Sustainability Planning

To implement the SCS, SCAG supports local planning practices that help lead to a reduction of greenhouse gas emissions. Many local governments in the SCAG region serve as models for implementing the SCS. Sustainable Planning & Design, Zoning Codes and Climate Action Plans are three methods that local agencies have been adopting and implementing to help meet the regional targets for greenhouse gas emission reductions outlined in the SCS.

Sustainable Planning & Design

Many of the local policy documents that SCAG has reviewed are based on best practices that encourage infill and mixed-use development. Mixed-use design guidelines embrace and encourage increased densities and a mixing of uses, while also reflecting community character. For example, numerous suburban specific plans in the SCAG region encourage the revitalization of traditional main streets, downtowns and corridors. Other plans provide guidance for converting single-use office parks and industrial districts into mixed employment, retail and residential districts.

Sustainable Zoning Codes

Many cities and counties in the SCAG region have adopted form-based zoning codes that are tailored to local conditions, such as specifying building size and design parameters but allowing for more flexibility regarding use. Moreover, several cities and counties are updating their zoning codes to make development standards more environmentally friendly and equitable. One example is the City of San Gabriel's "Greening the Code" strategy, which identifies ways for the city's existing development code to facilitate more sustainability. New policies can involve coordinating landscaping practices with water conservation, best management practices for stormwater management and capture, creating better pedestrian connectivity, allowing more flexibility for mixed-use development and promoting energy efficient designs.

Climate Action Plans

SCAG is supporting several local governments throughout the region in the formation of Climate Action Plans (CAP). CAPs outline strategies for reducing greenhouse gas emissions in a cost effective manner. This is done by creating greenhouse gas inventories so that local governments can efficiently target their emission reduction practices to sources that pollute the most. Strategies outlined by CAPs in the SCAG region include Green Building guidelines for municipal buildings and facilities, implementing public electric vehicle charging stations and establishing energy retrofit incentive programs for residents.

2016 RTP/SCS Strategy

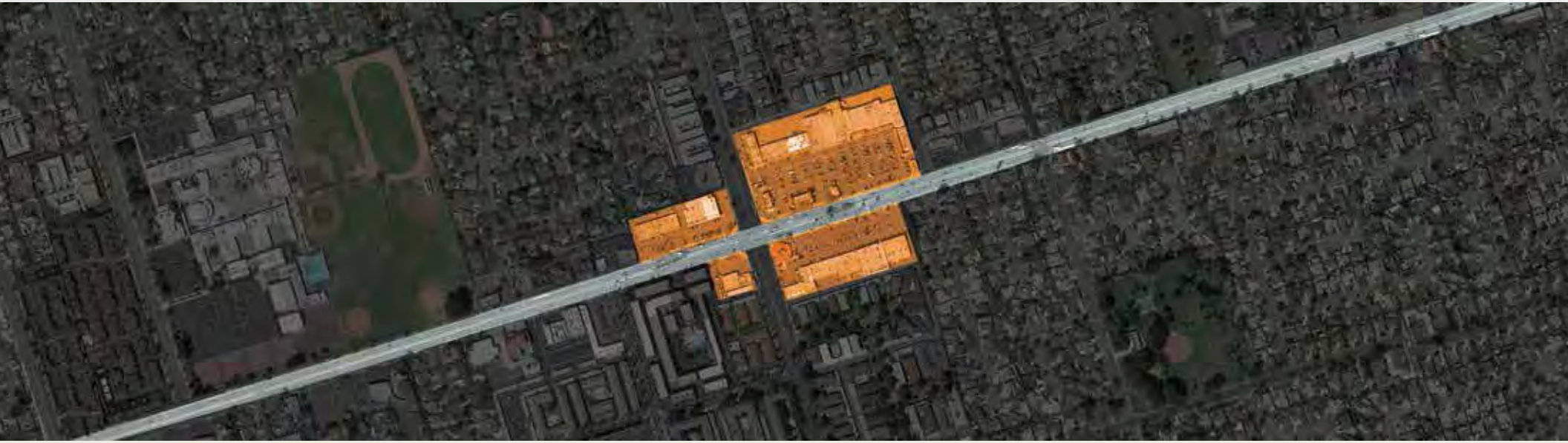
LIVABLE CORRIDORS

Enhancing the Connection Between Transit and Land Use

The SCAG region is crisscrossed by long arterial corridors, many of which are a legacy of Spanish colonial routes that linked the early missions and post-colonial ranchos. The suburban communities that developed rapidly after World War II were formed between these corridors, on a large (often one square mile) grid system. The inland portions of the South Bay, the Gateway Cities, the San Fernando and San Gabriel valleys, as well as the northern portions of Orange County follow this pattern. SCAG's Livable Corridors Strategy considers these suburban development patterns and proposes to encourage development along the boulevards that not only serve as major travel routes, but also destinations.

As the region transitions to higher investments in infill development and high quality, high frequency transit, these arterials are well suited to connect the region. The Livable Corridor Strategy specifically advises local jurisdictions to plan and zone for increased density at key nodes along the corridor and replacement of single-story under-performing strip retail with well-designed higher density housing and employment centers. This development along key corridors, when coordinated with improvements to the frequency and speed of buses along the corridors, will make transit a more convenient and viable option. Additionally, enhanced roadway designs to accommodate active transportation will also increase the vibrancy along these boulevards.

Several important transit investments in the SCAG region will help encourage this land use strategy. The Santa Ana Harbor Blvd Specific Plan incorporates the improved Orange County Transportation Authority (OCTA) Bravo! Route 543 and the planned OC Streetcar into its vision of the future. In Rancho Cucamonga, the City received a SCAG grant to reconcile the various specific plans along Foothill Blvd in anticipation of a future extension of the Omnitrans SbX. Across Los Angeles County, the Los Angeles County Metropolitan Transportation Authority (Metro) is planning for a high frequency network of buses with fewer stops. And the City of Los Angeles incorporated a "Transit Enhanced Network" as part of its General Plan Mobility Element to complement these investments.



Example of a Livable Corridor

Image courtesy of National Association of City Transportation Officials

2016 RTP/SCS Strategy

NEIGHBORHOOD MOBILITY AREAS

Encouraging Active Transportation for Short Trips

About 38 percent of all trips in the region are three miles or less. That is a short enough distance that can be covered by walking or biking, but more than 78 percent of these trips are made by driving. While convenient, driving for short trips can cause unnecessary congestion and pollution. What can be done to make it more convenient for people to walk, bike or even skate instead of driving, when practical?

The Neighborhood Mobility Areas strategy represents a set of state and local policies to encourage the use of active and other non-automobile modes of transportation, particularly for short trips in many suburban areas in Southern California developed between the late 1890s and the early 1960s. These suburban developments often were designed for streetcars and walking, in addition to automobiles and are characterized by small to medium lot single-family homes, a denser grid network of local roads, a higher density of intersections and accessibility to neighborhood retail establishments. By employing Complete Streets strategies, such as bike lanes, roundabouts, wider sidewalks or better lighting, the neighborhood design could encourage a return to greater active transportation use for those short trips. Similarly, planning a connected network of dedicated lanes and roadways with speed limits 35 mph and under can encourage more use of Neighborhood Electric Vehicles (NEV) for short trips. NEVs produce negligible greenhouse gas missions (based on energy production) and zero local pollution. In addition, NEVs take up less roadway capacity, less parking area at both the origin and destination and reduce the probability of an injury or fatality in the event of a collision with a pedestrian or bicyclist.

The Neighborhood Mobility Area concept is not new. Across the country, they are referred to as streetcar suburbs, first generation suburbs or suburban villages. But its application here in Southern California, when coupled with the renaissance some parts of the region are experiencing with transit and active transportation, would provide residents with greater mobility choices and an alternative to driving short distances.

Example of a Neighborhood Mobility Area

Image courtesy of National Association of City Transportation Officials

Protect Natural and Farm Lands

Many natural and agricultural land areas near the edge of existing urbanized areas do not have plans for conservation and they are susceptible to the pressures of development. Many of these lands, such as riparian areas, have high per-acre habitat values and are host to some of the most diverse yet vulnerable species that play an important role in the overall ecosystem.

Developing Conservation Strategies

Local land use decisions play a pivotal role in the fate of some of the region's most valuable habitat and farm lands. Many local governments have taken steps toward planning comprehensively for conserving natural lands and farm lands, while also meeting demands for growth. Across the region, transportation agencies and local governments have used habitat conservation plans and other tools to link land use decisions with comprehensive conservation plans in order to streamline development.

To support those and other comprehensive conservation planning efforts and to inform the local land use decision making process, SCAG studied regional scale habitat values, developed a conservation framework and assembled a natural resource database.[2] To coordinate with and support the viability of the Livable Corridors and HQTA land use strategies, this Plan suggests redirecting growth away from high value habitat areas to existing urbanized areas.

SCAG is engaging numerous stakeholders as it creates a Natural Lands Conservation Plan. Building on this effort may lead to a regional conservation program that CTCs, jurisdictions, agencies and non-profits can align with and support. This strategic and comprehensive approach allows the region to meet its housing and transportation needs, while ensuring that important natural lands, farm lands and water resources are protected. The 2012 RTP/SCS committed to a regional mitigation plan for inclusion in the 2016 RTP/SCS. With that as the foundation, the following are next steps for further developing a conservation strategy. More information can be found in the Natural & Farm Lands Appendix.

- Expanding upon the Open Space Conservation Database and Framework by incorporating strategic mapping layers to build the database and further refine the priority conservation areas
- Encouraging CTCs to develop advanced mitigation programs and/or include them in future transportation measures
- Aligning with funding opportunities and pilot programs to begin implementation of the Natural Lands Conservation Plan through acquisition and restoration
- Providing incentives to jurisdictions that cooperate across county lines to protect and restore natural habitat corridors, especially where corridors cross county boundaries.

[2] SCAG 2014 Inventory of Natural Resources Databases in SCAG region. Accessed at http://sustain.scag.ca.gov/Sustainability%20Portal%20Document%20Library/SCAG%20Inventory%20Natural%20Resources%20GIS%20Databases.pdf.

TRANSPORTATION STRATEGIES

The strategies for land use are tightly integrated with considerations for transportation, and that relationship is vital for our region to achieve its long-term regional goals. The same applies to our discussion of transportation strategies. The success of strategies related to transportation can only be achieved if they are tied closely to how we use land—how and where we grow, where we live, work, go to school, shop and so on. SCAG is pursuing numerous strategies divided into two broad categories: Maximizing Our Current System and Completing Our System. In all, the 2016 RTP/SCS includes $556.5 billion in transportation system investments through 2040.

MAXIMIZING OUR CURRENT SYSTEM

Working to make sure our existing transportation system is operating at maximum efficiency is a leading regional priority—and doing this is critical for the land use strategies discussed above to be effective. Over the past half century, the SCAG region has invested hundreds of billions of dollars into building and expanding the multimodal transportation system that we rely on today. Our investments must be protected and properly maintained to ensure that maximum productivity and efficiency are gained from the system. Under the system management approach, priority is given to maintaining and preserving the system, as well as ensuring that it is being operated as safely, efficiently and effectively as possible. This approach is illustrated in the system management pyramid (FIGURE 5.1). Protecting our previous investments and getting the most out of every component is the highest priority for our region.

Preserve Our Existing System

Southern California's transportation system is becoming increasingly compromised by decades of underinvestment in maintaining and preserving our infrastructure. These investments have not kept pace with the demands placed on the system and the quality of many of our roads, highways, bridges, transit, and bicycle and pedestrian facilities are continuing to deteriorate. Unfortunately, the longer they deteriorate the more expensive they will be to fix in the future. Even worse, deficient conditions compromise the safety of users throughout the

network. For all of these reasons, system preservation and achieving a state of good repair are top priorities of the 2016 RTP/SCS.

About $275.5 billion, or nearly half of all of the 2016 RTP/SCS proposed expenditures through 2040, is allocated to system preservation and operation (see FIGURE 5.2). Chapter 6 reflects the allocation of these expenditures for the transit and passenger rail systems, the State Highway System, and regionally significant local streets and roads within the 2016 RTP/SCS. Note that the allocation for the State Highway System includes bridges; the allocation for transit includes funding to both preserve and operate the transit system; and the allocation for regionally significant local streets and roads includes bridges and active transportation safety improvements. The 2016 RTP/SCS system preservation strategies include:

- Protecting and preserving what we have first, supporting a "Fix-it-First" principle.
- Considering life-cycle costs beyond construction.
- Continuing to work with stakeholders to identify and support new sustainable funding sources and/or increased funding levels for preservation and maintenance.

Manage Congestion

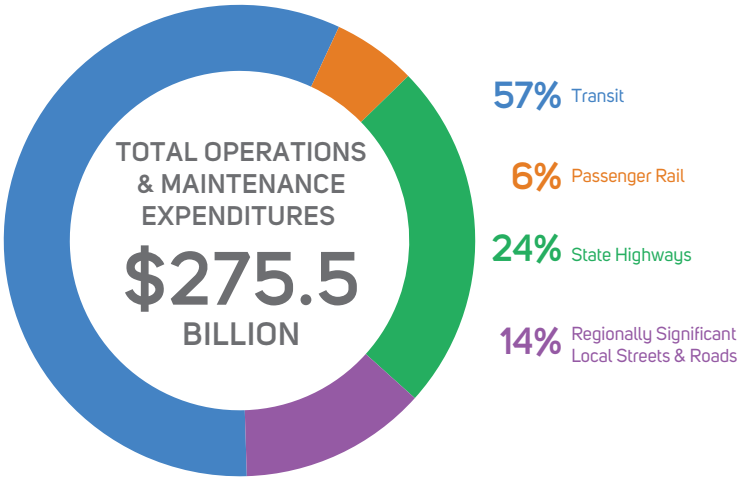
Congestion Management Process (CMP)

Federal regulations for Metropolitan Transportation Planning and Programming require the development, establishment and implementation of a CMP that is fully integrated into the regional planning process.[3] The Federal Highway Administration (FHWA) defines the CMP as a "systematic approach . . . that provides for effective management and operation, based on a cooperatively developed and implemented metropolitan-wide strategy, of new and existing transportation facilities eligible for funding under title 23 U.S.C. and title 49 U.S.C., through the use of operational management strategies." In compliance

[3] 23 CFR 450.320.

FIGURE 5.1 SYSTEM MANAGEMENT PYRAMID

FIGURE 5.2 PRESERVATION AND OPERATIONS EXPENDITURES



Note: Numbers may not sum to total due to rounding.

with federal law,[4] SCAG has made the CMP an integral part of the regional transportation planning process, including the 2016 RTP/SCS and the Federal Transportation Improvement Program (FTIP). The CMP is part of SCAG's integrated approach to improving and optimizing the transportation system, to provide for the safe and effective management of the regional transportation system through the use of monitoring and maintenance, demand reduction, land use, operational management strategies and strategic capacity enhancements. SCAG undertakes eight actions that are considered by FHWA to be the core of the CMP. These include developing regional objectives for congestion management; using performance measures and monitoring to understand the causes of congestion; identifying problems and needs; developing alternative strategies; and evaluating effectiveness. A more complete discussion of SCAG's CMP is provided in the Congestion Management Appendix.

The CMP requires that roadway projects that significantly increase the capacity for single-occupancy vehicles (SOVs) be addressed through a CMP that provides 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 in conjunction with roadway capacity improvement projects that would increase SOV capacity. SCAG previously used a $50 million threshold to identify SOV capacity-enhancing projects, but the agency is replacing this criterion with a project distance-based length criterion of one mile or more for the 2017 FTIP. Further details of this process are included in the upcoming 2017 FTIP.

Transportation Demand Management (TDM)

The 2016 RTP/SCS commits $6.9 billion toward TDM strategies throughout the region. There are three main areas of focus:

- Reducing the number of SOV trips and overall vehicle miles traveled (VMT) through ridesharing, which includes carpooling, vanpooling and supportive policies for shared ride services such as Uber and Lyft.
- Redistributing or eliminating vehicle trips from peak demand periods through incentives for telecommuting and alternative work schedules.
- Reducing the number of SOV trips through the use of other modes of travel such as transit, rail, bicycling and walking.

In addition, the following strategies expand and encourage the implementation of TDM strategies to their fullest extent:

- Rideshare incentives and rideshare matching.
- Parking management and parking cash-out policies.
- Preferential parking or parking subsidies for carpoolers.
- Intelligent parking programs.
- Promotion and expansion of Guaranteed Ride Home programs.
- Incentives for telecommuting and flexible work schedules.
- Integrated mobility hubs and first/last mile strategies.
- Incentives for employees who bike and walk to work.
- Investments in active transportation infrastructure.
- Investments in Safe Routes to School programs and infrastructure.

Transportation Systems Management (TSM)

The 2016 RTP/SCS includes $9.2 billion for TSM improvements. These include extensive advanced ramp metering, enhanced incident management, bottleneck removal to improve flow (e.g., auxiliary lanes), expansion and integration of the traffic signal synchronization network, data collection to monitor system performance, and other Intelligent Transportation System (ITS) improvements.

The 2016 RTP/SCS identifies a comprehensive set of strategies that work in concert to optimize the performance of the transportation system. This set of strategies does not focus solely on expanding the system, but also considers how we operate the system; how we coordinate land use planning with transportation planning; how we deal with incidents such as collisions or special events; how we provide information to the traveling public so people can make informed decisions about how, where and when to travel; and how we maintain the system. All of these strategies are based on a foundation of comprehensive system monitoring so that we can understand how the transportation system is performing and where we need improvement. This approach is based in part on work that California Department of Transportation (Caltrans) has done for many years to optimize the performance of the State Highway System. Two important categories for TSM strategies are:

1. **Corridor Mobility and Sustainability Improvement Plans:** Caltrans, SCAG and county partners in the past have worked together to improve the efficiency of our highways and arterials through the development of Corridor System Management Plans (CSMPs). Since the passage of Proposition 1B in November 2006 and with the creation Corridor Mobility Improvement Account (CMIA), which

[4] 23 USC 134 and 49 USC 5303-5305.

served to improve mobility on the State Highway System, several CSMPs have been developed for various corridors throughout the SCAG region. Historically, the response to congestion has been to add additional capacity. However, CSMPs have provided a lower cost, higher benefit option toward making highways and parallel arterial systems, transit and incident response management more efficient and were designed to focus primarily on operational strategies to optimize corridor performance through ITS strategies, in conjunction with operational and capacity improvements towards improving productivity along highway corridors. SCAG recognizes the efforts taken thus far under the current CSMP framework to improve mobility, but believes that CSMPs can be further improved upon. SCAG encourages the development of Corridor Sustainability Studies (CSS) which will build upon the existing CSMP framework by analyzing the corridor from a multimodal perspective. More specifically, these studies will include a focus on newer planning priorities such as Complete Streets and a Smart Mobility Framework (not addressed by current CSMPs). SCAG recognizes that the region could benefit from a site specific CSS focused on improving mobility for all modes of travel throughout the region.

2. **Integrated Corridor Management (ICM):** The ICM Initiative was first introduced by the U.S. Department of Transportation (U.S. DOT) back in 2006. Under the ICM approach, all elements within a corridor are considered to evaluate opportunities that move people and goods in the most efficient manner possible, while simultaneously ensuring that the greatest operational efficiencies are achieved. Since the introduction of ICM, great progress has been made. In Los Angeles, Caltrans (in coordination with Los Angeles County Metropolitan Transportation Authority or Metro) and various cities have embarked on the first Integrated Corridor Management pilot project on Interstate 210. This project aims to minimize congestion due to collisions and is also referred to as the Connected Corridors initiative. Over the next ten years, Caltrans plans to implement similar projects on 25 additional congested corridors statewide. ICM strategies to be considered as part of the Interstate 210 project include:

   - Integration of highway ramp meters and arterial signal systems
   - Arterial signal coordination
   - Traffic re-routing due to incidents or events
   - Transit signal priority on arterials and on-ramps
   - Parking management
   - Traveler communication (via changeable message signs, 511, radio, social networks, mobile app) of traffic conditions, transit services, parking, alternate route/trip/mode options
   - System coordination/communication between Caltrans (highway operator) and local jurisdictions (arterial operators).

Additional System Management Initiatives include:

- Arterial Signal Synchronization projects that have been completed on various arterials through the region to optimize traffic flow
- The Dynamic Corridor Congestion Management (DCCM) initiative in Los Angeles County, in which Caltrans is developing a corridor management initiative on Interstate 110 to coordinate highway ramp metering with arterial signals. Various efforts have been completed to inform the traveling public of expected travel times to various destinations and in some cases provide travel time comparisons with transit.
- The Caltrans Advanced Traffic Management (ATM) study for Interstate 105 and the Regional Integration of ITS Projects (RIITS) and IEN data exchange efforts at Los Angeles Metro.

Promote Safety and Security

Ensuring the safety and security of our transportation network for residents and visitors is a top priority. SCAG supports the implementation of the Strategic Highway Safety Plan (SHSP), which has an overarching goal of Toward Zero Deaths. The state's short-term goals are to reduce the number and rate of fatalities by three percent per year and to reduce the number and rate of severe injuries by 1.5 percent per year. SCAG is continuing to work with Caltrans and the CTCs toward identifying other means of improving the safety and security of our transportation system.

Regarding our transportation network's security, there are numerous agencies that participate in the response to incidents and assist with hazard preparations for individual jurisdictions. These include the California Emergency Management Agency, county offices of emergency management, fire departments, police departments and the California Highway Patrol. Collaboration among many of these agencies is essential when addressing incidents regionwide. The Federal Emergency Management Agency (FEMA) oversees this coordination. However, FEMA defines metropolitan areas differently than the U.S. DOT, so this limits SCAG's ability to participate at an agency level. Nevertheless, SCAG seeks to use its strengths and organization to assist first responders, recovery teams and planners alike in a supporting role.

FOCUS

BENEFITS OF TRANSPORTATION SYSTEMS MANAGEMENT/ TRANSPORTATION DEMAND MANAGEMENT (TSM/TDM)

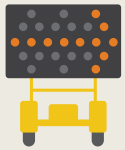
Enhanced Incident Management
Reduces incident-related congestion, which is estimated to represent half of the total congestion in urban areas

Transit Automatic Vehicle Location
Enables monitoring of transit vehicles and ensures on-time performance

Advanced Ramp Metering
Alleviates congestion and reduces collisions at on-ramps and highway-to-highway interchanges

Traffic Signal Synchronization
Minimizes wait times at traffic signals and therefore reduces travel time

Improved Data Collection
Allows implementing agencies and operators to monitor system performance and optimize the impact of transportation investments



Advanced Traveler Information
Provides real-time traffic conditions and alternative routing, and therefore allows the public to make more informed travel decisions

Universal Transit Fare Cards (Smart Cards)
Reduces time required to purchase transit tickets and allows interoperability among transit providers

Case Study: Interstate 210 Pilot Project

Historically, efforts to reduce congestion have focused solely on individual networks, in which underutilized capacity in parallel highway lanes, arterial lanes and transit services were often not considered. In recent years, TSM/TDM strategies have been developed to increase efficiency through the use of technologies. The application of these technologies, such as intelligent transportation systems (ITS), and a commitment by Caltrans and its partner agencies to work together have the potential to transform the ways that corridors are currently operated.

In 2012, Caltrans, with assistance from Metro and California Partners for Advanced Transportation Technology (PATH) at UC Berkeley, developed the first Integrated Corridor Management (ICM) pilot project within the SCAG region along the Interstate 210 (I-210) corridor. The purpose of the pilot is to look at all opportunities to move people and goods in the most efficient manner possible, to ensure the greatest potential gains in operational performance. This includes seeking ways to improve how arterials, highways, transit and parking systems work in conjunction with one another.

Strategies to be considered as part of the project include:

- Integration of highway ramp meters and arterial signal systems
- Arterial signal coordination
- Traffic re-routing due to incidents or events
- Transit signal priority on arterials and on-ramps
- Parking management (e.g., smart parking—locating available parking spaces at transit stations and private parking garages)
- Variable lane configuration systems
- Traveler communication (via changeable message signs, 511, radio, social networks, mobile app) of traffic conditions, transit services, parking, alternate route/trip/mode options
- System coordination/communication between Caltrans and local jurisdictions

The pilot is still under development, but it has already changed the way state and local transportation agencies work together in managing transportation systems. Caltrans aims to eventually expand the application of ICM concepts to other corridors over the next ten years. In this context, the Interstate 210 Pilot is a test bed to demonstrate how an ICM project can be developed by engaging and building consensus among corridor stakeholders, to address congestion for the betterment of an entire network.

Caltrans

CALIFORNIA PATH

SCAG continues to pursue the following strategies toward ensuring safety and security:

- Ensure transportation safety, security and reliability for all people and goods throughout the region.
- Prevent, protect, respond to and recover from major human-caused or natural events in order to minimize the threat and impact to lives, property, the transportation network and the regional economy.
- Provide a policy forum to help develop regional consensus and education on security policies and emergency responses.
- Assist in expediting the planning and programming of transportation infrastructure repairs from major disasters.
- Encourage the integration of transportation security measures into transportation projects early in the development process by leveraging SCAG's relevant plans, programs and processes (including regional Intelligent Transportation Systems (ITS) architecture).

For more details on safety and security and additional policies and strategies, please review the Transportation Safety & Security Appendix.

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, biking 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

Since 1991, the SCAG region has spent more than $50 billion dollars on public transportation. This includes high profile investments in rail transit and lower profile, vital investments in operations and maintenance. Looking toward 2040, the 2016 RTP/SCS maintains a significant investment in public transportation across all transit modes and also calls for new household and employment growth to be targeted in areas that are well served by public transportation to maximize the improvements called for in the Plan. This investment package includes a selection of major capital investments described in TABLE 5.2, which displays all locally notable transit capital projects and additional capital investment packages totaling more than $500 million. These investments include new rail transit facilities, vehicle replacements, bus system improvements and capitalized maintenance projects.

