



CALTRANS ZERO- EMISSION VEHICLE ACTION PLAN 2.0

Updated March 1, 2021



SUSTAINABILITY

People, planet, prosperity

INTRODUCTION

Transportation is the largest source of greenhouse gas (GHG) emissions in California—with tailpipe emissions, oil extraction, and oil refining combined accounting for roughly 50 percent of all in-state emissions. California leads the nation’s climate change response since passing the Global Warming Solutions Act in 2006, which called for a reduction of statewide GHG emissions to 1990 levels by 2020. In 2016, California codified additional GHG emissions reductions of 40% below 1990 levels by 2030. Recent California legislation and Executive Orders put the state on the path to implement a zero-carbon electricity grid by 2045 and call on the state to reduce emissions in the transportation sector:

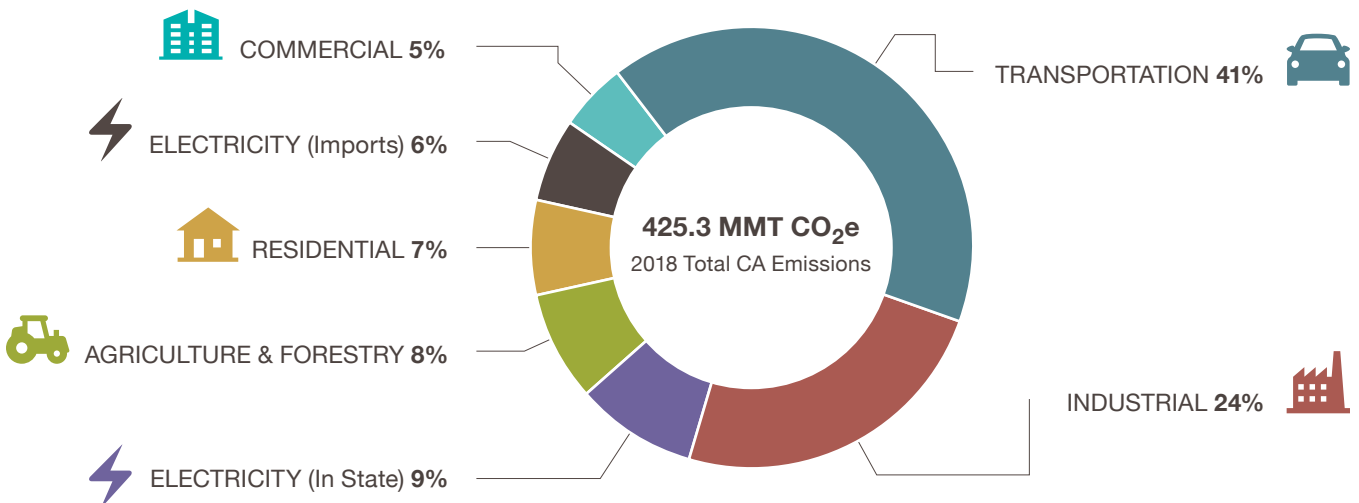
- Executive Order (EO) N-79-20 sets the following targets for California:
 - a. 100% of in-state sales of new passenger cars and light-duty trucks will be zero-emission by 2035;
 - b. 100% zero-emission Medium and Heavy Duty (MHD) vehicles in the state by 2045 and by 2035 for drayage trucks; and
 - c. 100% zero-emission off-road vehicles and equipment operations by 2035.

- SB 100 established a new statewide goal to achieve carbon neutrality by 2045

As part of EO N-79-20 implementation, the Governor’s Office of Business and Economic Development (GO-Biz) has developed a comprehensive Zero-Emission Vehicle (ZEV) Market Development Strategy. The Strategy aims to increase transparency and accountability for non-state and state agencies’ plans to meet California’s ZEV goals. EO N-79-20 requires each state agency to submit an action plan to GO-Biz on an annual basis. Each state department is required to communicate key strategies and results under the GO-Biz ZEV Market Development Strategy objectives assigned to that department.

