



Regional Medium – and Heavy-Duty (MD/HD) Zero Emission Vehicle (ZEV) Blueprint

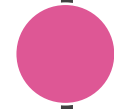


May 23, 2023

Agenda



Project Overview



**Public Outreach &
Stakeholder Engagement**



Infrastructure Needs



**Siting & Technology
Criteria**



**Near and Long-Term
Implementation Strategies**



Next Steps & Discussion

Project Overview

- **Develop a MD/HD ZEV Blueprint** to guide SANDAG's transition of freight and transit vehicles to zero-emission technologies
- **Identify the challenges** related to technology readiness, infrastructure availability, and cost
- **Establish best practices and strategies** for long-term success of MD/HD ZEV adoption in the region
- **Solicit input** from key stakeholders and community members for the development of a regional roadmap

Public Outreach and Engagement Plan

Integrated public outreach and engagement team structure



Project Lead / Outreach Oversight
External Stakeholder Presentations



Engagement / Planning Lead
Outreach Planning
Stakeholder Group Engagement
Materials Development



Community Engagement Lead
Community Outreach and Workshops

California's Zero Emission Goals



100% ZEV sales by 2035

Full transition to
ZEV short-haul/drayage trucks
by 2035



Full transition to **ZEV buses &
heavy-duty long-haul trucks**
by 2045*

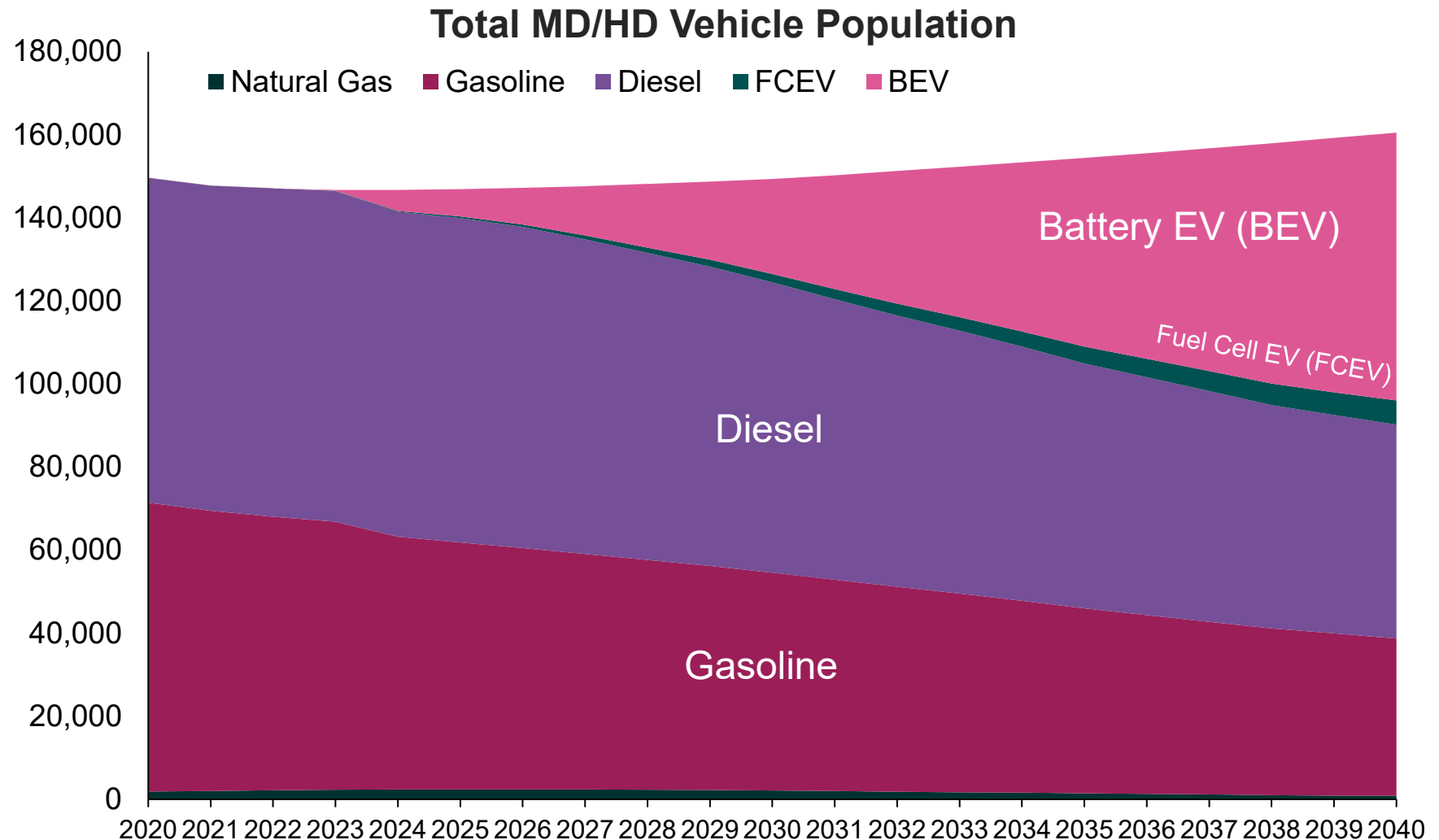


Full transition to
ZE off-road equipment
by 2035*

*where feasible

Future MD/HD Fleet Mix (San Diego Region)

- Nearly 70,000 of MD/HD vehicles in the region will be zero emission by 2040
- The rest of vehicles will remain as diesel and gasoline



Note: EMFAC2021 combines battery electric and fuel cell electric vehicle additions into a homogenous “electricity” fuel type

Primary Charging Models for MD-HD Vehicles

Depot Charging

- Used for vehicles with shorter, regional routes that return to a “home base” to charge.



On-Route Charging

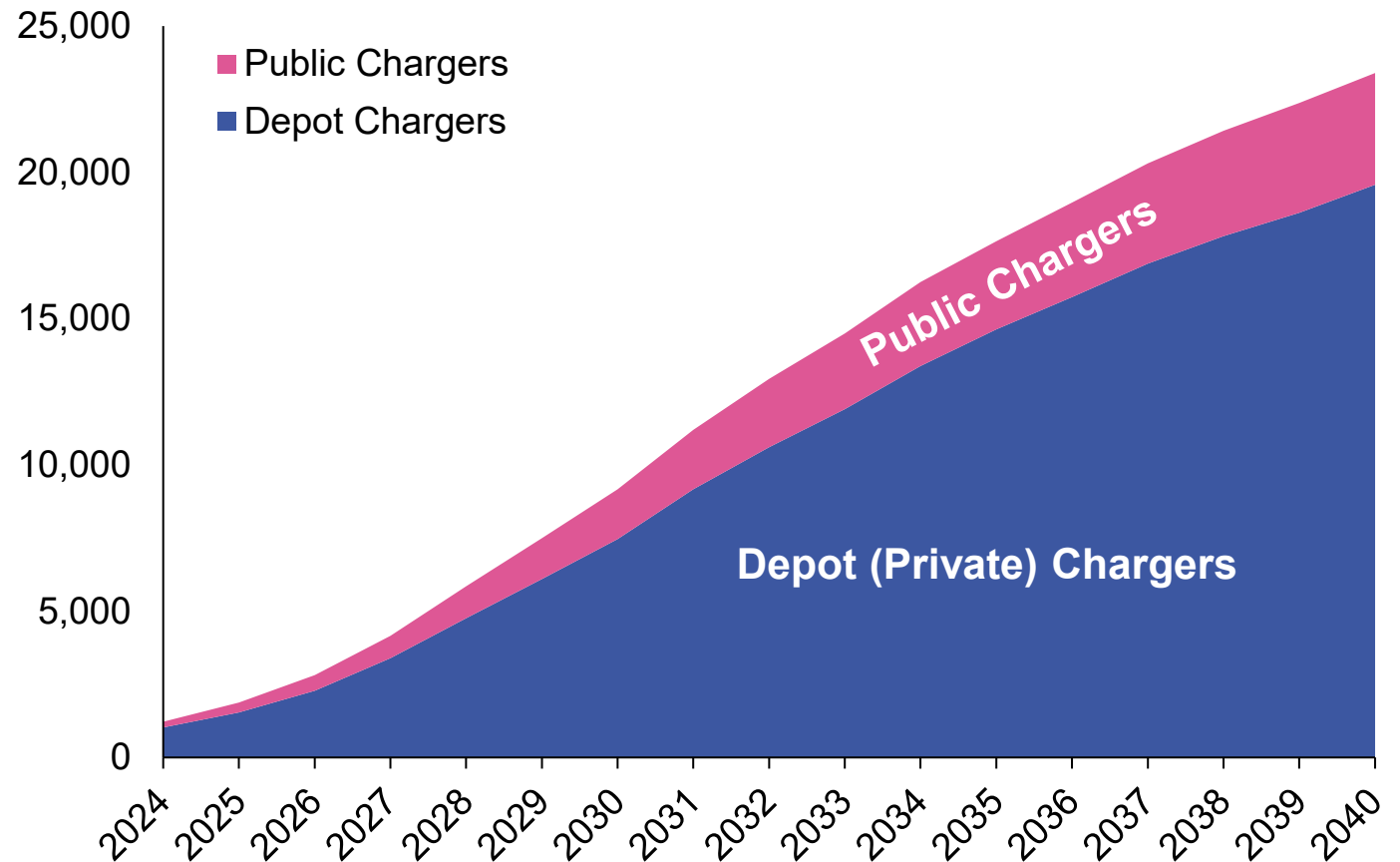
- Used for vehicles with longer, interregional routes to charge while “on-route”