When these projects are completed, the region will have a greatly expanded urban rail network, including ten light rail projects and three heavy rail projects on the Metro Rail system. New BRT and rapid bus routes will provide additional higher speed bus service in Los Angeles and Orange Counties and the Inland Empire. Orange County will add new streetcar services to link major destinations in Anaheim, Santa Ana and Garden Grove to the Metrolink system. Riverside County will extend Metrolink to San Jacinto and San Bernardino County will connect Metrolink to Ontario International Airport and to Redlands via Downtown San Bernardino.

In addition, the 2016 RTP/SCS includes extensive local bus, rapid bus, BRT and express service improvements. An expanded point-to-point express bus network will take advantage of the region's carpool and express lane network. New BRT service, limited-stop service and increased local bus service along key corridors, in coordination with transit-oriented development and land use, will encourage greater use of transit for short local trips. See EXHIBIT 5.2.

Also included in the investment package are renewed commitments to asset management and maintaining a state of good repair. TABLE 5.3 describes all transit operations and maintenance investments over $500 million. This list includes bus, urban rail and paratransit operations, the implementation of the Orange County Transportation Authority's (OCTA's) Short Range Transit Plan, expanded bus service on targeted corridors, preventative maintenance and an increased commitment on asset preservation funded from innovative revenue sources.

Aside from capital projects, there are many improvements that can help make transit operate more efficiently and effectively, make it more accessible to more travelers and increase ridership. The 2016 RTP/SCS recommends additional transit initiatives. Among them:

TABLE 5.2 SELECTED TRANSIT CAPITAL PROJECTS

COUNTY	PROJECT
Los Angeles	Airport Metro Connector
Los Angeles	Crenshaw LAX Transit Corridor
Los Angeles	East San Fernando Valley Transit Corridor
Los Angeles	Eastside Transit Corridor Phase 2
Los Angeles	Exposition Transit Corridor, Phase 2 to Santa Monica
Los Angeles	Metro Gold Line Foothill Extension Phase 2A
Los Angeles	Metro Gold Line Foothill Extension: Azusa to County Line
Los Angeles	Purple Line Extension to La Cienega, Century City, Westwood
Los Angeles	Regional Connector
Los Angeles	Sepulveda Pass Corridor
Los Angeles	South Bay Metro Green Line Extension
Los Angeles	West Santa Ana Branch Transit Corridor
Los Angeles	Bus & Rail Capital—LA County Near Term
Los Angeles	Countywide Bus System Improvement–Metro Fleet
Los Angeles	Countywide Bus System Improvement—LA County Muni Fleet
Los Angeles	Metro Rail System Improvements (Capital Costs Only)
Los Angeles	Metro Rail Rehabilitation and Replacement (Capital Costs Only)
Los Angeles	Transit contingency/new rail yards/additional rail cars (Capital costs only)—LA County
Los Angeles	Vermont Short Corridor
Los Angeles	Metro Red Line Extension: Metro Red Line Station North Hollywood to Burbank Bob Hope Airport
Los Angeles	Metro Green Line Extension: Metro Green Line Norwalk Station to Norwalk Metrolink Station
Los Angeles	Slauson Light Rail: Crenshaw Corridor to Metro Blue Line Slauson Station
Orange	Anaheim Rapid Connection
Orange	Countywide Fixed-Route, Express and Paratransit Capital (Baseline)—Orange County
Orange	OC Streetcar
Riverside	Coachella Valley Bus Rapid Service
Riverside	Perris Valley Line
Riverside	Perris Valley Line Extension to San Jacinto
San Bernardino	Foothill/5th Bus Rapid Transit
San Bernardino	Gold Line Phase 2B to Montclair
San Bernardino	Metrolink San Bernardino Line Double tracking
San Bernardino	Passenger Rail Service from San Bernardino to Ontario Airport
San Bernardino	Redlands Rail
San Bernardino	West Valley Connector Bus Rapid Transit

Source: 2016 RTP/SCS Project List

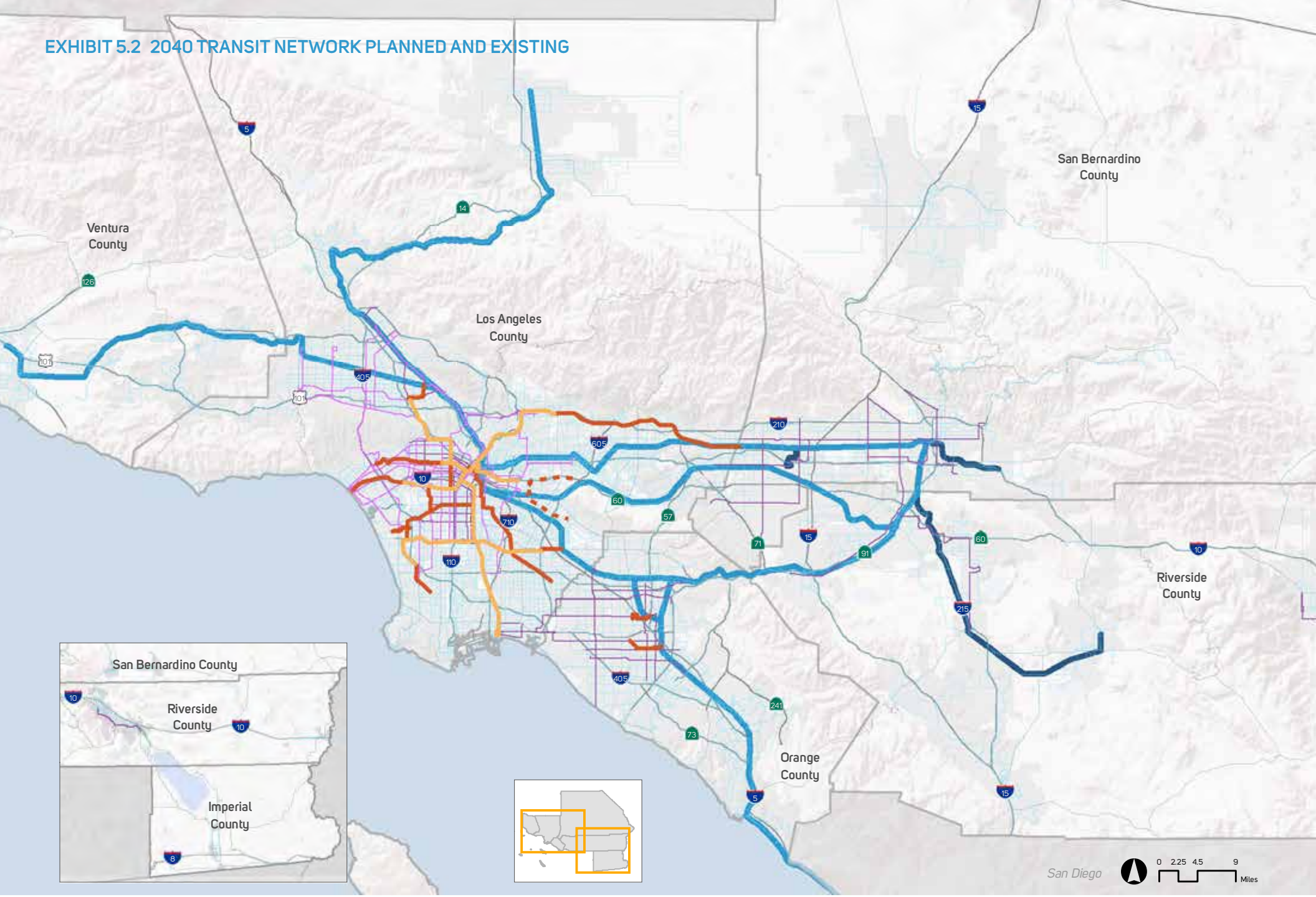
TABLE 5.3 MAJOR TRANSIT OPERATIONS AND MAINTENANCE PROJECTS AND INVESTMENTS

(Over $500 Million)

COUNTY	PROJECT
Los Angeles	Access Services Incorporated (Paratransit)—Metro subsidy
Los Angeles	Preventive Maintenance (Capital & Operating Maintenance Items Only)—LA County
Orange	Countywide Fixed-Route, Express and Paratransit Operations—Orange County
Orange	OCTA SRTP Implementation
Orange	Metrolink Operations—Orange County
Orange	Transit Extensions to Metrolink–Go Local Operations—Orange County
San Bernardino	San Bernardino Countywide Local Transit Service Operations
Regionwide	Regionwide Transit Operations and Maintenance—Preservation
Regionwide	Expand Bus Service: Productive Corridors
Regionwide	Expand Bus Service: BRT
Regionwide	Expand Bus Service: Point-to-Point

Source: 2016 RTP/SCS Project List

EXHIBIT 5.2 2040 TRANSIT NETWORK PLANNED AND EXISTING



Commuter Rail
- 2012 Base Year
- 2040 Plan

Urban Rail
- 2012 Base Year
- 2040 Plan

Urban Rail Alternatives

Rapid Bus and Bus Rapid Transit
- 2012 Base Year
- 2040 Plan

Bus Routes (2012 Base Year & 2040 Plan)

(Source: SCAG)

Implement and Expand Transit Priority Strategies: Transit priority strategies include transit signal priority, queue jumpers and bus lanes. Signal priority is a highly effective treatment that speeds up bus service and attracts new transit riders. The Metro Rapid program in Los Angeles County has increased speeds by more than 20 percent, compared with the local service on the same street. It also has brought new riders to its system. Bus lanes are even more effective at increasing speeds, however in our region there is a dearth of such lanes. SCAG encourages transit agencies and local jurisdictions to implement them, where appropriate.

Implement Regional and Inter-County Fare Agreements and Media: Implementing additional inter-jurisdictional fare agreements and media, such as Los Angeles County's EZ Pass, will make transit more attractive and accessible. A pass that would cover all transit services in Los Angeles and Orange counties, or the whole SCAG region, is an example. OCTA, the LOSSAN Managing Agency, recently secured a California Cap-and-Trade grant to establish fare agreements between the Pacific Surfliner and local transit operators along its corridor where an Amtrak ticket will be good for a connecting transit fare.

Implement New BRT and Limited-Stop Bus Service: BRT service provides frequent, high quality bus service and is characterized by features such as dedicated lanes, traffic signal priority, limited stops, pre-boarding fare payment and unique branding. BRT is about 20 percent faster than traditional local bus service. It is a premium service and has proven to attract new riders to transit. BRT implementation does require some capital investment, but it is scalable so that transit agencies can implement a range of elements to improve bus service depending upon the resources available. In an environment of scarce funding, offering limited-stop service is also an excellent alternative to BRT because it involves strategically reducing the number of stops a bus would serve along a given route. Limited-stop service has been shown to be about 15 percent faster than traditional local service.

Increase Bicycle Carrying Capacity on Transit and Rail Vehicles: Bicycling is becoming more popular and our transit system can do more to accommodate bicyclists. Many buses have bike racks with capacity for only two bikes. Meanwhile, Metro and Metrolink are now allowing more bicycles on their railcars and providing bicycle lockers at rail and fixed guideway bus stations. Allowing more bikes on transit vehicles, to a reasonable point, will increase transit ridership.

Expand and Improve Real-Time Passenger Information Systems: Most medium to large size transit agencies now offer up-to-the-minute updates on arrival and departure times. This allows passengers to make more informed travel decisions and improve the overall travel experience.

Implement First/Last Mile Strategies to Extend the Effective Reach of Transit: This is an area of study with recent focus. Making transit more accessible for biking or walking that first mile to a transit station, or from a transit station, or both, will encourage more transit use and reduce air pollution and greenhouse gas emissions. More than 90 percent of Metrolink riders drive to their origin station, representing a significant potential for providing alternatives. As mentioned before, several cities in Orange County are planning streetcar services to connect Metrolink riders to their final destinations.

Implement Local Circulators: Many jurisdictions in the region already have networks of local community circulators and fixed-route systems. Implementing more of these services would provide alternatives for residents of increasingly compact communities.

Passenger Rail

The 2016 RTP/SCS proposes three main passenger rail strategies that will improve speed, service and safety and provide an attractive alternative to driving alone. They are:

- Improving the Los Angeles–San Diego–San Luis Obispo Rail Corridor (LOSSAN Corridor)
- Improving the existing Metrolink system
- Implementing Phase One of the California High-Speed Train

The state's High-Speed Train will provide an additional intrastate transportation option in California, offering an alternative to air and auto travel and providing new capacity for travel on the state's highways and airports. The California High-Speed Rail Authority (CHSRA), in partnership with the Federal Railroad Administration (FRA), which has provided $3.6 billion in High-Speed and Intercity Passenger Rail funding, have chosen to begin construction in the San Joaquin Valley. The system will then be built south to our region, connecting to Palmdale, Burbank Bob Hope Airport, Los Angeles Union Station and Anaheim by 2029. This is consistent with the CHSRA's adopted 2014 Business Plan and Draft 2016 Business Plan.

Existing passenger rail facilities in Southern California and the Bay Area (the "bookends" of the Phase One system) will also be improved to provide immediate, near-term benefits while laying the groundwork for future integration with High-Speed Train. This "blended approach" to deliver the full integrated system, through phased implementation over time, will help reduce costs and environmental impacts. With the adoption of the 2012 RTP/SCS, the region and the CHSRA committed to spending $1 billion in Prop. 1A funds and other fund sources on these early investments in the "bookends."

This commitment by CHSRA and the transportation agencies was formalized in the memorandum of understanding (MOU) between CHSRA, Metrolink, SCAG, San Diego Association of Governments (SANDAG), Metro, Riverside County Transportation Commission (RCTC) and the City of Anaheim. The MOU includes a candidate project list to which $1 billion will be programmed in order to provide interconnectivity to the California High-Speed Train project and improve the speed, capacity and safety of our existing passenger rail network. The list includes 74 projects totaling nearly $4 billion and it shows the need for capital investments to improve the speed and service of the existing rail network regionwide. The top six projects on this list are each of the five county's (Los Angeles, Orange, Riverside, San Bernardino and San Diego) top projects—plus the Southern California Regional Interconnector Project (SCRIP, formerly called the Los Angeles Union Station Run-Through Tracks). See TABLE 5.4.

TABLE 5.4 TOP SIX MOU PROJECTS

Los Angeles	Southern California Regional Interconnector Project
Los Angeles	CP Brighton to CP Roxford Double Track
Orange	State College Blvd. Grade Separation
Riverside	McKinley St. Grade Separation
San Bernardino	CP Lilac to CP Rancho Double Track
San Diego	San Onofre to Pulgas Double Track

CP = A track switch, or the location of a track signal or other marker with which dispatchers can specify when controlling trains.

SCRIP is number one on the list because it will deliver regional benefits for all counties. Los Angeles Union Station was originally designed as a "stub" rail facility, with tracks only leaving the station in a northerly direction and no through-train operation capability. Up to six tracks will be built to extend out of the south of Union Station and across U.S. Route 101 to connect with the main tracks along the Los Angeles River. These additional tracks will increase Union Station's capacity by 40 to 50 percent, enabling the scheduling of many more through trains with improved running times. They will also result in sharply reduced air pollution and greenhouse gas emissions from idling locomotives.

Several additional strategies 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 will serve three distinct rail markets: commuter, intercity and interregional. The first is served by Metrolink, the second by Amtrak and the third will be served by California High-Speed Train service. However, the three carriers can be attractive to multiple rail travel markets. Passenger rail strategies for these markets include:

Increase Speed and Service: As noted above, the high-speed rail system MOU partners are in the process of planning and implementing the MOU capital projects to improve capacity, speed and service, bringing at least some segments of our rail network up to the federally defined high speed of 110 miles per hour or greater and to implement a blended system of rail services. In addition to the MOU project list, these projects are detailed in the LOSSAN Strategic Implementation Plan for 2030 and the Metrolink 2015 Strategic Assessment that looks out 10 years to 2025. As speeds and service levels improve, these services will become more competitive with SOV travel and as a result ridership will continue to grow. Further, their schedules should be adjusted once the state's High-Speed Train project is implemented, so that all rail services complement and feed one another.

Improve Accessibility and Connectivity: This strategy includes establishing rail connections to our region's airports, and improving transit, bicycling and walking accessibility and connectivity to rail stations. Burbank Bob Hope Airport is presently the region's best-served airport by rail, and will soon host two rail stations in the near future with service provided by two Metrolink lines, Amtrak and the state's High-Speed Train in the future. Ontario International Airport (ONT) is not directly served by rail, although SCAG together with Metro, SANBAG and CHSRA are studying various options to provide direct rail service

to the airport. LAX is also currently not served by any rail, but will be within the next decade via the Crenshaw Line and the Airport Metro Connector. Improving transit bicycling and walking accessibility to our region's passenger rail stations is also critical. Increasing rail feeder bus services in our region to passenger rail stations would reduce the incentive for SOV travel. Establishing more transit services such as OCTA's Stationlink service would provide this incentive. Finally, there is still little BRT or BRT-Lite service in our region outside of Los Angeles County, and establishing more BRT routes to serve rail stations such as the current Omnitrans sbX Green Line and the Riverside Transit Agency's future RapidLink Line 1 will help meet this goal.

Secure Increased Funding and Dedicated Funding Sources: Passenger rail has traditionally lacked dedicated funding streams. Amtrak is funded annually by the U.S. Congress, usually resulting in funding amounts insufficient to meet state of good repair needs or to increase Amtrak's levels of service and expand the network. With local control of the Pacific Surfliner now complete, the State of California has guaranteed funding levels to maintain current service levels (but not to increase service levels) for the first three years. One new funding source is California's Cap-and-Trade Transit and Intercity Rail Capital Program, which received $25 million in FY2014-15 and 10 percent of annual Cap-and-Trade auction proceeds beginning in FY2015-16. This FY2015-16 allocation is currently estimated to be more than $200 million. Similarly, the CHSRA has been given a dedicated Cap-and-Trade funding stream of 25 percent of funds, beginning in FY2015-16 (for FY2014-15 CHSRA received $250 million). FY2015-16 funding is estimated at more than $600 million.

Support Increased TOD and First/Last Mile Strategies: Increased TOD and first/last mile planning and investments are crucial to passenger rail station area planning. Increased and effective TOD improves our region's jobs/housing balance, and it reduces VMT, air pollution and greenhouse gas emissions. First/last mile investments also reduce VMT, air pollution and greenhouse gas emissions and encourage rail users to access rail stations with options other than driving alone.

Implement Cooperative Fare Agreements and Media: Cooperative fare agreements and media also offer opportunities for increasing rail ridership and attracting new riders. For example, the Rail2Rail pass allows Metrolink monthly pass riders who have origin and destination points along the LOSSAN corridor to ride Amtrak. In 2014, the North County Transit District (NCTD) reached an agreement with Caltrans Division of Rail (DOR), in which five daily Pacific Surfliner trains stop at all non-Pacific Surfliner Amtrak (Coaster) stops in San Diego County. This service has proven quite popular and successful. Agreements like this one could be expanded once the California High-Speed Train is built.

Active Transportation

The 2016 RTP/SCS includes $12.9 billion for active transportation improvements, including $8.1 billion in capital projects and $4.8 billion as part of the operations and maintenance expenditures on regionally significant local streets and roads. The Active Transportation portion of the 2016 Plan updates the Active Transportation portion of the 2012 Plan, which has goals for improving safety, increasing active transportation usage and friendliness, and encouraging local active transportation plans. It proposes strategies to further develop the regional bikeway network, assumes that all local active transportation plans will be implemented, and dedicates resources to maintain and repair thousands of miles of dilapidated sidewalks. To accommodate the growth in walking, biking and other forms of active transportation regionally, the 2016 Active Transportation Plan also considers new strategies and approaches beyond those proposed in 2012. Among them:

- Better align active transportation investments with land use and transportation strategies to reduce costs and maximize mobility benefits
- Increase the competitiveness of local agencies for federal and state funding
- Develop strategies that serve people from 8–80[5] years old to reflect changing demographics and make active transportation attractive to more people
- Expand regional understanding of the role that short trips play in achieving RTP/SCS goals and performance objectives, and provide a strategic framework to support local planning and project development geared toward serving these trips
- Expand understanding and consideration of public health in the development of local plans and projects.

[5] 8–80 years old is an age span that is used as a shorthand to refer to expanding the potential for all people to use active transportation. The term refers to addressing the needs school aged children who would be conceivably allowed to walk or bike to school unaccompanied if the environment were safer and older senior citizens who prefer physical separation from the noise and speed of vehicles.

Active Transportation has 11 specific strategies to maximize active transportation in the SCAG region. These are grouped into four broad categories: regional trips, transit integration, short trips and education/encouragement. All 11 strategies are based on a comprehensive local bikeway and pedestrian network that uses Complete Streets principles. These strategies include:

Regional Trips Strategies:

1. Regional Greenway Network
2. Regional Bikeway Network
3. California Coastal Trail Access

Transit Integration Strategies:

4. First/last mile (to transit)
5. Livable Corridors
6. Bike Share Services

Short Trips Strategies:

7. Sidewalk Quality
8. Local Bikeway Networks
9. Neighborhood Mobility Areas

Education/Encouragement Strategies:

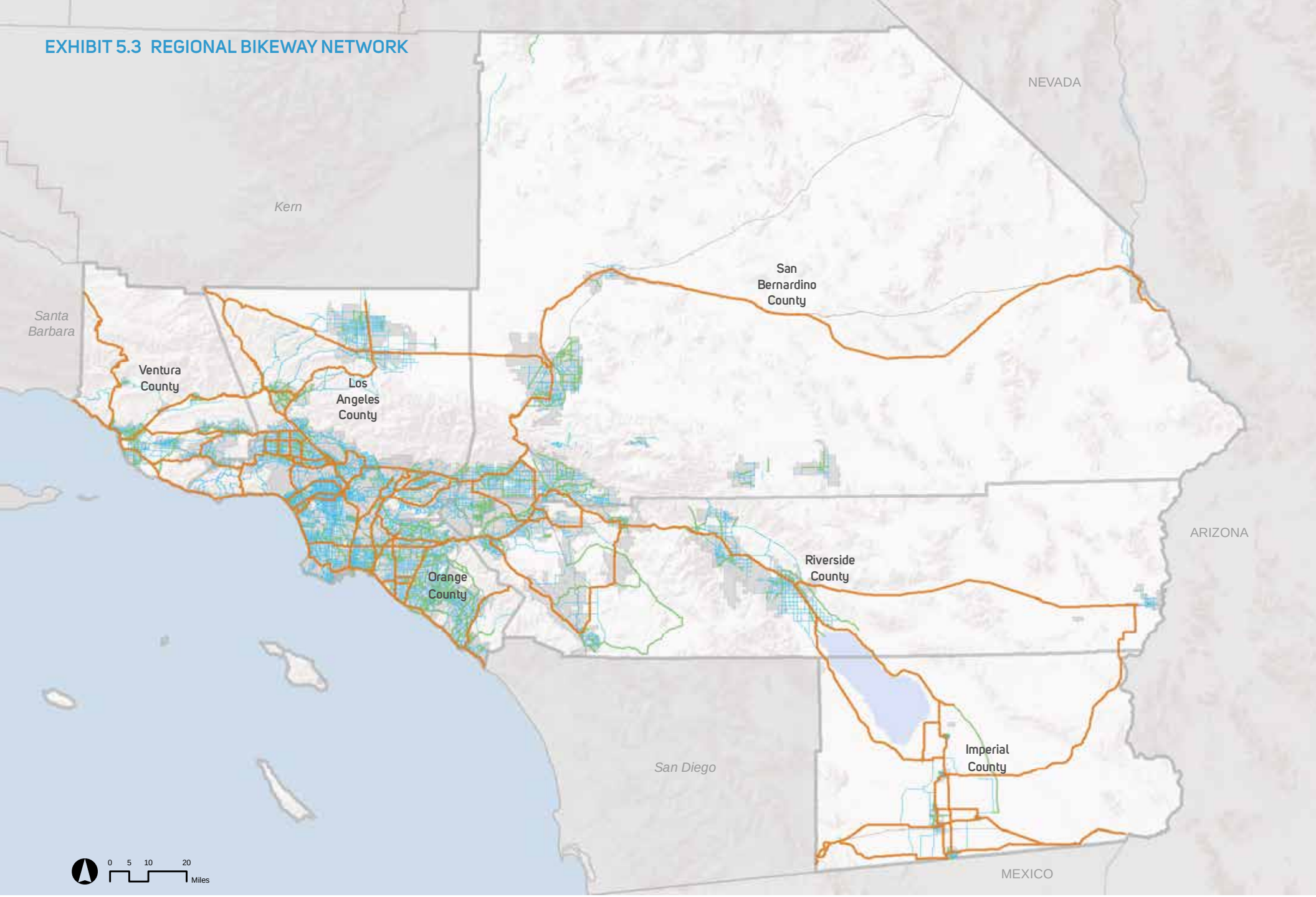
10. Safe Routes to School
11. Safety/Encouragement Campaigns

Regional Trips Strategies

Developing the following networks will serve those longer trips that people make less frequently, but add to total miles traveled. They are primarily biking trips for commuting and recreation. Although trips covering the full length of these corridors may be a small percentage of active transportation travel, the networks provide a backbone for shorter trips, much in the way the Interstate Highway System is used by many people as a bypass for short trips from one on-ramp to the next off-ramp. Completing the following networks are key strategies for promoting regional trips:

1. **Regional Greenway Network (RGN):** The planned RGN is a 2,200-mile system of separated bikeways mostly using riverbeds, drainage channels and utility corridors. The RGN connects to the regional bikeway network. This strategy provides the opportunity to better integrate urban green space, active transportation and watershed management, providing new urban green space for residents to go to for travel and recreation, including low-stress access to the California Coastal Trail. Benefits include increased health, improved safety and enhanced quality of life. These low-stress bikeways, connected to the regional bikeway network and local bikeways, should provide an attractive option for those bicyclists who do not wish to ride along roadways with motor vehicles. They include the High Desert Corridor; Santa Ana River Trail; OC Loop; Los Angeles River; San Gabriel River; San Jose Creek; Rio Hondo River; Ballona Creek; Bike Route 33; and CVLink.
2. **Regional Bikeway Network (RBN):** The planned RBN consists of 2,220 miles of interconnected bikeways that connect to jurisdictions, local bikeways and destinations. It connects to the RGN and has designated routes and wayfinding signage that help bicyclists easily understand the route structure and destinations. The primary purpose is to serve regional trips, commuting and recreational bicycling. Using locally existing and planned local bikeways as the foundation, the RBN closes gaps, connects jurisdictions, and provides a regional backbone for local bikeways and greenways. By having assigned route names/numbers, bicyclists can more easily travel across jurisdictions without having to frequently consult maps or risk having bikeways end on busy streets. It is anticipated that trips longer than three miles will likely be used in part on the RBN. SCAG has identified 12 regionally significant bikeways that connect the region. These include Bike Route 66; Bike Route 10; Bike Route 126; Pacific Coast Bike Route; Bike Route 5; Santa Ana River Trail; High Desert Corridor; Bike Route 33; Los Angeles River; San Gabriel River; Bike Route 86; and Bike Route 76 (see EXHIBIT 5.3).
3. **California Coastal Trail (CCT)Access:** Trails along the coast of California have been utilized as long as people have inhabited the region. The CCT was established by the Coastal Act of 1976 to develop a "continuous public right-of-way along the California coastline; a trail designed to foster appreciation and stewardship of the scenic and natural resources of the coast through hiking and other complementary modes of non-motorized transportation." The 2016 RTP/SCS Active Transportation Appendix identifies the improvements necessary to help complete the portions of the CCT in Ventura, Los Angeles and Orange counties and to provide biking and walking access to the CCT.

