

California HSR Authority's ZEV Market Development Action Plan – 2025 update

High-Speed Rail will have the state's fastest and highest capacity zero-emission vehicles and fleets. The fleet will be comprised of high-speed trainsets, intercity coaches, light, medium, and heavy-duty on-road vehicles, off-road equipment, and on-rail maintenance equipment. In addition, high-speed rail stations will serve as Zero Emissions Vehicle (ZEV) mobility hubs and provide infrastructure for ZEV charging.

Equity: Prioritize ZEV deployment and implementation in procurement contracts, develop station area plans with an economic development focus, create job training programs in a manner that benefits priority communities and creates more high-road jobs, and provide aid to zero emission vehicle partners.

A summary of California High-Speed Rail Authority's ZEV market development objections and actions are summarized below.

Activity Category	Key Actions	Vehicles	Infrastructure	End User	Unrelated
1. ZEV Mobility Hubs	1.A Station Area Plans				
	1.B Station Site Design				
	1.C Ongoing Stakeholder Engagement				
2. System Resilience	2. A Climate Adaptation Plan				
	2. B Climate Policy				
	2. C Renewable Energy Strategy				
3. ZEV Fleet Contract Requirements	3. A Procurement Mandates.				
	3. B Ongoing Knowledge Sharing				
4. Market Growth	4. A Just Transition				
	4.B Market Research				
	4.C Job Access				
5. VMT Reduction	5.A Renewable Electric High-Speed Rail				
	5.B Create Seamless Local Transfers				
	5.C Reduce Transfer Penalties				
6. Reduce Air Miles Travelled	6.A Renewable Electric High-Speed Rail				
	6.B Environmental Clearance				
	6.C Create Seamless Transfers				

