

STAFF REPORT

DATE: February 27, 2023
TO: Sacramento Regional Transit Board of Directors
FROM: Chris Flores, Chief of Staff
SUBJ: SACRAMENTO REGION ZERO CARBON TRANSPORTATION INITIATIVES

RECOMMENDATION

No Recommendation - For Information Only.

DISCUSSION

Starting in Summer 2021, SacRT partnered with the Sacramento Metropolitan Air Quality Management District (Sac Metro Air District), Sacramento Area Council of Governments (SACOG), and the Sacramento Municipal Utility District (SMUD) to begin identifying challenges and opportunities for the region to advance the deployment of both electric and other zero-emission vehicle technologies.

In 2022, the four agencies released the Sacramento Region Zero Carbon Transportation Initiatives: ZEV Deployment Strategy. This document, which is attached hereto as Attachment 1, is intended to send a clear message to state and federal that the Sacramento Region is ready for investment in electric, hydrogen, and other zero-emission vehicle technologies and position to the region to compete for federal and state funding.

The 4-Agencies have partnered on this comprehensive report that includes four complementary programs aimed at preparing the region for a zero-emission future including:

- 1) Transit Fleet Conversion & Refueling Infrastructure
- 2) Goods Movement and Medium & Heavy-Duty Fleet Transition
- 3) Charging & Transportation Options for Under Resourced Communities
- 4) Workforce Development

The plan prioritizes investments in under resourced communities, personal vehicles, shared-ride vehicles, public and private transit, micro-transit and shuttles, and medium-duty and heavy-duty (MD-HD) fleets.

Sacramento Region Zero Carbon Transportation Initiatives



ZEV Deployment Strategy



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The Opportunity

Between 2006 and 2016, the Sacramento metropolitan area ranked in the bottom-third of the 100 largest metro areas in composite rankings measuring improvements in growth, prosperity, and inclusion, according to the *Brookings Institute Report—Charting a Course to the Sacramento Region’s Future Economic Prosperity* (Parilla, Liu, & Gootman, 2018). Furthermore, the Sacramento Region suffers from some of the worst air quality in the nation, ranking 22nd by the American Lung Association for worst ozone and 15th for worst

Passenger vehicles make up nearly 43 million VMT on roadways in the region on an average weekday, commercial trucks generate a little over 9 million.

particulate matter pollution. Both ozone and particulate matter cause lung damage and other adverse health effects and are primarily caused by transportation emissions, with 67 percent of the ozone-causing emissions in Sacramento coming from on-road and other mobile sources. With a majority of the region’s greenhouse gas emissions (GHG) derived from transportation sources, these pollutants are disproportionately harming the Sacramento Region’s most under resourced communities. A solution-focused strategy for vehicles that aims to reduce vehicle miles traveled (VMT) and replace existing sources with zero-emission fuels, such as electricity and hydrogen, is critical to making desperately needed environmental improvements within the region.

In response, four Sacramento agencies, the Sacramento Metropolitan Air Quality Management District (Sac Metro Air District), Sacramento Area Council of Governments (SACOG), Sacramento Regional Transit (SacRT), and the Sacramento Municipal Utility District (SMUD) created the Sacramento Area Zero Emission Vehicle (ZEV) Deployment Strategy, a regional approach to improve air quality, reduce greenhouse gas emissions, abate exposure to toxins, adapt to a warming planet, and promote efficient mobility.

By investing in under resourced neighborhoods and working with community partners, the Sacramento Area ZEV Deployment Strategy is part of a larger regional mission to deliver energy, health, housing, transportation, education, workforce, and economic development solutions to transform its neighborhoods into sustainable communities.

Total VMT per Weekday in the Sacramento Region

VARIABLE	CURRENT
Passenger VMT (w/in region)	42,579,600
Passenger VMT (through-travel)	9,216,100
Commercial VMT (Trucks)	6,644,100
Transit Bus VMT	47,200
Total VMT	58,487,000

The Framework

The **Sacramento Area ZEV Deployment Strategy** is focused on concentrating investment in electrification of the region's transportation fleet to demonstrate technologies and our region's interest in a zero-emission transportation future. **The plan prioritizes electrification in under resourced communities, personal vehicles, shared-ride vehicles, public and private transit, micro-transit and shuttles, and medium-duty and heavy-duty (MD-HD) fleets** in alignment with the six-county Green Means Go regional pilot and the City of Sacramento's Transportation Priorities Plan. This document will detail four complimentary programs and cooperation across the four agencies that are already making progress in moving toward this future.

Sacramento Area ZEV Deployment Strategy

4 AGENCIES

Sacramento

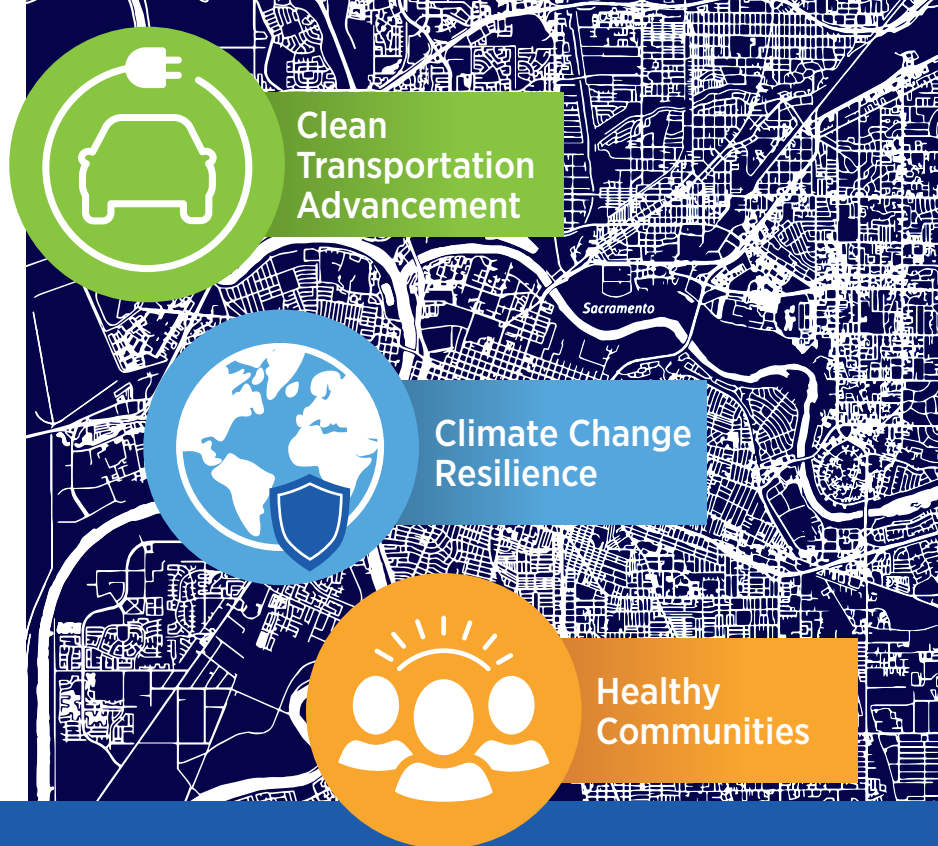


Regional Transit



1 GOAL

Zero Emission
Transportation Future





Zero-Emission Transportation Future

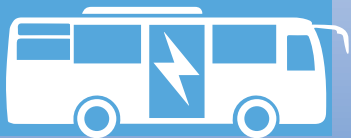
for the Sacramento Region



- 600 ZEV Buses
- 5+ Charging & Refueling Facilities

1

Transit Fleet



- 5 MD-HD Charging Plazas

2

MD-HD Fleet



- 52 eMobility Hubs
- 182 LD EV Chargers

3

eMobility



- 4,000 People Trained
- 1,000 People Hired

4

Clean Energy Workforce



Transit Fleet Conversion & Refueling Infrastructure

The Sacramento region is serviced by a network of transit agencies that are located in both Sacramento and the surrounding counties. To support both a reduction in emissions and VMT, transit fleets serviced by these agencies will need to transition to zero-emission fuels in accordance with the Governor's Executive Order N-79-20 mandating the California Air Resources Board's (CARB) to develop and propose strategies to achieve 100% zero-emissions from medium and heavy-duty on-road vehicles in the State by 2045 where feasible.ⁱⁱ This includes transit buses and a regional refueling facility to supply the commute operations for these buses. Collectively we would transition over 600 transit buses to zero-emission fuels and at least five strategically located charging facilities throughout the region. Preliminary actions are already in progress with over 20 electric buses already deployed along with the first charging station. Additional funding would support vehicle transition and deployment of the charging facilities to support this strategy and promote a long-term ZEV plan inclusive of both battery and fuel cell technologies powered by renewable electricity and hydrogen.

