California TRANSPORTATION PLAN 2040

Appendix 8

Matrix of Recommendations

Integrating California's Transportation Future

Caltrans

APPENDIX 8 | MATRIX OF RECOMMENDATIONS

"California's transportation system is safe, sustainable, universally accessible, and globally competitive. It provides reliable and efficient mobility for people, goods, and services, while meeting the State's greenhouse gas (GHG) emission reduction goals and preserving the unique character of California's communities." – CTP 2040 Vision

Additional recommendations outlined in this appendix provide ways that State, regional and local government, agencies, non-governmental organizations and community based organizations can implement the California Transportation Plan 2040 (CTP 2040) vision within their respective jurisdictions, scopes and responsibilities. It should be noted that many of the recommendations put forward in this appendix are not directly under State control and, therefore, will require the voluntary cooperation of other governmental and private organizations to achieve. These entities become partners with the State in ensuring that the CTP 2040 is the overarching guide and vision for all other plans and transportation investments. The CTP 2040 will continue to evolve through an extensive public involvement process, government-to-government engagement with tribal communities, and close work with all levels of local, regional, State, and federal partners.

The recommendations reflect the work of statewide transportation leaders, and the CTP 2040 policy advisory committee (PAC) and technical advisory committee (TAC) members. This appendix is organized with the recommendations under broad-based themes or categories—many are provided within the context of the strategies from Chapter 4. Some of the recommendations can be implemented or adopted immediately, while others have longer terms. The recommendations are presented as short-range (within the next 2 years), mid-range (within the next 3 to 5 years), and long-range opportunities (from the next 5 to 20 years). A short-range recommendation is something that can be implemented rather quickly. A short-range recommendation may result in a long-term program, policy, or other activity that lasts for years. Some categories have only short-range recommendations, while others only long-range. In addition, many recommendations are ongoing, e.g. short-range recommendations very well should continue into mid and long-range implementation.

SAFETY

IMPROVE PUBLIC SAFETY AND SECURITY

California Department of Transportation (Caltrans) supports a proactive approach to improve and promote multimodal public safety and security. Fatalities and injuries have reduced due to statewide efforts of creating awareness. However, there remains the need to reduce safety risk disparities with bicyclists and pedestrians, as these groups represent a significant percentage of all fatalities.

The CTP 2040 is consistent with the policies and strategies from the Caltrans five modal plans (i.e. Interregional Transportation Strategic Plan [ITSP], California State Rail Plan [CSRP], California Freight

Mobility Plan [CFMP], Transit Plan, and the Aviation Plan), Complete Streets, and the Strategic Highway Safety Plan (SHSP) 2014-19. The SHSP 2014-19 investments in safety improvements to the multimodal system are evident in California, which experienced a 30.4 percent reduction in fatalities and a 17.5 percent reduction in severe injuries from 2005 to 2012.[1] The CTP 2040 incorporates policies and mandates from the SHSP 2014-19, 2015 California Highway Safety Plan, and Surface Transportation Act, Fixing America's Surface Transportation Act (FAST Act) (Sections 1201, 1202 and 1203) that continue to promote safety and security. The CTP 2040 also encourages future reductions in fatalities and serious injuries with programs, such as toward zero deaths (TZD) and incorporating security design improvements and approaches—for example, Crime Prevention through Environmental Design (CPTED).

Lastly, Caltrans supports investments in new technology that incorporates safety improvements to the multimodal system for traffic and modal safety efforts, such as collision prevention programs, roadway infrastructure improvements, enforcement, public education, and advances in State-of-the-art safety technology, such as connected vehicles/autonomous vehicles (CV/AVs) and interconnected multimodal systems.

Recommendations

SHORT-RANGE

- Continue investments toward planning and construction of highway safety projects.
- Invest in rail safety public awareness campaigns and social norming to change behavior related to Operation Lifesaver, railroad grade crossing safety improvements, and safe operations for both passenger and freight rail.
- Emphasize planning and funding to increase railroad crossing safety improvements and grade separations.
- Emphasize planning and funding for projects that provide a safer network of both rural and urban bike and pedestrian routes.
- Implement aggressive public education and media/awareness campaigns to increase awareness of distracted motorists, cyclists, and pedestrians.[2]
- Improve traffic safety and security programs through prioritizing opportunities for risk reductions, implementation, monitoring, testing, evaluating, and revising safety and security plans.
- Identify hazardous materials transport routes that minimize risk in populated areas.
- Assess and minimize transportation security risks for hazardous materials shipment and identify appropriate measures to address the assessed risks.
- Ensure that activities and operations enhance transportation security.[3]
- Support grants and funding opportunities for cooperative multiagency/multi-municipality data systems, data sharing and resource and data pooling.

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[1] Business. Transportation, and Housing Agency Contributing Departments, "California Strategic Highway Safety Plan," 2012, http://www.dot.ca.gov/hq/traffops/survey/SHSP/SHSP-Booklet-version2_%20PRINT.pdf.

[2] http://www.chp.ca.gov/programs/pdf/CIEP_HM.pdf

[3] California Office of Traffic Safety, "California Highway Safety Plan," 2015, http://www.ots.ca.gov/Media_and_Research/Publications_and_Reports/hsp15/2015-HIGHWAY-SAFETY-PLAN.pdf.

- Continue outreach efforts to both urban and rural counties to help them improve safety, data collection, access, and analysis by continuing to fund traffic collision database and Geographic Information System (GIS) mapping.
- Continue to install and test positive train control (PTC) technology on all intercity and commuter passenger rail.
- Collect, analyze, and distribute safety data among planners and decision makers who coordinate and find areas that could benefit post benefit-cost analysis for investments that improve the safety of the arterials, corridors, ramps, etc.

MID TO LONG-RANGE

- Fund and improve the quality, completeness, timeliness, and uniformity of safety data and the sharing among federal, State, and local agencies and stakeholders.[4]
- Fund regional emergency medical services (EMS) programs to ensure rural communities have access to the latest "State-of-the-art" rescue and extrication equipment.[5]
- Fund "corridor driving under the influence (DUI) programs" that select corridors based on data showing disproportionate numbers of DUI collisions and convening task forces to implement identified solutions.[6]
- Improve outreach, education, and implementation of CPTED, an approach that deters crime and provides security through environmental design in transportation systems.
- Establish requirements, collaborate with and support research for manufacturers of CV/AV, and Self-Guided Magnetic Bus Technology to meet specific safety requirements that have the potential to improve safety, costs, and efficiency in reducing passenger fatalities and traffic incidents as well as operational benefits.
- Support vehicle technological improvements such as automatic braking and CV/AV.
- Support at-grade freight railroad crossing improvements.

SUSTAINABILITY

FOSTER LIVABLE/ HEALTHY COMMUNITIES AND SOCIAL EQUITY

In order to successfully foster livable and healthy communities, there has to be coordinated planning. The CTP 2040 encourages infill development and conservation opportunities, as a way to reduce urban sprawl and allow for better transit and rail, and to be consistent with Senate Bill (SB) 375. An integrated planning process should increase the public's ability to influence and understand the implications of planning decisions through outreach and utilization of new and emerging technologies. In transportation planning, consideration of social equity and environmental justice (EJ) modeling, and

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[4] California Department of Motor Vehicles, "Department of Motor Vehicles Strategic Plan FY 2014-2015. In Safety," 2014, https://www.dmv.ca.gov/portal/dmv/detail/pubs/strat_plan/strategic_plan/.

[5] California Office of Traffic Safety, "Moving Forward: Emergency Medical Services," http://www.ots.ca.gov/OTS_and_Traffic_Safety/Moving_Forward.asp.

[6] California Office of Traffic Safety, "California Highway Safety Plan," 2015, http://www.ots.ca.gov/Media_and_Research/Publications_and_Reports/hsp15/2015-HIGHWAY-SAFETY-PLAN.pdf.

measurement of health impacts will be necessary to improve outcomes related to quality of life, livable communities and equity.[7]

Land use and transportation decisions greatly affect the health and safety of the community and the environment. CTP 2040 calls attention to the fact that public health can be impacted by transportation services. Land use planners, transportation planners, and others must collaborate to ensure that the health and safety of the community remains a priority. Shared data across sectors would benefit all entities. No single agency has authority over every decision or policy. The transportation system should provide an equitable level of multimodal transportation services to all segments of the population.[8]

Recommendations

SHORT-RANGE

- Collaborate with stakeholders and partners early and often in the planning process.
- Collaborate to develop transportation planning tools, policies, and incentives to improve analysis and consideration of social equity, EJ, and public health impacts.
- Ensure that transportation plans reflect strategies to connect the transport/access of people, goods, and services in efficient ways to integrate housing, work, recreation, and public institution needs while at the same time, avoiding negative impacts to agricultural production areas and sensitive land and water resources; create funding decision priorities for projects that contribute toward these goals.
- Promote mixed-use activity nodes incorporating place-making urban design principles in conjunction with transportation improvements.
- Promote inclusion of affordable housing plans, policies, and projects within applications for federal funds to take advantage of scoring criteria for these in programs such as the Federal Transit Administration's (FTA) New Starts Program.
- Promote efficient infill housing development and redevelopment opportunities to reduce urban sprawl consistent with SB 375, the Sustainable Communities Strategies (SCSs), and other regional and State policy guidance.
- Implement the Smart Mobility Framework (SMF) principles statewide to integrate the transportation system and encourage non-motorized forms of transportation and Complete Streets.[9]
- Identify potential pedestrian and bicyclist improvements on State highways and work toward development of those projects.[10]
- Promote the Affordable Housing and Sustainable Communities (AHSC) Programs.

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[7] San Diego Association of Governments, "2050 Regional Transportation Plan," 2011, http://www.sandag.org/uploads/2050RTP/F2050rtp_all.pdf.

[8] Federal Transit Administration, "Complete Streets: Integrating the Transportation System. Deputy Directive DD- 64-R2," 2014, http://www.fta.dot.gov/12853_14875.html.

[9] Caltrans, "Smart Mobility 2010: A Call to Action for the New Decade," 2010, http://www.dot.ca.gov/hq/tpp/offices/ocp/smf_files/SmMblty_v6-3.22.10_150DPI.pdf.

[10] San Diego Association of Governments, "2050 Regional Transportation Plan," 2011, http://www.sandag.org/uploads/2050RTP/F2050rtp_all.pdf.

- Support an increase of the supply of new housing units for all income levels to meet California's housing needs.
- Work with tribal governments using principles of coordination, collaboration, and engagement to improve transportation for tribal communities.
- Support general plans that are consistent with State sustainability goals such as GHG reduction and vehicle miles traveled (VMT) reduction.
- Continue research on relationships between affordable housing and mobility, and disseminate the results from the research to inform local policies.
- Encourage local policies that can help mitigate displacement effects on low-income populations.

Mid to Long-range

- Partner with industries and innovators involved in technological approaches to environmental improvement.
- Support infill development and compatible land use around rail stations.
- Follow the model of the California Health in All Policies Task Force (HiAP), through which more than twenty State departments and agencies came together to promote public health, equity, and environmental sustainability across multiple policy areas, including transportation, housing, and land use.
- Implementing policies to provide sufficient distance between diesel-powered freight transportation projects and schools, residences, and other receptors to avoid significant health risks, e.g. through guidelines for freight siting and truck routes.
- Work with local and regional agencies to apply considerations of health, equity, and sustainability to transportation decision-making.

Practice Environmental Stewardship

Upholding environmental stewardship requires a multi-pronged approach. While meeting transportation goals and maintaining the transportation system, negative impacts to natural resources and working lands should be avoided to reduce costs, risks and protect and preserve the State's environment. California must develop transportation improvements that sustain and enhance the environment, and reduce GHG and criteria emission from vehicles. In all planning decisions, policy makers must consider climate change mitigation, adaptation, conserving natural resources, and limiting environmental impacts. While some recommendations may appear in other sections, there are mutual benefits. For example, recommendations in other sections, such as VMT reductions and expanded transit services and operations, have a mutual benefit of reducing GHG and criteria pollutant emissions and therefore are linked closely with environmental stewardship."

Recommendations

SHORT-RANGE

- Support wildlife connectivity and naturally functioning ecosystems through design plans to protect habitat and natural resources.

- Expand the use of technology and tools to provide environmental impact performance measures.
- Continue to promote policies that reduce GHG and criteria pollutant emissions such as the 2013 Zero-Emission Action Plan, which directs the State to accelerate the market for zero-emission vehicles (ZEVs) in California. This also includes a goal of 1.5 million ZEVs in California by the year 2025.[11]
- Support technological research and development of alternative fuels and transportation modes that can further improve air quality.[12]
- Promote active transportation, ridesharing, rail, and public/mass transit promoting policies for the co-benefit of reducing air pollution when they replace motor vehicle trips.
- Convene State, regional, and local stakeholders to establish coalitions that engage communities on the importance of environmental stewardship.
- Expand resiliency planning and climate change impact studies of sea-level rise (SLR) and storm events, and other climate change indicators that affect the future of communities, infrastructure, and ecosystems.
- Support electrification of passenger rail, mode shift from planes and autos to high-speed rail (HSR), and investments in renewable energy sources for transportation. Promote and expand strategies such as the Cap-and-Trade Program and HSR, and enhance environmental stewardship locally, regionally, and statewide.
- Continued coordination between Caltrans and the California Air Resources Board (ARB) on development of transportation policies as part of developing State Implementation Plans.
- Minimizing environmental impacts during construction of transportation projects where feasible by developing and disseminating a list of construction best practices.
- Providing funding and policy support for development, demonstration and deployment of needed clean technologies, including support for transportation and other infrastructure that enables and incentivizes use of zero- and near-zero-emission technologies.

