

Community Logo  
Placeholder



# An Electric Vehicle Action Plan for Lone Tree

April 2023



 **Xcel Energy**<sup>®</sup>

**PARTNERS IN ENERGY**  
An Xcel Energy Community Collaboration

# ACKNOWLEDGEMENTS

Thank you to the following individuals who contributed many hours of service to developing this Electric Vehicle Action Plan.

The content of this plan is derived from a series of planning workshops hosted by Xcel Energy’s Partners in Energy. Xcel Energy is the main electric and gas utility serving Lone Tree. Partners in Energy is a two-year collaboration to develop and implement a community’s energy goals. For more information about the planning workshops, see Appendix A: Xcel Energy’s Partners in Energy Planning Process.

## Electric Vehicle Action Team

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## Electric Vehicle Action Team

### Xcel Energy's Partners in Energy Team

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# EXECUTIVE SUMMARY

## About this Plan

### Our Electric Vehicle Vision and Goal

Vision:

Goals:

### Our Roadmap for Achieving this Vision & Goal

To achieve this vision, the City of Lone Tree EV Action Plan is divided into three focus areas:

- 1.

### Our Strategies

List strategies by Focus Area

### EV Baseline (and Targets)

(Key baseline numbers by focus area with future goal)

### Impact and Results of Plan Implementation

(GHG, air quality, transportation cost)

# INTRODUCTION



## What Is an EV Action Plan?

This EV Action Plan is a roadmap to strategically guide the City of Lone Tree's actions in a manner that supports electric vehicle adoption within the community.

The EV goals and strategies outlined in this plan were developed collaboratively with a stakeholder team, through three planning workshops conducted from December 2022 to March 2023. Since successful deployment of many EV strategies relies on collaboration between the City and Xcel Energy, representatives from both organizations were included. The City of Lone Tree team included representatives from Facilities, Public Works, Planning, Police, Mobility, and the City Manager's Office. The Xcel Energy team included experts in electrical infrastructure, billing, EV fleet advisory programs, and community communications. Team members coordinated throughout the process to share information and identify potential opportunities for partnership during implementation.

City of Lone Tree had previously developed an Energy Action Plan in 2022, and now joins several Colorado communities in developing an EV Action Plan through Xcel Energy's Partners in Energy, an offering that provides resources for community energy and EV planning. Partners in Energy also supports 18 months of plan implementation in the form of marketing and communications, data tracking and analysis, program expertise, and project management.

The components of the City of Lone Tree's EV Plan are detailed below:

**Why Lone Tree is Pursuing an EV Action Plan** A look at the City of Lone Tree's motivations for developing an EV Action Plan.

**Where Are We Now** Outlines the relevant characteristics of the City of Lone Tree electric vehicle landscape.

**Where We Are Going** Describes the City of Lone Tree’s EV vision and goals through a planning horizon of 2030.

**How We Are Going To Get There** Identifies focus areas and strategies to achieve the defined goals, along with targets and metrics that quantify success in each focus area.

**How We Stay On Course** Outlines how the City will track progress toward targets, goals, and vision, and how it will adapt to a changing landscape during the coming 18-month implementation period.

**Appendices** Provide additional information about the planning process, next steps, EV basics, and current Xcel Energy Programs.

## Why Lone Tree is Pursuing an EV Action Plan

The City of Lone Tree recognizes that electric vehicles are part of the future; and, the City has a desire to plan for the infrastructure to support adoption of electric vehicles. The creation of an EV Action Plan will serve as a guide for all community members as well as the City to adopt electric vehicles equitably and successfully as the electric vehicle market grows. An EV Action Plan is a step toward developing a strategic transportation network that ties to the City of Lone Tree’s 2040 Transportation Plan. More broadly, an EV Action Plan can build upon a number of other planning efforts the City of Lone Tree has recently undertaken while also supporting the State of Colorado’s electric vehicle efforts.

In development of the EV Action Plan, the EV Action Team provided their thoughts about why the City of Lone Tree should pursue an EV Action Plan. Some of their responses are below:

- To support the community’s needs and to create a more sustainable future
- It is a major component of the future of transportation
- Clean air, affordability, and convenience
- Compliance with city & state goals, and it is the right thing to do
- Meet citizen expectations
- City of Lone Tree is full of great people that help the City stand out as a Front Range leader for
- and example of good governance. It’s also a strategic location at the intersection of a lot of transportation intersections
- To help businesses thrive in a premier Colorado community with vibrant public spaces
- Keep up with market trends and consumer choice

## Related Planning Efforts

Below is a short summary of other planning efforts that have been reviewed in the development of this plan. Some aspects of each planning effort outlined below have been incorporated into the EV Action Plan.

### City of Lone Tree Energy Action Plan

The City of Lone Tree partnered with Xcel Energy's Partners in Energy program to develop an [Energy Action Plan](#). The energy vision that was developed as part of that process is "The Lone Tree community is committed to collaborating toward a sustainable future that provides equitable access to renewable energy and energy efficiency." This planning process also sparked interest in the development of an Electric Vehicle Action Plan through the Partners in Energy program.

### City of Lone Tree Comprehensive Plan

The City's [Comprehensive Plan](#) was adopted in 2019 and includes policies and strategies around transportation and a multimodal system. The goal outlined in the comprehensive plan is "A safe, connected, and efficient transportation system in harmony with surrounding land uses and the environment."

### City of Lone Tree 2040 Transportation Plan

The [Transportation Plan](#) provides a framework for the development and improvement of the City's transportation network. This plan includes the eight objectives below.

- **Multimodal Transportation:** Enhance and expand the City's multimodal transportation network.
- **Transit:** Transit services and facilities that serve the travel needs of users, including commuters and transit-dependent populations.
- **Roadway:** A roadway network that meets the travel needs of residents and businesses in a safe, convenient, pleasing, and efficient manner, while minimizing environmental impacts.
- **Sidewalks, Trails, and Bike Lanes:** A safe, connected, and robust system of sidewalks, trails, and bike lanes.
- **Travel Demand Management (TDM):** Maximize the public investment in infrastructure, reduce traffic congestion, conserve energy, and enhance air quality through an integrated TDM system.
- **Maintenance:** Maintain Lone Tree's existing local transportation infrastructure to keep it safe and efficient.
- **Transportation Funding:** Adequately fund the City's transportation system and infrastructure.
- **Regional Transportation Coordination:** Protect, leverage, and improve regional transportation systems through cooperative efforts.

### State of Colorado EV Plan 2023

The [Colorado EV Plan 2023](#) is an update to the State's 2018 and 2020 plans and continues to accelerate adoption of EVs of all types in Colorado. The plan builds on the



existing goal established of 940,000 light-duty EVs by 2030 and a long-term vision of 100% electric light-duty vehicles and 100% zero emission medium-duty vehicles. It establishes goals and new actions in four focus areas:

1. **Light-Duty Vehicles and Infrastructure:** Light-duty vehicles refer to vehicles 8,500 pounds or less, and primarily include privately-owned passenger cars, SUVs, and lighter pickup trucks, as well as fleet vehicles such as rental cars and ride-hailing fleets.
2. **Medium- and Heavy-Duty Vehicles and Infrastructure:** Medium- and heavy-duty vehicles are vehicles over 8,500 pounds and include everything from large pickup trucks and vans to school buses and semi-trucks. Many of these vehicles are commercial fleet vehicles, although a substantial proportion of medium-duty vehicles are privately owned.
3. **Electric Mobility (electric micromobility and shared electric modes):** Electric mobility refers to the broad and growing range of personal transportation options that are powered fully or in part by an electric motor, beyond privately-owned electric vehicles. For the EV Plan, it includes personally owned electric micromobility options (e.g., e-bikes, e-scooters), and shared options such as electric bikeshare networks, electric carshare networks, and electric vanpool services.
4. **Cross-Cutting Initiatives:** This area focuses on initiatives that affect multiple parts of the transportation system, including strategies or considerations that span multiple sectors, rather than just a single type of vehicle or mode of transportation. These include leading by example, equity and engagement, planning, and workforce development.

## Drivers for EV Planning

There are several benefits to the adoption of electric vehicles. Below are some key factors the City of Lone Tree considers important drivers in planning for an electric vehicle future.

### Market Dynamics

Automakers are committing to transitioning to electric vehicles in the next 10 to 15 years. Some of the major automakers that have made these commitments include General Motors, Ford, Volkswagen, Volvo, and Honda. General Motors is planning to only offer zero-emissions vehicles by 2035 (Wayland, 2021), while Ford is investing \$22 billion to have all-electric models for its most celebrated products by 2025 (Ford, 2021). Volkswagen will spend \$193 billion to support an electric vehicle transition with much of the investment focused on battery technology and charging infrastructure (Huff, 2023). Finally, Volvo has set a goal of being a fully electric car company by 2030 (Volvo, 2021), while Honda will only produce battery electric and hydrogen fuel cell vehicles by 2040 (Capparella, 2021).

The transition to zero-emission vehicles is a significant shift for the automotive industry. This market change will impact consumers and influence purchasing behaviors.

Communities will need to be responsive and adapt to meet an electrified future and identify opportunities to support the associated infrastructure needs.