EXHIBIT 5.3 REGIONAL BIKEWAY NETWORK



(Source: SCAG)

Transit Integration Strategies

Transit Integration refers to a suite of strategies designed to better integrate active transportation and transit by improving access for pedestrians, bicyclists and other people traveling under their own power around transit stations. Active transportation projects that fall within this suite of strategies are particularly competitive for Cap-and-Trade funding programs. Cap-and-Trade funding programs include the Affordable Housing and Sustainable Communities Program (AHSC), which aims to better link housing, transit and active transportation to reduce greenhouse gas emissions. With this in mind, the strategies detailed below will be most successful if they are coordinated with land use strategies such as TOD and providing affordable housing.

4. **First/Last Mile (to rail):** This strategy uses a Complete Streets approach to maximize the number of people walking or biking to rail. By 2040, 11 percent of people will live within one half mile of a rail station, and 27 percent will live within one mile of a rail station. By increasing the comfort and removing barriers to walking or biking, more people will walk or bike to transit stations. These stations include all Los Angeles County light rail, subway and fixed guideway bus stations and Metrolink stations; all Orange County Metrolink Stations and OC Bravo busways; all San Bernardino County Metrolink stations and SBx busways; all Riverside County Metrolink stations; and all Ventura County Metrolink stations.

   The existing transit access "shed" is considered the half-mile radius around a station (requiring a 10-minute walk), although in many cases the access shed is much smaller due to barriers in the built environment (a lack of crosswalks, long blocks, unsafe overpasses or underpasses). The strategy of developing first/last mile solutions will increase the number of people walking within and beyond one half mile, by creating the conditions that allow people to travel a longer distance in the same amount of time (10 minutes). The number of bicyclists accessing transit is also anticipated to increase, both within the one-mile bike access shed and beyond to a new bike access shed of three miles (requiring a 15-minute bike ride). Infrastructure improvements may include dedicated bike routes, sidewalk enhancements, mid-block crossings (short-cuts), reduced waiting periods at traffic signals, bicycle parking, signage and wayfinding, and others.

   In Los Angeles County, Metro has proposed an extensive active transportation network to support first/last mile access, including pathways that extend one half mile around each of the Metro stations. The pathways are envisioned to provide facilities and design elements that are consistent across the transit system, enabling seamless and intuitive door-to-door journeys. Pathways will be established along the most heavily traveled routes to transit stations, connecting riders to and from population and employment centers and other major destinations. They will improve and shorten the time it takes to access transit, enhancing the overall transit experience. The pathways will also facilitate transfers between modes, including traditional modes such as buses and park and ride lots, as well as new mobility options such as bike share and car share that can be integrated throughout active transportation networks.

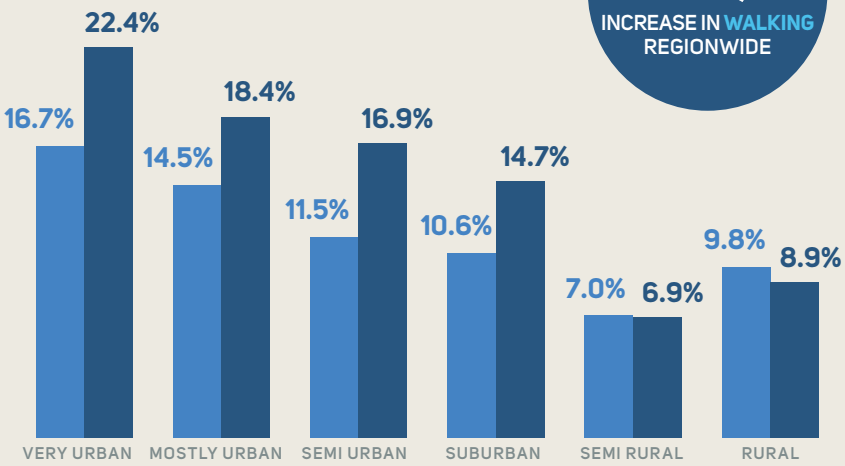
   First/last mile plans that include many of the same investments as outlined in Metro's first/last mile plan have been completed in Orange and San Bernardino counties as well. The regional strategy builds upon these planned investments, proposing enhancements at 224 rail stations by 2040.

5. **Livable Corridors:** From an active transportation standpoint, this strategy is similar to the first/last mile strategy noted above, but it targets high-quality bus corridors rather than the rail and fixed guideway system. (Planning for growth around Livable Corridors is also an important land use strategy) Livable Corridors share many of the same characteristics as transit-oriented rail corridors, but they have lower density development. Active transportation investments focus on sidewalk maintenance/enhancement, intersection improvements, bicycle lanes and bicycle boulevards to facilitate safe and easy access to mixed-use commercial nodes where residents can meet most of their daily needs and access bus service. In addition, this strategy promotes the inclusion of bike lanes, shared bus-bike lanes or separated bikeways. These run along or parallel to the main corridor to promote inter-regional connectivity. In developing the 2016 RTP/SCS, SCAG identified just under 3,000 miles of potential Livable Corridors. However, the investments proposed in the Plan under this strategy are not tied to a specific corridor; rather, the Plan assumes resources to support 670 miles accessing and along 154 miles of corridor. The Plan also provides policy language to support a much broader rollout of Livable Corridors to inspire and support local planning for projects. Having plans prepared with shovel-ready projects will allow our region to effectively compete for Affordable Housing and Sustainable Communities Program Inter-Connected Projects.

FOCUS ACTIVE TRANSPORTATION

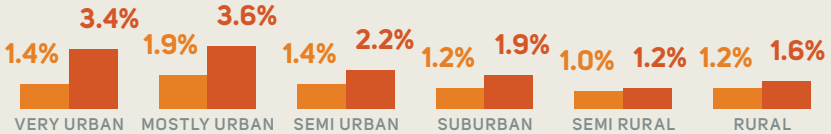
Biking & Walking in the Region

WALK TRIPS 2012 BASE YEAR 2040 PLAN



28% INCREASE IN WALKING REGIONWIDE

BIKE TRIPS 2012 BASE YEAR 2040 PLAN



71% INCREASE IN BIKING REGIONWIDE

Go Human and Traffic Safety

Across the SCAG region, the nature of streets and types of travel on them is changing dramatically. Bicycling is growing in popularity and the expansion of transit and explosion of new mobility services, like Uber and Lyft, means more people are walking and biking to make connections. However, as more people bicycle and walk, safety for these modes becomes increasingly important. In the SCAG region in 2012, 27 percent and five percent of all traffic fatalities were pedestrians and bicyclists, respectively.

Funded by a $2.3 million grant from the 2014 California Active Transportation Program, SCAG and its partners launched Go Human, a campaign to promote traffic safety and encourage people to walk or bike. Go Human is a reminder to all that people on the road are not just objects that get in our way—they are human beings. In late September 2015, messaging encouraging drivers to slow down and look for pedestrians and cyclists was distributed across all six counties in both English and Spanish. Advertisements appeared on local transit buses, bus shelters, Facebook, Pandora and local radio stations throughout the region. The launch date coincided with the decline in daylight hours, a period when pedestrian collisions begin to peak.

Go Human is a collaborative effort with county transportation commissions, county health departments and local cities and jurisdictions across the region. SCAG has worked with partners to expand the initial advertising purchases through partner newsletters, advertisements on websites, posters in local facilities and on social media. For example, the Los Angeles County Department of Public Works donated advertising space at 100 bus shelters. SCAG's funding also includes the production of toolkits and trainings to promote active transportation and the implementation of open streets and temporary events starting in spring 2016. For more information on the campaign, visit **www.gohumansocal.org**.

gohuman

6. **Bike Share Services:** Bike share is a point-to-point service combining the convenience of a bicycle with the accessibility of public transportation.[6] Using closely packed bike rental kiosks in heavily urbanized areas, bike share is designed to replace short-distance motor vehicle trips, reduce parking demand and complement local bus services such as DASH in the City of Los Angeles. Most importantly, bike share acts as a first/last mile strategy and it will be closely integrated with high quality transit stations. Los Angeles Metro, Santa Monica and Long Beach are currently implementing bike share within Los Angeles County. Bike share is anticipated to grow beyond these initial areas over the course of the Plan. A pilot program was recently completed in the City of Fullerton, in Orange County. The University of California, Irvine already has a bike share system in place for students and faculty. The regional bike share system will be comprised of about 8,800 bikes and 880 stations/kiosks.

Short Trips Strategies

For the purposes of this RTP/SCS, SCAG considers short trips as any trip less than three miles. These trips are primarily the utilitarian trips we take every day to the store, school or a restaurant. Planning policy objectives, including reducing VMT and greenhouse gas emissions and improving public health, depend highly on our region's ability to address these short trips. That's because trips less than three miles account for 38 percent of all trips in the region. Short trips can easily be taken by walking or biking.

The land use strategies described earlier in this chapter and promoted by the 2016 RTP/SCS seek to improve location efficiency—in other words, minimize the distance between origins and destinations to create even more short trips in the future. The short trip strategies described below aim to ensure that the roadway network evolves to help realize the walkable/bikeable vision advanced by land use strategies in regional and local plans, and improve mobility and reduce travel times in locations that are already considered location-efficient.

7. **Sidewalk Quality:** The Plan calls for 10,500 miles of sidewalks to be repaired or improved. This includes making them Americans with Disabilities Act (ADA) compliant and adding amenities such as exercise spots (logs or other no-maintenance objects that can be used for sitting, stretching or mild exercise) and rest seats for older walkers. These improvements are in addition to sidewalk enhancements incorporated into the other active transportation strategies.

8. **Local Bikeway Networks:** The region's Local Bikeway Networks promote local mobility, while also providing the needed bikeway density to interconnect with the regional bikeway network. The Plan proposes expanding the local bikeway network by an additional 6,016 miles. This is in addition to the 2,760 additional bikeway miles incorporated into other active transportation strategies, bringing total regional, local and greenway bikeway mileage to 12,700.

9. **Neighborhood Mobility Areas:** This strategy is targeted to locations that have a high proportion of short trips due to the mix of land uses, a fairly dense street grid pattern and the presence of locally serving retail destinations. These locations, however, do not benefit from high quality transit. Where Livable Corridors focus on connections to a corridor, Neighborhood Mobility Areas focus on connections within the neighborhood—to schools, places of worship, parks or greenways, and other destinations. SCAG has identified potential locations in the region to establish Neighborhood Mobility Areas. However, the investments proposed in the Plan under this strategy are not tied to a specific community. Some of the practices that inform this concept include: Level of Traffic Stress (LTS) bicycle planning, NEV planning, Plug-in Vehicle (PEV) readiness planning and a geographic analysis of commute trip lengths. These planning practices are based on the idea that non-auto trips increase as the perceived danger and anxiety for the user decreases.

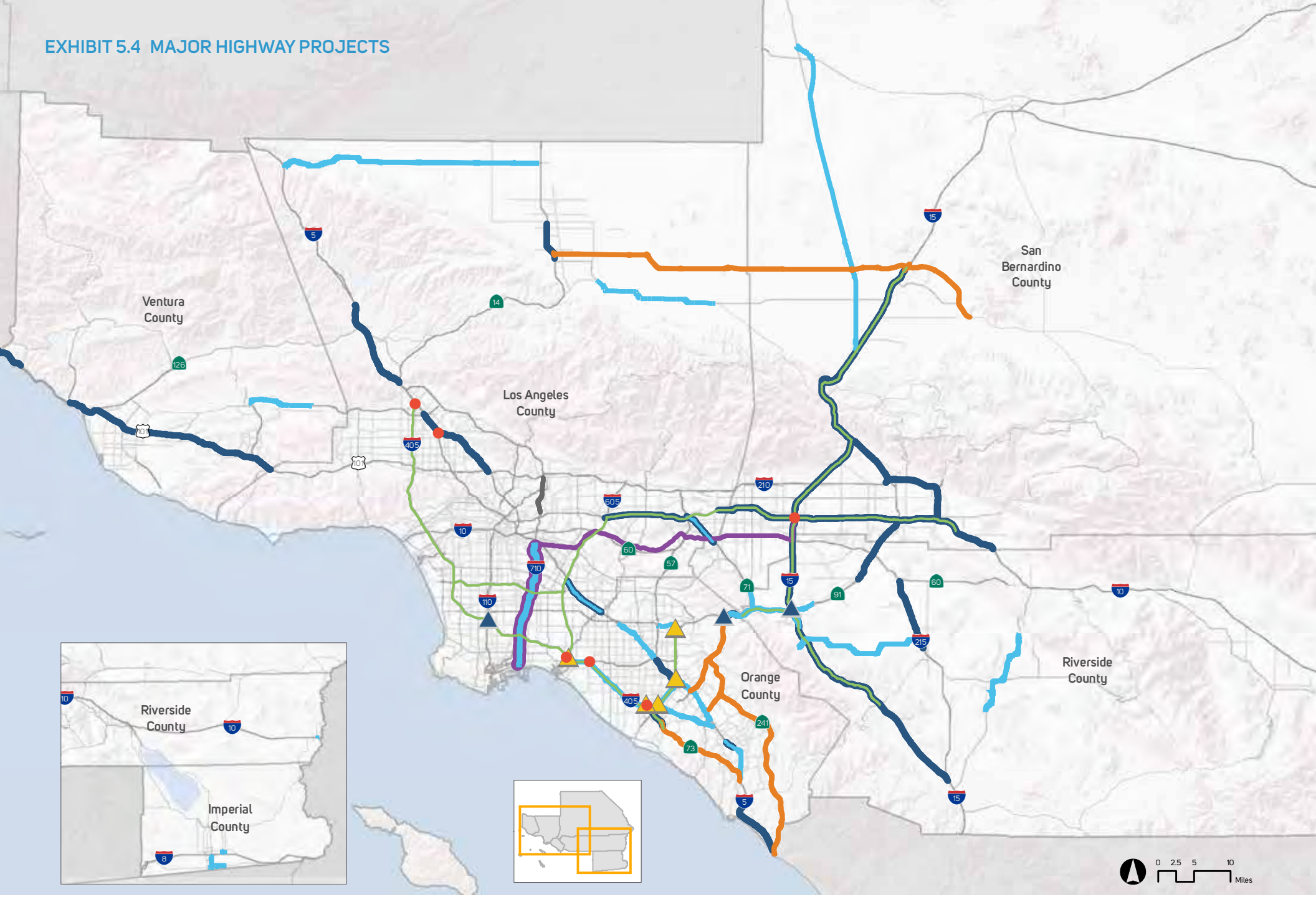
Education/Encouragement Strategies

Getting more people to bike and walk is not just about building the infrastructure. Individuals must feel safe biking and walking. The 2016 RTP/SCS Safety campaigns have two strategies: Safe Routes to School, which focuses on instilling safe habits at a young age while encouraging walking and biking to school; and a Safety/Encouragement campaign, which aims to reach all roadway users through a mix of education and training seminars and encouragement strategies.

10. **Safe Routes to School:** Safe Routes to School is a comprehensive TDM strategy aimed at encouraging children to walk and bicycle to school. It includes a wide variety of implementation strategies centered on the "6 Es"—Education, Encouragement, Engineering,

[6] King County Bike Share Business Plan. (2012). The Bike Share Partnership. Accessed at http://altaplanning.com/wp-content/uploads/King_County_Bike_Share_Business_Plan_0.pdf.

EXHIBIT 5.4 MAJOR HIGHWAY PROJECTS



(Source: SCAG)

Enforcement, Evaluation and Equity. When implemented, the 6 Es improve safety, reduce congestion and VMT, improve air quality and increase the physical activity of students and their parents—which improves public health outcomes. SCAG works with each county through SCAG's sustainability joint work programs, which are collaborative planning programs designed to support regional sustainability goals through local projects. Each joint-work program includes a Safe Routes to School program component.

11. **Education/Encouragement Campaigns:** Safety campaigns that employ advertising, public service announcements and media kits are designed to educate the public on the importance of safety. Other efforts aim to educate bicyclists, pedestrians and motorists on the rights and responsibilities of sharing the road. The 2016 RTP/SCS anticipates that these campaigns will be conducted every five years during the course of the Plan.

Highways and Arterials

The majority of trips in our region today is still made on our region's highways and arterials. Yet, the expansion of our highways and arterials has slowed down over the last decade. Revenue from traditional sources to fund transportation improvements is declining and costly expansions to address congestion may not be financially feasible. However, given that critical gaps and congestion chokepoints still exist within the network, improvements beyond TSM and TDM strategies need to be considered. Closing these gaps to complete the system will allow residents and visitors alike to enjoy improved access to opportunities such as jobs, education, recreation and healthcare.

Our highways and arterials serve as a crucial backbone of our overall regional transportation network. As part of the 2016 RTP/SCS, SCAG continues to advocate for a comprehensive solution based on a system management approach to manage and maintain our highway and arterial network. Although we recognize that we can no longer rely on system expansion alone to address our mobility needs, critical gaps and congestion chokepoints in the network still hinder access to certain parts of the region. County transportation plans have identified projects to close these gaps, eliminate congestion chokepoints and complete the system. Such improvements are included in the 2016 RTP/SCS. EXHIBIT 5.4 and TABLE 5.5 highlight some of the proposed highway completion projects. For projects that are currently or will be going through environmental clearance, SCAG would update the list as part of future RTP amendments if warranted by the nature of the project changes. A comprehensive list of projects is provided in the Project List Appendix.

Our region boasts one of the most comprehensive High Occupancy Vehicle (HOV) systems in the nation and heavy investments have been made to expand it. As part of the Plan, strategic HOV gap closures, highway-to-highway direct HOV connectors, and HOV direct access ramps need to be proposed as a strategy to complete the system. In addition, it should be noted that various highways within Orange County feature continuous access on certain HOV lanes. Studies have shown that continuous access HOV lanes do not perform any worse compared with limited access HOV lanes. TABLE 5.6 highlights some of the Plan's major HOV projects.

Our region's arterial system is comprised of local streets and roads that serve many different functions. One is to link our region's residents with schools, jobs, healthcare, recreation, retail and other destinations. Our region's arterials account 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 they can provide alternatives to them. Beyond motor vehicles, our arterials serve other modes of travel, including transit and active transportation. The 2016 RTP/SCS proposes a variety of arterial projects and improvements throughout the region. Operational and technological improvements can maximize system productivity through various cost-effective and non-labor intensive means—beyond improvements to expand capacity. These include signal synchronization, spot widening and adding grade separations at major intersections. In addition, as part of the Complete Streets Deputy Directive[7] (DD-64-R2), improvements such as bicycle lanes, lighting, landscaping, sidewalk widening and ADA compliance measures have shifted the focus of arterials toward considering multiple users—while also providing a greater sense of place. The 2016 RTP/SCS highways and local arterials framework and guiding principles are summarized here:

- 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.

[7] Complete Streets – Integrating the Transportation System. (2014) [Deputy Directive]. California Department of Transportation. Accessed at: http://www.dot.ca.gov/hq/tpp/offices/ocp/docs/dd_64_r2.pdf.

TABLE 5.5 SAMPLE MAJOR HIGHWAY PROJECTS COMMITTED BY THE COUNTIES

	COUNTY	ROUTE	DESCRIPTION	COMPLETION YEAR	COST ($1,000s)
MIXED-FLOW LANES	Imperial	SR-98	Widen and improve SR-98 or Jasper Rd to 4/6 lanes	2025	$1,170,483
	Imperial	SR-111	Widen and improve to a 6-lane highway with interchanges to Heber, McCabe, and Jasper, and overpass at Chick Rd	2030	$999,136
	Los Angeles	SR-57/SR-60	Improve the SR-57/SR-60 interchange	2029	$475,000
	Orange	I-5	Add one mixed-flow lane in each direction from SR-57 to SR-91	2040	$305,924
	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	2030	$274,900
	Orange	SR-91	Add one eastbound mixed-flow lane on SR-91 from SR-57 to SR-55 and one westbound mixed-flow lane from Kraemer to State College	2030	$425,000
	Orange	I-405	Add one mixed-flow lane in each direction from I-5 to SR-55	2030	$374,540
	Orange	I-405	Add one mixed-flow lane in each direction from SR-73 and I-605	2022	$1,300,000
	Ventura	SR-118	Add one mixed-flow lane in each direction from Tapo Canyon Rd to LA Avenue	2025	$216,463
EXPRESS LANES	Los Angeles	I-110	Construct express lane off-ramp connector from 28th St to Figueroa St	2023	$55,000
	Riverside	I-15	Add one express lane in each direction from Cajalco Rd to SR-7	2029	$453,174
	San Bernardino	I-15	Add two express lanes in each direction from US-395 to I-15/I-215 interchange	2030	$687,994
HOV LANES	Los Angeles	I-5	Add one HOV lane in each direction from Weldon Canyon Rd to SR-14	2017	$410,000
	Los Angeles	SR-14	Add one HOV lane in each direction from Ave P-8 to Ave L	2027	$120,000
	Los Angeles	SR-71	Convert expressway to highway-add one HOV lane and one mixed-flow lane	2028	$13,392
	Orange	I-5	Add one HOV lane in each direction from Pico to SD County Line	2040	$237,536
	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-10	Add one HOV lane in each direction from Ford to RV County Line	2030	$126,836
	San Bernardino	I-215	Add one HOV lane in each direction from SR-210 to I-15	2035	$249,151
	San Bernardino	I-210	Add one HOV lane in each direction from I-215 to I-10	2040	$178,780
	Ventura	US-101	Add one HOV lane in each direction from LA/VEN County Line to SR-33	2029	$132,000

TABLE 5.6 MAJOR HOV LANE PROJECTS

COUNTY	ROUTE	FROM	TO	COMPLETION YEAR
Los Angeles	I-5	Weldon Canyon	SR-14	2017
Los Angeles	I-5	Pico Canyon	Parker Rd	2025
Los Angeles	SR-14	Ave P-8	Ave L	2027
Los Angeles	SR-71	Mission Blvd	Rio Rancho Rd	2028
Orange	I-5	Pico	SD County Line	2040
Orange	I-5	SR-55	SR-57	2018
Orange	SR-73	I-405	MacArthur	2040
Riverside	I-15	SR-74	I-15/I-215 Interchange	2039
Riverside	I-215	Nuevo Rd	Box Springs Rd	2030
San Bernardino	I-10	Ford St	RV/SB County Line	2030
San Bernardino	I-215	SR-210	I-15	2035
San Bernardino	I-210	I-215	I-10	2040
Ventura	US-101	Moorpark Rd	SR-33	2029
HIGHWAY TO HIGHWAY HOV CONNECTORS				
Los Angeles	I-5/I-405	Connector (partial)		2029
Los Angeles	I-405/I-110	Connector Improvements		2021
Orange	I-405/SR-73	Connector		2040
San Bernardino	I-10/I-15	Connector (partial)		2035

TABLE 5.7 REGIONAL EXPRESS LANE NETWORK

	COUNTY	ROUTE	FROM	TO
EXPRESS LANE ADDITIONS	Los Angeles	I-10	I-605	San Bernardino County Line
	Los Angeles	I-105*	I-405	I-605
	Los Angeles	I-405**	I-5	Orange County Line
	Los Angeles	I-605	I-10	Orange County Line
	Orange	SR-55	SR-91	I-405
	Orange	SR-73	I-405	MacArthur Boulevard
	Orange	I-405**	Los Angeles County Line	SR-55
	Orange	I-605	Los Angeles County Line	I-405
	Riverside	I-15**	San Bernardino County Line	SR-74
	Riverside	SR-91*	Orange County Line	I-15
	San Bernardino	I-10**	Los Angeles County Line	Ford Street
	San Bernardino	I-15**	High Desert Corridor	Riverside County Line
EXPRESS LANE DIRECT CONNECTORS	Los Angeles	I-405/I-110	I-405 NB to I-110 NB and I-110 SB to I-405 SB	
	Orange	I-5/SR-55	Existing HOV to proposed express lane direct connector	
	Orange	SR-91/SR-55	Existing HOV to proposed express lane direct connector	
	Orange	SR-91/SR-241	SR-241 NB to SR-91 EB and SR-91 WB to SR-241 SB	
	Orange	I-405/SR-55	Existing HOV to proposed express lane direct connector	
	Orange	I-405/SR-73	Planned HOV to proposed express lane direct connector	
	Orange	I-405/I-605	Existing HOV to proposed express lane direct connector	
	Riverside	SR-91/I-15	SR-91 EB to I-15 SB and I-15 NB to SR-91 WB	

*Notes: * Dual express lanes for entire length ** Dual express lanes for a section*

- Any new roadway capacity project must be developed with consideration and incorporation of congestion management strategies, including demand management measures, operational improvements, transit and ITS, where feasible.
- Focus on addressing non-recurring congestion with new technology.
- Support Complete Streets opportunities where feasible and practical.