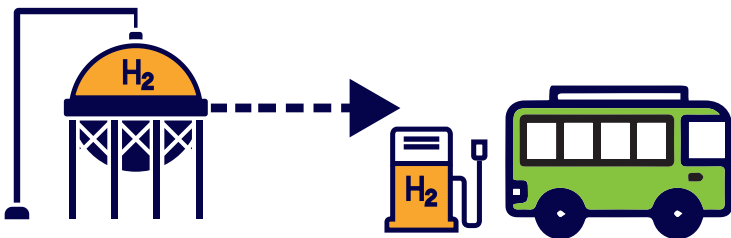
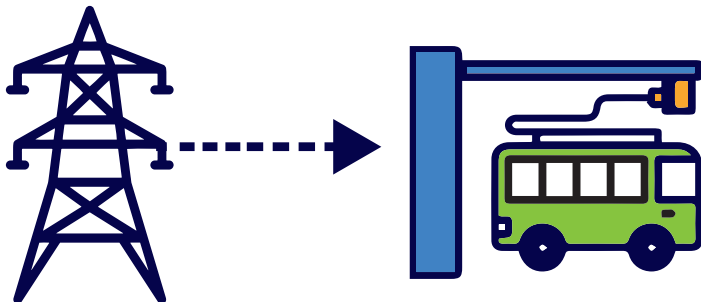
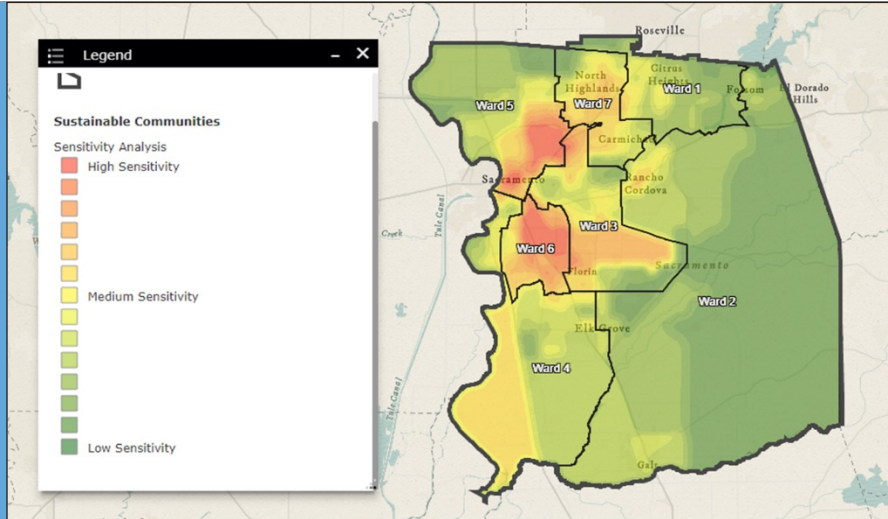
Eliminate fleet range anxiety with clean and reliable distributed charging.

Electric and hydrogen transit buses will create high grid distribution system demand at home base locations, potentially 4-5 megawatts per site, which could require grid distribution system upgrades that are expensive with extended time horizons for completion (3-5 years). While improvements in battery and electric bus technology are expected to increase over time, the adequate range is a concern for bus operators.



To provide charging access to bus operators as quickly as possible, project partners will work with SACOG, SacRT, and other transit providers in the region to leverage their planning efforts with SMUD's grid distribution system impact study and regional hydrogen development to produce and implement a strategy to provide electrified home bases and dispersed bus charging in the Sacramento region.

As an example of its strong commitment to creating an equitable and inclusive clean energy future, SMUD developed the Sustainable **Communities Resource Priorities Map** that helps analyze current data to indicate the local areas most likely to be underserved or in distress by lack of community development, income, housing, employment opportunities, transportation, medical treatment, nutrition, education, and clean environment. The data sets in the Resource Priorities Map include key indicators that would best aid in identifying and targeting communities with a greater sensitivity to social, economic, and environmental vulnerabilities. Importantly, this map is publicly available and external organizations and agencies have used it to make investment decisions to more equitably support historically under resourced communities.



600
Transit buses
converted
to zero
emissions

5+
Charging
& Re-Fueling
Facilities

Supporting
Neighborhood
Electrification
Efforts

Parameters



Investment: \$540M



Objectives: 600 transit buses, 3 new garages, existing garage modifications

- **Transit electrification** will include:
 - » SACOG regional study for MD-HD charging that includes grid distribution system capacity analysis and identification of charging constraints;
 - » Grid distribution system impact study;
 - » SMUD's Sacramento Region Medium and Heavy Duty Zero Emission Vehicle Blueprint Planning Project; and
 - » SMUD's Sustainable Communities Resource Priorities Map
- **Work** with charging infrastructure manufacturers and operators to understand how their technology can work for transit only and multi-purpose charging and can operate during times of low and peak grid distribution system demand.
- **Installing** DC fast chargers that meet the following criteria:
 - » Support SacRT bus fleets and garage design needs
 - » Supports transit agencies that connect into the Sacramento region, with a typical downtime between morning and evening commutes;
 - » Directs charging infrastructure to where grid distribution system upgrades are minimized and where multiple electrification objectives can be met (e.g., multi-use including goods movement and light-duty [LD], supporting neighborhood electrification, supporting vehicle to grid, and managed to charge).
- **SacRT working** with Sacramento City Unified School District (SCUSD) to upgrade their fleet of buses. SCUSD is co-sponsoring a site with schools for upgrades.



Equity:

- **Analyze** potential impacts of new bus charging infrastructure on underserved neighborhoods, working to reduce existing air pollution from the transit and ensuring that new bus traffic patterns benefit or do not harm the neighborhoods.
- **Conduct** focused outreach to school districts that include underserved neighborhoods offering technical assistance in developing school bus charging infrastructure while offering technical assistance to all districts.
- **Include** a workforce development component, for example, establishing a trade union and/or community college partnership.

Design Concepts

SMUD will work with SacRT and other regional operators to provide grid distribution system capacity to support the charging technologies adopted for their buses. The regional dispersed charging network that is focused on short “top off” charging to maintain range will likely use DC fast chargers with overhead ports.

SacRT will identify new locations for its three bus garages that can support electric and hydrogen buses, with adequate grid distribution system capacity, a site footprint that can accommodate sufficient space for overhead charging and that minimizes travel time to routes. SacRT proposes three new purpose-built ZEV garages and has completed a preliminary analysis of power availability and construction and procurement schedules.

Interregional transit buses that typically have one inbound and outbound route per day will need a location that can provide parking and charging and could potentially use SacRT or community college facilities. Community college locations could also serve as regional “top-off” locations for multiple bus operators.

Timeline

SacRT identified **36 months for grid distribution system upgrades** to support the power needs of each transit garage and targeted that work **beginning in early 2023 continuing through mid-2026**. Project partners will immediately engage with community colleges about the potential to serve as regional transit charging centers in the fourth quarter of 2022 so that their priorities can be understood when the grid distribution system impact study is completed at the end of 2022.

