



Paths to Clean Vehicle Technology and Alternative Fuels Implementation in San Bernardino County

Task 4.2 Implementation Strategies and Solutions

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1 Introduction

Local governments in San Bernardino County are called on to address the twin challenges of air pollution and climate change. Air pollution, particularly ground-level ozone (smog), leads to a variety of health problems for County residents, as documented through extensive research.¹ Because the region does not meet federal air quality standards, air pollution also threatens future federal transportation funding. Climate change has contributed to a variety of recent problems plaguing the region including drought, wildfires, heat waves, heavy rains, and mudslides. Projections show these effects will continue and worsen in the coming years, with major implications for the region's economy, environment, and quality of life.² Local governments in San Bernardino County are supporting state-led efforts limit the impacts of climate change.

The transportation sector is a major contributor to the emissions that cause both air pollution and climate change. Motor vehicles are responsible for nearly half of the nitrogen oxide (NOx) emissions that lead to smog formation in the region and approximately one-third of the greenhouse gas (GHG) emissions associated with climate change.

Role of Clean Vehicles and Fuels

The widespread adoption of clean vehicles and fuels is necessary to support the achievement of San Bernardino County's air quality and climate goals. Despite the progress made to support the deployment of these technologies, a variety of barriers have limited the penetration of alternative vehicles and fuels to date including vehicle purchase costs, fueling infrastructure availability and costs, lack of customer awareness, perceptions of vehicle performance, and uncertainty surrounding technology development and regulation. This memo identifies preliminary strategies and solutions to help local governments overcome these barriers and thereby advance clean vehicles and fuels in San Bernardino County. These strategies focus primarily on actions that local and regional public agencies can pursue.

As a framework for considering clean vehicle and fuel implementation strategies, it is helpful to group vehicles and associated strategies into the following three categories:

- **Municipal fleet vehicles** – vehicles owned and operated by local governments.
- **Resident, worker, and visitor vehicles** – primarily light-duty vehicles driven by those who live or work in the County
- **Commercial vehicles** – primarily heavy-duty vehicles operated by or serving businesses in the County

The remainder of this memo is organized around these three categories, recognizing that there may be some overlap in term of the types of vehicles addressed by a particular strategy.

¹ South Coast Air Quality Management District, *Final 2016 Air Quality Management Plan*, March 2017.

² California Air Resources Board, *California's 2017 Climate Change Scoping Plan*, November 2017.

Vehicle Technology and Fuel Options

There are many options for advanced technology and alternative fuel vehicles that can reduce emissions as compared to conventional gasoline and diesel vehicles. These options are discussed in the Task 3 report and listed in Table 1.

Table 1. List of Clean Vehicle and Fuel Options

Light-duty vehicle and fuel options	Medium- and heavy-duty vehicle and fuel options
Battery electric vehicle	Battery electric vehicle
Plug-in hybrid electric vehicle	Plug-in hybrid electric vehicle
Fuel cell vehicle	Fuel cell vehicle
Natural gas vehicle	Natural gas vehicle
E85 flexible fuel vehicle	Renewable natural gas
	Propane
	Biodiesel
	Renewable diesel

The clean vehicle options vary widely in terms of the level of technology readiness and commercial availability, as well as their emissions benefits. At this point, no one can say for certain which technologies and fuels will win out in the marketplace and prove to be the best option for vehicle owners in the long run. This uncertainty creates a dilemma for local governments, who may be eager to support the transition to clean vehicles and fuels but are wary about investing in vehicles and fueling infrastructure that may be obsolete in the future. While this uncertainty calls for careful planning and analysis before devoting municipal resources, it does not warrant inaction. Local governments can make well-informed decisions today that carry little risk of obsolete technologies and stranded assets.

For light-duty vehicles, it is abundantly clear that electric vehicles (including battery electric and plug-in hybrid electric) are the right choice. The price of EVs is declining, the number of commercial offerings is expanding significantly, and the emissions benefits are clear. More than 150,000 EVs were sold in California in 2019, or approximately 8 percent of total vehicle sales. In contrast, fuel cell vehicles (FCVs) face a much more uncertain future for the light-duty sector. Only about 2,000 FCVs were sold in California in 2019. Globally, EV sales were 300 times higher than FCV sales (2.2 million vs. 7,500) in 2019. While FCVs may have important niche applications in the future, at this stage it would be risky for local governments to invest in this option. E85 flexible fuel vehicles (FFVs) have been around since the late 1990s, and there are currently more than 1 million registered in California. But manufacturers have significantly reduced FFV production in recent years, as both consumer and regulator preferences have shifted to EVs.

For medium- and heavy-duty vehicles, the outlook is much less clear. Electric vehicle options for trucks are limited, vehicle prices are high, and the technology is not currently suitable for some applications (e.g., long-haul combination trucks). CARB’s Advanced Clean Truck Rule will help to drive growth in

electric trucks, but even that regulation calls for only 15 percent of new sales to be electric for Class 2B-3 and Class 8 combination trucks by 2030. That said, many regulatory agencies and industry observers believe that EVs will be the technology of choice in the long-term. Fuel cell technology is being explored for heavy trucks and may offer a viable alternative in some situations. However, the cost of future FCVs is uncertain because, other than transit buses, medium- and heavy-duty FCV deployments have primarily been limited to demonstration projects, and fueling infrastructure cost is likely to be the most significant barrier to the development of the medium- and heavy-duty FCV market. Natural gas vehicles are currently available for many medium- and heavy-duty vehicle applications, and by using renewable natural gas (RNG), these vehicles can dramatically lower both NO_x and GHG emissions. Many industry observers believe natural gas will remain an attractive alternative for some applications for at least the next decade or two. Renewable diesel provides an opportunity to reduce GHG emissions from the existing fleet of diesel vehicles without modification. This variety of options and uncertainty in the near-term has been described as the “messy middle”. For the next 10-20 years, a number of different technologies and fuels will offer the optimized solution for medium- and heavy-duty vehicles, while in the long-run, electric powertrains are expected to dominate the marketplace.³

2 Municipal Fleet Vehicles

If local governments in San Bernardino County seek to maximize the use of clean fuels and technologies for vehicle operating in the region, it is important that they lead by example. Local governments can play an important role in maximizing the deployment of cleaner transportation technologies. Government fleets contain just a small fraction of the total vehicle population that operates in the County. But government fleets have historically been leaders in the use of low-emission fuels and vehicles. By adding these vehicles to municipal fleets, cities help to reduce emissions, develop markets for the clean technologies, and demonstrate their environmental stewardship to the private sector.

Strategy 1: Conduct a fleet assessment

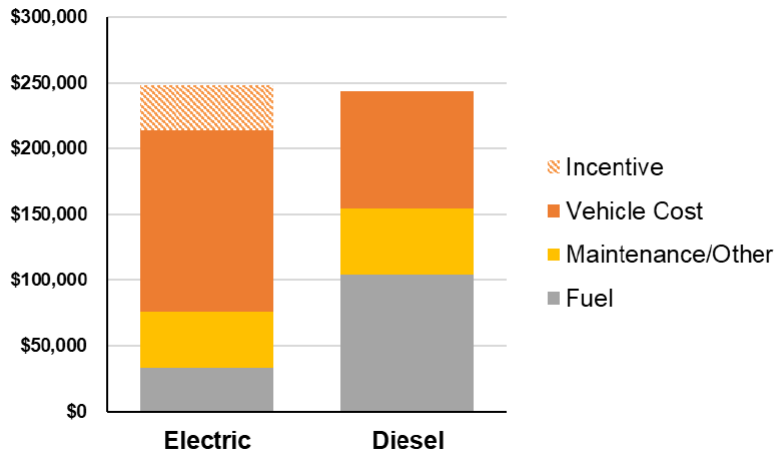
A first step in local government fleet greening is to conduct a fleet assessment to identify the best opportunities to replace gasoline and diesel vehicles that are being retired with alternative fuel vehicles. This starts with documenting a city’s current fleet, including the number of vehicles of each type and fuel, vehicle annual mileage, fuel consumption, and fueling location(s). Establishing a baseline for fuel use and fuel expenditures will help a city identify opportunities for improvement and allow the city to track progress over time. If city vehicles do not re-fuel at a centralized location, the city might need to implement new record-keeping procedures to track fuel purchasing.

