

AchiEVe:

Model Policies to Accelerate Electric Vehicle Adoption

Presented by the Sierra Club, Plug In America, FORTH, and the Electrification Coalition



ACKNOWLEDGMENTS

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INTRODUCTION

[The transportation sector in the US is the leading source of greenhouse gas emissions in our country](#) and is 92 percent dependent on oil. In addition to contributing to the climate crisis, emissions from our fossil fuel-powered cars, trucks, and buses are making our air unsafe to breathe. Too many people for too long, particularly in low-income neighborhoods and communities of color, have borne the brunt of air pollution and a lack of access to clean and accessible transportation options. The status quo of our transportation systems is threatening our health, our climate, the well-being of our communities, and our national security.

In order to combat our climate crisis, improve air quality and public health, and improve our energy security, we must move transportation away from oil and toward an electric future. Electrifying transportation is a solution that makes sense. Policymakers must prepare for this major shift in how transportation is fueled by implementing bold policies that will accelerate this transformation to plug-in electric vehicles (EVs). This toolkit is designed to provide public officials and advocates with model EV policies that accelerate the switch to these clean vehicles in an effective, sustainable, and equitable way.

EVs on the market today are high-performing, technologically advanced, quiet, and significantly lower in emissions compared to fossil fuel powered vehicles, even when factoring in total lifecycle emissions and the emissions from the electricity used to charge them. As we shift to more renewable sources of power, EVs become even cleaner over time. This is great news for public health and climate protection. The burgeoning EV market is also an opportunity for states to work with automakers to develop new regional economic development opportunities—both for vehicle manufacturing and for components further up the supply chain. Managing this transition and creating localized supply chains will be critical for the many autoworkers in the US whose jobs depend on being a part of the electric future of transportation.

The COVID-19 crisis has had major implications for not just the health of communities across the country but also the US economy, exposing and exacerbating long-standing inequities, including within our transportation systems. As we seek to rebuild our economy, we must do so equitably, leaving no person and no community behind. Investment in clean transportation — with a particular focus on public transit and electrification of cars, trucks, and buses — is a significant step toward building that future.

Decision-makers often want to know the best policies to accelerate this adoption. In this toolkit, we have compiled guidance on how to approach EV policies, and we have provided links to actual policies across a range of categories that are currently enacted at the state, local, and utility levels. In this toolkit, we compiled guidance on how to approach EV policies, we provide over 50 policies across a range of categories currently enacted at the state, local, and utility levels.

The charts below show which policies are most relevant for each audience. We encourage policymakers, regulators, and businesses to read through each of the policies relevant to the type of decision-maker and to work toward implementing a comprehensive set of measures to accelerate EV adoption.

GOVERNORS' OFFICES, STATE AGENCIES

[EV Proclamations and Driver Bill of Rights](#)

[Open Access and Interoperability](#)

[Uniform Signage Requirements](#)

[Solutions to Barrier of Auto Dealers Selling EVs](#)

[Zero-and Low-Interest Loans for Consumers](#)

[Policies for Batteries and Battery Recycling](#)

[Adopting ZEV Standards](#)

[Policies to Electrify Light-Duty Vehicle and Bus Fleets](#)

[Using VW Settlement Funds for Electrifying School Buses and Transit Buses](#)

[Using VW Settlement Funds to Grow EV Charging Networks](#)

[Evaluating Vehicle Registration Fees](#)

[Waived or Reduced Vehicle Registration Fees for EV Drivers](#)

[Electric Ride-Hailing Policies and Programs](#)

[State Energy Policy Strategies and Transportation Electrification](#)

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[Using VW Settlement Funds for Electrifying School Buses and Transit Buses](#)

[Using VW Settlement Funds to Grow EV Charging Networks](#)

[Policies for Medium- Heavy-Duty Freight](#)

[CMAQ Program and Transportation Electrification](#)

[Charging Infrastructure Funding and Financing](#)

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[EV-Ready Wiring Codes and Ordinances](#)

[Streetlight and Power Pole Charging Access](#)

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[Solutions to Barrier of Auto Dealers Selling EVs](#)

[Zero-and Low-Interest Loans for Consumers](#)

[Using VW Settlement Funds for Electrifying School Buses and Transit Buses](#)

[Using VW Settlement Funds to Grow EV Charging Networks](#)

[EV Infrastructure at Multiunit Dwellings](#)

[Right-of-Way Charging](#)

[EV Car-Sharing Programs](#)

[Charging Access in Underserved Communities](#)

[Policies to Enable Workplace Charging](#)

[School Bus Electrification Policies and Pilots](#)

[Financing of Infrastructure](#)

BUSINESSES

[Ride & Drive Events](#)

[Policies to Enable Workplace Charging](#)

[Charging Infrastructure Funding and Financing](#)

[Solutions to Barrier of Auto Dealers Selling EVs](#)

[Direct Sales Legislation](#)

ACRONYMS

AFV: Alternative Fueled Vehicle

BEV: Battery Electric Vehicle

EV: Electric Vehicle

EVSE: Electric Vehicle Supply Equipment

HEV: Hybrid Electric Vehicle

HOV: High-Occupancy Vehicle

NGO: Nongovernment Organization

MUD: Multiunit Dwelling

PEV: Plug-in Electric Vehicle

PHEV: Plug-in Hybrid Electric Vehicle

ZEB: Zero-Emission Bus

ZEV: Zero-Emission Vehicle

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POLICIES TO ENCOURAGE AND ENABLE VEHICLE PURCHASE

ADOPTING ZEV STANDARDS

Congress has set federal clean vehicle standards that are enforced by the US Environmental Protection Agency (EPA) and the US Department of Transportation (DOT). Before 2020, federal law also authorized California, owing to its severe transportation-related air pollution problems, to enact vehicle-emissions standards stronger than the federal ones, and other states were eligible to adopt and enforce these standards. These states are commonly called “177 states” after the section of the Clean Air Act that grants them this authority. There are two components to the California standards, which are referred to as the Advanced Clean Cars program: the low-emission vehicle (LEV) standards and the zero-emission vehicle (ZEV) standards. The LEV standards require a reduction in tailpipe emissions, while the ZEV standards require that automakers supply a certain percentage of ZEVs to that state or purchase credits

from other automakers to meet the state requirements.

At this writing, 14 states — plus the District of Columbia — have adopted the LEV standards. California and 10 other states have additionally adopted the ZEV standards. ZEV states include California, Colorado, Connecticut, Maine, Maryland, Massachusetts, New Jersey, New York, Oregon, Rhode Island, and Vermont. Other states — Nevada, Minnesota, New Mexico, and Washington — have announced that they intend to adopt the ZEV standard.

Recently, the Trump administration rolled back the federal clean car standards and revoked the California waiver that allows for the LEV and ZEV programs. Several states and organizations are challenging these rollbacks in court. Successfully advocating for new states to adopt the LEV and the ZEV standards is one of the most important tools to expand electric vehicle adoption in the United States. It



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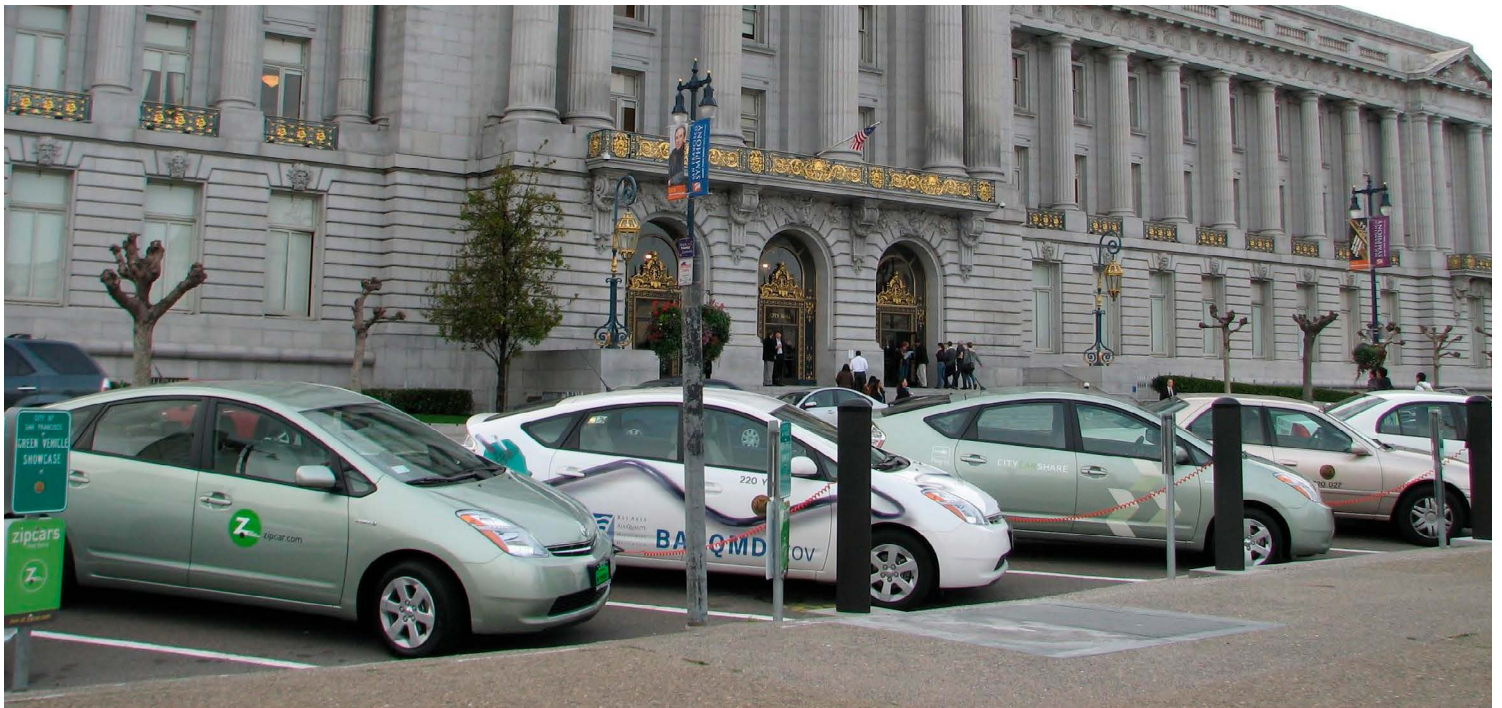


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signals to automakers, consumers, and policymakers that the manufacturing, sales, and adoption of EVs is a priority. Adoption of the LEV and ZEV standards increases both the availability and inventory (stock on hand at dealerships) of clean vehicles in the state — giving consumers more choice and enabling an easier purchase of these clean vehicles without having to go out of state.

DIRECT-SALES LEGISLATION

Direct-sales legislation enables EVs to be available for purchase directly from the auto manufacturer in a state. In some states, only auto dealers are eligible to sell vehicles, which forces companies that only make EVs and not gasoline powered vehicles (such as Tesla) to apply within that state for certification to sell directly to consumers. In addition, some states go a step further and prohibit EV-only manufacturers from servicing the EVs of their customers. The prohibition on direct sales to consumers by manufacturers hurts consumers who want to purchase EVs, as it limits the ability of the consumer to see the EV in a showroom, ask questions, and to do a test drive. Allowing the manufacturers of EVs to sell directly to customers in showrooms (online sales are allowed in every state, similar to Amazon or Carvana) enables these automakers to increase access while still allowing franchised dealers to sell EVs as well.

Colorado: [SB 167](#), which passed in 2019, allows for an exception to the direct-sales prohibition by an original equipment manufacturer (OEM) if that OEM is exclusively

selling EVs. The OEM will still have to obtain a dealer license in order to ensure that consumer protection measures are ensured.

Utah: In 2018, [HB 369](#) was signed into law. The bill created a pathway for EV manufacturers to use a direct-sales model to sell light-duty vehicles by issuing new licenses, permitting direct sales under certain conditions and exempting direct-sale manufacturers from the state's New Automobile Franchise Act.

Wyoming: [SB 57](#) was passed in 2017 and authorized motor vehicle manufacturers without dealerships within the state to adopt direct-sales models.

VEHICLE REBATES AND TAX CREDITS

Increasing purchase incentives for EVs has a significant effect on total EV sales, particularly among lower- and middle-income consumers who may not be able to afford higher upfront costs, even though they will save money on fuel and maintenance. As the price of batteries declines and economies of scale for manufacturing EVs are realized, purchase incentives will no longer be needed. However, EVs are not yet at the mass-market stage and therefore financial incentives help consumers make the switch to driving electric and to narrow that first-price market gap. Many states offer purchase incentives; rebates, particularly when offered at the point of sale, are the most effective. To address equity concerns, some states have set eligibility tiers or limits based on income or vehicle price (MSRP).

[Vehicle Purchase Rebate Template](#)

California: [Clean Vehicle Rebate Project](#) offers rebates for the purchase or lease of qualified battery electric vehicles of up to \$2,000. Qualified plug-in hybrids with a 35-mile range under the EPA Urban Dynamometer Driving Range Schedule (UDDS) are eligible for rebates of up to \$1,000. These rebates are also only available to vehicles with an MSRP of \$60,000 or less and are limited to one rebate per individual. For individuals with [low and moderate incomes](#), rebates are increased by \$2,500 (Reference: California Health and Safety Code [44274](#) and [44258](#))

Colorado: Tax credits are [available](#) for the purchase or lease of light-, medium-, and heavy-duty BEVs and PHEVs. The amount declines over the next few years but is currently at \$4,000 for the purchase of a light-duty BEV or PHEV, and \$2,000 for the lease of a light-duty BEV or PHEV through January 1, 2021.

Connecticut: The Hydrogen and Electric Automobile Purchase Rebate Program ([CHEAPR](#)) offers rebates of \$500 for any PHEV, \$1,500 for a BEV with a range of 200 miles or more, and \$500 for a BEV with a range less than 200 miles. The MSRP cap for BEVs and PHEVs is \$42,000. At the time of purchase or lease, the auto dealership submits an application on behalf of the customer, who has the option to receive the incentive through Electronic Funds Transfer within 10 days of the application being approved.

Delaware: [The Delaware Clean Vehicle Rebate Program](#) provides up to \$2,500 for the purchase or lease of a new BEV, and \$1,000 for a PHEV with an MSRP not to exceed \$60,000; available to businesses, individuals, and government.

New Jersey: The [Charge Up New Jersey](#) program offers a rebate of up to \$5,000 per eligible vehicle for the purchase or lease of a new BEV or a PHEV, with an MSRP of \$55,000 or less. The rebate amount is limited to one per person. The rebate is equal to \$25 per mile of EPA-rated all-electric range; BEVs with a range of 200 miles or more will receive the full \$5,000. The incentive is offered as a “cash-on-the-hood” at a NJ dealership or showroom. (Reference: [P.L.2019, C.362](#))

New York: The [Drive Clean Rebate](#) offers \$2,000 for the purchase or lease of an EV with a range greater than 120 miles, \$1,700 for an EV with a range of 40 to 119 miles, \$1,100 for an EV with a range of 20 to 39 miles. These vehicles must have an MSRP of less than \$60,000. For vehicles with an MSRP of greater than \$60,000, the

program offers a rebate of \$500. These are point-of-sale rebates.

Oregon: The [Oregon Clean Vehicle Rebate Program](#) offers cash rebates at the point of purchase or for the lease for EVs subject to certain criteria established by the Department of Environmental Quality. Rebates will be \$2,500 for new EVs with battery capacities of 10 kWh or greater and \$1,500 for EVs with battery capacities less than 10 kWh, such as PHEVs. Income-qualifying households are eligible for double rebates [stacking rebates] on new vehicles, or can apply a rebate of up to \$2,500 to a used EV. Businesses and governments are also eligible for rebates, and both electric motorcycles and neighborhood electric vehicles also qualify for smaller rebates. All EVs must have an MSRP of \$50,000 or less.

