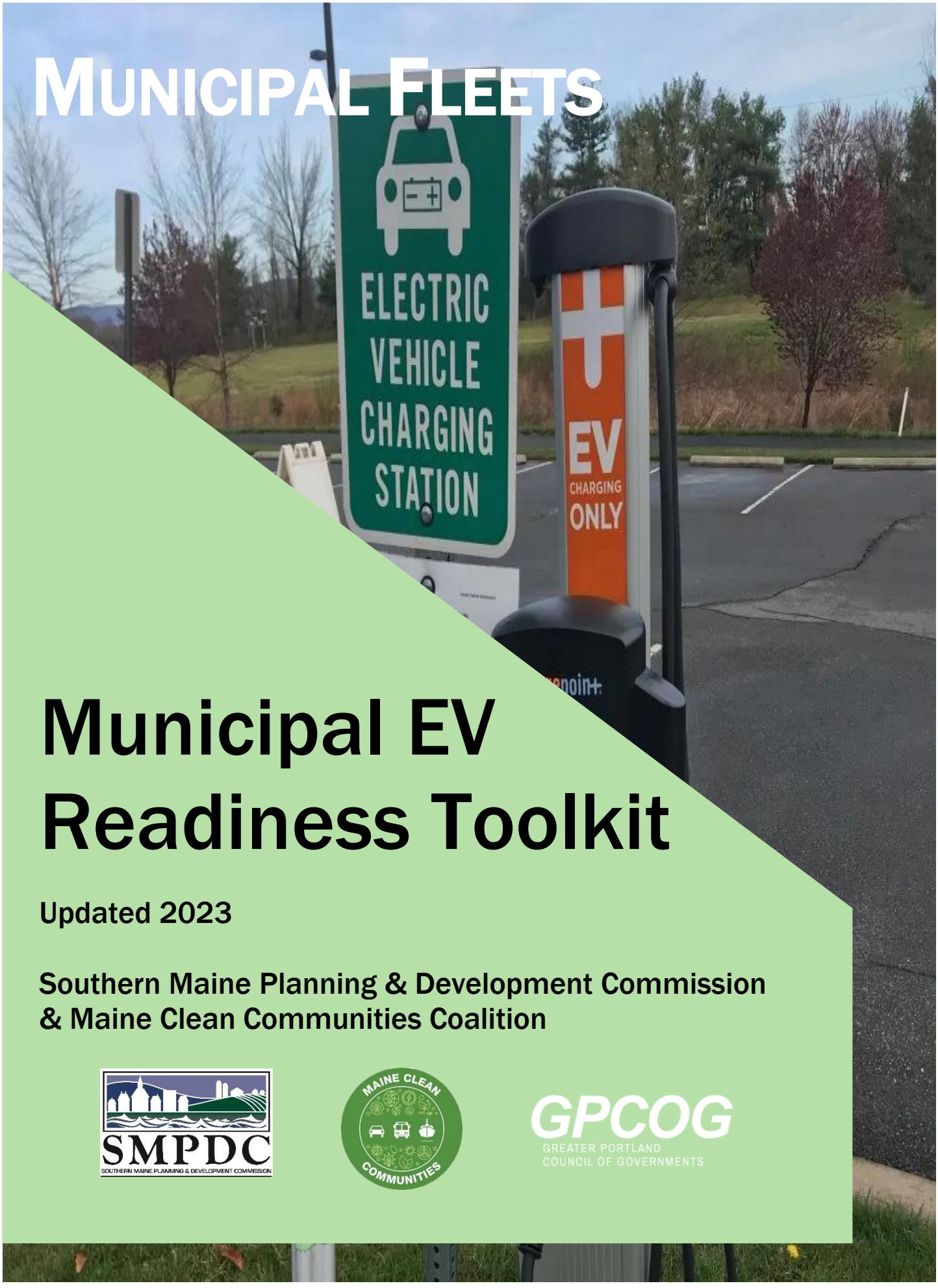


MUNICIPAL FLEETS

Municipal EV Readiness Toolkit

Updated 2023