Caltrans’ ZEV Technical Advisory Committee (ZEV TAC)—facilitated by the Headquarters Sustainability team—provides input and direction to the Department’s ZEV activities. The ZEV TAC has contributed to the preparation of this Caltrans ZEV Action Plan 2.0, an update to the original plan released in 2018. This Action Plan guides the Department’s ZEV-related policies and plans by both identifying key actions to meet the State’s ZEV targets and facilitating Department coordination. Additionally, the ZEV Action Plan 2.0 is a “living

2018 CALIFORNIA GHG EMISSIONS BY MAIN ECONOMIC SECTOR



Source: California Air Resources Board: 2000-2018 GHG Inventory

document” and will be updated, adapted, or modified as-needed to reflect new and emerging actions for the Department. Lastly this Action Plan commits to implementation that serves priority communities, when feasible, defined in the California State Transportation Agency’s (CalSTA) Climate Action Plan for Transportation Infrastructure (CAPTI) as disadvantaged, low-income, and Black, Indigenous, and People of Color (BIPOC) communities

Caltrans’ ZEV Action Plan 2.0 is divided into seven activity categories:

1. GREEN FLEET

- » Increasing zero-emission vehicles on road and rail.

2. RIGHTS-OF-WAY

- » Coordination to improve ZEV Electric Vehicle Supply Equipment (EVSE) within Caltrans’ right-of-way.

3. DIG SMART

- » Planning activities to minimize resources spent on ZEV technology installations.

4. BIKE/WALK INTEGRATION

- » Supporting biking and walking as zero-emission modes of transport.

5. RESEARCH AND DEVELOPMENT

- » ZEV research and development activities that support ZEV market growth.

6. ZEV INFRASTRUCTURE SIGNAGE

- » Improve visibility to the ZEV market by installing ZEV infrastructure signage.

7. PARTNERSHIPS AND COORDINATION

- » Internal and external coordination to support our main objectives.

Caltrans’ ZEV Action Plan 2.0 is summarized on the following page. To connect our ZEV Action Plan 2.0 to the GO-Biz ZEV Market Development Strategy, Caltrans’ key actions are structured around the four market pillars outlined in the GO-Biz Strategy document: Vehicles, Infrastructure, End User, and Workforce.

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SUMMARY OF ACTIONS

■ Directly Related
 ■ Indirectly Related
 □ Unrelated

			<i>Vehicles</i>	<i>Infrastructure</i>	<i>End User</i>	<i>Workforce</i>
1. GREEN FLEET	1.A	Implement Caltrans Workplace and Fleet EV Charging				
	1.B	Update and Implement Caltrans Fleet Acquisition Plan				
	1.C	Implement Intercity Rail Fleet Management Plan				
	1.D	Decarbonize and Reduce Air Pollutant Emissions of Intercity Rail				
	1.E	Increase Energy Efficiency of Intercity Rail				
2. RIGHTS-OF-WAY	2.A	Develop Caltrans ZEV Infrastructure Handbook				
	2.B	Address Key Gaps in ZEV Fueling Networks				
	2.C	Explore and Advance Hydrogen Fueling Corridors				
3. DIG SMART	3.A	Develop a Dig Smart Policy to Guide Department's Utility and Broadband Installations to Support Future ZEV Infrastructure Needs				
4. BIKE/WALK INTEGRATION	4.A	Implement Mode Share Action Plan 2.0				
5. RESEARCH & DEVELOPMENT	5.A	Track ZEV-Related Research and Communicate with Interested Parties				
6. ZEV INFRASTRUCTURE VISIBILITY	6.A	Facilitate Installation of ZEV-Related Signage				
	6.B	Promote Public Charger Locations				
	6.C	Promote Workplace Charger Locations				
7. PARTNERSHIPS & COORDINATION	7.A	Coordinate with Interagency Partners				
	7.B	Track Legislative ZEV Developments				
	7.C	Identify Federal Barriers to ZEV Infrastructure Implementation				
	7.D	Cultivate Funding Partnerships				
	7.E	Support Zero-Emission Transit Fleet Transition				
	7.F	Support Implementation of ZEV Freight Strategies				
	7.G	Explore Joint-Use of ZEV Fleets and Infrastructure with Transit Agencies				
	7.H	Support Local Jurisdiction's Transition to ZEVs				
	7.I	Facilitate Caltrans ZEV TAC				
	7.J	Facilitate ZEHTRANS Meetings				