SALES-TAX EXEMPTIONS

For auto dealers, a sales-tax exemption is easy to explain and administer, with no additional steps to take on behalf of the consumer. For the consumer, a sales-tax exemption requires no eligibility requirement and doesn't require the consumer to provide additional cash or a higher loan upfront.

[Sales Tax Exemption Template](#)

New Jersey: A [sales-tax exemption](#) is available for the purchase or lease of battery electric vehicles. See statute: [N.J.S.A. 54:32B-8.55 Sales Tax Exemption – Zero Emission Vehicle](#)

Washington: The [retail sales tax](#) of 6.5 percent will not apply to either the sale or lease of new or used BEVs or PHEVs with a range of at least 30 miles. The vehicle must be sold or valued at \$45,000 or less if the EV is new and \$30,000 or less if the EV is used. The sales and use sales tax exemption is available up to \$25,000, of the \$45,000 purchase price for 2021 and is reduced by \$5,000 every two years thereafter until 2025. See statute: [HB 2042 – 2019/20](#).

USED EV INCENTIVES

Federal, state, and local incentives have lowered the effective purchase price of new EVs, which in turn has lowered the cost of used EVs. There are an increasing number of used-EV incentives, which can take the form of a straight rebate, a “cash for clunker” program, or a reduced charging rate from local utilities. These incentives are important to make EVs even more affordable to historically



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underserved communities and lower-income households. Some incentives cover both new and used vehicles.

California:

- The [Clean Vehicle Assistance Program](#) offers grants and affordable financing at the point of sale to help low-income Californians purchase a new or used EV. Grants are \$5,000 for a used EV, but the used EV must be no more than eight years old with 75,000 miles or less to qualify.
- The [Clean Cars for All program](#) focuses on providing up to \$9,500 through the California Climate Investments (CCI) to lower-income California drivers to scrap their older, high-polluting car and replace it with a new or used BEV or PHEV. The program is limited to vehicle owners residing in participating air districts who meet income and vehicle requirements. The program allows for stacking incentives with the Clean Vehicles Rebate Program if purchasing a new car.
- The [Low Carbon Fuel Standard](#) requires the utilities in California that have opted in to this program to offer a credit back to current and future EV drivers. The credit has ranged from \$50 to \$1,000 depending on the utility, and may be used for the purchase of a used EV.
- Pasadena Water and Power (PWP) [provides rebates of \\$250](#) to residential customers who purchase or lease an eligible new or used EV. An additional \$250 is available

if the EV was purchased or leased from a Pasadena dealership. Customers participating in PWP's income-qualifying programs may also qualify for an additional \$250 rebate, for a total of \$750.

Florida: The Orlando Utilities Commission provides [rebates of \\$200](#) to residential customers who purchase or lease an eligible new or used EV. Applicants must apply within six months of the purchase or lease of the EV.

New Hampshire: The [New Hampshire Electric Co-op](#) offers rebates of \$1,000 for the purchase or lease of a new or used BEV, and \$600 for the purchase or lease of a new or used PHEV, plug-in hybrid.

Oregon: [Clean Vehicle Rebate Program](#): Low- and moderate-income households may qualify for the Charge Ahead program, which offers a rebate of \$2,500 for the purchase or lease of a new or used BEV or PHEV. All EVs must have an MSRP of \$50,000 or less.

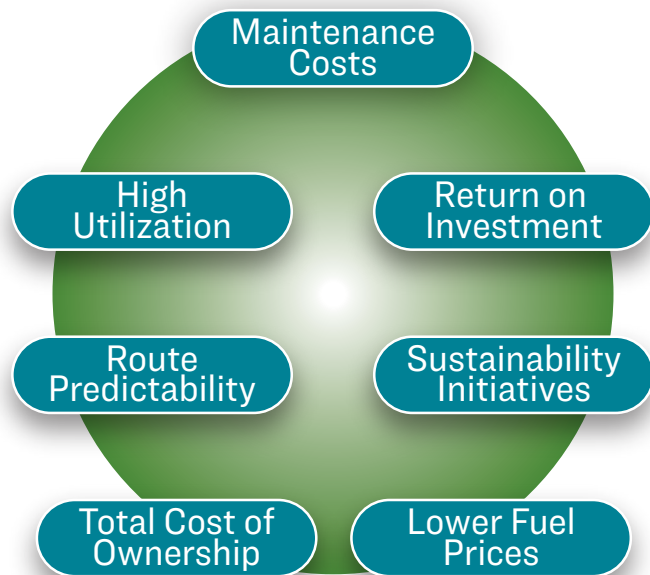
Pennsylvania:

- Duquesne Light Company offers [a rebate of \\$1,000](#) to DLC customers for the purchase or lease of a used BEV or PHEV.
- The state [Alternative Fuel Vehicle rebate](#) offers \$750 for “one-time preowned” BEVs and \$500 for a “one-time preowned” PHEV with less than 75,000 miles.

Washington: The [retail sales tax](#) of 6.5 percent will not apply to either the sale or lease of used BEVs or PHEVs with a range of at least 30 miles. See statute: [HB 2042 – 2019/20](#).

PUBLIC AND PRIVATE FLEET INCENTIVES

Fleets play an important role in moving the EV market forward by providing greater scale and visibility. This includes both public and private fleets ranging from light-duty to medium- and heavy-duty vehicles. Additionally, fleets provide an opportunity for early EV adoption; while high upfront costs can be difficult for individual customers to manage, fleet managers are much more interested in the total cost of ownership (TCO) of their vehicles. Given the lifetime cost savings of EVs due to low and predictable energy and maintenance costs, fleet managers are much more willing to take on higher upfront costs knowing they will recoup the cost and save money in the long run. To kickstart fleet adoption, a number of incentive programs have launched to reduce risk for early adopters to create proof-of-concept applications for fleet EVs.



California:

- [The Public Fleet Pilot Project \(statewide\)](#): Rebate for state and local government entities for the purchase or lease of a BEV or PHEV. BEV rebates are \$2,000, or in areas of a disadvantaged community, \$4,500. PHEV rebates are \$1,000, or in areas of a disadvantaged community, \$3,500. (Reference: California Health and Safety Code [44274](#) and [44258](#))

- [The Car Sharing and Rental Fleet Project](#) (Statewide): Rebate of up to \$4,500 for the purchase or lease of an EV for car sharing and rental fleets, up to 20 vehicles annually.
- [Alameda County was able to capture the Federal Electric Vehicle Tax Credit](#), which grants a tax credit between \$2,500 and \$7,500 per new EV purchased. Although not popularly used aside from retail purchases of EVs, the credit can be claimed “by the seller of a qualified plug-in electric drive motor vehicle... to a tax-exempt organization, [or] government unit...” and passed on to state or local agencies.

Colorado: The [Alt Fuels Colorado program](#) incentivizes the replacement and scrappage of pre-2009 vehicles with BEVs. Funds are available to all public, private and nonprofit fleets within Colorado. Vehicles will be funded at 110 percent of the incremental cost difference between a comparable new diesel piece of equipment and the new BEV.

New York:

- The [New York Truck Voucher Incentive Program \(NYTVIP\)](#) offers a voucher, or discount, for the purchase or lease of BEV or PHEV trucks, transit buses, school buses, or shuttle buses. Voucher amounts are based on a percentage of the incremental cost of the vehicle, which is the difference in cost between the BEV or PHEV and a comparable diesel vehicle, up to a per-vehicle cap.
- The [NY Vehicle Marketplace](#) allows state agencies and local governments to acquire vehicles, including BEVs and PHEVs, of all types and sizes (Class 1-8) — excluding school buses and transit buses — from a variety of vehicle dealers on contract under award [23166](#) by having the state Office of General Services (OGS) post its vehicle needs (a mini-bid) for vehicle dealers on contract to respond to. This means there are more types of vehicles and manufacturers available on contract to compete for business, resulting in competitive pricing. Some dealerships also offer lease vehicles.
- The [Municipal ZEV Rebate program](#) offers rebates to cities, towns, and local communities for the purchase or lease of BEVs and PHEVs for fleet use. EVs with a range of 51 miles or more are eligible for a rebate of \$5,000, while EVs with a range of 10 to 50 miles are eligible for \$2,500.

HOV LANE ACCESS

Programs that allow EVs to use highway lanes designated for high-occupancy vehicles (HOV lanes) are an important element in the suite of policies that promote vehicle electrification. HOV lane access can save drivers an hour or more a day through reduced commute times, thus serving as a powerful driver of EV purchases.

[HOV Lane Access Template](#)

Arizona: BEVs qualify for HOV lanes at any time, regardless of the number of passengers, as long as the BEV has the [alt fuel vehicle license plate](#). See statute: [28-2416. Alternative fuel vehicle special plates; stickers; use of high occupancy vehicle lanes; definition](#).

California: Legislators [extended](#) the HOV access perk to low-income people who buy used cars with expired decal stickers.

Florida: Plug-in EVs are eligible for the HOV lane with [Florida's HOV decal](#). Use of the I-95 express lane requires [another specific decal](#) from South Florida Commuter Services. Statute: [316.0741. High Occupancy-Vehicle Lanes](#).

Georgia: EVs are [eligible for the HOV lane](#) with the [correct license plate displayed](#). See statutes: [Georgia Code 32-9-4, 40-2-86.1, and 40-6-54](#)

Hawaii: EVs are [eligible for the HOV lane](#) with the [correct license plate](#) displayed. See statute: [SB 2746 CD-1 A Bill for an Act Relating to Electric Vehicles](#).

New Jersey: EVs are [eligible for the HOV lanes on the NJ Turnpike](#). See statute: [New Jersey Administrative Code 19:9-1.24](#)

ZERO- AND LOW-INTEREST LOANS FOR CONSUMERS

Financing programs can help lower-income customers purchase cars. Now, some financing programs are offered solely to purchase EVs, offering low- or even zero-interest loans.

California: The [Clean Vehicle Assistance Program](#) is administered by the Beneficial State Foundation (BSF) and offers low-income Californians grants of up to \$5,000 for an EV and affordable financing opportunities (≤ 8 percent interest); including up to \$2,000 for a Level 2 home charger installation for eligible vehicle purchases or a \$1,000 prepaid charge card and a free portable Level 1 charger.

Washington: The [EVs for EVERYONE program](#) is offered to Washington residents through a partnership between Plug In America and the Express Credit Union. Loans to purchase a new EV are as low as 3.24 percent, while loans to purchase a used EV are as low as 3.49 percent. Applicants also receive a free annual membership to the Plug In America toll-free support line, and have optional access to an experienced EV owner as a mentor to assist in the car-buying process.

POLICIES TO ELECTRIFY LIGHT-DUTY VEHICLE AND BUS FLEETS

EXECUTIVE ORDERS FOR FLEETS AND BEYOND

Executive orders are a powerful tool for driving transportation electrification. Governors have used executive orders to highlight and facilitate electrification, both of state-government fleet vehicles and across the transportation sector. Many executive orders establish fleet mandates and incentives requiring a fixed percentage or growing share of new vehicle purchases to be hybrid, electric, and/or alternative fuel vehicles. Other executive orders support electrification by requiring improvements in the fleet's overall fuel economy or other mechanisms to reduce state-wide transportation emissions. Ideally, these mandates and programs focus on easing adoption barriers for battery electric and plug-in

hybrid vehicles. Mayors also have issued executive orders to help push local fleet electrification.

Advocating for electrification of fleets owned or leased by states or cities is an effective way to put the importance of prioritizing clean transportation into the public spotlight and raise visibility. Because electricity is significantly less expensive than gasoline per mile, and because EVs require much less service, EVs save taxpayers money. The city of Seattle [determined](#) it would save \$2 million over 10 years if it purchased 300 Nissan LEAFs instead of hybrids for its passenger vehicles, and save more than \$3 million compared to gasoline vehicles.

[State Fleet Mandate Template](#)



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California:

- By 2030, state entities will work with the private sector to put at least 5 million zero-emission vehicles on California roads, spur the construction of 250,000 zero-emission vehicle chargers (including 10,000 DC fast chargers) by 2025, and continue to partner with regional and local governments to streamline the zero-emission vehicle infrastructure installation process wherever possible. ([Executive Order B-48-18](#))
- In July 2020, the California Air Resources Board passed the [Advanced Clean Truck \(ACT\) Standard](#), which requires a given percentage of truck manufacturers' sales be battery electric or fuel cell beginning with model year 2024. The policy will apply to manufacturers of at least 500 trucks annually. The ACT rule is estimated [to bring 100,000 electric trucks to California roads by 2030 and 300,000 by 2035](#). CARB also signaled that it is firmly committed to achieving a complete turnover — 100 percent — from diesel to zero-emission in medium- and heavy-duty vehicles by 2045, and earlier in certain market segments such as drayage trucks, refuse trucks, and government fleets.

Colorado: To accelerate the adoption of electric vehicles, [Executive Order B 2019 002](#) mandates the creation of a transportation electrification task force to develop and

implement state-wide strategies, develop a state zero-emissions vehicle program, and directs the Colorado Department of Transportation to develop a plan to align transportation investments with strategies that support widespread deployment of ZEVs. Under a revised statute, the gross vehicle weight rating limits for alternative fuel vehicles are 2,000 pounds greater than comparable vehicles. This helps electric trucks be competitive with conventionally fueled vehicles given electric trucks require large and heavy batteries to meet their use case. ([Colorado Revised Statutes 42-4-508 and 25-7-106.8](#))

New York City: New York City's [Executive Order 53](#) (2020) sets a citywide goal of transitioning the city's entire fleet to 100 percent all-electric and carbon neutral by 2040. The order also requires the Department of Citywide Administrative Services and NYC Fleet to issue and implement a Clean Fleet Transition Plan, to be updated every two years. The order also has similar provisions for improving fleet safety and cooperation across agencies, and for improving sustainability and safety communications with other New York City public, private, and nonprofit fleets.

North Carolina: [Executive Order 80](#) (2018) is a statewide commitment for North Carolina to reduce greenhouse gas emissions to 40 percent of 2005 levels and includes

two transportation initiatives. First, the Department of Transportation and the Department of Environmental Quality will collaborate on a ZEV Plan to increase registered ZEVs in the state to at least 80,000 by 2025 by establishing ZEV corridors and supporting the development of EV charging equipment. Second, all cabinet agencies shall prioritize the purchase, lease, and use of ZEVs where feasible.

Oregon:

- All state agencies are required to lease or purchase ZEVs for at least 25 percent of new light-duty vehicles to the greatest extent feasible. For vehicle classes where ZEV procurements are not feasible, state agencies may acquire alternative fuel vehicles so long as such use is economically and logistically possible. ([Oregon Revised Statutes](#) 283.327, 283.337, 267.030; [Executive Order](#) 20-04, 2020)
- Oregon Department of Energy, Department of Transportation, Public Utility Commission, Department of Environmental Quality, and Department of Education must develop tools and provide assistance to school districts about using zero-emission bus options when replacing school buses. Similarly, ODOT, ODOE, PUC, and ODEQ must develop tools and best practices to help transit agencies when making decisions about using zero-emission buses. ([Executive Order](#) 17-21, 2017)

Pennsylvania: [Executive Order 2019-01](#) (2019) requires all state agencies to replace 25 percent of their light-duty fleets with PEVs by 2025 and evaluate opportunities for both vehicle-miles-traveled reduction and incorporation of new technology. Agencies must collectively reduce overall energy consumption by 3 percent per year and reach 21 percent reduction from 2017 levels by 2025.