MID-RANGE

- Establish partnerships between State, regional and local agencies to implement recommendations from the 2014 Assembly Bill (AB) 32 Scoping Plan Update.
- Support local communities in the development of integrated transportation and land use strategies to resiliently respond to climate change through their General Plans, Regional Transportation Plans (RTPs), and Local Coastal Programs (LCPs).
- Collaborate (public and private entities) to demonstrate and deploy mobile source control technologies that will assist California in reducing air pollutants and reaching National Ambient Air Quality Standards attainment and reducing GHGs.

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[11] Governor's Interagency Working Group on Zero-emission Vehicles, "2013 ZEV Action Plan A roadmap toward 1.5 million zero-emission vehicles on California roadways by 2025," 2013, http://opr.ca.gov/docs/Governor's_Office_ZEV_Action_Plan_(02-13).pdf.

[12] Sacramento Area Council of Governments, "Metropolitan Transportation Plan/Sustainable Communities Strategy: 2035, 142." 2012, http://sacog.org/mtpscs/files/MTP-SCS/MTPSCS%20WEB.pdf.

- Maintain and strengthen the ZEV regulation, new vehicle GHG performance standards, the Cap-and-Trade Program and the Low Carbon Fuel Standard.

SUPPORT ECONOMIC VIBRANCY

The CTP 2040 supports an efficient and affordable transportation system that enhances mobility. Transportation costs are a significant portion of an average household income. Affordable transportation is essential to a healthy and vibrant population, enhancing physical and economic interactions, and promoting a sustainable and livable environment. The CTP 2040 looks to a future transportation system that adapts to population increases, societal preferences, technological innovations, and emerging needs of businesses to provide access for employees and customers. These factors will influence where people live and what type of transportation mode they will choose, as well as the cost of transportation services.

Recommendations

SHORT-RANGE

- Avoid projects with high health and environmental costs.
- Prioritize funding toward transportation alternatives that enhance efficient and affordable mobility.
- Work with tribal governments to improve access to State highways from tribal lands.
- Support the modification of design standards to implement the Main Street Guidelines.
- Support projects that improve intermodal freight access and reduce congestion especially along freight corridors.
- Support regional and local government planning for investments improving the proximity of jobs-housing relationships.
- Allocate transportation project funding in a manner incentivizing improved accessibility of housing and major employment centers, restraining commuting distances, and the combined cost of housing and transportation.

MID TO LONG-RANGE

- To the extent reasonable, adjust pricing of transportation modes to reflect the total cost for each mode, including health and environmental costs, providing subsidies to accommodate ability to pay without compromising economic competitiveness.
- Invest in interregional goods movement corridors.
- Improve the linkages between transportation, housing, and land use by tying policies to incentives with environmental benefit.
- Develop a tax and fee structure that facilitates an efficient and affordable transportation system consistent with long-term transportation, housing, land use, and resource management plans.

Obtain Permanent Funding

The CTP 2040 emphasizes the need for reliable, permanent sources of funding to ensure a sustainable system and service delivery. The State needs over $536 billion to sustain and improve the transportation infrastructure, but transportation revenue is estimated to only total $242 billion over the next 10 years.[13] This shortfall is primarily due to marginal transportation revenues. As mentioned, motor fuel taxes have remained constant for decades, shrinking in real terms when accounting for inflation. Moreover, the need to fund a multimodal system is more urgent than before, yet new transportation revenue sources have not been added. Policymakers must provide the transportation sector with permanent funding sources that account for inflation and population growth. One funding strategy currently being discussed in the context of the CTP 2040 goals is tolling/pricing strategies. More information about the proposal can be found here: http://calsta.ca.gov/

Recommendations

SHORT-RANGE

- Support efforts to implement a road pricing strategy with consideration of accounting for equity impacts, contingent upon capacity to simultaneously improve transit services.
- Support efforts to close the funding gap for Metropolitan Planning Organizations (MPOs) to implement the regions' SCSs. Encourage inter-governmental cross-sector collaboration in developing financing mechanisms, including cross-sector financing of sustainable, integrated corridors and supportive land uses.
- Support recommendations for dedicated freight funding.

MID TO LONG-RANGE

- Implement a revenue structure that is solely dedicated to improving non-motorized travel methods.

Address climate adaptation and resiliency of infrastructures to ensure reliable transportation

GHG reductions and climate adaptation must go hand-in-hand to effectively combat the challenges of climate change. The CTP 2040 highlights adaptation and resiliency as key factors in transportation planning. SLR, intense storm activity (causing flooding and washouts), drought, increase in forest fires, and higher temperatures are all a significant risk of climate change with uncertain effects on all modes

[13] Leiter, B., et al., "2011 Statewide Transportation System Needs Assessment," 2011, http://www.catc.ca.gov/reports/2011Reports/2011_Needs_Assessment_updated.pdf.

of transportation.[14] Preparing transportation infrastructure for climate change impacts is a new priority as future projects are designed and the current system is maintained. The tools and methodologies for evaluating and adapting to such impacts are still in the early stages of development and will require ongoing monitoring.[15]

Recommendations

SHORT-RANGE

- Incorporate climate change resiliency in long-range transportation documents to address potential climate change-related vulnerabilities.[16]
- Require climate change resiliency in State Highway Operations Protection Program (SHOPP) and State Transportation Improvement Program (STIP) programs and projects.
- Coastal communities must utilize LCPs alongside General Plans and RTPs to reduce GHG emissions and implement climate change adaptations, giving first priority to where the impacts of SLR are most intense. Consider project alternatives that avoid significant new development in areas that cannot be adequately protected (planning, permitting, development, and building) from flooding, wildfire and erosion due to climate change.[17]
- Focus on reliable transportation routes away from SLR impacts on harbors and ports[18], airports, access roads, rail tracks, and bridges.
- Track SLR and other climate change indicators using interactive maps and modeling that identify transportation infrastructure that could be vulnerable to environmental and climate changes.
- Develop a project-level checklist to evaluate facility risks and vulnerability due to climate change impacts. Evaluate projects for climate change vulnerabilities at the time funding is programmed, and incorporate project design features to improve resiliency of facilities and infrastructure." Example of vulnerability assessment system: Federal Highway Administration's (FHWA's) Vulnerability Assessment Scoring Tool (VAST).
- Evaluate SLR and potential adaptation responses to anticipated SLR in new construction, as well as repair and replacement projects, and factor these considerations into the selection of the preferred alternative to meet the project purpose and need.
- Education programs that teach community members about global warming, and how they can be an active part of the solution, particularly in the choices they make about transportation.

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[14] Committee on Sea Level Rise in California, Oregon, and Washington, et al., "Sea Level Rise in California, Oregon, and Washington: Past, Present, and Future," 2012, http://ssi.ucsd.edu/scc/images/NRC%20SL%20rise%20W%20coast%20USA%2012.pdf.

[15] San Diego Association of Governments, "2050 Regional Transportation Plan," 2011, http://www.sandag.org/uploads/2050RTP/F2050rtp_all.pdf.

[16] Caltrans, "State Smart Transportation Initiative Assessment and Recommendations," 2014, http://www.dot.ca.gov/CIP/docs/SSTIReport.pdf.

[17] California Natural Resources Agency, "2009 California Climate Adaptation Strategy: A Report to the Governor of the State of California in Response to Executive Order S-13-2008," 2009, http://resources.ca.gov/docs/climate/Statewide_Adaptation_Strategy.pdf.

[18] Applied Development Economics, Inc., et al., "2010 California Regional Progress Report," 2010, http://www.dot.ca.gov/hq/tpp/offices/orip/Collaborative%20Planning/California_Regional_Progress_Report.html.

- Accelerate the use of alternative fuels, new vehicle technology, pricing strategies, public transportation expansion, more bicycling and walking to contribute to GHG reduction goals.

MID TO LONG-RANGE

- Continue planning, funding, and implementing long-term solutions that will ensure that the State's transportation/access needs will be met through sustainable transportation choices that account for, and help mitigate, changing climate conditions.
- Develop uniform climate change assumptions for federal, State, and local agencies. It is difficult to conduct proper climate change planning activities if different agencies are using different assumptions such as the level of SLR, or intensity of storm activity.

STREAMLINE DELIVERY

The CTP 2040 guides various State agencies and departments to work together to establish programs that will help streamline delivery of infrastructure projects that are critical for achieving GHG emission reduction goals. Applying advance mitigation planning in multiple regions will help the State take the next critical steps to plan for sustainable infrastructure on an interregional basis.

Recommendations

SHORT-RANGE

- Adopt a process to advance projects that reduce GHG emissions by improving the efficiency of the environmental review process.
- Develop implementation guidance for SB 226 (expanding SB 375 California Environmental Quality Act [CEQA] streamlining provisions) with the Governor's Office of Planning and Research (OPR).
- Develop advance-mitigation-planning programs that will allow simultaneous consideration of the environmental effects of several planned infrastructure projects.

MID-RANGE

- Accelerate the use of alternative fuels, new vehicle technology, pricing strategies, public transportation expansion, and more bicycling and walking to achieve statewide GHG reduction goals.

MULTIMODAL SYSTEM ENHANCEMENTS

ACTIVE TRANSPORTATION SYSTEM (BICYCLING AND WALKING)

California must continue to promote active transportation. It is a key component of the CTP 2040. Programs such as the Active Transportation Program (ATP) were created to encourage increased use of these active modes of transportation by increasing proportion, mobility, and accessibility of biking and walking trips. These trips enhance public health while reducing GHG and congestion.

Often the transit system and active transportation go hand-in-hand. Thus, another proven practice is to implement more Complete Streets policies throughout cities in California. Complete Streets are those that enable safe access and mobility amongst motorists, bicyclist, pedestrians and transit service.

Recommendations

SHORT-RANGE

- Implement programs that encourage people to utilize active transportation modes and help educate travelers on the benefits of not using a car.[19]
- Offer strategic planning workshops on transit-oriented strategies at the local level.[20]
- Support local/regional multidisciplinary efforts to ensure safe active transportation in all jurisdictions in the State.
- Encourage local governments to develop communities with gathering places and mixed use local shops with walkable paths, bike lanes, and convenient transit stops (coordinated to access jobs, health care, and entertainment venues), that will also accommodate goods deliveries.
- Support the development and enhancement of the California Coastal Trail.

MID TO LONG-RANGE

- Fund and expand programs that promote transportation alternatives such as carpooling, vanpooling, transit, walking, and bicycling.[21]
- Create safe and effective walking and bicycling facilities that create neighborhood connectivity and continuity.
- Leverage private sector investment to find alternatives to automobiles.
- Experiment and evaluate alternatives through pilot projects that allow for a better understanding of successful and unsuccessful strategies to help improve current transit services.
- Find ways to improve non-auto interregional and interstate travel modes.
- Optimize traffic signal timing for transit or bicycle speeds to improve the multimodal efficiency on Complete Streets.[22]

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[19] Federal Highway Administration, "Application of TDM to Policy Issues," http://ops.fhwa.dot.gov/publications/fhwahop12035/chap3.htm.

[20] Matute, J.M., et al., "California Statewide Transit Strategic Plan: Recommendations for Caltrans," 2012, http://www.dot.ca.gov/hq/MassTrans/STSP/STSPrecommendations.pdf.

[21] California Transportation Commission, "Active Transportation Program," http://www.catc.ca.gov/programs/ATP.htm.

[22] Federal Highway and Transit Administration, "The Role of Transportation Systems Management and Operations in Supporting Livability and Sustainability: A Primer," 2012, http://ops.fhwa.dot.gov/publications/fhwahop12004/fhwahop12004.pdf.

- Work with tribes to identify potential pedestrian and bicyclist improvements on State highways in Indian Country and work toward development of those projects.[23]

Expand Transit and Rail Services and Operations

In order to meet increasing capacity needs and air quality requirements, California has to focus serious efforts and funding on expanding transit and intercity–commuter rail, and implementing HSR, service. It is also important to better leverage what has already been put into place by improving multimodal connections and implementing systems to integrate ticketing and customer services across modes. Comprehensive and coordinated planning should be conducted that examines the full market potential of an integrated multimodal system, and institutional structures that will support better coordinated systems.

Transit operators have options at their disposal that do not require trade-offs with automobiles. However, some measures will require that Caltrans and local governments prioritize transit and high occupancy vehicles (HOVs) over single occupancy vehicles (SOVs). These measures are important for California to move toward a sustainable transportation future. Caltrans can support local governments and regions that choose to prioritize transit by accelerating the implementation of transit-priority measures on state-administered facilities.

