

THE SUMMIT CLIMATE ACTION COLLABORATIVE PRESENTS:

# EV Readiness in Summit County, Colorado: Guidance for Local Communities and Businesses



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## ABBREVIATIONS

The following list of abbreviations can be found throughout this document:

**CC4CA** – Colorado Communities for Climate Action

**EV** – Electric Vehicle

**CDOT** – Colorado Department of Transportation

**SWEEP** – Southwest Energy Efficiency Project

**CEO** – Colorado Energy Office

**ZEV** – Zero Emission Vehicle

**CLEER** – Clean Energy Economy for the Region

*No community is immune  
to the impacts of climate  
change, and that includes the  
high-elevation towns nestled  
in the heart of Colorado's Rocky  
Mountains.*

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## INTRODUCTION

*No community is immune to the impacts of climate change, and that includes the high-elevation towns nestled in the heart of Colorado's Rocky Mountains. If the global community doesn't act quickly or decisively enough to fight climate change, our local communities face increased risk of wildfire and drought, shrinking snowpack, decreased habitat for wildlife, and changes to recreation-driven economies.*

In fact, we're witnessing these changes already. Colorado's average annual temperature has increased 2°F over the past 30 years. The temperature is rising across all seasons, and as a result, winter doesn't last quite as long as it used to. Springtime snowpack has been declining over the past 20 years, and peak runoff has shifted one to four weeks earlier. Meanwhile, we've seen increased incidence of severe drought. In a community where so much of our economy depends upon winter recreation – and in a state where so much of our water supply depends upon ample snowpack – these trends are troubling. And this data only represents what has already happened. Unless we act locally, nationally, and globally, bigger impacts are yet to come.

In 2018, a group of government, business, education and utility stakeholders developed the Summit Community Climate Action Plan. This plan sets a goal of reducing greenhouse gas emissions in Summit County 50 percent by 2030 and 80

percent by 2050. It also outlines key strategies to reach those goals.

The greenhouse gas emissions inventory prepared in conjunction with that plan found that emissions in Summit County are roughly split into thirds – commercial energy use, residential energy use, and transportation.

We cannot achieve the goals of our plan without significantly reducing carbon pollution from transportation. As destination communities, our local economies depend on people traveling to Summit County. But with over 75 percent of local transportation emissions coming from light-duty vehicles (passenger cars, pickup trucks, and vans), it's clear that cars and trucks are a major carbon problem.



Moving forward, we must create systems that encourage the use of multi-modal transportation, including airport shuttles, public buses, biking, and walking.

Not only are EVs better for the environment, but they're also more fun to drive. Over 96% of EV drivers say they won't go back to a gas-powered car.<sup>1</sup>

We also understand that many people will still choose to drive a personal vehicle. Modeling completed for our Climate Action Plan showed that a widespread transition to electric vehicles is the most impactful strategy for reducing transportation emissions across Summit County (although EVs won't reduce congestion or vehicle miles traveled). And while we can't tell people what type of car or truck to drive, we can make it easier and more convenient to drive an electric vehicle (EV) in our communities. The strategies outlined in this EV Readiness Plan are designed to do just that.



<sup>1</sup> Eric Ast, Pete O'Connor, and Noah Barnes, *Satisfied Drivers, Optimistic Intenders: How the EV Market Can Continue To Thrive, Fix Pain Points, and Evolve for the Next Generation of Drivers* (2021), <https://pluginamerica.org/wp-content/uploads/2021/02/2021-PIA-Survey-Report.pdf>.

*Our EV Plan vision:  
To accelerate Summit County communities  
towards a future where mobility is electric,  
shared, or human powered.*

### Why Electrify?

It might seem surprising, but electric cars have been around for over 100 years. In the early 1900s, almost 40 percent of American cars were electric, and they could travel 80 – 100 miles on a single charge.<sup>2</sup> But the popularity of electric cars fizzled shortly thereafter. Henry Ford’s mass-produced Model T cost less than the average EV, and the invention of the electric starter made gas-powered cars an affordable and convenient option. Moreover, electricity wasn’t widely available outside of cities whereas newly discovered Texas oil made gas cheap and easy to transport – unlike heavy replacement batteries. By 1940, the electric-vehicle heyday was already a thing of the past.<sup>3</sup>

These days, EVs are making a comeback, and for

good reason. Although transportation only accounts for a third of emissions in Summit County, it’s quickly becoming the top source of carbon pollution in Colorado, and it’s already the biggest source of emissions in the U.S.<sup>4</sup> Not only is transportation a major culprit in the climate crisis, but those dirty tailpipe emissions aren’t healthy to breathe, either.

Emissions from conventional gas-powered cars, especially fine particulate matter, can cause respiratory distress leading to hospital visits, lost workdays, and even mortality. Many of us have experienced the so-called “brown cloud” hovering over Denver. This layer of smog, caused both by vehicle emissions and nearby oil and gas drilling, has degraded Denver’s air quality so much that the city has violated clean air standards set by the U.S. Environmental Protection Agency.



<sup>2</sup> Julie Stoner, “Electric Cars Powered Up Earlier Than You Think, last modified June 13, 2017, <https://medium.com/@librarycongress/electric-cars-powered-up-earlier-than-you-think-d7c955d81946>.

<sup>3</sup> U.S. Department of Energy, “The History of the Electric Car, last modified September 15, 2014, <https://www.energy.gov/articles/history-electric-car>.

<sup>4</sup> State of Colorado, *Colorado Electric Vehicle Plan 2020*, (2020), 3, <https://drive.google.com/file/d/1-z-INQMU0pymcTQEH8OvnemgTbwQnFhq/view>.





Now, with more renewable energy powering electricity grids across the country, electric vehicles are part of the transportation solution. According to an analysis by the Environmental Defense Fund (EDF), Colorado's Zero Emission Vehicle (ZEV) standard, which requires automakers to provide more ZEV options to consumers, will reduce transportation emissions by 1 million metric tons annually starting in 2025 – that's the equivalent of taking over 200,000 cars off the road. Emissions will continue to decrease as more EVs are sold, so that in 2030, the emissions impact will be equal to removing more than 600,000 cars from Colorado's roads.<sup>5</sup>

In addition to the emissions reduction, increasing the number of electric vehicles has economic and public health benefits. EDF's report estimates statewide annual savings of up to \$2.2 billion because of the new ZEV standard.<sup>6</sup> And contrary to popular belief, EVs are less expensive to own than gas-powered cars. Not only is electricity cheaper than gas on a per gallon equivalent basis, but with fewer moving parts, they also require less maintenance. Colorado EV drivers can expect to save over \$250 a year in reduced fuel and maintenance costs.<sup>7</sup> And with the cost of battery packs continuing to fall, the upfront cost of an EV in most light-duty vehicle segments should be cost-competitive with gas vehicles by 2024.<sup>8</sup>

<sup>5</sup> Richard Rykowski, *Colorado Zero Emission Vehicle Program Will Deliver Extensive Economic, Health and Environmental Benefits*, (2019), 36, <http://blogs.edf.org/climate411/files/2019/08/FINAL-EDF-Colorado-ZEV-report-2019.pdf>.