Goods Movement and Medium & Heavy Duty Fleet Transition

MD-HD vehicles represent a small share of registered vehicle stock within both the state and Sacramento Region, accounting for 2.5 percent of vehicles; however, this small number of vehicles is responsible for about 18 percent of GHG emissions in the area because of the high number of miles traveled per year and comparatively low fuel efficiency. Additionally, MD-HD vehicles account for nearly 44 percent of NOX and 23 percent of fine particles (PM2.5) emissions from on-road transportation in the Sacramento Region.^{iv}

This small number of high-impact vehicles represents a significant opportunity to reduce GHG emissions and criteria emissions. California climate policy has established regulatory drivers for the manufacture and adoption of zero-emissions MD-HD vehicles that will drive uptake, but the provision of ZEV charging and hydrogen refueling infrastructure faces distinct challenges from those of the LD segment. First, unlike the LD sector, which can leverage pre-existing residential 110V supply, demand for MD-HD ZEV's is predicated on the availability of high-power charging infrastructure ahead of vehicle procurement and delivery. Second, the electricity demand for any one MD-HD multi-dispenser charging facility, will generate significant demand that must be accommodated in grid planning with relatively longer lead times than would otherwise be required to meet regulatory objectives.

Demand for MD-HD ZEVs is predicated on the availability of high-power charging infrastructure ahead of vehicle procurement and delivery.



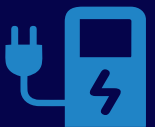
MD-HD charging also share some challenges with LD charging, in that sound construction design calls for engineering of charging and hydrogen fueling facilities capable of serving electricity and hydrogen to a zero-emission fleet, though in practice customers typically transition their fleets gradually, leading to under-utilization of built infrastructure. Despite the increasing availability of electric and hydrogen MD-HD vehicles—including delivery vans, shuttles, and school buses—customers remain hesitant to convert their fleets despite growing regulatory pressures. A 2020 SMUD customer journey study found that most fleet customers are deterred by the lack of charging and hydrogen fueling infrastructure. Most public and private fleet managers want to see the infrastructure in place first before risking electric and alternative fuel vehicle purchases. Meanwhile, fleet managers are discouraged by the risks associated with dependency on infrastructure that may not arrive when needed or potentially at all. Interviews with large area fleet managers cited the need for a regional plan to develop an integrated approach involving local governments, utilities, air districts, and other regional stakeholders to provide the vision, leadership, and direction to instill confidence that the necessary infrastructure exists or will arrive when needed.



Parameters



Investment: \$100M



Objectives: Collaborate to develop up to five MD- HD publicly available charging plazas serving MD- HD charging and hydrogen refueling needs that include overnight parking and other conveniences and amenities to serve the trucking industry.

- **Collaborate** with SACOG on the Northern CA Megaregion ZEV Medium/Heavy Duty Vehicle Blueprint to identify sites that meet regional MD-HD transportation needs and can support a statewide electric transportation network and multi-state corridor travel.
- **Assess** grid distribution system capacity, identify existing concentrated areas of MD-HD vehicle traffic and overlay with the Sustainable Communities Resource Priorities Map, grid distribution system capacity map, county zoning, land use maps, and other relevant data.
- **Identify** locations that meet regional and statewide needs, while improving air quality for under resourced communities and avoiding adverse transportation-related impacts to those communities.



Equity:

- **Provide** equitable access to zero-emission MD-HD charging and fueling ahead of the regulatory timeline, removing the barrier to zero-emission MD-HD adoption amongst independently-owned operators.
- **Utilize** charging plazas to improve air quality from existing truck traffic in impacted neighborhoods and avoid introducing new truck traffic into underserved neighborhoods.

Design Concepts

Sacramento sits at the intersection of Interstate 5, Interstate 80, Highway 50, and State Highway 99 which represents all the major goods movement highways in Northern California. Based on a study from the West Coast Clean Transportation Corridor Initiative, five major zero-emission truck charging plazas would be needed to support the region. Prospective locations were already identified and input from the electric utilities supported the locations.

The MD-HD charging plazas will utilize high power DC fast chargers and may have chargers installed over time as demand increases. Grid capacity will be future-proofed so that increased demand and/or improved technology can be accommodated. To meet the needs of the trucking industry, projects will include the collocation of travel plaza amenities such as food, showers, and internet access to minimize the impact of charging time on truck operators' schedules. Each site will be analyzed for the potential to support the collocation of LD charging, renewable energy supply, and battery storage. Plazas are likely to require 25 MW of electricity with hydrogen infrastructure to meet refueling demands. Location assessment and selection along with fuel connectivity and availability remain necessary for project advancement with site identification to include Sacramento, Placer, San Joaquin, and Yuba Counties.

Northern CA Megaregion ZEV Medium/Heavy Duty Vehicle Blueprint

Upon a \$500,000 award from Caltrans, SACOG is developing the Northern CA Megaregion ZEV Medium/Heavy Duty Vehicle Blueprint, a plan for **at least 11 major zero-emission truck charging plazas** to support the Northern CA megaregion along Interstate 5, Interstate 80, and State Route 99, while also providing recommendations for Highway 50 from the corridor analysis. The blueprint will bring together partners including San Joaquin Council of Governments (SJCOG), Metropolitan Transportation Commission, Caltrans districts, utilities (SMUD and PG&E), and local communities to identify actions and milestones to implement the electric charging and hydrogen refueling infrastructure needed to support the deployment of zero-emission MD-HD vehicles.^v

Using developed equity screening, charging plazas will be located according to three priorities.

1. Ability to effectively serve regional transportation needs, such as concentrations of companies or owner-operators that utilize MD-HD vehicles but would be unlikely to establish their onsite fleet charging facility.
2. Reasonable access to Interstate 5, Interstate 80, Highway 50, and Highway 99, with consideration given for supporting charging sufficient to cross Donner Summit on Interstate 80.
3. Grid capacity that can support multiple fast chargers that avoids to the degree feasible a new substation, so that charging will be available when regulatory mandates kick in.

Timeline

Project partners will utilize the Northern CA Megaregion ZEV Medium/Heavy Duty Vehicle Blueprint and additional grid capacity analysis estimated to be **completed at the end of 2022 to identify areas** nearby to Interstates 5 and 80 and Highways 50 and 99 that could accommodate the significant load associated with a DC fast charger facility for MD-HD trucks. **By 2023**, project partners will have worked with industry and the Sustainable Communities program to identify priority locations for a charging plaza, a concept design, a high-level budget, and an approach to agency and/or private ownership. Funding will be sought to deploy a pilot plaza and ultimately implement a regional infrastructure network of up to 5 plazas.

Charging & Transportation Options for Under Resourced Communities

To support zero-emission vehicles in under resourced communities, several joint projects have already been initiated including eMobility hubs in partnership with community-based organizations and the deployment of both electric share cars and charging infrastructure in multi-family housing (MFH) locations. Additional eMobility hubs have been planned to create a network in our region for under resourced communities. This initiative will add charging technologies, vehicle deployment options, innovative community services, and educational opportunities to provide transportation equity to these under resourced communities. To complete the network of eMobility hubs that can be used by both residents and micro-shuttles, 27 eMobility hubs are needed in Sacramento County and an additional 25 are needed across the region to support mobility needs. In addition to transportation support, these eMobility hubs will be designed with battery energy storage and microgrid capability to maintain charging operations during power outages and address resiliency needs in these critical areas.

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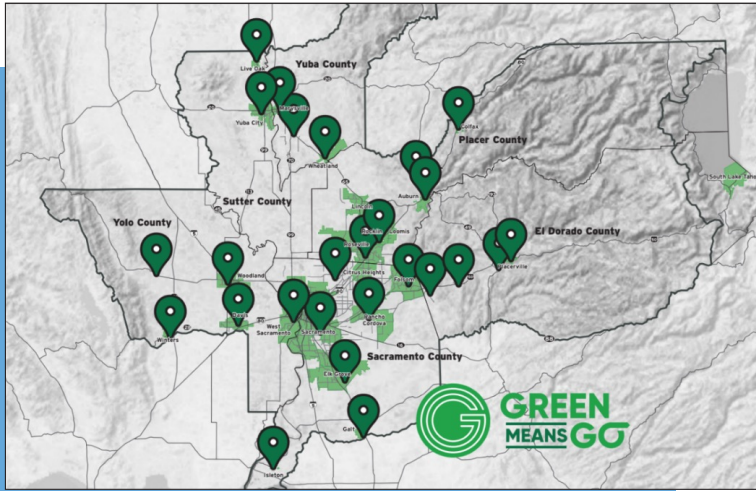
Locating eMobility hubs in areas targeted by the region for infill growth opportunities and comprehensive investments, such as transportation, sewer, water, and power networks, will increase hub demand and shift trips away from traditional single-occupancy vehicles. 23 cities and counties in our region have committed to specific targeted growth areas and lowering barriers to development, priming opportunities for additional eMobility hubs.