Recommendations

SHORT-RANGE

- Support technologies and capital improvements that increase convenience and competitiveness of public transit and rail, thereby making transit and rail preferred mode alternatives. This includes real-time transit information and trip planning tools, universal payment systems, as well as cost-effective infrastructure improvements optimizing reliability and connectivity between systems.
- Analyze the implications of changing market demands for transit and rail service and demographics and optimize existing resources to improve service to those markets.
- Expand funding for transit and rail service operations and capital improvements.
- Coordinate with tribes to expand transit services.
- Work with other State and regional agencies and operators to improve the perception of transit and rail in California through marketing and outreach.
- Continue to coordinate between Caltrans modal divisions.
- Share statewide successes and lessons learned in order to accelerate the implementation of cost-effective strategies to improve transit and rail.
- Streamline reporting processes for State and federal grants, and funding allocations.
- Provide statewide resources for customer service improvements like real-time passenger information systems.

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[23] San Diego Association of Governments, "2050 Regional Transportation Plan," 2011, http://www.sandag.org/uploads/2050RTP/F2050rtp_all.pdf.

- Report publicly-sponsored vanpool service data in order to attract federal operating funds.
- Support employer-assisted housing and use of Transportation Demand Management (TDM) policies with employers in transit corridors.
- "Ensure that each of the State's 12 deepwater ports have an active freight rail connection to the National Rail System."

MID TO LONG-RANGE

- Implement rail capital improvements that will support a greatly expanded rail and transit system in California. Support seamless transfers between local-regional transit and passenger rail systems.
- Help transit operators understand real-time passenger information systems and offer grants that can help offset initial costs of publishing data.
- Caltrans Division of Rail and Mass Transportation can work with local transit stakeholders throughout the State to evaluate and learn from the bus rapid transit (BRT) project.
- Improve perception of transit services by working with other State and local agencies.
- Report vanpool service data to attract federal funds.
- Share successes and lessons learned among transit authorities in order to improve transit services.
- Improve transit payment methods to speed up vehicle boarding, which in turn can increase the efficiency of buses arriving on-time more often.
- Create circulator service which specializes in transit to link popular and frequently visited destinations within universities and downtown areas.
- Improve upon scheduled transfers between regional transit services.

IMPROVE MULTIMODAL MOBILITY AND ACCESSIBILITY FOR ALL

Californians want a sustainable transportation system that is safe, reliable, cost-effective, and benign to the environment that takes into consideration the health of the public and the character of the community. Mobility and accessibility are important factors in transporting goods as well. In order to accomplish these demands, the CTP 2040 looks to improve multimodal mobility and accessibility by creating fluidity amongst transit, bicycle/pedestrian and vehicles, optimizing the State's existing highway system, and improving intermodal access to freight facilities.

The cost of travel is a leading concern for many Californians. Moreover, transportation inequity affects Californians with lower socioeconomic status who are not able to access the same destinations as people of higher socioeconomic status, or those individuals with no physical limitations. Thus, in keeping with the guidelines of equity, it is important that people have access to efficient, affordable, integrated housing and recreational access within California's transportation system. Reliable and accessible transportation will meet the needs of the State's citizenry and the visiting public that contributes significantly to State's economy.

Recommendations

SHORT-RANGE

- Create modal plans and programs that improve both safety and system operations while keeping the community, environmental, and economic goals in mind.
- Implement land use strategies that make travel easier through the reduction of distances in consumer activities (e.g., shopping, recreation, etc.).[24]
- Create public spaces with bicycle/pedestrian and transit access in order to reduce automobile dependency.
- Work with tribal nations and communities to improve multimodal accessibility and mobility by integrating the tribal transportation network into the overall transportation network.
- Provide funding and emphasize Transportation Demand Strategies such as ridesharing, vanpooling, park-and-ride lots, transportation information dissemination, and employer outreach programs. Focus on HSR/transit-oriented development (TOD) projects that capitalize on incorporating high-density, mixed use areas thereby reducing individual dependency on cars and encouraging the use of transit.
- Increase funding for projects or programs that improve public access and connections to desired destinations.
- Coordinate passenger/HSR and freight rail infrastructure to gain efficiencies.
- Create supportive policies and secure funding for the promotion of shared mobility (car sharing, bike sharing, real-time ridesharing, Transportation Network Companies, scooter share, shared neighborhood electric vehicles, and on-demand shuttle and jitney services).
- Support a unified or universal transportation account that combines all forms of public transportation payments including transit fares, municipal parking and toll collection into a single user-friendly system. By offering rewards based on frequent use, toll discounts and other incentives, the system can lead to a shift from driving alone to using public transit or ridesharing.

MID-RANGE

- Support infill development to slow urban sprawl and increase density. This will reduce distances between consumer activities, thus encouraging more people to take advantage of transit services, bicycling and walking.
- Increase the efficiency and reliability of transit service trips by timing signals to favor public transit.[25]
- Re-design the current roadways to integrate medians, channelized islands, and roundabouts to increase automobile throughput and multimodal accessibility.
- Ensure that an interconnected, multimodal transportation network serves all segments of the State's population as well as the significant number of tourists that visit each year.
- Add bicycle lanes, and change signal timing/countdown to increase safety at cross intersections.
- Develop rideshare programs and efficient parking management strategies to allow more people to travel using existing infrastructure, and support HSR/TOD and alternative transportation choices.

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[24] Handy, S., "Accessibility VS. Mobility-Enhancing Strategies for Addressing Automobile Dependence in the US," 2002, http://www.des.ucdavis.edu/faculty/handy/ECMT_report.pdf.

[25] Federal Highway Administration, "The Role of Transportation Systems Management & Operations in Supporting Livability and Sustainability: A Primer," 2012, http://ops.fhwa.dot.gov/publications/fhwahop12004/fhwahop12004.pdf.

- Work with tribes to improve multimodal accessibility and mobility.

PROMOTE SUSTAINABILITY IN RURAL COMMUNITIES AND SMALL TOWNS

The CTP 2040 supports sustainable and active transportation options for all of California's residents. However, rural communities and small towns have special transportation challenges due to their sparse and widely spread populations. Communities must work towards planning an improved interregional and interconnected transportation system through preservation of the existing road system. Factors such as severe weather conditions and surface abrasion from vehicle use jeopardize pavement integrity as well as travel safety. The CTP 2040 recommends strategies and options to address the special needs and circumstances of small rural communities.

Recommendations

SHORT-RANGE

- Expand vanpool services as an effective way to connect rural and exurban communities with employment, food and recreational outlets.[26]
- Link areas that have labor shortages with communities that have a surplus amount in labor.[27]
- Provide accessibility to regional job markets, which can allow the transport of locally made goods to urbanized areas as well as build connectivity for tourists and customers of rural community businesses.[28]
- Create efficient, sustainable transportation solutions that embrace communities' unique context and culture.[29]
- Integrate planning for the aging population in rural community and agency projects and services.[30]
- Educate rural residential developers about integrating bicycling, walking, and public transit into rural projects and plans.
- Increase the frequency of transit services that are available to riders to a level that can support their daily activities.
- Implement a system of park-and-ride lots to encourage transit agencies to increase express bus services to rural areas for transit ridership.

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[26] Matute, J. M., et al., "California Statewide Transit Strategic Plan: Recommendations for Caltrans," 2012, http://www.dot.ca.gov/hq/MassTrans/STSP/STSPrecommendations.pdf.

[27] California Association for Coordinated Transportation, "Keeping Communities Connected: New Challenges for California's Rural Transportation," 2007, http://www2.calact.org/assets/pdf/publications/CalACT-Keeping-Communities-Connected.pdf.

[28] United States Environmental Protection Agency, "Supporting Sustainable Rural Communities," 2011, http://www2.epa.gov/smart-growth/supporting-sustainable-rural-communities.

[29] Toth, G., "What is 'Rural Livability?"2010, http://www.pbs.org/wnet/blueprintamerica/blogs/the-dig-op-ed-what-is-rural-livability/1021/.

[30] California Association for Coordinated Transportation, "Keeping Communities Connected: New Challenges for California's Rural Transportation,"http://www2.calact.org/assets/pdf/publications/CalACT-Keeping-Communities-Connected.pdf.

- Integrate express bus stop concepts appropriate for rural areas, such as express runs, linking communities, expressway or freeway express bus stops, comprehensive bus stops, and ridesharing services.
- Encourage ride sharing and mobility management through coordination of Consolidated Transportation Services and other agencies.

MID-RANGE

- Increase the State Transit Assistance fund (STA) and obtain extra funds that can be allocated towards improving transit services.
- Integrate mixed-use housing into commercial areas within small towns allowing residents to be less reliant on cars.
- Develop rural roadways to support multimodal accessibility for bicyclists, pedestrians, transit, automobiles, and agriculture and goods movement vehicles.
- Encourage private sector companies to invest within the existing rural and small town communities.
- Increase connectivity to medical care and social services, employment and educational facilities to increase health and quality of life within rural residential communities. Also, build accessibility to employment and educational facilities.
- Partner with local, regional, and tribal governments on planning rural transit improvements with rural transit agencies.

System Efficiency and Technology

Coordinate Data and Analysis

The CTP 2040 performance measures should be used statewide to allow comparisons across regions. The California Statewide Travel Demand Model (CSTDM) (see Chapter 3) is a key tool for better understanding statewide travel and the cumulative effects of regional planning efforts on the transportation system. Creating an infrastructure for performance measurement statewide–including the collection and maintenance of data and the processing systems to make the data accessible and understandable–is costly. In particular, some rural agencies lack the recourses to apply a robust performance system.

Recommendations

SHORT-RANGE

- Coordinate data and analysis efforts across regions to ensure consistency and comparability of results.
- Expand partnerships with tribal governments to improve data collection for both traffic volumes and crash data.
- Secure funding to make data available statewide.

- Support funding for the purchase and maintenance of a statewide transit data collection repository–one that can capture and organize transit data funneled to Caltrans by local transit providers.

Active Transportation and Demand Management

The CTP 2040 shows that Active Traffic Management (ATM) is an effective and economical way to improve the current transportation system within California through dynamic: ramp meters, real-time weather/accident update message signs, and traffic incident management. With existing technologies, there is great potential to meet the State's future mobility needs. The CTP 2040 encourages investment in more Traffic System Management (TSM) technology and the maintenance of current devices.

The CTP 2040 also supports Active Demand Management (ADM) tools to develop sustainable and environmentally friendly modes of travel through dynamic: ridesharing, park and ride lots, transit, telecommuting, biking and walking. Along with ADM another approach the CTP 2040 supports is Active Parking Management (APM) in order to optimize the utilization of parking facilities through dynamic: overflow transit parking, parking reservations, way finding and priced parking.

Recommendations

SHORT-RANGE

- Support Integrated Corridor Management (ICM) strategies such as Corridor System Management Plans (CSMPs) where appropriate.
- Demonstrate/continued support for CV/AV efforts.
- ADM strategies must be incorporated into general planning and development review process.[31]
- Congestion management systems should incorporate ADM strategies that enhance regional mobility and accessibility to maximize transportation efficiency.
- Make ADM strategies a part of the public involvement dialogue to gain broadened community support.
- Implement and promote ADM strategies that enhance travel reliability for all modes including real-time traveler information, preferential treatment for HOV/high occupancy toll (HOT) lanes and transit vehicles.
- Implement strategies that decrease automobile traffic through reducing total vehicle travel.
- Inform companies of the benefits of offering alternative work arrangement strategies to employees, such as telecommuting, flextime, and compressed work weeks.
- Support economic incentives for new residential and nonresidential private development to implement Transportation Demand Management (TDM) measures to reduce GHG emissions.

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[31] Federal Highway Administration, "Application of TDM to Policy Issues," http://ops.fhwa.dot.gov/publications/fhwahop12035/chap3.htm.

- APM strategies must be taken into consideration in order to utilize technology that will optimize parking facilities and influence travel behavior.

MID-RANGE

- Develop a performance-based framework that prioritizes ATM work activities and funding.[32]
- Create an ATM infrastructure that fosters high-performance and good maintenance which will improve real-time system management.
- Develop and implement real-time corridor-wide strategies that optimize traffic flow, pedestrian safety, and the reduction of GHGs while working in cooperation with jurisdictional stakeholders.
- Put forth strategies that shift travel to be more transit-focused and rideshare-oriented, to achieve more road safety benefits.
- Incorporate the ICM concept, once finished, to improve the flow of traffic on the state highway system (SHS).

MID TO LONG-RANGE

- Implement automated toll collection services that reduce delays through collecting tolls electronically, which can increase the flow of traffic, rather than exacerbate congestion at conventional toll booths.[33]
- Adopt adaptive traffic signal controls, which can help with the reduction in delays and GHG emissions. Using adaptive control over traffic signals in real-time can improve the efficiency of corridors and traffic conditions through optimized algorithms.

LONG-RANGE

- Explore the technology of CV/AV and vehicle platooning.

INVEST STRATEGICALLY

The CTP 2040 sets a strategy for Caltrans and its partners to address mobility needs on interregional, sustainable, integrated corridors through investments that include system maintenance and preservation, system efficiency, operations, and multimodal capacity expansion.