<sup>6</sup> Rykowski, *Colorado Zero Emission Vehicle Program*, 4.

<sup>7</sup> State of Colorado, *Colorado Electric Vehicle Plan 2020*, 4.

<sup>8</sup> Jack Ewing, "The Age of Electric Cars is Dawning Ahead of Schedule," *New York Times*, September 20, 2020, <https://www.nytimes.com/2020/09/20/business/electric-cars-batteries-tesla-elon-musk.html>.



## EVs in Colorado

In 2019, the Colorado legislature established carbon reduction goals, aiming to reduce statewide emissions 50 percent by 2030 and 90 percent by 2050. With transportation rapidly becoming the largest source of carbon pollution in Colorado, the state set a goal of reaching 940,000 registered light-duty EVs by 2030. By requiring automakers to sell a minimum number of zero emissions vehicles (like electric and hydrogen cars) each year, the recent adoption of the Zero Emission Vehicle (ZEV) standard will help Colorado meet that goal. Beyond 2030, the state has a long-term goal of transitioning 100 percent of all light-duty vehicles in Colorado to electric and 100 percent of all medium- and heavy-duty vehicles to zero emission.<sup>9</sup>

Putting rubber to the road, the state is building a network of fast-charging corridors across Colorado to make long-distance travel more convenient for

EV drivers. Several other fast-charging stations have also been installed by Electrify America and Tesla. Colorado also offers financial incentives to encourage increased EV adoption, including tax credits for individuals who purchase electric cars and grant funding for charging infrastructure and transit buses.

Large utilities are getting in on the action, too. In spring 2020, Xcel Energy – electricity provider for nearly all of Summit County – submitted its own Transportation Electrification Plan to the Colorado Public Utilities Commission (PUC). Approved by the PUC in late 2020, the new programs outlined in the plan will provide further support to local and state EV initiatives. The company also announced its vision to power 1.5 million EVs across its eight-state service territory by 2030. By doing so, Xcel Energy asserts that its customers will save nearly \$1 billion a year in fuel costs by 2030.

### Cost to drive 100 miles in Colorado:<sup>10</sup>

  **GAS-POWERED CAR: \$9**

  **EV: \$3**

<sup>9</sup> State of Colorado, *Colorado Electric Vehicle Plan 2020*, 2.

<sup>10</sup> According to FuelEconomy.gov, the average 2021 vehicle gets 27 mpg. As of March 5, 2021, average the gas price in Colorado is \$2.69 per gallon. Comparison assumes an EV uses 29 kWh to drive 100 miles. Cost of electricity is \$0.11 per kWh.



## EV Readiness Across Summit County

The Climate Action Plan set a goal to increase the share of EVs on Summit County's roads to 30 percent by 2030 and 60 percent by 2050. To achieve this goal, the number of local EVs registered in Summit County must increase from 235 today to 10,440 by 2030. Our community would like to see these goals extended to visitors, too, meaning the total number of EVs cruising our roads will be much higher.

Since EV technology is advancing so rapidly, it will be important to reevaluate this goal every few years. For the purposes of this plan, increasing the market share for EVs was modeled at a 9 percent increase year-over-year between 2020 and 2030, with 6 percent of the vehicles registered in Summit County being replaced by new vehicles each year.<sup>11</sup> The recommended number of public charging plugs are based on a ratio of 25 EVs for each plug. From this model, the following key milestones were set:



### 2021

235 EVs on the Road

73 Public and Workplace  
Charging Plugs

### BY 2025

3,100 EVs on the Road

125 Public and Workplace  
Charging Plugs

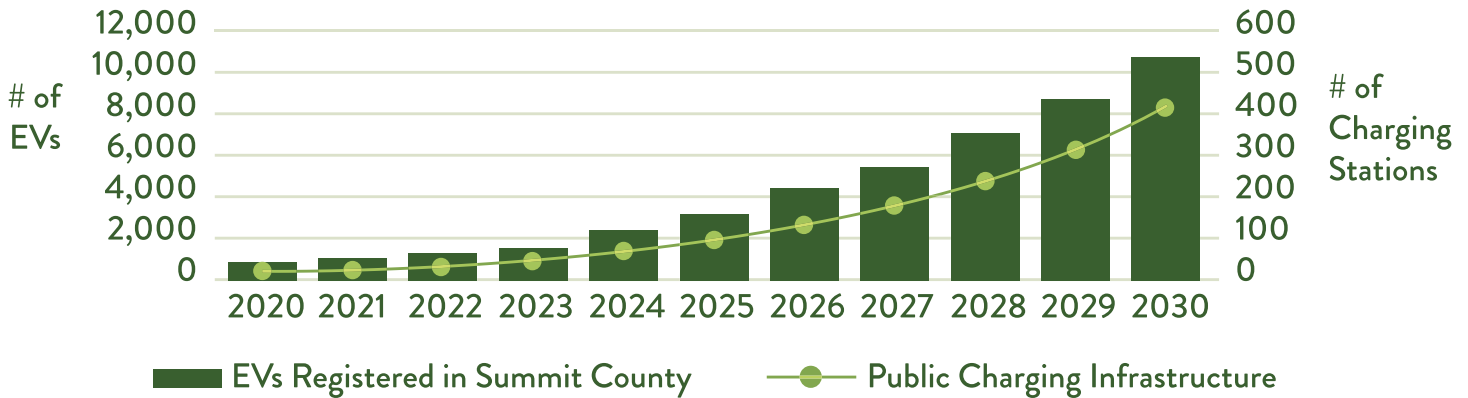
### BY 2030

10,440 EVs on the Road

420 Public and Workplace  
Charging Plugs

<sup>11</sup> Based on 2015 National Average from the U.S. Energy Information Administration, <https://www.eia.gov/todayinenergy/detail.php?id=36914>.

## MODELED GROWTH OF EVs AND PUBLIC CHARGING INFRASTRUCTURE<sup>12</sup>



Communities in Summit County must start preparing for an electrified future. And already we've seen early successes, including:

- Breckenridge, Dillon, Frisco, and Summit County governments adopted EV-ready building codes in 2020. Now, EV charging infrastructure is required for all new residential and commercial buildings.
- Breckenridge, Frisco, and Summit County are participating in Xcel Energy's Fleet Electrification Advisory Program.
- Two electric buses were added to the Breckenridge Free Ride public transit fleet in 2019.
- Three electric buses were added to the Summit Stage public transit fleet in 2020.
- 61 public Level-2 plugs and 12 public DC fast-charging plugs...and counting.

The strategies outlined in this plan will provide guidance to local governments, businesses, and community organizations so they're able to welcome increasing numbers of residents and visitors driving electric cars. Strategies are organized into five categories: **Infrastructure**, **Policy**, **Light-Duty Fleets**, **Public Transit**, and **Community Outreach**. Each strategy description includes a timeline for implementation and potential partners. For some strategies, links to further resources are provided.

