

Electrifying Transportation in Municipalities:

A Policy Toolkit for Electric Vehicle Deployment
and Adoption at the Local Level

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Electrification
Coalition

American Cities
Climate Challenge



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Vehicle electrification can help cities, towns, and counties achieve many top objectives, including reductions in climate emissions, improvements in public health and sustainability, advances in equity, economic development, job growth, and the EV market, and improved energy security. **Local governments across the United States have proven to be effective leaders in the transition to electric vehicles (EVs), implementing policies to spur electrification faster than their surrounding states and the nation as a whole.**

This report is designed to support local policymakers and advocates by providing a summary of the top transportation electrification policies that local agencies should consider. The intended audiences for this report include mayors, city/town councilmembers, county commissioners, city and county administrators, finance officials, metropolitan planning organizations, air quality districts, environmental

health departments, municipal/county fleet managers, transit directors, sustainability directors, and other relevant municipal and county agencies and officials.

The EV Policy Toolkit outlines key policies within **five categories**: charging infrastructure, multi-sector, freight, fleets, and consumer. Table 1 provides an overview of the top 15 local policies and actions. When prioritizing policies, each agency should consider the local social context, constituent makeup, levels of support, critical local issues, and appropriate messaging (e.g., emphasizing health, climate, or jobs). To help inform the decision-making process, we provide a qualitative and quantitative summary of each policy's impact on climate emissions, public health, social equity, jobs, and the EV market, complemented by an evaluation of the potential

Table 1. Summary of key policies to pursue at the city level

Summary of key city policies		Benefits & impact					Difficulty to pass	Current cost to implement
		Direct GHG reduction	Health	Equity benefits	Jobs	Market impact		
Benefits & impact key: ● High ● Medium ● Potential Negative Difficulty & cost key: ● Low ● Medium ● High								
Charging infrastructure	1. Infrastructure deployment	●	●	●	●	●	●	●
	2. EV-ready buildings & businesses	●	●	●	●	●	●	●
	3. Equitable charging	●	●	●	●	●	●	●
	4. Streamlined charging approval (permits)	●	●	●	●	●	●	●
Multi-sector	5. Zero emission (ZE) areas, diesel bans, or similar	●	●	●	●	●	●	●
	6. Road tolls and CO ₂ -focused congestion pricing	●	●	●	●	●	●	●
	7. Funding for electric vehicles and charging	●	●	●	●	●	●	●
Freight	8. Zero emission freight/delivery zones/curb access	●	●	●	●	●	●	●
	9. Zero emission ports and inland hubs/warehouse districts	●	●	●	●	●	●	●
Fleets (buses, light-duty)	10. Zero emission bus requirements & rollout	●	●	●	●	●	●	●
	11. Fleet EV funding and business models	●	●	●	●	●	●	●
	12. Light-duty city fleet requirements	●	●	●	●	●	●	●
	13. EV procurement and use policies (all classes)	●	●	●	●	●	●	●
Consumer	14. ZE mobility service provider/taxi deployment	●	●	●	●	●	●	●
	15. City programs for faster uptake (bulk purchase agreements & dealer & education campaigns) (action)	●	●	●	●	●	●	●

The assessments for each category are qualitative and quantitative. The rankings are expert-informed (EV industry, local governments, and advocates) and based on: 1) Transport CO₂ abatement modeling at state levels (e.g., freight emissions and passenger emissions are similar, freight is increasing, and bus emissions are a smaller part of emissions), 2) Health impacts are affected significantly by diesel emissions (particulate matter) that come primarily from trucks and buses, 3) Equity benefits and concerns cover potential economic burdens (e.g., road toll equity concerns unless designed to address), 4) Local jobs from charging infrastructure (based on studies in the US and Europe) and also the potential jobs to implement the policy, 5) Expert survey input on policy efficacy and market impact, 6) Difficulty to pass estimated from past evaluations and the policy stringency, 7) Costs to implement the policy (e.g., higher costs for policies that have more public engagement, policy design, potential pilots, enforcement, or to purchase vehicles and infrastructure).

BENEFITS OF ELECTRIFICATION

Cities that lead on vehicle electrification policy enjoy significant benefits, including greenhouse gas (GHG) emissions reductions, improvements in public health and social equity, savings on fuel and maintenance costs, job and economic growth, energy security, and more.

Climate: Cities produce roughly 70% of GHG emissions and account for [70% of all driving in the United States](#). In some states, a small number of cities represent a significant part of the state's emissions: Las Vegas and Reno produce 93% of Nevada's emissions, and one-third of New York's emissions are from New York City, Yonkers, and Albany (see Figure A1). In other states, even if the greenhouse gas emissions from a city do not make up a high percentage of the state emissions, the greenhouse gas emissions from a city are still significant due to the impact that emissions have on public health and the high-density populations in cities. Examples include cities in Texas, California, and Illinois (Figure A2).

Public Health and Social Equity: The transportation sector is a significant contributor of harmful air pollutants, particularly in densely populated areas. Transportation-related air pollutants such as particulate matter and nitrogen oxides adversely impact public health and have been linked to asthma, heart attacks, reduced lung capacity, heart disease, cancer, and more. Electric vehicles have zero tailpipe emissions, thereby drastically improving ambient air quality and health outcomes. Electrifying the transportation sector by 2050 across the U.S. [could accomplish the following](#): at least 6,300 premature deaths avoided per year, \$72 trillion saved in health costs per year, 93,000 asthma attacks avoided per year, and 416,000 lost workdays avoided per year. Air quality is also a critical social equity issue because pollution disproportionately affects Black, Latino, Indigenous, and impoverished communities, leading to poor health outcomes. Some of the worst air quality in the United States is associated with port and trucking facilities. [A 2021 study of the inclusion of equity for EV preparations](#) showed that only six of 36 states had equity mandates or considerations for low- and moderate-income communities and communities of color. The switch to a just and equitable transportation electrification future presents the unique opportunity to make dramatic air quality and health improvements for vulnerable populations.

Economic Development: Electric vehicles will drive municipal economic development and growth. EV operation and maintenance costs are lower, which saves municipalities money over time. Transitioning to EVs can create more local jobs through the deployment of charging infrastructure, through the maintenance needed on the charging stations over time, and an increased need for electric utility workers. Any money not spent on fuel and maintenance can be invested back into the local economy; the service sector stands to greatly benefit from this increase in local investment, which also provides more jobs than the oil and gas sector.

National and Energy Security: About [90% of all transportation in the United States](#) is powered by oil. This dependence has bound the United States' national, economic, and energy security to a highly volatile, cartel-influenced global oil market. Every year the U.S. military spends billions of dollars to safeguard global oil supplies. While the U.S. has gone to great lengths to secure supply and reduce volatility globally, not all supply disruptions can be predicted or prevented. When disruption occurs, prices everywhere are affected.

The [transportation sector is now the single largest emitter of carbon emissions in the United States](#). To ensure U.S. energy security, advance economic development, improve health, and abate climate impacts, we must dramatically accelerate the transition to electric vehicles. Most vehicles have a 10-20-year lifespan, so it is imperative that EVs make up a rapidly increasing share of new vehicles sold in the United States. The tipping point toward mass adoption is generally considered to be about 15% of new sales. [The Drive Electric Campaign](#) recommends that zero-emission vehicles reach 100% of new sales for buses, passenger vehicles, and freight vehicles by 2030, 2035, and 2040, respectively.

WHY EVS IN CITIES?

City and county leaders have opportunities to act more ambitiously, implement changes more quickly, and achieve meaningful results more rapidly than their counterparts at the state and federal levels. Cities will benefit from an immediate decrease in emissions, reduced operational costs, and the benefits described above related to improvements in health, social equity goals, economic development, and energy security. Transportation electrification policies can also support other goals, such as reducing air pollution, faster integration of renewable power, decarbonization, and improving future fuel-cost certainty.

Cities have demonstrated capability to be market leaders in EVs, buoyed by important policies that include financial incentives, High Occupancy Vehicle (HOV) access, high-level commitments, fleet policies, utility funding, charging rollout, and others. In 2018, [top cities had market shares of 2.7%](#), nearly three times the nationwide average of 1.0%. Some cities had significantly higher EV uptake in 2018 and [2019](#). San Jose led the charge with 20-21%, followed by other

California cities, Seattle, and Portland, ranging from 4% to 13%. Other cities with above-average EV uptake include Austin, Boston, Denver, Hartford, New York, Phoenix, and Washington, DC (Figure 1).

City influence: Cities can help drive the adoption of aggressive policies (we detail the top ones in this report) and increase political pressure for policy action at higher levels (state, national, utilities, other cities, and international city platforms).

Local commitments to 100% (or nearly 100%) vehicle electrification for both government fleets and privately owned vehicles can galvanize strong policy action and send essential market signals. Cities can aim to commit to reaching 100% new EV purchases up to five years earlier than statewide and national targets, meaning cities can aim for 100% by 2030 for buses, light-duty fleets, and taxis and 2035 for trucks. See Figure 2 for examples of commitments from Ann Arbor and GoEV Cities and Counties.