Regional Express Lane Network

Consistent with our regional emphasis on the system management pyramid, recent planning efforts have focused on enhanced system management, including the integration of value pricing to better use existing capacity and offer users greater travel time reliability and choices. Express lanes that are appropriately priced to reflect demand can outperform non-priced lanes in terms of throughput, especially during congested periods. Moreover, revenue generated from priced lanes can be used to deliver the needed capacity provided by the express lanes sooner and to support complementary transit investments.

The regional express lane network included in the 2016 RTP/SCS builds on the success of the State Route 91 express lanes in Orange County, as well as the Interstate 10 and Interstate 110 express lanes in Los Angeles County. Additional efforts underway include the extension of the State Route 91 express lanes to Interstate 15, as well planned express lanes on Interstate 15 in Riverside County. Express lanes are also planned for Interstate 15 and Interstate 10 in San Bernardino County and Interstate 405 in Orange County. TABLE 5.7 displays the segments in the proposed regional express lane network.

Goods Movement

Recent regional efforts have focused on strategies to develop a coherent, refined and integrated regional goods movement system that would address expected growth trends. Key strategies are highlighted below.

Regional Clean Freight Corridor System

The 2016 RTP/SCS continues to envision a system of truck-only lanes extending from the San Pedro Bay Ports to downtown Los Angeles along Interstate 710, connecting to the State Route 60 east-west segment and finally reaching Interstate 15 in San Bernardino County. Such a system would address the growing truck traffic and safety issues on core highways through the region and serve key goods movement industries. Truck-only lanes add capacity in congested corridors, improve truck operations and safety by separating trucks and autos, and provide a platform for the introduction of zero- and near zero-emission technologies. Ongoing evaluation of a regional freight corridor system is underway, including recent work on an environmental impact report (expected to be recirculated in 2016) for the Interstate 710 segment. Additionally, as a part of the 2016 RTP/SCS, SCAG continues to refine the east-west corridor component of the system along the State Route 60 corridor. Current efforts have focused on working to identify an initial operating segment. Additional study is underway to evaluate the East-West Freight Corridor project concept.

The East-West Freight Corridor would carry between 58,000 and 78,000 clean trucks per day that would be removed from adjacent general-purpose lanes and local arterial roads. The corridor would benefit a broad range of goods movement markets, both port-related and local goods movement-dependent industries. Truck delay would be reduced by up to 11 percent. Truck traffic on State Route 60 general purpose lanes would be reduced by 42 to 82 percent, depending on location; it would be reduced by as much as 33 percent on Interstate 10 and as much as 20 percent on adjacent arterials. Separating trucks and autos would also reduce truck-involved collisions on east-west highways that currently have some of the highest collision levels in the region (20–30 collisions a year on certain segments).

The regional freight corridor system also includes an initial segment of Interstate 15 that would connect to the East-West Freight Corridor, reaching just north of Interstate 10. Additional study is anticipated for this segment.

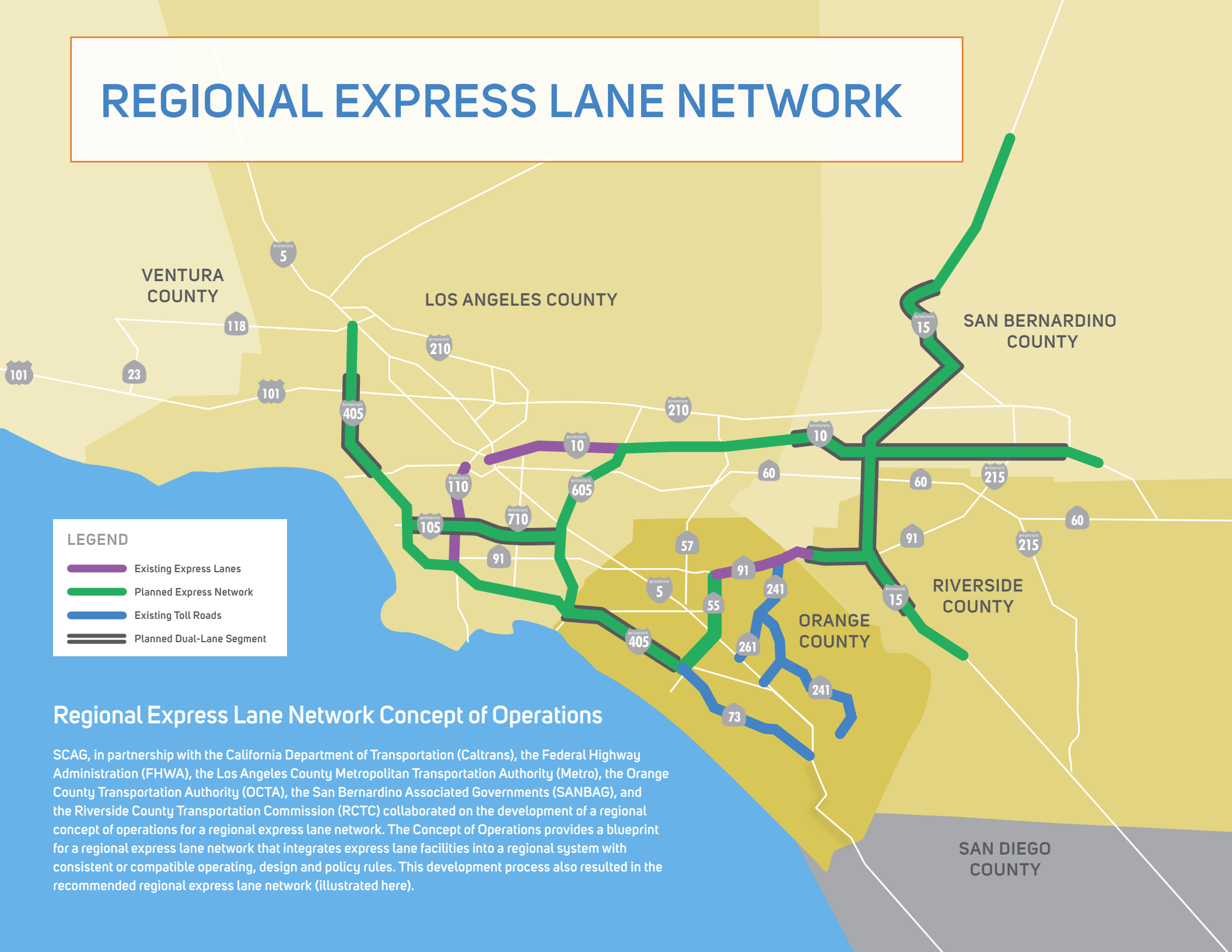
Truck Bottleneck Relief Strategy

In 2013, the American Transportation Research Institute (ATRI) identified the Los Angeles Metropolitan Area as leading the nation in costs to the trucking industry caused by traffic congestion, with nearly $1.1 billion in added operational costs to truckers.[8] The SCAG region had five of the top 100 truck bottlenecks in the U.S. in 2014—identified by ATRI as follows:

#8	State Route 60 at State Route 57 in Los Angeles County
#17	Interstate 710 at Interstate 105 in Los Angeles County
#37	Interstate 10 at Interstate 15 in San Bernardino County
#39	Interstate 15 at State Route 91 in Riverside County
#55	Interstate 110 at Interstate 105 in Los Angeles County.[9]

[8] Cost of Congestion to the Trucking Industry. (2014). American Transportation Research Institute.
[9] Congestion Impact Analysis of Freight Significant Highway Locations. (2014). American Transportation Research Institute.

REGIONAL EXPRESS LANE NETWORK



Regional Express Lane Network Concept of Operations

SCAG, in partnership with the California Department of Transportation (Caltrans), the Federal Highway Administration (FHWA), the Los Angeles County Metropolitan Transportation Authority (Metro), the Orange County Transportation Authority (OCTA), the San Bernardino Associated Governments (SANBAG), and the Riverside County Transportation Commission (RCTC) collaborated on the development of a regional concept of operations for a regional express lane network. The Concept of Operations provides a blueprint for a regional express lane network that integrates express lane facilities into a regional system with consistent or compatible operating, design and policy rules. This development process also resulted in the recommended regional express lane network (illustrated here).

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 from passenger vehicles and trucks.

In past RTPs, SCAG directly addressed truck bottlenecks by developing a coordinated strategy to identify and mitigate the top-priority truck bottlenecks. This analysis has been updated for the 2016 RTP/SCS and includes a "refresh" of truck bottleneck delays for the locations where congestion data were available. It also identifies potential new truck bottlenecks.

The 2016 RTP/SCS allocates an estimated $5 billion toward strategies to relieve goods movement bottlenecks. Examples of bottleneck relief strategies include ramp meterings, extending merging lanes, improving ramps and interchanges, improving capacity and adding auxiliary lanes. Additional information is provided in the Goods Movement Appendix.

Rail Strategy

The region's railroad system provides critical connections between the largest port complex in the country and producers and consumers throughout the U.S. More than half of the international cargo arriving at the San Pedro Bay Ports uses rail. Railroads also serve domestic industries, predominantly for long-haul freight leaving the region. The extensive rail network in the SCAG region offers shippers the ability to move large volumes of goods over long distances at lower costs, compared with other transportation options. The 2016 RTP/SCS continues to incorporate the following rail strategies for goods movement:

- **Mainline Rail Improvements and Capacity Expansion:** This includes double or triple tracking certain rail segments, implementing new signal systems, building universal crossovers and constructing new sidings. These improvements would benefit both freight rail and passenger rail service, depending on their location.
- **Rail Yard Improvements:** This includes upgrades to existing rail yards, as well as construction of new yards to handle the projected growth in cargo volumes.
- **Grade Separations of Roads From Rail Lines:** These projects reduce vehicular delay, improve emergency vehicle access, reduce the risk of accidents and lower emissions levels.
- **Rail Operation Safety Improvements:** This includes technology such as Positive Train Control (PTC) that can greatly reduce the risk of rail collisions.

The benefits of the rail strategies to the region are considerable and include mobility, safety and environmental gains. These strategies could eliminate nearly 5,500 hours of vehicle delay per day at grade crossings, decrease emissions (NOx, CO2 and PM 2.5) by nearly 44,000 lb. per day, and reduce overall train delay to the year 2000 level.

Goods Movement Environmental Strategy

Along with growth in the region's population and economy comes a growing demand to deliver goods in areas where people live and work. As a result, goods movement transportation has been a major source of emissions that contributes to regional air pollution problems, as well as localized air pollution "hot spots" that can have adverse health impacts. Moreover, much of the SCAG region (and nearly all of the urbanized area) does not meet federal ozone and fine particulate (PM 2.5) air quality standards. The transportation of goods is also a major source of greenhouse gas emissions that contribute to global climate change. Because of the need to maintain and improve our quality of life, economically and environmentally, SCAG proposes the environmental strategy below to address the air quality impacts of goods movement, while also allowing for the efficient and safe goods movement flow throughout the region. A critical component of this strategy, as described below, is the integration of advanced technologies that have co-benefits such as air quality, energy security and economic growth opportunities.

The 2016 RTP/SCS focuses on a two-pronged approach for achieving an efficient freight system that reduces environmental impacts. For the near term, the regional strategy supports the deployment of commercially available low-emission trucks and locomotives while centering on continued investments into improved system efficiencies. For example, the region envisions increased market penetration of technologies already in use, such as heavy-duty hybrid trucks and natural gas trucks. Applying ITS solutions to improve operational efficiency is also recommended. In the longer term, the strategy focuses on advancing technologies—taking critical steps now toward the phased implementation of a zero- and near zero-emission freight system. SCAG is cognizant of the need to incorporate evolving technologies with plans for new infrastructure. These include technologies to fuel vehicles, as well as to charge batteries and provide power.

The plan to develop and deploy advanced technologies includes phased implementation, during which technology needs are defined, prototypes are tested and developed, and efforts are scaled up. FIGURE 5.3 illustrates this process. The phases are summarized as follows:

FIGURE 5.3 PHASES OF TECHNOLOGY DEVELOPMENT AND DEPLOYMENT

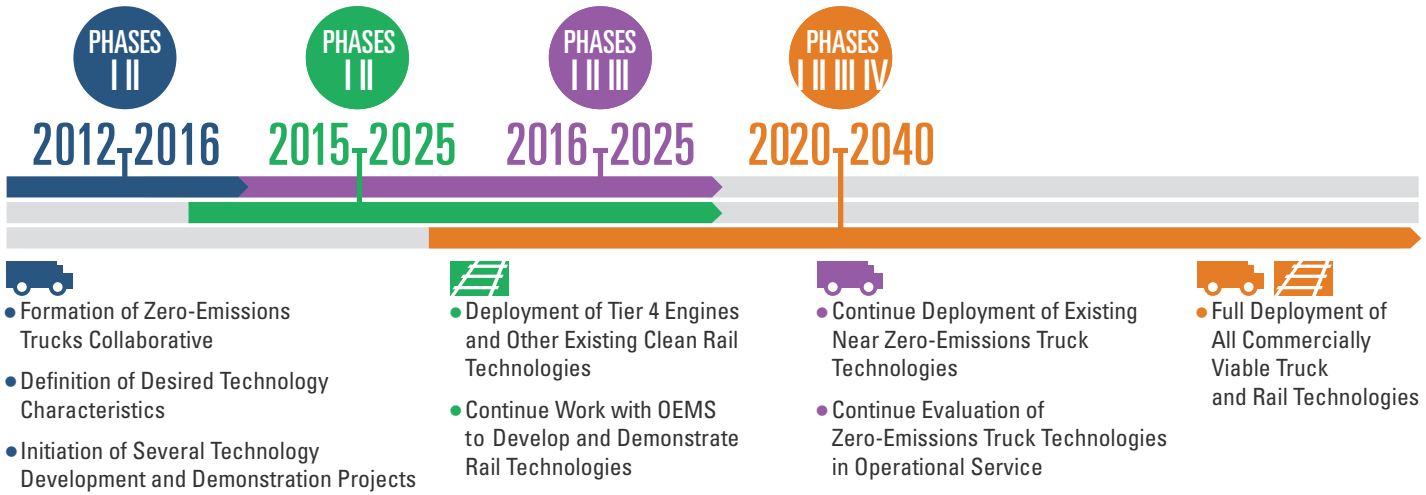
PHASE I Project Scoping and Evaluation of Existing Work: Continue to build on current regional research and technology testing efforts to further define the needs that the new technology must provide and to better understand the current capabilities, costs and stage of development of potential technologies.

PHASE II Evaluation, Development and Prototype Demonstrations: Evaluate, develop and test initial vehicle prototypes. Work with public and private sector partners to secure funding commitments for the development of new technology prototypes and demonstrations.

PHASE III Initial Deployment and Operational Demonstration: Initially deploy potential technologies, preferably with industry partners who can evaluate and report on their performance in the real world. Funding may be used for incentives for initial deployment and the continued evaluation and development of technologies.

PHASE IV Full-Scale Demonstrations and Commercial Deployment: Scale up deployment of viable technologies and implement needed regulatory and market mechanisms to launch them commercially. The Phase IV time frame accommodates the readiness of different levels of technology for various applications.

FIGURE 5.4 TRUCK AND RAIL TECHNOLOGY DEVELOPMENT AND DEPLOYMENT TIMELINE



Phases of New Technology Development and Deployment

The time frames illustrated in FIGURE 5.4 suggest a path toward implementing the phases described above. This cycle of technology development is continuous, and it will renew itself as new innovations emerge and technologies continue to evolve. The timelines presented are broad, to capture the breadth of technologies in various stages of development and to allow for further innovation in this sector. This path is discussed in greater detail in the Goods Movement Appendix.

Since SCAG adopted the 2012 RTP/SCS, the region has attracted outside funding and committed its own funding to support research and development efforts. Several studies have been conducted to date that contribute to "project scoping" by providing a greater understanding of the regional truck market and how truck use defines key performance parameters such as range and power needs. To evaluate and develop prototypes, three large-scale research and development efforts are underway to develop and test zero-emission trucks and charging infrastructure. These projects require continuing collaboration between original equipment manufacturers and public sector agencies.

Meeting Airport Demand

As discussed in Chapter 2, our region is served by a multiple airport system that includes commercial airports, military airfields and general aviation airports. All of these airports function as part of a system that provides a high level of air service to our residents and to visitors. Services that are not practical or financially viable at one airport in the system can be provided at an alternative facility. In addition, many of our airports function as relievers for other airports in case of emergencies or irregular operations due to inclement weather or other unusual events.

The commercial passenger and cargo airports in our region, especially those in the urbanized areas, each face constraints on their operations. At each airport, these constraints may include airspace conflicts, runway configurations, terminal capacity, ground access congestion and legal restrictions such as noise control ordinances. Because of the varying constraints on individual airports, it is important to maintain a diverse group of airports to serve the overall air travel demand of the region extending into the future.

Accommodating the future demand for air passenger and air cargo is critical to the economic health of the region. The economic impact of air travel to the region is expected to increase from $27.4 billion in 2012 to $43.8 billion in 2040 (in 2012 dollars), an increase of nearly 60 percent. The number of jobs supported by visitors arriving by air is expected to increase from 275,000 to 452,000. If the region's aviation system and supporting ground access network cannot accommodate the expected demand, some of this potential economic activity could be lost to other regions.

Forecasting Air Passenger Demand Based on the historical relationship between economic activity and the demand for air travel, as well as expected future economic conditions in our and other regions, total air passenger demand in our region is expected to increase from 91.2 million annual passengers (MAP) in 2014 to 136.2 MAP in 2040. This represents a 1.6 percent annual growth rate over the forecast period. This regional demand forecast for air passenger travel is strong and reflects the potential for the region to have long-term economic recovery and growth. More detail about the forecast methodology is presented in the Aviation & Airport Ground Access Appendix.

Some of the airports in our region benefit from having long runways, uncongested airspace and spacious, modern terminals. Airports with these benefits are expected to be able to accommodate any growth in demand foreseeable through 2040. However, four of the commercial airports in urban parts of the region face physical or policy constraints that may limit their capacity to accommodate increases in demand by 2040. The individual airport demand forecasts reflect the following constraints:

- Burbank Bob Hope Airport: 7.3 MAP (airfield capacity)
- Los Angeles International Airport: 82.9–96.6 MAP (airfield capacity)
- Long Beach Airport: 5.0 MAP (noise compatability ordinance)
- John Wayne Airport: 12.5 MAP (settlement agreement adopted by Board of Supervisors)

An analysis of these constraints is included in the Aviation & Airport Ground Access Appendix.

Several recent trends in the airline industry were considered in the capacity analyses. For example, the average number of seats on commercial flights in and out of airports in our region increased from 107 in 2007 to 119 in 2014, so each "operation" (take-off or landing) on the airfield and each "turn" (arrival and departure) of a gate can include more passengers. Therefore, as a result of airline industry trends, the estimated capacity of several constrained airports has increased compared to prior analyses, although there may not have been any physical change at the airport itself.

2040 AIR PASSENGER FORECAST

Airport Specific Demand, *Million Annual Passengers (MAP)*

Midpoint of 2040 Total
Regional Aviation Demand:

136.2 MAP

Based on the overall forecast regional demand for air travel, the origins and destinations of trips within the region and the capacity constraints of individual airports, the figure "2040 Airport Demand Forecasts" on the previous page presents the anticipated air travel demand at each commercial airport in our region in 2040.

Forecasting Air Cargo

The development of the air cargo demand forecasts is similar to that of the air passenger forecasts. The demand for air cargo is driven largely by the economic interrelationship of our region and other regions around the world. Because of its high cost, shipment by air is used primarily for time-sensitive and high-value goods. Total air cargo transported through our region's airports has experienced an uneven recovery since the recession of 2007, but remained below year 2000 levels even in 2014. Based on the historical relationship between economic activity and the demand for air cargo, as well as expected future economic conditions in our and other regions, total air cargo demand in our region is expected to increase from 2.43 million metric tons in 2014 to 3.78 million metric tons in 2040. This represents a 1.8 percent annual growth rate over the forecast period.

In 2014, more than 99 percent of air cargo in our region was handled at five airports: Los Angeles International Airport (77 percent), Ontario International Airport (19 percent), Burbank Bob Hope Airport (2 percent), John Wayne Airport (0.7 percent) and Long Beach Airport (0.6 percent). Air cargo can be classified as "belly" cargo (carried in the bellies of passenger airplanes) or full-freighter cargo (carried in dedicated freighter aircraft). LAX handled nearly 99 percent of the region's belly cargo and 70 percent of the full-freighter cargo.

Following the 2012 RTP/SCS, the air cargo forecasts assume some redistribution of air cargo across the airports in the region. Cargo carried on passenger airlines or by their cargo divisions is unlikely to be redistributed because these carriers benefit from consolidation of their passenger and cargo facilities at the same airport. Cargo carried by integrated delivery services, such as FedEx and UPS, is also unlikely to be redistributed because of the major investments these companies have made in facilities at individual airports (primarily, Ontario International Airport). Therefore, only cargo carried by charter airlines or all-cargo airlines would potentially diversify to other airports and, of the cargo that could potentially diversify, only some actually will.

Airport Ground Access

The ground access network serving the region's airports is critical to both the aviation system and the ground transportation system. Passengers' choice of airports is based in part on the travel time to the airport and the convenience of access, so facilitating airport access is essential to the efficient functioning of the aviation system. In addition, airport related ground trips can contribute to local congestion in the vicinity of the airports.

Currently, more than 200,000 air passengers arrive at or depart from the region's airports every day. By 2040, this number is forecast to increase to more than 330,000. Passenger surveys indicate that three percent of passengers take transit to LAX and one percent take transit to Burbank Bob Hope Airport. Surveys are not available at other airports, but because these two airports have the best transit access in the region it is likely that the transit share at the remaining airports is significantly below one percent.

The large majority of air passengers use a motor vehicle, either their own or a rental vehicle, to get to and from the airport. About half of all air passengers in the region are picked up or dropped off at the airport by a friend or relative. Each end of these pick-up/drop-off air trips results in two ground trips: one to the airport followed by one returning from the airport. Therefore, taking steps to encourage travelers to use transit or other modes of shared transportation is vital.

To reduce ground transportation congestion related to air passenger travel, the 2016 RTP/SCS includes the following strategies:

- Support the regionalization of air travel demand
- Continue to support regional and inter-regional projects that facilitate airport ground access (e.g., High-Speed Train, High Desert Corridor)
- Support ongoing local planning efforts by airport operators, CTCs and local jurisdictions
- Encourage the development and use of transit access to the region's airports
- Encourage the use of modes with high average vehicle occupancy (AVO)
- Discourage the use of modes that require "deadhead" trips to/from airports

In recent years, airport operators, CTCs and SCAG have all undertaken their own initiatives to improve ground access at the region's aviation facilities. The sections below discuss recent efforts and recommended strategies to improve ground access at three existing commercial airports in the region that have invested considerably in improving ground access. A more detailed discussion

of ground access improvement strategies at airports across the region is included in the Aviation & Airport Ground Access Appendix.

Burbank Bob Hope Airport

Burbank Bob Hope Airport is the only airport in the region with a direct rail-to-terminal connection, via the recently completed Regional Intermodal Transportation Center (RITC). The RITC serves multiple modes, including public parking, a consolidated rental car facility, regional bus service and bicycles, and commuter rail at the Metrolink Ventura line station. A pedestrian bridge currently in design will further facilitate access between the train station and the airport. In addition, a second rail station is currently planned on the Metrolink Antelope Valley line. BurbankBus has recently begun operating all-day bus service between the North Hollywood Metro Red Line Station and the airport, utilizing the RITC.

Key 2016 RTP/SCS projects for Burbank Bob Hope Airport include:

- Increased Metrolink service systemwide
- Metro Red Line extension from North Hollywood to Burbank Bob Hope Airport
- New east-west BRT service from Orange Line/North Hollywood to Pasadena (no direct connection to Burbank Bob Hope Airport)

Additional strategies include:

- Construct new Metrolink Station on Antelope Valley Line
- Support increased Metrolink service to stations on Ventura Line and Antelope Valley Line
- Support recommendations of recent Ground Transportation and Land Use Study:
  - Improve transit connection to North Hollywood Red/Orange Line Station
  - Improve transit connection to Pasadena and Glendale
- Support the development of a High-Speed Train station on Hollywood Way and provide convenient access between the station and the airport

Los Angeles International Airport

LAX is owned and operated by Los Angeles World Airports (LAWA), a proprietary department of the City of Los Angeles. In December 2014, LAWA's Board of Airport Commissioners approved a plan to overhaul and modernize LAX's ground access and transportation connections for arriving and departing passengers. The approved program includes:

- The LAX Train (Automated People Mover System)
- Intermodal Transportation Facilities (ITF)
- Consolidated Rent-A-Car Center (CONRAC)
- Central terminal area improvements
- Connection with the under-construction Metro Crenshaw Line

The CONRAC will consolidate the numerous off-site rental car facilities in the surrounding area into one convenient location 1.5-miles east of LAX and adjacent to Interstate 405 for convenient regional highway access. Two ITFs are included in the program offering airport travelers locations for parking, passenger pick-up and drop off, and flight check-in outside the terminal and away from the congested World Way roadway within LAX. The eastern ITF will include Metro facilities to connect with Metro's planned 96th Street/Aviation Boulevard Station serving the under-construction Metro Crenshaw/LAX Transit Project and existing Metro Green Line, as well as a bus plaza for Metro and municipal buses. The LAX Train will be an elevated automated people mover system with six stations connecting the CONRAC, both ITFs and Metro facilities to the LAX passenger terminals. The environmental review process for this project began in 2015 and construction is expected to begin in 2017.