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Activity Category	Objective	Key Collaborators	Key Actions	Action Description	Key Result	Target Date	2024 Progress
1. ZEV Mobility Hubs	Integrate multi-modal ZEV transitions at stations.	all stakeholders	1.A Station Area Plans	Complete station area plans that enable multimodal access and include electrical charging hubs.	Station Area Plans	December 2025	In Progress & On Track. Continued development of the multimodal access and electrical charging requirements for site planning & amended station related design criteria. Charging infrastructure, type, and provisioning at Central Valley Stations is ongoing as design advances. <u>Target Due Date Change:</u> Target due date updated to December 2025 from December 2024 as station designs progress.
			1.B Station Site Design	Design the station sites to be easily adaptable in accommodating anticipated merging technologies.	Future Ready Station Sites	December 2025	In Progress & On Track. Included specific values and success metrics for station sites related to topics of smart growth and future preparedness. <u>Target Due Date Change:</u> Target due date updated to December 2025 from December 2024 as station designs progress.
			1.C Ongoing Stakeholder Engagement	Maintain stakeholder engagement with respect to reaching priority community representatives.	Ongoing Stakeholder Engagement	Ongoing	In Progress & On Track. Historical engagement occurred as part of the project’s Environmental approval process. Current stakeholder engagement work includes community engagement regarding station area planning and station design efforts. For instance, community and stakeholder outreach is occurring to inform the early works for Fresno Station, including the pop-up event hosted at the 559 Night Market in Fresno. Additionally, an Equity and Environmental Justice Gap Assessment is being completed to identify opportunities to improve the Authority’s Environmental Justice and community outreach practices.
2. System Resilience	Establish world-class resilience for California’s rail system.	CEC, Local & regional government, Electricity Providers, Caltrans	2. A Climate Adaptation Plan	Complete a climate adaptation plan to establish and integrate climate hazards as another risk to the program in the mandatory risk assessment process for all system components. Additionally, the climate adaptation plan will include the results of statewide climate change exposure assessments and identify mitigation measures to be included in the design, as well as operations and maintenance to boost overall project resilience.	Climate Adaptation Plan	Completed (next update end of 2025)	Completed. A Climate Adaptation Plan was completed in May 2021 which: - Documents the Authority’s work to date to analyze, understand, and prepare for climate change when delivering the CHSR; and - Outlines the path forward for incorporating climate adaptation into Authority decisions. <u>Lessons Learned:</u> Meetings and workshops were successful tools for communicating the Climate Adaptation Plan but were not as effective for soliciting feedback. Instead, one on one meetings generated significantly more feedback. <u>Upcoming:</u> A Climate Adaptation Plan update is being drafted and will be released by end of 2025, based on updated Climate Data and analysis.
			2. B Climate Policy	Complete a climate policy that established and recognizes the Authority’s commitment and leadership to reducing greenhouse gas emissions and adapting to an uncertain future	Climate Policy	Completed	Completed. The Climate Policy has been finalized, approved and signed into effect as of February 3, 2023. <u>Lessons Learned:</u> The original scope of the Climate Policy needed to be expanded to allow for a more meaningful and detailed policy that more adequacy reflected the depth of the Authority’s commitments.
			2. C Renewable Energy Strategy	Complete technical and financial feasibility studies on potential behind the metersolar and battery storage systems. In efforts to create an onsite, decentralized energy hub which will reduce risks and reliance on the grid and supply the statewide system with renewable energy.	Conceptual Design Study for Battery Energy Storage Systems (BESS)	Completed	Completed. The BESS Conceptual design study was completed in February 2024. BESS Procurement will be integrated into Renewable Energy actions below. <u>Lesson Learned:</u> The BESS conceptual design study concluded that the solar and battery storage system will be cost saving for the project
3. ZEV Fleet Contract Requirements	Reinforce ZEV state regulations and policies by requiring ZEV across multiple classes for construction and operation.	Vehicle Manufacturers and Supply Chain; Infrastructure Providers; CARB, CEC; Caltrans; CWDB; SGC	3. A Procurement Mandates	Require the procurement of low and no emissions non-heavy duty on-road, heavy duty on-road, and maintenance vehicles through contract mandates.	<u>Non-heavy-Duty vehicles:</u> Mandate that at least 25% of non-heavy duty on road vehicles must be low and zero emissions in all new construction packages.	Completed	Completed. The Track and Systems procurement package mandated the use of at least 25% of non-heavy duty on road vehicles, at least 1 heavy duty on-road vehicle be a ZEV, and that the maintenance fleet meet lower emissions standards. All future packages will at a minimum include the above procurement mandates. Additionally, the Authority completed a ZEV Memo to evaluate the feasibility of requiring the procurement of ZEVs and equipment during the construction of the HSR. The results of this memo inspired a new policy adopted in April 2021 to mandate the following procurement requirements: - 100% ZEV for on road light and medium duty vehicles in all future procurement packages; - 100% ZEV for short haul and drayage by 2035, and 100% ZEV for all on road heavy-duty vehicles by 2045; and - 10% ZEV for off-road equipment be ZEV by 2035, and 100% ZEV for off-road equipment by 2045.
					<u>Heavy Duty Vehicles:</u> Mandate that at least one heavy duty on-road vehicle used for on-road hauling must be a ZEV in all new construction packages.		
					<u>Maintenance Fleet:</u> Mandate that all vehicles in the maintenance fleet must be electric, plug-in hybrid electric, biodiesel compatible, hydrogen powered, or otherwise eligible for the California Clean Vehicle Rebate Project.		
4. Market Development Growth	Support uptake of ZEV equipment in construction and workforce development.	Vehicle Manufacturers and Supply Chain; Infrastructure Providers; Organized Labor; Investors; Academia; International; NGOs; CARB, CEC; CWDB	4. A Just Transition	Identify opportunities where new jobs can be created with a special focus on job development for priority communities, during the implementation of the HSR’s ZEV Strategy and the state of California’s Just Transition Roadmap.	Job Analysis	December 2025	In Progress & On Track. Since the start of construction, the project has generated over 14,000 jobs across all construction sites, with more than 70 percent going to individuals in disadvantaged communities. Additionally, As of November 2023, the Authority has entered a memorandum of understanding (MOU) with 13 rail labor unions, which will cover an estimated 3,000 workers who will operate and maintain the high-speed trains, facilities, and stations from the Bay Area through the Central Valley and into Southern California. <u>Target Due Date Change:</u> The target due date updated to December 2025 from December 2024.
			4.B Market Research	Proactively work with state agencies to understand incentives, with vehicle manufacturers to understand market availability, and with academic and international partners for technological advances in the industry. Lessons learned will be collected and used to create a whitepaper, and new procurement requirements.	Research Report	December 2022	Completed. The Authority completed a ZEV Memo that reviewed the current market availability and cost of ZEV on-road light-, medium- and heavy-duty vehicles, and off-road equipment for use during the construction of HSR. The intention of the study was to assess the feasibility of replacing vehicles and equipment with ZEV alternatives.
					Updated Procurement Requirements	December 2023	Completed. The project’s Design Criteria Manual (Version 5.1) was updated to include emissions criteria regarding on-road and off-road fleet emission requirements, which will be applicable to all future construction packages. (ZEV procurement requirements are summarized in Action 3.A). <u>Lesson Learned:</u> Continuous attention to market availability and government ZEV targets is vital to set interim goals for heavy duty vehicles and off-road equipment.