Figure 1: EV uptake in cities

Electric vehicle share in metropolitan areas in 2019, ICCT

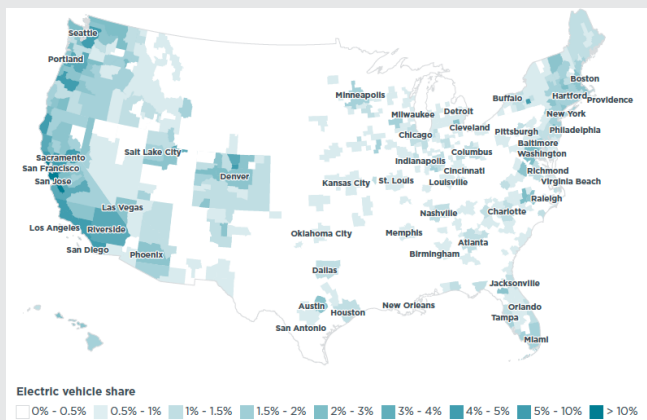


Figure 2: Example commitments:

Ann Arbor Climate Action Plan & Go EV Cities and Counties

The [Ann Arbor A2Zero Climate Action Plan](#) establishes an aggressive carbon neutrality plan that targets 100% renewable energy by 2030, switching cars and homes to electric power. The city targets 2025 for 90% of the city fleet to transition to BEVs.

[Go EV Cities & Counties](#) is an effort in Colorado through which cities commit to electrifying government fleets, buses, mobility service providers (such as Lyft, Uber), and defining goals to transition their entire communities.

CONSIDERING POLICIES, KEY STAKEHOLDERS, AND BUILDING UNDERLYING SUPPORT

While this is a comprehensive policy guide, cities, towns, and counties are at the forefront of innovation, and there are many opportunities to create new policies that advance transportation electrification. The questions below are important to consider when embarking towards a policy goal, whether the implementer is new to policy or highly experienced.

1. What are the challenges facing the community or other critical issues (including the environmental, social, and economic context)? What problem is the agency trying to solve?
2. Is there clear authority for the agency to move on the policy? What administrative or legislative route makes the most sense? Will this be most effective as an executive order, a resolution, a policy that passes through the city council, an amendment to a statute, or other avenues?
3. What is the level of public or other constituent support for the policy?
4. Overall benefits: Is the outcome worth the effort? E.g., are the benefits great enough, will the policy or action shift the market, is the policy too narrow or too broad?
5. Benefits beyond climate: Does the action connect to the current priorities and makeup of the community, such as considering health, equity, jobs, and EV market benefits?
6. Health, equity, and justice: Does the policy address communities most impacted by pollution and are they included in the process?
7. Does the policy help the organization show leadership?
8. Who has enacted the policy already? Are there existing or potential connections to support the agency's work? This can include other cities and advocates.
9. Does the policy support other organizational or community goals, such as those related to economic development, air quality, or costs savings?

To pass policies needed to advance transportation electrification, collaboration among diverse stakeholders is important. Table 2 shows examples of stakeholders and the wide variety of roles that civil society, businesses, and government stakeholders can play.

CONSIDERING POLICIES, KEY STAKEHOLDERS, AND BUILDING UNDERLYING SUPPORT / Continued

Table 2: Key stakeholder examples and roles

Type	Important stakeholder examples	Roles
Civil society	<ul style="list-style-type: none"> • Local transportation groups • Local climate groups • Social equity • Health groups • Local neighborhoods • Communities of color • Youth groups • Consumer advocates • Faith groups or leaders • Communications groups 	<ul style="list-style-type: none"> • Lead, participate in, and support coalitions • Bring a variety of persuasive arguments, including climate, health, air quality, jobs, etc., complemented by strategic communications • Support technical policy development, scenarios, and decisions, including supporting data on a mix of topics (EVs, cost of ownership, health impacts, benefits, jobs) • Support understanding of fleets that can rapidly move to EVs, including total cost of ownership assessments or telematics to identify the fleet vehicles best suited for replacement with an EV • Demonstrate broad and diverse support • Provide letters of support • Develop and publicize messages responding to questions or opposition or barriers • If relevant, provide testimony during policy development • Possible community science, such as truck counts in local neighborhoods • Connect with other cities • Jumpstart efforts with cities who have little experience with electrification
Corporations and workforce	<ul style="list-style-type: none"> • Chambers of commerce • Downtown business associations • Builders • Labor representatives • Utilities 	<ul style="list-style-type: none"> • Demonstrate demand for electric vehicles • Demonstrate business support for climate action and current actions they have taken on climate and EVs • Provide input on siting chargers and business implications
City, metro, or town government	<ul style="list-style-type: none"> • Mayor (e.g., executive orders) • City council (e.g., legislative actions) • City administration (e.g., decisions) • City transit or operational agencies • Air quality agencies • City fleet owners • City budget agencies • Metropolitan planning organizations • Air quality districts • Relevant county agencies/ organizations 	<ul style="list-style-type: none"> • Research and initiate policy conversations • Understand local context • Convene sessions with experts and departmental leaders on policy options • Guide the development of policies for departments to follow • Guide the adoption, implementation, and enforcement of policies • Update and revise policies from gained experience

Below we cover the top three to four policies within five categories: charging infrastructure, multi-sector, freight, fleets (buses and light-duty vehicles), and consumers. The policies are presented in descending priority and impact. For each policy, in addition to the benefits, difficulty to pass, and implementation costs, we provide examples and notes on program/policy design, other stakeholders that could be involved, and which policies apply to which sector of transportation.

CHARGING INFRASTRUCTURE

While the impact in GHG reduction or equity benefits is measurable, the pursuit of policies that accelerate charging infrastructure development is one of the most impactful first steps needed to uptake EVs across all vehicle classes. A city's efforts to reduce the barriers to creating a robust infrastructure network are foundational, ultimately leading to transportation electrification across cities. Additionally, it will enable consumer confidence and support public and private sector fleet transition to EVs. While about 80% of charging in the light-duty sector occurs at home or at the workplace, not all EV drivers will have access to a dedicated home charger. For example, city residents who live in multi-unit dwellings frequently do not have adequate access to charging stations. Therefore, it is important that municipalities and counties install charging stations at or near these multi-unit dwellings. Similarly, while business fleet operators may choose to install charging stations at private facilities, not all charging can be performed at these private facilities, particularly if the fleet has longer delivery routes. In order to achieve widespread transportation electrification, public-sector involvement in the planning and build-out of charging infrastructure is critical.

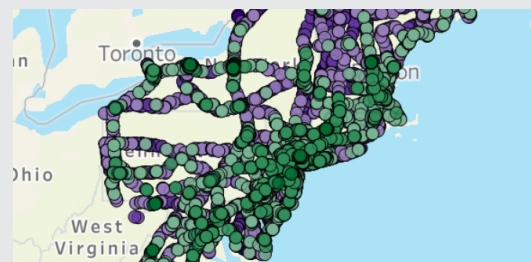
On the following page are more details on four charging-infrastructure policies: Charging infrastructure commitments, plans, and rollout; EV-ready buildings and businesses; equitable charging; and streamlined charging approval (permitting).

“Because of the chicken-and-egg nature of planning [EV and EVSE] decentralized transportation infrastructure, jurisdictions must take the lead in clearing regulatory pathways to make room for the adoption of EVs and deployment of the necessary infrastructure in order to ensure the possibility of market uptake of EVs.”

- New York State Energy Research and Development Authority and Transportation and Climate Initiative (Planning and Policy Tool Guide)

Help on planning infrastructure

The [Infrastructure Location Identification Tool and Visualization Maps](#) represent the outputs of a project conducted by M.J. Bradley & Associates and the Georgetown Climate Center to support the Transportation & Climate Initiative of the northeast and mid-Atlantic states. Cities can use the tool to plan and understand their charging needs.



CHARGING INFRASTRUCTURE / Continued

1. Charging infrastructure plans and rollout

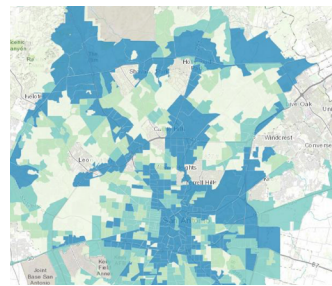
Policy	GHG reduction	Health	Equity	Jobs	Market impact	Difficulty	Current cost
Infrastructure deployment	● Medium	● High	● High	● High	● High	● Medium	● Costly

Increased availability of charging infrastructure

A municipality can accelerate electric vehicle adoption by establishing a comprehensive plan to increase the availability of charging infrastructure, or electric vehicle supply equipment (EVSE). Local government agencies should develop charging infrastructure plans with charging locations optimized to address all vehicle types and population segments (see Policy 3). A jurisdiction can integrate charging into its land use development plans and consider charging hubs for a variety of uses (e.g., mobility service provider charging during the day, resident charging at night, linking up freight truck charging with bus charging). This agency should consider needs such as disability access (Americans with Disabilities Act-compliant charging stations) and should be easy to use and safe. Public fast charging stations should be a priority. Once the vision and targets are established, cities should also identify funding sources and begin rollout, starting with public properties like municipal buildings, parking lots, garages, parks, community centers, and libraries.