The motto of "Fix It First," if applied to maintenance of the State's highways, would have a major impact on the cost of transportation in the State. The SHS has a replacement value of over $1.2 trillion.[34] Protecting this investment will require continuous maintenance and rehabilitation. According to the

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[32] Federal Highway Administration, "Active Traffic Management," 2015, http://ops.fhwa.dot.gov/atdm/approaches/atm.htm.

[33] Federal Highway Administration, "The Role of Transportation Systems Management & Operations in Supporting Livability and Sustainability: A Primer," 2012, http://ops.fhwa.dot.gov/publications/fhwahop12004/fhwahop12004.pdf

[34] Caltrans, "Interregional Transportation Strategic Plan," 2015, http://www.dot.ca.gov/hq/tpp/offices/omsp/system_planning/itsp.html.

ten-year study period (2011 to 2020), the total cost to bring the transportation facilities into a "State of good repair" was $341.1 billion.

The SHOPP provides capital funding to address this; however, funding levels are not sufficient to meet all maintenance and rehabilitation needs. If this is not addressed, the SHS will continue to deteriorate. Roads, highways, bridges, airports, seaports, railways, border crossings, and public transit infrastructure need adequate investment and restoration to protect the future of the State's economy and quality of life.[35] Ultimately investment decision-making will need to carefully consider cost-effective and location-efficient highway expansion projects supported and approved by local and regional transportation agencies. These will help meet future mobility and accessibility needs.

Recommendations

SHORT-RANGE

- Carefully consider funding projects that add road capacity and increase maintenance costs.
- Use CSTDM findings (see Chapter 3) to make sound transportation investments.
- Preservation of the existing transportation system in both rural and urban areas should always be high priority when making investment decisions on maintenance and rehabilitation.[36]
- Make quick and preventive treatments to avoid more costly maintenance in the future. Utilize and install new operational strategies and technologies to optimize system capacity.[37]
- All transportation partners should actively seek to leverage available funding for maintenance and operational improvements.
- Support a competitive capital program for transit capital replacement, acquisition, and the development and construction of transit centers and bus maintenance facilities.

LONG-RANGE

- In addition to HSR, target rail capital improvements that serve to integrate the network, that have system-wide benefits and that maximize the use of existing infrastructure capacity.
- Support a competitive capital program for transit capital replacement, acquisition, and the development and construction of transit centers and bus maintenance facilities.

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[35] Leiter, B., et al., "2011 Statewide Transportation System Needs Assessment," 2011, http://www.catc.ca.gov/reports/2011Reports/2011_Needs_Assessment_updated.pdf.

[36] Sacramento Area Council of Governments, "Metropolitan Transportation Plan/Sustainable Communities Strategy: 2035, 142." 2012, http://sacog.org/mtpscs/files/MTP-SCS/MTPSCS%20WEB.pdf.

[37] Caltrans, Division of Maintenance Pavement Program, "2013 State of the Pavement Report: Based on the 2013 Pavement Condition Survey, 2013, http://dot.ca.gov/hq/maint/Pavement/Pavement_Program/PDF/2013_SOP_FINAL-Dec_2013-1-24-13.pdf.

EXPAND FREIGHT NETWORK CAPACITY

Freight transportation supports business and the economy. The freight industry moved over $17 trillion dollars of goods nationally in 2012.[38] Congestion and insufficient infrastructure such as port access roads and rail line overpasses are leading problems for the freight industry resulting in impacts on fifteen major freight chokepoints and bottlenecks throughout California. Total shipment by tonnage is expected to grow by 180 percent by 2040. This growth leads to concerns about the State's ability to meet freight movement demands.

Recommendations

SHORT-RANGE

- Enhance incorporation of freight projects into planning documents, e.g., RTPs and Overall Work Programs (OWPs).
- Work with tribal governments to improve freight accessibility to tribal lands.
- Prioritize California Freight Mobility Plan (CFMP) projects to maximize financial resources.
- Invest in capitalized rail maintenance projects in shared use intercity passenger rail corridors that preserve freight capacity and maintain on-time passenger train performance.
- Support transportation fund appropriations in the State budget to fund road infrastructure improvements along high volume California-Mexico borders, commercial ports of entry (POE), and related access roads to reduce congestion, eliminate transportation bottlenecks, expand freight network capacity, and reduce GHG emissions and pollution.

MID-RANGE

- Create a dedicated, reliable, and long-term freight funding program.
- Maximize resources toward the freight network with collaborative efforts between the public and private sectors. For example, the public may be willing to help freight industries finance dedicated truck lanes to improve vehicle movement on public roadways.

MID TO LONG-RANGE

- Preserve lightly used rail lines because the overall freight demand is anticipated to grow throughout California's main line network, thereby exacerbating existing issues and conflicts on tracks jointly used by freight and passenger trains.[39]

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[38] Center for Transportation Analysis, "Freight Analysis Framework Data Tabulation Tool," 2014, http://faf.ornl.gov/fafweb/Extraction1.aspx.

[39] California State Transportation Agency, "California Transportation Infrastructure Priorities: Vision and Interim Recommendations," 2014, http://www.calsta.ca.gov/res/docs/pdfs/2013/CTIP%20Vision%20and%20Interim%20Recommendations.pdf.

Long Distance multimodal transportation

The long distance, multimodal transportation network in the State includes the interregional road and highway system, the intercity passenger rail system, and airports. The interregional road and highway system serves to connect the State's urban regions for people and goods. Similarly, integration between the planned California HSR system and existing commuter and intercity passenger rail systems will serve long-distance travel needs within California. This system also provides connections to major California airports for travel beyond the State. Aside from the familiar use of meeting commercial passenger and air cargo needs, California's General Aviation airports are also redefining themselves to better support community job growth and economic sustainability.

Recommendations

SHORT-RANGE

- Encourage mobility hubs for multiple modes of transportation.
- Expand business and light manufacturing opportunities, with considerations of existing and planned surrounding uses.
- Capitalize on the competitive advantage of having a business-friendly airport zone.
- Encourage multimodal accessibility at airports, seaports, and freight rail facilities.

Recommendations from modeling analysis

Reduce VMT per Capita

SHORT-RANGE

- Create policies to incentivize employers to develop commuter benefit programs that encourage transportation alternatives.
- Encourage parking management strategies at the workplace, such as parking cash-out or priority parking for HOVs that discourage drive-alone commuting to work.
- Provide greater telecommuting options and alternative work schedules designed to reduce the number of daily commute trips.
- Create policies that incentivize developers to provide TDM programs and services that mitigate the traffic impacts of developments.
- Secure additional funding to implement significant transit improvement strategies, including increasing speeds, decreasing fares, increasing BRT, and improving transfer times to include improved access/connections to transit and rail; as well as, improving the technologies (real-time traveler information, universal transportation account) that increases the convenience and competitiveness of public transit thereby creating more a positive attitude towards public transit for choice riders.
- Create policies and secure funding for increasing and improving bicycling and pedestrian infrastructure, security, and education.

- Implement substantial public outreach to publicize the GHG benefit of eco-driving, car sharing, and telecommuting to include transit and ridesharing. Create legislation to implement an aggressive mix of VMT per capita reduction strategies, including (but not limited to) road pricing strategies, increasing car sharing, increasing the minimum carpool requirements, and increasing HOV lanes.

MID-RANGE

- Utilize funds from the road pricing strategies to fund improvements for driving alternatives.
- Utilize Cap-and-Trade Program funds and other available funds to increase transit and rail infrastructure and service.
- Implement HSR service.

REDUCE GHG EMISSIONS IN THE TRANSPORTATION SECTOR

MID-RANGE

- Create incentives for drivers of ZEVs to greatly increase the percentage of ZEVs in the overall fleet in order to achieve the 2050 GHG reduction target for the transportation sector.
- Subsidize and incentivize (via legislation) an aggressive shift to alternative vehicle fuels, including (but not limited to) biofuel blends and electricity in order to achieve the 2050 GHG reduction target for the transportation sector.
- Subsidize and incentivize (via legislation) an aggressive advancement of vehicle technologies in order to achieve the 2050 GHG reduction target for the transportation sector.
- Continue to implement policies and funding programs and build infrastructure that will expand rail and transit services to further mode shift from vehicles to other modes.

ADVANCE MODELING AND DATA

SHORT-RANGE/ONGOING

- Secure stable funding for statewide data collection, model development, documentation, and data visualization activities to support policy making activities.
- Expand use of common input assumptions between State and MPO forecasting efforts, including socio-economic data, interregional travel forecasts, goods movement/trucking, pricing policies, and other areas where data sharing will result in better and more consistent travel demand forecasts across jurisdictions.
- Coordinate data and analysis efforts across regions to ensure consistency and comparability of results.
- Expand partnerships between State agencies and Caltrans for model training, coordination of activities, and periodically updating modeling guidelines and requirements for RTP/SCS and CTP forecasting.
- Implement the California Commercial Vehicle Inventory Survey (Cal VIUS).
- Coordinate statewide model activities such as the CSTDM, California Statewide Freight Forecasting Model (CSFFM), Caltrans-Amtrak Ridership Model, ARB's EMission FACtors model

(EMFAC), ARB's Vision for Clean Air (VISION) Model, and California High-Speed Rail Authority (CHSRA) Ridership Model and to enhance the capabilities of all agencies.

- Deploy a statewide integrated land use-transportation modeling system.
- Conduct a new statewide household travel/activity survey with Global Positioning System (GPS) and on-board vehicle diagnostics. Ideally, the statewide household travel survey should be conducted on an on-going and continuous basis. Decennial surveys have proven burdensome for Caltrans and MPOs, and key information on household changes over time are not currently collected.
- Secure funding for regular modal surveys (including transit on-board surveys, and pedestrian/bicycle activity surveys), and big data analysis using anonymous cell phone/GPS data to improve understanding of travel patterns.
- Conduct data collection and research on visitor travel to California. This information is largely absent from existing travel demand models.

SAFETY

IMPROVE PUBLIC SAFETY AND SECURITY

Recommendations	Partners	Years	CTP Goals/ Policies
Continue investments toward planning and construction of highway safety projects.	CT, RTPA/ MPO, FHWA, FTA, Locals, Transit	2	G4-P1/P2
Invest in rail safety public awareness campaigns and social norming to change behavior related to Operation Lifesaver, railroad grade crossing safety improvements, and safe operations for both passenger and freight rail.	CT, RTPA/ MPO, FHWA, FTA, FRA, Locals, Rail	2	G4-P1/P2
Emphasize planning and funding to increase railroad crossing safety improvements and grade separations.	CT, RTPA/ MPO, Locals, FTA, FRA, Rail	2	G4-P1/P2
Emphasize planning and funding for projects that provide a safer network of both rural and urban bike and pedestrian routes.	CT, RTPA/ MPO, FHWA, FTA, Locals	2	G4-P1/P2
Implement aggressive public education and media/awareness campaigns to increase	CT, RTPA/ MPO, FHWA, Locals	2	G4-P1/P2

awareness of distracted motorists, cyclists, and pedestrians.[40]			
Improve traffic safety and security programs through prioritizing opportunities for risk reductions, implementation, monitoring, testing, evaluating, and revising safety and security plans.	CT, RTPA/MPO, FHWA, Locals	2	G4-P1/P2
Identify hazardous materials transport routes that minimize risk in populated areas.	CT, RTPA/ MPO, FHWA, Locals	2	G4-P1/P2
Assess and minimize transportation security risks for hazardous materials shipment and identify appropriate measures to address the assessed risks.	CT, RTPA/ MPO, FHWA, Locals	2	G4-P1/P2
Ensure that activities and operations enhance transportation security.[41]	CT, RTPA/MPO, Locals	2	G4-P1/P2
Support grants and funding opportunities for cooperative multiagency/multi-municipality data systems, data sharing and resource and data pooling.	CT, RTPA/MPO, Resource Agencies	2	G4-P1/P2
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Continue outreach efforts to both urban and rural counties to help them improve safety, data collection, access, and analysis by continuing to fund traffic collision database and GIS mapping systems.	CT, RTPA/MPO, CHP, DMV, FHWA, FTA, FRA, Locals	2	G4-P1/P2
Continue to install and test PTC technology on all intercity and commuter passenger rail.	CT, RTPA, Locals, FTA, FRA, Rail	2	G4-P1/P2
Collect, analyze, and distribute safety data among planners and decision makers who coordinate and find areas that could benefit post benefit-cost analysis for investments that improve the safety of the arterials, corridors, ramps, etc.	CT, RTPA/MPO, CHP, DMV, Locals	2	G4-P1/P2
Fund and improve the quality, completeness, timeliness, and uniformity of safety data and the	CT, RTPA/MPO, CHP, DMV, Federal, Locals	3 to 20	G4-P1/P2

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[40] http://www.chp.ca.gov/programs/pdf/CIEP_HM.pdf

[41] California Office of Traffic Safety, "California Highway Safety Plan," 2015, http://www.ots.ca.gov/Media_and_Research/Publications_and_Reports/hsp15/2015-HIGHWAY-SAFETY-PLAN.pdf.

sharing among federal, State, and local agencies and stakeholders.[42]			
Fund regional emergency medical services (EMS) programs to ensure rural communities have access to the latest "State-of-the-art" rescue and extrication equipment.[43]	CT, RTPA, CALOES, Locals	3 to 20	G4-P1/P2
Fund "corridor DUI programs" that select corridors based on data showing disproportionate numbers of DUI collisions and convening task forces to implement identified solutions.[44]	CT, RTPA/MPO, CHP, DMV, Locals	3 to 20	G4-P1/P2
Improve outreach, education, and implementation of CPTED, an approach that deters crime and provides security through environmental design in transportation systems.	CT, RTPA/MPO, HCD, SGC, FHWA, FTA, FRA, Locals, Transit, Rail	3 to 20	G4-P1/P2
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Establish requirements, collaborate with and support research for manufacturers of CV/AV, and Self-Guided Magnetic Bus Technology to meet specific safety requirements that have the potential to improve safety, costs, and efficiency in reducing passenger fatalities and traffic incidents as well as operational benefits.	CT, RTPA/MPO, FHWA, FTA, Locals, Transit	3 to 20	G4-P1/P2
Support vehicle technological improvements such as automatic braking and CV/AV.	CT, RTPA/MPO, FHWA, FTA, Locals, Transit	3 to 20	G4-P1/P2
Support at-grade freight railroad crossing improvements.	CT, RTPA/ MPO, FTA, FRA, Locals, Rail	3 to 20	G4-P1/P2

[42] California Department of Motor Vehicles, "Department of Motor Vehicles Strategic Plan FY 2014-2015. In Safety," 2014, https://www.dmv.ca.gov/portal/dmv/detail/pubs/strat_plan/strategic_plan/.