OBJECTIVE 1: GREEN FLEET

Create and promote the greenest DOT fleet in the country and support the transition to zero-emission rail. Prioritize ZEV fleet and rail deployment to facilities located in regions that historically suffer from poor air quality.

Key Actions	Action Description	Key Results	Key Collaborators	Responsible Caltrans Divisions	Target Date
1.A Implement Caltrans Workplace and Fleet EV Charging	The Caltrans Workplace and Fleet EV Charging Implementation Plan identifies priority locations to install workplace and fleet EVSEs. The plan provides 5% EV charging availability for employees and will support a light-duty fleet of 100% ZEVs by 2045.	Install 1,000 Level 2 EVSE at Caltrans facilities across all districts.	DGS, Private Funding Partners, Public Utility Companies, CTC, CEC	Sustainability, Equipment, Business Operations, Budgets, Programming	Jul-22
		Obtain non-competitive bid approval for three hydrogen sweepers. Deploy in priority communities when feasible given infrastructure constraints.			Mar-21
		Update fleet replacement schedule according to optimized GHG reductions, pending vehicle availability. Prioritize ZEV fleet deployments in priority communities where feasible.			Jul-23
1.B Update and Implement the Caltrans Fleet Acquisition Plan	Caltrans' goal is to create and promote the greenest DOT fleet in the US, with a target of a 100% ZEV fleet by 2045. The annual Fleet Acquisition Plan includes all fleet vehicles, including ZEV.	50% of new light duty-fleet purchases are ZEVs.	DGS, DOE, OEMs	Equipment, Budgets, Programming	Jul-25
		Delivery of a strategy to achieve a zero-emission intercity rail fleet by 2035, with an emphasis on routes that impact priority communities			JPA's, Amtrak, Rail Agencies, CARB, CEC
1.C Implement Intercity Rail Fleet Management Plan	Caltrans has developed a strategy to transition its intercity rail fleet to 100% zero-emission by 2035, with hydrogen hybrid dual-mode technology. During the transition period GHG reductions from existing diesel locomotives will be achieved with renewable diesel. Caltrans plans a similar strategy and associated analyses for all railway services in California.	Develop a strategy for all railways in California for ZEV transition.	GO-Biz, US Department of Energy, OEMs, Freight Railroad Companies, FRA, CalSTA	DRMT	2022/23

OBJECTIVE 1: GREEN FLEET

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Key Actions	Action Description	Key Results	Key Collaborators	Responsible Caltrans Divisions	Target Date
1.D Decarbonize and Reduce Air Pollutant Emissions of Intercity Rail	Replace fossil fuels used by intercity rail with renewable energy to reduce emissions. Upgrade existing locomotives to reduce air pollutants and transition to zero-emission hydrogen hybrid dual mode vehicles.	Conduct research and development surrounding strategies to transition to Tier 4 rail fleet.	JPAs, Amtrak, CalSTA, CPUC/ regional utilities, Rolling Stock OEMs, BLET, Host Railroads, FRA, Academia and National Labs, CARB, CEC, GoBIZ, DOE, EPA, USDOT	DRMT, DRISI, Budgets	2023
		Transition to Tier 4 rail fleet.			2025
		Transition to 100% zero-emission fleet by 2035.			2025-2035
1.E Increase Energy Efficiency of Intercity Rail	Upgrade driver advisory technology to enable more efficient locomotive operations. Upgrade facilities where ground power can be provided during train layovers, rather than using diesel engines. Upgrade existing rolling stock or purchase new rolling stock to reduce energy consumption.	Driver advisory technology installed on all locomotives.	JPAs, Amtrak, CalSTA, CPUC/ regional utilities, Rolling Stock OEM, BLET, Host Railroads, FRA	DRMT	2025
		Upgraded facilities to supply ground power.			2025
		Upgraded or replaced equipment to reduce Head-End Power (HEP), with an emphasis on equipment replacements in priority communities first			2025