Charging infrastructure installation for privately owned LD vehicles has been more successfully implemented at single-family residences and workplaces than on a publicly available regional basis. Further, private investment in hub or plaza-type charging tends to be located in higher-resourced communities, where profitability is more assured. This infrastructure does not support EV owners who do not reside in a single-family home or whose homes are located in an under resourced area. The charging resources are not available to EV owners traveling into or through the Sacramento region. The pattern of EV charging presents a significant barrier to EV adoption for under resourced communities and interregional EV usage.

Project partners will analyze existing and planned grid distribution system infrastructure along with EV usage and charging patterns to identify technical parameters that influence siting and design of eMobility hubs (community-based charging) and charging plazas (interregional charging needs). To integrate equity into the effort, SMUD's Sustainable Communities program will lead an engagement effort with community-based organizations and residents to understand the priorities of under resourced communities for EV access and associated charging. Project partners will also work with private interests, such as original equipment manufacturers and travel service providers (e.g., travel plaza operators), to identify their role in the development and operation of charging plazas. Sustainable Communities will also lead engagement to ensure that new charging plazas benefit or, at a minimum, do not negatively impact under resourced communities.

SACOG Green Means Go

23 of the SACOG region's 28 local jurisdictions have identified Green Zones, key areas that must have infill capacity, be in an area planned for infill development, and be in a center, corridor, or established community. Through SACOG's Green Means Go multi-year pilot project and other supporting initiatives such as the Charging & Transportation Options for Under Resourced Communities, Green Zones will be the accelerators for economic development projects that promote increased alternative transportation options; increase housing near expanded travel options and other amenities; and make it easier for the region to access electric vehicles for cleaner transportation.ⁱ



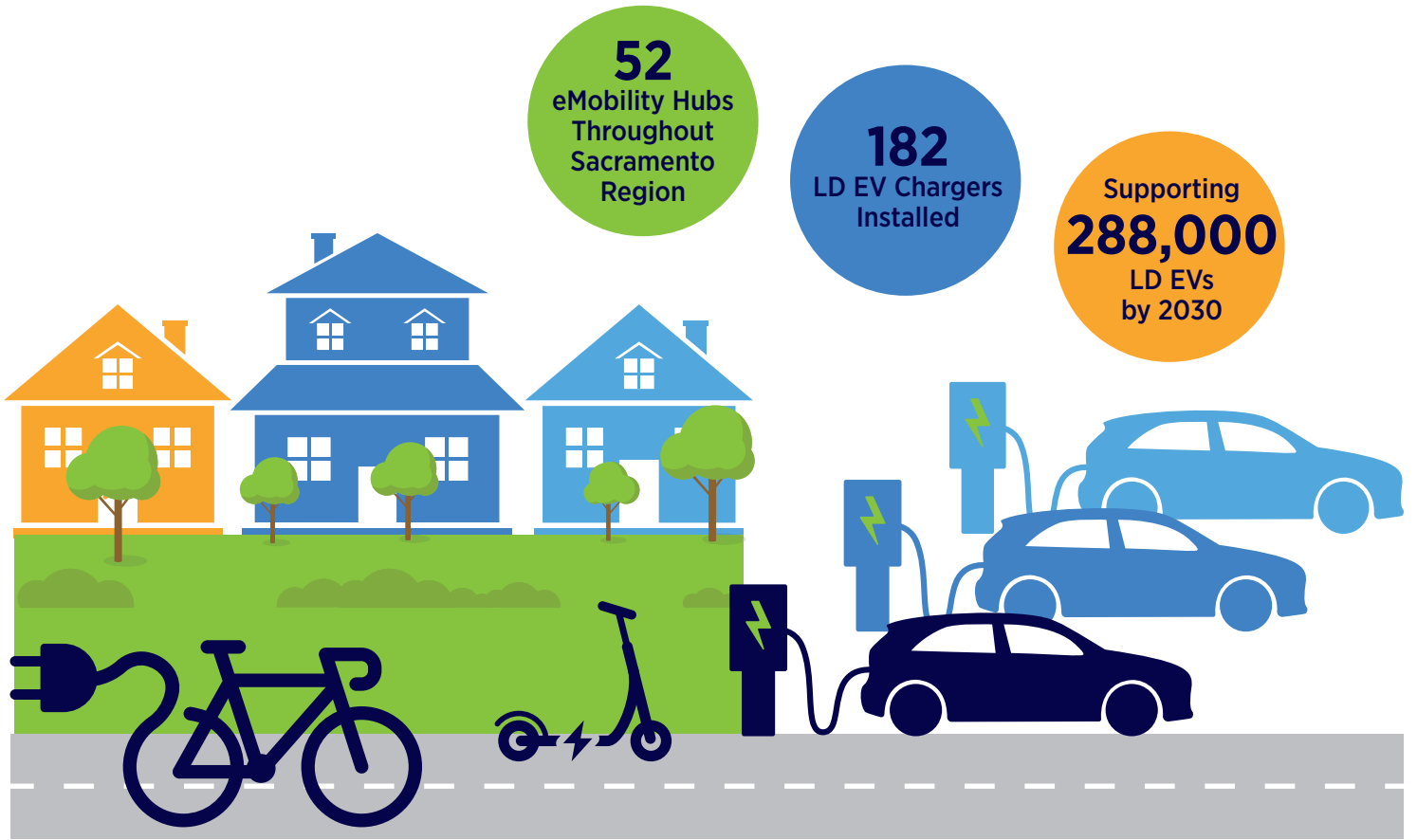
Green Tech Mobility Hub

The Green Tech Mobility Hub builds transportation equity to frontline neighborhoods of the Sacramento region. Located in the southwest corner of the intersection of Grand Avenue and May Street in the Del Paso Heights neighborhood in Sacramento, the Green Tech Mobility Hub provides integrated suite of mobility services, amenities, and technologies, including electric cars and hydrogen fuel cell vehicles, to bridge the distance between high-frequency transit and an individual's origin or destination.

The goal of the hub is to reduce harmful vehicle emissions, improve health and economic development in communities of color often disregarded as disadvantaged and provide jobs, education, outreach and access to training centers, workplaces, and medical care centers, minimizing negative environmental impact and improving lives throughout the community.^{vi} Sac Metro Air District and GreenTech are partnering with SMUD, California Air Resources Board, Beneficial State Bank, City of Sacramento, Breath California, and Aura planning to make this hub a reality.

The Green Tech Mobility Hub will support three existing programs:

- 1. Student Ride Hail Program:** Free rides to Green Tech students in need to access to job training, medical care centers, and workplaces.
- 2. Plan, Share, Go Program:** Matches community members in need with preplanned routes to job centers, hospitals, schools, churches, etc. with drivers. The same service will be used for delivery of groceries, medicine, and other necessities.
- 3. Our Community CarShare Project:** Car-sharing program that places battery powered electric vehicles at affordable housing communities and the Sac Valley Train Station and offers a free, membership carshare service where community members in the City of Sacramento can reserve electric vehicles for up to 3 hours per day.^{vii}



Parameters



Investment: \$182M



Objective: Create a regional network of 52 dispersed publicly accessible charging stations (i.e., eMobility hubs) that focus on under resourced communities and provide charging for those without home or work-based chargers.