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					<u>Manufacturer Coordination.</u> Coordinate among rail		In Progress & On Track. Green purchasing market research, sustainable procurement requirements writing, and design team coordination have occurred in 2024 for the sustainable procurement of various trackwork and alignment components.
					<u>Operations Coordination.</u> Work with partners to develop a workforce that can operate and maintain the system and fleet.	December 2028	<u>Target Due Date Change:</u> The target due date updated to December 2028.
5. Vehicle Miles Traveled (VMT) Reduction			5.A Renewable Electric High-Speed Rail	Operate the electric high-speed rail system using 100% renewable energy.	Implementation of Renewable Energy System	December 2025	In Progress & On Track. Concept engineering for the renewable energy system is in progress, including Solar Power systems, Traction Power Substations (TPSS) and Battery Energy Storage Systems (BESS). Procurement of a contractor is anticipated in 2025.
			5.B Create Seamless Local Transfers	Create a plan to link the electrified high-speed rail journey with multiple types of local ZEV travel options (e.g., intercity coaches) to provide users with uniform ZEV end to end journeys.	Local Transfer Plan	December 2025	In Progress & On Track. Ongoing analysis to establish metrics for transfer times and passenger journey comfort at all Central Valley Stations. Convenient transfers between modes and ZEV travel options are being considered in the Schematic Design process for arrival and departure from the stations.
			5.C Reduce Transfer Penalties	Reduce transfer penalties by working with the state to implement the state rail plan, as well as working with municipalities and local transit agencies to integrate the various transportation systems.	Integration & Transfer Penalty Plan	December 2025	In Progress & On Track. Ongoing coordination with local transit agencies to modify services in alignment with HSR service to improve passenger experience and reduce total trip durations. The Authority is participating in discussions around transfers and fare integration spearheaded by other entities.
6. Reduce Air Miles Travelled			6.A Renewable Electric High-Speed Rail	Operate the electric high-speed rail system using 100% renewable energy.	Implementation of Renewable Energy System	December 2028	In Progress & On Track. Renewable energy system concept engineering is ongoing, and procurement is upcoming.
			6.B Environmental Clearance	Complete all project-level environmental clearance documents necessary for Phase I of the HSR.	Environmental Clearance for all Phase I Segments	December 2025	In Progress & On Track. Environmental clearance for the whole Phase I system segments have been approved with only one segment remaining. The Palmdale to Burbank EIR/EIS was approved in June 2024, and only the EIR/EIS for Los Angeles to Anaheim remains, which the Authority expects to finalize in 2025.
			6.C Create Seamless Transfers		Local Transfer Plan	December 2025	In progress & On track. The Authority has reached agreement with local airports to increase regional transportation connectivity.
							<u>Target Due Date Change:</u> The target due date updated to December 2025 from December 2024.