Rhode Island: [Executive Order 15-17](#) (2015) requires that at least 75 percent of state motor vehicles be alternative fuel vehicles and the remaining 25 percent be hybrid electric vehicles to the greatest extent possible. By 2025, 25 percent of state motor vehicles must be zero-emission vehicles.

Virginia: [Governor Ralph Northom announced](#) that Virginia will spend \$14 million on 17 new electric buses throughout the state.

Washington: All state agency-owned vehicles are required to use 100 percent biofuels or electricity to the extent practicable and must prioritize both the leasing/purchasing of EVs for new procurements and the use of EVs for all trips.

For medium- and heavy-duty vehicles without EV model options, agencies must prioritize cost-efficient and low-emission options. ([Revised Code of Washington](#) 43.19.647 and 43.19.648; [Executive Order](#) 18-01, 2018)

TRANSIT BUS FLEET UPGRADE COMMITMENTS

Transit agencies across the country are [committing](#) to switch from fossil fuel powered transit bus fleets to fully electric buses, with transit authorities in 45 states operating or adopting electric buses. While the upfront cost of electric buses are higher than the cost of diesel buses, the total cost of ownership is far lower than that of diesel or compressed natural gas (CNG) buses. Studies show electric buses are up to eight times more [efficient](#) than compressed natural gas buses. An overview of the full environmental, public health, and economic benefits of electric buses is [here](#).

California: The California Air Resources Board passed the [Innovative Clean Transit Rule](#), which sets a statewide requirement for public transit agencies to transition to 100 percent zero-emission bus fleets by 2040, with all new purchases being electric by 2029. The 200 transit agencies across the state will play a pivotal role in reducing emissions by transitioning the state's more than 12,000 buses to zero-emission technology.

Chicago: The Chicago City Council passed a [resolution](#) to transition the Chicago Transit Authority (CTA) to fully electrify its bus fleet by 2040.

Los Angeles and Southern California: Along with adding 95 electric buses to its fleet, L.A. County Metro has [committed](#) to a fully 100 percent-electric transit bus fleet by 2030, replacing 2,200 natural-gas-powered buses. The 2017 council motion can be [found here](#). Transit agencies in Antelope Valley, the city of Los Angeles, Santa Barbara, Santa Monica, and San Bernardino County have also committed to all-electric buses by at least 2030.

New York City: [A report released before the announcement](#) by New York City Environmental Justice Alliance found 75 percent of bus depots in New York City are located in communities of color. It noted that fossil-fuel-powered buses emit air pollution linked to respiratory distress, asthma, and hospitalization for people of all ages. Soon after, the city of New York also announced its commitment to fully transition over 5,000 buses to be fully electric by 2040.

Seattle: The King County Metro Transit has [purchased](#) 40 battery electric buses, and plans to purchase 80 more by the end of the year. Metro Transit also completed a [report](#) detailing the feasibility of transitioning to a completely zero-emission carbon-neutral bus fleet by 2034. The report prioritizes the equitable distribution of benefits and the need to avoid negative impacts on communities overburdened by pollution in the metro area.

SCHOOL BUS ELECTRIFICATION POLICIES AND PILOTS

There is an emerging opportunity for the electrification of the roughly 480,000 buses that make up the US school bus fleet, of which some [95 percent currently run](#) on diesel fuel. Not only do electric school buses offer lifetime fuel and maintenance savings of [up to \\$170,000](#), they also offer significant environmental and public health benefits over school buses powered by fossil fuels. [A recent report](#) outlined many of these benefits, including reduced greenhouse gas emissions, lower student exposure to air pollution, and even improved test scores.

One of the main challenges to deploying electric school buses is the higher upfront cost for school districts, which are typically on a tight budget, though rapidly declining



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battery prices will help close the gap in the near future. The highly predictable use and significant downtime of school buses opens the door for cost sharing with electricity suppliers, and electric utilities are in the early stages of piloting the use of rate payer funds to assist school districts with purchase costs as part of broader resiliency efforts whereby the vehicle batteries could be used as grid assets when buses are not in service. Additionally, through the VW settlement funds, states have access to funds from the Environmental Mitigation Trust, which can be used to procure electric school buses. Currently, 29 states have either committed to or are likely to use some portion of their funds toward purchasing zero-emission buses. See the section on VW Settlement Funds for specific examples.

Twin Rivers, California: The Twin Rivers Unified School District Transportation Department was one of the first districts in the nation to deploy electric school buses in its fleet. In 2017, the first six of 30 buses began transporting students. The district reported the electric school buses have [reduced fuel costs by about 80 percent](#), and it hopes to further improve the total cost of ownership by taking advantage of vehicle-to-grid capabilities once the technology is ready. The acquisition is funded in part by the California Climate Investment grant, a local utility grant, and a local carbon reduction fund. The district plans to shift to an entirely alternative fuel fleet moving forward.

Virginia: [Dominion](#) will partner with Virginia school districts to accelerate electric school bus procurement. Dominion will provide financial assistance to school districts to offset the additional costs of an electric school bus (and charging infrastructure) above a standard diesel school bus. In return, Dominion, using vehicle-to-grid technology, will use the electric school buses when not in use as additional energy storage to support integration of distributed renewable energy. The initial phase will begin with 50 buses, while phase two would expand the program to a total of 1,000 buses by 2025.

White Plains, New York: In 2018, [White Plains School District](#) began an electric school bus pilot program with five buses, which are owned and operated by National Express, the district's contractor for student transportation. The pilot is financially supported by the New York State Energy Research and Development Authority and Con Ed. In return for Con Ed's support to offset the purchase of the electric buses, Con Ed has the right to use the bus batteries for its vehicle-to-grid program to support the electrical grid during the summer months when school is not in session.

USING VW SETTLEMENT FUNDS FOR ELECTRIFYING SCHOOL BUSES AND TRANSIT BUSES

Between 2006 and 2015, [Volkswagen](#) (VW) cheated on emissions tests on 500,000 of its diesel cars in the US, which [spewed](#) up to 40 times the legal limit of pollution while driving. Pollution from these vehicles contributed to high levels of smog, which is [known](#) to cause respiratory illnesses such as asthma and other health problems. Under the VW settlement terms, the automaker must [pay](#) more than \$15 billion in fines and clean air payments, including upwards of \$3 billion in funds distributed among all 50 states, the District of Columbia, Puerto Rico, and Tribal governments, to help mitigate the excess pollution it caused, as well as \$2 billion to be spent by Electrify America on EV infrastructure and advertising programs. The VW settlement provides a well-funded springboard for states to, among other things, replace fossil-fueled transit and school buses with clean [zero-emission buses](#).

Every state faces the challenge of choosing how best to spend the funds granted by the VW settlement. See [here](#), for research and advocacy resources provided by the Sierra Club on the advancement of zero-emissions public bus fleets. At the time of this report, there are still investment cycles remaining for the VW Settlement funding, and opportunities still exist for modifications to be made to each state's beneficiary plan, which details how the money should be spent. States can still opt to use their funding for electric bus adoption. Below are some examples of model mitigation plans that incorporate investments in zero-emission bus fleets.

Colorado: [The state has awarded \\$14 million](#) to six state transit agencies to replace diesel-gas buses with 24 new electric buses throughout the state

Ohio: The state will [allocate](#) \$3 million toward an electric school bus pilot project to demonstrate the viability of electric school bus fleet technology that produces no direct emissions under all possible operational conditions.

Rhode Island: The state has [announced](#) that an impressive 75 percent of its \$14.3 million in settlement funds will be spent on replacing 20 diesel-powered transit buses with electric zero-emission buses, and that environmental justice principles will be considered when deciding the routes of these new buses.

Tennessee: [The state has awarded \\$5.7 million](#) to three transit authorities to replace nine diesel transit buses with six all-electric and three diesel-hybrid buses. This marks the state's second grant program funded by VW settlement funds. The first, awarded in 2019, provided \$8.4 million in funding to 37 grantees to support school bus replacement projects across Tennessee.

Vermont: Funded by an [\\$18.7 million share of VW settlement funds](#), the state will coordinate a two-year [Electric School and Transit Bus Pilot Program](#) to demonstrate the feasibility of electric buses on Vermont's rural roads and viability as a reliable, cost-effective option. Vermont's allocation for the pilot program was adjusted in 2019 due to updated estimates in project costs and bus quantities.

Virginia: The state has [announced](#) it will dedicate \$20 million from the VW Trust to fund a new initiative to accelerate deployment of electric school buses. Virginia currently has approximately 3,500 diesel school buses in operation that are older than 10 years, 500 of which use engines built before the first EPA diesel-emissions standards. Public schools may be reimbursed up to \$265,000 for each electric school bus, including charging infrastructure.

Washington: [The state's Department of Ecology announced that \\$12 million from VW settlement funds](#) would be used to purchase 40 new, zero-emission electric school buses and charging infrastructure. In 2018 and 2019, the department awarded similar grants to transit agencies to purchase a total of 66 electric transit buses.

POLICIES TO INCREASE AVAILABILITY OF CHARGING INFRASTRUCTURE

Owners of gas-powered vehicles have many options when it comes to choosing gas stations, but for people who drive electric cars, fueling happens differently—whether it's at home, at work, or on the go. That's why, as the growth of electric mobility continues to gain momentum, the need for large-scale charging networks is becoming even more pressing. Just as there are many stakeholders and policy pathways on the journey to expand EV charging and remove institutional barriers, so are there unique needs and challenges that face our communities when it comes to charging EVs. Below are several options to address them.

[Building Codes for EVs Template](#)

Electric Vehicle Supply Equipment (EVSE)
[Installation at MUDs Template](#)

[Right-of-Way Charging Template](#)

CORRIDOR PROGRAMS

Highway corridors with access to DC (direct current) fast chargers¹ are an important element of achieving widespread adoption of electric vehicles. Such corridors are key to enabling long-distance driving and reducing range anxiety.

[Legislation](#) to create national corridor designations for electric vehicle charging was passed in 2015 to improve the mobility of EV users. The Federal Highway Administration (FHWA) was tasked with establishing these corridors to promote the build-out of a national network, ensure strategic development of charging infrastructure, and develop national signage. Since then, there have been several efforts to build out regional corridors, including:

Nevada Electric Highway: The [Nevada Electric Highway \(NEH\)](#) began as a partnership between the Governor's Office of Energy, NV Energy, and Valley Electric Association to expand the state's EV charging infrastructure on the route between Reno and Las Vegas (US 95). Charging site hosts are provided incentives and must install two Level 2 charging stations and one direct current fast charge (DCFC). In the second phase of the project, the site host must install two charging stations, but with the option to have both be DCFC.

Northeast Corridor Regional Strategy: Northeast States for Coordinated Air Use Management collaborated with regional stakeholders to create a Northeast corridor

strategy stretching from Maine to the District of Columbia.

[The strategy](#) provides guidance and recommendations to ensure a strategic integration of public and private infrastructure investments to build out a comprehensive charging network for the region.

Regional Electric Vehicle West (REV West): [REV West](#) is a memorandum of understanding (MOU) signed by governors from eight states (Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming) to create an Intermountain West Electric Vehicle Corridor. Through the MOU, states will collaborate on the location and support the build-out of DC fast-charging infrastructure to create a network that will enable EV drivers to move throughout the region on major transportation corridors. The MOU was re-signed by newly elected governors in 2020 to reaffirm support.

West Coast Electric Highway: Led by Washington State's Department of Transportation, the [West Coast Electric Highway](#) is a collection of projects, funding sources, and partners with a shared vision to provide DC fast chargers every 25 to 50 miles. The projects focus on Interstate 5, Highway 99, and other major roadways from British Columbia through California. Other major partners include Oregon's Department of Transportation, a California interagency group, and Plug In BC.

CHARGING INFRASTRUCTURE FUNDING AND FINANCING

Rolling out public EV charging infrastructure is a key action for EV adoption, both to enable users to drive further and to support EV access for vehicle owners who do not have access to a dedicated parking spot (either at home or work). As states and localities confront greatly diminished budgets due to the drop in revenues caused by the COVID-19 pandemic, innovative financing methods and funding sources can play an elevated role in developing charging infrastructure to support the growth of EVs. States and localities should also monitor the status of potential federal stimulus support targeting this sector, including through some of the programs described below.

Alternative Fuel Infrastructure Tax Credit: EV charging equipment is eligible for a tax credit of 30 percent, not to exceed \$30,000.

¹ Direct current fast charging refers to a high-speed electric vehicle charging station with a power output of 50 kilowatts or more.

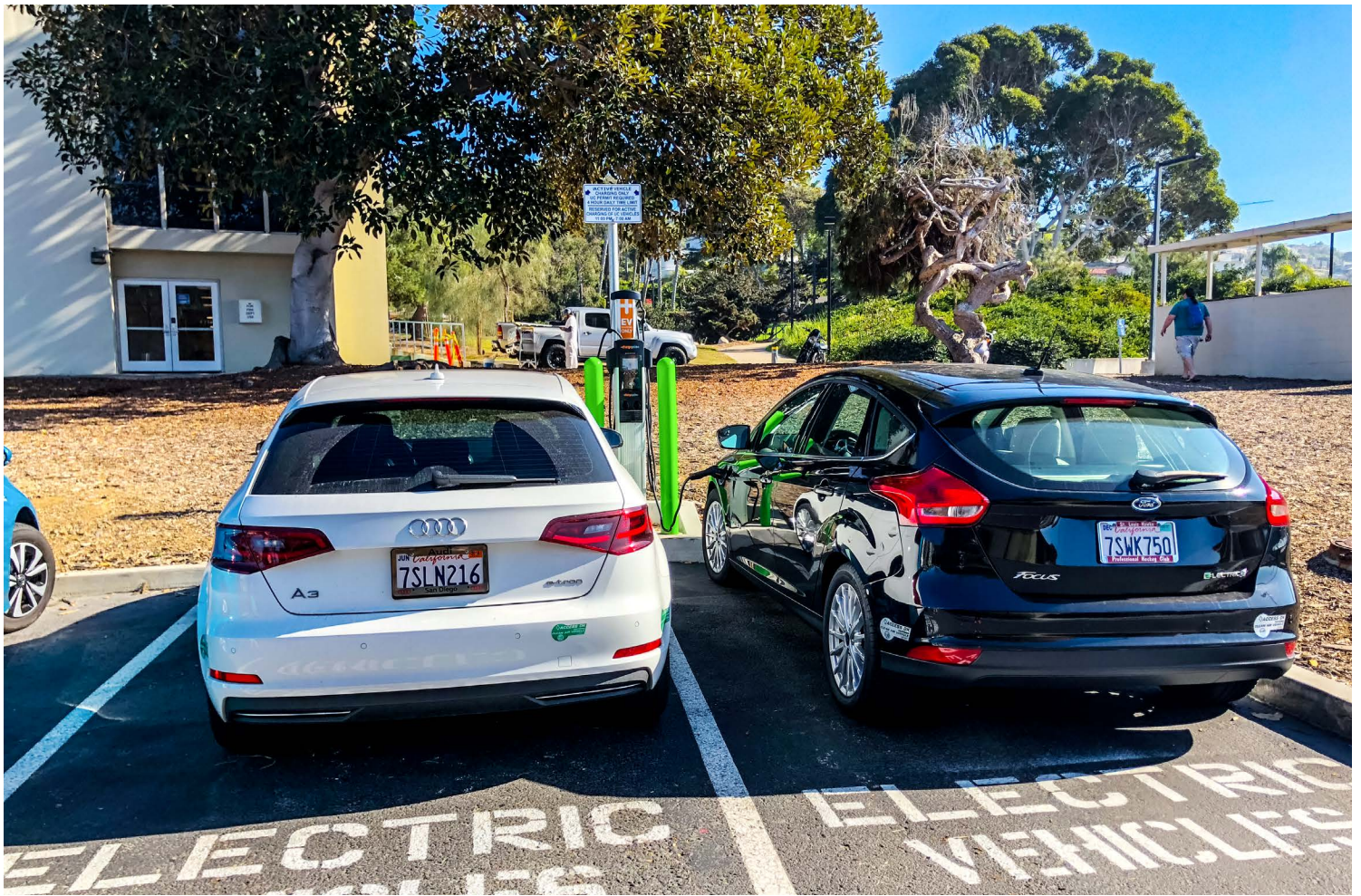


PHOTO CREDIT: ISTOCK.COM/ANOUGHKA

Carbon Credit Markets: Revenue generated from programs like the Regional Greenhouse Gas Initiative could be redirected to EV charging equipment. For example, New York State Energy Research and Development Authority has used [RGGI funds \(PDF\)](#) to support installation of EV chargers as a part of the Charge NY Initiative. Alternatively, certifying the reduction in greenhouse gas emissions from EVs that are powered by charging infrastructure versus conventional vehicles would create a pathway for operators to generate carbon credits. Operators could then sell these credits for an additional revenue stream and improve return on investment.²

Congestion Mitigation and Air Quality (CMAQ) Funds: Establishment of EV chargers and related infrastructure is eligible for funding under [CMAQ](#) if the facility is publicly owned or leased.