- **Complete** Grid distribution system impact study and charging infrastructure targets study to identify broad concepts of charging infrastructure needs by region.
 - » Updated assessment of vehicle usage and customer charging patterns
 - » Distribution transformer loading and forecasted impacts
 - » Distribution transformer sizing analysis and standards recommendations

- **Establish and implement** a strategy to engage community-based organizations and under resourced communities identified by SMUD's Sustainable Communities program. Use the strategy to set priorities for a network of eMobility hubs and shared EVs.
- **Identify** locations for eMobility hubs, considering:
 - » Under resourced communities,
 - » Charging deserts,
 - » Colocation with community assets such as parks and community or recreation centers, and
 - » Grid capacity and cost/timeline of any needed upgrades.
- **Build** partnerships with public and private stakeholders to identify an approach and establish a policy for agency or private ownership.
- **Work** with regional partners to facilitate car share, electric scooters, and other electric mobility options for residents of under resourced communities.
- **Coordinate** infrastructure planning with adjacent utilities.
- **Install** 182 chargers at 52 eMobility hubs across the region to support 288,000 LD EVs by 2030. These targets are contingent on the prove out of an initial set of eMobility hubs.
- **Acquire or develop** an information tool that maximizes the utility and usage of the eMobility hubs, such as location/type of charging, availability, downtime status, and associated amenities and community assets.
 - » Ensure that the tools are easily accessed by under resourced community residents, and
 - » Provide technical assistance to under resourced community residents on the information tool.



Equity:

- **Use** Sustainable Communities Resource Priorities Map to identify under resourced areas (charging deserts) and address charging needs in these communities.
- **Engage** with community-based organizations and residents from under resourced communities to understand and address their priorities for electric mobility and charging.
- **Work** with partners to provide under resourced communities access to EVs.
- **Prioritize** co-location of charging infrastructure with community assets important to residents of under resourced communities.
- **Design** the eMobility information tool so that it is accessible to under resourced communities and engage with residents of these communities to confirm the design and provide technical assistance on the tool.



Design Concepts

The priority charging technology used for the eMobility hubs will be the fastest available that can address under resourced community resident needs and be feasible given grid distribution system capacity upgrade costs. A mix of charging technologies will likely be deployed at different sites with a portfolio of varying mobility options assessed including flexible transportation management. Level 2 chargers might be sufficient for hubs co-located with community assets where users would be anticipated to stay for multiple hours. Charging plazas will likely utilize DC fast chargers to serve interregional transportation. A key component of any charging technology approach is the inclusion of an information tool that easily identifies location, availability, and downtime status.

eMobility hubs will be located in under resourced communities and charging deserts according to the input of residents and community-based organizations and the EV charging usage and grid distribution system capacity analysis. Charging plazas will be located where they can support interregional EV travel and travel within the region for those without ready access to home or workplace charging. Location choice will also consider impacts on the grid distribution system and the potential for co-location with MD-HD charging infrastructure.

Timeline

SMUD intends that charging will be available for an additional **5,800 LD EVs in 2022**, with a long-term objective of supporting **288,000 in 2030**. Project partners are currently working with community-focused coalitions on the early stages of planning three eMobility hubs and six sites have been identified for possible implementation.

Workforce Development

Workforce Development (WFD) projects aimed at low-income communities have multiple benefits. These projects help improve economic outcomes for communities that have historically been under resourced and help educate low-income community members about the benefits of electric transportation, low-cost electric transportation options, and the positive outcomes associated with electrification. Workforce training programs help develop the qualified workers that will be needed to transition the region to an electric-based transportation economy.

Project partners already collaborating with community-based organizations to train under resourced community members in the fundamentals of designing, installing, and maintaining distributed energy systems, electric sources space and water heating equipment, and electric transportation infrastructure.

The current workforce ecosystem has limits and challenges that could prohibit regional ZEV transportation and mobility solutions. A WFD strategy is a strong mechanism to address these limits and build local job pipelines that are responsive to an unfolding technology landscape. Project partners identify WFD needs that:

- **Create** more equitable career solutions for under resourced communities.
- **Expand and diversify** the pool of qualified competitive candidates for jobs within SMUD.
- **Identify and develop** regional talent to execute on clean energy vision.
- **Reduce** recruitment and retention challenges to be able to fill posted critical clean energy roles promptly.



The Sacramento Area ZEV Deployment Strategy envisions a near-term future where any community member can be an agent of change and innovation because zero-carbon training programs and job pipelines were made desirable, accessible, and equitable. Under resourced communities, those already disproportionately impacted by climate change, health hazards, and economic shifts, must have direct access and clear opportunities to lead a clean energy future. Equitable WFD programs can spur generational changes that uplift entire households, families, and communities.

4,000
People
Trained with
Clean Energy
Skills by 2024

1,000
People Hired into
High-Paying Clean
Energy Jobs
by 2024

Entry-Level
Employability,
Workforce
Retraining,
Reskilling,
& Local
Recruitment

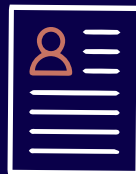


**Identify
Clean Energy
Jobs**



**Develop
Hands-On
Training Programs**

**Provide Job
Preparedness
& Placement**



**Create Employer
Relationships**

Parameters



Investment: \$145M



Objectives:

- **Bring** economic opportunities to under resourced communities.
- **Grow** partnerships that harbor entry-level employability, workforce retraining, reskilling, and local recruitment.
- **Train** 4,000 people in clean energy skills and get 1,000 people hired into high-paying jobs by 2024.
- **Coordinate** infrastructure planning with adjacent utilities.

Design Concepts

The Sacramento Area ZEV Deployment Strategy's success is conditional on external partnerships and regional innovation pipelines. These external partnerships through community-based organizations will be most effective at reaching and recruiting under resourced communities to present opportunities for direct upskilling and reskilling. No program or training outreach approach will appeal to all under resourced communities equally. Deep considerations of culture fit, participation benefits, language translation, and marketing voice should be incorporated into outreach plans.

Through a collaborative, community-based approach, project partners will identify emerging zero-emission transportation and mobility-related jobs and skills and create training programs to position participants from under resourced communities to fill the projected need for workers in the clean energy industry.

- **Assessment:** With partners including subject matter experts (scientists, engineers, and policymakers), think tanks, regional collaboratives, and industry employers, identify jobs that are being created as our region undergoes a paradigm shift to zero-emission transportation and mobility. For each associated zero-carbon or electrification-related job, identify the requisite skills for entry-level employment.

- **Job Training and Readiness Programming:** Partner with educational institutions, trade organizations, community-based organizations, and others to develop hands-on training programs. Partners will be chosen based on their knowledge of the communities we serve and their ability to develop highly qualified training programs.
- **Job Preparedness and Placement:** Project partners will facilitate participant employment by ensuring that training programs guide participants in securing interviews, assist with resumes, and support participants through the interview process and during the early stages of employment by ensuring access to wrap-around services such as transportation, childcare, case management and more.
- **Employer Relationships:** Establish strong working relationships with the building trades, labor organizations, trade networks, and regional employers to make sure they are part of the process starting with identifying the jobs and skills they are going to need in the future to help to build the training program and curriculum to hiring graduates from the training programs themselves.

To support the transition to zero-emission fuels lots of jobs will be created. Sacramento has already launched a WFD program, the California Mobility Center (CMC), to recruit under resourced community members for the high-paying jobs that will be created in this space. Additional efforts concerning outreach and programs with community-based organizations, junior colleges, vocational schools, and high schools are needed to create a pipeline of workers to support all these clean transportation technologies. This is a once-in-a-generation opportunity to harness new technology to create jobs in under resourced communities and Sacramento is ready to strike gold again.