Key 2016 RTP/SCS projects for LAX include:

- New Crenshaw/Green Line station at 96th/Aviation
- Automated People Mover

Additional strategies include:

- Support construction of Automated People Mover (APM) with connection to Metro Crenshaw Line
- Support construction of Consolidated Rental Car facility and Intermodal Transportation Facilities to reduce private vehicles and shuttles in Central Terminal Area
- Support expansion of FlyAway service to new markets
- Support ability of ride-hailing services to pick up passengers, to reduce deadhead trips in the central terminal area

Ontario International Airport

The 2014 SANBAG Ontario Airport Rail Access Study examined six alternatives to connect Ontario Airport to the regional rail system. One of these alternatives is the Metro Gold Line Foothill Extension Phase 2C that would extend the eastern terminus of the Metro Gold Line to the airport. However, Phase 2C is not funded at this time. Improved transit access from the Rancho Cucamonga Metrolink Station is included in the 2016 RTP/SCS project list.

Key 2016 RTP/SCS projects for Ontario Airport include:

- New Rancho Cucamonga Metrolink to ONT rail connection
- Numerous local highway interchange, arterial and grade separation improvements

Additional strategies include:

- Support recommendations of SANBAG Ontario Airport Rail Access Study to initiate transit connection to Metrolink and build transit market
- Continue analysis of transit options in upcoming SCAG Inter-County Transit and Rail Study
- Support development of intermodal transportation center
- Explore possibility of direct access from future Interstate 10 Express Lanes
- Consider focus on tourist charters that can attract passengers and use high-capacity vehicles for ground access
- Continue improvements to highways and arterials

For more details on how the region is expected to meet demands for airport service in the future, see the Aviation & Airport Ground Access Appendix.

TECHNOLOGICAL INNOVATION AND 21ST CENTURY TRANSPORTATION

Since SCAG adopted the 2012 RTP/SCS, technology and innovation have emerged as major themes of this Plan update. Technology as a concept is a very broad topic. The term has myriad connotations and encompasses products such as smart phones and electric cars; advancements in software development such as real-time travel information and online banking; and new service paradigms such as ride sourcing and peer-to-peer home sharing. Some of these so-called "new" concepts have actually been around for a long time, but only recently have they scaled up because of technological innovations. For example, car sharing and bike sharing concepts have been in development since the 1980s, but only in recent years has the ubiquity of cellular phones with Internet access, precise geographic mapping and the ability to instantly approve payments between users and providers made these systems more useful to a wider audience. The 2016 RTP/SCS uses the term "mobility innovations" to characterize the new technologies that help us move about the region.

MOBILITY INNOVATIONS

The 2016 RTP/SCS includes policies and analyzes the market growth of four key new mobility innovations: Zero-Emissions Vehicles, Neighborhood Electric Vehicles, Car sharing services and Ridesourcing (also known as Transportation Network Companies or TNCs). Please see the Mobility Innovations Appendix for policy recommendations and additional information.

Zero-Emissions Vehicles

While SCAG's policies are technology neutral with regard to supporting zero- and/or near zero-emissions vehicles, this section will focus on zero-emissions vehicles. Since SCAG adopted the 2012 RTP/SCS, the Governor's Office released the Zero Emissions Vehicle (ZEV) Action Plan for 2013 and 2015. These plans identified state level funding to support the implementation of Plug-in Electric Vehicle (PEV) and Hydrogen Fuel Cell refueling networks. As part of the 2016 RTP/SCS, SCAG modeled PEV growth specific to Plug-in Hybrid Electric Vehicles (PHEV) in the SCAG region. These are electric vehicles that are powered by a gasoline engine when their battery is depleted. The 2016 RTP/SCS proposes a regional charging network that will increase the number of PHEV miles driven on electric power. In many instances, these chargers may double the electric range of PHEVs. A fully funded regional charging network program would result in a reduction of one percent per capita greenhouse gas emissions.

Neighborhood Electric Vehicles (NEVs)

Neighborhood Mobility Areas reflect state and local policies to encourage the use of alternative modes of transportation for short trips. In the SCAG region, about 38 percent of all trips are three miles or less, but nearly 78 percent of these trips are made by driving full-sized cars. These short trips can easily be taken using an NEV. Policies to increase the purchase and roadway designs that increase the use of NEVs for short trips in Neighborhood Mobility Areas would result in a reduction of 0.1 percent per capita greenhouse gas emissions.

Shared Mobility (Includes the concept of Ridesourcing)

Shared Mobility refers to new mobility paradigms as well as old models that

GHG REDUCTIONS FROM MOBILITY INNOVATIONS 2040

ZERO-EMISSIONS VEHICLE (ZEV)

1.0%

NEIGHBORHOOD ELECTRIC VEHICLE (NEV)

0.1%

CARSHARING/ RIDESOURCING

0.9%

are finding new markets and methods of delivery, thanks to new technology platforms. Shared Mobility encompasses a wide range of services including:

- Return Trip Car Sharing
- Point-to-Point Car Sharing
- Peer-to-Peer Car Sharing
- Ridesourcing (also known as Transportation Network Companies)
- Dynamic On-Demand Private Transit
- Vanpool and Private Employer Charters

For all these services, mobile computing and payment systems are reducing transaction costs and opening up traditional mobility services to a wider population of producers and consumers. The net effect of these services on transportation mode choices and per capita VMT is still to be determined. However, preliminary research shows that the availability and use of these services correlates with a reduction in individual vehicle ownership. This reduction in ownership, meanwhile, results in an increase in non-motor vehicle modes for discretionary trips. In other words, people who no longer own a car will be more selective in their car trips.

In developing the 2016 RTP/SCS, SCAG looked at areas in which shared mobility services are expected to increase. The Plan anticipates robust growth in car sharing and ridesourcing. Ridesourcing is a term coined by researchers to refer to mobile phone-based applications that put riders in touch with drivers for a fee. Some drivers on one platform are professionals, while many other drivers are non-professionals earning income from giving rides. Policies to increase the use of car sharing and ridesourcing would result in a combined reduction of 0.9 percent greenhouse gas emissions.

ANTICIPATING CAR-TO-CAR COMMUNICATION AND AUTOMATED VEHICLE TECHNOLOGIES

Automakers already are manufacturing and installing advanced driver assist systems that can automatically center, reduce speed and brake in anticipation of vehicles ahead. Trucking companies are road testing automated driving and "platooning"—in which automated trucks safely follow or draft each other at very close distances to conserve fuel. Global corporations and research labs are testing small, fully automated vehicles on public roads. Certain automakers have begun experimenting with new service models like "fractional ownership" in which targeted customers collectively lease and share a vehicle. Locking and ignition packages are being offered to simplify the use of peer-to-peer car sharing platforms. These developments point to a very different vehicle ownership paradigm 25 years from now.

Automated/Connected Vehicle (ACV) innovations cover a range of enabling advancements that allow vehicles to operate with less driver input and coordinate with other vehicles to achieve improvements in safety, throughput and user experience. The term ACV covers on-board sensing capabilities, data integration and vehicle-to-vehicle (V2V) communication. ACV covers two distinct innovation paths: autonomous operation, where vehicles rely on digital maps and on-board sensing to operate without any driver input; and connected vehicle operation, where vehicles communicate with one another as well as the roadways they are traveling on. However, these two paths are being developed simultaneously and they may need to be integrated to achieve full benefits in terms of safety and reducing congestion, as promised by researchers. Vehicle to Infrastructure (V2I) communication is another aspect that is covered under roadway ITS operations. It is important to note that vehicles capable of partially automated operation, such as the top-of-the-line Mercedes S-Class and Infiniti Q35, are already available to the public. The California and Nevada Departments of Motor Vehicles (DMV) have already licensed manufacturers for on-road testing and those agencies will be releasing consumer model permitting rules by 2016.

Due to the uncertainty of deployment timelines and operational characteristics, initial research shows inconsistent impacts on travel behavior and locational choice. Some traffic simulations show that in the initial phases ACVs may increase congestion, especially if safety features are mandated at the expense of system operational efficiency. On the other hand, if fully automated vehicles change the vehicle ownership paradigm, they may facilitate more on-demand transportation services and an increased reduction in household vehicle ownership. In the long term, ACVs have the ability to dramatically increase the carrying capacity of the regional roadway network.

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). 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." The 2016 RTP/SCS also considers and is consistent with the provisions of the Fixing America's Surface Transportation Act (FAST Act).

The 2016 RTP/SCS, therefore, includes a discussion of mitigation measures consistent with these requirements. As a public agency in California, SCAG first and foremost fulfills mitigation requirements by complying with the California Environmental Quality Act (CEQA), so this section of the Plan includes a summary of mitigation as laid out in the Program Environmental Impact Report (PEIR) accompanying the 2016 RTP/SCS.

In addition, 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."

California law requires SCAG to prepare and certify a PEIR prior to adopting the 2016 RTP/SCS. The PEIR evaluates potential environmental impacts of the 2016 RTP/SCS 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 (and associated induced growth). These impact areas include 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; and Utilities and Service Systems. The 2016 RTP/SCS also acts as a "self-mitigating" plan in certain impact areas, in that its policies and strategies lead to improved environmental outcomes for air quality, greenhouse gas emissions, public health, congestion and other indicators, while accommodating existing and projected population growth. The section below summarizes the mitigation program contained within the PEIR for this Plan. The general purpose of the mitigation measures included in the PEIR is to identify how to protect the environment, and natural and cultural resources; improve the linkage between transportation and environmental planning; and enhance public health in concert with the proposed transportation improvements and related land use planning strategies.

It should be clearly noted that the 2016 RTP/SCS itself leads to improved environmental outcomes for per capita greenhouse gas emissions, the preservation of natural lands, recreational and active transportation opportunities and improved public health, among other key environmental indicators compared to the No Project Alternative. Nevertheless, the implementation of Plan programs, policies and strategies may lead to environmental impacts compared to the existing conditions. As such, program-level performance-based mitigation measures designed to offset any identified potentially significant adverse programmatic level environmental effects are summarized below. Project-level environmental mitigation should be appropriately identified and prepared by implementing agencies on a project-by-project or site-by-site basis as projects proceed through the design and decision-making process. Transportation project implementation and development decisions are subject to their own environmental review process and are expected to implement project-specific mitigation measures to minimize environmental impacts. This section, along with more detailed information in the PEIR, provides a framework that identifies feasible measures as resources which lead agencies can and should implement when they identify and mitigate project-level environmental impacts.

MITIGATION STRATEGIES

The PEIR provides a list of mitigation measures, which would be implemented by SCAG on a regional level, in order to assist in reducing environmental impacts related to implementation of the 2016 RTP/SCS. SCAG is also 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. SCAG works with member agencies and stakeholders but it does not identify, evaluate or implement projects or project-specific mitigation.

In addition, the PEIR includes a "catch-all" mitigation measure for each of the CEQA resource categories, stating that lead agencies "can and should" comply with generally applicable performance standards that are linked to existing statutes, regulations and adopted general plans, where available and appropriate. They are not intended to supersede compliance with existing law, regulations and adopted general plans. Instead, they help explain to lead agencies that the existing regulatory framework that could assist in mitigating potential environmental impacts at the project level.

CONSERVATION PLANNING POLICY

Long-range transportation plans are required to discuss the types of potential environmental mitigation activities and potential areas to carry out these activities. This includes activities that may have the greatest potential to restore and maintain the environmental functions affected by the Plan [23 U.S. Code Sec. 134]. As such, this is being addressed in the 2016 RTP/SCS and is separate and distinct from the mitigation measures addressed in the PEIR.

SCAG could approach federal requirements for mitigation by continuing and expanding the efforts already undertaken since the adoption of the 2012 RTP/SCS. Those efforts included mapping potential priority conservation areas, engaging partners, and developing regional mitigation policies and approaches for this plan. As outlined in the 2012 RTP/SCS, the goal of these efforts is the development of a program of large-scale acquisition and management of important habitats lands to mitigate impacts related to future transportation projects. In the 2016 RTP/SCS, regional goals also include supporting local land use strategies that reduce the demand for building outside of the existing development footprint, especially in important habitat areas. Building on this effort has the potential to create a regional conservation program that stakeholders such as CTCs, local jurisdictions, agencies, and non-profits can align with and support. SCAG has already engaged many of these stakeholders by convening a working group. This strategic and comprehensive approach allows for regional growth and progress, while at the same time ensuring that important natural and working lands and water resources are protected in perpetuity. With that as the foundation, the following suggested next steps for further development of a conservation policy could include the following:

• Expanding on the Natural Resource Inventory Database and Conservation Framework and Assessment by incorporating strategic mapping layers to build the database and further refine the priority conservation areas

• Encouraging CTCs to develop advance mitigation programs or include them in future transportation measures

• Aligning with funding opportunities and pilot programs to begin implementation of the Conservation Plan through acquisition and restoration

• Providing incentives to jurisdictions that cooperate across county lines to protect and restore natural habitat corridors, especially where corridors cross county boundaries

Please see the Natural & Farm Lands Appendix for additional detail.

SUMMARY OF THE ENVIRONMENTAL MITIGATION PROGRAM

The 2016 RTP/SCS includes an environmental mitigation program that links transportation planning to the environment. Building on its strong commitment to the environment as demonstrated in the 2012 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. The following discussion focuses on specific resource areas and example mitigation measures to avoid or substantially reduce the significant environmental impacts in these areas.

AESTHETICS

The SCAG region includes several highway segments that are recognized by the State as designated scenic highways or are eligible for such designation. Construction and implementation of projects in the 2016 RTP/SCS could impact designated scenic highways and restrict or obstruct views of scenic resources such as mountains, ocean, rock outcroppings, etc. In addition, some transportation projects could add urban visual elements, such as transportation infrastructure (highways, transit stations) to previously natural areas.

Mitigation measures developed by SCAG to minimize impacts to Aesthetics include, but are not limited to, information sharing regarding the locations of designated scenic vistas, and regional program development as part of SCAG's ongoing regional planning efforts, such as web-based planning tools for local government and direct technical assistance efforts such as the Toolbox Tuesday Training series and the sharing of associated online training materials.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines and review of county and city general plans and Caltrans designated scenic vistas, aesthetics performance standards-based mitigation measures may include, but are not limited to:

- Encourage the implementation of design guidelines by counties and cities, local policies, and programs aimed at protecting views of scenic corridors and avoiding visual intrusions in design of projects to minimize contrasts in scale and passing between the project and surrounding natural forms and developments.
- Design landscaping along highway corridors to add significant natural elements and visual interest to soften the hard-edged, linear transportation corridors.

- Remove blight or nuisances that compromise visual character or visual quality of project areas including graffiti abatement, trash removal, landscape management, maintenance of signage and billboards in good condition, and replacing compromised native vegetation and landscape.

AGRICULTURE AND FORESTRY RESOURCES

Approximately 2.6 million acres of important agricultural lands in the SCAG region currently exists. Out of the 2.6 million acres, 1.1 million acres are designated as Important Farmland and the other 1.5 million acres are designated as grazing land. With respect to forests and timberlands, forest lands include the Angeles National Forest, Cleveland National Forest, Los Padres National Forest, and San Bernardino National Forest, as well as forest lands with open space zones in Imperial and Los Angeles counties. No Timberland Production Zone exists within the SCAG region. However, the harvesting of timberland is only permitted in two agricultural zones, with one limited to Christmas tree harvesting. The 2016 RTP/SCS includes transportation projects and strategies that would have the potential to convert some Prime Farmland, Farmland of Statewide Importance, and Unique Farmland in all six counties and affect Local Farmland and Grazing land in five of the six counties. Forest and timberland zones would result in less than significant impacts.

SCAG-developed mitigation measures include, but are not limited to, coordination among applicable resource agencies, information sharing, and regional program development as part of SCAG's ongoing regional planning efforts, such as web-based planning tools for local government including CA LOTS, and other GIS tools and data services, including, but not limiting to, Map Gallery, GIS library, and GIS applications; and direct technical assistance efforts such as the Toolbox Tuesday Training series and sharing of associated online Training materials. Lead agencies, such as county and city planning departments, shall be consulted during this update process.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines, review of county and general plans and consistent with the Farmland Protection Policy Act of 1981 and the Farmland Mapping and Monitoring Program of the California Resources Agency, agriculture and forestry resource performance standards-based mitigation measures may include, but are not limited to:

- Encourage enrollments of agricultural lands that have Williamson Act programs.
- Develop project relocation realignment to avoid lands in Williamson Act contracts.
- Establish conservation easements consistent with the recommendations of the Department of Conservation, Farmland Security Zones, Williamson Act contracts, or other conservation tools.

AIR QUALITY

The 2016 RTP/SCS includes programs, policies and measures to address air emissions. Measures that help mitigate air emissions are comprised of strategies that reduce congestion, increase access to public transportation, improve air quality, and enhance coordination between land use and transportation decisions. In order to disclose potential environmental effects of the 2016 RTP/SCS, SCAG has prepared an estimated inventory of the region's emissions, and identified mitigation measures. The mitigation measures seek to achieve the maximum feasible and cost-effective reductions in emissions.

Mitigation measures developed by SCAG to minimize impacts to Air Quality include, but are not limited to, the determination as part of its conformity findings, pursuant to the federal CAA, that the Plan and its subsequent updates provided for the timely implementation of transportation control measures (TCM). Demonstration of TCM timely implementation including a list of these TCMs is documented in the Transportation Conformity Analysis Appendix. Additionally, during the 2016 to 2040 planning period, SCAG shall pursue activities to reduce the impacts associated with health risks for sensitive receptors within 500 feet of highways and high-traffic volume roadways.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines, and within the responsibility and jurisdiction of ARB, air quality management districts and other regulatory agencies, air quality performance standards-based mitigation measures may include, but are not limited to:

- Reduce emissions with the use of clean fuels and reducing petroleum dependency.
- Use watering trucks to minimize dust; watering should be sufficient to confine dust plumes to the project work areas.
- Revegetate disturbed lands, including vehicular paths created during construction to avoid future off-road vehicular activities.
- As appropriate, require that portable engine-driven equipment units used at the project work site, with the exception of on-road and off-road motor vehicles, obtain ARB Portable Equipment Registration with the state or local district permit.

BIOLOGICAL RESOURCES

The 2016 RTP/SCS seeks to minimize transportation-related impacts on wildlife, and also better integrate transportation infrastructure into the environment.

Impacts to biological resources generally include displacement of native vegetation and habitat on previously undisturbed land; habitat fragmentation and decrease in habitat connectivity; and displacement and reduction of local, native wildlife including sensitive species. Building new transportation routes and facilities through undisturbed land or expanding facilities and increasing the number of vehicles traveling on existing routes will directly injure wildlife species, cause wildlife fatalities, and disturb natural behaviors such as breeding and nesting. Without appropriate mitigation, this will result in the direct reduction or elimination of species populations (including sensitive and special-status species) and native vegetation (including special-status species and natural communities) as well as the disruption and impairment of ecosystem services provided by native habitat areas.

Mitigation measures developed by SCAG to minimize impacts to biological resources include, but are not limited to, consultation with resource agencies, as well as local jurisdictions to incorporate any local HCPs or other similar planning documents. Development of a conservation strategy with local jurisdictions and agencies and maintaining a list/map of potential conservation opportunity areas based on the most recent land use data.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines, within county and city general plans, the responsibility and jurisdiction of the USFWS, the CDFW, and other applicable agencies, biological resources performance standards-based mitigation measures may include, but are not limited to:

- Design projects to avoid sensitive natural communities and riparian habitats.
- Install fencing and/or mark sensitive habitat to be avoided during construction activities.
- Salvage and stockpiling topsoil and perennial plants for use in restoring native vegetation to all areas of temporary disturbance within the project area.

CULTURAL RESOURCES

Impacts to cultural resources, inclusive of tribal cultural resources, generally include substantial adverse changes to historical and archaeological resources and direct or indirect changes to unique paleontological resources or sites or unique geological features. These impacts can occur at the localized scale and in relation to existing conditions, as the Plan itself does not affect the total amount of growth in the region. Adverse changes include the destruction of culturally and historically (recent or geologic time) significant and unique historical, archaeological, paleontological, and geological features.

Mitigation measures developed by SCAG to minimize impacts to Cultural resources include, but are not limited to, sharing of information and SCAG's ongoing regional planning efforts such as web-based planning tools for local government including CA LOTS, and direct technical assistance efforts such as the Toolbox Tuesday series. Resource agencies, such as the Office of Historic Preservation shall be consulted during this process.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines, and review of county and city general plans, cultural resources performance standards-based mitigation measures may include, but are not limited to:

- Comply with Section 106 of the National Historic Preservation Act (NHPA) including, but not limited to, projects for which federal funding or approval is required for the individual project.
- Employ design measures to avoid historical resources and undertake adaptive reuse where appropriate and feasible. If resources are to be preserved, as feasible, project sponsors should carry out the maintenance, repair, stabilization, rehabilitation, restoration, preservation, conservation or reconstruction in a manner consistent with the Secretary of the Interior's Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings.
- Comply with California Health and Safety Code, Section 7050 and Sections 18950–18961, in the event of discovery or recognition of any human remains during construction or excavation activities associated with the project, in any location other than a dedicated cemetery, ceasing further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until the coroner of the county has been informed and has determined that no investigation of the cause of death is required.

ENERGY

California consumes more energy than any other state except Texas. However, in terms of energy consumption per person, California ranks 49th among the 50 states and District of Columbia. Current annual energy consumption in

California (including transportation) is approximately 7,641 trillion Btu, which represents approximately 7.9 percent of the nation's energy consumption. Transporting water into California is also a very energy intensive process. The California State Water Project (SWP) is the single largest user of energy in the state. The SWP uses approximately 5 billion kWh/year of electricity which is equal to 2 to 3 percent of the total electricity consumed in California. Water-related energy consumes approximately 20 percent of the total electricity in California. Implementation of the 2016 RTP/SCS would result in an increase in energy use due to the increase in households and transportation projects in the SCAG region.

SCAG developed mitigation measures include, but are not limited to, working with local jurisdictions and energy providers, through its Energy and Environment Committee, and administration of the Clean Cities program, Sustainability Planning grants program, and other SCAG energy-related planning activities, to encourage energy efficient building development. Additional measures include, pursuing partnerships with Southern California Edison, municipal utilities, and the California Public Utilities Commission to promote energy efficient development in the SCAG region, through coordinated planning, data and information sharing activities

Consistent with the provisions of Section 15091 of the State CEQA Guidelines, county and city form-based zoning codes and future updated zoning codes, energy performance standards-based mitigation measures may include, but are not limited to:

- Using energy efficient materials in building design, construction, rehabilitation, and retrofit.
- Reduce lighting, heating, and cooling needs by taking advantage of light colored roofs, trees for shade, and sunlight.

GEOLOGY AND SOILS

Impacts to geological resources generally include the disturbance of unstable geologic units (rock type) or soils, causing the loss of topsoil and soil erosion, slope failure, subsidence, project-specific seismic activity and structural damage from expansive soils. These activities, in addition to building projects on and around Alquist-Priolo Fault Zones and other local faults, could expose people and/or structures to the risk of loss, injury, or death.

Mitigation measures developed by SCAG to minimize impacts to Geology and Soils include, but are not limited to, sharing of information, and regional program development as part of SCAG's ongoing regional planning efforts, such as web-based planning tools for local government including CA LOTS, and direct technical assistance efforts such as the Toolbox Tuesday series. Resource agencies, such as the U.S. Geology Survey shall be consulted during this update process.

Based on County and City General Plans, geology and soils performance standards-based mitigation measures may include, but are not limited to:

- Comply with Section 4.7.2 of the Alquist-Priolo Earthquake Fault Zoning Act, requiring a geologic investigation to demonstrate that proposed buildings would not be constructed across active faults.
- Comply with the CBC and local regulatory agencies with oversight of development associated with the project, ensuring that projects are designed in accordance with county and city code requirements for seismic ground shaking.
- Adhere to design standards described in the California Building Code and all standard geotechnical investigation, design, grading, and construction practices to avoid or reduce impacts from earthquakes, ground shaking, ground failure, and landslides.

GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

California is the fifteenth largest emitter of greenhouse gases on the planet. The transportation sector, primarily cars and trucks that move goods and people, is the largest contributor with 37 percent of the state's total greenhouse gas emissions in 2013. On road emissions (from passenger vehicles and heavy duty trucks) constitute 90 percent of the transportation sector total. In order to disclose potential environmental effects of the 2016 RTP/SCS, SCAG has prepared an estimated inventory of the region's existing greenhouse gas emissions, identified mitigation measures, and compared alternatives in the PEIR. Although the 2016 RTP/SCS demonstrates a reduction in per capita greenhouse gas emissions and meets Senate Bill 375 targets, mitigation is identified here in summary form, and in the PEIR, to provide information on how greenhouse gas emissions can be reduced from other sectors as well as through subsequent planning and implementation.

SCAG developed mitigation measures include, but are not limited to, updating any future RTP/SCS to incorporate polices and measures that lead to reduced greenhouse gas emissions in accordance with Assembly Bill 32; coordination with ARB and air districts in efforts to implement the Assembly Bill 32 plan; continuing the coordination with other metropolitan planning organizations regarding statewide strategies to reduce greenhouse gas emissions and facilitate the implementation of Senate Bill 375. Additional measures include,

working with utilities, sub-regions, and other stakeholders to promote an accelerated penetration of zero (and/or near zero) emission vehicles in the region, including developing a strategy for the deployment of public charging infrastructure.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines, and within the responsibility and jurisdiction of ARB, local air districts, and/or lead agencies, greenhouse gas emissions and climate change standards-based mitigation measures may include, but are not limited to:

- Reduce emissions resulting from a project through implementation of project features, project design, or other measures.
- Incorporate Best Available Control Technology (BACT) during design, construction and operation of projects to minimize greenhouse gas emissions.
- Adopt plan or mitigation program for the reduction of emissions that are required as part of the Lead Agency's decision.
- Use energy and fuel efficient vehicles and equipment.
- Use the minimum feasible amount of greenhouse gas emitting construction materials that is feasible.
- Incorporate design measures to reduce greenhouse gas emissions from solid waste management through encouraging solid waste recycling and reuse.
- Incorporate design measures to reduce energy consumption and increase use of renewable energy.
- Plant shade trees in or near construction projects where feasible.
- Construct buildings to Leadership in Energy and Environmental Design (LEED) certified standards.