### Funding Opportunities

There are numerous new funding sources for electric vehicles and infrastructure becoming available at the federal, state, and local levels. These sources represent a significant opportunity for communities looking to capitalize on available dollars. At the federal level, the Biden administration advanced new funding for electric vehicles and charging infrastructure as part of the Bipartisan Infrastructure Law. This funding includes \$7.5 billion to build a national network of EV chargers (Electrification Coalition, 2023). In addition, federal tax credits of up to \$7,500 are available for qualified purchased or leased electric vehicles with the new rules starting in 2023.

Colorado's "Sustainability Of The Transportation System" bill, signed in 2021, created dedicated funding of over \$730 million for the state's transportation system (Colorado Energy Office, Colorado Department of Transportation, Colorado Air Pollution Control Division, 2023). There are also multiple state grant resources including the Charge Ahead Colorado grant program, Alt Fuels Colorado grant program, Regional Air Quality Council Electric Vehicle and Charging Station grants, as well as the Colorado Electric Vehicle grant fund available for communities.

Finally, Xcel Energy created the first-ever Transportation Electrification Plan for Colorado customers with a budget totaling more than \$110 million over three years (Colorado Energy Office, Colorado Department of Transportation, Colorado Air Pollution Control Division, 2023). Income-qualified customers in Xcel Energy's electric territory are eligible for \$5,500 rebate when consumers purchase or lease an EV ([EV Rebate - Colorado | Xcel EV Shopping Advisor \(xcelenergy.com\)](#)). Customers can also qualify for a \$500-\$1,300 rebate to offset the cost of installing a Level 2 charger depending on eligibility criteria ([Home Wiring | Xcel EV Shopping Advisor \(xcelenergy.com\)](#)).

### Air Quality

Improving public health and air quality for residents of the City of Lone Tree is a primary reason for pursuing an emissions-free EV future. The transportation sector produces pollutants such as particulate matter (PM), nitrogen oxides (NOx), carbon monoxide (CO), and volatile organic compounds (VOCs). Pollutants like NOx and VOCs contribute to ground-level ozone which, in addition to PM and CO, are harmful to respiratory health. Since 2019, the Front Range has received a "serious" violator designation based on federal air quality standards. In 2022, the region was downgraded by the Environmental Protection Agency to a "severe" violator. A classification of "severe" results in new regulations that aim to reduce emissions and will increase costs associated with gasoline (Woodruff, 2022). In addition, a in 2022 study conducted by the American Lung Association, Douglas County received an "F" grade for high ozone days for 2018-2020 and was ranked 23<sup>rd</sup> in a list of most polluted counties in the Country for ozone (American Lung Association, 2022).

# WHERE WE ARE NOW



To gain insight into the potential for electric vehicle (EV) adoption, as well as to identify existing obstacles and advantages, a review of the community baseline was conducted for the City of Lone Tree.

## **Community Characteristics**

Geographic and demographic characteristics are critical to understanding EV trends and identifying the right strategies to increase adoption. The following sections summarize the community characteristics that present both barriers to and opportunities for EV adoption in Lone Tree.

### **Geography & Development**

Lone Tree is located on the northern border of Douglas County. The City's incorporated boundary is nearly 10 square miles and conveniently located near critical transportation corridors including major highways (I-25, C-470, E-470) and the Regional Transportation District (RTD) light rail system.

Within the incorporated border, there has been and will continue to be significant development. The RidgeGate master planned community, with 3,500 acres located along I-25, will include 15 million square feet of commercial, retail, and medical space; 10,000 homes; and new parks and open space areas (RidgeGate, 2023). Cities surrounding Lone Tree include Centennial, Highlands Ranch, and Castle Pines. Figure 1 shows Lone Tree's most recent land use plan, including transportation considerations from their Comprehensive Plan adopted by the City in January 2019 (City of Lone Tree, 2023). The City has recently initiated an update process for the Comprehensive Plan that will be completed in the next couple of years.

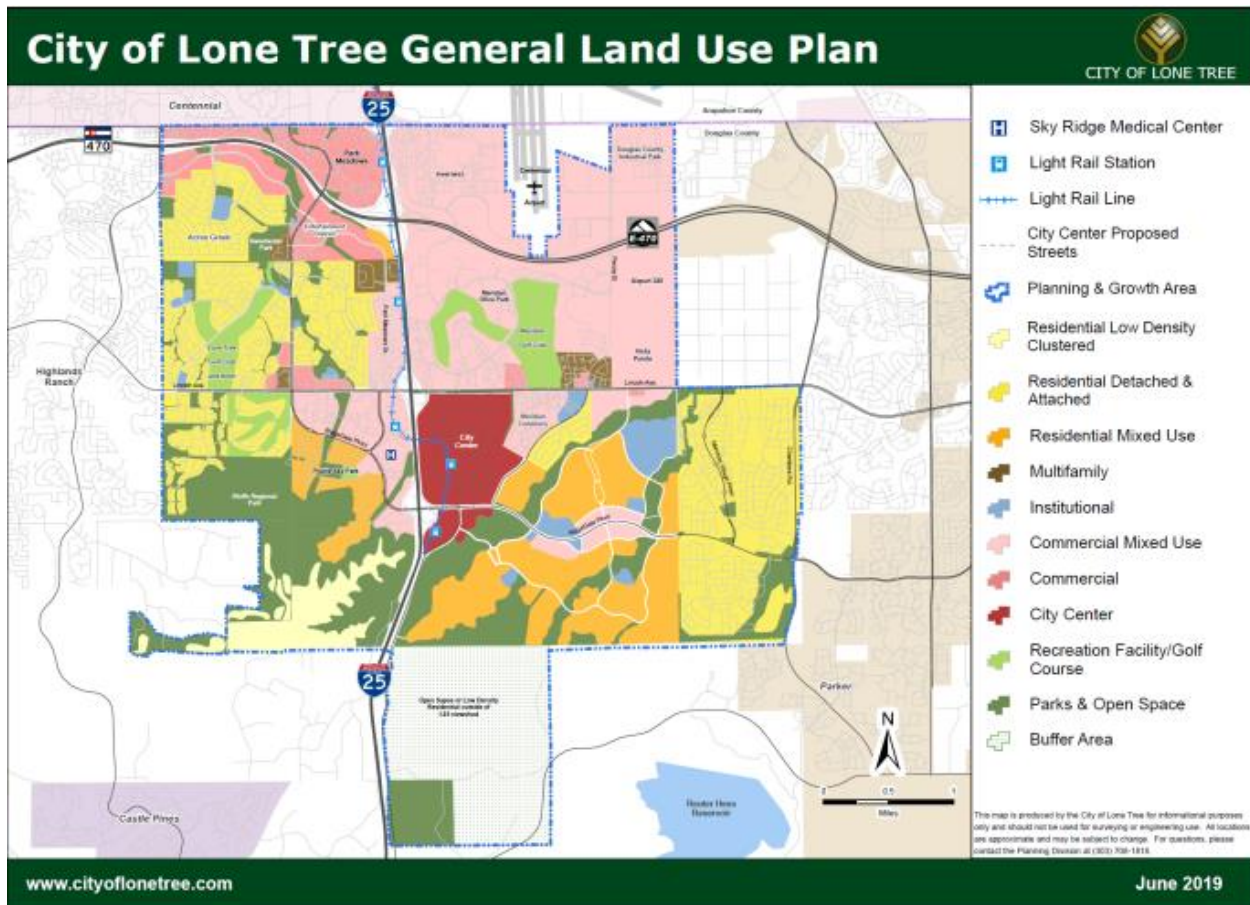


Figure 1: City of Lone Tree Map & Land Use Plan

## Population

The City of Lone Tree was home to approximately 14,200 residents in 2021. Lone Tree's population has grown by approximately 39 percent since 2010 (U.S. Census Bureau, 2023). Compared to other communities in Colorado, Lone Tree is a fast-growing community and is expected to continue to see rapid growth through 2050 and beyond with the development of the RidgeGate community. The RidgeGate community is projected to house approximately 30,000 residents, pushing Lone Tree's expected population estimates to over 40,000 sometime between 2050-2060 (once the development is fully built out). This anticipated growth, as well as Lone Tree's proximity to major highways, is expected to increase the number of vehicles on the road. Increasing the proportion of EVs on the roads can help mitigate anticipated increases in air pollution.

## Income

Lone Tree's median household income is nearly \$114,000, 12% lower than Douglas County's estimate (\$129,000) but 28% higher than the state's median household income (\$82,000). Lone Tree's income level would typically support increased EV

adoption rates, as many EV models in the market are still considered luxury vehicles with higher upfront costs. Lone Tree's median household income presents an opportunity to leverage strategies aimed at encouraging additional public and workplace charging infrastructure to demonstrate continued support for EV ownership.

## **Housing**

Today the majority of EV charging takes place at home. Home charging is easiest for single family residences with garages and for homeowners. Nearly 60% of Lone Tree's residents own their home and 60% of homes are classified as single-family housing. While this represents a significant market opportunity, the City also has an opportunity to support adoption of EVs in renter-occupied homes and multifamily properties. Barriers exist for renters and multifamily tenants and may include lack of access to local public charging, aging building electrical infrastructure, inability to upgrade charging without owner buy-in, and limited or shared parking arrangements. Increasing EV adoption for rental and multifamily properties will require careful coordination with property owners and can help address equity concerns related to access. State and utility programs are available to support the adoption of infrastructure at multifamily properties.