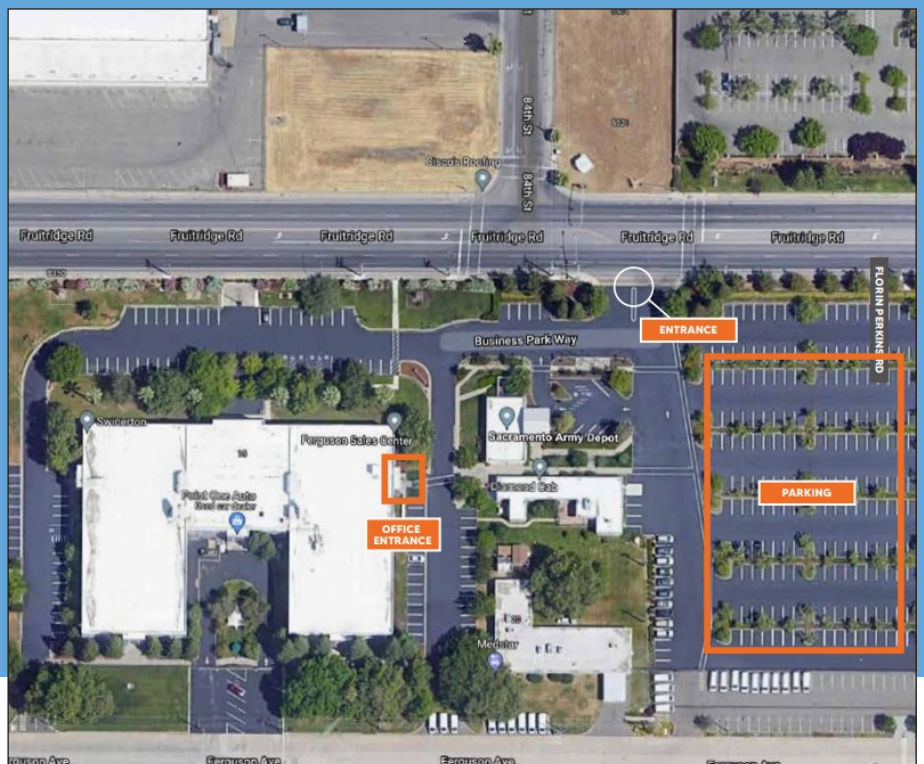
California Mobility Center Workforce Development

In 2019, SMUD formed the California Mobility Center (CMC), a research center and manufacturing hub for future transportation electrification and technology.

The CMC supports local workforce development through programs specializing

in creating entry points for various career opportunities in the advanced mobility and the overall advanced manufacturing sector, including job-readiness, technical training, and clear pathways for a variety of manufacturing careers.

In 2020, Sacramento invested \$1.4 million in the development of this center.



CMC Headquarters located at 15 Business Park Way Building 150 Suite 119, Sacramento, CA 95828

Endnotes

- ⁱ Sacramento Area Council of Governments, Sacramento Region Greenhouse Gas Reduction Pilot Program, Green Means Go; <https://www.sacog.org/greenmeansgo>
- ⁱⁱ California Air Resources Board Zero-Emission On-Road Medium-and Heavy-Duty Strategies; <https://ww2.arb.ca.gov/resources/documents/zero-emission-road-medium-and-heavy-duty-strategies#:~:text=Under%20the%20order%2C%20the%20California,by%202035%20from%20dray-age%20trucks>
- ⁱⁱⁱ SMUD's Sustainable Communities Resource Priorities Map; https://usage.smud.org/Sustainable-Communities/?_ga=2.267268814.1734268471.1611266746-c3054765841eecdd92c94fd24c10ae0d
- ^{iv} California Air Resources Board, Emission FACTor (EMFAC) 2021; <https://arb.ca.gov/emfac/>
- ^v Sacramento Area Council of Governments, FY 2021-22 Overall Work Plan; https://www.sacog.org/sites/main/files/file-attachments/draft_sacog_fy_2022-23_owp.pdf?1652231244
- ^{vi} Green Tech, Green Tech Net Zero Transportation Hub; <https://greentechedu.org/net-zero-transportation-hub>
- ^{vii} Sacramento Air Quality Management District, Our Community Share, Mobility Hub; <http://www.airquality.org/Our-Community-CarShare/Mobility-Hub>.
-



MOMENTUM

Sacramento Region Zero Carbon Transportation Initiatives

ZEV Deployment Strategy



Sacramento



Regional
Transit



SACRAMENTO METROPOLITAN



AIR QUALITY
MANAGEMENT DISTRICT

The Opportunity

4 Agencies and 1 Solution-Focused Strategy

- Reduce vehicle miles traveled (VMT)
- Replace existing sources with zero-emission fuels (electricity and hydrogen)
- Invest in under resourced neighborhoods

VARIABLE	CURRENT
Passenger VMT (w/in region)	42,579,600
Passenger VMT (through-travel)	9,216,100
Commercial VMT (Trucks)	6,644,100
Transit Bus VMT	47,200
Total VMT	58,487,000

Total VMT per Weekday in Sacramento Region

Improve air quality • Reduce GHG emissions • Abate exposure to toxins •
 Adapt to warming planet • Promote efficient mobility



Zero-Emission Transportation Future for the Sacramento Region

1

2

3

4



Investing in
Under Resourced
Communities

- 600 ZEV Buses
- 5+ Charging & Refueling Facilities

1

Transit Fleet



- 5 MD-HD Charging Plazas

2

MD-HD Fleet



- 52 eMobility Hubs
- 182 LD EV Chargers

3

eMobility



- 4,000 People Trained
- 1,000 People Hired

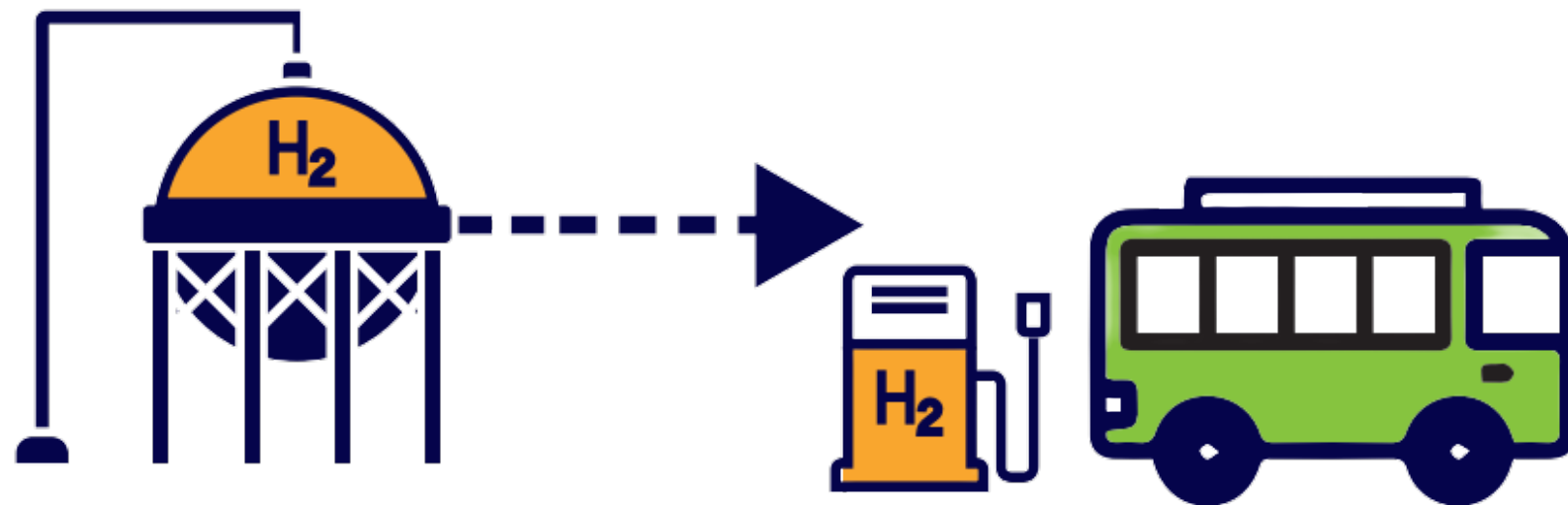
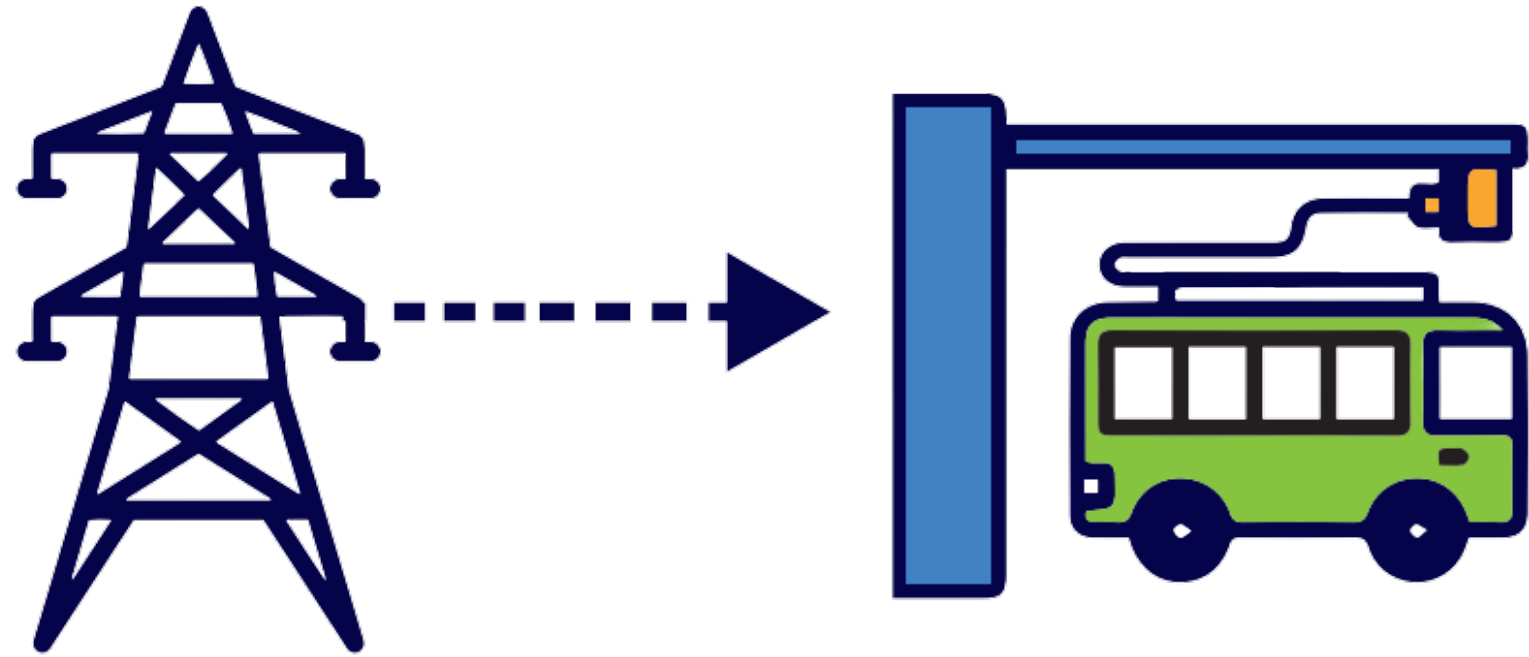
4