FHWA: Funds from the [Surface Transportation Block Grant Program](#) and [National Highway Performance Program](#) can be used for EV chargers in association with truck parking facilities as well as fringe and corridor parking facilities.

² For more information, see the Electric Vehicle Charging Carbon Coalition's [factsheet](#).

State investment banks can also use funds from these programs to offer loans and credit enhancement products.

Office of Energy Efficiency and Renewable Energy (EERE): The Department of Energy's EERE has two [funding opportunities](#) for EV charging infrastructure: the Clean Cities Program and the [State Energy Program](#). To receive funding, applicants must apply for open, competitive grants.

Low Carbon Fuel Standard (LCFS): LCFS programs could promote EV charger deployment by altering how operators generate credit revenues and improve investor return on charger investments, such as the introduction of capacity-based credits. Under California's amended LCFS [program](#), operators of EV DC fast chargers are awarded credits based on the capacity of the charger, rather than how much electricity has been supplied. In doing so, credit revenue for operators becomes significantly more predictable and reduces investor risk.

Pooled Procurements: Using collective bargaining power, cities, states, and private entities could participate in a bulk purchase of EV chargers to reduce costs. The Metropolitan Planning Council, which services the Boston metro area,

completed its second [EV charger group buy](#) program in March 2019. Eight cities and towns participated, and the collective was able to secure discounts on several different types of chargers. The [Electrification Coalition](#) co-hosts a purchasing collaborative for the Climate Mayors program that has supported thousands of purchases for light- to heavy-duty EVs.

VW Settlement Funds: Each state may designate up to 15 percent of its allocated environmental mitigation trust funds to acquiring, installing, operating, and managing EV chargers for light-duty vehicles. It should be noted these funds cannot be used to secure real estate or for other capital costs. There are [37 states](#) that have committed to allocate the full 15 percent to light-duty EV charging infrastructure projects.

(Commercial) Property Assessed Clean Energy (C/PACE): In most jurisdictions, EV charging equipment is eligible for PACE program financing. For example, the city of [Dublin, California](#), has partnered with a number of organizations to offer PACE financing for electric vehicle chargers.

Green Bonds: While there is no single standard for “green” bonds, they all are debt issuances used to finance investments in projects with perceived positive effects on climate and the environment. Financial institutions and corporations play a significant role in issuing green bonds (in 2017, Fannie Mae was recognized as the [largest issuer of green bonds](#) in the world, issuing over \$27.6 billion), but government agencies too can benefit from issuing municipal green bonds to raise funds. Transportation projects represent [the second-largest sector](#) in the green municipal market, and EV charging infrastructure should be included in [future debt-financed projects](#).

Loan Programs Office: One of the biggest barriers to early deployment of EV charging infrastructure is a lack of investor confidence in new technologies with unproven business models. Loan guarantees, like those offered by the Department of Energy’s [Loan Programs Office](#), can help reassure lenders to participate in projects and development of EV charging infrastructure. The [California Capital Access Program](#) has similar loan guarantees and encourages borrowers by offering up to a 15 percent rebate of the loan amount.

On-Bill Financing (OBF): OBF has been used to finance a number of energy-efficiency projects. It allows a utility to take on the upfront costs of these upgrades and is repaid

on the consumer’s utility bill. Housing developers can also engage with their electric utility to spread the cost of charging infrastructure across multiple tenants. [First Southwest Bank and La Plata Electric Association](#) recently added EV chargers to their list of projects eligible for OBF.

Revolving Loan Funds: Typically, low-interest revolving loan funds provide a source of capital that governments can loan. In a revolving loan fund, as loans are repaid the capital is reloaned to fund new projects. Washington State’s Department of Commerce has an [Energy Revolving Loan Fund](#), and transportation electrification projects are eligible.

EV-READY WIRING CODES AND ORDINANCES

EV-ready Building Codes are one of the most effective and low-cost strategies for states and local governments to encourage the adoption of electric vehicles. More than [half](#) of all vehicles today do not have reliable access to a dedicated off-street parking space at an owned residence. Overcoming this charging-access shortfall requires a greater focus on expanding charging access to larger structures such as multifamily unit dwellings, workplaces, and commercial properties. Numerous studies have shown that EV-ready building codes support this expansion and can save consumers [thousands](#) in installation costs.

A growing number of cities and states are announcing commitments, adopting building codes, and passing ordinances requiring that new homes, buildings, and parking structures be “EV-ready” — having the conduit and wiring in place to accommodate EV charging. These cities have found significant regulatory, environmental, and financial benefits from the implementation of EV building codes. The regulatory benefits include greater clarification as to where land uses are permitted to streamline the installation of infrastructure that serves a public purpose and captures public value in this infrastructure. Environmentally, these codes can help to support the goals of climate action plans and carbon emission reduction goals, executive orders regarding emissions, and other environmental policies. The financial benefits are substantial, as numerous studies have shown that it is more difficult and more expensive to retrofit existing buildings. A 2018 [report](#) by the California Air Resources Board describes ways to avoid retrofitting costs; these after-the-fact costs average around \$7,000 to \$8,000 per parking space, not including the electric vehicle supply equipment. Instead, installing EV-friendly wiring at the time of construction can be 64 to 75 percent less

expensive than post-construction installations, according to some [studies](#).

There are three categories of “EV-ready” wiring:

- 1. EV-Capable:** Foundational electrical capacity is installed but still lacks a conduit connected to an electrical outlet with the required voltage and amperage. There is electrical panel capacity and space to support a minimum 40-ampere, 208/240-volt branch circuit for each EV parking space, and the installation of raceways, both underground and surface mounted, to support the EVSE.
- 2. EVSE-Ready Outlet:** Electrical capacity and other necessary infrastructure are installed and “ready” for charging stations when demand increases. A designated parking space is provided with one 40-ampere, 208/240-volt dedicated branch circuit for EVSE servicing electric vehicles. The circuit shall terminate in a suitable termination point such as a receptacle, junction box, or an EVSE, and be located in close proximity to the proposed location of the EV parking spaces.
- 3. EVSE-Installed:** Fully operational fast-charging stations are connected to 240-volt charging outlets with the required electrical capacity to support them. Often predicated by a certain percentage of fully operational charging stations that are set by official government agencies or developed by private organizations that have received regulatory approval.

1. EV-CAPABLE
Install electrical panel capacity with a dedicated branch circuit and a continuous raceway from the panel to the future EV parking spot.
Aspen, CO: 3% of parking is EV-Capable (IBC)
Atlanta, GA: 20% is EV-Capable (Ordinance)

2. EVSE-READY OUTLET
Install electrical panel capacity and raceway with conduit to terminate in a junction box or 240-volt charging outlet (typical clothing dryer outlet).
Boulder, CO: 10% of parking is EV-Ready Outlet

3. EVSE-INSTALLED
Install a minimum number of Level 2 EV charging stations.
Palo Alto, CA: 5 to 10% of parking is EV-Installed

SOUTHWEST ENERGY EFFICIENCY PROJECT

EV Capable:

- International Code Council (ICC):** The ICC approved changes to the [International Energy Conservation Code 2021](#), which sets guidelines for new homes to be “EV-capable” with installed panels, outlets, and conduits capable of charging EVs. For single-family homes, the guidelines call for EV-capability for at least one full-size

EV. For multiunit dwellings, the guidelines call for EV-capability for two spots. These changes will be available for adoption as part of the 2021 International Codes. States or municipalities typically take at least six months to decide whether to adopt the latest standards.

- Atlanta:** The city council passed [ordinance 17-O-1654](#), which requires that all new residential homes and public parking facilities accommodate EVs. The ordinance requires that 20 percent of the spaces in all new commercial and multifamily parking structures be EV-ready and that all new development of residential homes be equipped with the infrastructure needed to install EV charging stations, such as conduit, wiring, and electrical capacity.
- Seattle:** A [law](#) signed by Seattle mayor Jenny Durkan mandates that all new buildings with off-street parking constructed in the city have the necessary wiring to be considered “EV-ready.” This includes single-family homes, multiunit dwellings, and parking structures.
- Massachusetts:** The Massachusetts Board of Building [Regulations and Standards](#) recently adopted a (very modest) [requirement](#) for new commercial construction to include one dedicated EV parking space in lots with 15 or more spaces.
- Oregon:** The Oregon Department of Consumer and Business Services enacted a building code, [918-020-0380 Electric Vehicle Ready Parking](#), requiring new construction of parking facilities with 50 or more open parking spaces to ensure that a minimum of 5 percent of parking spaces are EV-capable for future installation of electric vehicle charging stations.

EVSE-Ready Outlet:

- Chicago:** The city council approved the [Electric Vehicle Supply Equipment-Ready, or EVSE-Ready, ordinance](#), which requires that new residential construction consisting of at least five units have at least 20 percent of parking spaces be EVSE-ready. For commercial properties with at least 30 on-site parking spaces, 20 percent need to be EV-ready. In addition, for all applicable properties, at least one of the EV-ready spaces must be accessible to people with disabilities. EV-ready includes either “EVSE-Ready” or “EVSE-Installed.” Required infrastructure for either standard includes the design load placed on electrical panels and service equipment to support the additional electrical demand, the panel capacity to support additional feeder/branch circuits, and wiring.



PHOTO CREDIT: ISTOCK.COM/MARIOGUTI

- **San Francisco:** Since January 2018, the [Electric Vehicle Readiness Ordinance](#) has required all [new residential and commercial buildings to configure 10 percent of parking spaces](#) to be “turnkey ready” for an EV charger installation, and an additional 10 percent to be “EV flexible” for potential charger installations and other upgrades. The remaining 80 percent of parking spaces will be “EV capable,” ensuring conduit is run in the hardest-to-reach areas of a parking garage to avoid future cost barriers.
- **Boston:** The city of Boston recently passed a [policy requirement](#) that all new developments that trigger the Transportation Access Plan Agreement (TAPA) process or that are located within a Parking Freeze zone, shall have 25 percent of parking spaces be EVSE-installed, and the remaining 75 percent of parking spaces shall be EV-Ready for future installation, to the maximum extent. This policy applies to any [Article 80](#) development receives Boston Planning and Development Agency Board approval after March 7, 2019, and to any development that submits a parking freeze permit application to the Air Pollution Control Commission after March 20, 2019. The policy allows for flexibility by allowing an EVSE-Installed Requirement Equivalence. Each parking spot is equal to one point and may be offset by Level 1 Chargers, Level 2 Chargers, DCFC - 50kw, DCFC 50kw - 125kw, DCFC - 125-150kw, EV Carshare, and Electric Bike Parking amenities. Level 2 EVSE is the baseline charger for this weighted ratio and is equal to one point per connector, which is consistent with existing EV ordinances in other jurisdictions.
- **Boulder County, Colorado:** The Boulder Board of County Commissioners approved an amendment, [Section K111.4 Electric vehicle charging receptacle outlets](#), to city building codes that requires EV-ready charging receptacles for 2 percent of parking spaces in all new commercial, industrial, and multiunit residential buildings with 20 or parking spaces or additions or alterations to existing buildings that increase the total floor area of a building by either 50 percent or 5,000 square feet. [\[WD1\]](#) [\[SG2\]](#) [\[BN3\]](#)
- **Honolulu:** The Honolulu City Council recently passed [Bill 25](#), which sets EV-ready requirements for all new residential multiunit buildings that have eight or more parking stalls and commercial properties with 12 or more parking stalls. Section C406.8 of the bill requires that at least 25 percent of parking stalls at both multiunit

buildings, and commercial properties are EV-ready. For multiunit buildings all EV-ready parking spots must be Level 1 EV-ready, while commercial buildings must be Level 2 EV-ready capable.

EVSE-Installed:

- **Palo Alto, California:** Building codes for EVs can be [found here](#). The ordinance requires all new single-family residences and commercial buildings (including multifamily dwellings, mixed-use facilities, and hotels) to be EV-ready. The nonresidential EV additions to the ordinance require a three-tier combination of electric vehicle supply equipment, electric vehicle supply equipment-ready outlets, and circuitry for new multifamily and commercial construction. In terms of retrofitting costs, one [study found that electrifying](#) existing single-family homes can cost anywhere from \$2,500 to \$5,000, while associated costs (such as those for conduit and wiring) can add an additional \$1,000 to \$2,000.
- **Washington State:** The Washington Administrative Code [Title 51 – WAC 51-50-0427](#) requires that 5 percent of parking spaces in new buildings be equipped with EV charging infrastructure in compliance with sections 427.3, 427.4 and 427.5. If the calculated parking results in a fraction, the applicant must round up to the next whole number. This statute excludes occupancies with fewer than 20 parking spots. The electrical room must be designed to accommodate 20 percent of all parking spaces with 208/240 V 40-amp.
- **California:** Building codes for EVs can be found in the [California Green Building Standards Code 5.106.5.3 and A5.106.5.3 Electric vehicle \(EV\) charging](#). The required number of parking spots and EV chargers varies according to the number of available spots within the parking lot. There are also stricter voluntary standards under “Tier 1” and “Tier 2” for installing electric vehicle supply equipment parking. This standard applies to new buildings in California designated as “green” buildings.
- **Middletown, CT:** The city’s planning and zoning commission adopted a rule change that requires new multiunit dwellings and commercial property developments with [25 or more parking spaces install a minimum of one charging station or allocate 3 percent of parking spaces to electric vehicle charging](#) (Level 2 or 3), whichever is greater. Developments requiring 70 or more parking spaces must install a minimum of two charging stations or allocate 3 percent of parking spaces to electric vehicle charging, whichever is greater.

EV INFRASTRUCTURE AT MULTIUNIT DWELLINGS

EV drivers who live in a multiunit dwelling, such as an apartment building, should not give up hope of driving and charging EVs at or near home. Policies removing restrictions for electric vehicle supply equipment installation at MUDs are on the rise, which is crucial to further EV adoption by this demographic.