[43] California Office of Traffic Safety, "Moving Forward: Emergency Medical Services," http://www.ots.ca.gov/OTS_and_Traffic_Safety/Moving_Forward.asp.

[44] California Office of Traffic Safety, "California Highway Safety Plan," 2015, http://www.ots.ca.gov/Media_and_Research/Publications_and_Reports/hsp15/2015-HIGHWAY-SAFETY-PLAN.pdf.

SUSTAINABILITY

FOSTER LIVABLE/HEALTHY COMMUNITIES AND SOCIAL EQUITY

Recommendations	Partners	Years	CTP Goals/ Policies
Collaborate with stakeholders and partners early and often in the planning process.	CT, RTPA/MPO, Federal, State , Locals, Resource Agencies, Private	2	G5-P1
Collaborate to develop transportation planning tools, policies, and incentives to improve analysis and consideration of social equity, EJ, and public health impacts.	CT, RTPA/MPO, CDPH, EPA, Locals	2	G5-P3
Ensure that transportation plans reflect strategies to connect the transport/access of people, goods, and services in efficient ways to integrate housing, work, recreation, and public institution needs while at the same time, avoiding negative impacts to agricultural production areas and sensitive land and water resources; create funding decision priorities for projects that contribute toward these goals.	CT, RTPA/MPO, EPA, SGC, HCD, ARB, CNRA, DOC, Private, Locals, Transit, Rail	2	G5-P1/P3
Promote mixed-use activity nodes incorporating place-making urban design principles in conjunction with transportation improvements.	CT, RTPA/MPO, SGC, HCD, ARB, CNRA, DOC, Private, Locals, Transit, Rail	2	G5-P2
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Promote inclusion of affordable housing plans, policies, and projects within applications for federal funds to take advantage of scoring criteria for these in programs such as the FTA New Starts Program.	CT, RTPA/MPO, EPA, SGC, HCD, ARB, CNRA, DOC, Private, Locals, Transit, Rail	2	G5-P2
Promote efficient infill housing development and redevelopment opportunities to reduce urban sprawl consistent with SB 375, the SCSs, and other regional and State policy guidance.	CT, RTPA/MPO, EPA, SGC, HCD, ARB, CNRA, DOC, Private, Locals, Transit, Rail	2	G5-P2
Implement the SMF principles statewide to integrate the transportation system and encourage	CT, RTPA/MPO, EPA, SGC, HCD, ARB, CNRA, DOC, Private, Locals, Transit, Rail	2	G5-P2

non-motorized forms of transportation and Complete Streets.[45]			
Identify potential pedestrian and bicyclist improvements on State highways and work toward development of those projects.[46]	CT, RTPA/MPO, EPA, SGC, HCD, ARB, CNRA, DOC, Private, Locals, Transit, Rail	2	G5-P2
Promote the Affordable Housing and Sustainable Communities Programs.	CT, RTPA/MPO, EPA, SGC, HCD, ARB, CNRA, DOC, Private, Locals, Transit, Rail	2	G5-P2
Support an increase of the supply of new housing units for all income levels to meet California's housing needs.	CT, RTPA/MPO, EPA, SGC, HCD, ARB, CNRA, DOC, Private, Locals, Transit, Rail	2	G5-P2
Work with tribal governments using principles of coordination, collaboration, and engagement to improve transportation for tribal communities.	CT, RTPA/MPO, FHWA, FTA, FRA, DOC, Tribal, Locals, Transit, Rail	2	G5-P1/P3
Support general plans that are consistent with State sustainability goals such as GHG reduction and VMT reduction.	CT, RTPA/MPO, FHWA, FTA, FRA, Locals, ARB, Transit, Rail	2	G5-P2
Continue research on relationships between affordable housing and mobility, and disseminate the results from the research to inform local policies.	CT, RTPA/MPO, FHWA, FTA, FRA, Locals	2	G5-P2
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Encourage local policies that can help mitigate displacement effects on low-income populations.	CT, RTPA/MPO, ARB, FHWA, FTA, FRA, Locals, Private, HCD, CDPH	2	G5-P3
Partner with industries and innovators involved in technological approaches to environmental improvement.	CT, RTPA/MPO, Locals, Private	3 to 20	G5-P1
Support infill development and compatible land use around rail stations.	CT, RTPA/MPO, FRA, Rail, Local, Private	3 to 20	G5-P2

[45] Caltrans, "Smart Mobility 2010: A Call to Action for the New Decade," 2010, http://www.dot.ca.gov/hq/tpp/offices/ocp/smf_files/SmMblty_v6-3.22.10_150DPI.pdf.

[46] San Diego Association of Governments, "2050 Regional Transportation Plan," 2011, http://www.sandag.org/uploads/2050RTP/F2050rtp_all.pdf.

Follow the model of the California Health in All Policies Task Force (HiAP), through which more than twenty State departments and agencies came together to promote public health, equity, and environmental sustainability across multiple policy areas, including transportation, housing, and land use.	CT, RTPA/MPO, Local	3 to 20	G5-P1/P3
Implementing policies to provide sufficient distance between diesel-powered freight transportation projects and schools, residences, and other receptors to avoid significant health risks, e.g. through guidelines for freight siting and truck routes.	CT, RTPA/MPO, Local, Private, EPA, ARB, CDPH	3 to 20	G5-P1/P3
Work with local and regional agencies to apply considerations of health, equity, and sustainability to transportation decision-making.	CT, RTPA/MPO, CDPH, Local, Transit, Rail	3 to 20	G5-P3

PRACTICE ENVIRONMENTAL STEWARDSHIP

Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Support wildlife connectivity and naturally functioning ecosystems through design plans to protect habitat and natural resources.	CT, RTPA/MPO	2	G6-P1/P2
Expand the use of technology and tools to provide environmental impact performance measures.	CT, RTPA/MPO, FHWA, FTA, FRA, ARB, EPA	2	G6-P1
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Continue to promote policies that reduce GHG and criteria pollutant emissions such as the 2013 Zero-Emission Action Plan, which directs the State to accelerate the market for ZEVs in California. This	CT, RTPA/MPO, ARB	2	G6-P3/P4

also includes a goal of 1.5 million ZEVs in California by the year 2025.[47]			
Support technological research and development of alternative fuels and transportation modes that can further improve air quality.[48]	CT, RTPA/MPO, ARB	2	G6-P3/P4
Promote active transportation, ridesharing, rail, and public/mass transit promoting policies for the co-benefit of reducing air pollution when they replace motor vehicle trips.	CT, RTPA/MPO, ARB	2	G6-P3/P4
Convene State, regional, and local stakeholders to establish coalitions that engage communities on the importance of environmental stewardship.	CT, RTPA/MPO, Resource Agencies, ARB	2	G6-P1/P2
Expand resiliency planning and climate change impact studies of SLR and storm events, and other climate change indicators that affect the future of communities, infrastructure, and ecosystems.	CT, RTPA/MPO, ARB, Resource Agencies, Locals	2	G6-P1
Support electrification of passenger rail, mode shift from planes and autos to HSR, and investments in renewable energy sources for transportation. Promote and expand strategies such as the Cap-and-Trade Program and HSR, and enhance environmental stewardship locally, regionally, and statewide.	CT, RTPA/MPO, ARB, Rail, Aero, Locals	2	G6-P3/P4
Continued coordination between Caltrans and ARB on development of transportation policies as part of developing State Implementation Plans.	CT, RTPA/MPO, ARB, Locals	2	G6-P3/P4
Minimizing environmental impacts during construction of transportation projects where feasible by developing and disseminating a list of construction best practices.	CT, RTPA/MPO, Resource Agencies, Locals	2	G6-P1
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**

[47] Governor's Interagency Working Group on Zero-emission Vehicles, "2013 ZEV Action Plan A roadmap toward 1.5 million zero-emission vehicles on California roadways by 2025," 2013, http://opr.ca.gov/docs/Governor's_Office_ZEV_Action_Plan_(02-13).pdf.

[48] Sacramento Area Council of Governments, "Metropolitan Transportation Plan/Sustainable Communities Strategy: 2035, 142." 2012, http://sacog.org/mtpscs/files/MTP-SCS/MTPSCS%20WEB.pdf.

Providing funding and policy support for development, demonstration and deployment of needed clean technologies, including support for transportation and other infrastructure that enables and incentivizes use of zero- and near-zero-emission technologies.	CT, RTPA/MPO, ARB, FHWA, FTA, FRA, Transit, Rail	2	G6-P3/P4
Establish partnerships between State, regional and local agencies to implement recommendations from the 2014 AB 32 Scoping Plan Update.	CT, RTPA/MPO, CPUC, Local	3 to 5	G6-P3/P4
Support local communities in the development of integrated transportation and land use strategies to resiliently respond to climate change through their General Plans, RTPs, and LCPs.	CT, RTPA/MPO, SGC, HCD, ARB, CNRA, DOC, Private, Coastal, Locals, Transit, Rail	3 to 5	G2-P3, G6-P1/P2
Collaborate (public and private entities) to demonstrate and deploy mobile source control technologies that will assist California in reducing air pollutants and reaching National Ambient Air Quality Standards attainment and reducing GHGs.	CT, RTPA/MPO, ARB, Locals, Private	3 to 5	G6-P3/P4
Maintain and strengthen the ZEV regulation, new vehicle GHG performance standards, the Cap-and-Trade Program and the Low Carbon Fuel Standard.	CT, ARB, RTPA/MPO, Private	3 to 5	G6-P3/P4

SUPPORT ECONOMIC VIBRANCY

Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Avoid projects with high health and environmental costs.	CT, RTPA/MPO, Locals, Resource Agencies	2	G3-P1, G5-P3, G6-P1
Prioritize funding toward transportation alternatives that enhance efficient and affordable mobility.	CT, RTPA/MPO, Locals	2	G1-P3, G3-P3, G5-P3
Work with tribal governments to improve access to State highways from tribal lands.	CT, RTPA/MPO, Locals, Tribal	2	G3-P1, G5-P1/P3
Support the modification of design standards to implement the Main Street Guidelines.	CT, RTPA/MPO, Locals, CDPH, CPTED, SGC	2	G3-P1, G5-P2
Support projects that improve intermodal freight access and reduce congestion especially along freight corridors.	CT, RTPA/MPO, FRA, Locals, Rail	2	G3-P2
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**

Support regional and local government planning for investments improving the proximity of jobs-housing relationships.	CT, RTPA/MPO, FTA, FRA, FHWA, SGC, HCD, Transit, Rail, Locals	2	G3-P1, G5-P5
Allocate transportation project funding in a manner incentivizing improved accessibility of housing and major employment centers, restraining commuting distances, and the combined cost of housing and transportation.	CT, RTPA/MPO, FTA, FHWA, FRA, Transit, Rail, SGC, HCD, Locals	2	G1-P3, G3-P1/P3, G5-P2
To the extent reasonable, adjust pricing of transportation modes to reflect the total cost for each mode, including health and environmental costs, providing subsidies to accommodate ability to pay without compromising economic competitiveness.	CT, RTPA/MPO, CDPH, Locals, Resource Agencies	3 to 20	G3-P1/P3, G5-P3, G6-P1
Invest in interregional goods movement corridors.	CT, RTPA/MPO, Rail, FHWA, FRA, Locals	3 to 20	G3-P1/P2/P3
Improve the linkages between transportation, housing, and land use by tying policies to incentives with environmental benefit.	CT, RTPA/MPO, SGC, HCD, Transit, Locals	3 to 20	G3-P1, G5-P1/P2
Develop a tax and fee structure that facilitates an efficient and affordable transportation system consistent with long-term transportation, housing, land use, and resource management plans.	CT, RTPA/MPO, SGC, HCD, Resource Agencies, Locals	3 to 20	G3-P1/P3, G5-P1/P2, G6-P1/P2