Clean Energy Workforce



1

Transit Fleet Conversion & Refueling Infrastructure



600
Transit buses
converted
to zero
emissions

5+
Charging
& Re-Fueling
Facilities

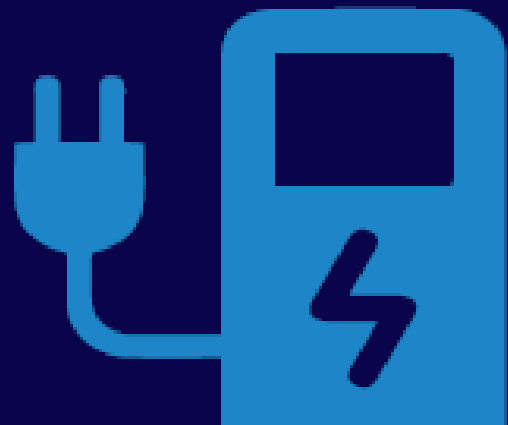
Supporting
Neighborhood
Electrification
Efforts



Investment: \$540 Million

600 Transit Buses • 3 Garages • Existing Garage Modifications

- Leverage research and initiatives from the 4 agencies to achieve transit electrification.
- Work with charging infrastructure manufacturers and operators to plan for transit only and multi-purpose charging operations in alignment with grid distribution system demand.
- Install DC fast chargers.



Support Neighborhood Electrification Efforts

- Analyze potential impacts of new bus charging infrastructure on underserved neighborhoods.
- Conduct focused outreach to school districts.
- Include workforce development.



The Design

- **Regional dispersed charging network focused on short “top off” charging to maintain range.**
 - DC fast chargers with overhead ports.
- **Three new bus garages that support electric and hydrogen buses** , with adequate grid distribution system capacity, a site footprint that can accommodate sufficient space for overhead charging and that minimizes travel time to routes.
- **A location that can provide parking and charging for interregional transit buses.**
 - SacRT location or community college facility.

Timeline

- 2022
Engage community colleges.
- 2023 - 2026
Grid distribution system upgrades.
- Prior to 2045
Over 600 zero-emission transit buses transitioned, and 5 charging facilities built.

2

Goods Movement and Medium & Heavy Duty Fleet Transition

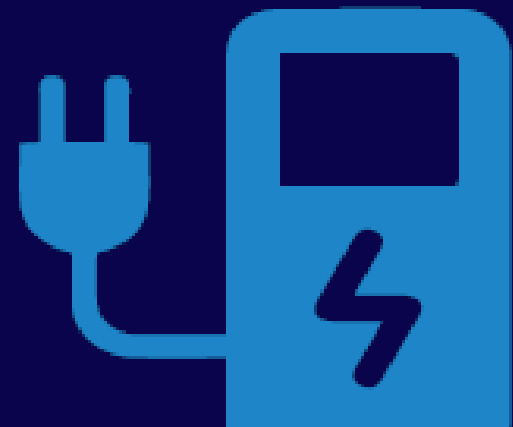


5
MD-HD
Charging
Plazas

Opportunities
to support
LD needs,
WFD training,
& more



Investment: \$100 Million



Up to 5 MD-HD Charging Plazas

- Identify sites considering regional MD -HD transportation needs, regional and statewide climate goals, grid distribution system capacity, industry input and partnership, opportunities to support other needs (e.g.; LD charging, workforce development, etc.).



Improve Community Health • Remove Barriers to Adoption

- Improve air quality.
- Avoid introducing new traffic into underserved neighborhoods.
- Provide equitable access to zero-emission MD-HD charging and fueling amongst independently -owned operators.

The Design

- **Strategically placed to support major goods movement highways in Northern California.**
 - Interstate 5, Interstate 80, Highway 50, and State Highway 99.
- **Plazas require 25 MW of electricity with hydrogen. Utilize high power DC fast chargers.**
 - Potential for more chargers over time.
 - Future-proofed grid capacity to accommodate increased demand and/or improved technology.
- **Colocation of travel plaza amenities (e.g., food, showers, and internet access).**
- **Potential to support additional opportunities (e.g., LD charging, workforce development, etc.).**

Timeline

- 2022
Complete Northern CA Megaregion ZEV Medium/Heavy Duty Vehicle Blueprint.
- 2023
Identify priority locations, concept design, budget, approach to ownership.
- Implement pilot plaza.

3

Charging & Transportation Options for Under Resourced Communities



52
eMobility Hubs
Throughout
Sacramento
Region

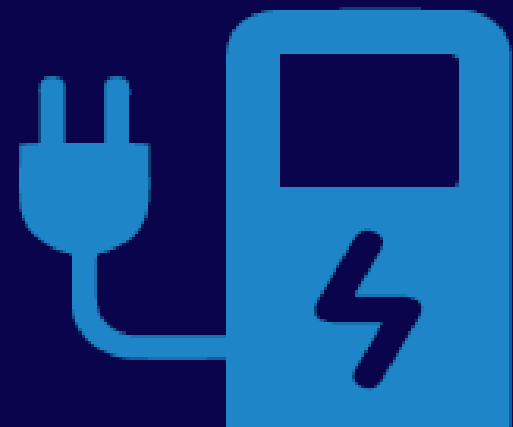
182
LD Ev Chargers
Installed

Supporting
288,000
LD EVs
by 2030



Investment: \$ 1 8 2 Million

52 eMobility Hubs • 182 LD EV Chargers Installed • 288,000 LD EVs by 2030



- Identify regional charging infrastructure needs and coordinate infrastructure planning
- Identify sites considering under resourced communities, charging deserts, colocation with community assets, grid capacity and cost/time of upgrades.
- Engage community -based organizations and under resourced communities. Determine priorities for eMobility hubs and shared EVs.
- Facilitate eMobility options (e.g., car share, electric scooters)
- Acquire or develop tool to maximize utility and usage.



