# Municipal Fleet Electrification

## A Case Study of Cincinnati, OH

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CLIMATE MAYORS

Electrification Coalition

Sourcewell

city of CINCINNATI

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## Introduction

The Climate Mayors Electric Vehicle Purchasing Collaborative (the Collaborative) is a joint effort by Climate Mayors, the Electrification Coalition, and Sourcewell working toward accelerating the transition of city fleets to electric vehicles (EVs). By creating a new and innovative cooperative purchasing mechanism, the Collaborative is reducing major barriers to fleet electrification for cities and other public agencies.

In the summer of 2017, the City of Cincinnati joined Climate Mayors, a network of over 450 U.S. mayors who are committed to taking meaningful action on climate change. The Electrification Coalition (EC) is the non-partisan, non-profit organization that leads implementation of the Climate Mayors' transportation electrification initiative, leveraging its broad experience as a municipal partner in accelerating EV adoption on a mass scale. Sourcewell, a public procurement agency, facilitates a competitive solicitation and award process for vehicles and service equipment on behalf of its more than 50,000 members across North America.

The Collaborative's partners have come together to offer a one-stop platform which connects cities with a growing selection of EVs and charging stations, transparent pricing, policy guidance, technical resources, assessment tools, and financing options that can monetize the federal EV tax credit (a current challenge for public agencies) to support cities' fleet electrification efforts. The Collaborative also provides cities with training, best practices, educational materials, and fleet analysis to support the successful transition of municipal fleets to electric.

## Overview

This case study focuses on the City of Cincinnati, Ohio's purchase of three all-electric fleet vehicles, a first for the municipality, and their plans to purchase 20 total in 2020. In the study, we look at the groundwork and factors that eventually led to the City completing its first procurement of EVs through

## Current Fleet Goals

*The overall fleet is currently comprised of 3,450 vehicles.*

*The City plans to transition 20 light-duty vehicles to electric by the end of 2020.*

## Cincinnati Government Emissions

| Sector | 2006 mtCO2e | 2015 mtCO2e | Percent Change |
|---|---|---|---|
| Water & Wastewater Treatment Facilities | 301,265 | 178,742 | -40.67% |
| Buildings & Facilities | 75,649 | 36,986 | -51.11% |
| Aviation (Lunken Airport) | Not Measured | 22,808 | N/A |
| Street Lights & Traffic Signals | 34,250 | 19,292 | -43.67% |
| Vehicle Fleet | 21,453 | 17,908 | -16.5% |
| **Total** | **432,617** | **275,736** | **-32.26%** |

the Collaborative. Incorporating the first EVs into a fleet requires dedicated planning and infrastructure improvement. Once a city gains first-hand experience, adoption is more rapid. This can be seen in their commitment to an increased number of EVs in 2020. The City's purchase and use of the Collaborative contributes to a growing cohort of municipalities across the United States that are demonstrating their commitment to emissions reductions and advanced transportation by utilizing the Collaborative's procurement solution and the EC's technical expertise.

The City has also been focused on new fleet electrification goals through this work, which has historically been difficult to launch due to restrictions on budget and limited vehicle availability for the right applications. While the City has seen progress in reducing emissions across all government departments and operations, transportation has remained the most difficult, seeing the least reduction in emissions throughout the Green Cincinnati Program. It was for this reason the Cincinnati City Council voted for the City to begin procuring EVs in December 2018. In turn, City staff focused on utilizing the resources of the Collaborative and Bloomberg American Cities Climate Challenge (of which Cincinnati is an awardee) to tackle new goals set around solar and EV deployment. The EC is also a project partner in the Climate Challenge and is assisting Cincinnati through that work.

## About Cincinnati, OH

With a population of nearly 300,000, the City of Cincinnati is no stranger to tackling the challenge of climate change and addressing its impact on residents. Over the last decade, City staff have already been hard at work through the Green Cincinnati Program, aimed at reducing greenhouse gas (GHG) emissions by 84 percent below 2006 levels by 2050. This will include operating 100 percent of City buildings and fleet as carbon neutral by 2035 and tripling renewable energy generation for residents and businesses. Achieving this target will be no small feat, and the City is identifying several key actions across the built environment, energy, food and water, and transportation sectors. Most recently, the City announced the construction of a 100 MW solar farm, the largest city-led solar project in the nation, which will be available for subscription by all residents as their electricity provider. The table below shows emissions reductions through the Green Cincinnati program.

## Cost-Benefit Analysis

Due to constraints in city budgets and processes, many cities face a challenge of justifying the higher up-front purchase price of a light-duty EV compared to a similar internal combustion engine vehicle. Though the lower operational and maintenance costs of EVs ultimately carry the potential to reduce lifetime

*City staff learning about the benefits of EVs.*

costs of the vehicle compared to gasoline, this is a new model for understanding vehicle total cost of ownership for cities. The Collaborative offers several key advantages for cities to leverage in reducing vehicle costs. First, available vehicle contracts offer a more competitive rate than if cities solicit individual requests for proposals or seek to purchase directly from dealers. Second, EC staff are also able to work with city staff to identify procurement strategies and incentives that could further offset the cost of vehicles and charging – such as leasing vehicles to allow access to the federal EV tax credit. The City of Cincinnati leveraged these benefits, and worked with EC staff on infrastructure planning, to identify new EV charging locations at fleet facilities. They also allowed for the potential to easily and cost-effectively scale in size as more EVs are added to the fleet, such as considering how to centralize EVs to the same parking location.