To keep us on track to meet our 2030 and 2050 climate action goals, the strategies in this plan are categorized using the following planning horizon:

**Short-term:** Projects beginning 2021–2023

**Medium-term:** Projects beginning 2024–2026

**Long-term:** Projects beginning 2027–2030

Those strategies marked with a ⚡ are projected to have a higher impact on emissions based on modeling performed by Partners in Energy. This plan will be a living document that we'll update as new technologies and strategies become available.

<sup>12</sup> For more information on the modeled growth scenario see Appendix B.



## Equity

The plan's stakeholders understand that purchasing an electric vehicle remains out of reach for many Summit County residents. While technology is advancing faster than experts predicted, it will still be a few more years (but within the lifetime of this plan) before the upfront cost of a new light-duty EV without government subsidies is cost competitive with a gas-powered car.<sup>13</sup> Even then, not everyone can afford a new car, and many people don't have access to home charging.

The strategies in this plan are designed to reduce these barriers for EV adoption to make it easier

for everyone in our community to drive or ride in an EV. From local incentives for EV infrastructure and expanded access to charging, to electric public transit and e-bikes, the stakeholder group wants to ensure that implementation of this EV readiness plan is equitable for all of Summit County's residents and visitors. As the Climate Action Collaborative's Transportation Working Group moves towards implementation, we'll follow the principles and equity checklist outlined in the 2018 Urban Sustainability Directors Network report, *A Guidebook on Equitable Clean Energy Program Design for Local Governments and Partners*.<sup>14</sup>



<sup>13</sup> Ewing, "The Age of Electric Cars," *New York Times*.

<sup>14</sup> Julie Curti, Farrah Andersen, and Kathryn Wright, *A Guidebook on Equitable Clean Energy Program Design for Local Governments and Partners*, (2018), <https://cadmusgroup.com/wp-content/uploads/2018/09/Cadmus-USDN-Equitable-Clean-Energy-Guidebook.pdf>.





# INFRASTRUCTURE



## INFRASTRUCTURE

According to consulting firm McKinsey & Company, EV sales in the U.S. are projected to more than double in the next five years.<sup>15</sup> Yet range anxiety and lack of access to charging remain key barriers to EV adoption.<sup>16</sup> To assure drivers that plugs are available, our local communities will expand electric vehicle charging infrastructure by directly installing public charging stations and incentivizing the private sector to do so – these plugs will support residents who do not have access to home charging as well as visitors.

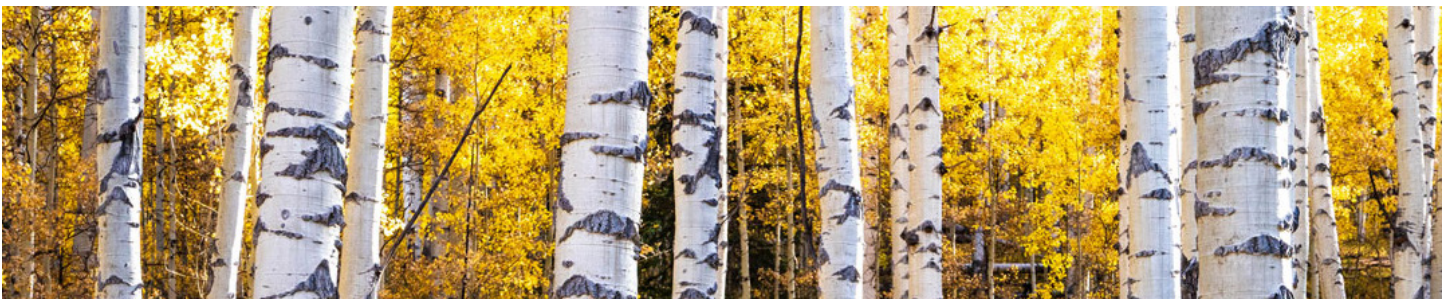
To meet the state’s goal of 940,000 EVs in Colorado by 2030, the Colorado Energy Office estimates that Summit County will need:<sup>17</sup>

 2,809 HOME CHARGING PLUGS

 307 PUBLIC AND WORKPLACE CHARGING PLUGS

 22 DC FAST-CHARGING PLUGS

Because our local EV goal is more aggressive than the state’s, this plan calls for greater public and workplace charging capacity.



<sup>15</sup> Zealan Hoover, Florian Nägele, Evan Polymeneas, and Shivika Sahdev, “How Charging in Buildings Can Power Up the Electric-Vehicle Industry,” last modified January 5, 2021, <https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/how-charging-in-buildings-can-power-up-the-electric-vehicle-industry>.

<sup>16</sup> Adam Maxwell, Bill LeBlanc, and Rachel Cooper, Colorado Energy Office: Electric Vehicle Awareness Market Research, (2020), <https://drive.google.com/file/d/15dmFXJ5RLT2U2Mc3b1Cfqu8xOTrCqAAi/view>.

<sup>17</sup> Christian Willis, e-mail message, February 3, 2021.

## 1. EXPAND EV CHARGING INFRASTRUCTURE ACROSS THE COMMUNITY ⚡

EV drivers in California’s robust market are supported by a ratio of one public charging plug for every 25 electric vehicles.<sup>18</sup> Using this ratio, our community would need 420 public and workplace charging plugs by 2030 to support the goal of 10,440 electric vehicles on our roads. This is the starting goal for this plan. However, other organizations like the International Energy Agency and U.S. Department of Energy indicate that higher ratios might be necessary – one public charging plug to support every 10 EVs.

Over the years, Transportation Working Group will pay close attention to how public charging is utilized and will adjust the goal accordingly. As a destination community, we’re certain that more charging infrastructure will be needed to support the millions of visitors we host each year.

Local governments alone cannot install the infrastructure needed to support EVs in our community. Achieving this strategy is dependent upon the private sector – especially local ski areas and lodging companies – understanding the benefit of installing EV charging infrastructure. The outreach initiatives and incentives outlined in this plan (combined with incentives offered by the state and Xcel Energy) are designed to encourage private sector involvement. It’s important to note that over 80 percent of EV charging takes place at home.<sup>19</sup> This plan assumes that residents who can install home charging infrastructure will do so, which is why there’s no goal for home charging plugs.

 **Timeline:** Short-term

 **Potential partners:** CEO, CLEER, local governments, private sector, Xcel Energy



<sup>18</sup> Loren McDonald, “What Is The “Minimum Acceptable” Ratio of EVs to Charging Stations?,” *EV Adoption*, last updated April 8, 2019, <https://evadoption.com/what-is-the-ideal-ratio-of-evs-to-charging-stations/>.

<sup>19</sup> U.S. Department of Energy, “Charging at Home,” <https://www.energy.gov/eere/electricvehicles/charging-home>.



## 2. OFFER INCENTIVES FOR EV CHARGING INFRASTRUCTURE AND E-BIKES

To increase access to electric transportation, local municipalities will provide rebates to residents for home charging infrastructure. And recognizing that cars are an expensive purchase even with tax credits, rebates for e-bikes will help alleviate cost burden for those who are unable to make a new or used car purchase.