Engage Under Resourced Communities as a Key Stakeholder

- Prioritize and address community charging needs and increase access to EVs and eMobility .
- Design eMobility information tool that it is accessible to under resourced communities.

Design

- **Mix of charging technologies and e -mobility options.**
 - Level 2 chargers for hubs co-located with community assets.
 - DC fast chargers at charging plazas to serve interregional transportation.
- **Inclusion of information tool that easily identifies location, availability, and downtime status.**
- **Located in under resourced communities and charging deserts.**
 - Support those without ready access to home or workplace charging.
 - Consider impacts on grid distribution system.
 - Potential for co-location with MD -HD charging infrastructure.

Timeline

- **2022**
Working with community -focused coalitions early-stage planning of 3 hubs.
- **2022**
Charging available for an additional 5,800 LD EVs.
- **2030**
Support 288,000 LD EVs.

4

Workforce Development



4,000
People
Trained with
Clean Energy
Skills by 2024

1,000
People Hired into
High-Paying Clean
Energy Jobs
by 2024



**Entry-Level
Employability,
Workforce
Retraining,
Reskilling,
& Local
Recruitment**

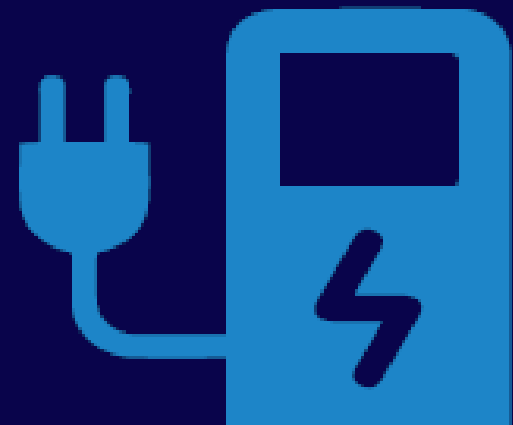


Investment: \$145 Million

4,000 people trained with clean energy skills by 2024 •
1,000 people hired into high-paying clean energy jobs by 2024

- Bring economic opportunities to under resourced communities
- Grow partnerships that harbor entry-level employability, workforce retraining, reskilling, and local recruitment.
- Coordinate infrastructure planning with adjacent utilities.

Improve economic opportunity in communities that have historically been under resourced through electric transportation.



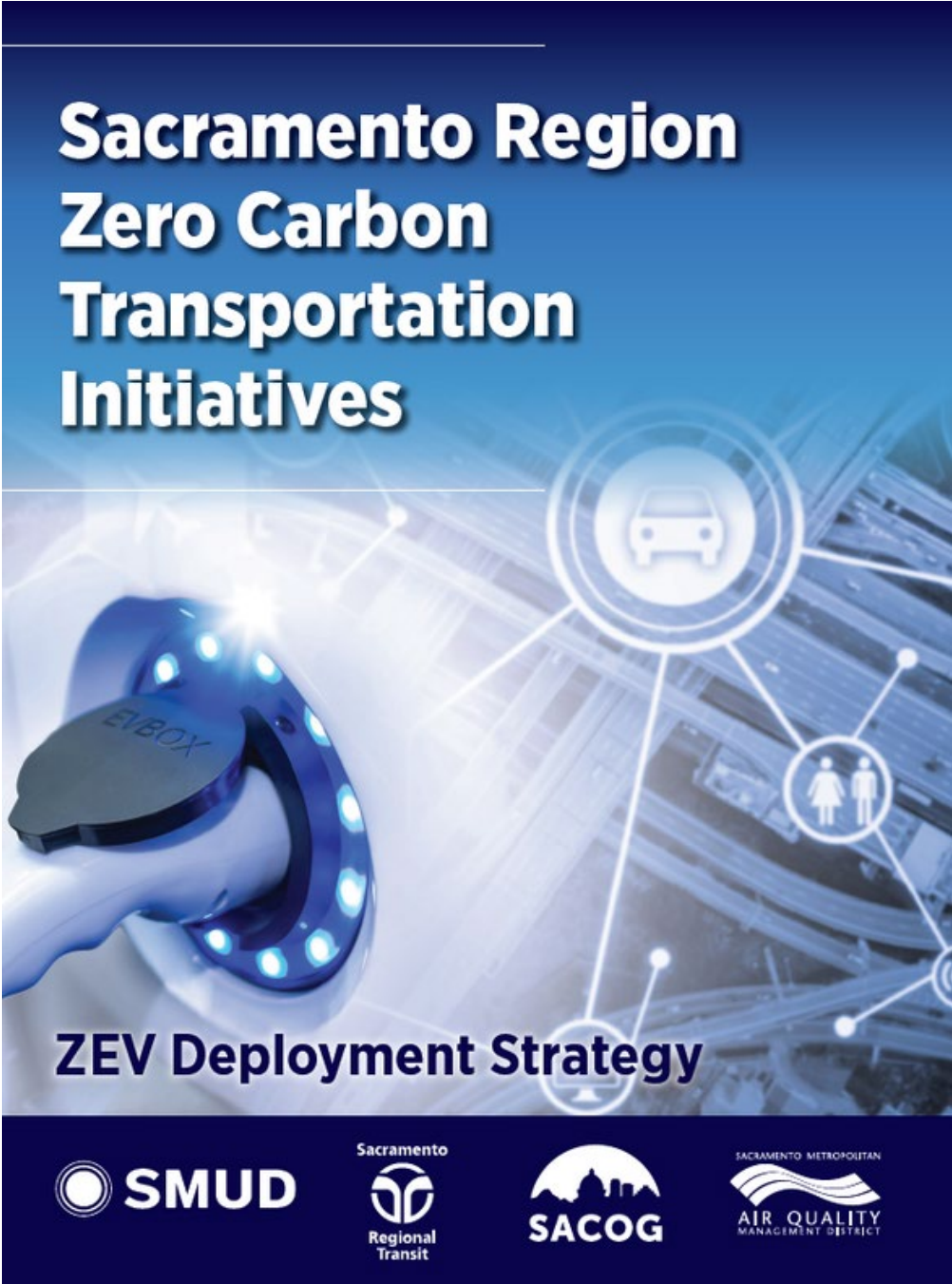
Design

- Conduct jobs assessment to identify zero -carbon or electrification -related jobs needed and requisite skills for entry -level employment.
- Develop hands -on job training and readiness programming .
- Job preparedness and placement.
 - Guide participants in securing interviews, assist with resumes, and support participants through the interview process .
 - Access to wrap-around services (e.g., transportation, childcare, case management, etc.).
- Create employer relationships.

Timeline

- 2022
Collaborating with community-based organizations to train under resourced community members.
- 2024
4,000 people in clean energy skills and 1,000 people hired into high-paying jobs.

The Full Report



[VIEW THE FULL REPORT](#)

The Sacramento Region Zero Carbon Transportation Initiatives includes further details on these four projects, along with information on adjacent efforts supporting the Sacramento Area ZEV Deployment Strategy.

Zero emission transit fleet conversion and refueling infrastructure

SACRAMENTO REGIONAL TRANSIT DISTRICT
ZERO EMISSION BUS (PHASE II)
FACILITIES MASTER PLAN REPORT

A yellow and blue bus with "Causeway Connection" written on its side is shown driving on a road. The bus is a zero-emission transit vehicle.

SACOG Green Means Go

A map of the Sacramento Area Council of Governments (SACOG) region, including Yuba, Placer, Yolo, Sutter, and El Dorado counties. Numerous green location pins are placed across the map, indicating various projects or locations. The "Green Means Go" logo is visible in the bottom right corner of the map area.