



# Cities & Climate Leadership

## Buy 100% Electric Vehicles for City Fleets

### THE OPPORTUNITY

Having overtaken power plants, the transportation sector is now the largest source of greenhouse gas (GHG) emissions in the U.S. The sector accounts for approximately 30% of total GHG emissions nationwide. Use of fossil fuels as the primary energy source for internal combustion engines accounts for the high GHG emissions. In 2016, petroleum products provided about 92% of the total energy used by all parts of the U.S. transportation sector. With the number of vehicle miles traveled by automobiles steadily increasing, petroleum use and GHG emissions also could increase, but forward-looking cities have the power to change this trend by embracing cleaner alternatives like electric vehicles.

With a favorable municipal policy framework, plug-in electric vehicles<sup>1</sup> present an exciting opportunity for cities to reduce air pollution, cut fuel costs in half, and promote public health by switching from gasoline to electricity.

Clean vehicles are available to make this change. In the Midwest, more than [20 electric vehicle models](#) are sold. Beyond passenger vehicles, a wider range of electric vehicles to meet the specialized needs of cities are coming to market. These include pickup trucks, street sweepers, [school buses](#), and [garbage trucks](#), all in an effort to decarbonize transportation. City leadership can accelerate smart electric vehicle use and their networks, especially in dense urban areas where emissions most endanger public health.

### CITY LEADERSHIP ON ELECTRIC VEHICLES

Buying electric vehicles for city fleets is one of the most meaningful ways a city can showcase its leadership in making clean technology possible and show a fast return on investment. Cities across the U.S. are already turning to electric vehicles for their fleets. Here are examples, from the Midwest and other regions.

**Thirty cities – including [Chicago, Illinois](#) and [Ann Arbor, Michigan](#)** – have come together to explore purchasing up to 114,000 electric vehicles at advantageous cost, including police cruisers, street sweepers and trash haulers. With a multi-city request for information (RFI), the cities asked automakers for the cost, feasibility and timeline for meeting this demand. The RFI demonstrates the willingness of cities to say that “if you build it, we will buy it.” The RFI generated a substantial positive response from automakers and the cities now are considering how to make a joint procurement work, with further steps planned for 2017.

**Columbus, Ohio**, won the USDOT’s Smart Cities Challenge grant and [plans to buy 200 hybrid electric vehicles](#) for its city fleet over the next three years.

**New Bedford, MA**, a city of 95,000, plans to have 80% of its passenger vehicle fleet all electric by 2025. The city fleet of 70 vehicles is now more than 30% electric, with 23 Nissan Leafs added in 2015 and 2016. A [review](#) of three fleet procurements, including New Bedford, describes procurement details. Note that

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<sup>1</sup> Plug-in electric vehicles are powered solely by electricity, unlike hybrid vehicles, which use more than one power source. For additional information, see the [Plug-In Electric Vehicle Handbook for Fleet Managers](#).

the procurements described in the report were designed to take advantage of available incentives from federal and state governments and automakers.

**Seattle** will purchase 100 electric vehicles through 2017, with a target of 400 electrified vehicles by 2023, making its light-duty fleet fully electric. Seattle is one of several West Coast cities that have published online tools for [municipal conversion to electric vehicles](#), including a recorded [webinar](#).

**Cities and partners can also take steps to become EV friendly/ready.** Midwest cities are also supporting residential use of electric vehicles. While buying electric vehicles for city fleets is an action that cities may have substantial control over, cities and partners also can encourage residents to adopt electric vehicles. One example is **Kansas City**, described as the [electric vehicle mecca of the Midwest](#), with 613 charging stations installed by the utility, including “next to trash cans in downtown back alleys, in the public library parking garage and next to the train station.” Another is the [7-state Midwest EVOLVE project to promote electric vehicles](#). In partnership with eight Clean Cities coalitions and others, the project aims to get drivers behind the wheel of electric vehicles to try them out and demonstrate their capabilities in Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, and North Dakota

For an overview of non-municipal use of electric vehicles, a recent [article](#) looks at ten cities where electric vehicle sales are high, noting infrastructure, price and incentives: “In our continuing look at the growth of [electric vehicles](#) in the U.S., we’ve considered which states are [adopting electric vehicles the fastest](#); which cities have [the best charging infrastructure](#) for plug-in cars in town; which automakers have EVs [priced near or below \\$25,000](#) after incentives; and which states have [the most generous incentives](#) for buyers.”