## **Commuting Patterns**

Lone Tree sees a significant inflow of commuters to the region, representing a strong need for more workplace and public charging infrastructure. Of the approximately 7,000 workers in the area, nearly 70% drive alone to work - with an average commute of just over 20 minutes (United States Census Bureau, 2023). On average, Lone Tree residents spend over \$14,000 annually on transportation expenses, which equates to about 18% of their income; and, they average over 17,000 vehicle miles per household annually (CNT, 2023). This represents a major opportunity for EVs to reduce commuting costs, air pollution, and greenhouse gas emissions.

At the same time, over 20,000 workers commute into Lone Tree every day (U.S. Census Bureau, 2018), resulting in lower air quality, greater traffic congestion, and increased pressure on existing infrastructure. Figure 2 on the following page demonstrates the inflow and outflow patterns of commuters through Lone Tree. This pattern highlights the importance of providing workplace and public charging infrastructure, as well as prioritizing and promoting other mobility options such as bus, bike, and light rail.

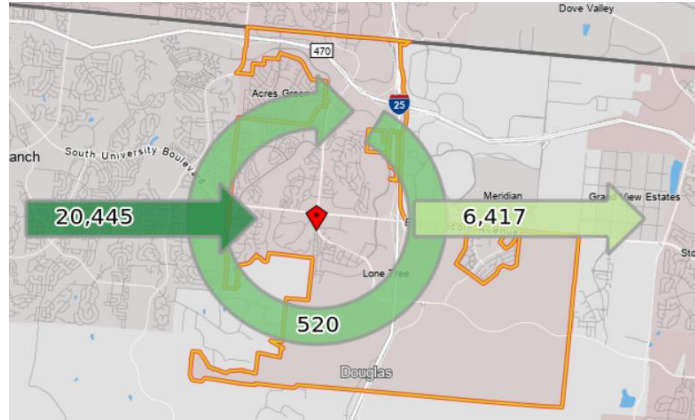


Figure 2. 2019 inflow and outflow commuting map (United States Census Bureau, 2023)

## Electric Vehicle & Charging Infrastructure Baseline

### Electric Vehicles

Battery electric vehicle (BEV) and plug-in hybrid electric vehicle (PHEV) data were reviewed for this plan.

- A BEV is powered by an electric motor and does not require gasoline. These vehicles are fueled by plugging into a charging station and energy is stored in the battery.
- A PHEV contains both an electric motor and a gasoline engine. A PHEV will utilize the electric motor until the battery charge runs out and then will use the gasoline tank to support continued operation.
- To learn more about EVs, review Appendix C: Electric Vehicles 101.

In 2023, EVs represented 7% of City of Lone Tree’s total registered vehicles (Douglas County Department of Motor Vehicles, 2023). This percentage demonstrates that Lone Tree is a leader in EV adoption when compared to Colorado (1%) and national (0.8%) averages (U.S. Department of Energy, 2023). The City is outpacing the State’s highest modeled estimates around expected EV growth through 2025. This represents an enormous opportunity for the community to identify and incentivize siting of public charging stations to keep pace with current adoption trends.

Table 1. City of Lone Tree vehicle registration totals

<b>EV Registration Data in Lone Tree</b>	<b>Total (received 3/2023)</b>
Battery EVs	310
Plug-in hybrid EVs	525
<b>Total EVs</b>	<b>835</b>
<i>Total Registered Vehicles in Lone Tree</i>	<i>12,574</i>
<b><i>Total EVs as a percent of Registered Vehicles</i></b>	<b><i>7%</i></b>

## Electric Charging Infrastructure

Public charging stations play an important role in helping residents feel confident that the required infrastructure is available to support their EV purchase. Further, although most EV owners tend to rely heavily on their home as their primary charging location, homeowners of older homes and renters are more likely to rely on public charging stations. Public charging also addresses equity concerns by providing access to residents who live in multifamily homes, use on-street parking, or choose not to charge their vehicles at home.

There are three primary types of EV chargers: Level 1, Level 2, and Level 3 (sometimes referred to as DC fast charging (DCFC)). Level 1 & 2 chargers require lower voltage and cost less to install but take longer to recharge a battery. DCFC chargers will quickly charge a battery but are significantly more expensive. To learn more about the types of chargers available, review Appendix C: Electric Vehicles 101.

According to the U.S. Department of Energy, the City of Lone Tree had 26 level 2 charging ports and 12 DC fast charging ports in operation as of the end of 2022 (U.S. Department of Energy, 2022). A map of current EV charging stations within Lone Tree is shown in Figure 3.

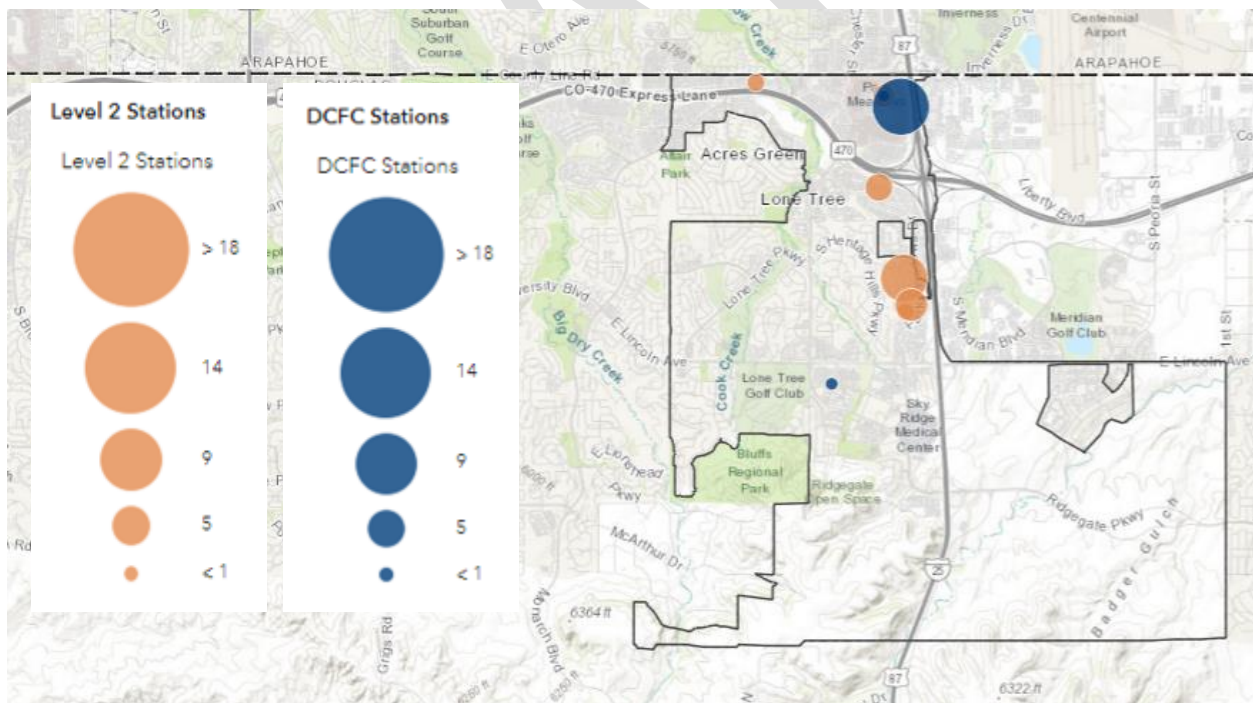


Figure 3: City of Lone Tree Electric Charging Stations

Based on Colorado’s EV goals, statewide charging infrastructure will need to grow by 28% per year by 2030 (see Figure 5). Approximately 80% of chargers are anticipated to be Level 2, and 20% are anticipated to be DC fast chargers (Hsu, Slowik, & Lutsey, 2021).