HAZARDS AND HAZARDOUS MATERIALS

Implementation of the 2016 RTP/SCS would affect the transportation and handling of hazardous materials in the SCAG region. Expected significant impacts include risk of accidental releases due to an increase in the transportation of hazardous materials and the potential for such releases to reach neighborhoods and communities adjacent to transportation facilities. The hazardous materials mitigation program aims to minimize the significant hazard to the public or the environment that involves the release of hazardous materials into the environment.

SCAG developed mitigation measures include, but are not limited to, coordination efforts with the United States Department of Transportation (U.S. DOT), the Office of Emergency Services, California Department of Transportation (Caltrans) and the private sector to continue to conduct driver safety training programs. Additionally, SCAG shall encourage the U.S. DOT and the California Highway Patrol to continue to enforce speed limits and existing regulations governing goods movement and hazardous materials transportation.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines, provisions of the Hazardous Waste Control Act, the Unified Hazardous Waste and Hazardous Materials Management Regulatory Program, the Hazardous Waste Source Reduction and Management Review Act of 1989, and the California Vehicle Code, hazards and hazardous materials standards-based mitigation measures may include, but are not limited to:

- Provide a written plan of proposed routes of travel demonstrating use of roadways designated for the transport of hazardous materials.
- Follow the manufacturer's recommendations on use, storage, and disposal of chemical products used during construction.
- During routine maintenance of construction equipment, properly contain and remove grease and oils.

HYDROLOGY AND WATER QUALITY

Impacts to hydrology and water quality from the 2016 RTP/SCS include potential water quality impairment from increased impervious surfaces. Increased impervious surfaces in water recharge areas potentially impact groundwater recharge and groundwater quality. Cumulative impacts include increased impervious surfaces; increased development in alluvial fan floodplains; and increased water demand and associated impacts, such as drawdown of groundwater aquifers. These impacts can occur at the localized scale and in relation to existing conditions, as the Plan itself does not affect the total amount of growth in the region. Increased output of greenhouse gases from the region's transportation system impacts the security and reliability of the imported water supply.

SCAG developed mitigation measures include, but are not limited to, working with local jurisdictions and water quality agencies, to encourage regional-scale planning for improved water quality management/demand and pollution prevention, providing opportunities for information sharing with respect to wastewater treatment and regional program development to promote Low Impact Development (LID) and reduce hydromodification.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines, and within the jurisdiction and authority of the Regional Water Quality Control Boards and other regulatory agencies, hydrology and water quality standards-based mitigation measures may include, but are not limited to:

- Complete, and have approved, a Stormwater Pollution Prevention Plan (SWPPP) prior to initiation of construction.
- Complete, and have approved, a Standard Urban Stormwater Management Plan, prior to occupancy of residential or commercial structures.
- Incorporate as appropriate, treatment and control features such as detention basins, infiltration strips, and porous paving, other features to control surface runoff and facilitate groundwater recharge into the design of new projects early on in the process to ensure that adequate acreage and elevation contours are provided during the right-of-way acquisition process.

LAND USE AND PLANNING

The 2016 RTP/SCS contains transportation projects to help more efficiently distribute population, housing, and employment growth, as well as a forecasted Land Development Category pattern of development described in detail in the SCS. These transportation projects and land use strategies are generally consistent with the county- and regional-level general plan data available to SCAG; however, general plans are not updated consistently. The Plan includes a projected Land Development Category pattern of development that, in order to maximize the effectiveness of the transportation system differs from local General Plan land uses beyond 2020.

SCAG developed mitigation measures include, but are not limited to, coordinate with member cities and counties to encourage that general plans consider and reflect as appropriate RTP/SCS policies and strategies. Other measures include infill, mixed-use, higher density and other sustainable development, and work with partners to identify incentives to support the creation of affordable housing in mixed-use zones. Additionally, SCAG shall work with its member cities and counties to encourage that transportation projects and growth are consistent with the RTP/SCS and general plans.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines and review of county and city general plans, land use and planning standards-based mitigation measures may include, but are not limited to:

- Ensure that the project is consistent with the applicable goals and policies of the adopted general plan where the project is located.
- Where an inconsistency is identified, determine if the environmental, social, economic, and engineering benefits of the proposed land use strategy or transportation improvement warrant a variance from adopted zoning or an amendment to the general plan.
- Wherever feasible incorporate direct crossings, overcrossings, or undercrossings at regular intervals for multiple modes of travel (e.g., pedestrians, bicyclists, vehicles).

MINERAL RESOURCES

Transportation projects as well as Land Development Category development patterns influenced by land use strategies identified in the 2016 RTP/SCS would require substantial amounts of aggregate resources to construct facilities. This would result in a significant impact. The six-county and 191 cities SCAG region has about 1,446 million tons of permitted aggregate reserves. The California Geological Survey (CGS) estimates that the SCAG region would need about 4,728 million tons of aggregate over the next 50 years. The difference of 3,282 million tons in demand could result in a shortage of aggregate supply. Based on this anticipated shortage of aggregate supply over the next 50 years, there would be an anticipated shortage during the next 25 years during implementation of the 2016 RTP/SCS.

SCAG developed mitigation measures include, but are not limited to, the coordination with the Department of Conservation, the CGS to maintain a database of (1) available mineral resources in the SCAG region including permitted and un-permitted aggregate resources and (2) the anticipated 50-year demand for aggregate and other mineral resources. Based on the results of this survey, SCAG shall work with local agencies on strategies to address anticipated demand, including identifying future sites that may seek permitting and working with industry experts to identify ways to encourage and increase recycling to reduce the demand for aggregate.

Based on County and City General Plans, mineral resources standards-based mitigation measures may include, but are not limited to:

- Recycle and reuse building materials resulting from demolition, particularly aggregate resources, to the maximum extent practicable.
- Identify and use building materials, particularly aggregate materials, resulting from demolition at other construction sites in the SCAG region, or within a reasonable hauling distance of the project site.

- Design transportation network improvements in a manner (such as buffer zones or the use of screening) that does not preclude adjacent or nearby extraction of known mineral and aggregate resources following completion of the improvement and during long-term operations.

NOISE

Some of the principal noise generators within the SCAG region are associated with transportation (i.e., airports, highways, arterial roadways, seaports, and railroads). Additional noise generators include stationary sources, such as industrial manufacturing plants and construction sites. Noise impacts resulting from the 2016 RTP/SCS generally include exposure of sensitive receptors to noise in excess of normally acceptable noise levels or substantial increases in noise as a result of the operation of expanded or new transportation facilities.

SCAG developed mitigation measures include, but are not limited to, the coordination with member agencies as part of SCAG's outreach and technical assistance to local governments under Toolbox Tuesday Training series, to encourage that projects involving residential and commercial land uses are encouraged to be developed in areas that are normally acceptable to conditionally acceptable, consistent with the Governor's Office of Planning and Research Noise Element Guidelines.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines and review of county and city general plans, noise standards-based mitigation measures may include, but are not limited to:

- Install temporary noise barriers during construction.
- Include permanent noise barriers and sound-attenuating features as part of the project design.
- Schedule construction activities consistent with the allowable hours pursuant to applicable general plan noise element or noise ordinance where construction activities are authorized outside the limits established by the noise element of the general plan or noise ordinance; notify affected sensitive noise receptors and all parties who will experience noise levels in excess of the allowable limits for the specified land use, of the level of exceedance and duration of exceedance; and provide a list of protective measures that can be undertaken by the individual, including temporary relocation or use of hearing protective devices.

POPULATION, HOUSING AND EMPLOYMENT

Transportation projects and land use strategies including new and expanded infrastructure are necessary to improve travel time and can enhance quality of life for those traveling throughout the region. The package of transportation improvements in the 2016 RTP/SCS is designed to accommodate total growth while maintaining or improving for mobility. The Plan would not affect the total growth in population in the region. The 2016 RTP/SCS can affect the distribution of that growth. Land use and housing impacts associated with transportation projects and development influenced by land use strategies, such as dividing established communities through right-of-way acquisition, can occur at a localized scale.

SCAG developed mitigation measures include, but are not limited to, working with member agencies to encourage and assist growth strategies to create an urban form designed to focus development in HQTAs in accordance with the polices, strategies and investments contained in the 2016 RTP/SCS, enhancing mobility and reducing land consumption.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines and review of county and city general plans, population, housing and employment standards-based mitigation measures may include, but are not limited to:

- Evaluate alternate route alignments and transportation facilities that minimize the displacement of homes and businesses. Use an iterative design and impact analysis where impacts to homes or businesses are involved to minimize the potential of impacts on housing and displacement of people.
- Prioritize the use of existing ROWs, wherever feasible.
- Develop a construction schedule that minimizes potential neighborhood deterioration from protracted waiting periods between right-of-way acquisition and construction.
- Construct affordable housing units, deed restricted to remain affordable for an appropriate period of time, as feasible or payment of fee, with the appropriate nexus to the impact, where such fees were established to address loss of affordable housing.

PUBLIC SERVICES

Any impacts to public services are identified only in relation to existing conditions or at a localized scale. These impacts generally include additional

demands on fire and police services, schools and landfills. Additional police and fire personnel would be needed to adequately respond to emergencies and routine calls, particularly on new or expanded transportation facilities. Other potential impacts at a localized scale could entail demands on public schools, solid waste facilities and disposal facilities.

SCAG developed mitigation measures include, but are not limited to, supporting local jurisdictions and other service providers in their efforts to develop sustainable communities and provide, equally to all members of society, accessible and effective services such as: public education, housing, health care, social services, recreational facilities, law enforcement, and fire protection.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines and review of county and city general plans, public services standards-based mitigation measures may include, but are not limited to:

- Coordinate with local public protective security services to ensure that the existing public protective security services would be able to handle the increase in demand for their services. If the current levels of services at the project site are found to be inadequate, provide fair share contributions towards infrastructure improvements and/or personnel requirements for the appropriate public services
- Identify projects that have the potential to generate the need for expanded emergency response services. Where such services and related staffing needs exceed the capacity of existing facilities, provide for the construction of new facilities directly as an element of the project or through a dedicated fair share contributions toward infrastructure improvements.

RECREATION

Impacts to recreation from the 2016 RTP/SCS would result from an increase in population. The use of regional parks and other recreational facilities are expected to increase and result in a substantial physical deterioration of facilities at an accelerated rate. Additionally, transportation projects included in the 2016 RTP/SCS could result in potentially significant impacts to recreational facilities which include closures to gaps in the highway network through areas that currently service as open space lands.

SCAG developed mitigation measures include, but are not limited to, facilitating the reduction of impacts as a result of increased use in recreational facilities through cooperation with member agencies, information sharing, and program development in order to ensure consistency with planning for expansion of new neighborhood parks within or in nearby accessible locations to HQTAs in funding opportunities and programs administered by SCAG.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines and review of county and city general plans, recreation standards-based mitigation measures may include, but are not limited to:

- Where projects require the construction or expansion of recreational facilities or the payment of equivalent Quimby fees, consider increasing the accessibility to natural areas and lands for outdoor recreation from the proposed project area, in coordination with local and regional open space planning or management agencies.
- Where construction or expansion of recreational facilities is included in the project or required to meet public park service ratios, apply necessary mitigation measures to avoid or reduce significant environmental impacts associated with the construction or expansion of such facilities, through the imposition of conditions required to be followed to avoid or reduce impacts associated with air quality, noise, traffic, biological resources, greenhouse gas emissions, hydrology and water quality, and others that apply to specific construction or expansion of new or expanded public service facilities.

TRANSPORTATION, TRAFFIC AND SAFETY

The 2016 RTP/SCS takes into account the population, households, and employment projected for 2040, and therefore the largest demand on the transportation system expected during the lifetime of the plan. In accounting for the effects of regional population growth, the model output provides a regional, long-term and cumulative level of analysis for the impacts of the 2016 RTP/SCS on transportation resources. The regional growth, and thus, cumulative impacts, is captured in the vehicle miles traveled (VMT), vehicle hours traveled (VHT), and heavy-duty truck VHT data. Consistent with Senate Bill 375 Regional Target Advisory Committee's final report to the California Air Resources Board, the 2016 RTP/SCS includes projects and strategies to reduce congestion and promote friendly speeds on the roadways. A subset of projects included in the 2016 RTP/SCS reduces greenhouse gas emissions by providing relief of existing and projected congestion. Those include toll roads, express lanes, high occupancy vehicle lanes, and dedicated truck toll lanes. Congestion pricing is a transportation demand management tool incorporated into the 2016 RTP/SCS that would reduce greenhouse gas emissions in addition to more efficient utilization of existing facilities. The SCAG region is vulnerable to

numerous threats that include both natural and human caused incidents. As such, a mitigation program related to safety is included in the PEIR.

SCAG developed mitigation measures include, but are not limited to, the facilitation of minimizing impacts to emergency access through ongoing regional planning efforts such as meetings with local member agencies, maintain forums with policy makers, and workshops with local, regional, and state partners such as Department of Transportation, Congestion Management Agencies, Fire Department, and other local enforcement agencies during consultation on development and maintenance of the Regional Transportation Plan.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines, county and city general plans and congestion management programs, transportation standards-based mitigation measures may include, but are not limited to:

- Promote ride sharing programs e.g., by designating a certain percentage of parking spaces for high-occupancy vehicles, providing larger parking spaces to accommodate vans used for ride-sharing, and designating adequate passenger loading and unloading and waiting areas.
- Encourage bicycling to transit facilities by providing additional bicycle parking, locker facilities, and bike lane access to transit facilities when feasible.
- Encourage the use of public transit systems by enhancing safety and cleanliness on vehicles and in and around stations, providing shuttle service to public transit, offering public transit incentives and providing public education and publicity about public transportation services.
- Encourage bicycling and walking by incorporating bicycle lanes into street systems in regional transportation plans, new subdivisions, and large developments, creating bicycle lanes and walking paths directed to the location of schools and other logical points of destination and provide adequate bicycle parking, and encouraging commercial projects to include facilities on-site to encourage employees to bicycle or walk to work.
- Build or fund a major transit stop within or near transit, or transit-oriented development.

UTILITIES AND SERVICE SYSTEMS

Impacts to utilities and service systems from the 2016 RTP/SCS include the potential for the construction of new utility infrastructure or expansion of existing infrastructure. Additional impacts could result in an increased amount of pollutants in urban runoff attributed to landscape irrigation, highway runoff, and illicit dumping. As mentioned previously, implementation of the Plan would increase impervious surfaces in the SCAG region through a combination of transportation projects and development influenced by land use strategies. Additional impacts such as insufficient water supply, strain to wastewater and solid waste treatment plants could also occur.

SCAG developed mitigation measures include, but are not limited to, working with local jurisdictions and water quality agencies, to encourage regional-scale planning for improved water quality management/demand and pollution prevention, providing opportunities for information sharing with respect to wastewater treatment and program development in the region.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines, and within the responsibility of local jurisdictions including the Imperial, Riverside, San Bernardino, Los Angeles, Ventura and Orange Counties Flood Control District, utilities and service systems standards-based mitigation measures may include, but are not limited to:

- Reduce exterior consumptive uses of water in public areas, and should promote reductions in private homes and businesses, by shifting to drought-tolerant native landscape plantings (xeriscaping), using weather-based irrigation systems.
- Reuse and minimize construction and demolition (C&D) debris and diversion of C&D waste from landfills to recycling facilities.
- Implement or expand city or county-wide recycling and composting programs for residents and businesses.

CONCLUSION

These transportation and land use strategies, programs and projects are ambitious, but based on our history SCAG is confident that together they will advance our movement toward a more mobile and sustainable region that achieves our long-term goals for people across our region. By closely integrating transportation and land use planning, the 2016 RTP/SCS places the region firmly on that path. For more details on the planned investments reviewed in this chapter, including a project list, please see the Project List Appendix.

The following chapter, "Paying for Our Plan," presents a review of how we expect to fund our ambitious list of transportation investments—that is, where the money will come from and what economic and policy developments could impact the availability of public funds needed to realize our goals.

SOCIAL DETERMINANTS OF HEALTH SERIES

Food | Housing | Education | Transportation | Violence | Social Support | Health Behaviors | Employment

Transportation and the Role of Hospitals

November 2017

American Hospital Association™

Advancing Health in America

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Introduction

Health and well-being are inextricably linked to the social and economic conditions in which people live. Research has shown that only 20 percent of health can be attributed to medical care, while social and economic factors—like access to healthy food, housing status, educational attainment and access to transportation—account for 40 percent (see Figure 1.)[1] Individuals struggling with food insecurity, housing instability, limited access to transportation or other barriers may experience poor health outcomes, increased health care utilization and increased health care costs. Addressing these determinants of health, commonly referred to as social determinants of health, or simply social determinants, will have a significant positive impact on people's health, including longer life expectancy, healthier behaviors and better overall health.[2]

Transportation is an economic and social factor that shapes people's daily lives and thus a social determinant of health.

The World Health Organization defines social determinants of health as "the conditions in which people are born, grow, work, live and age, and the wider set of forces and systems shaping the conditions of daily life."[3]

Transportation barriers can affect a person's access to health care services. These barriers may result in missed or delayed health care appointments, increased health expenditures and overall poorer health outcomes.[4] Transportation is interrelated with other social determinants of health such as poverty, social isolation, access to education and racial discrimination.

Transportation also can be a vehicle for wellness (see Figure 2). Developing affordable and appropriate transportation options, walkable communities, bike lanes, bike-share programs and other healthy transit options can help boost health.[5]

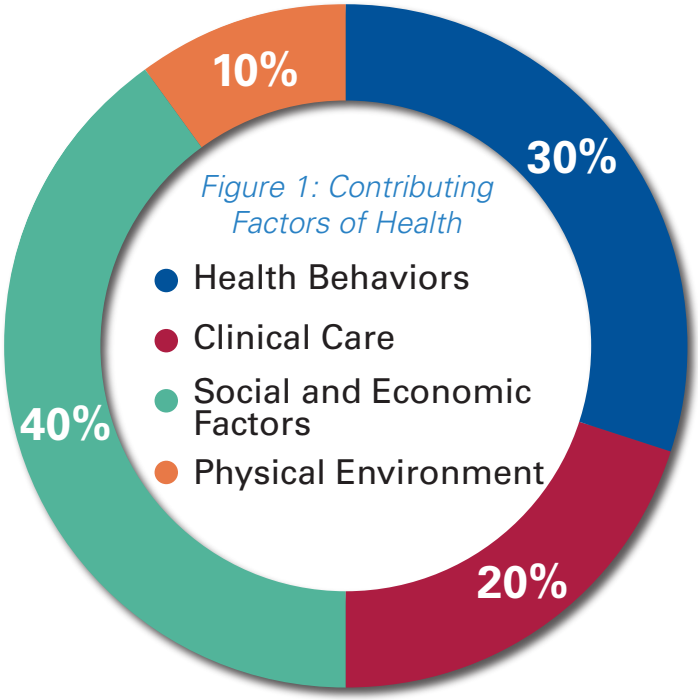
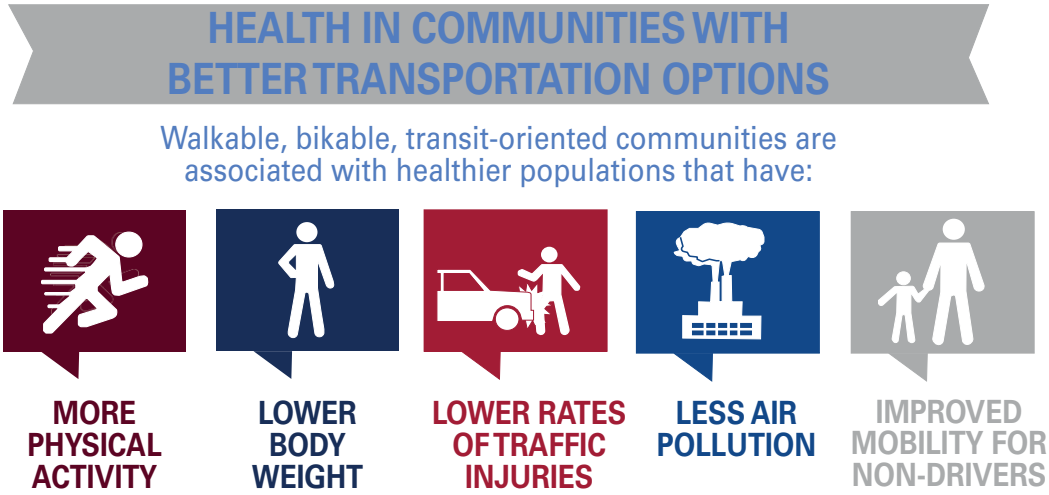


Figure 1: Contributing Factors of Health

Source: Health Research & Educational Trust, 2017.

Figure 2. Better Transportation Options Can Lead To Healthier Lives



Source: Better Transportation Options = Healthier Lives Infographic, Robert Wood Johnson Foundation, 2012.[6]

This guide explains the link between transportation and health and discusses the role of hospitals and health systems in addressing transportation issues, improving access and helping design and support better transportation options. Although hospitals and health systems traditionally have not focused on transportation issues within their purview of care delivery, there is a growing recognition that improving transportation access and support for patients can help improve health outcomes and lower health costs. See "Making the Business Case" on page 12.

Based on a literature review, subject matter expert reviews and interviews with four hospitals, this guide outlines strategic approaches that hospitals can use to build a healthier community that addresses the physical, behavioral and socio-economic needs of individuals and families and improves population health. In doing so, hospitals and health systems will better position themselves to achieve the Triple Aim of improved health, improved care and lower costs.[7]

Strategies for hospitals and health systems to address patients' transportation issues include:

- Understanding and assessing how transportation can affect overall community health
- Integrating support for transportation access into the organization's mission and practices
- Screening and evaluating patients' transportation needs
- Providing direct transportation services through community partnerships or programs
- Supporting policy and infrastructure programs that create safer and more accessible transportation options

Four case examples in this guide highlight hospitals and health systems that are successfully addressing transportation issues in their communities:

- **CalvertHealth Medical Center** has a Mobile Health Center that provides primary and preventive care services to residents with transportation challenges.
- **Denver Health Medical Center** is partnering with Lyft to provide vulnerable patients with transportation services to and from the hospital.

- **Grace Cottage Family Health & Hospital** collaborates with Green Mountain RSVP in a volunteer driver program, which helps patients attend their medical appointments and also builds community.
- **Taylor Regional Hospital** operates a hospitality van service for patients in Taylor County and three neighboring counties.

This guide is part of a series of resources from the Health Research & Educational Trust (HRET) on how hospitals and health systems can address the social determinants of health to improve the environment where people live, work and play. The American Hospital Association (AHA), HRET, and the Association for Community Health Improvement (ACHI) are committed to supporting community health and advancing health in America through innovative campaigns, initiatives, partnerships, publications and awards. To view all of the resources in the social determinants of health series, visit www.hret.org/sdoh.

Transportation and Health

Transportation connects people from their origin to their destination, affects land use and shapes our daily lives. Transportation is necessary to access goods, services and activities such as emergency services, health care, adequate food and clothing, education, employment, and social activities.[8] Because transportation touches many aspects of a person's life, adequate and reliable transportation services are fundamental to healthy communities.