When upgrading their own fleets, understanding the cost implications of fleet greening is critical. Many alternative fuel vehicles carry a higher up-front purchase price but have lower operating costs. A city should conduct a total cost of ownership (TCO) analysis, taking into account purchase price, any

³ North American Council for Freight Efficiency, Guidance Report: Viable Class 7/8 Electric, Hybrid and Alternative Fuel Tractors, 2019. <https://nacfe.org/report-library/guidance-reports/>

incentives available, resale value, fuel costs, and maintenance costs. The figure below shows an example of the results of a TCO analysis for a hypothetical electric vs. diesel medium-duty truck.

Figure 1. Example of Total Cost of Ownership Analysis



Source: *Preparing To Plug In Your Fleet*. Prepared by the Edison Electric Institute, October 2019.

Information on vehicle purchase prices can be obtained truck dealers, trade groups, or other research reports (such as those listed in Strategy 4 below). Estimating the change in fueling costs can be challenging because of differences in units of measurement, differences in fuel economy for alternative fuel vehicles, and changes in both tax incentives and market prices that make it difficult to accurately forecast fuel prices. The U.S. Department of Energy’s *Clean Cities Alternative Fuel Price Report* comes out every 3 months and provides up-to-date information on the price of alternative fuels in the United States in relation to gasoline and diesel prices. Alternatives to gasoline and diesel differ in their energy content, which also needs to be considered when evaluating fuels. For example, 85% ethanol (E85) currently costs less per gallon than gasoline, but because ethanol has about 35% less heating value than gasoline, the effective price of E85 is higher than gasoline.

Strategy 2: Establish EV procurement goals for a city’s light duty fleet

As discussed in Section 1, EVs are the recommended choice for replacement light-duty gasoline vehicles. City and County governments can accelerate the adoption of EVs through leadership by example and procure EVs for their own fleets. Local governments can establish goals for the purchase of EVs in the near-term, potentially extending and increasing through 2030 and beyond. Procurement targets are advantageous because they are directly within local governments’ control, provide local governments with firsthand experience owning and operating EVs, and potentially allow for significant fuel and maintenance cost savings over the life of the vehicles. As a complementary measure, local governments can update procurement guidance to require justification for the purchase of non-EVs.

The California Air Resources Board's (CARB) CVRP for Fleets offers incentives for the purchase or lease of up to 30 eligible EVs annually for local, State, and tribal government entities.⁴ Moreover, many cities have already made commitments to accelerate the electrification of their light-duty fleets. For example, the City of Sacramento has established a comprehensive Fleet Sustainability Policy that required a minimum of 50% of light-duty vehicles purchased in 2018 to be zero-emission vehicles and a minimum of 75% by 2020.⁵ Cities can also use State fleet procurement goals as a baseline: Executive Order B-16-2012 directed state agencies to make 10 percent of new vehicle sales electric by 2015 and 25 percent by 2020.⁶ More recently, the Governor's Office of Business and Economic Development stated a new goal of 100 percent EV purchases by 2030 – with the exception of certain vehicle types.⁷

Strategy 3. Expand charging infrastructure for a city's light duty EV fleet

Cities must accommodate additional EVs with corresponding investments in fleet charging infrastructure. Fleet managers should seek to deploy charging stations that meet the performance requirements and duty cycles of the EV fleet while minimizing costs. For vehicles used regularly during daytime hours, Level 2 (L2) charging stations will likely allow for these vehicles to be fully charged overnight at centralized depots. For vehicles that are used infrequently or travel short distances daily, Level 1 (L1) charging stations may be appropriate for recharging vehicles overnight. Installation of Direct Current Fast Charging (DCFC) stations can be significantly more expensive than L1 or L2 charging options and may be considered as a backup option. Alternatively, city fleets could leverage the existing public DCFC stations in San Bernardino County in cases where refueling is necessary. As fleets deploy charging infrastructure to meet their near-term needs, fleet managers may consider “futureproofing” their parking sites by making electrical upgrades necessary to support future charging station deployments. This approach to fleet planning could generate long-term savings when higher penetrations of EVs are incorporated into city fleets. Southern California Edison's (SCE) Charge Ready EV charging station incentive program is no longer accepting applications, but opportunities for additional incentives may become available in the near future with SCE's proposed Charge Ready 2 program.⁸ South Coast Air Quality Management District (SCAQMD) is also implementing a rebate program for EV charging stations deployed at government and non-profit sites in the City of San Bernardino.⁹ CARB's Low Carbon Fuel Standard (LCFS) can also generate additional revenue streams from the use of electricity as transportation fuel. For example, the Orange County Transit Authority's fleet reported the LCFS covered the cost of fuel and generated a \$3 million surplus for the authority over 3 years.¹⁰

⁴ <https://cleanvehiclerebate.org/eng/fleet/public-agencies>

⁵ <https://www.cityofsacramento.org/-/media/Corporate/Files/Public-Works/Fleet/FleetSustainabilityPolicy-00-Policy-Procedure-Cover.pdf?la=en>

⁶ <https://www.ca.gov/archive/gov39/2012/03/23/news17472/index.html>

⁷ <https://static.business.ca.gov/wp-content/uploads/2019/12/2018-ZEV-Action-Plan-Priorities-Update.pdf>

⁸ <https://www.sce.com/business/electric-cars/Charge-Ready>

⁹ https://www.driveclean.ca.gov/Calculate_Savings/Incentives.php

¹⁰ The fleet also includes medium and heavy-duty vehicles <https://www.act-news.com/news/generate-revenue-with-clean-fuels-lcfs/>

Strategy 4. Identify medium and heavy-duty vehicle replacement options

As discussed in Section 1, the appropriate clean vehicle and fuel options for medium- and heavy-duty vehicles (MD/HD) are not as clear as with light-duty vehicles. But feasible options exist for nearly every MD/HD vehicle type. Local governments should explore these options, identify appropriate choices, and integrate these vehicles into fleet purchasing decisions. To learn more about options for MD/HD vehicles, the Department of Energy's Alternative Fuel Data Center (<https://afdc.energy.gov/>) is a good starting point. It provides an unbiased overview of vehicle technologies and fueling infrastructure, and includes links to other resources. More detailed descriptions of clean vehicle technologies and fuels are available in other documents. Some of these are developed by entities affiliated with a specific industry group, and readers should therefore understand that the document reflect biases towards a particular technology or fuel. Resources include:

- Edison Electric Institute, Preparing to Plug In Your Fleet, 2019. www.eei.org/issuesandpolicy/electrictransportation/Documents/PreparingToPlugInYourFleet_FINAL_2019.pdf
- California Electric Transportation Coalition, Comparison of Medium- and Heavy-Duty Technologies in California, 2019. <https://caletc.com/comparison-of-medium-and-heavy-duty-technologies-in-california/>
- North American Council for Freight Efficiency, Guidance Report: Viable Class 7/8 Electric, Hybrid and Alternative Fuel Tractors, 2019. <https://nacfe.org/report-library/guidance-reports/>
- North American Council for Freight Efficiency, Guidance Report: Electric Trucks Where They Make Sense, 2018. <https://nacfe.org/report-library/guidance-reports/>
- Gladstein, Neandross & Associates, Game Changer Technical White Paper: Next Generation Heavy-Duty Natural Gas Engines Fueled by Renewable Natural Gas, 2016. <https://ngvgamechanger.com/>








Once cities have identified candidate replacement options, they should perform a total cost of ownership analysis, as described in Strategy 1.