Future MD/HD Charging Infrastructure Needs

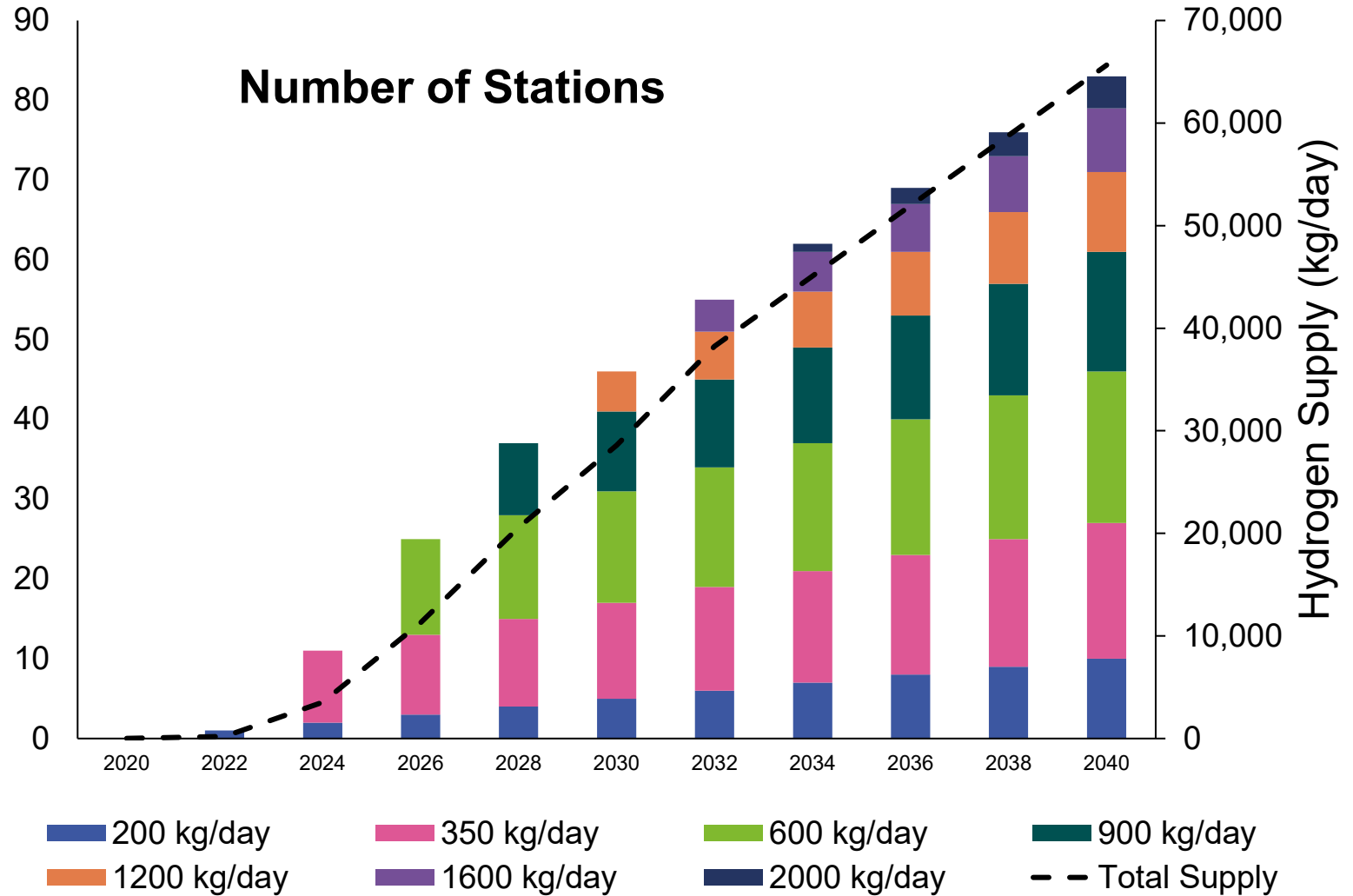
- 23,000 MD/HD chargers will be needed by 2040
 - Will provide a maximum of 3,800 MW to battery-electric MD/HD vehicles in the region
- 3,200 of these should be public charging stations