As a result of this work and coordination with the EC, Cincinnati has been able to scale up its planned EV procurements, raising its goal from a small number of vehicles to more than 20 EVs, which are now planned for procurement in 2020. By continuing to pursue grant funding, and revisiting capital and operating budgets with City staff, more savings can still be realized, further accelerating the City's electrification goals to meet carbon neutrality by 2035.

Following the initial steps of working with the Collaborative to assess cost savings potential, the City purchased three EVs from the Collaborative in January 2020, two Nissan LEAFs and one Chevrolet Bolt. These vehicles will be used for the general service fleet, with current deployment being used as parking enforcement vehicles.

## Addressing the Challenge

While the City of Cincinnati has considered EVs in the past, the two key barriers were:

- Identifying the best fit for specific vehicle replacements.
- Deteriming optimal EV charging locations.

To identify vehicles that maximize emissions and cost savings potential, the Electrification Coalition and Sawatch Labs helped the City launch a fleet telematics assessment, analyzing the fleet across 11 candidate vehicles representative of light-duty sedan operation. The data was collected and analyzed across a variety of factors including: daily

driving range, engine performance, average dwell and parking time, and amount of fuel consumed. Considering these factors allowed the EC and Sawatch Labs to identify the best EV and PHEV replacements. As the City already had telematics data captured and gathered for fleet vehicles, Sawatch Labs was able to extend this analysis across multiple months, helping account for fluctuations in weather, temperature, and vehicle usage.

Overall, 100 percent of the vehicles analyzed correlated to an EV option that was suitable for daily operation within the region, and would decrease overall fleet costs and GHG emissions. These were encouraging findings considering the hilly terrain and cold winters faced by the City. The resulting recommendations gave Cincinnati the data needed to demonstrate the cost savings and GHG reduction benefits of electrifying fleet vehicles. The table to the right shows these results.

| Fleet Analysis Summary | |
|---|---|
| Vehicles Assessed | 11 Vehicles |
| Total Operational Cost Savings | Up to $150,000 |
| Average Change in Total Cost of Ownership | 17% Reduction |
| Total Gallons of Gallons of Fuel Avoided | 65,000 |
| Total GHG Emission Reduction | 1,450,000 |

## Continuing to Scale

The City remains focused on deploying EVs in the fleet and leveraging tools and resources provided through the Collaborative. By working with the EC, Cincinnati can access the best EV pricing available and gain valuable insight for successful and timely deployment. As next steps, the City will continue to electrify growing portions of the light-duty fleet and will consider medium- and heavy-duty EVs as model availability expands. Additional actions are complemented by the City's development of solar generation, allowing more of the City's operation to be powered by renewable energy and further progressing towards Cincinnati's 2035 carbon neutrality goal. The City plans to purchase 20 EVs

in 2020 based on the success of their first three vehicles and the technical support available to staff from the EC to assist with implementation.

## Conclusion

Engagement with the Climate Mayors EV Purchasing Collaborative provided a streamlined solution for Cincinnati, OH to procure its first electric fleet vehicles. With a number of federal- and state-based funding opportunities available, there is no time like the present to add EVs to municipal fleets.

In addition to access to procurement solutions, the Collaborative gathers a community of municipal professionals with experience in fleet electrification from which to draw technical support and share resources and best practices. Cities that participate in the Collaborative are also recognized for their commitment through a variety of media and conference opportunities. The EC works with cities from the planning stage through the implementation stage and supports them in making data-driven decisions.

Overall, the Collaborative remains a catalyst to help cities, such as Cincinnati, realize the full potential of electrification, to navigate a path to success with economic and environmental benefits.

For more information about how your agency can partner with the Climate Mayors EV Purchasing Collaborative to take advantage of cooperative purchasing and rich technical assistance, please visit: **www.DriveEVFleets.org**

Or call 800-267-7830

Climate Mayors, founded in 2014, is a bipartisan, peer-to-peer network of U.S. mayors working together to demonstrate leadership on climate change through meaningful actions in their communities, and to express and build political will for effective federal and global policy action. The Climate Mayors coalition has emerged as a key voice and demonstration of the ongoing commitment of U.S. cities to accelerate climate progress.

The Electrification Coalition (EC) is a nonpartisan, not-for-profit group of business leaders committed to promoting policies and actions that facilitate the acceleration of electric vehicle adoption on a mass scale in order to combat the economic, environmental and national security dangers caused by our nation's dependence on oil.

Sourcewell is a self-supporting government organization, partnering with education and government agencies throughout North America. On behalf of 50,000 members, Sourcewell conducts competitive solicitations, awarding to the most responsive and responsible vendors.