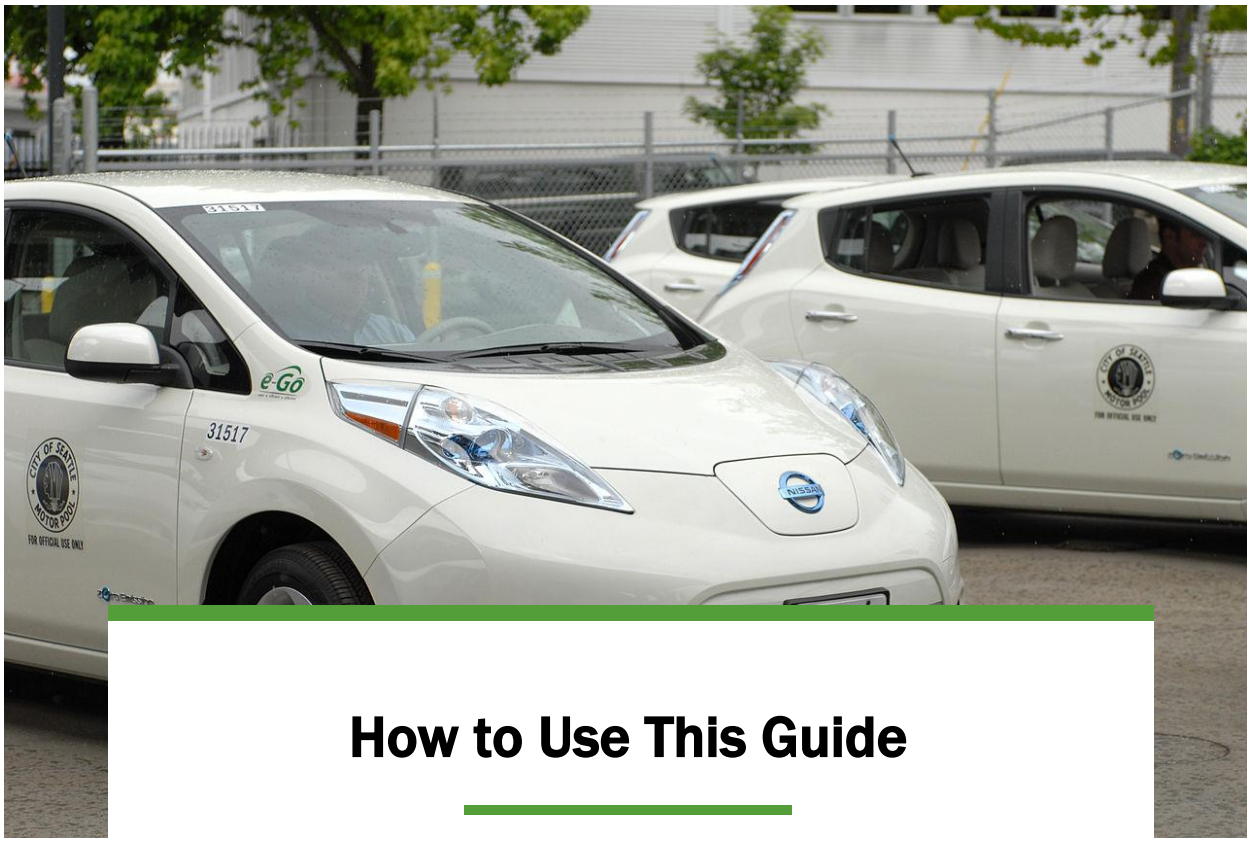
Southern Maine Planning & Development Commission
& Maine Clean Communities Coalition