Strategy 5. Establish goals and procure EVs for MD/HD vehicles where appropriate

For MD/HD vehicle applications that are suitable for electrification, local governments can continue to advance transportation electrification by establishing EV fleet procurement goals and incorporating EVs into purchasing decisions. Several overlapping state and regional incentives can significantly reduce the upfront cost of purchasing EVs and charging equipment, helping to offset a higher initial purchase price. Cities can complete assessments to determine which vehicle types are best suited for electrification and reevaluate procurement options as EV technologies improve; vehicles that run short, predictable routes with access to centralized depot charging may be ideal candidates. Information and best practices for municipal fleets can be shared through SCAQMD, SCAG, SBCTA, and local utilities. Cities may consider using relevant EV sales targets from the pending Advanced Clean Truck Regulation as a procurement

target baseline.¹¹ Transit agencies in the County are required to meet the zero-emission bus provisions established in the Innovative Clean Transit Rule.¹²

Table 2. Commercialization Stages of Medium and Heavy-Duty Vehicle Technologies

Vehicle Weight Class	Commercialization Stage			
	Commercially Available	Limited Commercial Availability	Demonstration/Prototype	
Class 3 (10,001-14,000 lbs.)	 Mini Bus			
Class 4 (14,001- 16,000 lbs.)	 City Delivery			
Class 5 (16,001-19,500 lbs.)	 Large Walk In			
Class 6 (19,501-26,000 lbs.)	 School Bus			
Class 7 (26,001-33,000 lbs.)	 City Transit Bus			
Class 8 (33,001+ lbs.)	 Heavy Semi Tractor			 Semi Sleeper

CARB’s Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP), CARB’s Volkswagen Beneficiary Mitigation Plan, CARB’s Air Quality Improvement Program, CEC’s Clean Transportation Program demonstration project funding, Caltrans Low Carbon Transit Operations Program, SCE’s Charge Ready Transport program, SCAQMD’s Carl Moyer Program, and CARB’s Low Carbon Fuel Standard all provide various incentives for MD/HD EVs. In many cases, vehicle, infrastructure, and fueling incentives can be stacked such that fleet managers can achieve significant savings relative diesel alternatives. The table below provides more information on State-administered programs available to facilitate the transition to MD/HD vehicles; San Bernardino County and SCAQMD have already participated directly in several of these programs.

¹¹ <https://ww3.arb.ca.gov/regact/2019/act2019/appa.pdf>

¹² <https://ww3.arb.ca.gov/regact/2018/ict2018/ictfro.pdf>

Table 3. State Agency MD/HD EV Incentive Programs

Program Name	Lead Agency	Program Description
Hybrid and Zero-Emission Truck and Bus Voucher Incentive Program (HVIP)	CARB	HVIP provides incentives for purchasers and lessees of zero-emission and low NOx MD/HD vehicles on a first-come, first-served basis. Unlike other incentive programs, HVIP does not require scrappage of replaced vehicles and can be combined with other funding sources. Vehicles operating in disadvantaged communities are eligible for increased incentives.
Carl Moyer Program	CARB	The Carl Moyer Program is a voluntary grant program that provides funding toward the incremental cost of clean MD/HD and off-road vehicles and engines that contribute to compliance with national ambient air quality standards – operating in partnership with local air districts. The program requires scrappage of baseline vehicles.
VW Beneficiary Mitigation Plan (BMP)	CARB	The BMP provides funding for zero-emission and low-NOx vehicles and related infrastructure that reduce the impact of NOx emissions attributable to VW’s non-compliant diesel vehicles. The BMP is primarily a scrap-and-replace program for a wide variety of MD/HD vehicle types and platforms.
Goods Movement Emission Reduction Program	CARB	This program provides funding to local agencies to reduce air pollution attributable to freight movement in the State’s busiest transit corridors. Funding may go towards new vehicle purchases or retrofits that reduce particulate matter emissions. This program has been fully awarded.
Advanced Technologies Demonstration Projects	CARB	This initiative is intended to accelerate the adoption of near-commercial vehicle technologies that reduce emissions. Per-vehicle incentives are relatively high for these early-stage demonstrations and intended to facilitate the commercialization of promising MD/HD vehicles across a variety of use cases.
Clean Off-Road Equipment Voucher Incentive Project (CORE)	CARB	CORE seeks to scale the deployment of commercially available off-road equipment and on-road freight vehicles by reducing upfront cost barriers. Similar to HVIP, it will be offered on a first-come, first-served basis and offer a streamlined purchasing experience for fleets.
Zero and Near-Zero Emission Freight Facilities Project	CARB	This project seeks to assess transformative strategies to accelerate zero and near-zero emission on-road vehicles in a manner that reduces GHGs, air pollutants, and other contaminants. SCAQMD received \$45 million for a series of zero-emission projects in and adjacent to San Bernardino County.
Community Air Protection Incentives	CARB	The Community Air Protection Incentives program establishes a community-driven process to assess and deploy vehicles and infrastructure that improve public health in disadvantaged communities.
Low Carbon Fuel Standard (LCFS)	CARB	The LCFS is a market-based program intended to reduce the carbon intensity of transportation fuels in California. MD/HD fleets can be

		eligible to receive revenue from LCFS credits generated by the use of low carbon fuels.
Low Carbon Transit Operations Program (LCTOP)	Caltrans	LCTOP provides funding to transit agencies to expand transit service while reducing greenhouse gas emissions, including zero-emissions buses and fueling infrastructure. A majority of funding must benefit disadvantaged communities.
Intercity Rail Capital Program (TIRCP)	Caltrans	TIRCP provides grant funding to modernize and decarbonize transit operations, which includes the purchase of zero-emission buses.
Advanced Freight and Fleet Vehicle Projects	CEC	This project is funded by CEC’s Clean Transportation Program and provides funding for a range of alternative fuel MD/HD demonstration projects. A majority of projects funded to date are focused on medium or heavy-duty EVs.

Strategy 6. Establish goals and procure natural gas MD/HD vehicles where appropriate

For MD/HD vehicle applications that are suitable for natural gas, local governments can accelerate natural gas vehicle (NGV) adoption by establishing NGV procurement targets for their fleets. Cities can prioritize NGV procurements for vehicle types that may not be suited for zero-emission vehicles in the near-term and reevaluate procurement options as zero-emission technologies become increasingly competitive. NGVs will allow cities to reduce their emissions footprint while potentially realizing fuel cost savings relative to diesel. Many of the programs identified in Table 3 such as HVIP, Carl Moyer, and Volkswagen Beneficiary Mitigation Plan all provide incentives for fleet purchases of NGVs. SCAQMD’s Vehicle Incentive Program and SCAQMD’s Lower Emission School Bus Incentive Program also provide a local source of funding for NGV purchases. For example, the City of Ontario leveraged SCAQMD funding to procure 60 NGVs – including solid waste and medium-duty trucks – that reduce its dependence on diesel fuel.¹³

Strategy 7: Take advantage of vehicle master purchase contracts

Cities can often buy fuel efficient and alternative fuel vehicles at lower prices by using a state or county master contract. By leveraging these procurement programs, a city can take advantage of the larger state or county purchase contracts to gain more favorable pricing than it might otherwise. Cities have used the state Department of General Services (DGS) and Los Angeles County contracts for this purpose.