Examples

- **Columbus (Ohio)** set an ambitious goal in 2020 of installing [925 EV charging ports](#) at workplaces, multi-unit residential buildings, and [public spaces](#) across the Columbus region. By April 2021, 914 EV charging ports, were installed representing 98% of the charging goal.
- The **Twin Cities' (Minneapolis-Saint Paul, Minnesota) EV Spot Network** is a partnership between the cities, HOURCAR, and Xcel Energy to create about 70 charging hubs for carshare and public charging. It is the largest Midwest charging network.



- **San Antonio's (Texas) EV Fleet Study** provides strategic guidelines for accelerating EV adoption and equitable distribution. The report identifies priority locations for public workplaces, fast charging (see map), and residential charging.

- **Orlando (Florida)** and the Orlando Utilities Commission, a local utility, installed 100 charging stations at 30 locations across the city. Orlando integrates general federal guidance on Americans with Disabilities Act (ADA) compliance into its EV charging ordinance. Officials intend to co-locate a dual-port charger alongside at least one ADA spot in each of the 30 locations.
- **Hawaii** requires at least one parking space for charging in publicly accessible parking lots with more than 100 spaces.
- **EVSE & accessibility: Atlanta's (Georgia)** EV Readiness Workbook follows ADA guidelines for installing EV charging infrastructure, including design, signage, and placement. **Tustin (California)** development regulations include requirements for EV charger spacing and signage. **Boston (Massachusetts)** has design guidelines on accessibility. **Park City (Utah)** provides guidelines for installation of EVSE in new developments, including ADA-compliant spaces.

CHARGING INFRASTRUCTURE / Continued

2. EV-ready buildings

Policy	GHG reduction	Health	Equity	Jobs	Market impact	Difficulty	Current cost
EV-ready buildings & businesses	● Medium	● Medium	● High	● High	● Medium	● Medium	● Low cost

Pre-wired, EV-ready buildings

In preparation for a 100% ZEV community, one of the most cost-effective policies a municipality or county can implement is requiring new buildings to be pre-wired and ready for EV charging. Adopting a vision for EV-ready buildings has significant equity benefits, as the EV-ready building codes can be applied to multi-unit dwellings, which often house low- and moderate-income populations. Adoption of EV-ready building codes also sets the stage for good jobs required for the installation of charging stations. A jurisdiction can adopt codes that require new construction and sizable renovations to be EV-capable, EV-ready, and/or EVSE-installed. Codes may vary by building type; fully operational installed charging equipment may be required in a new commercial space, while EV-ready wiring for a Level 2 charger may be required for a new residential duplex. Building codes can include different levels of EV-ready, EV-capable, and EVSE installation requirements for different scales of renovation on existing buildings.

Examples

- **Ann Arbor (Michigan)** requires all new buildings and existing building renovations to include [EV Charging Infrastructure](#) (February 2021). Rules include minimum EV parking percentages (10-100%) according to building type.
- **Atlanta (Georgia)** adopted an ordinance in 2017 requiring all new single-family homes to be EV-ready (conduit, wiring, and electrical capacity), in addition to 20% of new commercial and 20% of new multi-family residential parking to be EV-ready.

- **Auburn Hills (Michigan)** amended zoning ordinances to incorporate [Electric Vehicle Infrastructure](#) and strongly urge all new residences with garages be constructed with a 40-amp outlet on a dedicated circuit in close proximity to future EVSE.
- **Fayetteville's (Arkansas)** ongoing planning process aligns land use, transportation, and building codes with the city's ambitious long-term climate goals and recommends policies apply to as much development as possible with context-sensitive requirements (EV-capable, EV-ready, and EVSE-installed).
- **Oakland (California)** requires all new multi-family and non-residential buildings to be wired for EV charging, with full circuits to be installed with 40-Amp 208/240-Volt capacity, including raceway, electrical panel capacity, overprotection devices, wire and termination point, at the time of construction.
- **St. Louis (Missouri)** adopted EV-ready building regulations in 2021 that take effect in 2022 and require new construction and major renovations of multi-family and commercial buildings to be EV-ready. Major renovations of single-family units will fall under these policies starting in 2024.

CHARGING INFRASTRUCTURE / Continued

3. Equitable charging

Policy	GHG reduction	Health	Equity	Jobs	Market impact	Difficulty	Current cost
Equitable charging	● Medium	● Medium	● High	● High	● Medium	● Medium	● Medium

Equitable charging for multi-family housing

Planning for and building out a network of charging infrastructure is critical for a just and equitable transition to transportation electrification. Equitable charging means ensuring EV charging infrastructure is installed in a way that addresses a spectrum of needs. Examples include planning for, requiring, and/or installing charging infrastructure at workplaces and businesses, in the public right-of-way, at multi-unit dwellings, and across neighborhoods. Charging at multi-family housing is especially important to improving equitable access.

Examples

- **Mountlake Terrace (Washington)** adopted a city ordinance to facilitate the installation of EVSE to expedite EV adoption. The ordinance requires a minimum percent of parking dedicated to charging stations for multi-family residential, commercial, office, and industrial development. The highest requirements are for multi-family residences, with 10% of parking spaces dedicated to charging stations.
- **Salt Lake City (Utah)** adopted an EV-ready building code ordinance in May 2019. The ordinance requires that at least 20% of the parking spaces for multi-unit dwellings be EV-ready.

- **Urban Sustainability Directors Network (USDN)** developed a guide ([Electric Vehicle Charging Access for Renters: A Guide to Questions, Strategies, and Possible Next Steps](#)) for communities to help residential tenants access charging. Renters are often unable to charge at home because of a lack of off-street parking, inability to afford charging installation, or a property owner's unwillingness to install the equipment.
- **ACEEE Published [Siting Electric Vehicle Supply Equipment \(EVSE\) with Equity In Mind](#)** in April 2021, summarizing challenges for EVSE investment (including parking availability, multi-unit dwellings, permitting, multiple transport modes), the role of utilities (e.g., ratepayer funds dedicated to equitable outcomes, working with transit and school buses), current utility activities and investment focused on equitable EVSE (especially in Arizona, California, Colorado, New Mexico, and Oregon, prioritizing multi-unit dwellings, and school and transit buses), and community engagement and metrics (community needs assessment, mobility equity analysis, and placing decision-making in the hands of the local community).

CHARGING INFRASTRUCTURE / Continued

4. Streamlined charging approval (permits)

Policy	GHG reduction	Health	Equity	Jobs	Market impact	Difficulty	Current cost
Streamlined charging approval	● Medium	● Medium	● Medium	● Medium	● Medium	● Easier	● Medium

Streamlined charging approval

One of the roadblocks to increased deployment of charging infrastructure is complex and lengthy permitting processes. Municipalities and counties can remedy this by streamlining the permitting process for approving and installing charging infrastructure, including online permitting and centralized permitting. Any streamlined permitting process or program should account for the needs of medium- and heavy-duty trucks and buses, such as high-power charging and space designated for charging (e.g., hubs).

Examples

- **Chicago (Illinois)** allows licensed electricians to apply for EV charger permits online in one day.
- **Houston (Texas)** adopted a 24-hr permitting process whereby inspections scheduled by noon of a business day will be conducted that day if an electrical contractor has already purchased a permit. Requests made after 12 p.m. are performed within 24 hours.

- In **Rochester (New York)**, a standard electrical permit is all that is required to install home charging equipment. The process is straightforward and consistent with other electrical projects. Requiring a separate permit specifically for EV charging stations would create an unnecessary barrier.
- The state of **California** adopted rules that require consistent [municipal rules and regulations expediting EVSE permitting](#). California leaders determined that rapid and efficient EVSE installation statewide is in the state's best interest.



MULTI-SECTOR

Policies addressing multiple sectors at once, including freight trucks, buses, fleets, and personal vehicles, can have greater benefits than a policy focused on a single sector or vehicle type. However, multi-sector policies can be more difficult to pass or implement. Multi-sector policies include tools ranging from constraining zero emission zones or

diesel bans to incentives such as funding for electric vehicles and charging infrastructure.

Below are more details on three policies: Zero emission areas, diesel bans, or similar; road tolls and CO₂-focused congestion pricing; and funding for electric vehicles and charging.

5. Zero emission areas, diesel bans, or similar

Policy	GHG reduction	Health	Equity	Jobs	Market impact	Difficulty	Current cost
Zero emission areas, diesel bans, or similar	 High	 High	 High	 High	 High	 Difficult	 Medium

Zero Emission Areas For Air Quality & Health

Zero-emission/clean air zones, diesel bans, or similar policies restrict or deter combustion vehicles from entering an area to improve air quality and health and advance zero-emission mobility, including ZEVs, biking/e-biking, and walking. Policies may apply to all modes or target vehicles with significant particulate emissions, such as medium- and heavy-duty trucks and buses. Cities often begin the clean air zones within a core center of the city and expand the area over time, such as expanding out to wide ring roads.

To establish a Zero Emission Area (ZEA), it is essential to first develop sufficient charging infrastructure, build broad public awareness and support, build political will with decision-makers, and have an excellent technical design. Strong technical design can include pilot zones, consideration for which modes of transportation to address first, design to alleviate impacts on vulnerable populations, design to include robust implementation and enforcement, inclusion of air quality monitoring, and consideration for expanding geographic reach and modes over time. See ideas from the ZEA Handbook, referenced at right.