OBTAIN PERMANENT FUNDING

Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Support efforts to implement a road pricing strategy with consideration of accounting for equity impacts, contingent upon capacity to simultaneously improve transit services.	CT, RTPA/MPO, Transit	2	G3-P3
Support efforts to close the funding gap for MPOs to implement the regions' SCSs. Encourage inter-governmental cross-sector collaboration in developing financing mechanisms, including cross-sector financing of sustainable, integrated corridors and supportive land uses.	CT/RTPA/MPO, SGC, Locals, FHWA, FTA, FRA, Transit, Rail	2	G3-P3, G5-P2
Support recommendations for dedicated freight funding.	CT, RTPA/MPO, Locals, FHWA	2	G3-P2
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**

Implement a revenue structure that is solely dedicated to improving non-motorized travel methods.	CT, RTPA/MPO, Locals	3 to 20	G1-P3, G3-P3

ADDRESS CLIMATE ADAPTATION AND RESILIENCY OF INFRASTRUCTURES TO ENSURE RELIABLE TRANSPORTATION

Recommendations	Partners	Years	CTP Goals/ Policies
Incorporate climate change resiliency in long-range transportation documents to address potential climate change-related vulnerabilities.[49]	CT, RTPA/MPO, Locals	2	G2-P3
Require climate change resiliency in SHOPP and STIP programs and projects.	CT, RTPA/MPO, Locals	2	G2-P3
Coastal communities must utilize LCPs alongside General Plans and RTPs to reduce GHG emissions and implement climate change adaptations, giving first priority to where the impacts of SLR are most intense. Consider project alternatives that avoid significant new development in areas that cannot be adequately protected (planning, permitting, development, and building) from flooding, wildfire and erosion due to climate change.[50]	CT, RTPA/MPO, Locals, Coastal	2	G2-P3
Focus on reliable transportation routes away from SLR impacts on harbors and ports[51], airports, access roads, rail tracks, and bridges.	CT, RTPA/MPO, Locals, Coastal	2	G2-P3
Track SLR and other climate change indicators using interactive maps and modeling that identify transportation infrastructure that could be vulnerable to environmental and climate changes.	CT, RTPA/MPO, Locals, Coastal	2	G2-P3
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**

[49] Caltrans, "State Smart Transportation Initiative Assessment and Recommendations," 2014, http://www.dot.ca.gov/CIP/docs/SSTIReport.pdf.

[50] California Natural Resources Agency, "2009 California Climate Adaptation Strategy: A Report to the Governor of the State of California in Response to Executive Order S-13-2008," 2009, http://resources.ca.gov/docs/climate/Statewide_Adaptation_Strategy.pdf.

[51] Applied Development Economics, Inc., et al., "2010 California Regional Progress Report," 2010, http://www.dot.ca.gov/hq/tpp/offices/orip/Collaborative%20Planning/California_Regional_Progress_Report.html.

Develop a project-level checklist to evaluate facility risks and vulnerability due to climate change impacts. Evaluate projects for climate change vulnerabilities at the time funding is programmed, and incorporate project design features to improve resiliency of facilities and infrastructure." Example of vulnerability assessment system: FHWA's Vulnerability Assessment Scoring Tool (VAST).	CT, RTPA/MPO, Locals	2	G2-P3
Evaluate SLR and potential adaptation responses to anticipated SLR in new construction, as well as repair and replacement projects, and factor these considerations into the selection of the preferred alternative to meet the project purpose and need.	CT, RTPA/MPO, Locals, Coastal	2	G2-P3
Education programs that teach community members about global warming, and how they can be an active part of the solution, particularly in the choices they make about transportation.	CT, RTPA/MPO, Locals	2	G2-P3, G5-P1, G6-P1/P3/P4
Accelerate the use of alternative fuels, new vehicle technology, pricing strategies, public transportation expansion, more bicycling and walking to contribute to GHG reduction goals.	CT, RTPA/MPO, Locals, FHWA, FTA, FRA, Transit, Rail, Private	2	G6-P3/P4
Continue planning, funding, and implementing long-term solutions that will ensure that the State's transportation/access needs will be met through sustainable transportation choices that account for, and help mitigate, changing climate conditions.	CT, RTPA/MPO, Locals, FHWA, FTA, FRA, Transit, Rail	3 to 20	G2-P3
Develop uniform climate change assumptions for federal, State, and local agencies. It is difficult to conduct proper climate change planning activities if different agencies are using different assumptions such as the level of SLR, or intensity of storm activity.	CT, RTPA/MPO, Locals, Coastal	3 to 20	G2-P3, G5-P1

STREAMLINE DELIVERY

Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Adopt a process to advance projects that reduce GHG emissions by improving the efficiency of the environmental review process.	CT, RTPA/MPO, OPR	2	G6-P3
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**

Develop implementation guidance for SB 226 (expanding SB 375 CEQA streamlining provisions) with the Governor's OPR.	CT, RTPA/MPO, OPR	2	G6-P3
Develop advance-mitigation-planning programs that will allow simultaneous consideration of the environmental effects of several planned infrastructure projects.	CT, RTPA/MPO, Resource Agencies, Locals	2	G6-P1/P2/P3
Accelerate the use of alternative fuels, new vehicle technology, pricing strategies, public transportation expansion, and more bicycling and walking to achieve statewide GHG reduction goals.	CT, RTPA/MPO, Rail, Transit, Locals	3 to 5	G6-P3/P4

MULTIMODAL SYSTEM ENHANCEMENTS

ACTIVE TRANSPORTATION SYSTEM (BICYCLING AND WALKING)

Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Implement programs that encourage people to utilize active transportation modes and help educate travelers on the benefits of not using a car.[52]	CT, RTPA/MPO, Transit, Local	2	G1-P3, G5-P2/P3
Offer strategic planning workshops on transit-oriented strategies at the local level.[53]	CT, RTPA/MPO, FTA, Locals, Transit	2	G1-P3, G5-P2/P4
Support local/regional multidisciplinary efforts to ensure safe active transportation in all jurisdictions in the State.	CT, RTPA/MPO, FHWA, FTA, FRA, Transit, Rail, Locals	2	G1-P3, G5-P1/P2/P5
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**

[52] Federal Highway Administration, "Application of TDM to Policy Issues," http://ops.fhwa.dot.gov/publications/fhwahop12035/chap3.htm.

[53] Matute, J.M., et al., "California Statewide Transit Strategic Plan: Recommendations for Caltrans," 2012, http://www.dot.ca.gov/hq/MassTrans/STSP/STSPrecommendations.pdf.

Encourage local governments to develop communities with gathering places and mixed use local shops with walkable paths, bike lanes, and convenient transit stops (coordinated to access jobs, health care, and entertainment venues), that will also accommodate goods deliveries.	CT, RTPA/MPO, Transit, Locals, Private	2	G1-P3, G5-P1/P2/P5
Support the development and enhancement of the California Coastal Trail.	CT, RTPA/MPO, Locals, Coastal, Resource Agencies	2	G1-P3, G5-P1/P2/P5
Fund and expand programs that promote transportation alternatives such as carpooling, vanpooling, transit, walking, and bicycling.[54]	CT, RTPA/MPO, OPR, FHWA, FTA, FRA, Transit, Rail, Locals	3 to 20	G1-P3, G5-P1/P2/P5
Create safe and effective walking and bicycling facilities that create neighborhood connectivity and continuity.	CT, RTPA/MPO, Locals	3 to 20	G1-P3, G4-P1/P2, G5-P2/P3
Leverage private sector investment to find alternatives to automobiles.	CT, RTPA/MPO, FHWA, FTA, FRA, Transit, Rail, Locals, Private	3 to 20	G3-P3, G5-P1, G6-P4
Experiment and evaluate alternatives through pilot projects that allow for a better understanding of successful and unsuccessful strategies to help improve current transit services.	CT, RTPA/MPO, FHWA, Transit, FTA, Locals	3 to 20	G1-P1/P2/P3, G2-P2
Find ways to improve non-auto interregional and interstate travel modes.	CT, RTPA/MPO, FHWA, locals	3 to 20	G1-P1/P2/P3, G2-P2
Optimize traffic signal timing for transit or bicycle speeds to improve the multimodal efficiency on Complete Streets.[55]	CT, RTPA/MPO, Locals, Transit	3 to 20	G1-P1
Work with tribes to identify potential pedestrian and bicyclist improvements on State highways in Indian Country and work toward development of those projects.[56]	CT, RTPA/MPO, Tribal, Locals	3 to 20	G1-P3, G5-P1/P3

EXPAND TRANSIT AND RAIL SERVICES AND OPERATIONS

[54] California Transportation Commission, "Active Transportation Program," http://www.catc.ca.gov/programs/ATP.htm.

[55] Federal Highway and Transit Administration, "The Role of Transportation Systems Management and Operations in Supporting Livability and Sustainability: A Primer," 2012, http://ops.fhwa.dot.gov/publications/fhwahop12004/fhwahop12004.pdf.

[56] San Diego Association of Governments, "2050 Regional Transportation Plan," 2011, http://www.sandag.org/uploads/2050RTP/F2050rtp_all.pdf.

Recommendations	Partners	Years	CTP Goals/ Policies
Support technologies and capital improvements that increase convenience and competitiveness of public transit and rail, thereby making transit and rail preferred mode alternatives. This includes real-time transit information and trip planning tools, universal payment systems, as well as cost-effective infrastructure improvements optimizing reliability and connectivity between systems.	CT, RTPA/MPO, Transit, Rail, Locals	2	G1-P1/P2, G2-P2
Analyze the implications of changing market demands for transit and rail service and demographics and optimize existing resources to improve service to those markets.	CT, RTPA/MPO, Transit, Rail, Locals	2	G1-P1/P2
Expand funding for transit and rail service operations and capital improvements.	CT, RTPA/MPO, Transit, Rail, Locals	2	G1-P2, G2-P2, G3-P3
Coordinate with tribes to expand transit services.	CT, RTPA/MPO, Tribal, Transit, Rail, Locals	2	G1-P2/P3, G5-P1
Work with other State and regional agencies and operators to improve the perception of transit and rail in California through marketing and outreach.	CT, RTPA/MPO, Transit, Rail, Locals	2	G3-P1, G5-P1
Continue to coordinate between Caltrans modal divisions.	CT, RTPA/MPO, Transit, Rail, FHWA, FTA, FRA, HCD, Resource Agencies, Tribal, Locals	2	G5-P1
Share statewide successes and lessons learned in order to accelerate the implementation of cost-effective strategies to improve transit and rail.	CT, RTPA/MPO, Transit, Rail, FHWA, FTA, FRA, Locals	2	G1-P2, G5-P1
Streamline reporting processes for State and federal grants, and funding allocations.	CT, RTPA/MPO, FHWA, FTA, FRA, Locals, Transit, Rail	2	G3-P3, G5-P1
Provide statewide resources for customer service improvements like real-time passenger information systems.	CT, RTPA/MPO, FHWA, FTA, FRA, Transit, Rail, Locals	2	G1-P1, G3-P3
Report publicly-sponsored vanpool service data in order to attract federal operating funds.	CT, RTPA/MPO, FHWA, FTA, FRA, Transit, Rail, Locals	2	G3-P3, G5-P1
Support employer-assisted housing and use of TDM policies with employers in transit corridors.	CT, RTPA/MPO, Transit	2	G1-P3, G5-P1/P2
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**

"Ensure that each of the State's 12 deep water ports have an active freight rail connection to the National Rail System."	CT, RTPA/MPO, FHWA, FRA, Rail, Locals, Private	2	G3-P2
Implement rail capital improvements that will support a greatly expanded rail and transit system in California. Support seamless transfers between local-regional transit and passenger rail systems.	CT, RTPA/MPO, FHWA, FTA, FRA, Rail, Locals, Private, Rail, Transit	3 to 20	G1-P1/P2/P3
Help transit operators understand real-time passenger information systems and offer grants that can help offset initial costs of publishing data.	CT, RTPA/MPO, Transit, Locals	3 to 20	G1-P2, G3-P3
Caltrans Division of Rail and Mass Transportation can work with local transit stakeholders throughout the State to evaluate and learn from the BRT project.	CT, RTPA/MPO, Rail, Transit, Locals	3 to 20	G5-P1
Improve perception of transit services by working with other State and local agencies.	CT, RTPA/MPO, Rail, Transit, Locals	3 to 20	G5-P1
Report vanpool service data to attract federal funds.	CT, RTPA/MPO, FHWA, FTA, Transit, Locals	3 to 20	G5-P1, G3-P3
Share successes and lessons learned among transit authorities in order to improve transit services.	CT, RTPA/MPO, Transit	3 to 20	G1-P3, G5-P1
Improve transit payment methods to speed up vehicle boarding, which in turn can increase the efficiency of buses arriving on-time more often.	CT, RTPA/MPO, Transit	3 to 20	G1-P1
Create circulator service which specializes in transit to link popular and frequently visited destinations within universities and downtown areas.	CT, RTPA/MPO, Transit, Locals	3 to 20	G3-P1, G5-P2
Improve upon scheduled transfers between regional transit services.	CT, RTPA/MPO, Transit	3 to 20	G1-P1, G5-P1