 **Timeline:** Short-term


 **Potential Partners:** CEO, CLEER, HC3, local governments, Xcel Energy

## 3. OFFER INCENTIVES TO HOAs THAT INSTALL CHARGING INFRASTRUCTURE

As a destination community, Summit County has a lot of multi-family buildings and condos. But only a few currently offer EV charging. Because home charging is convenient – and an important consideration for people thinking of purchasing an EV – the Transportation Working Group will encourage homeowners’ associations (HOAs) to install infrastructure to serve both residents and visitors. We’ll also share best practices with HOAs so they can develop charging rules that best meet their needs.

 **Timeline:** Short-term

 **Potential Partners:** CEO, CLEER, HC3, local governments, Xcel Energy

 **Resources:** [How to install electric vehicle charging stations at multi-unit dwellings](#), [MUD charging](#), [Xcel Energy – EV Charging for building owners](#)



## 4. COORDINATE WITH XCEL ENERGY TO IDENTIFY CHARGING GAPS

The Transportation Working Group realizes that to encourage widespread EV adoption, we need to install as much charging infrastructure as possible in key locations – not only to supply the people who live and work here, but also the millions of visitors we host each year.

To get started, we’ll provide resources and assistance to all businesses, property managers, and homeowners’ associations interested in installing EV charging. Moving forward, we’ll continue working with Xcel Energy to identify additional locations that would be ideal for charging, in terms of both electrical supply and driver interest.

 **Timeline:** Medium-term

 **Potential Partners:** CEO, CLEER, HC3, local governments, Xcel Energy



A full-page photograph with a green tint. In the foreground, there is a dense patch of tall grasses and numerous white daisies. Behind the flowers, a body of water is visible, with reeds and other aquatic plants growing along the shore. The word "POLICY" is centered in the middle of the image in a white, sans-serif font.

# POLICY



## POLICY

*Implementing new public policy is another important tool for increasing access to charging infrastructure. For example, development and building codes can be used to incentivize installation of charging infrastructure. And as EVs become more widespread, policy will also be necessary to set rules for parking, charging, etc.*

### 1. PROVIDE WORKPLACE CHARGING FOR EMPLOYEES ⚡

Local governments will support EV adoption by providing charging infrastructure for employees. A workplace charging policy defines how employees will access charging infrastructure and who should pay for the electricity used.

Sending a survey to employees will determine interest in EVs, number of employees who have access to home charging, and commute distances, thus helping to prioritize locations for installing charging infrastructure. Workplace charging is essential for employees who live in multi-family buildings without access to charging.

While local governments will lead by example, the Transportation Working Group will share resources and best practices with the private sector to encourage local businesses to install workplace charging for their employees as well.

🕒 **Timeline:** Short-term

👥 **Potential Partners:** CEO, CLEER, local governments, private sector, third-party charging providers, Xcel Energy

📖 **Resources:** [Alternative Fuels Data Center – Workplace Charging for Plug-in Vehicles](#), [Department of Energy Plug-in Electric Vehicle Handbook for Workplace Charging Hosts](#), [NYSERDA Best Practices and Cases](#)



## 2. REQUIRE INSTALLATION OF EV CHARGING INFRASTRUCTURE WITH MAJOR RENOVATIONS OF COMMERCIAL AND MULTI-FAMILY BUILDINGS ⚡

The Summit Sustainable Building Code requires commercial and multi-family buildings to install EV charging in new construction. Municipalities updating codes to require the installation of EV charging during existing building retrofits will ensure that tenants and patrons are provided equal opportunity for EV charging.

 **Timeline:** Short-term

 **Potential Partners:** Local governments

## 3. UPDATE DEVELOPMENT CODES TO INCENTIVIZE EV CHARGING ⚡

With the 2020 adoption of new sustainable building codes, many Summit County communities already require a percentage of parking spaces in new developments to provide EV charging infrastructure. To further encourage installation of EV charging, communities should consider building incentives into development codes. For example, the Town of Frisco reduced the number of required parking spaces in commercial developments for every EV charging station provided beyond building code minimum. And the Town of Breckenridge offers positive development code points for EV charging installation above code minimum.

 **Timeline:** Short-term

 **Potential Partners:** Local governments

 **Resources:** [Alternative Fuels Data Center – Plug-in electric vehicle deployment policy tools](#)


## 4. CREATE EV CHARGING POLICIES

EV-specific policies will be incorporated into existing zoning regulations, development codes, and community plans. This guidance will ensure that residents and visitors have a consistent experience across the community. Important considerations include:

- **Rates and billing responsibility:** Who will pay for the electricity – the customer or the station owner? Will a third-party provider own and operate the station?
- **Permitting:** What is the permitting process for existing residential and commercial buildings to install charging equipment? Does it make sense to create a separate permit application and fee for EV charging equipment?
- **Siting:** Required parking space dimensions, configurations (bollards, wheel stops, etc.), signage, lighting, wayfinding, vehicle and pedestrian clearances, ADA compliance, etc.
- **Parking rules:** How long will EV drivers be allowed to use a public charging station? Do vehicles need to be actively charging to park in an EV-only spot? What are the consequences for vehicles in violation of these rules? What about non-EV cars parked in EV-only spots? Make sure rules are in compliance with state statutory requirements and local traffic codes.

 **Timeline:** Short-term

 **Potential Partners:** CEO, CLEER, local governments, SWEEP, Xcel Energy

 **Resources:** [Summary of Best Practices in Electric Vehicle Ordinances](#), [NYSERDA Best Practices and Cases](#), [Colorado Requirements and Best Practices](#)





## 5. ENCOURAGE MUNICIPAL PARTNERS TO ADOPT A GO EV CITY RESOLUTION

GoEV City is a Colorado program designed to motivate cities and counties to set bold targets for EV adoption. By adopting the resolution, local communities signal their commitments to implement strategies in EV readiness plans such as this one. Locally, the Summit County Board of County Commissioners made the GoEV County pledge in September 2020. The Transportation Working Group will encourage other local municipalities to consider becoming GoEV communities.

 **Timeline:** Short-term

 **Potential Partners:** Local governments, SWEEP

 **Resources:** [GoEV Cities & Counties](#)

## 6. COORDINATE AND ADVOCATE REGIONALLY

The Transportation Working Group will engage with groups like the Colorado Energy Office, Colorado Communities for Climate Action, Clean Energy Economy for the Region, and Southwest Energy Efficiency Project to advocate for transportation electrification at the state level.

 **Timeline:** Ongoing

 **Potential Partners:** CC4CA, CEO, CLEER, HC3, local governments, SWEEP, Xcel Energy



A green-tinted photograph of a rocky mountain slope above a calm lake. The text "LIGHT-DUTY FLEETS" is overlaid in white, bold, sans-serif capital letters. The mountain is rugged with patches of vegetation, and the lake reflects the sky and the mountain's silhouette. The overall mood is serene and natural.

