

CASE STUDY

# Reducing Greenhouse Gas Emissions With Electric Vehicles in Maricopa County

Maricopa County, Arizona, recently took steps to begin electrifying its county vehicle fleet to reduce greenhouse gas emissions and ozone-producing air pollutants. To prepare for the transition, an electric vehicle (EV) infrastructure plan was needed to develop a phased approach to the transition and determine where and how to deploy the EV charging infrastructure.



## Challenge

Maricopa County, the fourth-most populous county in the United States and home to more than 4.5 million residents across nearly 10,000 square miles, has seen exponential population growth over the last 30 years. Even with the rapid growth in population, the county has made significant strides to improve the community's air quality through a wide range of policies, programs and clean air initiatives.

With a fleet of over 2,700 vehicles spanning 36 departments, county leadership was tasked by the Maricopa County Board of Supervisors to develop an EV infrastructure plan and adopt recommendations and a timeline to convert a portion of the county fleet to electric vehicles.

The purpose of the EV infrastructure plan would be to help identify which vehicles should be converted to EVs, make recommendations on potential EV charging sites, and determine how EVs might help reduce fuel and maintenance costs. It would also address any questions Maricopa County staff might have about the process of transitioning to a zero-emission fleet.

## Project Stats

### Client

Maricopa County

### Location

Maricopa County, Arizona

# \$4.7M

**ESTIMATE FOR CHARGING  
INFRASTRUCTURE  
DEPLOYMENT**

# 19%

**EXPECTED REDUCTION IN  
GREENHOUSE GASES**

# 377

**EVS SUPPORTED**

# 55

**EV CHARGING  
SITES RECOMMENDED**

# 82%

**OF PROPOSED EVS WOULD  
NEED TO BE CHARGED  
ONLY ONCE PER WEEK**

# 100%

**LEVEL 2  
CHARGING**

## Solution

1898 & Co., part of Burns & McDonnell, was hired to create Maricopa County's comprehensive EV infrastructure plan. The 41-week project focused on the existing light- and medium-duty vehicle fleet, which included cars, SUVs, pickup trucks and vans.

The project kicked off with an outreach plan and video to inform, educate and inspire Maricopa County staff about transitioning to electric vehicles, followed closely by a two-day Ride & Drive event for county leadership, fleet managers, the Maricopa County Board of Supervisors and other invited guests.

A parking survey identified ideal locations where fleet vehicles could park throughout the day and when off-duty. Collecting this data was instrumental in determining optimal locations for charging during the site selection process. A fleet inventory analysis and vehicle review was conducted to understand the types of vehicles in the fleet, how they were being used and when they were being operated. Interviews conducted with fleet managers across the 36 departments dove deeper into specific operational requirements, duty cycles and use cases. Energy modeling was performed to determine the energy required to meet the daily vehicle miles traveled (VMT). The outputs from this simulation were used to determine the recommended charger types, as well as the charging duration.

The project team then moved to site selection and evaluated 55 parking locations identified in the parking survey to determine the most feasible sites for EV charging and infrastructure deployment. Lastly, several emission reduction calculators were evaluated for applicability and ease-of-use as a reporting platform for Maricopa County.

## Results

After analyzing the data, the project team recommended 15 locations for charging and infrastructure deployment, performing site walks to assess feasibility and determine location-specific infrastructure recommendations. Some of the sites selected were isolated and rural, while others were densely populated and urban. Conceptual designs showed a phased approach to construction through 2030, including preliminary cost estimates. The team also recommended options to expand EV charging by incorporating off-grid, transportable solar chargers to increase charging availability and mitigate outages.

Results from the financial analysis found that fuel and maintenance savings for the EVs would reduce the county's operating cost per mile by about 64%. The plan also included potential funding sources that could assist the county in offsetting a portion of the capital cost associated with implementing the EV infrastructure plan.

The emissions analysis showed that electrifying vehicles at the top 15 sites would reduce greenhouse gas emissions by 19%. Additionally, EVs do not emit NOx or VOCs, which cause ground-level ozone.

Ultimately, the Maricopa County Board of Supervisors approved funding to begin implementing the EV infrastructure plan.

### About 1898 & Co.



1898 & Co. is a business, technology and cybersecurity consulting firm serving the industries that keep our world in motion. As part of Burns & McDonnell, our consultants

leverage global experience in critical infrastructure assets to innovate practical solutions grounded in your operational realities. For more information, visit [1898andCo.com](https://www.1898andCo.com).