DGS awards master vehicle contracts to individual dealerships for specific models of vehicles within a general class of vehicles, such as hybrid sedans. Local agencies can order vehicles directly from selected dealerships under the DGS master vehicle contracts. Local agencies can order vehicles directly from the selected dealerships under the DGS master contracts. More detailed information on the purchasing

¹³ <https://www.socalgas.com/documents/innovation/natural-gas-vehicles/NGV-Ontario-Solid-Waste-CNG-Trucks.pdf>

process can be found on DGS's website, including the following resource:

<https://www.green.ca.gov/fleet/Documents/147013-DGS-DriveGreen-2019-ADA.pdf>.

Strategy 8: Establish RNG procurement goals for natural gas fleet vehicles

If a city is operating natural gas vehicles, the GHG emissions from these vehicles can be significantly reduced by using renewable natural gas (RNG). Some state incentive programs, such as HVIP, already require vehicles purchased through the program to secure RNG contracts to cover all of the planned vehicle fuel use. However, local governments can build on this requirement by procuring RNG to cover the fuel use of all NGV fleet vehicles – reducing the emissions associated with fleet vehicle operations. For example, the City of Ontario signed a five-year, 3 million gallon-equivalent RNG contract with Clean Energy in 2019 to support city fleet operations.¹⁴

Strategy 9: Establish renewable diesel procurement goals for fleets

For diesel vehicles in city, county, and school district fleets, local governments can establish renewable diesel procurement goals to lower the GHG emissions associated with vehicle operation – including vehicles typically exempted from SCAQMD source specific standards such as Rule 1191 or Rule 11196.¹⁵ Renewable diesel is a drop-in replacement for fossil diesel at all blend levels, and cities can contract with fuel suppliers to supply renewable diesel to support their fleet operations at prices comparable to fossil diesel.¹⁶ The City of Oakland procures Neste renewable diesel to fuel all 366 diesel vehicles in their fleet.¹⁷

3 Resident, Worker, and Visitor Vehicles

Most of those who live in, work in, or visit San Bernardino County drive a light duty passenger vehicle. As discussed in Section 1, EVs are the recommended alternative for reducing both air pollution and GHG emissions from light duty vehicles. This section describes strategies for local governments to encourage the purchase and use of EVs in their jurisdictions. Most detailed information in SBCTA's recently completed Zero-Emission Vehicle Readiness and Implementation Plan.¹⁸

Strategy 10: Assess clean vehicle registrations in local jurisdictions

Cities can plan more effectively for the transition to alternative fuel vehicles by completing a detailed assessment of vehicle registrations in their jurisdiction. The California Department of Motor Vehicles

¹⁴ <https://www.greencarcongress.com/2019/11/20191106-rng.html>

¹⁵ <http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/rule-1191.pdf?sfvrsn=4>;
<http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/rule-1196.pdf?sfvrsn=6>

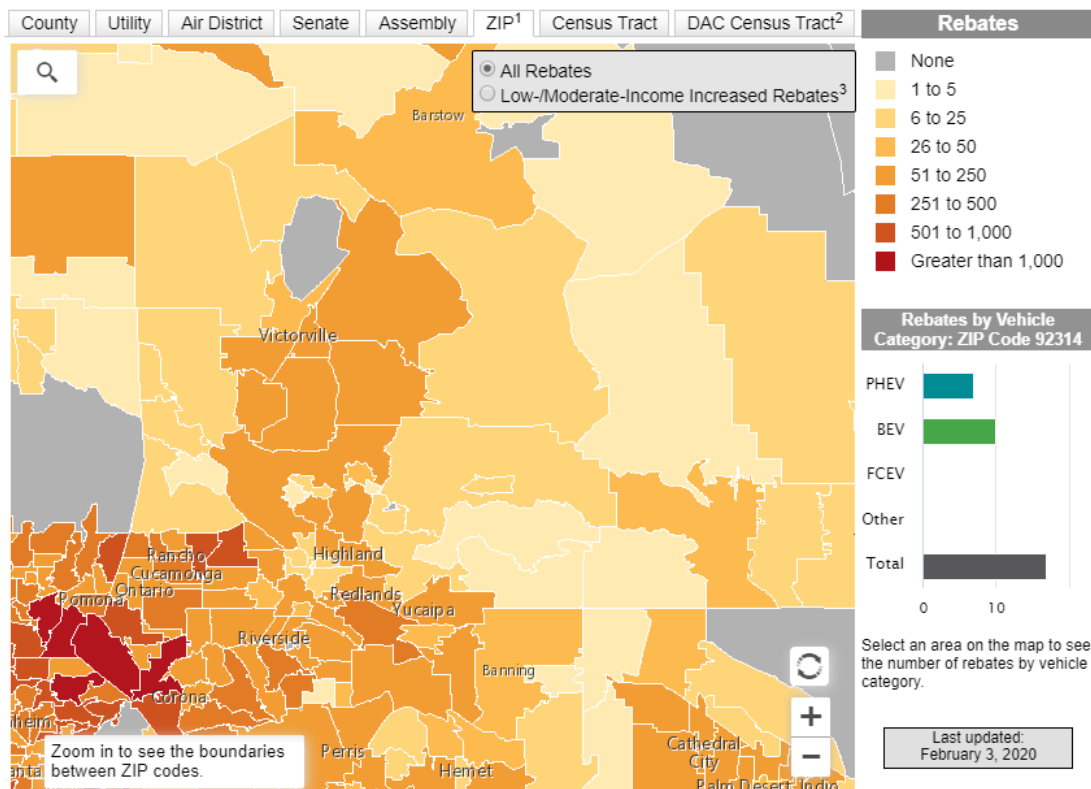
¹⁶ Renewable diesel is currently more expensive to produce than fossil diesel, but Low Carbon Fuel Standard credit revenue allows renewable diesel to be priced more competitively with fossil diesel.

¹⁷ <https://www.oaklandca.gov/news/2019/city-of-oakland-drives-environmental-progress-with-new-renewable-diesel-model>

¹⁸ https://www.gosbcta.com/wp-content/uploads/2019/10/ICT-fact-sheet_011620.pdf

compiles and reports data on vehicle registrations by fuel type, by county, city, or zip code.¹⁹ This data source can be used to determine the number and percent of battery electric, plug-in hybrid, fuel cell, ethanol, and natural gas vehicles are registered at the city level. Officials can develop estimates by assuming its share of the vehicle registrations is commensurate with a city’s share of the total County population. Officials can also develop more accurate estimates of EVs and FCEVs in their jurisdiction by using CVRP data. According to the Zero-Emission Vehicle Readiness and Implementation Plan, 52% of CVRP rebates were for PHEVs, 46% for BEVs, and 2% for FCEVs.²⁰ The Center for Sustainable Energy also maintains a rebate map that provides zip code and census tract-level information that cities can use. The figure below shows CVRP participation by zip code across a portion of San Bernardino County.