# LIGHT-DUTY FLEETS

## LIGHT-DUTY FLEETS

*Between Summit County’s municipalities alone, there are over 500 fleet vehicles, half of which are light-duty vehicles. With nearly 35,000 cars registered in the community, fleet vehicles are not responsible for a large portion of emissions, but they play an important community role in demonstrating the feasibility and commitment to electric vehicles.*

While these strategies are targeted towards municipal fleets, they are equally appropriate for other organizations. By converting municipal fleets to EVs, our communities validate the practicality of these vehicles for ski areas, school districts, shuttle companies, construction companies, and waste haulers, as well as locals and visitors. And with several light-duty options currently available and more coming to market soon, light-duty vehicles are low-hanging fruit for fleet electrification.

### 1. DEVELOP A VEHICLE REPLACEMENT PLAN ⚡

Municipal fleet managers will incorporate EV transitions into fleet vehicle replacement plans. These plans determine which vehicles are due to be replaced over the next 5 – 10 years to identify opportunities for EVs, charging infrastructure needs, and budget for both vehicles and infrastructure.

Other important items to consider when drafting a Vehicle Replacement Plan include:

- **Total Cost of Ownership (TCO):** TCO compares metrics related to the standard gas-powered vehicle and potential EV replacement vehicle, including upfront cost, current and projected fuel costs, maintenance, and expected salvage value.

- **ZEV First Policy:** This would require updating purchasing guidelines so that employees have to justify the purchase of a non-ZEV vehicle.<sup>20</sup>



**Timeline:** Short-term



**Potential partners:** CEO, local governments, Xcel Energy



**Resources:** [Climate Mayors Electric Vehicle Purchasing Collaborative](#), [ElectrifyNY: Fleet Electrification Plan](#), [Xcel Energy EV Supply Infrastructure Program](#)


<sup>20</sup> Why ZEV instead of EV? Because hydrogen may play an important role in the heavy-duty category.



## 2. CREATE AN EV FEASIBILITY INVENTORY

Local municipalities will create EV Feasibility Inventories, which list all light-duty fleet vehicles and identify which are ideal for EV replacement. Xcel Energy's Fleet Electrification Advisory Program (FEAP) can help organizations develop EV feasibility inventories by tracking vehicle use patterns to inform replacement recommendations.

 **Timeline:** Short-term

 **Potential Partners:** Local governments, third-party fleet consultants, Xcel Energy

 **Resources:** [Albany, New York: Electric Vehicle Feasibility Study \(2012\)](#), [Wrangell, Alaska: Electric Vehicle Feasibility Study \(2013\)](#), [Xcel Energy Fleet Electrification Advisory Program](#)



**2021**

**BY 2025**

All new light- and medium-duty vehicle purchases at Arapahoe Basin will be electric, including UTVs and snowmobiles.

**BY 2030**

10,400 EVs  
registered in  
Summit County

940,000 EVs  
registered in  
Colorado

**BY 2040**

15,660 EVs registered  
in Summit County





### 3. PURCHASE A PILOT LIGHT-DUTY VEHICLE

Allowing staff to test drive an EV will increase comfort and confidence in their use. Municipal fleet managers and sustainability staff will educate employees on appropriate trip type, charging, operation, etc.

 **Timeline:** Short-term

 **Potential partners:** Car dealers and manufacturers, CEO, local governments, statewide EV procurement groups, U.S. Climate Mayors

 **Resources:** [US General Services Administration, Electric Vehicle Training Series \(2016\)](#)

### 4. DEVELOP EV MANUFACTURER AGREEMENTS TO PROVIDE MAINTENANCE TRAINING TO EMPLOYEES

While maintaining an EV is often no more difficult than maintaining a gas- or diesel-powered vehicle, technicians must be specially trained in order to avoid getting shocked by the electrical system. By including employee training in manufacturer agreements and exploring additional opportunities for EV maintenance training, fleet technicians will be able to perform routine maintenance in house.

 **Timeline:** Long-term

 **Potential partners:** Car manufacturers, local governments





# PUBLIC TRANSIT



## PUBLIC TRANSIT

*Both Breckenridge and Summit County offer free public transit and have already started purchasing electric buses. Strategies related to buses will help these communities continue planning for bus electrification as well as encourage managers of other bus fleets to follow suit.*



### 1. DEVELOP BUS ELECTRIFICATION PLANS ⚡

Local transit agencies will create bus electrification plans to consider routes, charging, procurement options, and facility upgrades. Engaging with Xcel Energy will be important for assessing facilities and charging needs.

🕒 **Timeline:** Short-term

👥 **Potential partners:** Bus manufacturers, local governments, Xcel Energy

📖 **Resources:** [Edison Electric Institute, Preparing to Plug in your Bus Fleet](#), [Vancouver's Low-Carbon Fleet Transition Plan](#)

### 2. DEVELOP SUCCESS STORIES AND RESOURCES FROM EARLY ADOPTERS

The Transportation Working Group will collect stories to share experiences, benefits, and lessons learned of transitioning bus fleets to EVs. These will be shared with ski areas, shuttle companies, and the school district to encourage other fleet managers to consider electrification.

🕒 **Timeline:** Short-term

👥 **Potential Partners:** Breck Free Ride, CEO, HC3, Roaring Fork Transportation Authority, Regional Transportation District, Park City Transit, Summit Stage, Xcel Energy

### 3. HOLD ELECTRIC BUS WORKSHOPS AND DEMONSTRATIONS

The Transportation Working Group will work with electric bus and/or school bus manufacturers to showcase their models and technology, giving fleet managers and drivers the opportunity to “kick the tires.” We will invite the Summit School District, ski areas, and shuttle companies to attend and will pair these events with educational workshops for fleet managers. Potential workshop topics include technology overview, benefits to the community and the fleet, charging infrastructure needs, and sources of funding.

 **Timeline:** Short-term

 **Potential partners:** Bus manufacturers, CEO, CLEER, CDOT, local governments, Xcel Energy



### 4. CREATE A BUS CHARGING SCHEDULE TO TAKE ADVANTAGE OF BENEFICIAL ELECTRICITY RATES ⚡

Charging electric vehicles can be cheaper than filling up with gas or diesel, but fleet managers need to actively manage charging schedules to reduce time-of-day or demand charges. Transit agency managers will coordinate with Xcel Energy account representatives and advisors to select rates and create ideal charging schedules to minimize electricity costs.