Low- and zero-emission zones first originated in Europe. While they are nascent in the U.S., several cities are exploring implementation options and variations, and they are expected to grow in scope and number. Some U.S. cities are exploring ZEA implementations that also include road pricing (also see Policy 6).

Zero Emission Area Handbook

The Global New Mobility Coalition's (GNMC) [ZEA Handbook](#) provides guidance for cities and business on how to plan, implement, and manage feasible ZEAs. Example cities include London and Sacramento.

Steps include:

- Establish work principles for all stakeholder groups
- Set an ambitious vision, incorporating economic and environmental considerations
- Define performance metrics to measure impact (societal, economic, and environmental)
- Define a winning pilot format, considering transit, residents, commuters, commercial traffic, local businesses, and others
- Prioritize asset classes and measures
- Close legal, financial, & technological implementation gaps
- Quantify direct impact
- Quantify and manage externalities
- Plan transition and timing for each measure
- Learn from city case studies
- Learn from GNMC members
- Ensure community dialogue and buy-in

MULTI-SECTOR / Continued

Examples

- Signatories to the [C40 Green and Healthy Streets](#) pledge to procure only zero-emission buses by 2025 and to establish zero-emission only areas by 2030. U.S. signatories include **Austin, Honolulu, Seattle, Santa Monica, and West Hollywood**. Seattle will introduce a Zero Emission Area plan by the end of 2021 as part of its commitment.
- **Los Angeles's (California) [Transportation Electrification Partnership](#)** (TEP) aims to have electric-only public transportation and zero-emission goods movement by 2028, the year the city will host the Olympic Games. LA City officials developed an LA Zero Emission Area roadmap, which was completed June 2021.

6. Road tolls and CO₂-focused congestion pricing

Policy	GHG reduction	Health	Equity	Jobs	Market impact	Difficulty	Current cost
Road tolls and CO₂-focused congestion pricing	● High	● High	● Potential negative	● Medium	● Medium	● Medium	● Medium

Tolls based on CO₂ intensity

Road tolls based on CO₂ intensity (sometimes in conjunction with HOV lanes) aim to incentivize the adoption of low- to no-emission vehicles. Tolls can be structured to foster and benefit ZEVs and achieve dramatic reductions in emissions. Congestion charging usually aims to reduce congestion and improve drive times, but examples have shown that climate emissions can also drop ([2.5-22% in Gothenburg Sweden, Stockholm Sweden, London UK, Singapore, and Milan, Italy](#)). These policies may focus on all modes of transportation but may be more effective at reducing emissions when targeted at freight, which has disproportionately high emissions. U.S. road tolls typically focus on light-duty vehicles early in the adoption phase, though officials can utilize toll roads to address all vehicles. Cities might use HOV lanes, gradually becoming more restrictive for high-polluting vehicles and permissive for low- to no-emission vehicles (e.g., toll roads could allow free access for EVs or HOV 2+ passengers to HOV 3+ passengers). Tolls/charges can incentivize shared use of the road and should include protections for lower-income and other vulnerable groups. Revenues from road tolls may be used to improve nonpersonal-vehicle mobility options and increase livability in communities plagued by localized air pollution. Roadway pricing on trucks on a per-km basis has been introduced in European countries. Important design considerations include excluding all combustion fuels (including natural gas) and considering the CO₂ intensity (miles per gallon) in the tolling.

Examples

- **Seattle (Washington)** The Seattle Department of Transportation is exploring [congestion pricing](#) to not only address congestion, but also to reduce climate emissions.
- **New York City (New York)** has a [congestion pricing](#) program that financially deters the use of the road based on time of use, congestion level, and vehicle size. It will decrease emissions through reduced trips and lower per-mile emissions but is not targeted at electrification efforts. The congestion pricing will apply to all personal vehicles and those that carry people for hire, including taxis and ride-hailing companies. Car users will benefit from reduced congestion, transit riders will benefit from increased investments in transit, and communities will benefit from reduced air pollution and improved health outcomes. The program was passed in 2019 and begins in 2021.
- **Los Angeles's (California)** Metropolitan Transportation Authority (LA Metro) outlined its vision for reducing congestion in [LA Metro's Vision 2028 Strategic Plan](#) through road pricing. LA Metro has released four concepts for their traffic reduction program pilot. Within the next five years officials will plan and implement a pilot traffic reduction program.

MULTI-SECTOR / Continued

- Beyond the U.S.: **Germany** established a [heavy-duty truck vehicle toll](#) in 2002. The per-km tolls are based on vehicle size, weight, and route. EVs are exempt from the toll. Natural gas vehicles have been exempted since 2019, but will be subject to the toll in 2024.

- Beyond the U.S.: Cities with major congestion pricing programs (sometimes combined with low emission zones) include **Gothenburg and Stockholm (Sweden), London (UK), Singapore, and Milan (Italy)**. Taking from two to nine years to prepare, cities saw [12-22% reduction](#) in vehicle trips, 10-33% reduction in travel time, and 2.5-22% reduction in climate emissions.

7. Funding for electric vehicles and charging

Policy	GHG reduction	Health	Equity	Jobs	Market impact	Difficulty	Current cost
Funding for electric vehicles & charging	High	High	High	Medium	High	Medium	Costly

Taxes for vehicles & charging

The most common way to provide incentives for EV purchases and the build out of charging infrastructure is through rebates. Funding for rebates can be included in the organization’s transportation budget, funded by a variety of revenue streams, including taxes on the sale of vehicles, gasoline taxes, or general fund dollars. In addition, cities, towns, and counties can partner with local electric utilities to offer rebates to their residents. Rebates can be offered for the purchase of an EV and the build-out of EV charging infrastructure for the light-duty sector, the medium- and heavy-duty sector, buses, and rideshares. Decision makers should ensure that transportation equity goals are achieved with any rebates set aside for these purposes; some cities have dedicated a portion of the rebate funding specifically for equity goals. Should the city not pursue a rebate, cities can coordinate and facilitate a “group-buy” purchase with selected automakers to lower the purchase price of EVs for the city and its residents. These group-buy programs can also be a way to partner with many local stakeholders, including utilities. Note that cities should be aware of other funding sources for EV purchase and EV charging infrastructure at the state, utility, and federal levels.

City examples:

- **Columbus (Ohio)** offered rebates to help taxis and other ride hailing services to switch to electric vehicles. Incentives of \$3,000 each (\$90,000 total) were available to transportation providers who purchased new, fully electric vehicles between November 2018 and April 2019.
- **Phoenix (Arizona)** partnered with Nissan in 2017 to offer \$10,000 discounts on the Nissan Leaf, which was followed in 2018 with a city partnership with local utilities to offer \$3,000 off the Nissan Leaf.

- **Ashland (Oregon)** electric utility users with an active account can apply for a \$1,500 rebate for the registration of a qualifying new or used battery electric vehicle.
- **The San Joaquin Valley Air Pollution Control District (California)** offers up to [a \\$3,000 rebate for the purchase of an EV](#) or other alternative fuel vehicles. Residents and businesses are eligible in an eight-county area.
- **Other city incentives for purchases or infrastructure** (some of which have expired, but can serve as references) can be found in the [State and Local Policy Database from the American Council for an Energy Efficient Economy](#).

State examples:

- Restructuring and replacing the **Colorado gas tax**. A proposal would add a fee on top of the gas tax to make up for declining gas tax revenues associated with fuel efficiency and EVs. An additional component would add a Vehicle Miles Traveled (VMT) fee. Some new revenues would be used for EV charging infrastructure.
- **The Idaho Department of Environmental Quality (IDEQ)** offers up to \$7,500 for entities to build DC fast charging EVSE in strategic locations in Idaho. Specific highway corridors will be prioritized as well as stations within a half-mile of a major highway. Funding for this project comes from Idaho’s VW settlement.
- The State of **Utah** renewed its [Alternative Fuel Heavy-Duty Vehicle Tax Credit Program](#) which provides tax credits for the purchase of heavy-duty electric, natural gas, or hydrogen-electric vehicles initially at \$15,000, declining to \$1,500 by 2030.

FREIGHT

Freight electrification policies can sharply decrease diesel emissions and overall greenhouse gas emissions, leading to significant health benefits. The number of vehicles to convert to electric is smaller (compared to vehicles in the light-duty sector), but the reduction in emissions is substantial. Some of the highest concentrations of diesel emissions occur at shipping ports and other transportation

hubs and disproportionately impact Black, Latino, Asian and Indigenous communities.

Below are more details on Policies 8 and 9: Zero-emission freight/delivery zones/curb access and zero emission ports and inland hubs/warehouse districts.

8. Zero-emission freight/delivery zones/curb access

Policy	GHG reduction	Health	Equity	Jobs	Market impact	Difficulty	Current cost
Zero-emission freight/delivery zones/curb access	● High	● High	● High	● High	● High	● Medium	● Medium

Zero-emission zones for all trucks and smart loading zones

Zero-emission freight zones operate similarly to general zero-emission areas (see Policy 5 above) but focus solely on trucks: delivery trucks, vans, and other medium- and heavy-duty vehicles that deliver goods. Curb access programs incentivize or restrict vehicles to specific classes (and times) and can be used to promote ZEVs. Examples include creating smart loading zones for freight with consideration for time needed to load and unload, and also the required access needed. While many policies are applied to medium- or heavy-duty trucks (and grouped under freight in this toolkit), curb access can also apply to and incentivize ZEVs among mobility service providers, transit, or other modes. In some cases, providing greater curb access would eliminate or change parking needs.