MD-HD Charging Infrastructure Needed in San Diego Region



Hydrogen Fueling Stations

- 83 hydrogen fueling stations will be needed by 2040
 - Will provide 65,000 kilograms of hydrogen per day for hydrogen powered vehicles in the region.



MD-HD ZEV Infrastructure Siting Criteria

- Developing siting criteria will help address the high cost of building charging and hydrogen fueling infrastructure – and be key to successful adoption of ZE MD-HD vehicles in the region
- The report identifies five groups of siting criteria for MD-HD EV charging and hydrogen fueling infrastructure
 - Utilization
 - Land
 - Equity
 - Grid capacity
 - Environmental

Utilization Criteria

- Utilization criteria refers to estimating demand for charging or hydrogen fueling with the goal of maximizing economic viability

Vehicle Volume



i.e. How many MD-HD vehicles pass by?

Trip Length



i.e. What are the average distances of trip ending in that site?

Dwelling Time



i.e. Are they staying long enough?

Land Criteria

- Land criteria encompasses availability, compatibility, value, ownership, demand, as well as community impacts



Existing Parking



Land Space



Scalability



Land Price/
Economic Vitality



Land Use & Zoning



Proximity to ZEV
Infrastructure



Amenities



Access, Congestion,
Safety



Proximity to
Hydrogen Fuel Chain

Equity Criteria

- Equity criteria ensures that disadvantaged communities (DAC) are not adversely impacted and benefit from ZEV infrastructure

Proximity to DAC



How close is this site to a DAC? Is it going to increase truck traffic in a DAC?

Benefit to DAC



Will the placement of the site results in higher fraction of ZE MD-HD vehicles in DACs?

Grid Capacity Criteria

- Grid capacity considers the ability to connect to the existing electrical grid, expand in the future, and recommends integrating distributed energy resources (DER), such as solar panels or battery storage, into station development to ensure resiliency and avoid costly grid upgrades.

Upgrade/ Scalability



Does the site have enough electrical infrastructure capacity to host chargers? Could the site be expanded in future?

DER Integration

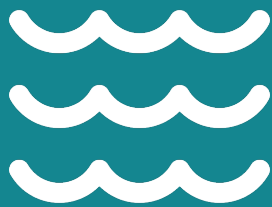


Can the site host DER such as solar panels, battery storage?

Environmental Criteria

- Environmental criteria considers potential construction, operational impacts and community impacts on charging station development sites.

Flood Risk



Is the site located in the region with high flood hazard or potential sea level rise impacts?