 **Timeline:** Medium-term

 **Potential partners:** Local governments, Xcel Energy







# COMMUNITY OUTREACH

## COMMUNITY OUTREACH

*Market research performed for the Colorado Energy Office revealed that many Colorado residents harbor a lot of misconceptions and misinformation about EVs.<sup>21</sup> There's also a lack of awareness about tax credits and utility incentives available for EV purchases. Yet most Coloradans are open to buying an EV in the next decade. Community education campaigns will be key to overcome EV misinformation and encourage more residents to switch to EVs. We'll also target outreach to auto repair companies, empowering them to participate in the EV transition.*

### 1. PROVIDE ELECTRIC VEHICLE EDUCATION OPPORTUNITIES FOR LOCAL RESIDENTS AND BUSINESSES

The Transportation Working Group will plan annual EV education campaigns, including opportunities for hands-on experience with EVs. We'll also explore the feasibility of hosting EV ride-share programs locally. The Colorado Energy Office is developing a statewide EV marketing campaign, and we'll be sure to leverage these resources when conducting our own community outreach. In addition, we'll work to make sure our community is aware of future Xcel Energy programs that make owning an EV easier and more affordable.

 **Timeline:** Short-term

 **Potential Partners:** CEO, CLEER, car dealerships, HC3, Xcel Energy

### 2. OFFER WORKSHOPS ON ELECTRIC VEHICLE REPAIR FOR LOCAL AUTO REPAIR SHOPS ⚡

The business of car repair relies on fixing traditional gas-powered vehicles. To support auto repair workforce through the EV transition, we'll host workshops so local technicians can learn to service electric vehicles.

 **Timeline:** Medium-term

 **Potential partners:** Car manufacturers, CEO, Colorado Mountain College, HC3

<sup>21</sup> Maxwell, LeBlanc, and Cooper, *Electric Vehicle Awareness Market Research*, (2020).

## QUICK WINS

In 2021, the Transportation Working Group will implement the following initiatives:

- Host at least one community EV Ride and Drive Event
- Develop a pilot rebate program
- Leverage new Xcel Energy programs to install more charging stations

*While our group opted not to include these as their own strategies, here a few inspired ideas specific to local municipalities we'd like to keep working on:*

- Implement take-home policies for EV fleet vehicles
- Include EV goals in site-specific community plans, PUDs, and master plans
- Adopt e-bikes into local fleets
- Build better road infrastructure to accommodate e-bikes
- Offer e-bike-share programs





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## APPENDIX A: EV READINESS PLAN STRATEGY LIST

CATEGORY	STRATEGY	TIME-LINE <sup>1</sup>	GHG IMPACT <sup>2</sup>	COST/ EFFORT <sup>3</sup>	EQUITY	PRIMARY IMPLEMENTER
INFRASTRUCTURE	Expand EV charging infrastructure across the community	ST	High	High	Y	Local governments*
	Offer incentives for EV charging infrastructure and e-bikes	ST	Medium	High	Y	Local governments / HC3
	Offer incentives to HOAs that install charging infrastructure	ST	Medium	Medium	Y	Local governments / HC3
	Coordinate with Xcel Energy to identify charging gaps	MT	Low	Low		Transportation Working Group
POLICY	Provide workplace charging for employees	ST	High	Low	Y	Local governments*
	Require installation of electric vehicle charging infrastructure with redevelopment or major renovations of multi-family and commercial buildings	ST	High	High	Y	Local governments
	Update development codes to incentivize EV charging	ST	High	High		Local governments
	Create EV charging policies	ST	Medium	High		Local governments
	Encourage municipal partners to adopt a GoEV City resolution	ST	Low	Low		Transportation Working Group
	Coordinate and advocate regionally	On-going	Low	Low		Transportation Working Group

\* While local governments are expected to lead by example, it is unrealistic to assume they would provide public and workplace charging to support the entire community. These strategies indicate that local governments will be the primary implementer within their own jurisdictions and for their own employees.

<sup>1</sup> Short-term (ST) strategies will be implemented 2021 – 2023. Medium-term (MT) strategies will be implemented 2024 – 2026. Long-term (LT) strategies will be implemented 2027 – 2030.

<sup>2</sup> Based on modeling provided by Partners in Energy; see Appendix C for details. Strategies in bold will have a direct impact on emissions, all other strategies have indirect impacts.

<sup>3</sup> Based on stakeholder group input.

CATEGORY	STRATEGY	TIME-LINE <sup>1</sup>	GHG IMPACT <sup>2</sup>	COST/EFFORT <sup>3</sup>	EQUITY	PRIMARY IMPLEMENTER
LIGHT-DUTY FLEETS	Develop a vehicle replacement plan	ST	<b>High</b>	High		Local governments
	Create an EV feasibility inventory	ST	Medium	Low		Local governments
	Purchase a pilot light-duty vehicle	ST	Low	High		Local governments
	Develop EV manufacturer agreements to provide maintenance training to employees	LT	Medium	Low		Local governments
PUBLIC TRANSIT	Develop bus electrification plans	ST	<b>High</b>	High	Y	Local governments
	Develop success stories and resources from early adopters	ST	Medium	Low		Transportation Working Group
	Hold electric bus workshops and demonstrations	ST	Medium	Low		Transportation Working Group
	Create a bus charging schedule to take advantage of beneficial electricity rates	MT	High	High		Local governments
COMMUNITY OUTREACH	Provide electric vehicle and e-bike education opportunities for local residents and businesses	ST	High	Low	Y	Transportation Working Group
	Offer workshops on electric vehicle repair for local car repair shops	MT	High	Low		Transportation Working Group

<sup>1</sup> Short-term (ST) strategies will be implemented 2021 – 2023. Medium-term (MT) strategies will be implemented 2024 – 2026. Long-term (LT) strategies will be implemented 2027 – 2030.

<sup>2</sup> Based on modeling provided by Partners in Energy; see Appendix C for details. Strategies in bold will have a direct impact on emissions, all other strategies have indirect impacts.

<sup>3</sup> Based on stakeholder group input.



## APPENDIX B: EV GROWTH ANALYSIS

Summit County will need to have 10,440 light-duty EVs registered by 2030 to meet the carbon reduction goals set in the Climate Action Plan. The chart below shows the modeled EV growth rate necessary for the community to meet these goals. Note that this model assumes the following:

1. The annual growth rate of EV adoption remains constant following the models presented in the CEO's 2015 EV Market Study.<sup>20</sup>
2. The number of vehicles registered in Summit County is about 35,000, based on a 2017 vehicle registration number of 34,797.
3. Of the registered vehicles in Summit County, 48% are passenger vehicles and 45% are light-duty trucks.
4. Nearly 2,000 passenger vehicles and light-duty trucks are replaced in Summit County each year (a 6% annual turnover rate).
5. Light-duty EVs are likely to make up the vast majority of the new EVs between 2020 and 2030.
6. The maximum percentage of light-duty vehicle sales that will be EVs is 95%.
7. Summit County is targeting a 25:1 ratio of electric vehicles to public charging plugs.