OBJECTIVE 2: RIGHTS-OF-WAY

Leverage Caltrans' rights-of-way to increase opportunities to access EV infrastructure, particularly in high priority communities and "gap" locations where there is no private investment.

<i>Key Actions</i>	<i>Action Description</i>	<i>Key Results</i>	<i>Key Collaborators</i>	<i>Responsible Caltrans Divisions</i>	<i>Target Date</i>
2.A Develop Caltrans ZEV Infrastructure Handbook	Establish processes and procedures for implementing workplace and public ZEV infrastructure. The Handbook considers pricing and identifies areas of responsibilities for workplace charging and fleet charging use prioritization.	Adopt Caltrans ZEV Infrastructure Handbook.	CEC, CPUC, CARB, GOBiz	Sustainability	May-21
2.B Address Key Gaps in ZEV Fueling Networks	Collaborate with CEC to identify and address key gaps in DCFCs and hydrogen fueling networks.	Complete the installation of 47 DCFCs at 36 locations.	Local and Regional Government, CEC, Electric Utilities	Design	Jun-21
2.C Explore and Advance Hydrogen Fueling Corridors	Update objectives for supporting hydrogen fueling with emphasis on support for heavy-duty vehicles, including the development of fueling corridors for freight. Explore partnerships with various industry stakeholders.	Engage with CEC to pilot hydrogen mobile fueling stations.	CTPSTAC, DOTP, Local and Regional Governments	Equipment	Dec-21

OBJECTIVE 3: DIG SMART

Plan utility and broadband installations to support future ZEV infrastructure needs, particularly in priority communities.

<i>Key Actions</i>	<i>Action Description</i>	<i>Key Results</i>	<i>Key Collaborators</i>	<i>Responsible Caltrans Divisions</i>	<i>Target Date</i>
3.A Develop a Dig Smart Policy to Guide Department's Utility and Broadband Installations to Support Future ZEV Infrastructure Needs	<p>As identified in the 2020 Broadband Action Plan, the Department will develop a Dig Smart policy in order to advance practices that may lower the capital cost of infrastructure deployment and minimize disruptions caused by ongoing or duplicitous construction.</p> <p>The policy may consider installation of conduit as part of any appropriate and feasible state-funded transportation project in strategic corridors, as an incentive for broadband service build-outs to un- and under-connected communities.</p>	Adoption of Dig Smart policy	CalSTA	Sustainability, Planning, Design	Aug-21

OBJECTIVE 4: WALK/BIKE INTEGRATION

Mainstream walking and biking in SHS projects, particularly for priority communities and are responsive to their needs and desires.

<i>Key Actions</i>	<i>Action Description</i>	<i>Key Results</i>	<i>Key Collaborators</i>	<i>Responsible Caltrans Divisions</i>	<i>Target Date</i>
4.A Implement Mode Share Action Plan 2.0	<p>The Department has developed a comprehensive plan of 47 actions for achieving the Department's goals to improve bicycling and pedestrian access for communities.</p> <p>In 2020, the Department outlined an additional set of 35 high-priority actions (the Complete Streets Action Plan) to be completed by the end of 2021.</p>	<p>Delivery of Complete Streets Action Plan, High Priority Actions 2020-21, with a focus on priority communities.</p>	<p>Complete Streets Stakeholders</p>	<p>Sustainability, Design, Planning, Project Delivery, Programming, Maintenance, DRMT, Traffic Operations</p>	<p>Dec-21</p>

OBJECTIVE 5: RESEARCH AND DEVELOPMENT

Focus ZEV research and development efforts on how to best support ZEV deployment. Consider equitable approaches, visualization, and outcomes in all Caltrans-funded ZEV research.