IMPROVE MULTIMODAL MOBILITY AND ACCESSIBILITY FOR ALL

Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Create modal plans and programs that improve both safety and system operations while keeping the community, environmental, and economic goals in mind.	CT, RTPA/MPO, Resource Agencies, Locals, Transit, Rail, FHWA, FTA, FRA, Private	2	G1, G2, G3, G4, G5, G6
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**

Implement land use strategies that make travel easier through the reduction of distances in consumer activities (e.g., shopping, recreation, etc.).[57]	CT, RTPA/MPO, Locals, Private	2	G1-P3, G3-P1, G5-P3
Create public spaces with bicycle/pedestrian and transit access in order to reduce automobile dependency.	CT, RTPA/MPO, Transit, Locals	2	G1-P3, G5-P2
Work with tribal nations and communities to improve multimodal accessibility and mobility by integrating the tribal transportation network into the overall transportation network.	CT, RTPA/MPO, Tribal, Transit, Rail, Locals	2	G1-P3, G5-P1/P3
Provide funding and emphasize Transportation Demand Strategies such as ridesharing, vanpooling, park-and-ride lots, transportation information dissemination, and employer outreach programs. Focus on HSR/TOD projects that capitalize on incorporating high-density, mixed use areas thereby reducing individual dependency on cars and encouraging the use of transit.	CT, RTPA/MPO, FHWA, FTA, FRA, Rail, Transit, Locals, Private	2	G1-P1/P2/P3, G3-P3, G5-P2
Increase funding for projects or programs that improve public access and connections to desired destinations.	CT, RTPA/MPO, FHWA, FTA, FRA, Transit, Rail, Locals	2	G1-P2/P3, G3-P3, G5-P2
Coordinate passenger/HSR and freight rail infrastructure to gain efficiencies.	CT, RTPA/MPO, Rail, FRA, Locals	2	G1-P3, G5-P1
Create supportive policies and secure funding for the promotion of shared mobility (car sharing, bike sharing, real-time ridesharing, Transportation Network Companies, scooter share, shared neighborhood electric vehicles, and on-demand shuttle and jitney services).	CT, RTPA/MPO, Transit, Locals Private	2	G1-P2/P3, G3-P3, G5-P1
Support a unified or universal transportation account that combines all forms of public transportation payments including transit fares, municipal parking and toll collection into a single user-friendly system. By offering rewards based on frequent use, toll discounts and other incentives, the system can lead to a shift from driving alone to using public transit or ridesharing.	CT, RTPA/MPO, FHWA, FTA, FRA, Rail, Transit, Locals	2	G1-P1, G3-P1/P3
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**

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[57] Handy, S., "Accessibility VS. Mobility-Enhancing Strategies for Addressing Automobile Dependence in the US," 2002, http://www.des.ucdavis.edu/faculty/handy/ECMT_report.pdf.

Support infill development to slow urban sprawl and increase density. This will reduce distances between consumer activities, thus encouraging more people to take advantage of transit services, bicycling and walking.	CT, RTPA/MPO, Transit, Locals	3 to 5	G5-P1/P2
Increase the efficiency and reliability of transit service trips by timing signals to favor public transit.[58]	CT, RTPA/MPO, Transit, Locals	3 to 5	G1-P1
Re-design the current roadways to integrate medians, channelized islands, and roundabouts to increase automobile throughput and multimodal accessibility.	CT, RTPA/MPO, Locals	3 to 5	G1-P2
Ensure that an interconnected, multimodal transportation network serves all segments of the State's population as well as the significant number of tourists that visit each year.	CT, RTPA/MPO, Locals, Transit, Rail	3 to 5	G1-P3, G5-P3
Add bicycle lanes, and change signal timing/countdown to increase safety at cross intersections.	CT, RTPA/MPO, Locals	3 to 5	G1-P3, G4-P1
Develop rideshare programs and efficient parking management strategies to allow more people to travel using existing infrastructure, and support HSR/TOD and alternative transportation choices.	CT, RTPA/MPO, Transit, Rail, Locals	3 to 5	G1-P1/P2/P3
Work with tribes to improve multimodal accessibility and mobility.	CT, RTPA/MPO, Tribal, Locals, Rail, Transit	3 to 5	G1-P3, G5-P1/P3

PROMOTE SUSTAINABILITY IN RURAL COMMUNITIES AND SMALL TOWNS

Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Expand vanpool services as an effective way to connect rural and exurban communities with employment, food and recreational outlets.[59]	CT, RTPA/MPO, Locals, Transit	2	G1-P3, G3-P1, G5-P1/P3
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**

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[58] Federal Highway Administration, "The Role of Transportation Systems Management and Operations in Supporting Livability and Sustainability: A Primer," 2012, http://ops.fhwa.dot.gov/publications/fhwahop12004/fhwahop12004.pdf.

[59] Matute, J. M., et al., "California Statewide Transit Strategic Plan: Recommendations for Caltrans," 2012, http://www.dot.ca.gov/hq/MassTrans/STSP/STSPrecommendations.pdf.

Link areas that have labor shortages with communities that have a surplus amount in labor.[60]	CT, RTPA/MPO, Locals, Transit, Rail, Private	2	G1-P3, G3-P1, G5-P1
Provide accessibility to regional job markets, which can allow the transport of locally made goods to urbanized areas as well as build connectivity for tourists and customers of rural community businesses.[61]	CT, RTPA/MPO, Locals, Private, Transit, Rail	2	G1-P3, G3-P1/P2, G5-P1
Create efficient, sustainable transportation solutions that embrace communities' unique context and culture.[62]	CT, RTPA/MPO, Locals, Transit, Rail	2	G5-P2
Integrate planning for the aging population in rural community and agency projects and services.[63]	CT, RTPA/MPO, Locals, Transit, Rail	2	G5-P3
Educate rural residential developers about integrating bicycling, walking, and public transit into rural projects and plans.	CT, RTPA/MPO, Locals, Transit, Rail	2	G1-P3, G5-P1/P2/P3
Increase the frequency of transit services that are available to riders to a level that can support their daily activities.	CT, RTPA/MPO, Locals, Transit, Rail	2	G1-P3, G5-P3
Implement a system of park-and-ride lots to encourage transit agencies to increase express bus services to rural areas for transit ridership.	CT, RTPA/MPO, Locals, Transit, Rail	2	G1-P3, G5-P2
Integrate express bus stop concepts appropriate for rural areas, such as express runs, linking communities, expressway or freeway express bus stops, comprehensive bus stops, and ridesharing services.	CT, RTPA/MPO, Locals, Transit, Rail	2	G1-P3, G5-P3
Encourage ride sharing and mobility management through coordination of Consolidated Transportation Services and other agencies.	CT, RTPA/MPO, Locals, Transit, Rail, Private	2	G5-P1
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Increase the STA and obtain extra funds that can be allocated towards improving transit services.	CT, RTPA/MPO, Transit, FTA	3 to 5	G1-P2/P3, G3-P3, G5-P3

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[60] California Association for Coordinated Transportation, "Keeping Communities Connected: New Challenges for California's Rural Transportation," 2007, http://www2.calact.org/assets/pdf/publications/CalACT-Keeping-Communities-Connected.pdf.

[61] United States Environmental Protection Agency, "Supporting Sustainable Rural Communities," 2011, http://www2.epa.gov/smart-growth/supporting-sustainable-rural-communities.

[62] Toth, G., "What is 'Rural Livability'?" 2010, http://www.pbs.org/wnet/blueprintamerica/blogs/the-dig-op-ed-what-is-rural-livability/1021/.

[63] California Association for Coordinated Transportation, "Keeping Communities Connected: New Challenges for California's Rural Transportation,"http://www2.calact.org/assets/pdf/publications/CalACT-Keeping-Communities-Connected.pdf.

Integrate mixed-use housing into commercial areas within small towns allowing residents to be less reliant on cars.	CT, RTPA/MPO, HCD, Private, Locals	3 to 5	G5-P1/P2/P3
Develop rural roadways to support multimodal accessibility for bicyclists, pedestrians, transit, automobiles, and agriculture and goods movement vehicles.[64]	CT, RTPA/MPO, Transit, Locals	3 to 5	G1-P2/P3, G3-P3, G5-P2/P3
Encourage private sector companies to invest within the existing rural and small town communities.	CT, RTPA/MPO, Private, Locals	3 to 5	G1-P2, G3-P3, G5-P1
Increase connectivity to medical care and social services, employment and educational facilities to increase health and quality of life within rural residential communities. Also, build accessibility to employment and educational facilities.	CT, RTPA/MPO, Private, Locals	3 to 5	G1-P3, G5-P3
Partner with local, regional, and tribal governments on planning rural transit improvements with rural transit agencies.	CT, RTPA/MPO, Tribal, Locals, Transit	3 to 5	G5-P1/P2/P3

SYSTEM EFFICIENCY AND TECHNOLOGY

COORDINATE DATA AND ANALYSIS

Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Coordinate data and analysis efforts across regions to ensure consistency and comparability of results.	CT, RTPA/MPO	2	G1-P1, G5-P1
Expand partnerships with tribal governments to improve data collection for both traffic volumes and crash data.	CT, RTPA/MPO, Tribal, Locals	2	G1-P1, G5-P1, G4-P1, G6-P1
Secure funding to make data available statewide.	CT, RTPA/MPO	2	G1-P1, G3-P3, G5-P1
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**

[64] United States Environmental Protection Agency, "Supporting Sustainable Rural Communities," 2011, http://www2.epa.gov/smart-growth/supporting-sustainable-rural-communities.

Support funding for the purchase and maintenance of a statewide transit data collection repository– one that can capture and organize transit data funneled to Caltrans by local transit providers.	CT, RTPA/MPO, Transit, Locals, FTA	2	G1-P1, G3-P3, G5-P1

ACTIVE TRANSPORTATION AND DEMAND MANAGEMENT

Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Support ICM strategies such as CSMPs where appropriate.	CT, RTPA/MPO, Transit, Rail, Locals	2	G1-P1
Demonstrate/continued support for CV/AV efforts.	CT, RTPA/MPO, FTA, FHWA, FRA, Transit, Locals	2	G1-P1/P2
ADM strategies must be incorporated into general planning and development review process.	CT, RTPA/MPO, Locals, FTA, FHWA, Transit	2	G1-P1/P2/P3, G5-P2
Congestion management systems should incorporate ADM strategies that enhance regional mobility and accessibility to maximize transportation efficiency.	CT, RTPA/MPO, FHWA, FTA, Transit, Locals	2	G1-P1/P2/P3
Make ADM strategies a part of the public involvement dialogue to gain broadened community support.	CT, RTPA/MPO, Locals	2	G1-P1, G5-P1
Implement and promote ADM strategies that enhance travel reliability for all modes including real-time traveler information, preferential treatment for High Occupancy Vehicle / High-Occupancy Toll (HOV/HOT) lanes and transit vehicles.	CT, RTPA/MPO, FHWA, FTA, Transit, Locals	2	G1-P1/P2/P3, G5-P1
Implement strategies that decrease automobile traffic through reducing total vehicle travel.	CT, RTPA/MPO, Locals	2	G1-P1/P2/P3
Inform companies of the benefits of offering alternative work arrangement strategies to employees, such as telecommuting, flextime, and compressed work weeks.	CT, RTPA/MPO, Private	2	G5-P1, G6-P3/P4
Support economic incentives for new residential and nonresidential private development to implement TDM measures to reduce GHG emissions.	CT, RTPA/MPO, Private, Locals	2	G1-P2, G5-P1/P2, G6-P3/P4
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**

APM strategies must be taken into consideration in order to utilize technology that will optimize parking facilities and influence travel behavior.	CT, RTPA/MPO, Private, Locals	2	G1-P1/P2/P3
Develop a performance-based framework that prioritizes ATM work activities and funding.[65]	CT, RTPA/MPO, FHWA, FTA, Transit, Locals	3 to 5	G1-P1/P2/P3
Create an ATM infrastructure that fosters high-performance and good maintenance which will improve real-time system management.	CT, RTPA/MPO, FHWA, FTA, Transit, Locals	3 to 5	G1-P1/P2/P3
Develop and implement real-time corridor-wide strategies that optimize traffic flow, pedestrian safety, and the reduction of GHGs while working in cooperation with jurisdictional stakeholders.	CT, RTPA/MPO, FHWA, FTA, Transit, Rail, Locals, Private	3 to 5	G1-P1/P2/P3, G5-P1
Put forth strategies that shift travel to be more transit-focused and rideshare-oriented, to achieve more road safety benefits.	CT, RTPA/MPO, Transit, Local	3 to 5	G1-P3, G4-P1, G5-P1/P2/P3
Incorporate the ICM concept, once finished, to improve the flow of traffic on the SHS.	CT, RTPA/MPO, Locals	3 to 5	G1-P1/P2, G3-P1
Implement automated toll collection services that reduce delays through collecting tolls electronically, which can increase the flow of traffic, rather than exacerbate congestion at conventional toll booths.	CT, RTPA/MPO, Locals	3 to 20	G1-P1, G3-P3
Adopt adaptive traffic signal controls which can help with the reduction in delays and GHG emissions. Using adaptive control over traffic signals in real-time can improve the efficiency of corridors and traffic conditions through optimized algorithms.	CT, RTPA/MPO, Locals	3 to 20	G1-P1, G6-P3/P4
Explore the technology of CV/AV and vehicle platooning.	CT, RTPA/MPO, Locals, Private, Transit	5 to 20	G1-P2

INVEST STRATEGICALLY

Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Carefully consider funding projects that add road capacity and increase maintenance costs.	CT, RTPA/MPO, FHWA, FTA, FRA, Rail, Transit, Locals	2	G2-P1/P2
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**

[65] Federal Highway Administration, "Active Traffic Management," 2015, http://ops.fhwa.dot.gov/atdm/approaches/atm.htm.