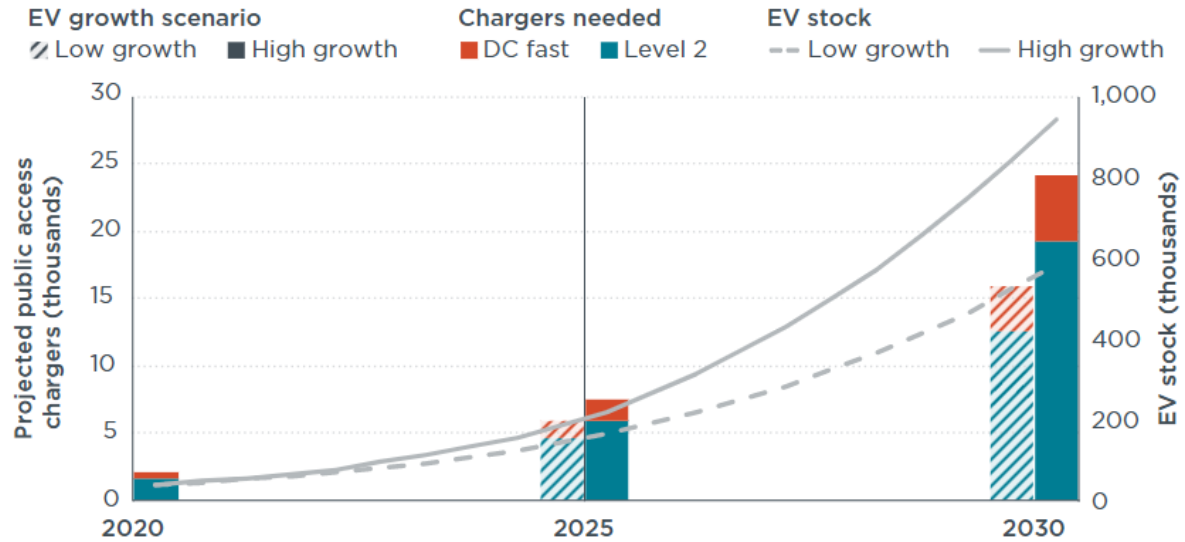
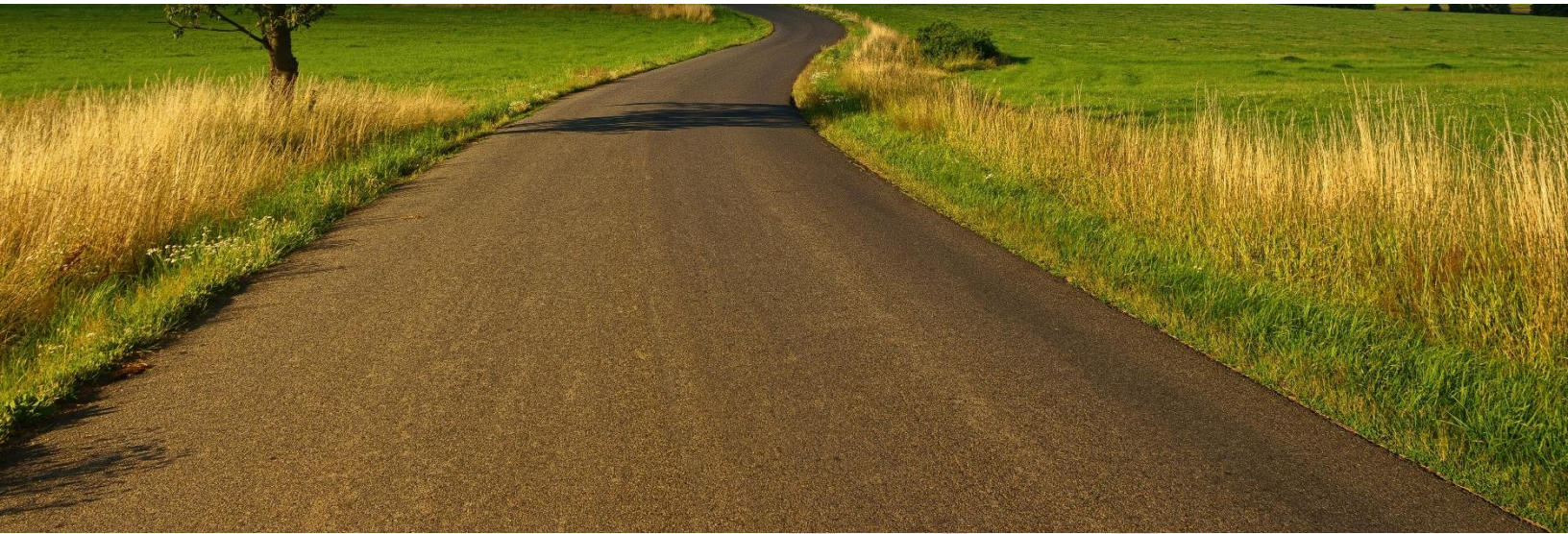


Figure 4. Colorado statewide public charging infrastructure needed under high-growth (70% EV sales by 2030) and low-growth (42.25% EV sales by 2030) scenarios (Hsu, Slowik, & Lutsey, 2021).

Achieving this level of infrastructure will require concerted coordination across public and private entities. This will include supporting installation of at-home charging stations; encouraging workplace charging; incentivizing or requiring multifamily charging; and identifying strategic locations to install public charging.



# WHERE WE ARE GOING



## **Electric Vehicle Vision Statement**

During the planning process, the Electric Vehicle Planning Team created a vision statement for this Electric Vehicle Action Plan.

This statement helped guide the planning process and reflects the intention of the community.

**The Lone Tree community will pursue accessible, equitable, innovative, and collaborative solutions to become a leader in EV adoption and infrastructure deployment.**




## **Goal**

Working together, the Team set an overarching plan goal to measure success.

**Lone Tree strives to have 2,800 electric vehicles in the community by 2030 to reduce transportation greenhouse gas emissions and improve air quality.**

## Focus Areas




To achieve a community-wide commitment to transportation electrification, the Electric Vehicle Planning Team identified the following focus areas to prioritize strategies and resources.

	<p><b>Municipal Transportation Electrification (MTE)</b>            Fleet electrification is an important step to demonstrate the City’s commitment to EV adoption. The City of Lone Tree is electrifying its fleet as capable technology advances and is supporting fleet operations by deploying EV charging infrastructure.</p>
	<p><b>Public Charging (PC)</b>            Support for the installation of public charging affirms that infrastructure is available and ensures it is convenient and accessible for those who live in, work in, and visit Lone Tree.</p>
	<p><b>Outreach &amp; Education (OE)</b>            Focused outreach for development and redevelopment - to businesses, and those who live in, work in, and visit Lone Tree - on the benefits, programs, and funding available for EV charging stations, EVs, and charging at home. Micromobility opportunities will also be explored as an alternative transportation method within the outreach and education to the community.</p>

These focus areas were chosen to provide a collaborative approach for how the City will accelerate EV adoption and infrastructure deployment.

## Strategies

For each focus area, the Electric Vehicle Planning Team identified strategies, prioritized the strategies, and developed implementation actions and details. Overall, for the 3 focus areas, 25 strategies were named. Each focus area prioritized three strategies to focus on for the next two years. Each strategy includes a short description identifying the target audience and coordination with other City strategies, defines metrics, identifies roles and responsibilities, and identifies key steps and timeline. The impact of EV adoption and GHG emissions for each strategy is described, along with co-benefits including equity, accessibility, and resiliency. Considerations such as technical feasibility and resources needed to complete each strategy are described. Additionally, applied to each strategy is an icon, described below, to illustrate the type of resources required.

	<p>This project can be paid for from the standard operating budget</p>
	<p>A special budget ask will be required for this project</p>
	<p>Xcel Energy programs, State/Federal programs, or grant money could help fund this strategy</p>

# HOW WE ARE GOING TO GET THERE



## **Focus Area: Municipal Transportation Electrification (M)**

Municipal transportation electrification increases EV visibility within the community and provides significant reductions in operational costs and GHG emissions for the fleet. While the technology is still in progress for several types of special-use and heavy-duty vehicles, many options for light-duty vehicles are currently available. In particular, fleet vehicles that take short trips and return to a designated parking location are ideal EV candidates, due to the predictability of use for battery range planning and charging infrastructure siting.

Initiatives from federal and state governments and Xcel Energy, as well as commitments from auto manufacturers to stop manufacturing gas-powered vehicles, indicate that fleet managers should begin planning for fleet electrification immediately. For many organizations, this means restructuring procurement, budgeting, capital project planning, and operations. Also important is building partnerships with businesses to create a robust EV charging infrastructure network.

The following strategies for this focus area demonstrate the City's commitment to leading by example through electrifying its own fleet so it can realize the benefits of electrification. Implementation details for each strategy are found in the following sections.

## Strategy M-1: Develop a vehicle replacement plan for City fleet



### M-1: Develop a vehicle replacement plan for City fleet

Description & Context		
<p><b>What is this strategy?</b></p> <ul style="list-style-type: none"> <li>A vehicle replacement plan for City fleet will be developed to determine which Lone Tree-owned vehicles in the fleet are the best candidates for electrification, along with a potential timeline for replacement. The replacement plan will be based on items such as estimated total cost of ownership, primary vehicle use and needs, and vehicle information such as age, mileage, etc. In choosing vehicles to target for replacement with EV's, better options include high-mileage and/or high-idling vehicles, and vehicles that return to the same location.</li> </ul> <p><b>Who is the Target Audience?</b></p> <ul style="list-style-type: none"> <li>City of Lone Tree staff</li> </ul> <p><b>Alignment with Other Lone Tree Strategies</b></p> <ul style="list-style-type: none"> <li>Tie the replacement plan to Strategy M-2: Develop an electric-first vehicle procurement policy for the City</li> </ul>		
Metrics of Success		
<ul style="list-style-type: none"> <li>Pilot an electric patrol vehicle for the City's Police Department, as available</li> <li>Complete a vehicle replacement plan</li> <li>100% EV fleet for non-PD vehicles</li> </ul>		
Roles and Responsibilities		
<p><b>City of Lone Tree</b> <i>Role: Lead</i></p> <p><i>Responsibilities:</i></p> <ul style="list-style-type: none"> <li>Provide information on vehicle fleet and existing charging infrastructure to inform the vehicle replacement plan</li> <li>Determine targeted vehicles, based on the inventory, to replace with EV's</li> <li>Incorporate results of vehicle replacement plan</li> </ul>	<p><b>Xcel Energy's Partners in Energy</b> <i>Role: Support</i></p> <p><i>Responsibilities:</i></p> <ul style="list-style-type: none"> <li>Provide resources and research to support selection of vehicles for electrification by Lone Tree</li> <li>Develop the vehicle replacement plan utilizing inputs from Lone Tree</li> </ul>	<p><b>Other Partners</b></p> <ul style="list-style-type: none"> <li>Douglas County</li> <li>Town of Parker (maintenance facility)</li> </ul>