<i>Key Actions</i>	<i>Action Description</i>	<i>Key Results</i>	<i>Key Collaborators</i>	<i>Responsible Caltrans Divisions</i>	<i>Target Date</i>
5.A Track ZEV-Related Research and Communicate with Interested Parties	Track research and innovation related to ZEV implementation and communicate this information to interested parties. Collaborate with ZEV TAC to identify research and development priorities.	Participate in UC Davis' STEPS program activities and disseminate relevant information to internal and external partners.	Academia, CARB, CEC, OPR, SGC	DRISI, Equipment, Sustainability	Aug-21
		Create prioritized funding list of ZEV research proposals, focusing on research that can benefit priority communities			Nov-21
		Continue to fund ZEV-related research through university partners and disseminate results to internal and external partners.			Apr-2021; Ongoing

OBJECTIVE 6: ZEV INFRASTRUCTURE VISIBILITY

Raise awareness of publicly accessible ZEV infrastructure through signage, mapping, and other communications tools. Ensure all published information is accessible to all, as per the accessibility standards outlined in Assembly Bill 434.

<i>Key Actions</i>	<i>Action Description</i>	<i>Key Results</i>	<i>Key Collaborators</i>	<i>Responsible Caltrans Divisions</i>	<i>Target Date</i>
6.A Facilitate Installation of ZEV-Related Signage	Facilitate installation or update highway signage directing customers to ZEV charging and hydrogen fueling stations, including signs indicating HOV/HOT access for ZEVs. Support standardized roadside and other signage.	Update Sign Installation Guide according to the signage-related changes in the California MUTCD, if necessary.	Local and Regional Government, Electric Vehicle Charging Station Providers, Electricity and Hydrogen Providers	Safety Programs	Updated Annually
6.B Promote Public Charger Locations	Update information on public charging installations at Department facilities on the Caltrans website. Include a web map of Department-owned operational public EV chargers.	Update QuickMap with Caltrans public EV charger data. Share Caltrans public EV charger locations with private way-finding services.	Electric Vehicle Charging Station Providers, Electric Utilities	Design, Traffic Operations, IT	Jun-21
6.C Promote Workplace Charger Locations	Maintain and update map of ZEV infrastructure at Caltrans facilities statewide and make available to all Department employees through the intranet.	Develop intranet map with Caltrans workplace EV charger data.	Electric Vehicle Charging Station Providers, Electric Utilities	Maintenance, Equipment	Dec-21

OBJECTIVE 7: PARTNERSHIPS & COORDINATION

Coordinate internally and externally to support ZEV program goals. Establish a clear stakeholder engagement process, with a focus on reaching underserved communities of color, and low-income community representatives.

Key Actions	Action Description	Key Results	Key Collaborators	Caltrans Responsible Divisions	Target Date
7.A Coordinate with Interagency Partners	Provide regular updates on the Department's ZEV efforts to Department staff, partner agencies, and the public.	Provide regular ZEV updates during national or regional conferences. Coordinate with other state transportation agencies on public charging corridors and public speaking events to represent the Department's work on ZEV implementation.	Academia, Non-Governmental Organizations, State Transportation Agencies, California State Agencies	Sustainability, Division of Equipment, Caltrans Districts	Ongoing
		Keep the Caltrans ZEV Website up-to-date with current Department ZEV efforts.			Ongoing
7.B Track Legislative ZEV Developments	Identify and track Legislative issues—Federal, State, and Local—that affect the ZEV Program goals.	Provide input and support to the legislative process. Align legislative input with State values and state actor capacities.	CalSTA	Legislative Affairs	Ongoing
7.C Identify Federal Barriers to ZEV Infrastructure Implementation	Identify Federal regulations that affect the Department's ability to achieve ZEV goals. Pursue changes as needed.	Provide input and support for Federal legislation and regulation that enhances the State's ZEV goals.	CalSTA, GO-Biz, CARB	Federal Liaison	Ongoing
7.D Cultivate Funding Partnerships	Actively cultivate partnerships with third-party funders to support ZEV infrastructure installation and ZEV-related projects.	Partner with VW subsidiary, Electrify America, to maintain and operate 271 EVSEs at Caltrans workplace locations as required under the established contract.	Investors/Financing Institutions, Governments of all Levels, DGS, OEMs	Sustainability, Equipment	Dec-26
		Leverage CALeVIP rebate funding for Caltrans EVSE workplace locations.			Jul-22
		Leverage DGS funding for Caltrans EVSE workplace locations.			Jul-22