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<sup>20</sup> BCS Incorporated, *Colorado Energy Office: Electric Vehicle Market Implementation Study*, (2015), <https://drive.google.com/file/d/1J8NklU4q1KrQMs5mUAWj7ZnNfpWQ7u-/view>

YEAR	EV MARKET SHARE	NUMBER OF NEW EVS	NUMBER OF EVS REGISTERED	NUMBER OF PUBLIC CHARGING PLUGS
<b>2020</b>	2%	47	191	19
<b>2021</b>	12%	225	416	19
<b>2022</b>	21%	403	819	33
<b>2023</b>	30%	581	1,400	56
<b>2024</b>	39%	759	2,159	86
<b>2025</b>	48%	937	3,096	124
<b>2026</b>	57%	1,115	4,210	168
<b>2027</b>	66%	1,292	5,503	220
<b>2028</b>	75%	1,470	6,973	279
<b>2029</b>	84%	1,648	8,621	345
<b>2030</b>	94%	1,826	10,447	418

Based on this analysis, about 53% of all light duty vehicles replaced over the next 10 years will need to be electric vehicles starting with about 2% in 2020 and ramping up quickly to about 94% of vehicles in 2030. This is an annual EV adoption growth rate of about 9% of a year.

Based on the analysis done by CEO, the high growth scenario for the state modeled a 2.5% growth rate. This means that these aggressive EV goals will make Summit County a leader in state-wide adoption, showing commitment to environmental stewardship and carbon reduction.

## APPENDIX C: GREENHOUSE GAS EMISSIONS REDUCTION POTENTIAL

To better understand the potential greenhouse gas (GHG) emissions reduction from various electric vehicle (EV) strategies, a high-level screening of an initial strategy list was completed by Xcel Energy's Partners in Energy team. This screening was completed in two steps.

### STRATEGY CATEGORIZATION

Each strategy was reviewed and placed into one of the following categories:

1. Direct: These strategies, when implemented, caused an immediate reduction in vehicle GHG emissions. (e.g., vehicle replacement)
2. Indirect: These strategies may be required to successfully electrify the vehicle fleet, but there are no GHG emissions reductions without follow-up action (e.g., EV-friendly policies)

### IMPACT QUANTIFICATION

Next, the potential impact of the strategies is categorized into either major, minor, or negligible for each category. This is done through a qualitative analysis of the following factors:

1. **Emissions Source Addressed:** Based on the provided GHG emissions inventory for the county, each vehicle type was categorized into a major emissions source, minor emissions source, or a negligible source of GHG emissions. The categorization by vehicle type is shown below:

MAJOR SOURCE (>1% OF TOTAL SCOPE 1 VEHICLE EMISSIONS)	MINOR SOURCE (<1% AND >0.1% OF TOTAL SCOPE 1 VEHICLE EMISSIONS)	NEGLIGIBLE (<0.1% OF TOTAL SCOPE 1 VEHICLE EMISSIONS)
<ul style="list-style-type: none"> <li>Personal light-duty</li> <li>Trucks</li> </ul>	<ul style="list-style-type: none"> <li>Buses</li> <li>Light-duty fleet</li> </ul>	<ul style="list-style-type: none"> <li>Light Rail</li> <li>Heavy Rail</li> <li>Trolley Bus</li> <li>Commuter Rail</li> <li>Demand Response</li> <li>Ferry Boat</li> <li>Other</li> </ul>



**2. Percentage of Vehicle Population Impacted:** This metric considers what proportion of the identified vehicle population (e.g., buses) would be impacted by the proposed strategy. For this review we broke this analysis into three categories: less than 1%, less than 25%, and more than 25%.

**3. Strategy Type:** For indirect strategy types only, we evaluated the strategy's level of influence on the vehicle population by identifying the strategy type. The categories used are outlined below.

- a. Inform:** These strategies are focused on educating users on benefits of EVs or details on EV ownership designed to encourage the user to purchase an EV.
- b. Encourage:** These strategies provide financial or other incentives to encourage EV adoption.
- c. Enable:** These strategies provide the necessary support required for EV ownership such as charging infrastructure and EV friendly codes or policies.

For each of the factors described above, the strategy was ranked on a scale of 0 to 2 as shown in the table below.

CRITERIA	INDIRECT STRATEGIES	DIRECT STRATEGIES
<b>EMISSIONS SOURCE ADDRESSED</b>	0=Negligible 1=Minor Sources 2=Major Sources	0=Negligible 1=Minor Sources 2=Major Sources
<b>PERCENTAGE OF VEHICLE POPULATION IMPACTED</b>	0=Less than 1% 1=Less than 25% 2=More than 25%	0=Less than 1% 1=Less than 25% 2=More than 25%
<b>STRATEGY TYPE</b>	0=Inform 1=Encourage 2=Enable	n/a

Each strategy was assigned a score of 0 to 2 based on the average score of all the criteria. This average score was used to define the potential impact as follows:

AVERAGE SCORE	STRATEGY IMPACT RATING
≤ 0.5	Negligible
> 0.5 and < 1.5	Minor Direct/Indirect
1.5-2	Major Direct/Indirect

## RESULTS

Each strategy identified by the stakeholder group was scored based on the ranking above and the results are shown in the table below:

STRATEGY	DIRECT STRATEGIES		INDIRECT STRATEGIES		NEGLIGIBLE
	MAJOR	MINOR	MAJOR	MINOR	
FLEET & TRANSIT					
1. Purchase a pilot light-duty vehicle for organizational staff to use					✓
2. Create an EV Feasibility Inventory				✓	
3. Develop a Vehicle Replacement Plan <sup>21</sup>	✓				
4. Install EV charging infrastructure at key fleet locations				✓	
5. Develop an EV-use employee training program					✓
6. Develop EV manufacturer agreements to provide maintenance training to employees				✓	
7. Develop fleet success stories and resources from early adopters				✓	
8. Hold electric bus workshops and demonstrations				✓	
9. Develop bus electrification plans <sup>22</sup>	✓				
10. Create a bus charging schedule to take advantage of beneficial electricity rates. <sup>23</sup>			✓		
11. Explore opportunities for installing fast-charging top-off at major transit stations. <sup>24</sup>				✓	

<sup>21</sup> Assumes that more than 25% of the fleet vehicles are converted to EVs.

<sup>22</sup> Assumes that more than 25% of buses are converted to EVs.

<sup>23</sup> Assumes that more than 25% of buses are impacted by this charging schedule.

<sup>24</sup> Assumes that less than 25% of buses will use these chargers.

STRATEGY	DIRECT STRATEGIES		INDIRECT STRATEGIES		NEGLIGIBLE
	MAJOR	MINOR	MAJOR	MINOR	

## POLICY & PUBLIC ACCESS

1. Update Development Codes to Incentivize EV Charging
2. Create EV Charging Policies
3. Coordinate with Xcel Energy to Identify Charging Gaps
4. Provide Workplace Charging for Employees
5. Encourage municipal partners to adopt a GoEV City resolution
6. Coordinate and Advocate Regionally
7. Require installation of electric vehicle charging infrastructure with redevelopment / major renovations of multi-family and commercial buildings.

		✓		
			✓	
				✓
		✓		
				✓
				✓
		✓		

## EDUCATION & OUTREACH

1. Provide electric vehicle education and engagement opportunities for local residents and businesses.
2. Offer local incentives for EV charging infrastructure and e-bikes.
3. Partner with other organizations and car dealerships to sponsor group-buy events.
4. Offer incentives to HOAs that install charging infrastructure.
5. Offer workshops on electric vehicle repair for local car repair shops.