Barriers to transportation greatly affect the quality of people's lives. These statistics highlight the scope of the problem:

- 3.6 million people in the U.S. do not obtain medical care due to transportation barriers.[9]
- Regardless of insurance status, 4 percent of children (approximately 3 million) in the U.S. miss a health care appointment each year due to unavailable transportation; this includes 9 percent of children in families with incomes of less than $50 000.[10]
- Transportation is the third most commonly cited barrier to accessing health services for older adults.[11]

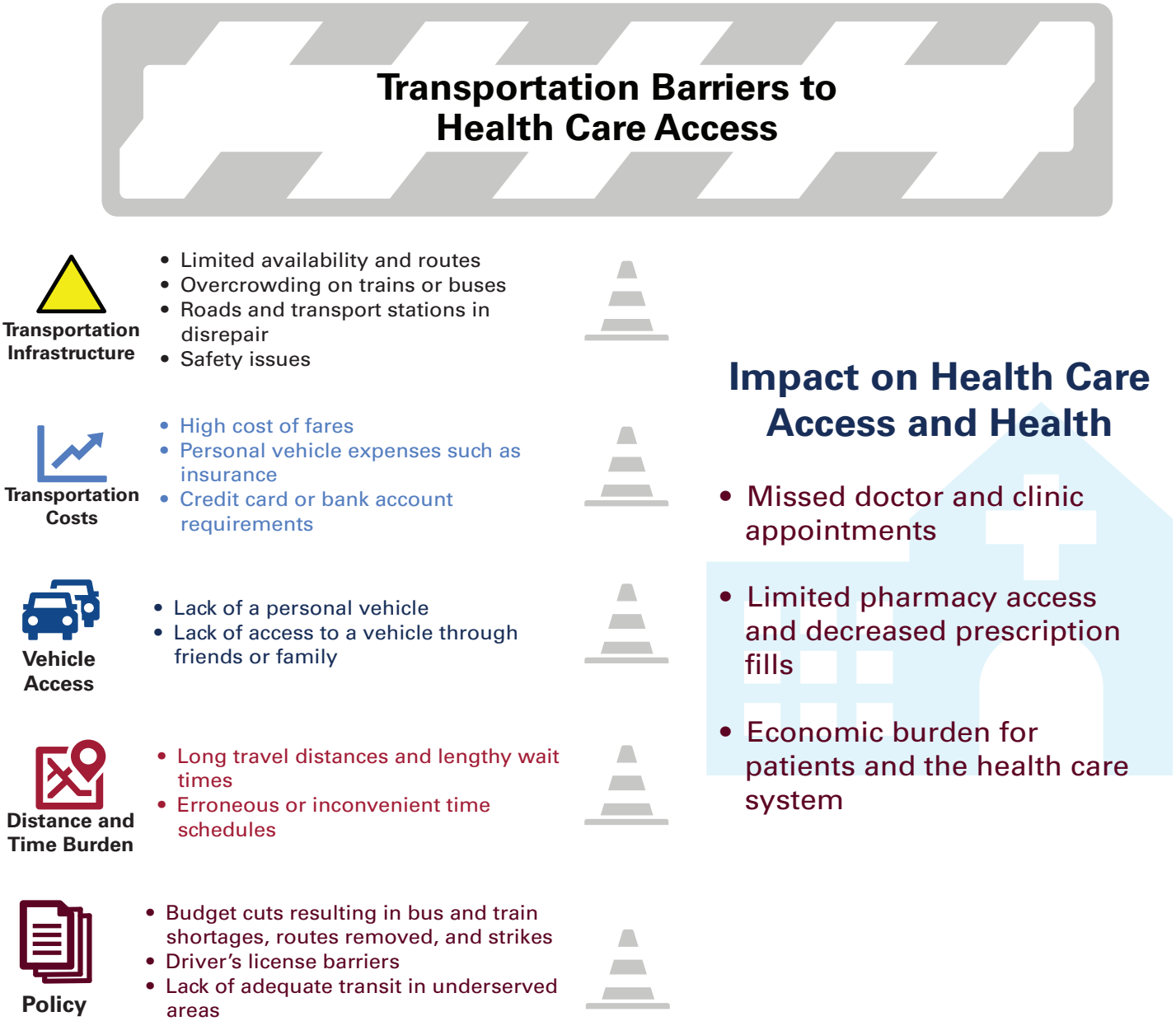
Transportation challenges affect urban and rural communities. Overall, individuals who are older, less educated, female, minority, or low income—or have a combination of these characteristics—are affected more by transportation barriers.[12] Children, older adults and veterans are especially vulnerable to transportation barriers due to social isolation, comorbidities, and greater need for frequent clinician visits.[13]

Transportation issues affect people at varying levels depending on how different challenges overlap. For example, a low-income person struggling with travel may have an increased burden if he or she experiences a temporary physical disability. Limited health literacy, cognitive impairment, fragmentation of health history, access to health insurance, poverty or food insecurity can intersect at any period of time and affect individuals and communities.

Transportation Issues

Transportation issues include lack of vehicle access, long distances and lengthy travel times to reach needed services, transportation costs, inadequate infrastructure and adverse policies that affect travel. Figure 3 outlines types of transportation issues and the impact on health care access. Like other social determinants of health, transportation barriers are interconnected so the presence of one may exacerbate or create other barriers.

Figure 3. Transportation Issues and the Impact on Health Care Access



Source: Health Research & Educational Trust, 2017.

Vehicle Access

Studies show that people who have access to a vehicle or to friends and family with a vehicle are more likely to use health care services than those without vehicle access.[14] Modes of transportation affect health care access too. People with reliable access to private transportation are more likely to go to a medical appointment than those who rely on public transportation.[15]

Place, Distance and Time

Perceived distance and time burdens are frequently cited by patients as a barrier to health care utilization.[16]

In urban environments, buses typically provide a crucial link to main rail systems. However, those living in less central neighborhoods must rely on bus services that are limited. These urban residents are more vulnerable to encountering old bus fleets, breakdowns and other related public transit issues.[17]

Rural environments have different transit options, costs and availability, but residents still may experience transportation challenges.[18] Residents may be widely spread out in rural areas so trips can take a long time. Rural roads that are curvy or hilly can be challenging to develop and maintain, which could complicate transportation logistics.[19]

Overall, studies have found that lack of reliable transportation affects economic mobility, health utilization and more.[20]

Telehealth options and taking services to patients to reduce travel burden are ways to address place, distance and time challenges. CalvertHealth's Mobile Health Center visits community centers and churches to provide primary and preventive care services, which helps alleviate some of the travel burden for patients.

Studies show an association between poorer health outcomes and how far a patient lives from health care facilities they need to access. This association is evident at all levels of geography—local, urban and rural.[21]

Transportation Affordability

For vulnerable populations, transportation can be unaffordable. Vehicle ownership, cost of insurance, fees, and train and bus fares can be expensive. Individuals vulnerable to transportation barriers are more likely to have low incomes and high expenses associated with comorbidities.[22] Data from the Bureau for Labor Statistics show that people earning between $5,000 and $30,000 per year spend 24 percent of their income on transportation.[23]

Alternative transportation options such as bike-sharing programs require a bank or credit card account, thus excluding unbanked individuals.[24]

Using care coordinators or community health workers to help patients identify travel assistance programs through Medicaid or community programs can help reduce transportation costs.

Policy and Infrastructure

Government policies can exacerbate transportation problems with budget cuts, roadway design, transit policies, requirements for driver's licenses and more. Consequences can be increased fares, limited transit availability, labor strikes,[25] and lack of transit or bike-share options in low-income communities.[26] Driver's license laws such as suspensions for failure to pay fines also impede an individual's ability to travel and obtain necessary services and employment and thus increases the burden.[27]

Poor transportation infrastructure is related to inequity.[28] Freeways in disrepair, inadequate railways and roads, limited transit availability and routes, or unsafe public transportation all can contribute to barriers to health care utilization, employment, child care, fresh and healthy groceries, and other life necessities.[29] Generally, communities that are walkable, bike-friendly and transit-oriented are associated with healthier outcomes.[30]

Hospitals can address transportation policy and infrastructure issues in many ways. For example, identify areas where transportation needs are most pronounced. Participate in local or regional transportation planning initiatives and help planners focus on these vulnerable areas and allocate resources to address infrastructure. See Figure 4 for more strategies.

The Role of Hospitals

To address transportation issues and help create better transportation options for patients, hospitals can implement multiple strategies to increase patients' access to health care and other services.

There is a strong business case for hospitals and health systems to address transportation needs since individuals experiencing these issues are more likely to miss appointments or not fill prescriptions, leading to delays in care and potentially to disease progression and complications or readmissions. (See "Making the Business Case" on page 12.) Improving transportation also improves:

- health outcomes,
- quality of life and
- cost savings for patients and health systems.

Due to their reach and influence, hospitals and health systems are well positioned to make a positive impact on the health outcomes of the communities they serve by addressing transportation issues.

Since transportation affects people in different ways, strategies addressing these issues need to be varied yet targeted. Multiple strategies need to be employed to maximize reduction in transportation gaps. Figure 4 describes effective strategies to address transportation issues. Many of these strategies are used by hospitals and health systems highlighted in the case studies in this guide.

Figure 4. Strategies for Hospitals to Address Transportation Issues

Strategy	Description	Examples
Understand and assess how transportation can affect overall community health	There are different indicators to assess how the transportation environment affects health in communities. Use data to understand the health impact of transportation.	» Use the CDC Transportation Health Impact Assessment Toolkit; the toolkit is geared toward community planners and health professionals to engage with all stakeholders and account for future transportation initiatives that have health impacts.[31] » Review data from the Transportation and Health Tool to understand the health impact of an existing transportation system or proposed transportation project.[32]
Integrate access to transportation with organization's mission and practices	A strong organizational commitment will help provide solutions to transportation barriers.	» Make a financial and personnel commitment to building, executing and growing transportation services externally (patients) and internally (employees); Seattle Children's Hospital offers employees free transit passes, shuttle links to transit hubs, free bikes and onsite bike-sharing.
Expand partnerships to support addressing transportation issues	Partnerships with government agencies, health and social service providers, elected officials, transportation authorities, private transportation providers, volunteers and educational institutions can create new opportunities to address transportation issues.	» Participate in local or regional transportation planning initiatives and educate decision-makers about how health can be affected by transportation.
Support policy and infrastructure programs aimed to improve transportation access and address other social determinants of health	Many of these programs are multinational and focus on improving transportation access and increasing safe, healthy and equitable mobility for all.	» Become involved with programs and policies such as Vision Zero, Complete Streets, livable community initiatives, and smart growth approaches. » Invest in transit systems to improve health; MetroHealth System sponsored a bus rapid transit route and the return on investment has been significant.

Strategy	Description	Examples
Invest resources in understanding patients' transportation needs	Transportation barriers and gaps may differ from patient to patient so there is not a one-size-fits-all solution.	» Use methods such as a health impact assessment, SWOT analysis or environmental scans; with such knowledge, hospitals and health systems are in a better position to measure transportation impacts and develop solutions.
Use a screening tool to help identify patients with transportation needs	Patients may be hesitant or may not mention transportation issues. They may be unaware that transportation is a need to discuss during an appointment.	» Screen by using tools or checklists such as the Social Needs Screening Toolkit from Health Leads to identify patients' transportation needs and other social determinants of health.
Provide direct transportation services through community partnerships or programs	When transportation is unavailable, health care systems may need to provide transportation directly to patients and staff.	» Establish volunteer-driver programs. See the Grace Cottage Family Health & Hospital case example. » Partner with ride-sharing companies like Uber or Lyft. See the Denver Health Medical Center case example. » Operate door-to-door shuttle services. See Taylor Regional Hospital case example.
Educate staff about transportation issues	Knowledgeable staff who build trust and offer services in a respectful, culturally competent manner are key to successfully addressing patients' transportation issues.[33]	» Use care coordinators, community health workers or other staff to help patients identify and apply for transportation assistance through patient insurance. » Provide cultural sensitivity training for drivers and staff.
Promote transportation options and increase awareness through outreach	Partnerships with community-based organizations promote interest in shared mobility systems. Many patients who are eligible do not enroll or are not aware of the program's transportation benefits.	» Provide assistance in multiple languages and in promotional materials that speak to the concerns of target communities. » Increase efforts in Medicaid nonemergency medical transportation benefit enrollment and focus on outreach, informing eligible patients of transportation services.[34] » Provide travel vouchers or transit passes for patients.

Strategy	Description	Examples
Support or invest in programming or infrastructure to reduce travel for patients	Some areas have extremely limited travel options. It may be beneficial to bring programming or services to patients instead of patients traveling to providers and other services.	» Create prescription mail service. » Provide telehealth options. » Offer pharmacy and other services onsite to reduce travel. » Establish mobile health clinics. See CalvertHealth Medical Center case example. » Operate door-to-door shuttle services.

Source: Health Research & Educational Trust, 2017.

Impact on Health Care Access and Health

Connection to Other Determinants of Health

Transportation and other social determinants of health are interrelated and play a major role in a person's health and well-being. For example, lack of transportation to grocery stores is one of many causes of food insecurity.[35] Physical environmental attributes such as limited transportation options or food deserts can contribute to limited consumption of fresh, healthy foods.[36] Transportation to and from work, school, recreation and other activities can have an impact on an individual's social support, education, employment, housing and health behaviors. Overall, transportation barriers, along with other social determinants of health, are a population health issue. The impact of transportation can be measured in multiple ways such as the cost of missed appointments, decreased pharmacy access and prescription fills, and economic barriers.

Making the Business Case

Missed appointments

Patients frequently identify transportation barriers as a major reason for missing health care appointments.[37] Missed appointments are associated with increased medical care costs for the patient, disruption of patient care and provider-patient relationships, delayed care and increased emergency department visits.[38] Missed appointments and the resulting delays in care cost the health system $150 billion each year in the U.S.[39] When a patient is unable to find or afford a ride, costs accrue for patients, caregivers, providers, insurers and taxpayers. Health care systems lose revenue from missed appointments because of the effects on delivery, cost of care and resource planning.[40]

Decreased pharmacy access and prescriptions fills

Patients are less likely to fill prescriptions if they experience transportation issues. According to one study, 65 percent of patients said transportation assistance would help with prescriptions fills after discharge. Studies have shown that restriction of Medicaid payments for transportation resulted in decreased prescription refills.[41]

Economic barriers

Transportation is linked to economic mobility. Approximately 80 percent of workers drive or ride in a car to work.[42] Research has shown that disruption or barriers to transportation negatively affects productivity and employment and causes health inequities.[43] Multimodal transportation systems offering a combination of affordable, high-quality vehicular, public or alternative transportation options support community economic development, health care utilization and promote healthy behaviors such as exercise.[44]

Conclusion

Barriers to transportation and lack of transportation options can interfere with people enjoying a healthier, higher quality of life. People depend on safe and easy transportation to travel to health care services as well as places of employment, childcare, places of worship, parks and recreation, social gatherings and more.

Hospitals and health systems are recognizing that social, economic and environmental factors affect the opportunities that patients and their families have to engage in healthy behaviors, which ultimately improves health outcomes. Additionally, addressing social determinants of health, like transportation, is important for achieving greater health equity.

Hospitals and health systems can address patients' transportation needs and improve the health of their communities by implementing a variety of strategies, including:

- Understanding and assessing the impact of transportation on public health
- Supporting policy and infrastructure programs aimed to improve transportation access and to create safer, healthier transportation options
- Investing resources in understanding patients' transportation needs
- Providing mobile clinics or direct transportation services through community partnerships or programs
- Using technology, such as providing telehealth options, to reduce travel time for patients

By making the commitment to address transportation barriers and building partnerships with community organizations and other entities, hospitals and health systems can improve transportation and health care access for patients and families and create more equitable, healthier communities.

Case Studies

CalvertHealth Medical Center

Introduction

Located in southern Maryland, CalvertHealth Medical Center is the only hospital in Calvert County. More than 77 percent of Calvert County's 90,000 residents visit the hospital for health care services. In addition to the main campus in Prince Frederick, the health system has four satellite medical centers, located in Dunkirk, Lusby, Solomons and Twin Beaches.

Calvert County is a rural county with only one highway, so people who live away from the highways or town centers have difficulty accessing essential services. CalvertHealth's 2014 community health needs assessment (CHNA), developed in partnership with Conduent Healthy Communities Institute (HCI) Corporation, identified access to health care services as one of the community's top three priority health needs. Lack of transportation was identified as one of the most significant socio-economic barriers to health in the county. About 4 percent of households in Calvert County do not own a car, making it difficult, particularly for low-income households, to travel to hospitals, doctor's offices and grocery stores.

At a Glance

System Name
CalvertHealth

Featured Hospital Name:
CalvertHealth Medical Center

System Stats
5 locations, including more than 20 medical offices

Hospital Type
Nonprofit, private, independent

Location
Prince Frederick, Maryland

Beds
126

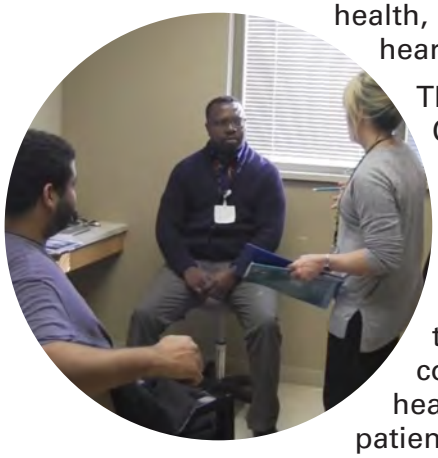
Interventions

To address transportation barriers and improve health care access and delivery in Calvert County, CalvertHealth Medical Center has introduced several initiatives.

Mobile Health Center. CalvertHealth's CHNA and Conduent HCI's integrated data platform, with real-time community health data, facilitated the development of many programs that address barriers to health care. Using HCI' SocioNeeds Index and access to care maps, CalvertHealth identified regions and populations in Calvert County experiencing difficulty accessing care. Since 2016, the Mobile Health Center, managed by the hospital's community wellness department, delivers care to residents who cannot visit hospitals or doctor offices regularly for primary and preventive care services. With support from the CalvertHealth Foundation, donations from local businesses and organizations, and proceeds from two fundraising events, more than $300,000 was raised to buy the Mobile Health Center. Essentially a 40 foot "state-of-the-art" truck, the Mobile Health Center has two fully equipped exam rooms—one for medical/dental services and one transitional room—a waiting area, classroom space and a wheelchair lift. The hospital has created a video tour of the Mobile Health Center.

Limited access to health care services due to transportation barriers and lack of health insurance is overwhelming in North Beach/ Chesapeake Beach, Prince Frederick and Lusby. The Mobile Health Center schedules regular visits to community centers and local churches in these three areas. In

addition to providing primary care services and dental care, the Mobile Health Center offers screening for diabetes, cholesterol and high blood pressure. On selected dates and locations, the mobile unit also screens for lung cancer, skin cancer, breast health, bone density and hearing and vision.

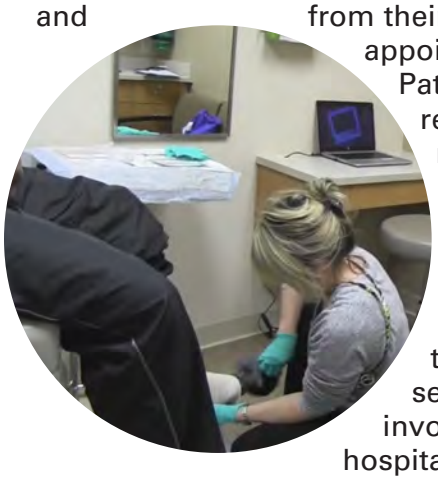


The Mobile Health Center serves as an engagement and care center where a certified registered nurse practitioner is there to discuss medical concerns, identify health risks and help patients navigate to the appropriate level of care within the health system and find local health resources within their geographic area. With this initiative, CalvertHealth is working to provide education, support and outreach to community members and promote wellness.

CalvertHealth CARES. Since 2013, CalvertHealth has been a member of Partners in Accountable Care Collaboration and Transitions (PACCT), a community coalition of health care providers and about 30 local agencies. The coalition is committed to sharing and developing best practices and solutions to improve patient outcomes and experience. CalvertHealth CARES (Collaborative Activation of Resources and Empowerment Services), an initiative of PACCT launched in 2015, is a free, comprehensive community benefit program to meet the needs of patients after discharge and reduce readmission rates and emergency department usage. Patients are offered health services based on medical need. CalvertHealth CARES includes several initiatives, including the Medication and Transportation Assistance Program (MAP/TAP) and the CalvertHealth CARES Clinic.

The Transportation Assistance Program (TAP) was developed after PACCT and other community organizations reported the transportation challenges of community members. Hospital patients and employees verbally reported significant transportation barriers in the community, such as inaccessible locations of bus stops, limited taxi services, and lack of sidewalks and walk bridges. In addition, the number of no-shows to physician appointments was an issue. To address the transportation challenges encountered by patients and employees, TAP was integrated into the CalvertHealth CARES program. The hospital budgets $2,000 annually for this program.

CalvertHealth CARES has conducted patient interviews to determine the underlying reasons for missed appointments and then identify the services needed the most. If patients specifically report they miss their medical appointment due to inaccessible transportation, they are referred to TAP. TAP uses a quantitative screening tool to assess the needs of patients with transportation barriers. A social worker conducts the screening and scores the assessment to identify patients who are greatly affected by transportation due to poor health, lack of finances, unemployment, homelessness or other reasons. TAP partners with a local taxi service to provide patients with a taxi voucher. The taxi service transports patients from Calvert County and some patients outside the county to and from their medical appointments.



Patients are required to make their own cab arrangements and asked to tip their driver. The taxi company sends an invoice to the hospital for payment.

Additionally, as part of the CalvertHealth CARES Clinic, a pharmacist visits patients who are experiencing difficulties picking up prescriptions, attending doctor's appointments or understanding their medication and care plan. The pharmacist delivers medications to patients and educates them about their medication to build health literacy.

Collaboration with STAAR Alert. As part of a grant funded by the Health Services Cost Review Commission, Totally Linking Care—a coalition that includes CalvertHealth, seven other hospitals and several community organizations—is partnering with STAAR Alert, a medical alert system that offers personalized in-home care services to patients. This partnership is a new approach to delivering health care to patients with limited access due to poor medical conditions, aging or lack of transportation. This service provides medical management devices, electronic pill boxes, electronic scale, blood pressure cuffs and glucometers in patient's homes. Patient reports can be downloaded by the hospital and transmitted to the patient's primary care doctor or to the collaborative.

Impact

In the first six weeks of its launch, the Mobile Health Center provided services to 330 residents at local schools, health fairs, churches and community events. The mobile unit also provides dental screening at a community center that serves local elementary schools, and individuals who need additional treatment are connected to CalvertHealth's dental clinic.

The CalvertHealth CARES's TAP program covered taxi transportation for 16 patients between January and June 2015, with an average expenditure of $62. Between March 2015 and January 2017, CalvertHealth CARES received 1,721 referrals for its CalvertHealth CARES clinic and MAP/TAP program. Overall, the hospital has seen a nearly 9 percent reduction in readmission rates since the start of CalvertHealth CARES. With the launch of the CalvertHealth partnership with STAAR Alert in November 2017, the hospital hopes to decrease the number of patients who cannot visit physician offices because of transportation issues.

Lessons Learned

- Bridging gaps in health care is a need.
- Investing in patients is the key to understanding how to care for them.

Next Steps

The Mobile Health Center is organizing visits to the local Head Start and Judy Center programs as well as expanding services to senior centers and partnering with faith-based organizations to address identified health disparities. The center is also exploring partnering with schools and local youth organizations to offer health assessments and physicals for sports participation. The CalvertHealth community wellness department is developing a program to address the health needs of the Spanish-speaking population in the county.

The CalvertHealth CARES program will continue to focus on enhancing current services, including seamless implementation of the STARR Alert system.

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Denver Health Medical Center

Introduction

Denver Health, a large safety net hospital, provides health care for approximately 150,000 individuals in Denver, the state of Colorado and the Rocky Mountain region. The health care system focuses on improving clinical care and enhancing knowledge and practices through education and research. Denver Health's main campus includes a Level I trauma center and has wards to accommodate care for correctional inmates. Besides 10 community health centers and 17 school-based clinics, the hospital also runs a center for eating disorders, poison and drugs and offers detoxification services through Denver CARES.

At a Glance

System Name
Denver Health Medical Center

System Stats
10 neighborhood family health centers, 17 in-school clinics

Hospital Type
Urban, safety net

Location
Denver, Colorado

Beds
525

Hospital leaders noticed that even though many patients seek several types of treatment at the hospital and its affiliated clinics, the no-show rate for outpatient visits was significant. Additionally, patients who had been admitted to the hospital were waiting an extended amount of time after discharge to travel home. After surveying patients, the hospital identified lack of transportation as a primary reason that patients were missing their appointments and waiting so long after discharge to go home.

Denver Health's mission emphasizes the importance of a patient's health and satisfaction. Limited access to routine health care due to transportation issues may make patients wait until they are in a health crisis to seek care in the emergency department. This is not the best option for patients nor the best way for hospitals to provide care. If transportation barriers are preventing patients from receiving the health care they need or preventing them from returning home in a timely fashion, patients are likely to be less satisfied with their care.

To help patients with transportation issues, Denver Health offers free bus tickets, cab vouchers, and a private car service through a vehicle donated by Oprah Winfrey. The "Oprah" car is staffed by retired community residents who are interested in helping get patients to and from appointments. More recently, the hospital started a collaboration with Lyft, the on-demand transportation company.

Intervention

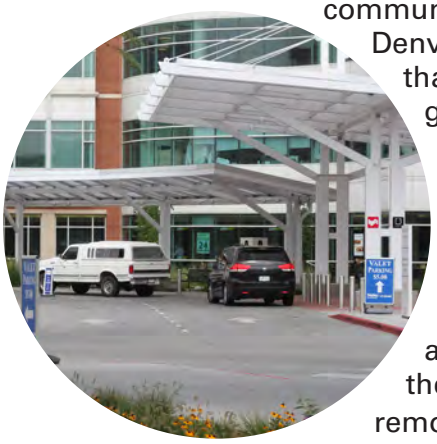
In November 2016, Lyft and Denver Health collaborated to develop a platform allowing the hospital to order rides for patients in need of transportation services. The service is offered to recently discharged patients and to patients who need transportation to and from outpatient clinical appointments. When the service was launched, it was piloted with patients in the emergency department. After three months, the service was expanded to hospital inpatients. Recently, it has been extended to four outpatient clinics as well.

The initiative is still expanding based on the community's needs and suggestions for improving practices. For example, nurses were initially calling and making appointments with Lyft, but by the time a patient was discharged, the Lyft driver had already come and gone. Since this service is extremely fast and trackable, the hospital staff is now responsible

for requesting and tracking a Lyft ride once the patient's discharge is complete. Patient navigators and social workers raise awareness among Denver Health patients and the larger Denver community by advertising and coordinating rides to and from medical appointments. Funded by the Denver Health Foundation, this service can cost an average of $7.40 per ride and is limited to 25 miles.

Impact

In the first three months of this collaboration, Denver Health ordered more than 200 rides from Lyft for patients visiting the hospital and its clinics. Denver Health uses the patient advocate office to track the number of complaints about lack of adequate transportation. Prior to the Lyft partnership, patient advocates received complaints daily. Since the partnership was launched, there have been zero complaints recorded about lack of transportation. The hospital also tracks the number of rides per location, to determine where the greatest community needs are located.



Denver Health has found that the Lyft program is a great benefit to patients for whom English is a second language. Navigating public transportation for these patients can be especially challenging, and getting a ride from the clinic to their homes removes that stress.