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<i>Key Actions</i>	<i>Action Description</i>	<i>Key Results</i>	<i>Key Collaborators</i>	<i>Caltrans Responsible Divisions</i>	<i>Target Date</i>
7.E Support Zero-Emission Transit Fleet Transition	Accelerate introduction of ZE transit vehicles across the State by working with transit agencies to transition to zero-emission fleets through funding and technical assistance.	Leverage various funding options to assist transit agencies with the transition to ZEV with ICT regulations.	CARB, Transit Agencies, FTA, CalSTA	DRMT	2021
7.F Support Implementation of ZEV Freight Strategies	Implement California Sustainable Freight Action Plan (CSFAP) and California Freight Mobility Plan (CFMP) ZEV strategies to incentivize zero-emission freight. Prioritize inclusion of zero-emission freight projects in the CFMP project list. Support local and regional agencies and businesses in zero-emission infrastructure and vehicle deployment. Make ZEVs integral to freight approaches.	Complete the California Statewide Truck Parking Study (CSTPS) with ZEV fueling strategies at private or public truck parking lots. The CSTPS will also place an emphasis on freight corridors with the greatest air quality impacts on priority communities.	CTC, CARB, CEC, CPUC, CalSTA	Planning	May-22
		Implement the California Sustainable Freight Action Plan (CSFAP) Caltrans-led and ZEV-related Pilot Projects, in partnership with local and regional agencies.			Ongoing
		Coordinate with the California Freight Advisory Committee (CFAC) and the Truck Parking Technical Advisory Committee (TPTAC) on ZEV issues and opportunities.			Quarterly Meetings

OBJECTIVE 7: PARTNERSHIPS & COORDINATION

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Key Actions	Action Description	Key Results	Key Collaborators	Caltrans Responsible Divisions	Target Date
7.G Explore Joint- Use of ZEV Fleets and Infrastructure with Transit Agencies	Coordinate efforts between transit agencies to identify options to share facilities, charging/fueling infrastructure and vehicles. Create economy of scale to reduce cost of ZEV transition.	Review ICT rollout plans and create a technology inventory and identify collaboration and coordination opportunities between large transit agencies.	CARB, Transit Agencies, FTA, CalSTA	DRMT	2022
		Review ICT rollout plans and create a technology inventory and identify collaboration and coordination opportunities between small transit agencies.			2024
7.H Support Local Jurisdictions' Transition to ZEVs	Coordinate and inform local partners on ZEV efforts while encouraging partners to develop and adopt regional ZEV infrastructure plans and policies as part of their regional and local transportation plans.	Increase planning and grant applications related to ZEV planning and infrastructure implementation, with a focus on building capacity in priority communities.	Investors/Financial Institutions, MPOs, Regional Transportation Planning Agencies	Planning	Annual Reporting
7.I Facilitate Caltrans ZEV TAC	Coordinate ZEV TAC meetings to monitor the ZEV Action Plan implementation and updates.	Facilitate bi-monthly ZEV TAC meetings. Add equity as a standing agenda item.	Caltrans ZEV Technical Advisory Committee	Sustainability	Ongoing
7.J Facilitate ZEHTRANS Meetings	Regional ZEV transit technology coordination that enables sharing best practices and grant opportunities for ZEV adoption.	Facilitate monthly ZEHTRANS meetings. Add equity as a standing agenda item.	CARB, Transit Agencies, AQMDs, CEC, GO-Biz	DRMT	Ongoing