The costs of the policy are “medium,” primarily due to implementation costs; such costs include signage, monitoring, and enforcement. The costs rise somewhat with larger geographic scopes of the zone. Additionally, if parking is given up in the zone design, there could be foregone parking funds.

City examples:

- **Santa Monica (California)** in partnership with The Los Angeles Cleantech Incubator (LACI) established and deployed the nation's first [Zero Emissions Delivery Zone](#) in early 2021. The voluntary delivery zone is one square mile and provides priority curb access for zero-emission vehicles (trucks, scooters and cars), including providing real-time parking availability data to ZEV drivers. Initial

partners include 15 technology, delivery, and automobile companies and manufacturers, including IKEA, Shopify, Motiv Power Systems, and Nissan. The zone provides participating partners with decreased delivery and dwell times along with designated parking, all while the community benefits from cleaner air.



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- **Honolulu (Hawaii)** is developing an approach to de-carbonize a large part of the city through a “Carbon-Free Corridor” along an elevated 20-mile rail system currently being built. The city will implement a plan to transform land use and last-mile connections and provide incentives for accelerated zero-emission transportation and mobility development.

- **Curbside Management Strategies:** Curbs, once exclusively dedicated to parking for adjacent stores, are being re-imagined to foster delivery zones, safer bicycle infrastructure, faster and more reliable transit corridors, ride hailing, and outdoor dining for a growing number of cities.
- See Policy 5 for examples of multi-sector zero-emission areas. Many cities are working to address curb access, though not necessarily to prioritize electrification.

FREIGHT / Continued

- [Columbus \(Ohio\)](#) piloted a curb access project that converted eight high-traffic areas into managed curb access for commercial and on-demand drivers. The program demonstrated decreased dwell times for deliveries, decreased citations for illegal parking, and higher user satisfaction through on-line registration and reservations.
- [New York City \(New York\) Neighborhood Loading Zones](#) prioritizes loading zones to ease double parking and shorten delivery times. The demand for loading zones has grown significantly with the rise of e-commerce and increased deliveries stemming from the COVID-19 pandemic. Dedicated curb space may ease traffic flow and create safer spaces for all users.

9. Zero-emission ports and inland hubs/warehouse districts

Policy	GHG reduction	Health	Equity	Jobs	Market impact	Difficulty	Current cost
Zero-emission ports and inland hubs/warehouse districts	 High	 High	 High	 High	 High	 Difficult	 Costly

Seaport and inland ports for health, equity, and ZEVs

Hubs of freight activity, including seaports, inland hubs, and warehouse districts, produce some of the highest concentrations of particulate emissions detrimental to human health, and they are also large producers of greenhouse gas emissions. Zero-emission ports and inland hubs that electrify freight trucks (drayage and regional haulers) and freight handling equipment such as yard haulers have a vast potential to protect human health, particularly communities of color, which have been disproportionately impacted by the particulate emissions from this sector. Policies can set goals for zero-emissions vehicles and other equipment, and authorize the purchase and deployment of electric vehicles and charging infrastructure. Agencies can fund the work by setting facility impact fees related to mobile source pollution. Relevant actions are often in connection with State Implementation Plans (SIPs) to improve to air quality.

These efforts have reduced the port’s carbon footprint by 55% from its 2016-2017 baseline, and it is on track to see a 75% reduction by 2040.

Examples

- The [Port Authority of New York and New Jersey](#) will transition 50% of their light-duty fleet to electric vehicles by 2025, electrify ground support equipment at airports, electrify cargo handling equipment, fully electrify their airport shuttle bus fleet, and provide charging for customers.
- The [Port of Houston \(Texas\)](#) established a CO₂ reduction program based on a 100% renewable energy contract, efficiency improvements and port equipment upgrades.

- The **Ports of Los Angeles and Long Beach (California)**, under the [Clean Air Action Plan](#), set a goal in 2017 to transition cargo equipment and drayage trucks to zero emission by 2030 and 2035. [New investments](#) in electrical cargo-handling and drayage trucks could streamline operations, reduce emissions, and lower operating costs. In 2021, the ports are moving forward on [truck fees](#) (\$10/truck, adding up to \$40 million per year for each port for three years) to fund the zero emission transition, while carefully considering equity implications.

FLEETS: BUSES AND LIGHT-DUTY VEHICLES

Cities, towns, and counties can play a direct and robust role to accelerate the transition to an electrified transportation sector by making commitments to electrify public-sector fleets and encourage private-sector fleets to do the same. Buses and light-duty vehicles are the best place to start because of the wide variety of models now available (although an increasing number of heavy-duty EVs will become available within the next few years).

Fleet electrification offers significant financial benefits to public fleets as EV purchase prices continue to drop, and total cost of ownership now wins out over ICE vehicles.

Below are more details on four policies: Zero-emission bus requirements and rollout, fleet EV funding and business models, light-duty fleet requirements, and EV procurement and use policies.

10. Zero emission bus requirements and rollout

Policy	GHG reduction	Health	Equity	Jobs	Market impact	Difficulty	Current cost
Zero emission bus requirements & rollout	● High	● High	● High	● Medium	● High	● Medium	● Costly

100% e-bus by 2030

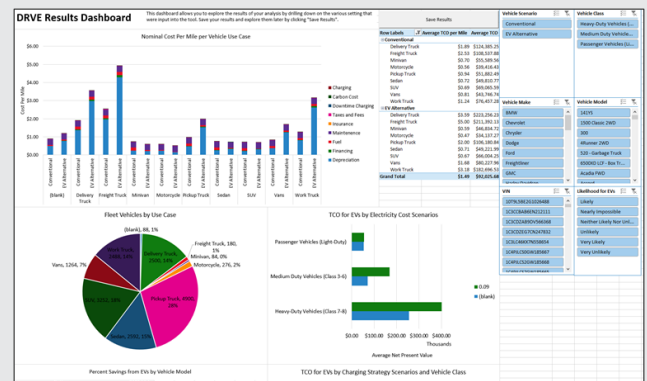
One of the most direct influences a city, town, or county can have on electrification is to purchase and roll out electric buses, yielding substantial benefits related to emissions reductions, public health, and equity. Public agencies can require up to 100% EV procurement by transit fleets and/or change their contracting processes to prioritize e-buses. Agencies may also negotiate with regional transit providers to incorporate EVs into the fleet. Lessons learned from charging infrastructure deployment for buses can be applied to other fleet vehicles and applications, especially other medium- and heavy-duty uses.

Examples

- As noted in Policy 5, cities that are signatories to the [C40 Green and Healthy Streets](#) pledge, commit to 100% electric bus procurement by 2025 (in addition to zero emission areas).
- [Miami-Dade County \(Florida\)](#) partnered with U.S.-based Proterra to install 75 chargers and 42 new buses in a [comprehensive plan](#) to electrify, making this fleet one of the largest e-bus fleets in America. Proterra supports electrification by going beyond delivery of e-buses and providing support for charging design, building, financing, operations, maintenance, and energy optimization.

Dashboard for Rapid Vehicle Electrification (DRVE) Tool

The Electrification Coalition's [DRVE Tool](#) allows for cost and emission comparisons between conventional and electric light-, medium-, and heavy-duty vehicles. Users can evaluate a mix of procurement ownership structures, vehicle types, electric vehicle charging configurations, total cost of ownership, and other scenarios.



FLEETS: BUSES AND LIGHT-DUTY VEHICLES / Continued

- **Beverly (Massachusetts)**, a small town of about 40,000 people, is transitioning its entire school bus fleet (27 buses) to electric and uses locally made Thomas Built e-buses.
- **Charlotte (North Carolina)** is piloting 18 electric buses for 12-18 months on the way to its long-term goal of 100% electric buses. The city is partnering with eTransEnergy, a subsidiary of its local utility Duke Energy, on this pilot. Their rollout will prioritize “Corridors of Opportunity” to elevate health equity and introduce e-buses first in areas with the highest pollution.
- **California** established a [100% zero-emission statewide bus fleet goal](#) in 2018 to be reached by 2040. This first-in-the-nation commitment was supported by a diverse coalition.

The regulation phases in gradually until 2029, when all new purchases are required to be electric. Between 2020 and 2050, the rules will reduce carbon emissions by 19 million metric tons, or the equivalent of taking 4 million cars off the road.

- The governor of **New Jersey** signed legislation in January 2020 that established goals [to increase use of zero-emission transit vehicles](#) in the state. The EV procurement requirement will gradually increase from 10% of new purchases in 2024 to 50% by 2026 and 100% by 2032.

11. Fleet EV funding and business models

Policy	GHG reduction	Health	Equity	Jobs	Market impact	Difficulty	Current cost
Fleet EV funding & business models	● Medium	● Medium	● Medium	● Medium	● High	● Easier	● Costly

Secure grants, rebates, and incentives for EVs

A crucial part of advancing EVs is to secure funding to purchase the vehicles. Securing EV funding can be helpful for all vehicle classes. Cities, towns, and counties can look to various potential funding sources to support fleet electrification, including state, federal, or public-private partnerships with businesses or utilities. Funds can be in the form of grants, rebates, or other incentives.