SMPDC
SOUTHERN MAINE PLANNING & DEVELOPMENT COMMISSION

MAINE CLEAN COMMUNITIES

GPCOG
GREATER PORTLAND
COUNCIL OF GOVERNMENTS

Table of Contents



How to Use This Guide

Maine municipalities can be leaders in electrification by replacing their fleet vehicles with Electric Vehicles (EVs). Municipal fleet electrification is a significant step in reducing municipal greenhouse gas emissions and air pollution. Municipalities that adopt EVs into their fleet will also save money, support sustainability goals, improve public health, and promote local energy sources. By demonstrating EV technology, municipal EVs encourage community members to consider purchasing their own EVs. This guide outlines three steps a municipality can take to electrify their fleet. Each step is detailed with suggestions and sources such as websites, articles, and tools.

Transitioning Municipal Fleets to EVs

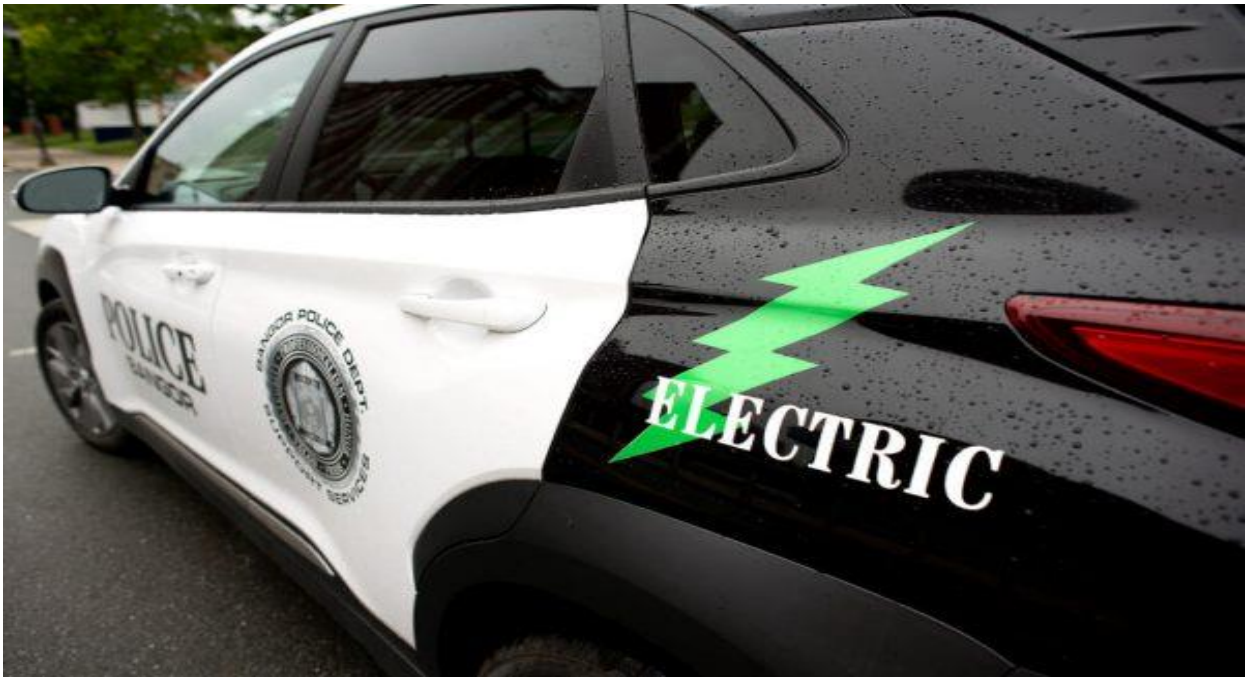
Transportation is responsible for 54% of Maine's greenhouse gas emissions. Maine released the state's first climate action plan, Maine Won't Wait, outlining key strategies and targets to reduce greenhouse gas emissions. One emission-reduction goal is putting 41,000 light-duty EVs on the road in Maine by 2025 and 219,000 by 2030. Maine municipalities will play a key role in leading the state's transition to electric vehicles and reducing our environmental footprint.