		✓		
			✓	
		✓		
			✓	
		✓		



## APPENDIX D: XCEL ENERGY ELECTRIC VEHICLE PROGRAMS

With the approval of Xcel Energy's new Transportation Electrification Plan by the Colorado Public Utilities Commission, several EV programs are expected to launch in 2021. Check out Xcel Energy's new website, [ev.xcelenergy.com](https://ev.xcelenergy.com), for the most up-to-date program information.

### RESIDENTIAL

#### Xcel Energy EV Website

Xcel Energy's EV website is an online resource center where residential customers can learn more about EVs by:

- Browsing EVs by range, price, or a personalized Match Score. Users can also compare EVs to see costs, battery size, and time to charge.
- Exploring available manufacturer rebates and tax incentives to help them save when purchasing an EV.
- Finding local auto dealerships that are knowledgeable about EVs.
- Learning more about how to charge at home and where to charge on the road. Users can explore available charging programs, including pricing plans.

#### Xcel Energy EV Network

Users can join the [Xcel Energy EV Network](#) to receive up-to-date information about future EV programs offered by Xcel Energy.

#### EV Trade Partner Network

Auto dealers, electricians, and charging station developers can join the [Xcel Energy EV trade partner network](#) to keep informed with information customers need to power their electric vehicles. Participants will receive updates on EV electric pricing and program information, access to trainings, and other resources.

## COMMERCIAL

### Fleet Electrification Advisory Program

Businesses or organizations looking to develop an electrification plan for their fleets can participate in Xcel Energy's Fleet Electrification Advisory Program as a first step in the assessment process. The program includes a vehicle assessment to determine if a specific vehicle's driving needs could be met with an electric vehicle. To support the development of fleet electrification plans, a charging site suitability assessment will help determine a path for infrastructure installation.

Participants have access to an online planning tool to provide real-world data that includes all the latest EV models, customizable financial analytics and GPS data for infrastructures needs.

For more information, visit: [xcelenergy.com/CommercialEVs](https://xcelenergy.com/CommercialEVs).

### EV Critical Peak Pricing

EV Critical Peak Pricing enables fleet managers to pay less for energy to charge EVs during off-peak hours. A limited number of critical peak events may be called during the year, and when fleet operators shift their EV charging away from these critical periods, special pricing will help them save money on their energy bills. Participating customers will also be provided with a tool to view near real-time energy usage. This service is provided by Xcel Energy at no additional charge. Contact your Xcel Energy account representative for more information on EV Critical Peak Pricing and questions about how new electrical loads might affect utility costs.

Additional programs are expected to become available in 2021. Contact your Xcel Energy account representative for more information.

## APPENDIX E: EQUITY CHECKLIST

This checklist is taken from the *Urban Sustainability Directors Network's A Guidebook on Equitable Clean Energy Program Design for Local Governments and Partners*.

### PROGRAM DESIGN STEPS

#### STAGE 1—PROGRAM DESIGN PROCESS

- ☐ Assemble the team who will help organize and plan for the clean energy program
- ☐ Build internal team alignment and a shared understanding of equity
- ☐ Define equity, goals, and desired outcomes for engagement and program design from the local government perspective
- ☐ Gather and assess baseline data to inform community outreach and program design
- ☐ Listen to understand community goals and existing initiatives
- ☐ Partner with experienced and trusted community organizations for engagement
- ☐ Select and deploy appropriate modes of engagement and minimize the burden of participation
- ☐ Communicate about equity and clean energy with tailored messages that resonate

### GUIDING EQUITY PRINCIPLES

#### 1. LISTEN AND RESPOND

Local governments should first listen to the communities they seek to serve. Program design should be as responsive as possible to the needs expressed by community members, and local government staff should be transparent about their resources. Ideally, this would build from preexisting community connections and engagement, and help define program goals.

#### 2. PARTNER WITH TRUSTED COMMUNITY ORGANIZATIONS

Local governments should work with community organizations to design and deliver programs, and where applicable, help build the capacity of community organizations through the partnership.

#### 3. RECOGNIZE STRUCTURAL RACISM

Programs not targeting LMI households will not necessarily serve all disadvantaged populations. Racial analysis and baseline data must be part of an inclusive program design process to understand and address structural barriers that exist beyond income.



**PROGRAM DESIGN STEPS****STAGE 2—PROGRAM STRUCTURE**

- ☐ Refine the sustainability and equity goals the program will seek to achieve
- ☐ Define program eligibility and who the program will serve
- ☐ Consider the contextual factors that need to be part of the program design
- ☐ Select the clean energy technologies that will be included in the program
- ☐ Recruit key program partners needed to make the program successful
- ☐ Choose an appropriate financing mechanism—or several combined—to use in the program
- ☐ Identify sustainable sources for program funding
- ☐ Determine the program administrator, which could be the local government or a partner
- ☐ Map out customer interaction and access to the program's resources
- ☐ Build equity into the supply chain via workforce development and procurement
- ☐ Establish consumer protection measures to protect LMI households from potential harms

**GUIDING EQUITY PRINCIPLES****4. EFFICIENCY FIRST**

Programs should ensure LMI households can access energy efficiency benefits as a key step to reducing energy burdens and increasing household health and comfort.

**5. REDUCE FINANCIAL BURDENS**

Programs should not add financial burdens for LMI households and should aim to reduce financial and other burdens.

**6. INCREASE BENEFITS**

Programs should seek to deliver services beyond clean energy technologies and capitalize on co-benefits, such as job creation or community resilience for people of color, indigenous communities, and other historically underserved and underrepresented populations.

**7. MAKE IT EASY**

Program participation should be as easy as possible for any household with effective, efficient, and culturally competent program design, outreach, and delivery.

**8. INTEGRATE WITH OTHER SERVICES**

Wherever possible, programs should align with other services for LMI households.

**9. PROTECT CONSUMERS AND WORKERS**

Programs should have carefully considered consumer and workforce protection elements and consumer education to avoid unintended consequences.

**PROGRAM DESIGN STEPS****STAGE 3—PROGRAM IMPLEMENTATION  
AND EVALUATION**

- ☐ Develop a program implementation timeline
- ☐ Determine roles and responsibilities for implementation
- ☐ Recruit program participants and administer the program
- ☐ Conduct program monitoring and evaluation
- ☐ Develop long-term steps for the program's continuation

**GUIDING EQUITY PRINCIPLES****10. BEYOND CARVE-OUTS**

Programs should do more than set aside a small portion of benefits for LMI households, and where possible, center the needs of LMI households and other historically underserved communities in program design and delivery.

**11. TRACK PROGRESS**

Programs should establish and assess against baseline equity data—both quantitative and qualitative—to inform program design, establish metrics, and track progress.

**12. LONG-TERM COMMITMENT**

Programs should provide support for LMI households beyond installing a clean energy technology, and include structures for helping with technology service, upkeep, and repair.