Agencies can explore innovative business models for EV acquisition, including leasing all or part of the vehicles. Batteries are typically the costliest part of the vehicles, and some organizations will lease or finance the batteries themselves.

- **Pay As You Save:** A fleet might partner with a utility (or other capital provider) using a “Pay As You Save” financial mechanism that allows the partner to pay for the upfront battery cost. The fleet pays back the costs monthly using savings from fuel and maintenance costs. Once the partner entity recovers its initial investment, the fleet owns the equipment.

- **Capital/municipal leasing** is a popular financing alternative to an ownership or operating lease. These tax-exempt leases carry much lower interest rates, allowing communities to expedite transportation electrification.
- **Mobility-as-a-Service (MaaS)**, also known as Transportation- or Fleet-as-a-service (TaaS or FaaS) shifts fleet ownership and operations to a private entity, which assumes responsibility for vehicle ownership, maintenance, insurance, and other aspects of fleet management.

FLEETS: BUSES AND LIGHT-DUTY VEHICLES / Continued

Examples

- **Federal Transit Administration (FTA) Low or No emission vehicle program.** The FTA program supports the transition of the nation's transit fleets to the lowest polluting and most energy efficient vehicles available. The 2021 program allocates \$180 million to support these efforts.
- **Highland Electric Transportation** is a \$253 million start-up company with a mission to provide a budget-neutral solution to electrify fleets. Broadly, energy service companies (ESCOs) finance and deliver energy efficiency projects, paid for by municipalities through the energy savings. Fleet electrification efforts are well-suited for Transportation-ESCOs (T-ESCO) given the higher capital costs of EVs paired with much lower fuel costs. Highland, a T-ESCO, handles all aspects of financing and management for a fixed annual fee that is cost competitive with existing diesel fleets. Montgomery County, Maryland, awarded Highland its first budget-neutral contract.
- **Dominion Energy** (18 eastern states) is investing in the incremental costs to buy electric school buses and the associated infrastructure to help realize their many benefits, including: improved grid reliability, lower emissions, and cost savings to schools.
- **Holy Cross Energy**, a nonprofit electric cooperative in Colorado, provides fleets up to two [free Level 2 EV chargers](#). The customer is responsible for labor costs, which can be paid up front or over time via the agency's monthly utility bills.
- The **Orlando Utilities Commission (OUC) Charge It** program sells and leases Level 2 (240 volt) and Level 3 (fast) chargers. The leases are for a 5-year term, with an open-ended buy out option at the end. If the site host does not buy-out the charger, OUC retains ownership.

EV Funding and Finance Guide

The Electrification Coalition's [Guidebook for Funding and Financing Electrification](#) summarizes a wide range of funding sources a public agency might pursue, including federal programs (DOT, DOE, EPA), State programs (incentives and Volkswagen settlement funds), utility programs, tax credits, bonds, leasing, and loan guarantees.

How Much Funding Is Available?

The following examples give a sense of the scale of resources available from various sources (FY 2020 levels except where noted):

- Surface Transportation Block Grants: \$12 billion
- Congestion Mitigation and Air Quality Improvement (CMAQ) program: \$2.5 billion
- Low or No Emission Vehicle Grants: \$55 million
- Diesel Emission Reduction Act School Bus Rebate Program: \$10 million
- Pennsylvania's Alternative Fuels Infrastructure Grant Program: \$5 million
- Utilities: \$1.2 billion approved (January-August 2020)
- Volkswagen settlement: \$3 billion for mitigation trust fund, \$2 billion in ZEV infrastructure (total)
- Regional Greenhouse Gas Initiative (RGGI): \$248 million (2018)

FLEETS: BUSES AND LIGHT-DUTY VEHICLES / Continued

12. Light-duty fleet requirements

Policy	GHG reduction	Health	Equity	Jobs	Market impact	Difficulty	Current cost
Light-duty fleet requirements	● High	● Medium	● Medium	● High	● High	● Easier	● Medium

100% electric light-duty fleets by 2030

Cities, towns, and municipalities can adopt policies that transition municipal fleets to be up to 100% electric by 2030 (or earlier). For most light-duty applications, EVs offer an attractive total cost of ownership with significant savings on fuel and maintenance costs, the benefits of which rise with increased vehicle usage (miles driven). The transition to an all-electric fleet can be phased in to coincide with increasing EV model availability in the coming years. The number of light-duty battery electric vehicle (BEV) and plug-in hybrid (PHEV) models is expected to increase from 55 to 81 models between 2019 and 2022 and to more than 100 models by 2025. Worldwide, there are about 150 models today, with numbers forecasted to grow to over 500 by 2022 and over 700 by 2030. Municipalities and counties can set similar electrification benchmarks for medium- and heavy-duty vehicles in their fleets. Some agencies' programs limit electrification to vehicle applications that don't incur substantially increased costs.

Examples

- As part of the [Ann Arbor A2Zero Climate Action Plan](#), **Ann Arbor (Michigan)** established in 2017 a goal to electrify 90% of the city's light duty fleet by 2025, and followed by medium- and heavy-duty vehicles at a later date. The 90% goal provides some flexibility for applications that may be too difficult or expensive to electrify.
- **Charlotte (North Carolina)** strives for a [100% Zero Carbon City Fleet](#) by 2030 (passed in 2018). The directive requires zero carbon (EVs, hydrogen, biogas or biofuel) vehicles. Additionally, the electricity used to run these vehicles must be powered using zero carbon electricity sources either on-site or through contracts.
- **Pittsburgh (Pennsylvania)** set an aggressive goal in 2017 of a [100% fossil-fuel-free fleet by 2030](#) in addition to powering the fleet with locally generated or purchased renewable energy.
- **Tallahassee (Florida)** adopted a [Clean Energy Resolution](#) in 2019 that, among other goals, set a goal to shift all light-duty vehicles to 100% electric by 2035.

13. EV procurement and use policies (all vehicle classes)

Policy	GHG reduction	Health	Equity	Jobs	Market impact	Difficulty	Current cost
EV procurement and use policies	● High	● Medium	● Medium	● Medium	● Medium	● Easier	● Medium

EV-first procurement

Guidelines for procuring and using EV technology may be more necessary in the near term to boost adoption and comfort with EVs. Several policies can help communities transition to electricity more quickly in all vehicle classes (light-, medium-, and heavy-duty) and optimize the benefits of their EVs. "EV-first" procurement policies stipulate that new vehicle purchases must be EVs unless a waiver is obtained based on high cost or other substantive reasons. Procurement policies can apply to specific vehicle types or applications, expanding in scope over time as more models

become available. EV use policies apply to the operation of existing vehicles in the fleet. If an electric option exists for a given application or use, staff must operate the EV, rather than any available ICE vehicle. Finally, telematics is a GPS technology that can improve the understanding of and efficiency of fleet vehicle use. Telematics may help officials optimize EV duty cycles, range needs, and transportation logistics, though data privacy considerations must be addressed.

FLEETS: BUSES AND LIGHT-DUTY VEHICLES / Continued

Examples

- **Albuquerque (New Mexico)** developed a [Vehicle Acquisition Policy and Procedures](#) policy (passed in 2020) that prioritizes zero-emission and fuel-efficient vehicles. The goal is to reduce carbon emissions and save taxpayers money on fuel.
- **Seattle's (Washington) 2017 Drive Clean Seattle** targets fleet emissions reductions by 50% by 2025 through electrification, cleaner fuels, and prohibiting idling. Seattle's efforts to electrify its fleet began in 2010, and by 2017, 20% of the vehicles in the city fleet were EVs. Through subsequent updates to the policy, the city established a stronger goal of transitioning 100% of the light-duty vehicles in the fleet to electric by 2023.
- **Charlotte's (North Carolina) Zero Carbon Fleet program** identifies the use of telematics to optimize use and EV charging. Telematics will be installed across the entire vehicle fleet to increase efficiency, including identifying which vehicles work best with electrification, reducing fleet size by identifying more efficient routes, and extending the range of EVs by identifying less efficient driving practices.
- **Climate Mayors EV Purchasing Collaborative.** In 2017, Los Angeles and 30 other cities began bundling fleet procurement needs (for all classes of vehicles) and EV charging infrastructure needs to demonstrate demand and reduce purchase costs. The Collaborative has grown to more than 250 cities, counties, transit agencies, port authorities, colleges and universities. Members have committed to purchasing over 4,000 EVs. The Collaborative, a partnership of the Electrification Coalition, Climate Mayors, and Sourcewell, also provides trainings, best practices, educational resources, and analysis for member organizations.
- **EV Smart Fleets: Public Sector Fleet EV Procurement Examples - a case study of three all-electric vehicle procurements conducted by the U.S. Navy, City of New Bedford (Massachusetts), and City of Seattle (Washington).**

CONSUMER-FACING POLICIES

Many policies that encourage the adoption of EVs among consumers are enacted at the federal and state levels (e.g., purchase incentives, charging infrastructure development), but towns, counties, and cities have a large role to play to increase the adoption of EVs amongst consumers as well. Not only are local governments critical in the build-out of additional EV charging infrastructure, but they also have a unique role to play in education and awareness. Municipal and county governments can also coordinate bulk purchases

and implement policies that require ride-sharing companies to transition their vehicles to be electric.