Use CSTDM findings (see Chapter 3) to make sound transportation investments.	CT, RTPA/MPO, Locals	2	G2-P1/P2
Preservation of the existing transportation system in both rural and urban areas should always be high priority when making investment decisions on maintenance and rehabilitation.[66]	CT, RTPA/MPO, Locals	2	G2-P1/P2
Make quick and preventive treatments to avoid more costly maintenance in the future. Utilize and install new operational strategies and technologies to optimize system capacity.[67]	CT, RTPA/MPO, Locals, Private	2	G2-P1/P2
All transportation partners should actively seek to leverage available funding for maintenance and operational improvements.	CT, RTPA/MPO, FHWA, FTA, FRA, Transit, Rail, Locals	2	G2-P1/P2
Support a competitive capital program for transit capital replacement, acquisition, and the development and construction of transit centers and bus maintenance facilities.	CT, RTPA/MPO, Transit, FTA, FHWA, Locals	2	G2-P1/P2, G3-P3
In addition to HSR, target rail capital improvements that serve to integrate the network, that have system-wide benefits and that maximize the use of existing infrastructure capacity.	CT, RTPA/MPO, FRA, Rail, Locals	5 to 20	G1-P2
Support a competitive capital program for transit capital replacement, acquisition, and the development and construction of transit centers and bus maintenance facilities.	CT, RTPA/MPO, Transit, FTA, FHWA, Locals	5 to 20	G2-P1/P2, G3-P3

EXPAND FREIGHT NETWORK CAPACITY

Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Enhance incorporation of freight projects into planning documents, e.g., RTPs and OWPs.	CT, RTPA/MPO, FRA, Rail, Locals	2	G3-P1/P2
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**

[66] Sacramento Area Council of Governments, "Metropolitan Transportation Plan/Sustainable Communities Strategy: 2035, 142." 2012, http://sacog.org/mtpscs/files/MTP-SCS/MTPSCS%20WEB.pdf.

[67] Caltrans, Division of Maintenance Pavement Program, "2013 State of the Pavement Report: Based on the 2013 Pavement Condition Survey, 2013, http://dot.ca.gov/hq/maint/Pavement/Pavement_Program/PDF/2013_SOP_FINAL-Dec_2013-1-24-13.pdf.

Work with tribal governments to improve freight accessibility to tribal lands.	CT, RTPA/MPO, Tribal, Locals	2	G3-P1/P2
Prioritize CFMP projects to maximize financial resources.	CT, RTPA/MPO, Rail, Locals	2	G3-P1/P2
Invest in capitalized rail maintenance projects in shared use intercity passenger rail corridors that preserve freight capacity and maintain on-time passenger train performance.	CT, RTPA/MPO, FRA, Rail, Locals	2	G3-P1/P2
Support transportation fund appropriations in the State budget to fund road infrastructure improvements along high volume California-Mexico borders, commercial ports of entry, and related access roads to reduce congestion, eliminate transportation bottlenecks, expand freight network capacity, and reduce GHG emissions and pollution.	CT, RTPA/MPO, Locals, FHWA, FRA, Rail, Private	2	G3-P1/P2/P3
Create a dedicated, reliable, and long-term freight funding program.	CT, RTPA/MPO, FRA, Rail, Locals	3 to 5	G3-P1/P2/P3
Maximize resources toward the freight network with collaborative efforts between the public and private sectors. For example, the public may be willing to help freight industries finance dedicated truck lanes to improve vehicle movement on public roadways.	CT, RTPA/MPO, Locals, Rail, FRA, Private	3 to 5	G3-P1/P2/P3, G5-P1
Preserve lightly used rail lines because the overall freight demand is anticipated to grow throughout California's main line network, thereby exacerbating existing issues and conflicts on tracks jointly used by freight and passenger trains.[68]	CT, RTPA/MPO, Rail, FRA, Locals	3 to 20	G2-P1, G3-P2

LONG DISTANCE MULTIMODAL TRANSPORTATION

Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Encourage mobility hubs for multiple modes of transportation.	CT, RTPA/MPO, FHWA, FTA, FRA, Rail, Transit, Locals, Private	2	G1-P1/P3
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**

[68] California State Transportation Agency, "California Transportation Infrastructure Priorities: Vision and Interim Recommendations," 2014, http://www.calsta.ca.gov/res/docs/pdfs/2013/CTIP%20Vision%20and%20Interim%20Recommendations.pdf.

Expand business and light manufacturing opportunities, with considerations of existing and planned surrounding uses.	CT, RTPA/MPO, Private, Locals, SGC, Resource agencies	2	G3-P1, G5-P2
Capitalize on the competitive advantage of having a business-friendly airport zone.	CT, RTPA/MPO, Aero, Private, Locals	2	G3-P1
Encourage multimodal accessibility at airports, seaports, and freight rail facilities.	CT, RTPA/MPO, Aero, Private, Locals, Transit, Rail	2	G3-P1/P2

RECOMMENDATIONS FROM MODELING ANALYSIS

REDUCE VMT PER CAPITA

Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Create policies to incentivize employers to develop commuter benefit programs that encourage transportation alternatives.	CT, RTPA/MPO, Private, FHWA, FTA, FRA, Transit, Rail, Locals	2	G5-P1
Encourage parking management strategies at the workplace, such as parking cash-out or priority parking for HOVs that discourage drive-alone commuting to work.	CT, RTPA/MPO, Private, FHWA, Locals	2	G1-P1, G6-P3/P4
Provide greater telecommuting options, and alternative work schedules designed to reduce the number of daily commute trips.	CT, RTPA/MPO, FHWA, FTA, FRA, Transit, Rail, Private, Locals	2	G1-P1, G6-P3/P4
Create policies that incentivize developers to provide TDM programs and services that mitigate the traffic impacts of developments.	CT, RTPA/MPO, FHWA, FTA, FRA, Transit, Rail, Private, Locals	2	G1-P1, G5-P2, G6-P1/P3/P4
Secure additional funding to implement significant transit improvement strategies, including increasing speeds, decreasing fares, increasing BRT, and improving transfer times to include improved access/connections to transit and rail; as well as, improving the technologies (real-time traveler information, universal transportation account) that increases the convenience and competitiveness of public transit thereby creating more a positive attitude towards public transit for choice riders.	CT, RTPA/MPO, FHWA, FTA, FRA, Rail, Transit, Locals	2	G1-P1/P2/P3, G3-P3
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**

Create policies and secure funding for increasing and improving bicycling and pedestrian infrastructure, security, and education.	CT, RTPA/MPO, FHWA, FTA, FRA, Transit, Locals	2	G1-P3, G3-P3, G4-P1, G5-P1/P2
Implement substantial public outreach to publicize the GHG benefit of eco-driving, car sharing, and telecommuting to include transit and ridesharing. Create legislation to implement an aggressive mix of VMT per capita reduction strategies, including (but not limited to) road pricing strategies, increasing car sharing, increasing the minimum carpool requirements, and increasing HOV lanes.	CT, RTPA/MPO, Transit, Rail, Locals, Private	2	G6-P3/P4
Utilize funds from the road pricing strategies to fund improvements for driving alternatives.	CT, RTPA/MPO, Transit, Rail, Locals, Private	3 to 5	G1-P2/P3
Utilize Cap-and-Trade Program funds and other available funds to increase transit and rail infrastructure and service.	CT, RTPA/MPO, Transit, Rail, Locals	3 to 5	G1-P2/P3
Implement HSR service.	CT, RTPA/MPO, Rail, FRA, Locals	3 to 5	G1-P3, G3-P1

REDUCE GHG EMISSIONS IN THE TRANSPORTATION SECTOR

Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Create incentives for drivers of ZEVs to greatly increase the percentage of ZEVs in the overall fleet in order to achieve the 2050 GHG reduction target for the transportation sector.	CT, RTPA/MPO, Private, FHWA, Locals	3 to 5	G6-P3/P4
Subsidize and incentivize (via legislation) an aggressive shift to alternative vehicle fuels, including (but not limited to) biofuel blends and electricity in order to achieve the 2050 GHG reduction target for the transportation sector.	CT, RTPA/MPO, Private, FHWA, FTA, FRA, Rail, Transit, Locals	3 to 5	G6-P3/P4
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**

Subsidize and incentivize (via legislation) an aggressive advancement of vehicle technologies in order to achieve the 2050 GHG reduction target for the transportation sector.	CT, RTPA/MPO, Private, FHWA, FTA, FRA, Rail, Transit, Locals	3 to 5	G6-P3/P4
Continue to implement policies and funding programs and build infrastructure that will expand rail and transit services to further mode shift from vehicles to other modes.	CT, RTPA/MPO, Private, FHWA, FTA, FRA, Transit, Rail, Locals	3 to 5	G6-P3/P4

ADVANCE MODELING AND DATA

Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**
Secure stable funding for statewide data collection, model development, documentation, and data visualization activities to support policy making activities.	CT, RTPA/MPO, CEC, ARB, HCD, CDPH, Resource Agencies, Transit, Rail, Locals	2 or on-going	G3-P3, G5-P1
Expand use of common input assumptions between State and MPO forecasting efforts, including socio-economic data, interregional travel forecasts, goods movement/trucking, pricing policies, and other areas where data sharing will result in better and more consistent travel demand forecasts across jurisdictions.	CT, RTPA/MPO, Rail, Transit, FHWA, FTA, FRA, Locals, Private	2 or on-going	G1-P1, G5-P1
Coordinate data and analysis efforts across regions to ensure consistency and comparability of results.	CT, RTPA/MPO, CEC, ARB, HCD, CDPH, Resource Agencies, Transit, Rail, Locals	2 or on-going	G1-P1, G5-P1
Expand partnerships between State agencies and Caltrans for model training, coordination of activities, and periodically updating modeling guidelines and requirements for RTP/SCS and CTP forecasting.	CT, RTPA/MPO, CEC, ARB, HCD, CDPH, Resource Agencies, Transit, Rail, Locals	2 or on-going	G1-P1, G5-P1
Implement the California Commercial Vehicle Inventory Survey (Cal VIUS).	CT, RTPA/MPO, Locals, Private, DMV	2 or on-going	G1-P1, G5-P1
Coordinate statewide model activities such as the CSTDM, CSFFM, Caltrans-Amtrak Ridership Model EMFAC, Vision, and CHSRA Ridership Model and to enhance the capabilities of all agencies.	CT, RTPA/MPO, CEC, ARB, HCD, CDPH, Resource Agencies, Transit, Rail, Locals	2 or on-going	G1-P1, G5-P1
Recommendations	**Partners**	**Years**	**CTP Goals/ Policies**

Deploy a statewide integrated land use-transportation modeling system.	CT, RTPA/MPO, Locals	2 or on-going	G1-P1, G5-P1
Conduct a new statewide household travel/activity survey with GPS and on-board vehicle diagnostics. Ideally, the statewide household travel survey should be conducted on an on-going and continuous basis. Decennial surveys have proven burdensome for Caltrans and MPOs, and key information on household changes over time are not currently collected.	CT, RTPA/MPO, CEC, ARB, HCD, CDPH, Resource Agencies, Transit, Rail, Locals	2 or on-going	G1-P1, G5-P1
Secure funding for regular modal surveys (including transit on-board surveys, and pedestrian/bicycle activity surveys), and big data analysis using anonymous cell phone/GPS data to improve understanding of travel patterns.	CT, RTPA/MPO, CEC, ARB, HCD, CDPH, Resource Agencies, Transit, Rail, Locals	2 or on-going	G1-P1, G3-P3, G5-P1
Conduct data collection and research on visitor travel to California. This information is largely absent from existing travel demand models.	CT, RTPA/MPO, CEC, ARB, HCD, CDPH, Resource Agencies, Transit, Rail, Locals	2 or on-going	G1-P1, G5-P1