The strategy to a successful transition of your municipal fleet can be broken down into three high-level actions:

1. Create an effective planning strategy and update local policies to support fleet electrification

2. Pinpoint the proper state, federal and manufacturing funding incentives and keep a well-tracked budget

3. Install the proper EV infrastructure to meet the fleet's needs



Source: Bangor Daily News

Planning for Municipal EVs

To support the transition to electrification of our transportation fleets, several states are utilizing a hands-on approach to develop new policies that prioritize the procurement of EVs and support the development of the state's EV infrastructure.

Examples of legislature prioritizing EVs:

- Louisville, KY: Mayor signs an executive order directing all city departments to prioritize the purchasing of electric and hybrid vehicles, green equipment, and necessary infrastructure to support the transition to electric vehicles.
- State of Maine: Maine Governor calls for a "Clean Transportation Roadmap" to help achieve the state's climate action goals to increase the number of EVs on the road by 2030.

Municipal fleets are a logical choice to transition to EVs due to the predictable duty cycles and a shorter distance traveled of around 200 miles per charge in a single day. With the proper infrastructure installed, these EVs should recharge overnight in the municipal lot and will be ready again by morning. The combination of manufacturing and state-funded rebates can make the leasing or purchasing of new EVs much more affordable.

Planning best practices for fleet electrification include:

1. Update Fleet Purchasing Policy to Prioritize Electric Vehicles

Fleet managers are responsible for defining the fleet's policies and procedures. To remain effective, fleet policies must be routinely updated and shared with municipal leaders. Implementing a new policy may sometimes be a challenge due to the needed support of staff, senior management, human resources, and other municipal leadership.

2. Complete Baseline Fleet Evaluation

Start with a high-level baseline fleet evaluation. Identify opportunities to procure AFVs with a lower total cost of ownership than existing vehicles to identify an initial pool of candidate vehicles for further evaluation. The following tools will help understand opportunities available and the cost of transition to EVs.

Conducting a baseline fleet evaluation is an essential step for:

- Optimizing your fleet management
- Reducing the dependency on fossil fuels and smoothly transitioning a fleet to electric.

Start with a high-level baseline evaluation of opportunities to procure AFVs with a lower total cost of ownership than existing vehicles to identify an initial pool of candidate vehicles for further evaluation. The following tools will help understand opportunities available and the cost of transition to EVs.

3. Sustainable Fleet Management

The Federal Energy Management Program (FEMP) suggest combining these four core principles of sustainable fleet management:

1. **Right-sizing fleets and vehicles to missions**

   Right sizing a fleet is used to identify older and inefficient vehicles and replace them with more efficient alternative fuel options, in this case, electric vehicles. Right sizing the fleet will determine optimum fleet inventory, eliminate any unnecessary vehicles, increase overall fuel efficiency and reduce the fleet's vehicle miles traveled (VMT).

The Alternative Fuels Data Center has a guide on best practices for right sizing a fleet.

2. **Reducing vehicle miles traveled (VMT) and idling**

   There are several tactics that may be used to reduce the fleet of vehicle miles traveled and increase travel efficiency.

A) Eliminate vehicle trips: Connecting virtually has never been easier. Avoid unnecessary in-person meetings and instead offer virtual options for meetings.

B) Agency carpooling or agency shuttles: Not everything can be done virtually. When you have to attend an in-person meeting, consider offering to carpool with co-workers or taking a shuttle to your destination.

C) Public transportation: If an electric fleet vehicle is not available, consider taking public transit to meetings or conferences.

3. **Increasing fleet fuel efficiency**

   Fleets can drastically increase fuel efficiency by swapping their vehicles to battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs)

4. **Optimizing cost-effective alternative fuel use**

   Battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs) are suitable for many of Maines municipal fleets and should be prioritized as we build out the states electric vehicle charging network.