Below are more details on two policies and actions: Zero-emission taxis and transportation network companies; city programs for faster electrification, including bulk purchase agreements and dealers and educational campaigns.

14. Zero emission taxis and transportation network companies

Policy	GHG reduction	Health	Equity	Jobs	Market impact	Difficulty	Current cost
Zero emission taxis and transportation network companies	● Medium	● Medium	● High	● Medium	● High	● Medium	● Medium

100% ZEV taxis

Uber and Lyft, the two largest transportation network companies (TNCs), have already committed to zero-emission operations by 2030, but local jurisdictions still have important roles to play in the rideshare and taxi spaces. They can require taxi companies and TNCs to drive only EVs if the company wants to operate within the jurisdiction (established as part of the permitting/licensing process), impose volume caps on ride-hailing vehicle licenses while exempting electric ride-hailing vehicles (and over time license only EVs), provide differential taxes or fees to encourage EVs, or provide subsidies for rideshare EVs. These requirements may be enacted in conjunction with zero-emission zones and other fleet electrification standards. Cities can also support the deployment of zero emission taxis and TNC vehicles with charging infrastructure policies (Policy 7) and curb access (Policy 8).

Examples

- **New York City (New York)** [exempted](#) EVs from its ride-hail license cap.
- **San Francisco (California)** adopted a surcharge tax in late 2019 on ride-hail companies that will be in place for 25 years. It sets [discounted rates for electric vehicles](#) (1.5% for EVs vs. 3.25% in ICE vehicles).

• **Supporting corporate announcements and actions:** Cities and counties can build on the market momentum created by Lyft and Uber’s commitments to electrify by enacting strict requirements for all TNCs.

- Lyft announced in June 2020 that it would achieve [100% electrification of its vehicles by 2030](#) (and prevent “tens of millions of metric tons” of pollutants from entering the atmosphere). Lyft also premiered the ‘Green Mode’ program in Portland, OR, which allows passengers to request hybrid or electric vehicles. Lyft partnered with Portland General Electric to provide free charging.
- Uber announced in 2020 that it would achieve [100% electrification of its vehicles by 2030](#) in the U.S., building on earlier notices from 2017 [that 10% of its fleet would be electric](#) by 2019. To support EV awareness and uptake, Uber has [EV Champions](#) in Portland and awareness campaigns in Austin, Los Angeles, Montreal, Sacramento, San Diego, San Francisco, and Seattle.
- **State level:** California’s [Clean Miles Standard](#) is the first U.S. program that sets a target of 90% electric vehicle miles traveled (eVMT) by ride hailing fleets by 2030. The California Air Resources Board approved the program in May 2021.

CONSUMER / Continued

15. City programs for faster adoption, including bulk purchase agreements and dealer and educational campaigns

Policy	GHG reduction	Health	Equity	Jobs	Market impact	Difficulty	Current cost
City programs for faster uptake, including bulk purchase agreements	● Medium	● Medium	● High	● Medium	● Medium	● Medium	● Medium

Savings through bulk purchases and raising awareness

ACTION: The “policies” detailed above (1-14) indeed focus on specific policies a city can enact. City actions and programs that encourage faster uptake, including bulk purchase agreements and dealer and educational campaigns as detailed here, are not necessarily policies that can be adopted, but rather supplemental actions that can support transportation electrification.

Cities, towns, and counties can increase broad awareness about EVs for consumers by engaging in actions and programs that encourage faster uptake, such as bulk purchase agreements. This activates the marketing power of local governments and utilities to get the word out and can directly assist in reducing EV purchase prices. Bulk purchase agreements can address multiple common barriers to EV uptake, including awareness and purchase costs (even though light-duty EVs are more cost-effective than their gas counterparts on a total cost of ownership basis due to the fuel and maintenance savings, higher purchase prices are a very real near-term barrier).

Purchase agreements can be across cities or on a smaller scale within specific cities. These programs encourage early adoption of EVs before they reach price parity with gas vehicles; the need for bulk purchase agreements is expected to be less in the coming years as price parity with conventional vehicles is achieved.

Education and awareness of EVs across all transportation sectors is still needed. One cost-effective way to raise awareness and influence consumer purchases is through dealer engagement and broad educational campaigns. Cities can work with franchise car dealerships to help train the dealers on how to sell EVs, leading to increased EV sales. In coordination with dealers or independently, cities may conduct educational outreach campaigns to inform residents about EVs, support ride and drives, and raise awareness about their financial, climate, and health benefits.

Examples

- **Boulder County (Colorado)** implemented the [nation's first group EV purchasing program](#) in 2015 to boost EV sales. The group buy discount was \$8,350, which, in combination with federal and state rebates, totaled to 62% off the retail price of a Nissan Leaf. In Colorado, there were 289 EVs purchased in four months (four times the previous monthly averages). Across the U.S., between 2015 and 2017, there were 48 group purchasing programs across 20 states.
- **Salt Lake City (Utah)** ran an EV group purchase in 2015, led by the University of Utah in partnership with Utah Clean Energy.
- **Minnesota** offered [discounts on EVs](#) (Nissan Leafs) through [Drive Electric Minnesota](#).
- **Fort Collins (Colorado)** has implemented [five group EV purchases](#) as recently as 2020. Pre-negotiated savings can be dramatic, reducing the prices by \$5,000-10,000 beyond state and federal tax credits ([2016](#), [2019](#), [2020](#)). Programs resulted in EV sales up to three times the Colorado average. The Electrification Coalition facilitated these through its Drive Electric Northern Colorado program.
- The **Orlando** (Florida) [Electrified Dealer Program](#), in conjunction with the local utility (Orlando Utilities Commission), incentivizes consumers and dealers with \$50 dealer rebates and \$200 consumer rebates per vehicle sold.
- **Columbus'** (Ohio) Smart Columbus program introduced the [Electrified Dealer Program](#), which aims to accelerate EV adoption in the Columbus region by having dealerships commit to placing EVs on their lots and actively marketing them. The Smart Columbus program also featured a multi-faceted consumer adoption program, which included the nation's largest-ever [ride and drive program](#), hosting 12,000 drives over a two-year span.
- **EV Cincy** is an educational initiative created by the City of Cincinnati as part of the American Cities Climate Challenge. The initiative provides educational opportunities for local businesses and organizations to learn about the environmental and economic benefits of EVs.
- **Drive Electric Northern Colorado** (DENC) was established to encourage EV adoption through outreach and communication. The group holds events in which consumers can test drive EVs and E-bikes. DENC is a partnership of the Electrification Coalition, City of Fort Collins, City of Loveland, and Colorado State University.



- **NYSERDA (New York) Drive Clean rebate program** provides point-of-sale rebates of up to \$2,000 for purchase or lease through participating dealers. Funding is based on the vehicle's electric range. The program was established in 2020 with a total budget of \$85 million. Rebates help consumers and auto dealers to purchase and sell EVs and local communities to prepare for transportation electrification.
- See also the [Climate Mayors EV Purchasing Collaborative](#) detailed under Policy 13.
- Find additional information in: [The Electric Vehicle and Photovoltaic Power Purchase Handbook](#), a toolkit for developing electric vehicle and rooftop solar group purchase programs. Additional examples can be found in [GoEVCity's education and awareness toolkit](#).

Beyond municipal policies, city officials can support EV-friendly transportation policies at the state, utility, and federal level. For example, a city might support policies such as Zero Emission Vehicle regulations (e.g., the [Advanced Clean Cars Program](#) for passenger cars or the [Advanced Clean Trucks rule](#)); ZEV memorandums of understanding (for [light-duty vehicles](#) or [trucks](#)); policies that support the purchase of EVs such as rebates or [tax credits](#); direct sales legislation to allow for increased consumer choice by new EV-only automakers (such as in [Colorado](#) or [Connecticut](#)); and utility [rates](#), [incentives](#), or business models for [battery leasing](#).

For details, see the [Electrification Coalition's State EV Policy Showroom](#). This Showroom is a collection of tools and resources for policymakers, EV advocates, industry partners, and other stakeholders seeking to advance policies that accelerate the deployment and adoption of electric vehicles and charging infrastructure. The showroom includes:

- **The AchiEV Toolkit: Model Policies to Accelerate Electric Vehicle Adoption.** A national toolkit designed to accelerate the switch to clean, electric vehicles (EVs) in an effective and equitable way by providing various stakeholders with model EV policies at the state, local, and utility levels. (Sierra Club, Plug In America, FORTH, and Electrification Coalition, [Version 4.0 August 2020](#)).

- **State EV Policy Dashboard:** An interactive display of up-to-date data for major categories of leading state executive branch and legislative EV policy efforts (see Figure 3).
- **EV Roadmap Roundup:** An analysis of 17 state EV roadmaps that provides cross-cutting recommendations and allows users to compare reports across states. Includes links to local, state, and national roadmaps.
- **EV Funding and Finance Guide:** How to Amp Up Transportation Transformation: [A Guidebook for Funding and Financing Electrification](#).
- **EV Tools and Calculators Clearinghouse:** A compilation of tools and calculators for quantifying the impacts of electrification efforts.
- **Freight Electrification Report:** An Electrification Coalition report that addresses the advantages electric trucks have over diesel trucks, the barriers impeding production and sales, and lays out actions that stakeholders can take to facilitate and accelerate freight electrification.
- **ZEV State Scorecard:** A single, comprehensive, and data-driven ranking of the key policies being implemented in states that participate in the Multi-State Zero Emission Vehicle Memorandum of Understanding to support increased EV adoption.