## M-1: Develop a vehicle replacement plan for City fleet

<p>into the budgeting cycle</p> <ul style="list-style-type: none"> <li>Implement the replacement plan</li> </ul> <p>Contact: City Manager's Office</p>	<p>Contact: Partners in Energy, Xcel Energy Clean Technology Team</p>	
Key Implementation Steps and Timeline		
Action Steps		Action Steps
1.	Collect vehicle information to develop an inventory of Lone Tree's current fleet, including current vehicle type, age, and mileage	2023
2.	Share information with the City of Lone Tree to help inform vehicles targeted for replacement with EV's within the Command Staff and Investigations vehicles	2023
3.	<p>Develop a vehicle replacement plan for selected vehicles in the Lone Tree fleet, utilizing the following steps/information</p> <ul style="list-style-type: none"> <li>Determine vehicles that would be suitable for electrification through Fleet Electrification Advisory Program (FEAP)</li> <li>Recommended replacement models</li> <li>Replacement timelines (typically ~8-10 years)</li> <li>Budget request timelines</li> <li>Available financial incentives</li> </ul>	2023
4.	<p>Identify infrastructure needs associated with fleet electrification and incorporate into capital project planning and budgeting, after consultation with the Town of Parker and Douglas County to determine common charging hubs where appropriate</p> <p>Consider home charging infrastructure reimbursement opportunities through the City of Lone Tree</p>	2024
5.	Participate in FEAP with all fleet vehicles and incorporate results into plan	2024
6.	Purchase EVs and install needed charging infrastructure, as available	2024 and ongoing
Impact		
EV Adoption and GHG Emissions		
<ul style="list-style-type: none"> <li>The City demonstrates leadership in EV adoption</li> </ul>		
Resource Considerations		



## M-1: Develop a vehicle replacement plan for City fleet



### Funding Needs

- Funding required to replace or add one police vehicle
- No additional funding required to develop and enact the vehicle replacement plan



### Potential Funding Sources

- Xcel Energy FEAP and EV Supply Infrastructure (EVSI) program
- Xcel Energy Critical Peak Pricing Program
- Colorado Energy Office (CEO) Charge Ahead Colorado grants
- Infrastructure Investment and Jobs Act (IIJA) competitive Discretionary Grant Program for Charging and Fueling Infrastructure
- Climate Mayors' EV Purchasing Collaborative discounts
- (Anticipated) Colorado Department of Public Health and Environment (CDPHE) Clean Fleet Enterprise

### Technical Feasibility and Considerations

- Lone Tree currently purchases vehicles through the State of Colorado vehicle pool, which dictates the quantity and the type of vehicles available for purchase
- With lingering supply chain issues caused by the COVID-19 pandemic, it has been challenging to obtain vehicles in a timely manner
- Public Works has some take-home vehicles; home charging opportunities could be considered to help support electrification of those vehicles

## Strategy M-2: Develop an electric-first vehicle procurement policy for the City



### M-2: Develop an electric-first vehicle procurement policy for the City

Description & Context		
<p><b>What is this strategy?</b></p> <ul style="list-style-type: none"> <li>Develop and adopt an internal City policy that enables staff to choose an EV or other zero-emission vehicle for fleet vehicle replacements or new additions, based on an evaluation rubric including such items as if the vehicle is readily available, meets the needs of the City, and whether the incremental costs associated with total cost of ownership is cost-effective (among other items)</li> <li>A review of existing policies and procurement guidelines will also be completed to understand the opportunity to extend this City-based policy to a policy regarding procurement of contracted services.</li> </ul> <p><b>Who is the Target Audience?</b></p> <ul style="list-style-type: none"> <li>City staff &amp; contracted service providers</li> </ul> <p><b>Alignment with Other Lone Tree Strategies</b></p> <ul style="list-style-type: none"> <li>Tie electric-first policy to Strategy M-1: Develop a vehicle replacement plan for City fleet.</li> </ul>		
Metrics of Success		
<ul style="list-style-type: none"> <li>Complete an evaluation of existing policies and procurement guidelines to inform standards for contracted services</li> <li>Adopt an electric-first vehicle procurement policy</li> <li>Adopt an electric incentive option regarding procurement of services</li> </ul>		
Roles and Responsibilities		
<p><b>City of Lone Tree</b> <i>Role: Lead</i></p> <ul style="list-style-type: none"> <li>Review existing contracted services procurement policies for instances where a rubric could benefit and inform service provider selection</li> <li>Draft policy language, including final evaluation rubric</li> </ul>	<p><b>Xcel Energy’s Partners in Energy</b> <i>Role: Support</i></p> <ul style="list-style-type: none"> <li>Provide policy language examples from other organizations</li> <li>Inform rubric creation and evaluation criteria</li> </ul> <p><i>Contact:</i></p> <ul style="list-style-type: none"> <li>Partners in Energy</li> </ul>	<p><b>Other Partners</b></p> <ul style="list-style-type: none"> <li>Town of Castle Rock</li> <li>Town of Parker</li> </ul>



## M-2: Develop an electric-first vehicle procurement policy for the City

<ul style="list-style-type: none"> <li>Explore Council-adopted policy language</li> </ul> <p><i>Contact:</i></p> <ul style="list-style-type: none"> <li>City Manager's Office</li> </ul>		
Key Implementation Steps and Timeline		
Action Steps		Action Steps
1.	Research policy language and procurement evaluation criteria from other organizations	2023
2.	Develop draft policy language. Contractor procurement could be a policy that is written and adopted now, for implementation as technology becomes available to support it. Consider the opportunity to incentivize contractors in the short term with improved pricing to pursue earlier adoption. Consider alternative fuel sourced vehicles such as hydrogen-powered	2023
3.	Explore a Council-adopted policy for approval	2023
4.	Implement the policy	2023 and ongoing
5.	Seek and collect feedback from internal City of Lone Tree staff and contracted service providers, with the intent to make revisions to the policy language as needed	2023 and ongoing
Impact		
EV Adoption and GHG Emissions		
<ul style="list-style-type: none"> <li>The City ensures that EVs are considered for fleet vehicles and requires justification for not acquiring an EV</li> </ul>		
Resource Considerations		
	<b>Funding Needs</b> <ul style="list-style-type: none"> <li>No additional funding required to develop and enact policies</li> </ul>	
	<b>Potential Funding Sources</b> <ul style="list-style-type: none"> <li>Xcel Energy FEAP and EVSI program</li> <li>CEO Charge Ahead Colorado grants</li> <li>IJA competitive Discretionary Grant Program for Charging and Fueling Infrastructure</li> <li>Climate Mayors' EV Purchasing Collaborative discounts</li> </ul>	





## M-2: Develop an electric-first vehicle procurement policy for the City

- (Anticipated) CDPHE Clean Fleet Enterprise

### Technical Feasibility and Considerations

- Routes for refuse hauling include considerations of the disposal site. The disposal site for Lone Tree is 40 miles away

DRAFT

## Strategy M-3: Build a municipal business partnership network




### M-3: Build a municipal business partnership network

Description & Context		
<p><b>What is this strategy?</b></p> <ul style="list-style-type: none"> <li>Building on existing relationships the City of Lone Tree has with the business community, explore opportunities to make additional connections with businesses in order to foster channels for outreach, events, and EV adoption.</li> </ul> <p><b>Who is the Target Audience?</b></p> <ul style="list-style-type: none"> <li>Lone Tree businesses</li> </ul> <p><b>Alignment with Other Lone Tree Strategies</b></p> <ul style="list-style-type: none"> <li>Incorporate materials and resources from Strategy O-2: Conduct EV awareness and resources outreach to those who live in, work in, and visit Lone Tree to inform network and coordinate partnerships where advantageous.</li> <li>The business partnership network is a channel to accomplish Strategy O-3: Conduct EV infrastructure outreach to businesses to benefit employees &amp; the public.</li> </ul>		
Metrics of Success		
<ul style="list-style-type: none"> <li>Create 100 new business connections (equivalent to 25% of the business outreach target in Strategy O-3)</li> </ul>		
Roles and Responsibilities		
<p><b>City of Lone Tree</b> <i>Role:</i> Lead</p> <ul style="list-style-type: none"> <li>Identify business networks and partners</li> <li>Identify gaps in business partnerships</li> <li>Connect with identified businesses</li> </ul> <p><i>Contact:</i></p> <ul style="list-style-type: none"> <li>City Manager's Office</li> </ul>	<p><b>Xcel Energy's Partners in Energy</b> <i>Role:</i> Support</p> <ul style="list-style-type: none"> <li>Support the identification of businesses and connections</li> </ul> <p><i>Contact:</i></p> <ul style="list-style-type: none"> <li>Partners in Energy</li> </ul>	<p><b>Other Partners</b></p> <ul style="list-style-type: none"> <li>Park Meadows</li> <li>Charles Schwab</li> </ul>
Key Implementation Steps and Timeline		
	Action Steps	Timeline
1.	Identify existing networks and potential initial partners to form a new network around or grow an existing network. These could	2023