Using utility cost comparison tools:

Fleet Procurement Analysis Tool
The Microsoft Excel-based tool can evaluate a variety of procurement ownership structures, vehicle types, and procurement scenarios. The tool compares procurements side-by-side on a cost-per-mile basis and provides an analysis of cash flows and location-specific lifecycle emissions. Maine Clean Communities can guide you through the tool to maximize effectiveness.

Alternative Fuel Life-Cycle Environmental and Economic Transportation (AFLEET) tool
The AFLEET tool uses data from Argonne's Greenhouse gases, Regulated Emissions, and Energy use in Transportation (GREET) fuel-cycle model to estimate petroleum use, greenhouse gas emissions, air pollution emissions, and cost of ownership of light-duty and heavy-duty vehicles.
Future Automotive Systems Technology Simulator (FASTSim)
FASTSim simulates fuel and energy consumption for a range (e.g. conventional, electric, hybrid, fuel cell) of vehicle types that can be used to evaluate vehicle performance under a range of driving conditions. In less than 5 minutes, users can perform efficiency and cost comparisons of vehicle powertrains.

4. Learn What Electric Vehicles Are Available in Maine

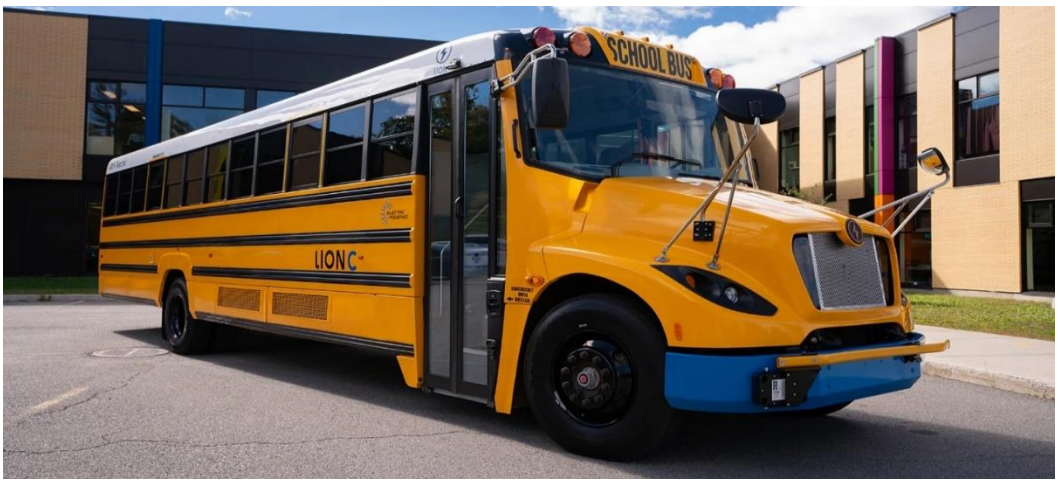
While considering your fleet transition, it's important to know what EVs are currently on the market and which ones are available in stock and for funding opportunities.

Maine Clean Communities has multiple fact sheets listed on our website that go into detail over the different types of EVs, including, Light-Duty Vehicles, Medium, and Heavy-Duty Electric Vehicles, as well as charging infrastructure resources.

Efficiency Maine has a comprehensive list of all Maine car dealerships that participate in their EV rebate program.

- Light-Duty Vehicles:
  - The most common Light-Duty EVs you'll see in municipal fleets are the Chevrolet Bolt and Nissan LEAF. The Toyota Prius is also popular, although it's a Plug-in Hybrid Electric Vehicle (PHEV).
  - Common uses for PHEV could be for Code Enforcement, Fire Chief, Police Chief and other municipal leaders.