CEQA / NEPA



Does the site require to undergo CEQA/NEPA review?

Brownfields



If a site is a brownfield, can it be redeveloped?

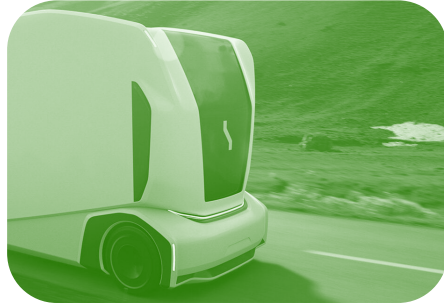
Regional Needs and Targets for MD-HD ZEV Deployment

Policy



Reinforce current federal, State, and local regulatory measures.

Cost



Reduce vehicle and infrastructure equipment costs.

Infrastructure



Accelerate regional ZEV infrastructure deployment.

Education



Prepare workers in the freight and trucking industries for the ZEV transition.

Community



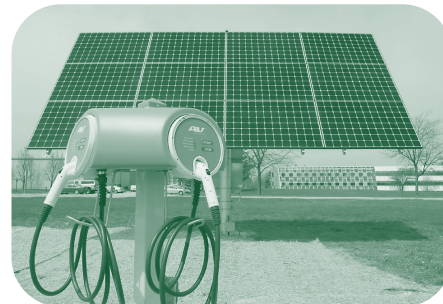
Improve awareness of ZEV technologies.



Advocate for other regional, national, and binational policies.



Improve ZEV market competitiveness and Return on Investment.



Decarbonize electricity generation and hydrogen production.

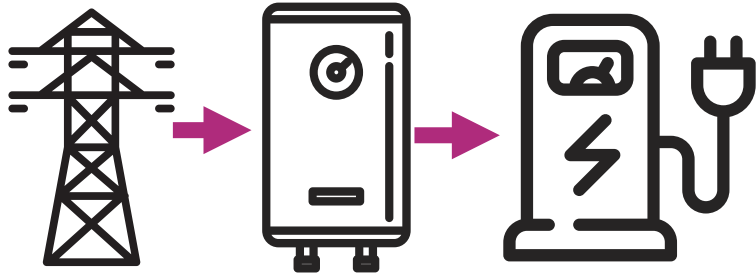


Develop education and training programs at all levels for ZEV-relevant careers.

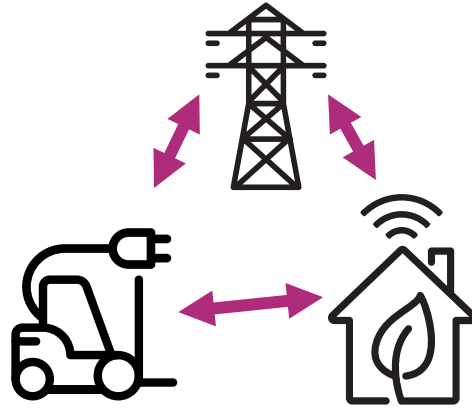


Advance equity and environmental justice through ZEV adoption.

Strategy I: Regional Regulatory and Funding Support



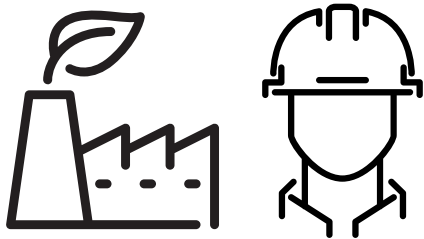
Programs that allow utilities to install all necessary electrical infrastructure that is needed to operate EV charging stations



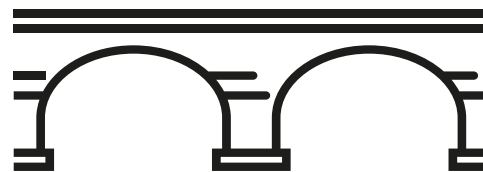
Strategies for EV charging that consider the time, power level, and/or location of charging, and benefit the grid and meets fleets' needs.



Targeted incentive programs to reduce equipment upfront cost, to establish functional market, and to prioritize ZEV deployment in Disadvantaged Communities.