## M-3: Build a municipal business partnership network

	<p>include resources, programs, or event series that surrounding nearby towns and cities have started</p> <ul style="list-style-type: none"> <li>▪ Business types for consideration: larger businesses with campuses, restaurants, retail, big box stores. And, consider siting opportunities to have infrastructure well-distributed across the City of Lone Tree</li> <li>▪ Review existing charging infrastructure map to inform specific businesses</li> </ul>	
2.	Identify key gaps to fill in the existing network landscape, including micromobility	2023
3.	Make connections with the identified business partners to build relationships, collect contact information, compile outreach channel opportunities, and identify key events or event opportunities	2023 & ongoing
4.	Incorporate new outreach channels, events, and contacts into the outreach plan created in Strategy O-2 & O-3, including opportunities to explore micromobility options	2023 & ongoing
<b>Impact</b>		
<p><b>EV Adoption and GHG Emissions</b></p> <ul style="list-style-type: none"> <li>▪ Indirect EV adoption through the businesses in Lone Tree</li> </ul> <p><b>Co-benefits</b></p> <ul style="list-style-type: none"> <li>▪ EV education and accessibility across the business community</li> </ul>		
<b>Resource Considerations</b>		
<p> <b>Funding Needs</b></p> <ul style="list-style-type: none"> <li>▪ No additional resources necessary</li> </ul> <p><b>Potential Funding Sources</b></p> <ul style="list-style-type: none"> <li>▪ No additional resources necessary</li> </ul>		
<b>Technical Feasibility and Considerations</b>		

## Focus Area: Public Charging (P)

Most charging can be done at home or at work, where vehicles are typically parked for a longer period of time and a consistent charging schedule can be established. Home and workplace charging can be less complex to install, especially if Level 1 charging is used, requiring no infrastructure upgrades. However, public charging plays a critical role in completing the charging infrastructure pyramid (Figure 6).

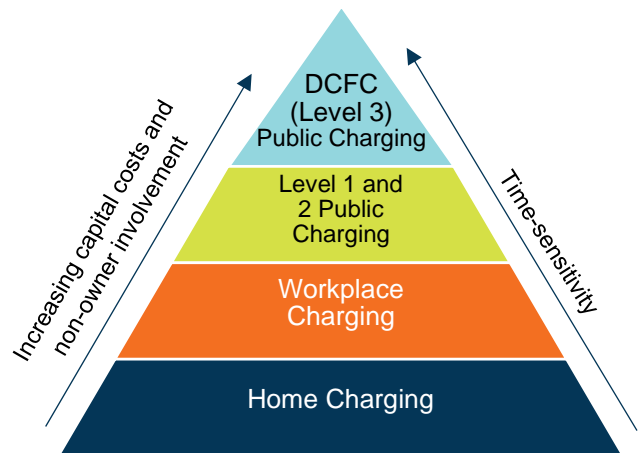


Figure 5: EV Charging Infrastructure Pyramid

Public charging is a visible indicator of a community's commitment to EVs, assuring residents and visitors that they will be able to recharge their vehicle when needed. Public charging also provides a charging option for those who are not able to charge at home or work. Those who live in multifamily properties, rental homes, or older homes without garages may not have access to charging at home because they may not have the decision-making power to install a charging station or they may face existing infrastructure limitations. When identifying where to place public charging, areas with these types of housing characteristics are often good places to start.

The following strategies for this focus area will guide the City's efforts to coordinate with other entities and to develop a public charging infrastructure network in the City of Lone Tree. Implementation details for each strategy are found in the following sections.

## Strategy P-1: Develop a City-led program to encourage public and workplace charging stations



### P-1: Develop a City-led program to encourage public and workplace charging stations

Description & Context		
<p><b>What is this strategy?</b></p> <ul style="list-style-type: none"> <li>A centralized City resource (i.e., go-to staff resource and website) available to share information on the financial and technical resources to support businesses and organizations in installing EV charging stations and electrified micromobility stations.</li> </ul> <p><b>Who is the Target Audience?</b></p> <ul style="list-style-type: none"> <li>Business owners</li> <li>Business employees</li> <li>Local organizations</li> </ul> <p><b>Alignment with Other Lone Tree Strategies</b></p> <ul style="list-style-type: none"> <li>Share program with network developed in Strategy M-3: Build a municipal business partnership network</li> <li>Incorporate outreach about City-led program into Strategy O-3: Conduct EV infrastructure outreach to businesses to benefit employees &amp; the public</li> </ul>		
Metrics of Success		
<ul style="list-style-type: none"> <li>Number of connections through the City resource</li> </ul>		
Roles and Responsibilities		
<p><b>City of Lone Tree</b> <i>Role: Lead</i></p> <ul style="list-style-type: none"> <li>City dedicates resource to be knowledgeable about EV programs.</li> <li>City staff supports development of tools and resources about EV programs.</li> <li>City resource uses tools and resources to inform businesses and organizations about EV</li> </ul>	<p><b>Xcel Energy's Partners in Energy</b> <i>Role: Support</i></p> <ul style="list-style-type: none"> <li>Partners in Energy to support development of tools and resources about EV programs.</li> <li>Continue to update materials.</li> </ul> <p><i>Contact:</i></p> <ul style="list-style-type: none"> <li>Partners in Energy</li> </ul>	<p><b>Other Partners</b></p> <ul style="list-style-type: none"> <li>South Denver Metro Chamber of Commerce</li> <li>Douglas County Community Development to help connect businesses to funding resources</li> <li>Drive Clean Colorado</li> <li>Charging infrastructure installers</li> </ul>



## P-1: Develop a City-led program to encourage public and workplace charging stations

<p>programs and direct them to those programs.</p> <p><i>Contact:</i></p> <ul style="list-style-type: none"> <li>▪ City Manager's Office</li> </ul>		
Key Implementation Steps and Timeline		
Action Steps	Timeline	
1.	<ul style="list-style-type: none"> <li>▪ Determine City resource (potentially City Manager's Office, in collaboration with Community Development) to become EV resources "go-to", potentially in combination with other sustainability efforts through the Energy Action Plan or other initiatives               <ul style="list-style-type: none"> <li>○ Consider partnership with Denver South to host resources on the website and/or utilize staff time as a resource</li> </ul> </li> <li>▪ Compile and develop tools and resources about EV programs and a map of existing public EV charging infrastructure               <ul style="list-style-type: none"> <li>○ Consider a flow chart of resources and key contacts, based on the type of project a business is considering</li> </ul> </li> </ul>	2023
2.	<ul style="list-style-type: none"> <li>▪ Create outreach and channel for businesses and organizations to inquire about EV programs and electrified micromobility options</li> <li>▪ Inform businesses and organizations about EV programs and opportunities</li> <li>▪ Direct businesses and organizations to the proper program or contact</li> </ul>	2023
3.	<ul style="list-style-type: none"> <li>▪ Continue to update tools and resources about EV programs and opportunities</li> <li>▪ Continue to inform businesses and organizations about EV programs and opportunities</li> <li>▪ Continue to direct businesses and organizations to the proper program or contact</li> </ul>	2023 and ongoing
Impact		
EV Adoption and GHG Emissions		



## P-1: Develop a City-led program to encourage public and workplace charging stations

- EV charging installations build a robust charging network demonstrating convenient access to charging encouraging EV adoption. With higher rates of EV adoption, GHG emissions are reduced.

### Co-benefits

- Equity – Public and workplace EV charging provides charging access to EV drivers who may not have access to home charging
- Accessibility – Local businesses and organizations installing public charging increases opportunities for people who live in, work in, and visit Lone Tree to charge their vehicles
- Resilience – More installed EV charging stations provides redundancy when EV chargers may be down due to unplanned events or maintenance

### Resource Considerations



#### Funding Needs

- Potentially no additional funding required to develop City-led program informing about EV programs and funding opportunities



#### Potential Funding Sources

- Colorado Department of Transportation (CDOT) E-Mobility Education and Awareness Grant

### Technical Feasibility and Considerations

- New EV programs are in development or have recently become available through the federal and state government; Xcel Energy has a number of EV-related incentive programs to support this strategy
- Staff will need to become familiar with newly announced programs, funding opportunities, and requirements

## Strategy P-2: Develop a streamlined land use application and permitting process for EV charging stations in Lone Tree



### P-2: Develop a streamlined land use application and permitting process for EV charging stations in Lone Tree

Description & Context		
<p><b>What is this strategy?</b></p> <ul style="list-style-type: none"> <li>Help local electrical contractors navigate required permits for EV charging station installation by continuing to allow a simple, separate permitting process for EV charging infrastructure.</li> </ul> <p><b>Who is the Target Audience?</b></p> <ul style="list-style-type: none"> <li>City of Lone Tree Building Division and Planning Division</li> </ul> <p><b>Alignment with Other Lone Tree Strategies</b></p> <ul style="list-style-type: none"> <li>Incorporate education on the existing permitting process in Strategy O-1: Develop a package of EV infrastructure resources for new development and redevelopment</li> <li>Opportunities for Strategy P-1: Develop a City-led program to encourage public and workplace charging stations</li> </ul>		
Metrics of Success		
<ul style="list-style-type: none"> <li>A simple, separate permitting process for EV charging installations</li> </ul>		
Roles and Responsibilities		
<p><b>City of Lone Tree</b> <i>Role: Lead</i></p> <ul style="list-style-type: none"> <li>Develop a guide or process checklist for what is required for EV infrastructure installation, including both building permits and Planning applications                             <ul style="list-style-type: none"> <li>Incorporate contact points where working with Xcel Energy</li> </ul> </li> </ul>	<p><b>Xcel Energy's Partners in Energy</b> <i>Role: Support</i></p> <ul style="list-style-type: none"> <li>Support development of EV charging station permit process</li> <li>Support education on the permitting process along with available resources to support additional charging stations</li> </ul> <p><i>Contact:</i></p> <ul style="list-style-type: none"> <li>Partners in Energy</li> </ul>	<p><b>Other Partners</b></p>