- Medium- and Heavy-Duty Vehicles:
  - There are several different options for Medium- and Heavy-Duty EVs on the market. They include transit buses, school buses, shuttle buses, cargo vans, medium-sized trucks and more. Global Commercial Vehicle Drive to Zero keeps an updated list of Medium- and Heavy-Duty technology.
  - Mount Desert Island High School just purchased their first EV school bus for around $350,000 in 2021 and approx. 80% of it was funded through the Volkswagen Emissions Fraud Settlement.



Lion Electric Type C School Bus

5. Building a Team for an Electric Fleet Conversion

Transitioning a municipal fleet to EVs will require support from several key leaders within the municipality. Consider building a team of leaders from several departments to spearhead the transition. Key members may include, but are not limited to:

1. **Municipal Fleet Manager:** Getting the fleet manager on board with city fleet electrification will be a significant step. The fleet manager determines vehicle options to offer department heads for new purchases. They have the power to shift the offered vehicle options to electric only. Connect with the fleet manager on current vehicle inventory and if there is a plan to retire and replace vehicles with EVs in the upcoming years. Fleet managers may also determine to "right-size" their fleet (fleet manager determines vehicles aren't being effectively utilized – may result in shifting vehicle allocation or needs) which could be used as a potential funding source for new EVs.

2. **Municipal Finance Director:** The city finance director will usually be the member who would guide the municipal fleet electrification assessment. The assessment consists of data on the total cost of vehicle ownership, identifying new fleet compositions and establishing a long-term program for replacing gas-powered vehicles with EVs. The finance director should explore public-private partnerships to reduce costs.

    - A private-public relationship might look like: Partnering with a utility company to have them install/own/operate the charging infrastructure.

3. **Sustainability Director:** If your municipality has a sustainability director, this person can help make the case for fleet electrification based on environmental benefits to meet the city and state climate action plans. If your municipality does not have a sustainability director, the host organization of Maine Clean Communities, Greater Portland Council of Governments sustainability team may serve as this role.

4. **Elected City Leaders:** Determine if the mayor, city council members, or other elected officials are willing to champion a stance on climate action and discuss city fleet electrification with them.

Alterative positions could be the director of public works, town or city manager and board members.

Financing and Budgeting

When purchasing a new EV, there are a variety of funding sources available to help offset the overall cost of the vehicle in the form of rebates. These will typically be offered directly through the car manufacturer or Efficiency Maine Trust.

Explore implementation of opportunities and strategies early in the process. Try to secure a commitment from stakeholders to allocate funding to electrifying the municipal fleet. Getting stakeholder commitments may help avoid possible organizational budgeting barriers.

Cooperative & Bulk Purchasing Strategies

Cooperative purchasing may be a good option if your municipality has strong partners within the state. It's a strategy used to negotiate the procurement of EVs at a lower cost for the purchasing parties.

"Cooperative purchasing is a method of procurement conducted by, or on behalf of, one or more governmental units for use by other governmental units."

City of Portland, ME is planning to utilize a bulk purchasing program to offer lower-cost building and vehicle clean energy equipment as part of the "Electrify Everything" campaign.

State Funding Incentives

Electric Vehicles:
When purchasing a new EV there are often a variety of funding sources available to help offset the overall cost of the vehicle in the form of point-of-sale rebates. State rebates will typically be offered directly through Efficiency Maine Trust.

Charging Infrastructure:
Some of the biggest capital costs involved with fleet electrification are purchasing the electric vehicle charging station(s), hiring contractors to install them and any associated maintenance and upgrade costs. There are two major sources of charging infrastructure incentives for Mainers.

- Efficiency Maine consistently updates their available EV charging station incentives with current rebate and grant information.

- Central Maine Power is exploring a "Make-Ready" program funding to advance EV charging accessibility.

The Make-Ready Program would offer rebates to business and municipal customers who install EV chargers. These rebates offset construction costs associated with the electric infrastructure (make-ready) required to support L2 chargers.