California: A MUD, such as a community apartment, condominium, or cooperative development, must not prohibit or restrict the installation or use of electric vehicle supply equipment in a homeowner’s designated parking space. If installation in the homeowner’s designated parking space is not possible, the homeowner may, with authorization, add electric vehicle supply equipment in a common area for their use. Specifically, the homeowner must obtain appropriate approvals from the MUD owner or association, comply with applicable architectural standards, engage a licensed installation contractor, provide a certificate of insurance, and pay for the electricity usage associated with the electric vehicle supply equipment. If the electric vehicle supply equipment is installed in a common area for use by all members of the association, the common-interest development must develop terms for use of the electric vehicle supply equipment. (Reference [California Civil Code 4745](#) and [6713](#)).

California also passed [AB 1796](#), which gives apartment renters with a dedicated parking space in rent-controlled units the right to install a Level 1 or Level 2 charging station for their EV.

Colorado: Both individual tenants and landlords of MUDs can install electric vehicle supply equipment given certain restrictions in statute, but they are [free from undue prohibitions](#) from landlords and various associations, respectively.

Florida: [House Bill 841](#) took effect on July 1, 2018, and allows unit owners in MUDs to install electric vehicle supply equipment at their own expense under certain conditions within the law. Condominium associations are also not allowed to prevent the construction of these spaces as before.

Hawaii: A similar [law](#) in Hawaii allows MUD owners to place electric vehicle supply equipment on the property provided they follow certain guidelines. It declares that property owners cannot be unreasonably restricted in their electric vehicle supply equipment placement and that private entities cannot prohibit electric vehicle supply equipment outright.



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Boston: The Massachusetts Legislature, [via Bill H.4069](#), allows the city of Boston to prevent associations from prohibiting or unreasonably restricting owners from installing electric vehicle charging stations, subject to certain constraints laid out in the statute.

Oregon: The Oregon Legislature put forth a similar [bill](#) that allows unit owners to install electric vehicle supply equipment in their MUD without being prohibited from doing so by a condominium association, HOA, etc.

STREETLIGHT AND POWER POLE CHARGING ACCESS

One option for curbside EV charging involves using the existing electrical infrastructure provided through streetlights and power poles. Any LED streetlight uses less electricity than what the streetlight was originally equipped for, and thus has the capacity to host EV charging stations. These streetlights can host Level 1 or possibly Level 2 EV charging stations, depending on power supplied to the streetlight and the capacity on the streetlight's electric circuit.

Seattle: The city of Seattle, the Woodland Park Zoo, and ReachNow installed 20 Light & Charge systems at the Woodland Park Zoo. The [Light & Charge system](#) transforms existing streetlights and parking lot lights into host sites for EV charging stations as part of the smart city network.

Lancaster, CA: The city of Lancaster launched the [BLVD Streetlight EV Charging demonstration](#) in 2017. The project integrates EV charging stations into five streetlights along a popular downtown boulevard.

Los Angeles: The city has installed EV chargers on [284 streetlights across the city](#) and is installing [chargers on utility poles](#) as well.

RIGHT-OF-WAY CHARGING

Cities should begin planning to incorporate charging into the urban streetscape over the long term. This can take many forms, but most importantly, city policy should support clusters of fast chargers in highly visible on-street locations. Such charging is especially important to support ride-hail drivers, taxis, and other high-mileage vehicles. In addition, these charging stations provide a familiar and reliable place for EV owners without a dedicated parking garage — such as those who live in multiunit dwellings — to charge their vehicles.

Sacramento, CA: In June 2017, the city of Sacramento and EVgo entered into an [agreement](#) for EVgo to build three curbside, 150kw chargers and three 50kw chargers in the public right-of-way. The chargers are now available for use. In 2019, the city selected EVgo to also own and operate an additional 15 charging stations on public sidewalks. To support local artists, the city of Sacramento's Department of Public Works and the Office of Arts and Culture and EVgo are asking artists to submit qualifications to design

vinyl wraps for two commission locations in midtown Sacramento, each with three curbside EV charging stations.

Portland, OR: One of the earliest deployments of fast charging infrastructure in a “pod” at curbside was [Electric Avenue](#) in Portland. Launched in 2011 by Portland General Electric and Portland State University, Electric Avenue now consists of four DC fast chargers and level 2 chargers located on a busy downtown street.

Seattle: The [Electric Vehicle Charging in the Public Right of Way \(EVCROW\) Program](#) was a pilot program that allowed for the installation of EV charging stations at curbside locations in the public right-of-way. The program ended December 31, 2019, with [an evaluation report](#) with key takeaways for future programs.

New Orleans: The City Council unanimously voted to allow EV owners to apply for permits to install chargers for personal, noncommercial use next to the curb between their home and the street—a necessity in a city where many homes do not have driveways. Some of the requirements include how much space must remain on the sidewalk for pedestrians to pass and how close the devices can be to fire hydrants. A permit is \$300 with a yearly renewal fee of \$100. The [city ordinance is here](#).

Berkeley, CA: The city of Berkeley [extended](#) its Residential Curbside Electric Vehicle Charging Pilot project for curbside charging through December 2020. It charges applicants a processing fee of \$397 and has the applicant pay for the purchase and installation of the electric vehicle supply equipment. The parking space on the street is to remain free and open to the general public.

EV-UTILITY INVESTMENTS

Utilities have an important role to play in accelerating deployment of EV charging infrastructure, which leads to increased EV adoption and expanded access to the benefits of vehicle electrification to presently underserved market segments. Efforts to ease barriers to charging station infrastructure build-out by utilities are numerous and varied; see below for approaches that benefit EV owners, utility companies, and the general public.

Charging Infrastructure Principles for Utilities and Public Officials

Electric utilities — and their regulators — must take an active and supportive role in planning for an electric future, given the electricity grid, economic, and societal

PROTECTING EV-DESIGNATED PARKING SPOTS

Unfortunately, not all drivers on the road are courteous and respect and follow the signs that designate an EV charging spot for EV drivers only. If the driver of an internal combustion engine vehicle is parked in an EV-only designated spot, someone’s plan to charge up while shopping for groceries could be thwarted, and it may become hard to complete the rest of the journey. Some jurisdictions are realizing that preserving areas for EV drivers to charge their cars is an important concern and have begun implementing parking regulations for public charging stations to prevent this.

Arizona: Pursuant to section [28-2416](#), a person who is found responsible for parking a gas-powered motor vehicle within any parking space specifically designated for parking and fueling electric vehicles can be cited and subject to a civil penalty of at least \$350.

Washington State: RCW [46.08.185](#) states it is a parking infraction with a penalty of \$124 for any person who parks a vehicle in an EV charging station on public or private property if the vehicle is not connected to the charge equipment.

Oregon: [ORS 811.587](#) states that it is unlawful to park in a space reserved for an alternative fuel vehicle refueling with the penalty of \$115, equivalent to a [Class D](#) traffic violation.

Illinois: [HB 0198](#) makes it unlawful for a non-electric vehicle that is blocking a designated charging station can be towed and the owner fined between \$75 to \$100.

benefits of widespread transportation electrification. In particular, electric utilities are well-positioned to address infrastructure and market-education challenges.

Addressing key barriers to EV adoption and realizing the benefits of EVs will require careful guidance from utility regulators and support from state public officials. The key roles for utility regulators are to

- **support** the “EV conversation” among key stakeholders;
- **integrate** transportation electrification into resource-planning processes;
- **identify**, and, where appropriate, resolve key issues that will define utility and market roles;



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- **review** and approve reasonable, no-regrets utility EV charging investment programs that are in the “public interest.”

In the EV context, the public interest should refer to programs that will integrate new electricity load to the benefit of all utility customers, be designed to increasingly rely on renewable sources of power, deploy infrastructure in locations where it will be used and useful, equitably serve all customers, and define utility and market roles to support the growth of an innovative and competitive market for EV service providers.

Defining the principles that should guide EV-Utility investment from the start can put all stakeholders on the same page, guide utilities in designing programs, and inform regulators’ review of those proposed investments. One good example is the Transportation Electrification Accord.

[The Transportation Electrification Accord](#) was primarily crafted by NGOs and has now been signed by more than 50 vehicle manufacturers, electric utilities, EV infrastructure and technology companies, consumer advocates, and public interest groups representing interests ranging from labor to environmental. The accord spells out high-level principles that explain how to electrify the transportation sector in a way that maximizes economic, social, and environmental benefits. The 11 principles that comprise the accord address what transportation electrification should encompass and where stations are needed. Specifically, the principles highlight the need and some of the means

to intelligently integrate new electricity load with the grid. They emphasize the need to serve all electricity customers, particularly those in communities most harmed by air pollution and facing burdensome household energy costs. The principles prioritize consumer protection and open access in the deployment of new infrastructure and they address the role that electric utilities — which are critical stakeholders — must play in moving transportation electrification forward.

More recently, environmental and consumer advocacy NGOs and the Edison Electric Institute — which represents electric utilities — put out a [Joint Statement Supporting Electric Transportation](#). Advocates, utilities, and regulators should take advantage of both this statement and the accord as they craft their EV-Utility policies and should point to these documents as evidence of broad stakeholder support for these types of programs.

Authorizing Legislation

State public officials also have important roles. New legislation can provide certainty regarding state utility commission authority and the role of utilities in the transportation electrification context by resolving basic legal and policy issues and/or encouraging state utility regulators to invite and approve EV programs by utilities.

California: [SB 350](#) was signed by Governor Jerry Brown in 2015 and finds that “widespread transportation electrification requires electrical corporations to increase access to the use of electricity as a transportation fuel.” It

directs the California Public Utilities Commission to order electric utilities within its jurisdiction to propose projects and programs to support electrification of California's transportation sector in order to meet the state's air quality targets, reduce oil use, and limit greenhouse-gas emissions.

Colorado: SB [19-077](#) requires electric utilities (Xcel and Black Hills Energy) to submit Transportation Electrification Plans (TEPs) to the PUC by May 2020 and triennially thereafter. These plans must include "regulated activities to support widespread transportation electrification" such as physical charging infrastructure, rate design changes, incentive programs, and customer education. The process of development and approval of TEPs is a high-impact, timely opportunity to speed EV adoption across the state.

Massachusetts: [H4781](#), which was passed in 2017, authorizes electric utilities to propose EV-related investments and establishes the test that the state's utility commission (the Department of Public Utilities), must use to review any proposed investments.

New Hampshire: [SB 575](#) does not define the electric utility role, but it does resolve another basic issue that is important to the development of the EV charging market; it clarifies that nonutility owners or operators of charging stations are not public utilities subject to regulation by the state's utility commission solely by virtue of operating a charging station.

Oregon: SB [1547](#) was signed in March 2016 by Governor Kate Brown and called for renewable portfolio standard changes alongside a coal phaseout, implementing demand response programs, and electrifying the transportation sector. The Public Utilities Commission has adopted a rule, building on SB 1547, requiring public utilities to file plans every two years to "accelerate transportation electrification" in their service territories, and to include an analysis of the current market, existing policies and any barriers to development and adoption of electric vehicle infrastructure.

The Oregon Public Utility Commission must direct electric utilities to file applications for programs to accelerate transportation electrification, including investments or customer rebates for EVSE. ODOE must also engage with utilities on how to improve transportation electrification plans and increase EVs in its service territories. ODOE must also provide technical assistance on accommodating EV loads. ([Executive Order](#) 17-21, 2017)

DC Fast Charging: Demand-Charge Mitigation

Utilities can also help mitigate one of the primary near-term barriers to deployment of DC fast chargers: demand charges. At low levels of utilization, demand charges (charges that are based on maximum instantaneous usage at a site) can swamp volumetric charges for DCFC, eroding the business case for installing these critical stations.

Examples of how utilities have proposed to address the demand-charge disincentive:

1. **[PGE in California:](#)** Subscription fee based on throughput of chargers plus strong time-of-use rates; no demand-charge (subscription fee acts like a modest demand charge).
2. **[Southern California Edison:](#)** Five-year demand-charge holiday; demand charges phased back in over the following five years.
3. **[New York utilities:](#)** Public Service Commission approved an off-bill demand-charge discount that declines over time and is intended to offset the disincentive to invest in DCFC while utilization rates are low.

Utility Marketing, Education, and Outreach Programs

In addition to helping provide charging infrastructure, appropriate grid planning, and supportive rate design, utilities also have an important role to play in educating consumers and building market awareness about electric transportation. A [recent study](#) from NRDC shows that EVs are driving rates down. Utilities can have great reach and credibility with consumers. An effective outreach campaign can have multiple channels and activities, including the website, newsletters, bill stuffers, and events. Utilities should also train staff to be "EV experts" who can answer questions for customers, as well as promote the vehicles with staff.

Oregon: Portland General Electric (PGE), using funding from Oregon's Clean Fuels program, has provided [\\$1.75 million in grants](#) to community-based organizations to advance transportation electrification. PGE is also funding "ride & drive" events and other customer outreach.

- [Columbia River PUD](#) in Oregon has a variety of [EV information](#) on its website, including "EV facts," benefits of driving electric, cost savings, information on tax credits and rebates, environmental benefits, and a list of available EV models.
- Eugene Water and Electric Board ([EWEB](#)) in Oregon, partnered with the University of Oregon and local car



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dealers to offer [rEV Up Eugene!](#) This workshop provided residents with all they needed to know about EVs.

Montana: [Flathead Electric](#) has an “Electric Vehicle Blog” where its members can share their stories and experiences with EVs. Salem Electric included EV trivia questions in its monthly newsletter in 2019 as an interactive way to spread the word about an EV 101 and Ride & Drive the utility hosted during the summer. Several Pacific North West utilities have partnered with Forth to offer EV education at their annual customer appreciation days.

Additional outreach activities: Organize a ride & drive event. Ride & drive events provide participants with an opportunity to learn about EVs and to test drive in a fun and engaging setting, without having to visit an auto dealership. These events are a key component of education and outreach. A well-executed ride & drive integrates with a community event attracting thousands of people who are exposed to utility programs and can learn about EVs available locally. Ideal community events for ride & drives include farmer’s markets, sustainability-related events (e.g., Earth Day events), or classic car shows. Test drives open people’s eyes to the myriad advantages EVs offer, especially their responsiveness. Local auto dealers realize the benefits and are even more excited to participate after they experience their first ride & drive. Forth has partnered

with many utilities (Puget Sound Energy, Avista, Tacoma Utilities, Portland General Electric, Pacific Power, Columbia River PUD, Eugene Water and Electric Board, and the city of Ashland, among others) in the Pacific Northwest to offer ride & drive events.

INVESTOR-OWNED UTILITY PROGRAMS

In several states, regulators have approved programs for investor-owned electric utilities to support the adoption of EVs, including investments in EV charging infrastructure. These include utilities installing thousands of charging stations and investing money in EV outreach and education. Well-conceived programs ensure that utility investments increase access to clean transportation options in low-income neighborhoods and underserved communities; increase deployment of EV chargers in multiunit dwellings, workplaces, fast charge locations, and other settings that are currently poorly served by the competitive market; and ensure that programs or rate structures are implemented to manage the new EV load to minimize strain on the grid and facilitate integration of renewable energy. Here are links to examples of programs or proposals to consider:

Ohio: [AEP Ohio](#) (\$10 million light-duty vehicle charging infrastructure program approved in 2018) (pages 26-32).

Florida: [Duke Energy Florida](#) (\$8 million light-duty vehicle charging infrastructure program approved 2017) (pages 40–44).

California: [San Diego Gas & Electric](#) (\$45 million investment in light-duty vehicle charging infrastructure approved in 2016). [San Diego Gas & Electric, Southern California Edison and Pacific Gas & Electric](#) (\$43 million of pilot programs to electrify light-, medium- and heavy-duty vehicles approved in 2018).

Colorado: [Xcel](#) (\$102 million investment for transportation electrification will develop 20 new programs for home, multifamily, commercial fleet, and community-based charging; rebate programs; initiatives for low-income customers; and an EV school bus program.)