## P-2: Develop a streamlined land use application and permitting process for EV charging stations in Lone Tree

<p>is appropriate</p> <ul style="list-style-type: none"> <li>▪ Include the guide or checklist in the Education and Outreach strategy</li> </ul> <p>O-1: Develop a package of EV infrastructure resources for new development and redevelopment.</p> <p><i>Contact:</i></p> <ul style="list-style-type: none"> <li>▪ City Manager's Office</li> </ul>		
Key Implementation Steps and Timeline		
Action Steps	Timeline	
1.	<ul style="list-style-type: none"> <li>▪ Explore compiling best practices to streamline the EV charging permitting process. Continue to allow applicants to break out the EV components from a larger project to allow permitting timelines to continue and prevent project delays               <ul style="list-style-type: none"> <li>○ Determine and identify points in the permitting process that must be aligned with outside funding resources</li> </ul> </li> </ul>	2024
2.	<ul style="list-style-type: none"> <li>▪ Standardize the permitting process               <ul style="list-style-type: none"> <li>○ Develop website and guide/checklist for land use and permitting applications required for EV charging infrastructure, to establish a straightforward and consistent method for residents and businesses to become EV ready</li> <li>○ Continue to use online platform (Accela) for permit processing, permitting status updates, and allowing for timely inspection scheduling.</li> </ul> </li> </ul>	2024
3.	<ul style="list-style-type: none"> <li>▪ Educate on the new EV charging station permit process(es)</li> </ul>	2024 and ongoing



## P-2: Develop a streamlined land use application and permitting process for EV charging stations in Lone Tree

	<ul style="list-style-type: none"> <li>○ Develop materials to educate local officials, community inspectors, electrical contractors, and others responsible for aiding in the permitting and installation process, to guarantee accurate and up-to-date information. Tie to Strategy P-1: Develop a City-led program to encourage public and workplace charging stations</li> </ul>	
<b>Impact</b>		
<p><b>EV Adoption and GHG Emissions</b></p> <ul style="list-style-type: none"> <li>▪ A streamlined permitting process will decrease barriers to EV charging station installations, potentially leading to faster and increased EV charging station installations</li> </ul> <p><b>Co-benefits</b></p> <ul style="list-style-type: none"> <li>▪ Equity – A streamlined permitting process will reduce administrative barriers to installing EV charging</li> <li>▪ Accessibility – A streamlined permitting process will reduce barriers to installing EV chargers and will encourage more installations and increase EV charger access</li> <li>▪ Resilience – Encouraging more EV chargers will develop a robust network improving access and the reliability of operational EV chargers</li> </ul>		
<b>Resource Considerations</b>		
<div style="display: flex; align-items: flex-start;">  <div> <p><b>Funding Needs</b></p> <ul style="list-style-type: none"> <li>▪ No additional funding required to develop and enact new permitting process</li> </ul> <p><b>Potential Funding Sources</b></p> <ul style="list-style-type: none"> <li>▪ No additional funding required to develop and enact new permitting process</li> </ul> </div> </div>		
<b>Technical Feasibility and Considerations</b>		
<ul style="list-style-type: none"> <li>▪ May need to align with other permitting requirements</li> </ul>		

## Strategy P-3: Provide siting guidance for Level 2 and Level 3 public charging stations



### P-3: Provide siting guidance for public DC fast charging stations

Description & Context		
<p><b>What is this strategy?</b></p> <ul style="list-style-type: none"> <li>Guidance to identify key locations for public charging at municipal sites, private businesses, and community centers. Key considerations for determining target locations should include, but are not limited to, traffic patterns and dwell time (how long a driver spends in each location), tourist areas, and low-income areas.</li> </ul> <p><b>Who is the Target Audience?</b></p> <ul style="list-style-type: none"> <li>Community Development Department</li> <li>Developers</li> </ul> <p><b>Alignment with Other Lone Tree Strategies</b></p> <ul style="list-style-type: none"> <li>With locations identified, use materials from Strategy P-1: Develop a City-led program to encourage public charging stations</li> </ul>		
Metrics of Success		
<ul style="list-style-type: none"> <li>Map of existing EV charging infrastructure in Lone Tree</li> <li>Siting guidance for one to three DC fast charging hubs in Lone Tree</li> <li>Develop an inventory of potential public and municipal charging sites by understanding traffic patterns, length of stay, existing charging stations, destination attractions, and areas where home access to charging may be limited</li> </ul>		
Roles and Responsibilities		
<p><b>City of Lone Tree</b> <i>Role:</i> Support</p> <ul style="list-style-type: none"> <li>GIS team will support mapping needs</li> </ul> <p><i>Contact:</i></p> <ul style="list-style-type: none"> <li>City Manager's Office</li> </ul>	<p><b>Xcel Energy's Partners in Energy</b> <i>Role:</i> Lead</p> <ul style="list-style-type: none"> <li>Partners in Energy will lead mapping efforts of existing charging stations and other relevant data points</li> <li>Partners in Energy will facilitate any questions on public charging analysis and connect City with resources</li> </ul>	<p><b>Other Partners</b></p> <ul style="list-style-type: none"> <li>Charging station providers</li> <li>Businesses</li> <li>Local organizations</li> <li>Schools</li> <li>Organizations to advise on locations and inform equity questions</li> </ul>



## P-3: Provide siting guidance for public DC fast charging stations

	<ul style="list-style-type: none"> <li>▪ Xcel Energy EV Advisor will support process of assessing charging needs and planning execution</li> </ul> <p><i>Contact:</i></p> <ul style="list-style-type: none"> <li>▪ Partners in Energy</li> </ul>	
Key Implementation Steps and Timeline		
Action Steps		Timeline
1.	<ul style="list-style-type: none"> <li>▪ Partners in Energy conduct initial mapping of existing charging sites</li> <li>▪ City of Lone Tree and Partners in Energy determine additional siting options (e.g., equity criteria, multifamily housing, land use, dwell time locations)</li> </ul>	2023
2.	<ul style="list-style-type: none"> <li>▪ Identify key businesses, organizations, districts and/or other community locations for targeted outreach               <ul style="list-style-type: none"> <li>○ Consider library and other City districts</li> </ul> </li> <li>▪ Identify key locations for potential City-owned public charging sites. Include desired level of charging in identification               <ul style="list-style-type: none"> <li>○ Consider public-private locations</li> </ul> </li> <li>▪ For City-owned sites, identify grant and Xcel Energy opportunities               <ul style="list-style-type: none"> <li>○ Xcel Energy to work with City to understand infrastructure needs at selected sites</li> </ul> </li> </ul>	2024
3.	<ul style="list-style-type: none"> <li>▪ For City owned and public-private site locations:               <ul style="list-style-type: none"> <li>○ Complete Xcel Energy Electric Vehicle Supply Infrastructure (EVS) program application for applicable sites, if necessary</li> <li>○ Complete Charge Ahead Colorado application for applicable sites, if necessary</li> </ul> </li> </ul>	2024
4.	<ul style="list-style-type: none"> <li>▪ Install EV charging stations</li> <li>▪ Repeat process for additional stations</li> </ul>	2024 and ongoing
Impact		
<p><b>EV Adoption and GHG Emissions</b></p> <ul style="list-style-type: none"> <li>▪ Guiding identification of EV charger sites will lead to a well-planned EV charger network, providing convenient access to charging, encouraging EV adoption</li> </ul> <p><b>Co-benefits</b></p>		



### P-3: Provide siting guidance for public DC fast charging stations

- Equity – EV charger site identification will prioritize sites that will support EV adoption for those who may not have access to home charging
- Accessibility – EV charger site identification will prioritize convenient access to EV chargers
- Resilience – Well-planned locations for EV chargers will develop a robust network, improving access and the reliability of operational EV chargers

#### Resource Considerations



##### Funding Needs

- No additional funding required to develop and provide siting guidance for charging infrastructure



##### Potential Funding Sources

- Xcel Energy EVSI program
- Colorado Energy Office Charge Ahead Colorado grants
- Federal EV charging tax credits
- Federal competitive Discretionary Grant Program for Charging and Fueling Infrastructure
- *(Anticipated)* Colorado Energy Office Community Access Enterprise

#### Technical Feasibility and Considerations

- Resources to support public EV charging development
  - U.S. Access Board Design Recommendations for Accessible EV Charging Stations
  - Examples guidelines from other communities (e.g., Boulder County regional effort, Denver code language which includes “Universal” spaces to accommodate accessibility needs)
  - Siting and Design Guidelines for EVSI
  - Technical & Design Guidelines for EV Charging Infrastructure
- Existing developments and new developments (projects) will be useful to consider for actual new sites

## **Focus Area: Outreach & Education (O)**

Communitywide adoption of EVs provides Lone Tree the opportunity to improve air quality, reduce GHG emissions, and save on transportation costs. With more than 70% of Lone Tree residents driving alone to work, encouraging individuals to choose an EV for their next vehicle is a key strategy to reaching this plan's goals (US Census Bureau, 2022).