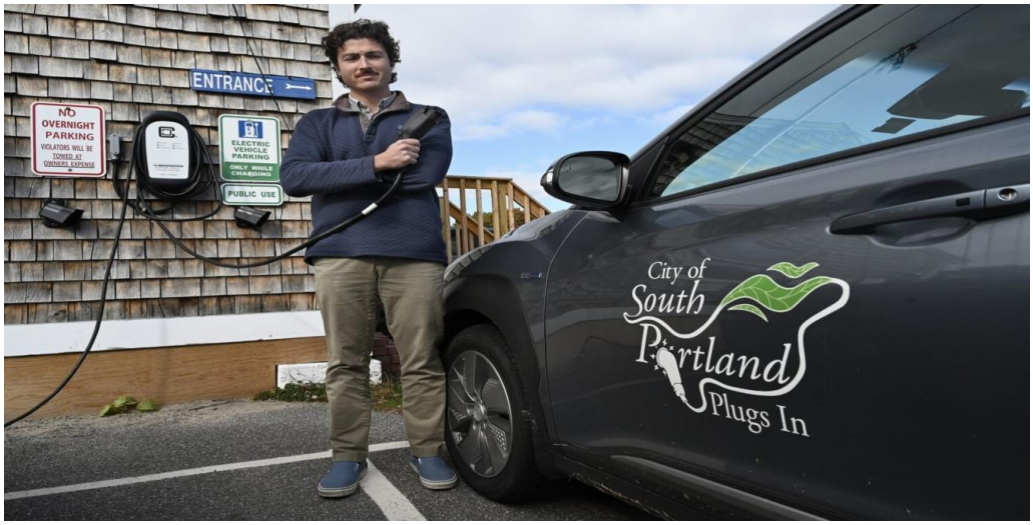
- Make-Ready is broadly defined as the electrical infrastructure between the utility grid interconnection and the chargers, including stepdown transformers, electric service panels, conduit, conductors (wire), switch gear and power conditioning units (for DCFC), mounting pads or brackets, and other such elements.

Federal Funding Incentives

Federal funding incentives are typically distributed in the form of a tax credit or tax incentive. Buyers will see any tax EV benefits when filing their annual taxes through the IRS.

- Fueleconomy.gov has a full list of EV tax incentives for every car manufacturer currently available.

- The Low or No Emission competitive program provides funding to state and local governmental authorities for the purchase or lease of zero-emission and low-emission transit buses as well as acquisition, construction, and leasing of required supporting facilities.



Source: Shawn Patrick Ouellette, Portland Press Herald Staff Photographer

Installing EV Infrastructure

Municipal Electric Vehicle Charging Stations

To ensure a smooth and efficient transition to an EV fleet, municipalities must ensure the proper infrastructure is being installed to meet charging demands. Depending on the charging station your municipality purchases, an EVCS can have multiple charging ports and can handle multiple vehicles. Some important factors to consider are what level chargers are needed, where will the chargers be located, and whether they will be "network" or "non-network" chargers.

Breakdown of what charging infrastructure is available and best uses

Level 2 Chargers: 240 volts of AC power from source to hardwired charging unit to the vehicle. The charge time can vary between 2-10+ hours depending on the vehicle. This is the perfect option for municipalities that park their fleet vehicles in the same location overnight.

Typical costs: $400 – $6,500 for equipment; $600 – $12,700 for installation. Network chargers will increase costs as they offer more customizations.

DC Fast Chargers: High-powered DC fast-charging station delivers DC power directly to the car bypassing the on-board charger. Charge time will be approx. one hour and if the charging station is both open to the public and a networked, can help offset the cost of fleet investments through charging fees.

Typical costs: $10,000 - $40,000 on equipment; $4,000 - $51,000 installation

Network vs. non-network chargers:

Network EV Charging Station:

With network chargers, fleet managers can see additional levels of data and control capabilities vs. a non-network station. Fleet managers can access updates remotely, utilize built-in reporting and analytics on charging usage and energy costs. Network chargers tend to be significantly more expensive for access to these features. If municipal lots are open to people who aren't fleet drivers, network chargers allow you an additional layer of control and potential opportunity to collect revenue from public usage.