Oregon: [Portland General Electric](#) (\$4.3 million investment in outreach and technical assistance, TriMet electric bus pilot, charging, home charger pilot, workplace and/or fleet charging, and pilot evaluations approved in 2018).

PUBLIC UTILITY PROGRAMS

Municipal or publicly owned utilities are controlled by a city or local government body that administers utility services. These nonprofit organizations are run either by public employees or by locally elected officials, as opposed to private investor-owned utilities that select their leadership via a shareholder-elected board. Around 2,000 “munis” supply power to [14 percent](#) of the US population, varying in size from fewer than 1,000 customers in Fonda, Iowa, to around 4 million customers in the Los Angeles Department of Water and Power service area. Resources vary given the size differences between municipal utilities, although most serve fewer than [4,000](#) customers. Below are the best ways for municipal utilities to help increase the awareness and adoption of EVs in their service areas.

Westerville Electric Division, Westerville, OH: The city of Westerville’s Electric Division offers a [rebate](#) to offset the purchase, installation, and maintenance costs of Level 2 electric vehicle supply equipment. Single-family homes are not yet eligible for the rebate, but MUDs, hotels, offices, and retail spaces all qualify. This is important because as more people purchase plug-in electric vehicles, utilities should encourage more public charging points to allow accessible, hassle-free refueling.

City of Azusa, Azusa, CA: Azusa Light and Power offers residential customers a \$150 rebate toward the purchase and installation of a Level 2 electric vehicle supply

equipment, and the utility also offers an off-peak charging [rate](#). Its website also has links to public charging stations in the area, a link to federal incentives, and links to other state-level incentives in California. While the electric vehicle supply equipment rebate is not large compared with other programs, anything municipal utilities can do to help decrease the barriers to plug-in electric vehicle adoption is important. Even if a muni does not offer any incentives, it is good practice to provide basic information on charging stations and available incentives at the state and federal levels.

Austin Energy, Austin, TX: Austin Energy is a larger municipal utility that [offers](#) to cover 50 percent of the purchase and installation costs of a Level 2 electric vehicle supply equipment for qualifying customers, up to \$1,200 for a WiFi-enabled charging station. The utility also offers a time-of-use charging rate and allows its customers to charge for a flat rate across its “Plug-In EVerywhere” charging network.

Madison Gas & Electric (MG&E), Madison, WI: MG&E is another larger municipal utility and features its “Charge@ Home” [program](#) at the center of its website’s home page. Making it simple for consumers to navigate a website is preferable to burying plug-in electric vehicle information in multiple tabs on a clunky web interface. MG&E will install a Level 2 charger at no cost to the homeowner, who then only has to sign up for a time-of-use rate and pay a \$20/month charge on top of existing electrical fees. As noted on MG&E’s website, utilities should want to invest in EV programs because it gives them valuable information on how to best manage plug-in electric vehicle charging as the market expands.

Roanoke Electric, Aulander, NC: Roanoke Electric, a Touchstone Energy electric cooperative utility, has recently launched its debut [EV Pilot Program](#). The program provides EV owners a special discount rate to charge their vehicles. The rate program is a flat fee of \$50 a month and will provide EV drivers up to 1,500 miles of range. Participants can also opt to have charging stations installed at their home — about a \$1,700 value. Roanoke also offers a \$3,500 rebate for Nissan LEAFs and low-interest loans for EV purchases.

USING VW SETTLEMENT FUNDS TO GROW EV CHARGING NETWORKS

As mentioned in the Electrifying Vehicle Fleets section, the [Volkswagen settlement](#) provides tens of millions of dollars in



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funds that are available for states to build new—and expand existing—charging networks. Every state has the option of investing a maximum of 15 percent of its settlement funds in building out EV charging networks, and at least 49 states have elected to do so.

Increasing EV adoption will require significant investment in EV charging stations. Experts have identified key areas where adding charging stations will accelerate EV adoption, such as apartments and condominiums, workplaces, and highway corridors. Certain states have outlined plans to install charging stations in a variety of neighborhoods, including underserved communities and areas that endure the greatest harm from air pollution.

Colorado: The state's final plan [carves out](#) 15 percent of funds (\$10.4 million) toward EV charging along

interstate corridors and also ensures environmental justice communities will have equal access in the installation plan. Charging-station placement will also be based on major “points of interest” such as grocery stores, malls, and landmarks.

California: The state [has committed](#) 35 percent of the funds allocated for charging stations to be invested in disadvantaged communities.

Washington, DC: Will [prioritize](#) investment that benefits areas of the city that bear a disproportionate share of the air pollution burden. These regions were determined by looking at asthma rates in the district and underrepresented neighborhoods as defined by income levels.

EVALUATING VEHICLE REGISTRATION FEES

Unfortunately, additional annual registration fees for EV drivers, that are sometimes far above the equivalent of what drivers would pay for gasoline taxes, are on the rise. Before 2017, fewer than 10 states had EV registration fees. Currently, at least 26 states have enacted EV fees, with the highest set at \$248 annually. These fees are an impediment to widespread EV adoption and add to the already higher upfront cost of EVs.

Lawmakers who support EV registration fees often approach them in the same way, as a tool to make up for the lost revenue from the gasoline tax, since EVs use less

or no gas compared with their counterparts. In fact, these annual fees are often more costly per year than what drivers of fossil fuel-powered vehicles pay in gas taxes. Moreover, given that EVs are currently a very low percentage of the overall fleet, the amount of lost revenue reclaimed is very small. The transportation system is in need of a larger, more sustainable funding stream than the gasoline tax, which accounts for the bulk of funding for the system, and many states are looking to develop wholly new approaches that can address the need for revenue alongside concerns for equity and efficiency and meet state goals for electrification.

WHY IS AN ANNUAL REGISTRATION FEE THE WRONG SOLUTION TODAY?

- Many of the states where EV fees are enacted have been [shown to be punitive](#). EV drivers are being forced to pay double and even triple the rates of what drivers of gas vehicles pay in gas taxes.
- We should be incentivizing the switch over to cleaner vehicles to combat climate change rather than preventing or penalizing that switch. These fees prevent further adoption of EVs — especially for low-income and underserved communities.
- EV registration fees in this current market do little to solve our transportation funding shortfalls. States that have enacted and collected EV fees still have huge shortfalls in revenues for transportation-related infrastructure and costs. A recent analysis by *Consumer Reports* shows that EV fees will not make a dent in declining revenues, generating only an average of 0.04 percent of current state highway funding, which will only increase to 0.3 percent of state highway funding by 2025.
- All drivers should be paying equitably to infrastructure projects and road usage. In fact, EV drivers already do pay. The gas tax is only a portion of revenues collected by a state for building and maintaining roads. EV drivers already contribute to these purposes through other funding streams. Other sources of funding for road maintenance and construction include registration fees, tolls, sales tax, and many other sources of tax revenue earmarked for highway funding, which are also paid by EV drivers. In addition, in most states, EV drivers are already paying a variety of taxes on the additional electricity they use to charge their vehicles.

For more information and talking points, see the [PIA factsheet](#).

[Reduced Registration Fee Template](#)

STATES WITH WAIVED OR REDUCED VEHICLE REGISTRATION FEES FOR EV DRIVERS

While some states have increased EV fees, at least a few have gone the other direction and have reduced fees to provide an additional incentive and signal to the market.

Connecticut: Offers [reduced registration fees](#): \$80 for a passenger car; \$38 for an EV passenger car. (Reference [Chapter 246](#) Sections 14-31 and 14-49 of General Statutes of Connecticut)

Oregon: The state has launched a road use pilot program, [OReGO](#), that will charge vehicles on a per-mile basis. While the state began charging EVs and other fuel-efficient vehicles higher registration fees in 2020, EV owners that opt into the OReGO program will pay the same registration fee as vehicles with less than 40 MPG. Otherwise, it is \$187 to register an electric vehicle every two years; \$113 for vehicles with a 40+ MPG; \$103 for 20-39 MPG; and \$98 for 0-19 MPG.

Vermont: The [registration fee](#) for electric-powered vehicles is \$74 for one year, or \$136 for two — compared with what conventional vehicles pay: \$132 for one year, or \$242 for two. In 2016, Vermont's Agency of Transportation released a [study](#) of whether it would be fiscally effective to charge EV owners a higher registration fee. Leaders have recommended refraining from an EV fee until EVs constitute at least 15 percent of the state's vehicles.

PRIORITIZING EQUITY AND EXPANDING ACCESS

Though EV deployment has increased in recent years, low-income communities and communities of color overburdened by pollution are likely to encounter the strongest barriers to EV adoption. EVs are much more [affordable](#) than gasoline-powered cars after factoring in lowered maintenance and fuel costs, but the up-front price tag can still be larger than the price of gas-powered cars. For low-income and many moderate-income families, the \$7,500 federal tax credit doesn't fully address the economic barrier that many people face when buying or leasing their next car. Additionally, many low-income individuals are not able to access the \$7,500 credit, given

that they do not have the tax liability. They can access it indirectly if they lease, but it's not always guaranteed that the financing company or dealership will pass on the savings to the consumer.

Overburdened communities also face charging-access challenges, and are often people who live in multiunit buildings without dedicated charging spaces.

Overburdened communities typically experience more severe health impacts from vehicle tailpipe emissions because they're often located near major roadways and transportation hubs. These emissions increase the risks



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of asthma, cancer, and other pollution-related illnesses. For a mass transition to clean vehicles to happen, they will have to be adopted by and made affordable for low-income communities and communities disproportionately impacted by vehicle pollution. States, cities, and utilities have many options to orient programs to increase electrification for all communities so that everyone can share the benefits of clean air and access to clean transportation choices, regardless of income, race, or location.

REBATES FOR LOW-INCOME DRIVERS

California: [Charge Ahead California Initiative](#) aims to bring one million electric cars, trucks, and buses to California by 2023. [SB 1275](#) directs the California Air Resources Board (CARB) to create equity programs that increase access to and use of EVs among low- and moderate-income individuals. For example, rebate payments to low-income consumers are prioritized through the [Clean Cars 4 All Program](#), and low-income [eligible](#) applicants may receive additional compensation of \$7,500 toward replacing a [high-emitting motor vehicle](#). Through CARB, the Community Housing Development Corporation has a Transportation Program that serves low-income residents in six Bay Area counties by providing a [vehicle-financing option](#) for the purchase of a used hybrid electric vehicle, plug-in hybrid, EV, or fuel cell electric vehicle. The pilot program went statewide in June 2018. The [Clean Vehicle Assistance](#)

[Program](#), launched June 2018, helps low- to moderate-income California residents with grants of up to \$5,000 to purchase a new or used hybrid or electric vehicle.

Oregon: In addition to the \$750 to \$2,500 rebate for the purchase or lease of a plug-in hybrid or EV, drivers with low to moderate income who live in areas with elevated concentrations of air pollution are eligible for an additional [rebate](#) of up to \$2,500 to replace a car that is at least 20 years old. The state's [Clean Vehicle Rebate Project](#) provides \$2,500 for used plug-in electric vehicles and \$5,000 for new plug-in electric vehicles to qualifying low-income individuals.

Pennsylvania: The Department of Environmental Protection offers \$750 for a one-time preowned alternative-fuel vehicle through its [Alternative Fuels Incentive Grant Program](#). Qualifying low-income individuals are eligible for an additional \$500 rebate.

Vermont: Burlington Electric Department offers a \$1,200 [rebate](#) to its customers, as well as an additional \$600 and \$300 for moderate-income consumers buying battery electric vehicle and plug-in hybrids, respectively.

EV CAR-SHARING PROGRAMS

Los Angeles: [BlueLA](#) is a 100 percent EV car-sharing program geared toward low-income residents. Members are not required to return the vehicle to the same place

they picked it up. This means working families can pick up an EV from near their home and drop it off near a public transportation hub, making the program more flexible and convenient. It's an excellent example that demonstrates how a community-invested car-sharing program can increase the mobility of underserved communities in a successful and sustainable way.

Oregon: Forth launched a [community-based EV carshare pilot](#) with the Hacienda Community Development Corporation in 2017 and continues to partner with community-based organizations to develop sustainable community-driven business models. With USDOE support, Forth will be launching [a rural pilot](#) later this year in Hood River, Oregon.

Sacramento: [Gig Car Share](#) works in partnership with the city of Sacramento and Electrify America to provide hundreds of free-floating Chevy Bolts in the city. Through an app, users can find a car near them, unlock it, use it, and park it in any approved parking space that is listed.

St. Paul, Minnesota: In partnership with HOURCAR and Xcel Energy, the Transportation Advisory Board of the Metropolitan Council has granted \$4 million for an EV Community Mobility pilot. The federal grant matches \$4 million previously committed by Xcel Energy. The proposed fleet of battery electric vehicles will serve a 35-square-mile area in the Twin Cities, with charging stations available for public use.

CHARGING ACCESS IN UNDERSERVED COMMUNITIES

California: [CARB's Clean Cars for All and Clean Vehicle Assistance Programs](#). As part of these two programs,

CARB offers an additional \$2,000 for the purchase and installation of a charging station if the consumer purchased a battery-electric vehicle. It will soon expand eligibility to those consumers who purchased a plug-in hybrid vehicle to address charging no matter the plug-in vehicle purchased.

Northern California: PG&E launched a \$4 million program in 2019 to reduce barriers to EV adoption in low- and moderate-income communities in Northern California. The program provides incentives for up to 2,000 low- and moderate-income households for the costs of a residential EV charger, increases awareness of the benefits of EV adoption, and provides information on additional incentives and programs available to customers.

San Diego: The San Diego Gas & Electric (SDG&E) [Power Your Drive Program](#) has installed more than 3,000 charging stations at 255 locations, which include workplaces, multiunit dwellings, and underserved communities. SDG&E pays for the EV stations and installation; the site host pays a one-time participation payment: \$630/port for workplaces, \$235/port for multiunit dwellings, and \$0 for underserved community installations.

Austin, Texas: Austin Energy implemented a program that also helps underserved communities by targeting owners of multiunit dwellings, which house more than 40 percent of the city's population. Under this program, Austin Energy provides a rebate of up to \$4,000, or 50 percent of the cost, to install approved Level 2 (240V) charging stations and/or Level 1 (120V) outlets. The utility also provides rebates up to \$10,000 to hosts who want to install a DC fast charger. To qualify for these credits, the charging station must be open to all property residents.

CONSUMER EDUCATION AND PROTECTION

EV PROCLAMATIONS AND DRIVER BILL OF RIGHTS

EV Proclamations: One of the easiest ways to show support for EVs is through a proclamation or resolution that emphasizes their benefits. These proclamations or resolutions can be adopted at the local, city, or state level. These actions are strong tools to continue building momentum for the transition to EVs and to show which public officials will take a stand by signing on. [Here is a link to an example.](#)

EV Driver Bill of Rights: The switch to driving an electric vehicle is a lifestyle switch. The vehicle uses different technology than a gas vehicle and owning the vehicle presents different challenges and opportunities. For these reasons, consumers need to be assured that they have certain rights when it comes to driving an EV. These can be summed up by a resolution called an EV Driver Bill of Rights. A resolution does not hold the force of law, but represents the optimal guidelines for specific EV policies and on specific EV issues. However, the resolution can instruct state or local agencies to adopt policies that do have the force of law and comply with the intent specified in the EV Driver Bill of Rights.