Figure 2. CVRP Rebates by Geography: San Bernardino County



Source: Center for Sustainable Energy

Strategy 11: Identify gaps in EV charging infrastructure

Similar to the clean vehicle registration assessment, cities can also identify gaps in local EV charging infrastructure networks by developing a greater understanding of current public charging investments. The U.S. Department of Energy’s Alternative Fuels Data Center Station Locator tool provides detailed information on publicly available charging infrastructure, including: station address, contact number,

¹⁹ https://www.dmv.ca.gov/portal/dmv/detail/pubs/media_center/statistics

²⁰ https://www.gosbcta.com/wp-content/uploads/2019/10/SBCOG-ZEV-Plan_Final-10-4-19_Online-3.pdf

charging station type, plug type, number of outlets, and hours of accessibility.²¹ Station Locator maps can provide cities with a comprehensive view of where public charging infrastructure exists and where gaps remain. Maps may be particularly valuable for closing gaps in DCFC infrastructure needed to enable intercity highway corridor travel and reduce range anxiety among prospective EV drivers. SBCTA’s Zero-Emission Vehicle Readiness and Implementation Plan recommends deploying DCFC stations at least every 50 miles to facilitate inter- and intra-county travel.²² Planned Electrify America charging stations will address charging access in some areas, but infrastructure gaps will remain across rural areas in the County and on major corridors such as I-15 and I-40. The table below presents recommendations from the Zero-Emission Vehicle Readiness and Implementation Plan on potential DCFC station sites.

Table 4. Potential DCFC Sites in San Bernardino County

New DCFC Location	Potential Sites	Rationale
Ludlow (I-40)	Dairy Queen, Chevron, Ludlow Inn	Additional coverage between Barstow and planned Electrify America station
Fenner (I-40)	Hi Sahara Oasis	Additional coverage between Needles and planned Electrify America station
Needles I-40)	Needles Chamber of Commerce	Provide CCS/CHAdEMO coverage in Needles
Vidal (SR 62)	Vidal Chevron	Additional coverage between Needles and County Line
Twentynine Palms (SR 62)	Phoenix Redevelopment Site	Additional coverage between Yucca Valley and County Line, provide CCS/CHAdEMO coverage in Twentynine Palms
Yucca Valley (SR 62)	Stater Bros. Market, Southern California Edison, Vons	Additional coverage between Los Angeles and Big Bear and Twentynine Palms
Big Bear Lake (SR 18)	Big Bear Lake Convention Center	Additional coverage between Los Angeles and Yucca Valley

Source: Center for Sustainable Energy, Zero-Emission Vehicle Readiness and Implementation Plan, Prepared for San Bernardino County Transportation Authority, 2019.

Strategy 12: Streamline EV charging station permitting processes in accordance with AB 1236

Assembly Bill (AB) 1236 requires most California cities to develop ordinances to streamline EV charging station permitting processes and provide clarity for EV charging service providers, site hosts, and local governments seeking to accelerate EV adoption.²³ The figure below illustrates the key requirements of the bill.

²¹ <https://afdc.energy.gov/stations/#/find/nearest>

²² https://www.gosbcta.com/wp-content/uploads/2019/10/SBCOG-ZEV-Plan_Final-10-4-19_Online-3.pdf

²³ https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160AB1236

Figure 3. AB 1236 Requirements

	AB 1236 Compliant (EVCS Friendly)	Not AB 1236 Compliant (Challenging to Deploy Charging)
Required by AB 1236	Ordinance creating an expedited, streamlined permitting process for electric vehicle charging stations (EVCS) including level 2 and direct current fast chargers (DCFC) has been adopted	No permit streamlining ordinance; and/or ordinances that create unreasonable barriers to EVCS installation
	Checklist of all requirements needed for expedited review posted on Authority Having Jurisdiction (usually a city or county) website	No checklist for EVCS permitting requirements
	EVCS projects that meet expedited checklist are administratively approved through building or similar non-discretionary permit	Permitting process centered around getting a discretionary use permit first
	EVCS projects reviewed with the focus on health and safety	EVCS projects reviewed for aesthetic considerations in addition to building and electrical review
	AHJ accepts electronic signatures on permit applications*	Wet signatures required on one or more application forms
	EVCS permit approval not subject to approval of an association (as defined in Section 4080 of the Civil Code)	EVCS approval can be conditioned on the approval of a common interest association
	AHJ commits to issuing one complete written correction notice detailing all deficiencies in an incomplete application and any additional information needed to be eligible for expedited permit issuance	New issue areas introduced by AHJ after initial comments are sent to the station developer

Source: GO-Biz

Many cities in San Bernardino County have not fully met the requirements of the law. In order to efficiently deploy charging infrastructure on a large scale while conserving local governments’ time and resources, cities can develop a streamlining ordinance and publish an online checklist for an expedited review of charging station permit applications. Cities can also strive to exceed the requirements of the law by publishing relevant permitting guidance documents, designating a charging station permitting expert on staff, holding pre-application meetings with prospective charging station site hosts, conducting concurrent permit reviews among relevant city departments, and taking additional steps to increase transparency in the application process. According to the California Governor’s Office of Business and Economic Development (GO-Biz), the City of Riverside has a “streamlined” permit application process and an online checklist available for applicants seeking a permit for charging station installations.²⁴

Strategy 13: Update and strengthen EV-Ready building codes beyond CALGreen requirements

The state’s green building code, CALGreen, sets requirements for the construction of new buildings in California and has recently developed requirements for the installation of electrical infrastructure (e.g. conduit, panels) that supports the deployment of EV charging stations. As of January 2020, newly constructed buildings are required to meet the updated specifications outlined in the table below.

²⁴https://library.municode.com/ca/riverside/codes/code_of_ordinances?nodeId=PTIICOOR_TIT16BUCO_CH16.23E_LVECHSTSTPEPR; <https://www.riversideca.gov/building/drawings.asp>

Table 5. CALGreen 2020 EV Ready Requirements

Building Type	Requirement
Single Family Residences, Duplexes, and Townhomes (with garages)	Must install conduit and panel capacity to support future installation of Level 2 charging stations
Multi-unit Dwellings	Must install conduit and panel capacity to support future installation of Level 2 charging stations at a minimum of 10% of parking spaces
Non-Residential Buildings	Must install conduit and panel capacity to support future installation of Level 2 charging stations at 4-10% of parking spaces depending on number parking spaces available.

Source: California Department of General Services

CALGreen has also developed “reach codes” that outline how local jurisdictions can exceed the requirements specified in the building code. These reach codes typically require higher percentages of parking spaces to be equipped with conduit and panel capacity necessary for additional Level 2 charging station deployments. Cities can also demonstrate leadership by strengthening EV readiness requirements beyond the furnishing of conduits and panels to include the installation circuits and wiring to support EV charging stations – further reducing the cost and complexity of deploying EV charging stations at the building site. Cities can also extend building codes to include existing buildings – particularly in cases when existing buildings undergo major retrofits. Cities can also explore and encourage the use of EV energy management systems (EVEMS) in meeting building code requirements for multi-unit dwellings and non-residential buildings. At a fundamental level, EVEMS allow more charging stations to be deployed with a fixed amount of electrical capacity by sharing, cycling, or delaying EV charging across multiple stations; these systems can potentially reduce the cost of complying with building codes without significantly altering the charging experience for EV drivers.