Support for accessible, clean, and safe hydrogen production.



Advocate for consistent ZE policies across state and national borders.



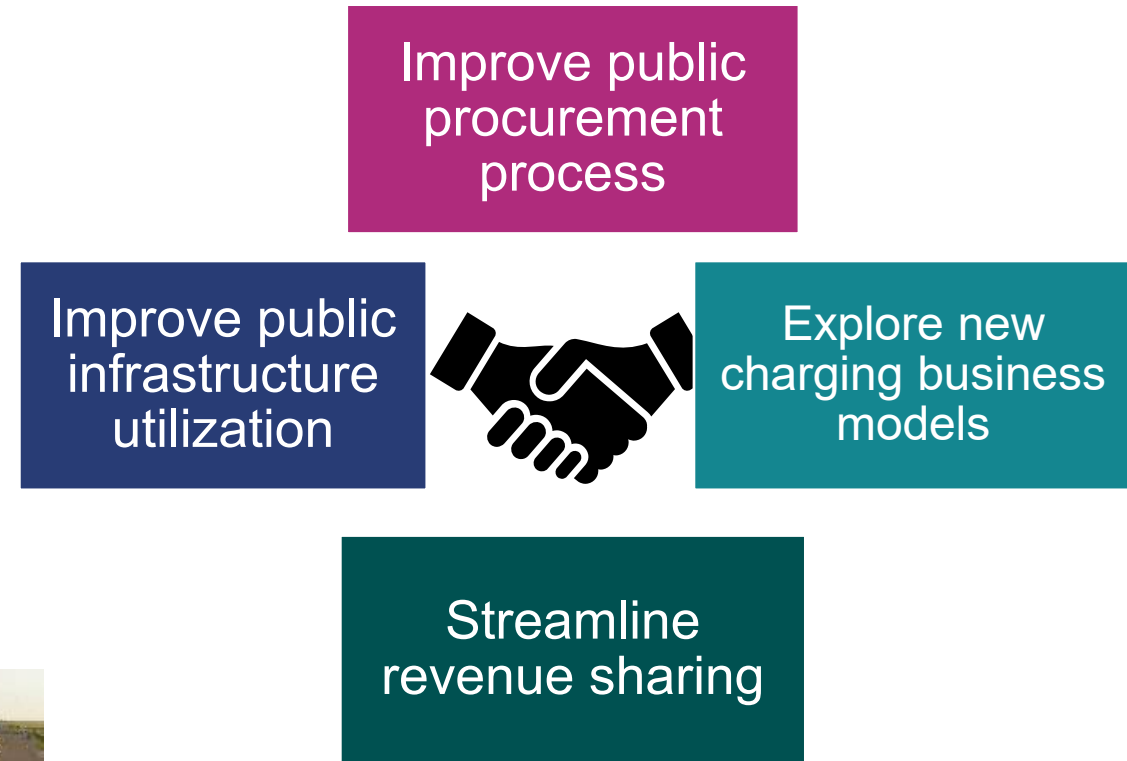
Consider weight allowance due to increasing battery-electric vehicle weight.

Strategy II: Infrastructure Deployment and Energy Demand

Streamline Siting, Land Use, Zoning and Permitting Process



Promote Public-Private Partnership



Strategy III: Education, Outreach, and Engagement



Showcase Proof of Concept and ZEV Model Demonstration



Raise Awareness of Current Regulations and Incentive Programs



Facilitate Bidirectional Communications with Communities and Fleets



Develop training and education programs to prepare trucking and fleet industry workers for ZEV transition and technology advancement.

- Technicians, mechanics, truck drivers, logistics staff, electricians, scientists, etc.

We Welcome Your Feedback

Does the siting criteria presented appropriately address key economic, social, environmental and community impact factors?

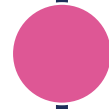
Help us brainstorm strategies to address truck and bus electrification!

Blueprint Timeline



Needs Assessment

Completed January 2023



ZEV Technology & Siting Criteria

Finalize end of May 2023



Near & Long-Term Implementation Strategies

Summer/Fall 2023



Draft Blueprint Review

Fall 2023



Final Blueprint

January 2024

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