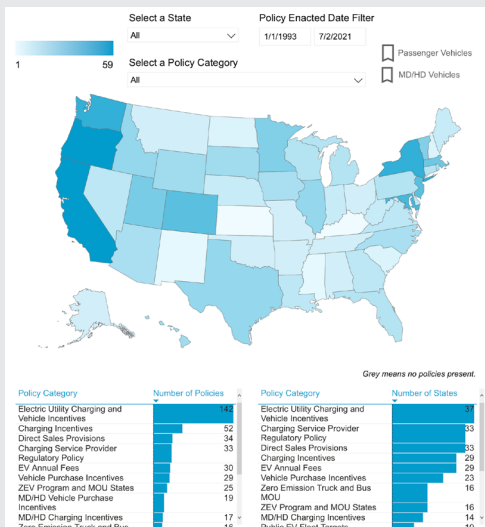
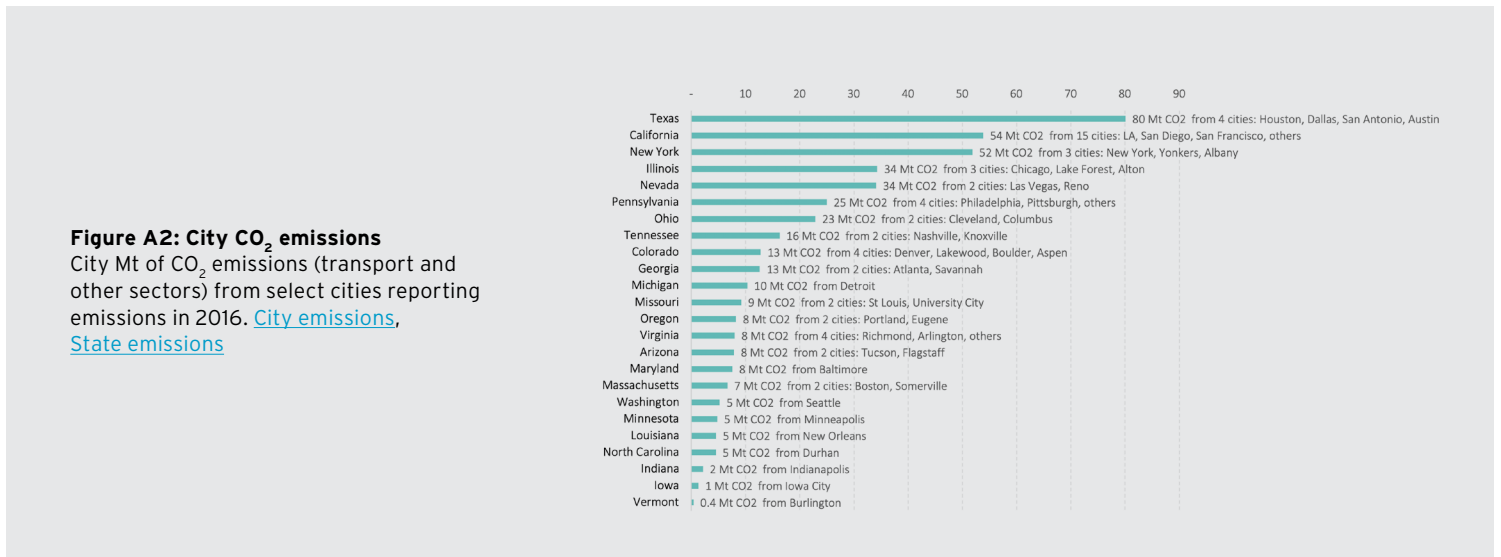
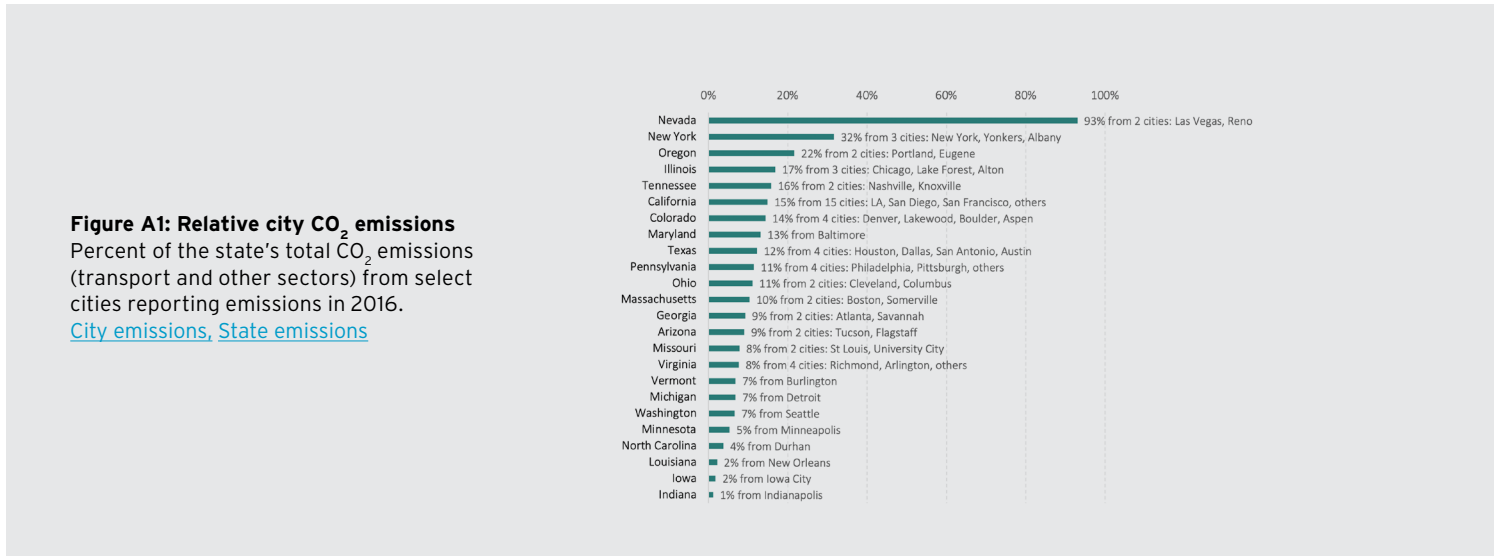


Figure 3: State EV Policy Dashboard

Cities, towns, and counties can explore their state's EV policies through the Electrification Coalition's [State EV Policy Dashboard](#).

CITY EMISSIONS DETAILS

Figure A1 shows select city emissions (representing transport plus other sectors) as a percent of the state's emissions. Figure A2 shows the underlying Mt of CO₂.



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ADDITIONAL REFERENCES

Policy Toolkits & Readiness Guides

- **AchiEVe: Model Policies to Accelerate Electric Vehicle Adoption.** Sierra Club, Plug In America, FORTH, and Electrification Coalition ([Version 4.0 August 2020](#))
- **GoEV City** ([toolkit](#))
- **Global Commercial Drive to Zero Policies and Actions Toolkit: Summary of Policies and Actions to promote Zero Emission Commercial Vehicles**
- **The Electric Vehicle and Photovoltaic Power Purchase Handbook:** A toolkit for developing electric vehicle and rooftop solar group purchase programs (SWEEP, 2015)
- **City of Atlanta EV Readiness** Workbook Atlanta Office of Resilience
- **A Toolkit for Community Plug-In Electric Vehicle Readiness.** Veloz. 2012.

Charging

- **Siting Electric Vehicle Supply Equipment (EVSE) with Equity in Mind.** Washington, DC: ACEEE. (Huether, 2021)
- **Electric Vehicle Charging Access for Renters:** A Guide to Questions, Strategies, and Possible Next Steps. (USDN Innovation Fund, 2020). A guidebook to provide cities with stakeholder-tested and context-grounded strategies that local governments can use to overcome common challenges and enable access to EV charging for renters in existing buildings within their cities.

- Accessibility: [U.S. Department of Energy Americans With Disabilities Act \(ADA\) Requirements for Workplace Charging Installation](#) (DOE, 2021). ADA-compliant PEV charging stations should be accessible, easy to use, and safe.

Global

- **How to design and implement a clean air or low emission zone** (C40)
- **Zero Emission Area Handbook** (Global New Mobility Coalition with McKinsey, May 2021). The handbook provides pragmatic guidance for cities and business on how to plan, implement and manage feasible ZEAs. Example cities include London and Sacramento.
- Global EV City Casebook (IEA, [2021 update, 2012 version](#))
- **EV Capitals of the World (ICCT)**



About the Author: The Electrification Coalition is a nonpartisan, not-for-profit group committed to promoting policies and actions that facilitate the deployment of plug-in electric vehicles (EVs) on a mass scale to combat the national security and economic dangers caused by America's dependence on oil. Coalition supporters represent the entire electrified transportation value chain, positioning the organization as a dedicated rallying point for an array of electrification allies.



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