The City of Oakland’s EV-readiness ordinance requires new electric panel capacity to service 20% of parking spaces in new multi-unit dwellings and non-residential buildings as well as full circuits installed for 10% of parking spaces.²⁵ The City of San Francisco applies EV-ready building codes to existing buildings undergoing “major alterations” – defined as significant upgrades where the area of construction exceeds 25,000 square feet.²⁶ The City of Vancouver requires 100% of parking spaces in new multi-unit dwellings to be EV-ready but does not require panel upgrades to serve 100% of spaces at full power – suggesting that buildings can employ EVEMS to meet the requirements of the code without significant panel upgrades.²⁷

²⁵ <http://www2.oaklandnet.com/oakca1/groups/pwa/documents/report/oak063669.pdf>

²⁶ <https://sfbos.org/sites/default/files/o0092-17.pdf>

²⁷ <http://businessportal.ca.gov/wp-content/uploads/2019/07/GoBIZ-EVCharging-Guidebook.pdf>

Strategy 14: Update and strengthen EV-Ready parking and zoning ordinances for new buildings

City parking regulations and requirements can also encourage EV charging station deployment. Many cities and municipalities have minimum parking requirements that govern the number of spaces that real estate developers need to provide for certain building types. Developers may be hesitant to deploy charging in new and existing buildings if parking spaces equipped with charging infrastructure are not counted toward minimum parking requirements – particularly in urban areas with limited land availability. Updated parking ordinances that recognize EV charging equipped spaces as parking spaces (and not traditional fueling stations) will create certainty for project developers looking to deploy charging stations at commercial properties. Cities can go further to incentivize EV charging stations in new buildings by allowing EV charging equipped spaces to count as *two* parking spaces for the purposes of meeting local minimum parking requirements – potentially reducing developer costs associated with satisfying zoning requirements. For example, the City of Stockton allows parking spaces equipped with EV charging stations to count as two parking spaces for up to 10% of total parking required by the local zoning ordinance.²⁸ Cities can also encourage EV car sharing by modifying parking ordinances to reduce parking requirements when EV car sharing is used on site: for every space designated for car sharing, the City of Santa Monica allows building developers to reduce their parking requirement by two spaces.²⁹ Finally, cities can designate priority parking spaces at municipally owned lots as EV-only and update local parking codes to enforce compliance via fines or other mechanisms.³⁰

Strategy 15: Deploy charging infrastructure through existing and pending utility transportation electrification programs, state programs, and regional programs

SB 350 has been the legislative driver behind the portfolio of investor-owned utilities' transportation electrification programs – providing over \$1 billion in cumulative investment to support the electrification across all vehicle classes.³¹ SCE has implemented and in the process of implementing several programs to increase access to EV charging across its service territory, and SCE's Charge Ready 2 program is currently pending before the California Public Utilities Commission. Local officials can coordinate early on with SCE to determine whether municipally owned parking lots at parks, schools, libraries, and other locations would be eligible and suitable sites under the program. Cities can also avail themselves of funding from the California Energy Commission's (CEC) Southern California Incentive Project (SCIP) under CALeVIP.³² The SCIP provides up to \$80,000 per Direct Current Fast Charger and has allocated \$2 million to support fast charging deployment in San Bernardino County.³³ At the time this memo was written, over \$700,000 in incentives remain available; city and county officials can leverage these funds to support fast charging deployment at municipal sites along major highway corridor routes

²⁸ https://qcode.us/codes/stockton/view.php?topic=16-3-16_64-16_64_030&frames=off

²⁹ http://www.qcode.us/codes/santamonica/view.php?topic=9-3-9_28-9_28_180

³⁰ Note that cities can adapt priority parking spaces to include other alternative fueled vehicles such as FCVs.

³¹ https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB350

³² CALeVIP is the California Electric Vehicle Infrastructure Project.

³³ <https://calevip.org/incentive-project/southern-california>

and other high demand areas. Metropolitan Planning Organizations have also established EV charging station incentive programs to achieve light-duty vehicle greenhouse gas emissions reductions pursuant to SB 375.³⁴ In its 2016 Regional Transportation Plan/Sustainable Communities Strategy, SCAG proposed a \$274 million Regional Charging Station Network initiative to support the deployment of 380,000 Level 1 and 2 stations across SCAG’s footprint.³⁵ SCAQMD has developed the Residential EV Charging Incentive Pilot Program, which provides up to \$500 in rebates toward the purchase of residential Level 2 chargers for qualified residents in the air district’s jurisdiction.³⁶ Cities may also want to partner with utilities to engage directly with convenience stores in their jurisdictions; convenience stores may be ideal locations for new Direct Current Fast Charging stations

Strategy 16: Explore the feasibility of implementing EV car sharing services

Cities have begun promoting alternatives to vehicle ownership via EV car sharing and other shared mobility services. Car sharing services could provide access to e-mobility for residents that may not be able to afford a personal vehicle and may serve as a complement to public transit. Charging infrastructure deployment at designated car sharing parking spaces may also be necessary to refuel EVs in a timely manner and maintain high utilization levels. CARB’s CVRP, California Strategic Growth Council Transformative Climate Communities Grants, and private company investment could all serve as potential funding sources for car sharing initiatives. Los Angeles’ BlueLA is all-electric car sharing service with approximately 100 vehicle and 200 charging stations at 35 Central Los Angeles locations.³⁷ The service is available 24/7 and members do not incur any maintenance, parking, or insurance fees. Low-income members qualify for discounted pricing.

Strategy 17: Advocate for new and existing programs and policies that advance EVs at the state level

Local government and SCAQMD can engage the California Assembly and state agencies to encourage the expansion of programs and increased stringency of regulations that would accelerate EV adoption in San Bernardino County. Participation in public hearings and comment periods can help demonstrate San Bernardino County’s leadership and commitment to advance transportation electrification. Examples of existing state level incentive programs for light duty vehicles are included in the following table.

Table 6 State Agency Light Duty EV Incentive Programs

Program Name	Lead Agency	Program Description
Clean Vehicle Rebate Project (CVRP)	CARB	CVRP provides incentives toward the purchase of new, qualified battery electric and plug-in hybrid electric vehicles for qualified drivers. Funds are awarded on a first-come, first-served basis.

³⁴ https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200720080SB375

³⁵ http://scagrtpscs.net/Documents/2016/final/f2016RTPSCS_MobilityInnovations.pdf

³⁶ <http://www.aqmd.gov/home/programs/community/community-detail?title=ev-charging-incentive>

³⁷ <https://www.bluela.com/>

Clean Cars 4 All Program	CARB	Clean Cars 4 All promotes cleaner air by providing low-income residents in eligible air districts with incentives to scrap and replace their old vehicle with low-emission options such as EVs or transit passes. The program also supports incentives for residential EV chargers.
Clean Mobility Options	CARB	Clean Mobility Options is a grant-based program to address the transportation needs of low-income and disadvantaged community residents. The program supports initiatives such as zero-emission carsharing and vanpooling.
VW Beneficiary Mitigation Plan (BMP)	CARB	The BMP provides modest funding opportunities to support fueling infrastructure for zero-emission vehicles, including EVs.
Financing Assistance for Lower-Income Consumers	CARB	This initiative provides attractive financing options for qualified California residents on a grant basis for the purchase of low and zero-emission vehicles.
Zero-Emission Assurance Project (ZAP)	CARB	ZAP provides incentives toward the replacement of EV batteries and fuel cells in used EVs for qualified California drivers. The program will launch in 2020.
CALeVIP	CEC	CALeVIP provides rebates for the purchase and installation of publicly accessible and shared use charging infrastructure on a first-come, first-served basis. The program has funded both L2 and DCFC charging infrastructure to date.

Local jurisdictions can also encourage their state representatives to support new statutes that provide explicit authority for cities to advance regulations that advance EVs and other alternative fuel vehicles. For example, statutes that enable cities to establish zero-emission zones could accelerate EV adoption while providing local governments with a new source of revenue.³⁸ These zones may be effective in larger, more congested cities and would be accessible to non-zero-emission vehicles for fee, further encouraging drivers to transition to EVs. Equity will be an important consideration as cities contemplate the location of zones, pricing schedules, and potential exemptions.