Something to consider when choosing a network charger is whether you're locked into a contract or can switch services at any time. Being tied to a contract, you might be limited to specific hardware options with specific providers.

Non-network EV Charging Station:

Non-network stations are a much cheaper option with the tradeoff of having less access to extra features, robust data collection and control options. These standalone stations are not connected to an EVCS network and cannot be accessed remotely.

Charging Stations Site Design

Once the municipality has decided on which charging hardware to use, the next consideration should be the overall site design where the charging station will be located. The municipality should consider the time of day when the charger will be most frequently used (midday or overnight) whether the charging station will be private (not accessible to the public) or public.

The U.S. Access Board issues guidelines under the Americans with Disabilities Act (ADA), Architectural Barriers Act (ABA), and many other laws, released a technical assistance document to assist in the design and construction of EV charging stations to ensure they are accessible and usable by people with disabilities.[1]

Design Recommendations for Accessible Electric Vehicle Charging Stations

Entities subject to the ADA or ABA must provide accessible EV charging stations. EV charging stations that may be covered under these accessibility laws include:

- State or local government offices
- Public parks
- Municipal building parking lots
- Street parking and the public right-of-way
- Residential housing facilities provided by a state or local government
- Rest stops along the Interstate Highway System

Universal Design

Universal Design (UD) principles can and should guide the installation of public facing EV charging infrastructure. EV charging infrastructure should support the diverse needs and abilities of all current and future EV owners. Some important considerations include having adequate lighting for nighttime, an easily accessible geographical location, mobility accessibility, safety precautions, language accessibility, and ease of use.

The 7 Principles of Universal Design:

- Equitable Use
- Flexibility in Use
- Simple and Intuitive Use
- Perceptible Information
- Tolerance for Error
- Low Physical Effort
- Size and Space for Approach and Use

[1] https://www.access-board.gov/tad/ev/#types-of-ev-charging-stations-that-must-be-accessible

EV Safety Training

EV Safety Training for First Responders and Vehicle Drivers

Vehicle fires and safety procedures vary based on the type of vehicle and fuel type. Electric vehicles have advanced, high voltage battery systems that typically range from 100 – 600 volts. Battery packs are encased in sealed shells and meet rigorous testing standards. Batteries include safety features such as insulated high voltage lines, surge protectors, and automatic shut offs. Hybrid electric vehicles (HEVs) and plug-in hybrid electric vehicles (PHEVs) have internal combustion engines (ICEs). Since EVs have different safety features and hazards, it's important the municipality's first responders and staff are properly trained in case of an emergency. There are several online training and resources available from the National Fire Protection Association.

National Fire Protection Association (NFPA)

The National Fire Protection Association is an agency comprised of experienced safety officials tha coordinates with organization across the country to education, train, and raise awareness of alternative fuel vehicle (AFV) hazards. The NFPA develops and provides access to virtual and in person content and training sessions for first responders and safety officials. Some courses can be customized to fit career specific curriculum such as Fire/Rescue and EMS specific knowledge. These courses are designed to be highly interactive and meet National Transportation Safety Board recommendations.

Here's a list of just a few of the courses the NFPA offers through their website:

- Alternative fuel vehicles training program for emergy responders
- Fire service training on alternative fuel vehicles
- EMS training on alternative fuel vehicles
- Crash reconstruction training on alternative fuel vehicles

The NFPA has several one-page guides and resources to identify AFV safety hazards:

- Emergency Response Guides – based on vehicle make
- Submerged Hybrid / Electric Vehicle – one-pager
- Electric and Hybrid Vehicle Quick Refence – Fire Service Edition

National Fire Protection Association Website – nfpa.org/ev