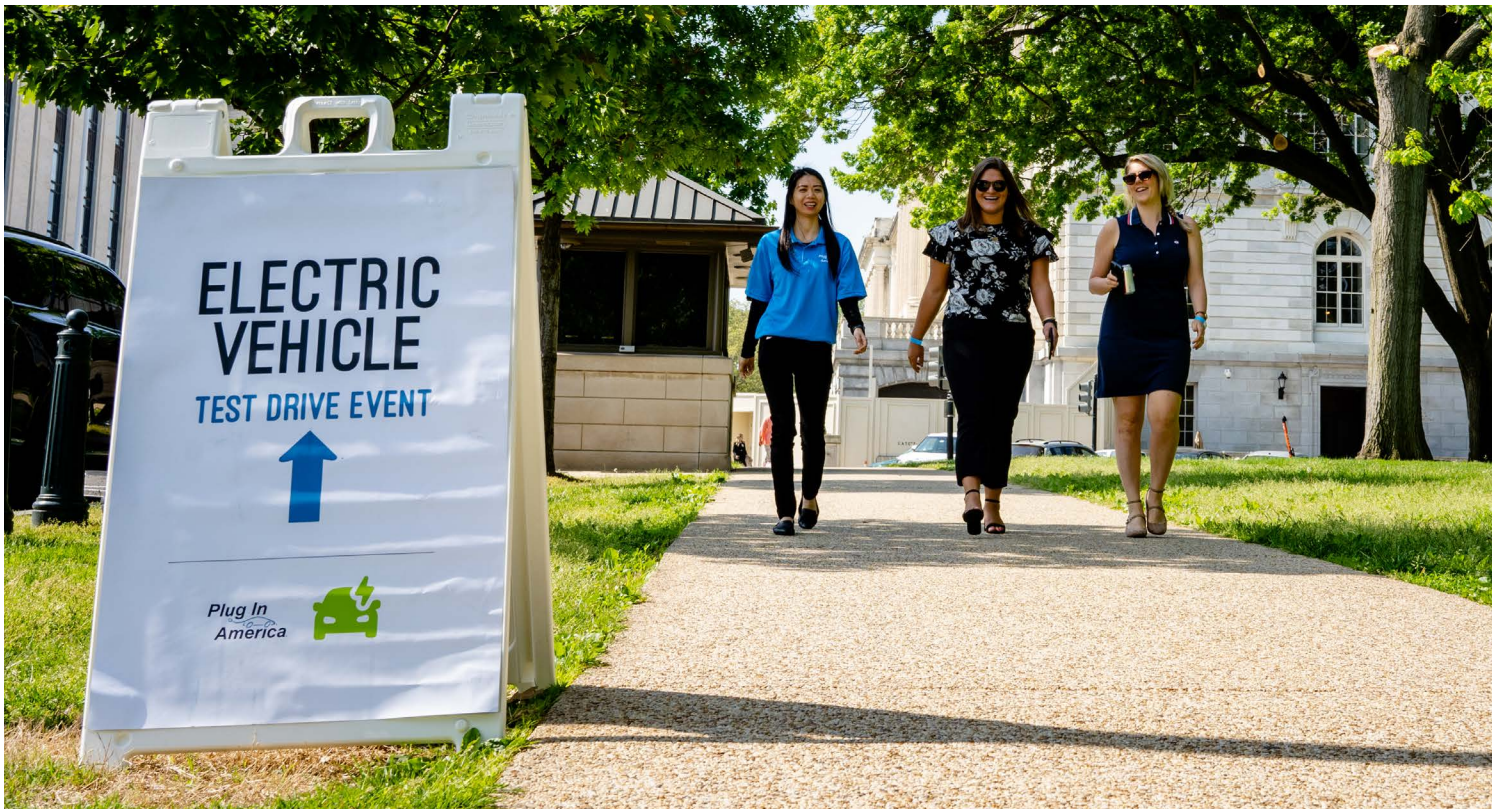


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A [sample EV Driver Bill of Rights](#) could include sections about the consumer purchase experience, the consumer charging experience, and the consumer ownership experience

RIDE & DRIVE EVENTS

Nothing gets people more excited and sold on the idea that an EV could work for them than a ride & drive event. These opportunities give people the chance to kick the tires and check out EVs for themselves, so they can see just how easy a transition it is.

The annual [National Drive Electric Week](#) events, and the [Drive Electric Earth Day](#) events, presented nationally by the Sierra Club, Plug In America, and the Electric Auto Association, alongside with many other local partners, allow people to organize their own pro-EV events. These might include parades, an EV showcase at existing festivals, or just an event where people can swap EV stories with neighbors at a driveway party. The best events include opportunities for test drives as well as for public officials to attend and announce new EV policies. Many drive electric events aim to combat the stereotypes and myths often associated with EVs and EV drivers, and work to promote EVs in lower-income and more diverse communities that face higher barriers to EV adoption.

During times of social distancing guidelines, virtual EV educational events are a good and necessary backup.

OPEN ACCESS AND INTEROPERABILITY

States must resolve basic issues related to access, payment, and pricing at EV charging stations in order to support current and future EV drivers. This is particularly important in a world with an ever-increasing number of EV service providers who offer varied models for access and pricing. To provide EV drivers with a positive charging experience, public officials should set basic ground rules for charging-station access, payment options, and pricing transparency.

“Open access” is the ability to get a charge at any public charger, including Level 1, Level 2, and DC fast charging. This means that the public charging station is not locked behind a gate or wall but is essentially open for access by the public. Open access also means that one or more methods of payment are available to enable the charge to begin, for example via a credit card swipe or a mobile app.

Electric vehicle drivers should never be stranded at a public charging location where they cannot actually charge. Pricing transparency is the clarity of price of a charge when the EV driver connects to the charger, including any roaming fees or demand charges. The price should be available through online mapping applications to help drivers select a charging



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station. Front-end interoperability is a key principle for the entire charging infrastructure ecosystem. Currently, many companies have their own card or key, which means drivers must either join multiple “clubs” or risk being unable to charge; this should be remedied.

Providing mapping data is another key criterion for consumer protection. All electric vehicle service providers should provide mapping data for charging locations, including costs for charging (both in and out of network).

California: [SB 454](#) created the Electric Vehicle Charging Stations Open Access Act. [Regulations](#) for the legislation were adopted by the CA Air Resources Board in June 2019.

Massachusetts: [Chapter 448 of the Laws of 2016](#) included some provisions on open access and prohibitions on subscription fees for public charging stations.

New Hampshire: [SB 575](#) prohibits an owner or operator of a charging station from requiring a membership or subscription fee for use of a charging station, requires that charging stations support multiple payment options, and mandates reporting of charging-station location and other data to the Department of Energy’s [Alternative Fuels Data Center](#).

UNIFORM SIGNAGE REQUIREMENTS

There is a critical need for charging station signage, from highway visibility down to the last several hundred

feet around a station. Even if charging-station locations are noted on smartphone mapping tools, car navigation systems, and web-based maps, the stations can still be challenging to locate because the physical hardware is not that large. Directional signage installed on streets near charging stations will aid navigation and also help to reduce EV driver “range anxiety.” [A sample template to use is linked here.](#)

Federal: The federal government provides guidance for EV signage through its *Manual on Uniform Traffic Control Devices*, but it is often up to state transportation agencies to decide whether to use the signs and how to implement the policy guidelines. For highways that have been designated as Alternative Fuels Corridors, there is [specific guidance](#) on the design and appropriate use of signs. States designating an Alternative Fuels Corridor must also use [appropriate signs](#) in advance of each exit that has charging infrastructure and on the exit ramps as well as provide “trailblazing” signs further along the route to the charging site. A corridor-designation sign alone is insufficient. The Federal Highway Administration also [provides guidance](#) for standardized parking signs close to the EV charging station.

West Coast Green Highway: A [standardized symbol](#) to mark public charging stations along major highways has been adopted in Washington, Oregon, and California. Standards for local street signs to indicate charging-station

locations, parking signs, and pavement markings are also specified.

Washington: [RCW 46.08.185](#) details the charging-station signage required, as well as the monetary penalty for parking a gas car in the charging spot. Charging-station signage must also meet the requirements in [RCW 47.36.030](#).

California: The California Health & Safety Code, Division 26, Part 5, Chapter 8.7, [Section 44268.2](#) requires that charging stations be labeled in accordance with Part 309 of Title 16 of the Code of Federal Regulations. The PEV Collaborative has also [proposed recommendations](#) for charging-station signs and accessibility.

POLICIES FOR BATTERIES AND BATTERY RECYCLING

While the batteries in EVs are typically under warranty by the automaker for eight years, they can last anywhere from 15 to 20 years or longer without losing much capacity to hold a charge, depending on how the vehicle is driven and charged. However, it is important to establish the foundation for strong battery recycling programs and policies now.

- Currently, [S 3356](#), the Battery and Critical Mineral Recycling Act of 2020, is an active bill before Congress. This bill would call for the Department of Energy (DOE) to award multiyear grants to eligible entities for research, development, and demonstration projects to create innovative and practical approaches to increase the reuse and recycling of batteries in EVs. In addition, the bill would establish a program at the DOE to award competitive grants to states and local governments to assist in the

establishment or enhancement of state-based battery collection, recycling, and reprocessing programs. Finally, the bill would also instruct the EPA to develop best practices for the collection of batteries that may be cost-effectively implemented by states and local governments, and would create a taskforce that would develop an extended battery producer responsibility framework.

- The California Air Resources Board will establish the [Zero-Emission Assurance Project](#) (ZAP) to offer rebates for the replacement of the battery or other related vehicle component for eligible used EVs. Rebates will be limited to one per vehicle, and applicants must be at or below 80 percent of the statewide median income. Rebates will be available through July 31, 2025.

SOLUTIONS TO BARRIER OF AUTO DEALERS SELLING EVS

The Sierra Club's [Rev Up Electric Vehicles report](#) highlights the gaps of the auto industry — that the automakers and dealers are still barely making an effort to manufacture and sell EVs — and that consumers are looking for more makes and models than what is currently being provided by automakers, and that consumers are missing vital information at the dealerships about charging, incentives, and other related technology. Training auto dealers to sell EVs is one of the remaining barriers to greater EV adoption. EVs take longer to sell because customers have more questions about the vehicles — and in auto sales at dealerships, where pay is largely commission based, the time it takes to sell a vehicle matters immensely. Offering an incentive to dealers to sell EVs helps to overcome this hurdle. Providing training and certification for dealers on the EVs is another way to overcome this barrier. As more cars

are sold online via services such as Carvana, and as cars like EVs require little maintenance and service compared to gas cars, auto dealers will need to modify their business models.

PlugStar: This [training platform](#) performed by Plug In America, the voice of the EV consumer, can be provided online or in-person to auto dealers. Qualified Plug In America staff teach the auto dealers about the EV battery, how to charge and how to access charging stations, as well as review the answers to questions consumers might ask. After the training, at the request of the auto dealers, Plug In America will also coordinate a ride & drive for local customers to experience driving electric, directly linking the customer to the trained dealer. In addition, Plug In America will connect the dealer to the local utility to ensure the dealer is aware of any incentives or programs and the available charging rates. At the request of the auto dealer,



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Plug In America also provides a 1-800 support line, online shopping assistant, customized websites for the auto dealer, plus more resources.

Madison Gas and Electric Dealer Program: The [Dealership Rewards program](#) offers a \$50 gift card to each dealer who connects Madison Gas and Electric with

customers in their service territory who are interested in purchasing an EV. The customer must submit information via an online form. In addition, the utility tracks dealership activity, including the greatest number of qualified leads, highest EV sales and event participation. The winning dealership receives a social media advertising campaign valued up to \$1,500.

POLICIES FOR MEDIUM- AND HEAVY-DUTY FREIGHT

Though they make up just 5 percent of all the vehicles on the road, trucks (vehicles in classes 3-8) account for [25 percent of total transportation pollution](#) in the US. While there have been great strides in the production and model availability of light-duty passenger vehicles, manufacturing and deployment of freight vehicles is just starting to take off. Automotive manufacturer commitments to addressing a lack of model availability and significant orders from companies such as FedEx, UPS, and Ikea suggest EV market penetration will continue, particularly as upfront costs fall and lower total cost of ownership is realized. The 2020s will be a crucial decade in which adoption patterns will largely determine how quickly the nation can reduce oil dependence and associated emissions. Policymakers have a

key role to play in addressing the high upfront vehicle costs, developing the necessary charging infrastructure, and supporting improved charging infrastructure and costs.

Multi-State Medium and Heavy-Duty Zero-Emission Vehicle MOU: Recently, 15 state governors and the mayor of the District of Columbia released a [joint memorandum of understanding](#) on their commitment to truck electrification and eliminating toxic air pollution from medium- and heavy-duty trucks and buses by 2050. The states joining this effort are California, Colorado, Connecticut, Hawaii, Maine, Maryland, Massachusetts, New Jersey, New York, North Carolina, Oregon, Pennsylvania, Rhode Island, Vermont, and Washington, as well as the District of Columbia. The new MOU calls for 30 percent of new truck and bus sales to be

zero-emission by 2030, and 100 percent zero-emission by 2050.

California: The California Air Resources Board (CARB) [unanimously approved](#) a first-in-the-nation standard that will deliver zero-emission trucks to California. The recently adopted Advanced Clean Truck (ACT) rule requires manufacturers to produce zero-emission trucks beginning in 2024 and increases production targets through 2035. By including large pickup trucks, delivery trucks, and semi-trucks, the ACT Rule will help transform the entire freight industry.

Carbon Credit Markets: California is expected to submit a waiver request to the EPA in order to obtain authority to enact their new rule. States with carbon credit programs, such as [California's Low Carbon Fuel Standard](#) and [Oregon's Clean Fuels Program](#) provide an additional revenue source for fleets looking to electrify. Fleet charging infrastructure can generate credits for charging their vehicles, which can then be sold on the market. This [revenue can be passed along](#) to fleets, which helps fleets to justify higher upfront costs by realizing the lower TCO of electric vehicles sooner. For example, a single transit bus in California can generate about [\\$10,000 in credit revenue annually](#).

Reduced Emissions Zones: The [Port of Los Angeles Clean Truck Program](#) (CTP) has been successful in reducing air pollution from harbor trucks by over 90 percent and three years ahead of schedule. Initially, when the program started in 2008, the CTP banned all pre-1989 trucks. The program also set in place a progressive ban on all trucks that did not meet 2007 emission standards by 2012. The most current iteration of the CTP bans all trucks older than model year 2013 from signing up with the Port Drayage Truck Registry, which is required for port entry. The Clean Air Action Plan Update in 2017 set targets for the transition to zero-emission terminal equipment by 2030 and on-road

trucks by 2035. The port has received almost [\\$80 million in grant funding](#) from the California Energy Commission and CARB to pilot six projects demonstrating zero-emission equipment.

HD Rate Design: Fuel cost savings by shifting to electric vehicles are crucial to make electrification worthwhile for fleets and commercial operators. To help operators achieve these fuel savings, utilities should design electricity rates to remove uncertainty and facilitate adoption. Ideal rates will typically be transparent and predictable, include time of use rates, and reduce or remove demand charges. For example, [Southern California Edison](#) has three different EV rate designs for business customers based on their needs.

Truck Replacement Program (TRP): [New Jersey's TRP](#) is funded by CMAQ and the EPA's Diesel Emission Reduction Act and provides grant funding for the replacement of up to two trucks per entity. Trucks must be diesel-fueled and older than model year 2003. The fund provides up to 50 percent of the cost of a new truck or a maximum of \$25,000, whichever is less.