Strategy 18: Engage disadvantaged and low-income communities on the benefits of EVs

Residents in disadvantaged communities (DACs) and low-income communities (LICs) often face significant challenges to owning EVs. Recent initiatives taken by state and local actors, including CARB's Clean Mobility Options program, are beginning to support a more equitable transition to EVs for residents in these communities. Local and regional agencies, in partnership with community-based organizations, should seek opportunities to engage and educate low-income residents – providing information on EV technologies, benefits, relevant local events, and relevant programs to accelerate

³⁸ <https://ww2.arb.ca.gov/sites/default/files/2019-12/SB%20498%20Report%20Draft%20121719.pdf>

transportation electrification in DACs and LICs. All presentations and outreach materials should be available in appropriate languages. Cities and metropolitan planning organizations can also designate an internal liaison to lead engagements with local community partners. For example, SCAG has an Environmental Justice (EJ) Working Group, which serves as a forum to share information on EJ issues related to planning and transportation. SCAG’s extensive network of local government members also allows for SCAG to compare outreach and engagement efforts across local jurisdictions.

Strategy 19: Develop a Climate Action Plan (CAP) that prioritizes clean vehicles and fuels

Cities and county governments can develop and regularly update CAPs in accordance with local and state climate goals. CAPs leverage existing information from greenhouse gas inventories to establish greenhouse gas mitigation targets, identify cost-effective strategies to achieve these targets, and develop monitoring mechanisms to evaluate progress. Light-duty vehicles are a leading source of greenhouse gas emissions in many local jurisdictions, and cities have identified actions to accelerate the adoption of alternative fuel vehicles – including EVs.³⁹ CAPs can introduce a series of aggressive EV adoption and transportation sector emission reduction targets while outlining the necessary actions needed to reach these goals. The California Strategic Growth Council Sustainable Communities Planning Grants, along with city funding, can provide resources needed to draft and support implementation of local CAPs.⁴⁰ For example, the City of Brawley received a grant from the California Strategic Growth Council to develop a climate action plan, which included measures to increase EV adoption and streamline city regulations to encourage EV charging station deployment.⁴¹ San Bernardino County is also currently updating its CAP.

4 Commercial Vehicles

Most of the commercial vehicles in San Bernardino County are medium- and heavy-duty used to transport freight. Given its concentration of warehouses, logistics providers, and transportation companies, the County has a disproportionately large share of commercial vehicle travel and emissions. There are opportunities for local governments to encourage cleaner vehicles among commercial fleets based in the County and among trucks serving County businesses. The County is also traversed by several major freeways that carry trucks moving between Southern California seaports and the rest of the U.S. Because many of these vehicles do not stop in San Bernardino County, there is less opportunity for local governments to influence them, although the provision of charging stations and other alternative fuel infrastructure could be beneficial.

³⁹ CAPs can encourage the adoption of a wide variety of low carbon transportation fuels, including but not limited to: electricity, hydrogen, renewable natural gas, and liquid biofuels.

⁴⁰<http://bondaccountability.resources.ca.gov/Program.aspx?ProgramPK=121&Program=SGC%20Sustainable%20Communities%20Planning%20Grants%20-%20DOC&PropositionPK=4>

⁴¹ http://www.brawley-ca.gov/cms/kcfinder/upload/files/planning/Brawley_Draft_Climate_Action_Plan.pdf

As discussed in Section 1, the most appropriate clean vehicle technologies and fuels for medium- and heavy-duty trucks differ by vehicle type and application, and in some cases are unclear because technology development and acceptance lags behind that of light-duty passenger vehicles. For this reason, it would be inappropriate for a city to invest significant public resources in a particular technology or fuel type. Rather, cities should remove any barriers to private sector investment in clean vehicles and fuels, and should support public projects that have a strong likelihood of long-term usefulness.

Strategy 20: Streamline EV charging station permitting processes in accordance with AB 1236

Similar to light-duty EVs, MD/HD EVs benefit from streamlined permitting processes for the deployment of corresponding EV charging infrastructure. However, the need for streamlined permitting may be even more critical in the case of MD/HD EVs. Protracted permitting processes can negatively impact a fleet owner's experience in transitioning to EVs and may reinforce negative perceptions about vehicle performance. Moreover, the battery size and duty cycles of MD/HD vehicles may require a greater proportion of charging stations to be Direct Current Fast Charging stations – which may require a more complex permit review process. Streamlining permitting for MD/HD fleets will accelerate the region's progress toward meeting climate and air quality goals while making the charging station deployment process simpler for fleet owners.

Strategy 21: Educate and enroll fleet customers in beneficial electricity rate plans

Electricity rates can significantly affect the total cost of ownership of EVs and influence fleet operators' willingness to transition to electric technologies. Determining electric fuel costs under rate schedules that vary by time of use (kilowatt-hours) and electricity demand (kilowatts) may also be new to many operators. SCE's current general service time of use (TOU) EV rates, including the tariff shown below, eliminate demand charges for customers through 2024, and then gradually phases demand charges back into the rate design – allowing customers to become familiar with EV technologies and determine how to best manage their electricity demand. These rates will likely help fleet owners manage their electricity costs as they transition to EVs. However, SCE should actively encourage MD/HD EV customers to enroll in the appropriate EV rate plan and educate customers on how they can manage their electricity demand to reduce exposure to demand charges, mitigate the risk of utility electrical upgrades, and improve the total cost of ownership of operating EV fleets.

Table 7. SCE TOU-EV-8 Electricity Rate for Commercial EV Customers

TOU-EV-8 Large Power with Monthly Max Demand between 21 - 500 kW EV-Only		2019-2023	2024	2025	2026	2027	2028	2029+
TOU Period		All Energy Rate Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Full FRD Rate Year 11
Summer On - \$/kWh	4-9pm weekdays	\$0.41816	\$0.41131	\$0.40447	\$0.39762	\$0.39077	\$0.38393	\$0.25882
Summer Mid - \$/kWh	4-9pm weekends	\$0.27718	\$0.27034	\$0.26349	\$0.25664	\$0.24980	\$0.24295	\$0.20051
Summer Off - \$/kWh	All except 4-9pm all days	\$0.12550	\$0.11866	\$0.11181	\$0.10496	\$0.09812	\$0.09127	\$0.10135
Winter Mid - \$/kWh	4-9pm all days	\$0.27801	\$0.27116	\$0.26432	\$0.25747	\$0.25062	\$0.24378	\$0.20134
Winter Off - \$/kWh	9pm-8am all days	\$0.13206	\$0.12522	\$0.11837	\$0.11152	\$0.10467	\$0.09783	\$0.11078
Winter Super-Off- \$/kWh	8am-4pm all days	\$0.08133	\$0.07448	\$0.06764	\$0.06079	\$0.05394	\$0.04710	\$0.05837
Customer Charge (\$/Month)		\$106.75	\$106.75	\$106.75	\$106.75	\$106.75	\$106.75	\$106.75
FRD (\$/kW)		\$0.00	\$1.99	\$3.99	\$5.98	\$7.97	\$9.97	\$11.96
% of Final FRD		0	16.67%	33.33%	50.00%	66.67%	83.33%	100.00%
FRD % Increase By Year			16.67%	16.67%	16.67%	16.67%	16.67%	16.67%

Source: California Public Utilities Commission

SCE’s TOU-EV-8 rate plan provides opportunities for fleet operators to realize potential fuel cost savings relative to standard commercial electricity rates. SCE also has a dedicated transportation electrification team committed to advising commercial customers on charging infrastructure and rate options for MD/HD EVs.⁴²

Strategy 22: Advocate for programs and policies that advance MD/HD EVs at the state level

Local government actors can drive the electrification of MD/HD vehicles by encouraging the expansion of supportive policies and programs. Participation in public hearings and comment periods can help demonstrate San Bernardino County’s leadership and commitment to advance MD/HD EVs. Beyond advocating for incentive programs identified in Table 3, local jurisdictions can play an active role influencing pending CARB regulations outlined in the table below.