## BENEFITS

With fewer moving parts, and without fluids, plugs, and belts to change, electric vehicles have lower maintenance costs than conventional gasoline and diesel vehicles. Operating costs are lower – with fuel costs about [one-fourth](#) to [one-half](#) that of conventional automobiles – and electricity prices are more stable and predictable than volatile gasoline costs.

The US Department of Energy describes the [benefits of electric vehicles](#) over conventional automobiles:

- **“Energy efficient.** EVs convert about 59%–62% of the electrical energy from the grid to power at the wheels. Conventional gasoline vehicles only convert about 17%–21% of the energy stored in gasoline to power at the wheels.”
- **“Environmentally friendly.** EVs emit no tailpipe pollutants, although the power plant producing the electricity may emit them.”
- **“Performance benefits.** Electric motors provide quiet, smooth operation and stronger acceleration and require less maintenance than internal combustion engines (ICEs).”

If the power generation comes from renewables, then there is no carbon pollution at the source. Additionally, emerging technologies allow vehicles to act as on-site power storage to feed power back to the grid during peak times – another environmental and economic advantage. So why aren’t electric vehicles more widely used?

## CHALLENGES

Despite the advantages noted above – energy efficiency, environmental benefits, and high performance – the key concern about electric vehicles has been “range anxiety.” How far can you go on a single

charge, where can you recharge and how long will it take? While these are important concerns, the use patterns of most municipal fleet vehicles are especially well-suited to currently-available electric technology. Because many municipal vehicles travel fewer than 200 miles each day, operate within a predictable geographic area, and tend to park in the same place when not in-use, they are an ideal fit with today's electric vehicles.

Technological improvements in battery storage and charging time have advanced dramatically in the last several years, leading to more competitive pricing and increased consumer acceptance. Expanded electric vehicle infrastructure is addressing range concerns as well. Currently, there are more than [16,000](#) public charging stations in the U.S. and growing. Municipalities may benefit from the national [Volkswagen Clean Air Act Civil Settlement](#) that is being used in some jurisdictions to provide additional public charging infrastructure.

While the cost of electric vehicles is currently higher than that of internal combustion engine vehicles, federal or state incentives may drive down initial costs. The rapidly falling cost of batteries is also pushing costs down. As the market develops, costs can be expected to decline further.

## TAKING ACTION

Leading by example, cities can create a ripple effect by the visible implementation of electric vehicles in their fleets. Their use demonstrates the feasibility and cost savings that flow from these efficient, lower maintenance vehicles.

Tools are currently available to help cities (1) compare costs, (2) evaluate financial incentives, (3) assess pilot procurement programs, and (4) procure electric vehicles, especially with cooperative buying:

1. **Cost Assessment.** Both maintenance costs and operating costs for electric vehicles typically are lower than for conventional vehicles. A [cost calculator](#) shows comparisons, based on models and use patterns, that a locality can individualize to assess feasibility.
2. **Federal Incentives.** The Departments of Energy and Transportation issued a [Guide to Federal Funding, Financing, and Technical Assistance for Plug-in Electric Vehicles and Charging Stations](#) in 2016 that lists funding programs, financing incentives, and technical assistance for vehicles and charging stations. Each program has particular conditions that must be considered.
3. **Fleet Electric Vehicle Pilot Program.** This [guide](#) addresses the benefits of a pilot program to:
  - Learn about new technologies and how to implement them.
  - Invest in basic equipment, data management and infrastructure to support adoption.
  - Educate employees about plug-in vehicles and prepare systems to manage them.
 The guide outlines questions for fleet managers as they set up and assess a pilot program.
4. **Procurement Assistance.** A multistate procurement effort to make electric vehicles more affordable for public fleets is being developed by [EVSmartFleets](#). It is expected to be ready in 2017 and aims to increase public fleet electric adoption through reduced vehicle price (15% reduction through volume purchases, creative financing and other tools), improved access to vehicle models, and reduced administrative costs. Any state or local governmental entity can join. Another source is the [Electric Vehicle Procurement Best Practices Guide](#), which builds on information from the U.S. Department of Energy and successful case studies.

**City leadership influences how fast new technology becomes widespread. With these tools, cities can demonstrate their care for the environment and save taxpayer dollars by a commitment to buy 100% electric vehicles for city fleets.**