Voucher Incentive Programs: Voucher programs intend to lower vehicle costs at the point of purchase and offer funds on a first-come, first-served basis. Approved vendors apply for vouchers and deduct the voucher amount from the purchase cost. Once the vehicles are purchased, the vendor submits the paperwork and is reimbursed the voucher amount. The [California Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project](#) (HVIP) and the [New York Truck – Voucher Incentive Program](#) (NYT-VIP) both offer vouchers to assist with electric truck procurement. HVIP is funded by the cap-and-trade dollars from California Climate Investments, while NYT-VIP is jointly funded by CMAQ funds from the New York State Department of Transportation and VW Settlement funds from the New York State Department of Environmental Conservation.

POLICIES TO ENABLE WORKPLACE CHARGING

Workplace charging provides a solution to two of the largest barriers to electric vehicle adoption: consumer awareness and lack of charging infrastructure. For people without access to home charging, workplace charging can provide a much needed low-cost source of fuel to support the decision to purchase an electric vehicle. In fact, research shows that employees with access to workplace charging are six times more likely to purchase an electric vehicle. Greater exposure to electric vehicles owned by colleagues and eas-

ily available charging infrastructure combine to provide a positive reinforcement for EV adoption. Level 2 charging stations, which can provide roughly 25 miles of charge in an hour, allow employees to refuel from their morning commute in just a couple of hours and, thus, can be accessed by a number of employees throughout the course of a day.

In addition to being a tremendous benefit to employees, employers stand to benefit from investing in workplace

charging as well. Installing workplace charging can be one way to attract and retain employees. It also goes a long way to demonstrate a business's commitment to environmental sustainability and earn LEED points. Workplace charging is a critical part of the puzzle to increase EV adoption but comes with its own set of barriers. In addition to the cost of purchasing and installing charging stations, employers are generally unfamiliar with the process to do so and can become discouraged from implementing a program without easy solutions. Some utility companies are filling the education gap through technical-assistance programs, but their efforts are localized and could benefit from a coordinated national approach to help employers navigate these processes. A few incentive programs are listed below.

Incentive Programs:

Currently extended through the end of 2020, businesses who install electric vehicle charging equipment are eligible for a [Federal tax credit](#) of 30 percent off the cost, not to exceed \$30,000.

The [Charge Ahead Colorado](#) program provides financial support for electric vehicle charging stations to fund 80 percent of the cost of a charging station, up to \$9,000 for a Level 2 charging station and up to \$30,000 for a DC Fast Charging Station.

Many utility companies, such as [Pacific Gas & Electric](#), [Sacramento Municipal Utility District](#), [Alameda Municipal Power](#), and [Holy Cross Energy](#), also offer incentives for their commercial customers to help offset the costs of charging station installations. These incentive programs help reduce the cost barrier associated with workplace charging but many also support employers through the process of installation with technical assistance and resources, which is just as important. As other utilities across the country roll out programs to support workplace charging installations, public utility commissions and policy makers must continue to support these types of investments to help reduce the cost barriers to businesses interested in installing workplace charging.

ELECTRIC RIDE-HAILING POLICIES AND PROGRAMS

Transportation network companies (TNCs) are a popular and convenient mobility option, with 10 percent of all Americans using ride-hailing services regularly, a metric that increases significantly in higher density cities. There is a complementary relationship between ride-hailing and walking, biking and taking public transit. Ride-hailing services have also materially increased vehicle miles traveled (VMT), making them a strategic target for CO₂ reduction efforts through electrification. Targeting the advancement of shared mobility, and TNCs specifically, will have 3-5x the VMT reduction than targeting single-occupancy vehicles. Recently, [Lyft announced](#) its commitment to electrifying its entire fleet by 2030, which could cut tens of millions of emissions and save drivers up to \$10 billion.

The onus of electrifying TNCs should not fall on TNC drivers. A supermajority of TNC drivers identify as low income and as minority groups. Thus, intentionally designing EV programs to benefit TNC drivers will increase access to underserved populations in a commercial application. The below categories highlight lever categories to pull to advance TNC electrification:

OUTREACH AND EDUCATION

Activate and generate awareness on the benefits of electric mobility to ride-hailing drivers from a trusted source (for example, TNC EV Ambassadors, or ride-hail driver groups). Emphasize the financial benefits of driving electric.

Increase Access to EVs:

- **Ensure** that TNCs are being encouraged or required to increase electrification, pooling, and complementary programs with public transit.
- **Advance** equity for riders to be more inclusive of disadvantaged populations.
- **Incentivize** first and last mile riding (i.e., Via & the Uber Community Initiative) to provide reliable transportation to those who need access.
- **Support** needs of short-term rental and car-share companies that offer electric cars in their fleet. This can be done through raising fleet cap incentive for shared mobility usage. Additionally, look at subsidizing high-mileage drivers who are willing to test a new vehicle. These rental services provide TNC drivers a rare doorway to test out the lifestyle before committing.
- **Incentivize** programs that increase access to affordable

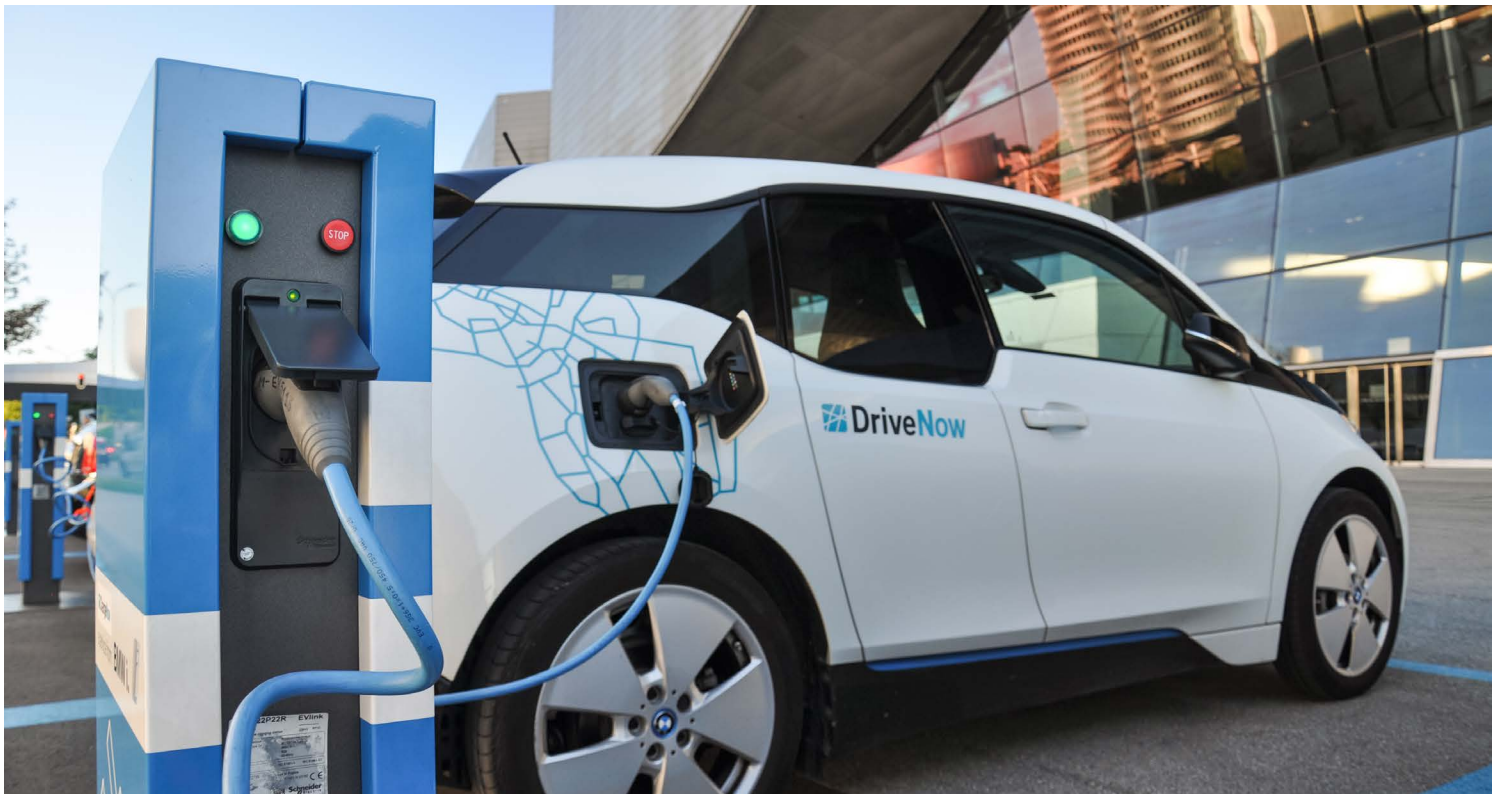


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financing of used and new EVs. Forth's Fair Financing Pilot helps TNC rideshare drivers who are low-income, underbanked, and/or have poor credit to secure financing and coaches them on the purchase of a used electric car in Portland. Program description below:

- **For TNC drivers**, vehicle costs are often the second biggest expense after housing. This pilot seeks to offer a financial path towards EV ownership as the cost to maintain an EV is significantly lower than that of a combustion engine. Participants who are either part or full-time TNC drivers will be provided with financial counseling and assistance with credit repair, mentorship and education around the benefits of EVs, and how they could be optimized as a revenue-generating asset.
 - **Additionally**, participants will have access to low-interest loans. This program will create an option for these borrowers to have access to an interest rate capped at 9.9 percent (compared to predatory loans that may have interest rates of up to 25 percent), and may serve borrowers with a "poor" FICO score as low as 550. Forth is also looking into additional micro-lending alternatives and a loan loss reserve to reduce the interest rates even further.

- **Waive** taxes and surcharges for drivers who go electric.

Charging:

- **An estimated 85 percent** of TNC rideshare drivers don't have access to home charging. To ameliorate, work with

a utility partner to incentivize installation of residential charging stations in single-family housing and MUDs.

- **Work** with transit hubs to deploy fast charging at TNC waiting lots. Design and build areas to prioritize electric needs (i.e., geo-fence includes nearest charging stations).

Other policy suggestions:

(from ICCT's [Emerging Policy Approaches to Electrify Ride-Hailing in the United States](#))

- **Reallocate** parking space. Parking is a key reason people use ride-hailing, particularly with destinations where it's hard and/or expensive to park: airports, event venues, universities, downtowns. Note that even when parking is free and easy, 72 percent of people still used a ride-hailing service.
- **Reenvision** parking operations by providing attractive perks: preferential access to curbs/lanes for entities that are making efforts toward electrification.
 - **Consider** opening funding for dedicated charging stations for TNC and high-mileage driving applications.
- **Allow** access to bus-only lanes, similar to what is sometimes given to taxis, for verified electric ride-hailing vehicles.
- **Impose** volume caps on ride-hailing vehicle licenses while exempting electric ride-hailing vehicles; over time license only electric vehicles.

- **Consider** creating low-emission vehicle zones or limiting vehicle traffic in select areas to electric vehicles.
- **Consider** promoting competition around charging installation:
 - **Streamline** the permitting processes for private sector installations.
 - **Adopt** electric vehicle-ready building codes.

STATE ENERGY POLICY STRATEGIES AND TRANSPORTATION ELECTRIFICATION

There are many state energy policies and programs that are driving market changes. Primarily, these policies outline specific steps a state may take in order to improve their energy landscape by improving the independence, reliability, resiliency, sustainability, and affordability of the supply of electricity. While there are a number of paths to achieving these goals, electrifying transportation continues to garner attention as both a strategy and an eventuality for which to prepare the grid.

South Carolina: [South Carolina State Energy Policy](#) identifies leading by example with its state fleet and identifying alternatives to its petroleum-dominated fleet. As such, the state targets to improve fleet diversity and reduce vulnerability to the current fuel supply, while simultaneously improving overall fuel efficiency.

Tennessee: The State Energy Policy Council's (SEPC) [2020 annual report](#) to the governor and General Assembly

identified transportation as a key area to develop a greater understanding and improve transportation efficiency and vehicle emissions within the state to improve the resiliency of the transportation sector. To achieve these goals, SEPC recommended policymakers capitalize on the resources and infrastructure to expand the production, adoption, and utilization of electric vehicles within the state.

Utah: One of Utah's [State Energy Policy](#) objectives is to reduce dependence on international energy sources by promoting regional and local sources of electricity and improving diversity of transportation modes within the state. As such, Utah's [2020 Energy Action Plan](#) commits to install EV infrastructure along major corridors; promote grants and incentives for EVSE; create EV charging signage; promote idle-free zones; improve access, compatibility, and interoperability of EV charging networks across REV West; and improve data tracking and reporting of EVs within the state.

CMAQ PROGRAM AND TRANSPORTATION ELECTRIFICATION

The Congestion Mitigation and Air Quality (CMAQ) program, established in 1992 and administered by the Federal Highway Administration, is a flexible funding source for state and local governments to address areas that have been deemed nonattainment or maintenance by the Environmental Protection Agency in regard to the national ambient air quality standards as set by the Clean Air Act. The funds can be used toward qualifying transportation projects targeted at reducing emissions. These funds must be used for projects in nonattainment or maintenance areas unless the state has none, in which case CMAQ funds can go toward eligible transportation projects that are a part of the state's Transportation Improvement Fund. CMAQ projects must reduce ozone, volatile organic compounds, nitrogen oxides, carbon monoxide, or particulate matter emissions related to transportation.

Colorado: The Regional Air Quality Council was awarded CMAQ funds and works with the Colorado Energy Office to administer the [Charge Ahead Colorado](#) program for the planning area of the Denver Regional Council of Governments. The Charge Ahead Colorado program provides grants for electric vehicles as well as Level 2 and DC fast charging infrastructure.

Kentucky: In 2019, the state announced that it would use some of its [\\$10 million in CMAQ grants](#) toward electric transportation projects. Lextran received \$1.4 million for the purchase of two electric buses replacing existing diesel buses. The Transit Authority of River City was awarded nearly \$1.6 million to replace two diesel buses with electric buses.

Nevada: The Regional Transportation Commission of Washoe County (RTC) used CMAQ funds in 2017 to [purchase 17 electric buses](#) and the Villanova Maintenance



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Facility was expanded and upgraded to accommodate RTC's on-going fleet electrification efforts.

New York: [The New York Truck Voucher Incentive Program](#) (NYTVIP) is a rebate program targeted at reducing

emissions by accelerating deployment of clean vehicle technologies for the medium- and heavy-duty sector. NYTVIP is funded through CMAQ and VW Settlement funds and has a total of [\\$35.1 million available for 2020](#).

CONCLUSION

Electric vehicle adoption is a win-win for people, the environment, and businesses while simultaneously helping to enhance our national security. The right mixture of policies can help keep one of the US' largest and historically most successful industrial sectors from falling behind, while retaining and increasing jobs. Many groups and diverse stakeholders with a broad range of concerns and interests stand to benefit from state and local policies that advance electric transportation and charging infrastructure.

Many environmental, environmental justice, and public health advocates support EV policies because EVs result in large reductions in emissions and improved air quality, particularly for the overburdened communities located along freeways and major transportation hubs and that experience disproportionate health impacts from pollution. State and local governments benefit from savings in fuel and maintenance costs for public transportation, as well as

from opportunities to meet health and climate protection goals. EV drivers benefit from savings in fuel costs. Everyone benefits from reductions in public health risks. Unionized workers, such as electrical and utility workers, benefit from increases in work needed to install and maintain charging infrastructure as well as to manufacture EVs and parts. Bus drivers benefit from the elimination of exposure to harmful emissions while on the job. And transit riders and school children benefit from breathing cleaner air on rides to work and school. The nation as a whole benefits from reduced dependency on oil, a commodity with significant price volatility that creates economic instability and carries a high price tag, in dollars and lives, for national defense.

Widespread EV adoption will also bring additional benefits to our electrical grid, including diverting money once sent out of the country for oil to more local sources of electricity.

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