Lessons Learned

- When collaborating with on-demand transportation services, it is imperative to understand how the system works. Because this service is fast and has an average wait time of two to three minutes, the hospital must delegate certain staff members to order the service, to avoid longer wait times and ensure patients are connected with their ride home.
- Identify the area in the community where people would benefit the most from the service. Knowing that people genuinely need the Lyft service is essential in maintaining and eventually increasing the number of patients attending medical appointments and reporting better health outcomes due to improved access to care.
- Have the infrastructure in place to coordinate patient and driver interaction. Though initially it was challenging for the Lyft drivers to connect with patients, the hospital established a process to ensure the drivers are connected with the right patients. Making sure that the patient identifies the driver using a picture and car description and instructing the drivers to verify the patient's name and address when they enter the car has helped to ensure the process works as planned.
- Recognize there is always room of improvement.

Next Steps

The hospital's goal is to investigate the feasibility of a self-driving shuttle to use in designated spots around the community. Denver Health believes this service would increase access to care for various patient populations and also increase patient satisfaction and positive health outcomes and reduce pollution. The hospital is researching opportunities to use telehealth to improve care delivery without patients having to visit the hospital regularly for minor health issues. Denver Health also plans to assist communities with refugees by providing educational materials to help them better understand and use the hospital's transportation services.

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Grace Cottage Family Health & Hospital

Introduction

Since 1949, Grace Cottage Family Health & Hospital has become a primary source of health care for people in Townshend, Vermont. It provides acute, chronic, palliative, emergency and inpatient end-of-life care and also offers an inpatient rehabilitation program. The hospital operates Messenger Valley Pharmacy, the only retail pharmacy in Townshend. These services are available to approximately 7,700 residents from 20 surrounding towns. This rural critical access hospital has 10 primary care doctors, a podiatrist, a pediatrician, a psychiatric nurse practitioner and a urologist.

In Windham County, Vermont, Grace Cottage Hospital's 2015 community health needs assessment identified lack of transportation as one of the most significant barriers for residents to access adequate health care. The hospital also conducted one-on-one interviews to identify individual needs. Though there is a countywide bus and car service to provide transportation ("The Current"), it is available only for residents that meet certain requirements. This service only accepts riders who are 60 years of age or older or who qualify for Medicaid, and a rider must request a ride with two business days' advance notice. This type of service does not work well for those with urgent needs.

At a Glance

Hospital Name
Grace Cottage Family Health & Hospital

Hospital Stats
Family health clinic, pharmacy, diagnostic laboratory

Hospital Type
Rural, nonprofit, community, critical access

Location
Townshend, Vermont

Beds
19

Recognizing that many patients were unable to access care due to some type of transportation barrier, the hospital's community health team initiated the volunteer driver program in 2016. This program's only requirement is that a rider must be physically or cognitively independent, or travel with an assistant. Rides are provided to and from Grace Cottage for residents of Athens, Brookline, Jamaica, Newfane, Townshend, Winhall and other towns along the Routes 30 and 35 parameters. Potential riders are referred first to The Current, if they qualify. If not, rides are arranged with the volunteer drivers.

Intervention

Grace Cottage collaborated with Green Mountain RSVP, a nonprofit, nationwide program of volunteers age 55 and older, to start the volunteer driver program at the hospital. This collaboration recruits volunteer drivers from West River Valley and other neighboring towns. To improve access to wellness services and medical appointments, Grace Cottage utilized RSVP's insurance rider program to station volunteer drivers at the hospital. Volunteer drivers use their personal cars to assist those struggling to attend medical appointments at Grace Cottage's primary care practices or to return home after outpatient appointments or inpatient stays. The program's services are available to all patients.

The Grace Cottage transportation program fulfills requests for rides even if made less than 48 hours before scheduled appointments, which the countywide bus and car service does not, thus addressing a gap for patients who need urgent rides to

specialists and local tertiary care facilities. The hospital's community health team coordinates the program and its drivers. The program started with one driver, and almost a year later, it has increased to six drivers. Grace Cottage Hospital and RSVP both contribute to the program. RSVP vets all drivers by completing insurance and background checks, and it provides insurance to cover the drivers in case of an accident. The hospital provides a free lunch to drivers each time they give a ride to a patient and also includes drivers in volunteer recognitions.

Though buy-in from risk management was initially challenging to obtain, presenting this to leadership as an innovative practice that could address issues of access to care helped them see the financial and health outcome benefits of the program, without any insurance liability.

Impact

This program has made a major difference in the community. It has created new resources through collaboration and also increased community support. RSVP volunteers are older adults who are searching for ways to actively spend time and energy helping the community and its residents. Through the driver program, these volunteers are able to interact and build relationships with community members and hospital staff. Each driver gave an average of four to six rides a month in the first six months of the program, and now the average has increased to eight to 12 rides a month. The program has not had a formal evaluation matrix, but none of the drivers have missed any of their assigned appointments since the program started.

William Monahan, the community health team outreach coordinator who developed the program, has built a positive relationship with the drivers and with patients seeking the service. Monahan says, "After hearing about the program, patients have called me desperately asking for help because they have no means of attending their medical appointments." Monahan makes it a point to visit these patients in the hospital or clinic, to assure them that the hospital is working to address community needs. "Patients have hugged and thanked me for this program. Without the program, many would not have been able to get treatment when it's most needed. Seeing patients smile and appreciate the service is more than what we could have hoped for," Monahan says.

Lessons Learned

- Collaboration is key to developing resources that move health forward.
- Collaboration is also key to enhancing community growth.

Next Steps

The leadership and staff at Grace Cottage Family Health & Hospital recognize that transportation barriers restrict patients from accessing timely care and also prevent them from accessing food. The hospital plans on collaborating with a local food pantry, Veggie VanGo, expanding its program to transport healthy foods to patients and families in need. Volunteer drivers would deliver food from the pantry to vulnerable community members who are unable to visit the food pantry's weekly food drop.

Currently, all volunteer drivers provide rides to patients "out of the kindness of their hearts." The hospital has recently applied for a grant that would provide funds for gas cards for the drivers.

Starting with fiscal year 2018, data on the number of rides provided and the

types of appointments achieved will be recoded for use in future reports.

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Taylor Regional Hospital

Introduction

Serving approximately 110,000 people in the rural community of Campbellsville, Kentucky, and surrounding regions, Taylor Regional Hospital is an acute care facility with a Level III trauma center, and other care centers. With 94 physicans specializing in more than 25 specialties, the hospital served more than 98,000 patients in 2016. The hospital also has a correctional medical program to serve patients in area prisons.

Taylor Regional Hospital identified transportation as a major barrier to health care delivery, through its community health needs assessment. Besides doing a community health needs assessment every three years to determine services that are inaccessible in the community, the hospital also solicits input from public leaders and community organizations. The cancer center at the hospital screens patients to identify those with transportation issues. Patients are also referred by their providers for transportation services.

At a Glance

Hospital Name
Taylor Regional Hospital

Hospital Stats
10 physician offices, rehab center, cancer center, dialysis center

Hospital Type
Rural, nonprofit, community, medical, surgical

Location
Campbellsville, Kentucky

Beds
90

Any type of transportation services are located an hour away from Campbellsville, which restricts community residents from receiving timely care. Without taxis or public transportation in the area, residents of Taylor, Green, Marion and Adair counties are supported by a hospitality van service. This service, provided by the hospital and sponsored by 14 entities, including local businesses and community organizations, has opened many opportunities for residents to seek transportation when needed.

Intervention

Taylor Regional Hospital discerned the need for transportation services after evaluating the number of patients coming in for follow-ups, cancer screenings, lab testing, and other appointments. With transportation services available only in areas an hour away from Campbellsville, the hospital's cancer committee noticed that more people were missing their routine check-ups and radiation treatments. Though Medicaid patients have access to transportation services, many uninsured patients and some patients with Medicare and private insurance in Taylor County had no means of getting to and from the hospital or its clinics. Hospital leadership recognized that lack of transportation interrupts care delivery, therefore it initiated a hospitality van service for patients facing transportation issues.

The hospitality van service consists of two vans, running every day of the week from 7:00 a.m. to 5:30 p.m. The vans pick up and drop off patients at the hospital, dialysis centers, cancer centers, rehab centers and other facilities. As part of its commitment to engage the community in this program, the hospital dispatches the hospitality van service to three neighboring counties, increasing transportation access for various communities and age groups. Though the vans are owned by

the hospital, pickup and drop-off do not have to be at hospital-owned facilities. Patients who need transportation can use this service for medical appointments at any center, clinic or facility. Beyond that, the vans also deliver prescriptions to patients and provide transportation outside regular hours for special treatment or appointments, if needed.

The hospital has operated the van service since 2007, and it has been a part of the hospital's annual business and budget plans. Taylor Regional bears the cost of maintaining the vans and employing one full-time driver, one part-time driver and one per diem driver. Fourteen local organizations that sponsor the service are responsible for funding $80 each per month for gas. To raise money to purchase new vans with fewer miles, the hospital holds an annual fundraiser. With these funds, the hospital buys a new van every two years, which costs about $35,000 per van.

Taylor Regional Hospital also publicizes the van hospitality services through various channels. Home health agencies in the area and local community organizations, such as the homeless shelter, drug rehab center and health department, all inform patients of the van services that are available. The hospital has built strong partnerships with the 14 sponsoring organizations, and their logos are included on the van. The hospital also advertises their support via social media and the hospital's website.

Through these efforts and with community support, the van service has expanded over the years. The van service transports about 1,100 different patients every year, and many of them have multiple visits. In 2007, the van service traveled 18,481 miles; in 2016, it increased to 104,972 miles.

Impact

Though the hospital has not conducted a formal survey to evaluate the program and its services, it assesses the impact using feedback from community members who use the service. Jane Wheatley, CEO of Taylor Regional Hospital, says, "With 25,000 people using this service, we've never received a negative comment or complaint about it. Patients themselves and their loved ones have expressed how helpful this service has been in receiving treatment." The hospital continues to promote and raise awareness. Hospital leaders are passionate about creating a positive impact on the well-being of the community and are not focused on a large financial return on investment. "As long as we break even, we know that this service is helping people get the treatment they need whenever they want to," Wheatley says. "There is no dollar amount on the success of this program; patients' satisfaction encourages us to keep going."

One patient, Schultz, who lives 15 miles from Campbellsville, needed total knee replacement surgery. Afraid of leaving her husband suffering from dementia alone, Schultz almost avoided having the surgery because she had no way of traveling back and forth for rehab after surgery. The hospital offered Schultz transportation through the van service. Because of this help, Schultz attended all of her therapy sessions and now volunteers for the hospital's auxiliary department.

Lessons Learned

The hospitality van service has increased access to care for many communities near Taylor Regional Hospital, and support from the community helped make it possible. Investing in the community

and identifying residents' health-related needs are the first steps in the process. To develop a similar transportation service, the hospital recommends:

- Seek leadership buy-in
- Pursue support from city and county government officials
- Collaborate with community organizations and business for additional resources, whether it is for funding, volunteers, utilities or other needs
- Maintain a budget for maintaining the service every year (e.g., to purchase new tires or brakes)
- Address challenges as an opportunity to grow
- Report back to the community about efforts to address priority health issues

Next Steps

With the success of the hospitality van service over the years, Taylor Regional Hospital is discussing branching out to other communities. The hospital is considering purchasing another van and employing a part-time driver to extend services to other nearby communities and continue improving health outcomes.

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Endnotes

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Transportation to Healthcare Destinations

How A Lifeline for Patients Impacts the Bottom Line for Healthcare Providers

This document outlines the connections between transportation and healthcare, providing context and suggestions that will enable transportation providers to engage in conversations with healthcare agencies and make the case for more collaboration between the two sectors. For this document, two fundamental questions were posed: To what degree is a lack of transportation associated with missed medical appointments? and What do those missed appointments actually cost health systems? In addition to gathering information from literature linking healthcare and transportation, insight was gained directly from providers and by reviewing information from institutions like the Robert Graham Center, which is in the process of gathering non-medical data, (i.e. social, economic, and housing information) from patients for the creation of more comprehensive electronic medical records. The reflections section includes connections made by the literature and some thoughts on ways to weave commentary about social factors that impact health into discussions partners from different sectors might have as they look to positively impact the health of the communities they serve. The document has a companion resource guide transportation providers can use to begin conversations with the healthcare community.

Even in areas where access to healthcare services is relatively easy, achieving and maintaining good health outcomes is a complicated undertaking because of the many factors that contribute to individuals' health. Improving the frequency and quality of the interaction patients have with the healthcare provider team can positively impact health. This is especially true for individuals with limited income who are particularly vulnerable to the negative impacts of poor housing, inadequate education, lack of access to healthy food, challenging physical environments, and high rates of unemployment. As health systems pay closer attention to the costs associated with caring for populations of patients, they have had to focus on the nonmedical factors that impact health outcomes. Factors like housing, education, employment, and economic development all play a major part. Also on that list is transportation. The focus of this document is to explore the role

transportation plays in connecting patients to their healthcare providers, medications, and other health-related services.

The Role of Transportation in Poor Health Outcomes

In any population, missed medical appointments (treatment non-adherence) results in poor health outcomes. There are many reasons cited by patients for missing appointments, including not being able to leave work, inability to find child care, and lack of health insurance, but transportation-related challenges are one of the most often mentioned.

This connection between transportation challenges and the ability to keep medical appointments has been discussed in several studies; and, although anecdotal evidence abounds, we still do not have comprehensive data to determine the ultimate impact that transportation barriers have on health outcomes. However, one report by Syed and colleagues looked at the results of 61 studies that in one way or another explored the issue of transportation barriers; in those 61 studies, researchers reported that anywhere from 3% to 67% of the population sampled reported a lack of transportation as a barrier to healthcare.[1]

Among the findings from those 61 studies are the following:

- A survey of 183 caregivers of children in urban Texas who had at least one medical appointment over a 9-week period found an overall no-show rate of 26%. For those with a history of missed appointments, 50% cited transportation problems, and for those who kept appointments, 30% cited transportation issues. Factors associated with missed appointments included not owning a car and not having access to a car.[2]
- Cancer patients who were significantly less likely to receive first-line chemotherapy were those who lived in neighborhoods that had a higher percentage of households without any vehicle.[3]
- In one study of 200 children with a history of missed appointments, 51% of parents identified transportation barriers as the primary reason for missing clinic appointments.[4]
- A study of almost 47,000 Medicaid patients demonstrated that when patients were required to receive prior approval for Medicaid-funded transportation, there was an associated reduction in visits for primary care visits at hospital-affiliated healthcare clinics and reduced refilling of prescriptions. Neighborhood-located health centers partially ameliorated the decline in primary care visits.[5]
- In rural North Carolina, patients who had a driver's license or a friend or family member with access to a vehicle, attended anywhere from 1.5 to 2.3 times as many healthcare visits for chronic care as those who did not.[6]
- In a study of an urban population in Dayton, Ohio, 30% of respondents indicated that a lack of transportation was one of the barriers to their seeking heathcare.[7]
- One study looked at access to healthcare for those who used public transit to get there. They found that accessibility to a hospital, defined as getting to a hospital or clinic in 30

min or less by public transit, or being within walking distance (less than a half-mile way), varied from 0 to 28%. Additionally, 55% of missed appointments or late arrivals were due to transportation problems.[8]

Benefit of Accessing Consistent Healthcare

Improving the access patients have to providers is an opportunity to improve health outcomes immediately and in the long-term. Patients who spend more time with their healthcare team have better rapport with their providers, greater understanding of their medical conditions, and are likely to be more satisfied with their experience with the provider, making it a relationship they want to maintain.

As more and more healthcare systems establish "medical homes" for patients, transportation will be a key factor in how well that approach is implemented. In this model, the primary care medical home is accountable for meeting the large majority of each patient's physical and mental healthcare needs, including prevention and wellness, acute care, and chronic care. This model is implemented with a team of care providers, and is focused on delivering comprehensive, coordinated care to patients. Patients who receive the needed, regular primary and preventive care through such a coordinated system will be less likely to rely on emergency departments for care.

The Cost of Missed Appointments

Many factors contribute to the high cost of healthcare. When patients miss appointments—whether for primary/preventive care or as follow-up to a recent hospitalization or other acute care (e.g., surgical procedure)—the cascade of events can all lead to higher costs. For example, not following a healthcare provider's recommended treatment regimen can lead to

- *poorer health outcomes*, especially for those with chronic conditions, which in turn can lead to a more acute complication needing immediate attention and potentially leading to an emergency department visit or a premature hospital readmission, both more costly than if the patient had followed through with outpatient or clinic-based appointments.
- *diminished ability to closely follow a patient's condition*. During appointments, not only do healthcare providers treat symptoms of chronic or acute conditions, they also perform necessary diagnostic and screening tests, prescribe or adjust medications, and refer patients to other medical services.
- *lost opportunity for patient education*. Healthcare providers use appointments to build rapport with the patient and educate them on different aspects of their healthcare diagnoses or conditions. It is also the time when providers can ask patients about other non-medical aspects of their life that may be impacting their health and refer them to other supportive services, in essence treating the whole person and not just their disease.

- *financial implications for the healthcare provider*, related to staff time and resources already dedicated to providing a service to the patient which, once the patient doesn't show, cannot be billed, thus resulting in lost revenue for the provider.

The literature shows a wide variance in the cost of missed medical appointments, with health systems reporting a range of $150 to %274 in lost revenue per missed appointment. Across a healthcare system, this adds up quickly. For example, in a health system that has 1,000 patient visits each year, if 100 (or 10%) of those patients missed appointments each year, this would result in annual revenue losses ranging from $15,000 to $27,400. Using the same missed appointment rate, a system that sees 45,000 patients each year would see annual revenue losses of $675,000 to $1.2 million each year. Of course, if the no-show rate is higher than 10%, these costs would go correspondingly higher.

In addition, it should be noted that these cost estimates only consider the cost of running the clinical unit, and do not take into account the additional cost associated with patients needing to use the emergency department for follow-up (estimated in one study to be 15 times more expensive than a regular clinic appointment), premature hospital admissions, inadequate management of pain, or missed opportunities to provide education, perform further assessment, and prescribe medication. These indirect costs were highlighted in a 2012 study of primary care visits for diabetic patients in which a correlation was found between "no-shows" (patients who missed appointments) and a greater risk of hospitalization.[9]

Another cost driver that came to light in conversation with practitioners was the issue of the cost of not being able to discharge patients from hospital beds. A night in a hospital can cost much as $1,500, without factoring in the cost of ambulance transport, major procedures, or diagnostic testing, so having discharge-ready patients stay beyond their course of treatment is costly. Hospitals need beds for sick patients; further, they wish to avoid spending hospital resources for patients who no longer need hospital-based care and want to decrease the chance of those "discharge-ready" patients getting sick from an infection acquired while in the hospital. In addition, when hospitals do not have available beds for new patients, they must divert these patients—and the potential revenue they would bring to the hospital—to another facility. These potential consequences of not being able to discharge patients home has led to hospitals providing taxi fare or some other transportation option just to get them home.

How Addressing Transportation Can Help

Understanding the needs of patients and how factors like transportation impact their health requires good data. Some of this can be achieved by interviewing patients directly, or by reviewing large volumes of medical records and charts.

Given the range of methods, questions, and settings in which this research is done, it is no surprise that there is a lot of variability in what the research shows. The literature reviewed described transportation as one of many factors impacting a patient's access to care. The literature also suggested that improving transportation options would likely serve to decrease missed medical

appointments and the many undesirable outcomes that go along with that. Fixing this not only benefits patients, but also benefits health systems who annually lose millions of dollars because of missed appointments, high emergency department or urgent care utilization, and premature hospital readmissions accompanied by heavy fines and reimbursement penalties.

The incentive to address transportation gaps is also driven by the desire of health systems to provide patients with a quality healthcare experience. Moving patients to and from visits is facilitating care, and increases the likelihood of appointments being kept and of patients being satisfied, more compliant, better informed about their condition(s), and healthier. With the competition created in markets where patients have the ability to choose their provider or payer, the advantage will go to those that can rise above the competition by providing an attractive suite of services designed to make it easier for patients to access care, medication, and other related services. Healthcare providers might look at the option of covering transportation costs (*see next section*), coordinating appointment scheduling with available transportation options, partner with shared-ride providers, or even providing transportation services for clients.

New OIG Opinion: Provision of Medical Transportation and "Safe Harbor" Protection from Penalties

The U.S. Department of Health and Human Services, Office of Inspector General (OIG), issued a new ruling on December 7, 2016, covering financial contributions to and provision of non-emergency medical transportation (NEMT) by healthcare providers. The rule effectively creates a new safe harbor for two types of local transportation: transportation that is provided for individual patients and shuttle services for patients or others – along a fixed route with a set schedule. The rule makes clear that healthcare providers are allowed to contribute to or provide transportation services within certain parameters without being in violation of regulations against unfair business practices. In essence, the new rule permits healthcare providers—including hospitals, clinics, physician's offices, dialysis clinics, medical laboratories, physical therapists, and the like—to choose to fund by themselves, or in combination with others, local NEMT or shuttle services that may go way beyond NEMT.[10]

Reflection

It is clear that transportation barriers have an impact on health outcomes, although the literature shows such variance in how that connection is made that it is hard to be say with certainty that simply improving transportation options will improve health outcomes. It is however indisputable that missed medical appointments carry with them significant cost. Combine this with the fact that hospitals are being heavily penalized for premature readmissions and primary care providers may not be reimbursed if they are unable to show improvements in their patient's medical conditions, and the "missed appointment puzzle" becomes more pressing.

At the root of the best response to this problem is the availability of data collected from patients as they interact with health systems and healthcare providers. Being able to make the case for transportation as a primary determinant of health outcomes requires more robust data, specifically

the kind reflecting the social, economic, and environmental realities of the low-income, minority, and rural communities most impacted by health challenges. Reliable data from patients captured in electronic medical records is already used for research and to help understand patient populations. It is hoped that over time, more providers bolster their patient's electronic medical records with inputs related to the broader socioeconomic and environmental factors that directly and indirectly impact health.

Filling out a patient's profile with relevant socioeconomic factors, including transportation, can

- lead to a more robust understanding of the patient and what the most impactful interventions are for that patient
- tells the healthcare system more about patient experiences, bolstering their ability to enhance the care provided to patients
- puts funding where resources are needed
- informs policy-making, and
- sets a standard for a comprehensive approach to health and healthcare.

This mindset underpins the patient-centered approach to managing patients' health and the cost of their care. It is a mindset that places a premium on spending more time with patients and getting to know them in a very comprehensive way. This methodology understands the complexity of the factors that impact health, and recognizes that health is more than healthcare. The data systems that support such ventures should be similarly detailed and broad in the data they are capable of gathering. Health systems seeking to work in this way need to ensure that they have payers willing to support the non-medical (i.e. transportation) opportunities to improve health outcomes that the "new data" present.

What kind of data would need to be collected? The data could run the gamut, such as:

- determining a patient's primary language and literacy level
- understanding the environment in which the patient lives
- understanding the patient's family responsibilities and dependents
- knowing about a patient's employment status, work environment, and work activities
- exploring the patient's mobility options (e.g., driver's license, ownership of motor vehicle, current insurance, access to rides by others, access to public transportation)

Combining these data with the medical information in patients' medical records, when added to in-depth focused interviews, will help piece together the many aspects of patients' lives that influence their health. It will enable clinical operations to better understand patient health behaviors based on information coming directly from clients, and could open the door for designing health-impacting programs *with* clients in which they will be more likely to participate.

Notes

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Additional Resources

Agency for Healthcare Research and Quality, Department of Health and Human Resources. "Defining the Patient-Center Medical Home." https://pcmh.ahrq.gov/page/defining-pcmh

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AVTA Third-Party In-Kind Valuation Plan

Task	Activity	Title	Name of In-Kind Match Provider	Fair Market Value Determination	Fair Market Value or Hourly Rate	Number of Hours	Estimated Cost
4	Public, stakeholder, committee, and working group meetings	Meeting space	Stakeholder public space (non-governmental and non-AVTA	Using average rate determined by survey of public spaces	20	32	$640.00
4.1.1	Community Advisory Committee formation	Volunteer members	Estimated 12 members who voluntarily attend five, 2-hour meetings - attendance records	Using standard minimum wage rate for CA	10.5	120	$1,260.00
4.1.2	Jurisdictional Working Group	Volunteer members (not including jurisdictional staff)	Estimated 5 members in who voluntarily attend five, 2-hour meetings - attendance records	Using standard minimum wage rate for	10.5	50	$525.00
4.2.1	Pre-plan Community Meeting Stakeholders	Volunteer attendees	Estimated 50 attendees at 2 hour stakeholders meeting who attend on a volunteer basis - attendance records	Using standard minimum wage rate for CA	10.5	100	$1,050.00
4.2.1	Pre-plan Community Meeting Advocates	Volunteer attendees	Estimated 25 attendees at 2 hour Advocates meeting who attend on a volunteer basis - attendance records	Using standard minimum wage rate for CA	10.5	50	$525.00
4.2.1	Pre-plan Community Meetings Community Members	Volunteer attendees	Estimated 300 attendees at 2 hour Public meetings who attend on a volunteer basis - attendance records	Using standard minimum wage rate for CA	10.5	600	$6,300.00
4.2.1	Pre-plan Roundtable Meetings	Volunteer attendees	Estimated 25 attendees at 2 hour Public meeting who attend on a volunteer basis - attendance records	Using standard minimum wage rate for CA	10.5	50	$525.00
4.2.1	Plan Review Meeting with Public, Stakeholders, and Advocates	Volunteer attendees	Estimated 100 attendees at 2 hour Public meeting who attend on a volunteer basis - attendance records	Using standard minimum wage rate for CA	10.5	200	$2,100.00
4.2.2	Outreach Surveys	Volunteer participants	Estimated 3000 returned surveys that take 30 minutes to complete - completed, returned surveys	Using standard minimum wage rate for CA	10.5	1500	$15,750.00
						TOTAL ESTIMATED IN-KIND MATCH VALUE	**$28,675.00**

Total in-kind match will be documented on a monthly basis and will be based on attendance records at meetings and written notices of value for donated meeting space.