Table 8 Pending CARB MD/HD EV Regulations

Regulation Name	Description
Advanced Clean Trucks Regulation	The Advanced Clean Truck Regulation would require MD/HD vehicle manufacturers to produce and sell an increasingly greater number of zero-emission vehicles through 2030. The rule would also require detailed reporting on fleet operations for large employers.
Zero-Emission Vehicle Truck Regulation	The Zero-Emission Vehicle Truck Regulation explores the conversion of public and private fleets to zero-emission vehicles. Targeted fleets may include last-mile delivery, utility fleets, refuse fleets, and others.

⁴² <http://businessportal.ca.gov/wp-content/uploads/2019/07/GoBIZ-EVCharging-Guidebook.pdf>

<u>Zero-Emission Transportation Refrigeration Units Regulation</u>	This regulation proposes a complete transition to zero-emission transportation refrigeration units (TRUs) and limiting idling of TRUs powered by internal combustion engines.
<u>Zero-Emission Drayage Truck Regulation</u>	This regulatory concept would update CARB’s current Truck and Bus regulation to require the phase-in zero-emission drayage technologies that reduce criteria air pollutant emissions in sensitive areas.

New statutory authority to establish zero-emission zones could also encourage the adoption of MD/HD EVs. Green loading or logistics zones in areas with elevated criteria pollutant emissions could create further incentives to adopt zero-emission vehicles, which may not be subject to fees or access limitations to these zones.⁴³ Zone-based regulations may be dynamic and become increasingly stringent as EV technologies become more commercially available.

Strategy 23: Update and streamline permitting requirements for hydrogen fueling stations

As discussed in Section 1, the future is uncertain for fuel cell vehicles. Investment of public funds in hydrogen fueling infrastructure is not recommended due to this uncertainty. However, if there is private sector interest in hydrogen fueling infrastructure, local governments should not discourage this investment. FCVs may prove feasible for select MD/HD applications, and if to, local agencies will have an important role to play in the siting and installation of hydrogen fueling infrastructure for MD/HD vehicles. Cities can improve installation processes by identifying hydrogen as a transportation fuel in zoning ordinances, reviewing permit applications solely based on health and safety criteria, exempting hydrogen fueling stations from CEQA review processes where appropriate. All permitting requirements can be made accessible via an online checklist for station developers and fleet managers seeking to streamline installation processes. SCAQMD can potentially advise cities on best practices and experiences with deploying fueling infrastructure for fuel cell demonstration projects.

Strategy 24: Update and streamline permitting requirements for natural gas fueling stations

NGVs powered by RNG will likely remain part of a comprehensive strategy to reduce emissions from MD/HD vehicles in San Bernardino County, and expanding natural gas fueling infrastructure will be critical for supporting the adoption of new NGVs. Inefficient and opaque review processes can cause project delays that hinder the adoption of CNG vehicles and delay the transition away from diesel vehicles. Cities can facilitate private investment this infrastructure by ensuring that permitting of natural gas fueling stations is streamlined and efficient. Zoning ordinances can clarify natural gas’ use as a transportation fuel, and permitting officials could review applications solely based on health and safety criteria – ensuring that reasonable fueling projects get approved. Permitting requirements can be made

⁴³ <https://ww2.arb.ca.gov/sites/default/files/2019-12/SB%20498%20Report%20Draft%20121719.pdf>

accessible via online checklist for station developers and fleet managers seeking to deploy CNG fueling stations. Similar to hydrogen fuel cell projects, SCAQMD may also be able to provide guidance to cities on best practices for streamlining CNG station deployment.

Strategy 25: Encourage clean trucks through permitting of warehouses and industrial facilities

In some instances, cities can use the permitting process to encourage cleaner vehicles at new warehouses and industrial facilities. Cities may require a conditional use permit (CUP) for approval of new development. CUPs are intended as a tool for the city to review and provide input on a facility's design and place restrictions on its operations, prior to project approval. CUPs are conventionally used to address environmental concerns in new land uses. CUPs place performance standards on a new land development in order to ensure compliance with general plan policies and local ordinances.

For warehouses and industrial facilities, performance standards in CUPs could include:

- If the facility owner operates a truck fleet at the site, a requirement that a portion of the fleet be a zero emission or near-zero emission vehicle.
- Requirement to install onsite electric truck charging infrastructure or hydrogen fueling infrastructure
- Requirement that facility developers and owners to establish an investment plan supporting zero-emission infrastructure.
- Requirement that the facility operator adopt a rate structure that incentivizes contracting with trucking companies that utilize the lowest emitting transport technologies.

Property and Business Improvement Districts (PBID) or Enhanced Infrastructure Financing Districts (EIFD), AB 617 Community Air Protection Incentives, and CARB's Zero and Near Zero Emission Freight Facility program all provide potential funding sources for fleet managers to leverage for transitioning to alternative fuel vehicles.

Strategy 26: Invest in knowledge maintenance on emerging clean vehicle technologies

The MD/HD transportation sector is undergoing rapid change with the emergence of zero-emission alternatives to traditional diesel vehicles across an array of vehicle platforms. Many new models are expected to be commercially available in 2021 or shortly thereafter. However, many pilots and vehicle demonstration projects are underway now assessing the performance of these emerging technologies. Some of these efforts are taking place in or adjacent to San Bernardino County as part of a continued effort to reduce local emissions. Cities can reach out to CARB and other State and regional agency funders of these projects to gather more information on pilot parameters and gain preliminary insights into the viability of various zero-emission vehicle options. For example, Volvo LIGHTS (Low Impact Green Heavy Transport Solutions) is a program using funding from California Climate Investments (Cap-and-Trade revenue) to demonstrate battery electric trucks across Southern California. Several of the pilots are located in San Bernardino County, including:

- Dependable Supply Chain Solutions in Ontario is installing two 150 KW fast charging stations and deploying three Volvo heavy-duty battery electric trucks;
- TEC Equipment in Fontana and La Mirada will deploy 15 Volvo heavy-duty battery electric trucks, two 150 KW fast charging stations, and two 50 KW fast charging stations; and
- San Bernardino Valley College (SBVC) Heavy/Medium Duty Truck Technology Department is designing Certificate and Associate's degree-level training program specific to heavy-duty, battery electric truck maintenance to promote the region's workforce development.

5 Conclusion

Clean vehicles and fuels present a significant opportunity to abate emissions in a manner consistent with San Bernardino County's climate and air quality goals. Light, medium, and heavy-duty vehicle segments all have a role to play in the County's transition to cleaner transportation options. Municipal vehicle fleets, private vehicles, and commercial vehicle fleets similarly share responsibility for meeting regional goals. To achieve these goals, the approach to clean transportation will vary by vehicle type. In the case of light-duty vehicles, a strong case can be made for prioritizing the adoption of EVs and associated charging infrastructure. However, the array of vehicle platforms, diversity of fuels, and relative nascency of some alternative fuel vehicle options in the medium and heavy-duty segment make it challenging to adhere to a "one-size-fits-all" approach. These findings need not delay the County's transition to cleaner vehicle fleets: there are several low-risk strategies local jurisdictions can pursue to prepare the region for adoption of alternative fuel vehicles and encourage private investment. Local jurisdictions should also remain informed on upcoming zero-emission vehicle regulations and incentive programs at the State-level – serving as a resource for local fleets looking to transition. In partnership with regional industry and community stakeholders, San Bernardino County can take meaningful steps to reduce emissions while maintaining economic growth.