COMPLETED ACTIVITIES

<i>Key Actions</i>	<i>Key Results</i>	<i>Key Collaborators</i>	<i>Caltrans Responsible Divisions</i>	<i>Completion Date</i>
ZEV Data Collection	Created a system to collect data on ZEV charger use and operation for fleet and employee charging at facilities. Track all workplace ZEV infrastructure in ZEV Access Database	DGS, Private Funding Partners, Public Utility Companies, Public Agency Funding Programs	Sustainability, Equipment, Business Operations	Completed
MHD ZEV Purchasing Policy	Participate in the creation of DGS medium-and heavy-duty ZEV purchasing policy.	DGS	Equipment	Dec-20
Workplace & Fleet EV Charging Infrastructure Plan	Identify priority locations to install workplace & fleet charging. Provide guidance and support for the development of ZEV infrastructure plans at each location.	DGS, Public Utility Companies, Original Equipment Manufacturers	Sustainability, Equipment	Jul-19
ZEV Charging Equipment Inventory	Create a centralized database for the number and location of workplace EVSEs installed and proposed, including funding sources. As of March 1st, 2021, Caltrans has installed 586 workplace EVSEs.	DGS, Private Funding Partners, Public Agency Funding Programs	Equipment, Design, Business Operations	2019
ZEV Access to HOV/HOT lanes	Provide ZEV access to High Occupancy Vehicle (HOV) and High Occupancy Toll (HOT) lanes.	Local and Regional Governments, DMV	Traffic Operations	Completed
Caltrans ZEV Summit "ZEVfest 2018"	Plan and execute a Caltrans ZEV Summit to accelerate ZEV knowledge and holistically discuss the role of Caltrans in supporting California's ZEV future.	GO-Biz, CEC, DGS, CARB	Sustainability	2018

ACRONYMS

BLET	Brotherhood of Locomotive Engineers and Trainmen	FAP	Fleet Acquisition Plan
CalSTA	California State Transportation Agency	FRA	Federal Rail Administration
CAPTI	California Air Resources Board	GO-Biz	Governor's Office of Business and Economic Development
CARB	California Air Resources Board	HOT	High-Occupancy Toll lane
CEC	California Energy Commission	HOV	High-Occupancy Vehicle lane
CPUC	California Public Utilities Commission	ICT	Innovative Clean Trust
CTC	California Transportation Commission	IT	Division of Information Technology
CTP	Clean Transportation Program (also referred to as Alternative Renewable Fuel and Vehicle Technology Program)	JPA	Joint Power Authorities
CTPSTAC	California Truck Parking Study Technical Advisory Committee	LCTOP	Low Carbon Transit Operations Program
DCFC	Direct Current Fast Charger	National Labs	National Laboratories
DGS	Department of General Services	OEMs	Original Equipment Manufacturers
DMV	Department of Motor Vehicles	OPR	California Governor's Office of Planning and Research
DOE	Caltrans Division of Equipment (also referred to as Equipment)	STEPS	University of California at Davis Sustainable Transportation Energy Pathways
DRISI	Caltrans Division of Research, Innovation and System Information	TAC	Transportation Advisory Committee
DRMT	Caltrans Division of Rail and Mass Transit	EV	Electric Vehicle
EPA	Environmental Protection Agency	US DOE	United States Department of Energy
EVSE	Electric Vehicle Supply Equipment	US DOT	United States Department of Transportation
		ZEHTRANS	Zero-Emission Heavy Transport Working Group
		ZEV	Zero-Emission Vehicle