Despite progress made toward electrifying vehicles across Colorado, many barriers to EV adoption still exist. Some of the most common barriers to adoption of EVs include lack of familiarity with products and technology, lack of knowledge of available incentives, higher up-front cost of electric vehicles, and range anxiety (National Renewable Energy Laboratory, 2017). In a 2020 Colorado study, 66% of respondents who drive EVs indicated they have a fear of running out of EV charge before reaching their destinations, even though the typical daily community of most (80%) is 30 miles or less per day—well within the typical EV charge range (E Source, 2020).

This focus area directs the spread of EV awareness and acceptance throughout the community, with the objective of increasing public adoption and increasing EV purchases and use. The strategies aim to connect residents and businesses with information and resources. This includes education and outreach about EVs, chargers, and available incentives, along with exploring financing mechanisms to reduce the cost of EVs and chargers.

## Strategy O-1: Develop a guide of EV infrastructure resources for new development and redevelopment





### O-1: Develop a guide of EV infrastructure resources for new development and redevelopment

Description & Context		
<p><b>What is this strategy?</b></p> <ul style="list-style-type: none"> <li>To facilitate access to resources, to aid in the electric vehicle transition in the community, a summarized guide of utility, state, federal, and other resources will be created to help developers and contractors more easily navigate what is available to them.</li> </ul> <p><b>Who is the Target Audience?</b></p> <ul style="list-style-type: none"> <li>Developers and contractors serving Lone Tree</li> </ul> <p><b>Alignment with Other Lone Tree Strategies</b></p> <ul style="list-style-type: none"> <li>Educate developers on permitting process developed from P-2: Develop a streamlined permitting process for EV charging stations in Lone Tree</li> <li>City resource from Strategy P-1: Develop a City-led program to encourage public and workplace charging stations; provide and update resources</li> <li>EAP N-1: Targeted Developer and Builder Outreach</li> </ul>		
Metrics of Success		
<ul style="list-style-type: none"> <li>Resource guide created</li> </ul>		
Roles and Responsibilities		
<p><b>City of Lone Tree</b> <i>Role:</i> Support</p> <p><i>Contact:</i></p> <ul style="list-style-type: none"> <li>City Manager's Office, with assistance from Community Development Department</li> </ul>	<p><b>Xcel Energy's Partners in Energy</b> <i>Role:</i> Lead</p> <ul style="list-style-type: none"> <li>Develop outreach strategy and materials that can be easily updated as new resources become available</li> </ul> <p><i>Contact:</i></p> <ul style="list-style-type: none"> <li>Partners in Energy</li> </ul>	<p><b>Other Partners</b></p> <ul style="list-style-type: none"> <li>South Metro Fire and Southgate Water and Sanitation to collaborate on outreach</li> </ul>
Key Implementation Steps and Timeline		
Action Steps		Timeline
1.	Review outreach strategy developed under EAP Strategy N1 and identify opportunities to update with EV resources	2023
2.	Build outreach plan: <ul style="list-style-type: none"> <li>Develop key messages (e.g., How are you being sustainable? Do you know about these resources?)</li> </ul>	2023



## O-1: Develop a guide of EV infrastructure resources for new development and redevelopment

	<ul style="list-style-type: none"> <li>▪ Determine outreach channels for direct outreach (e.g., one-on-one interviews)               <ul style="list-style-type: none"> <li>○ Consider resources to combine with a “new resident kit” for City of Lone Tree</li> </ul> </li> <li>▪ Identify opportunities to collect feedback and share information through development review process (e.g., initial consultation)</li> <li>▪ Develop timeline for implementation</li> </ul>	
3.	Develop co-branded outreach materials	2023
4.	Implement outreach strategy and use results to inform outreach with developers and builders	2023 and ongoing
<b>Impact</b>		
<p><b>EV Adoption and GHG Emissions</b></p> <ul style="list-style-type: none"> <li>▪ Educating developers about the benefits and cost-effectiveness of installing EV chargers during new development or redevelopment will increase charging access, encouraging more EV adoption</li> </ul> <p><b>Co-benefits</b></p> <ul style="list-style-type: none"> <li>▪ Equity – Educating developers about programs and incentives to install EV chargers will encourage EV charger installations, making it a standard feature at many developments and increasing access for more people</li> <li>▪ Accessibility – Increasing awareness of programs and incentives will increase EV charger installations, increasing access to convenient charging</li> <li>▪ Resilience - Increasing awareness will provide an opportunity for developers to plan for resiliency through building design</li> </ul>		
<b>Resource Considerations</b>		
<p><b>Funding Needs</b></p>  <ul style="list-style-type: none"> <li>▪ No additional funding required to develop initial materials</li> <li>▪ Will require City staff time to support material reviews and implementation</li> </ul>		
<p><b>Potential Funding Sources</b></p>  <ul style="list-style-type: none"> <li>▪ Colorado Department of Transportation (CDOT) E-Mobility Education and Awareness Grant</li> </ul>		
<b>Technical Feasibility and Considerations</b>		
<ul style="list-style-type: none"> <li>▪ Resources may need to be updated periodically</li> </ul>		



**Strategy O-2: Conduct EV awareness and outreach to those who live in, work in, and visit Lone Tree**



**O-2: Conduct EV awareness and outreach to those who live in, work in, and visit Lone Tree**

Description & Context		
<p><b>What is this strategy?</b></p> <ul style="list-style-type: none"> <li>Highlight and educate community members about the benefits of EV ownership, charging opportunities, and available resources and incentives - through various community focused outreach channels and events.</li> </ul> <p><b>Who is the Target Audience?</b></p> <ul style="list-style-type: none"> <li>Residents</li> <li>Commuters</li> <li>Visitors</li> </ul> <p><b>Alignment with Other Lone Tree Strategies</b></p> <ul style="list-style-type: none"> <li>EAP R-1: Residential Energy Education</li> <li>Strategy P-1: Develop a City-led program to encourage public and workplace charging stations</li> </ul>		
Metrics of Success		
<ul style="list-style-type: none"> <li>Reach 5,000 people annually in Lone Tree through outreach activities</li> </ul>		
Roles and Responsibilities		
<p><b>City of Lone Tree</b> <i>Role: Lead</i></p> <ul style="list-style-type: none"> <li>Ongoing monitoring and evaluation.</li> </ul> <p><i>Contact:</i></p> <ul style="list-style-type: none"> <li>Communications Department</li> </ul>	<p><b>Xcel Energy’s Partners in Energy</b> <i>Role: Support</i></p> <ul style="list-style-type: none"> <li>Outreach plan development and drafting of outreach collateral.</li> <li>Share best practices from other communities.</li> </ul> <p><i>Contact:</i></p> <ul style="list-style-type: none"> <li>Partners in Energy</li> </ul>	<p><b>Other Partners</b></p> <ul style="list-style-type: none"> <li>HOAs</li> <li>City Council</li> <li>Lone Tree Sustainability Team</li> <li>Area businesses</li> <li>Tourist locations</li> </ul>
Key Implementation Steps and Timeline		
Action Steps		Timeline
1.	Review outreach materials developed as part of EAP effort and determine opportunities for collaboration and coordination. Develop EV-specific materials and resources for all audiences that incorporates electric vehicle opportunities, charging options and infrastructure resources, and explores micromobility options including e-bikes, scooters, etc.	2023



## O-2: Conduct EV awareness and outreach to those who live in, work in, and visit Lone Tree

2.	Build outreach plan: <ul style="list-style-type: none"> <li>▪ Develop key messages</li> <li>▪ Determine which City outreach channels to use</li> <li>▪ Confirm roles for content creation and distribution</li> <li>▪ Develop timeline for distribution</li> <li>▪ Establish consensus on methods used to track outreach</li> </ul>	2023
3.	Implement outreach plan through City outreach channels; coordinate with community partners	2023
4.	Evaluate outreach plan successes and lessons learned, to inform future plans	2023 and ongoing
<b>Impact</b>		
<p><b>EV Adoption and GHG Emissions</b></p> <ul style="list-style-type: none"> <li>▪ Increasing knowledge and awareness about EVs will inform those who live in, work in, and visit Lone Tree about EVs, driving adoption</li> </ul> <p><b>Co-benefits</b></p> <ul style="list-style-type: none"> <li>▪ Equity – Materials and resources can be targeted to different audiences, highlighting the benefits, programs, and incentives appropriate for them</li> <li>▪ Accessibility – Materials and resources can be shared through different methods that reach audiences in a variety of channels</li> </ul>		
<b>Resource Considerations</b>		
	<p><b>Funding Needs</b></p> <ul style="list-style-type: none"> <li>▪ No additional funding required to develop initial materials.</li> <li>▪ Will require City staff time to support material reviews and implementation</li> </ul>	
	<p><b>Potential Funding Sources</b></p> <ul style="list-style-type: none"> <li>▪ Colorado Department of Transportation (CDOT) E-Mobility Education and Awareness Grant</li> </ul>	
<b>Technical Feasibility and Considerations</b>		
<ul style="list-style-type: none"> <li>▪ Consider channels for key events, large destinations to promote</li> <li>▪ Consider additional signage throughout the community for charging stations</li> <li>▪ Ribbon cutting ceremonies for new installations of charging hubs</li> </ul>		

## Strategy O-3: Conduct EV infrastructure outreach to businesses to benefit employees & the public



### O-3: Conduct EV infrastructure outreach to businesses to benefit employees & the public

Description & Context		
<p><b>What is this strategy?</b></p> <ul style="list-style-type: none"> <li>Share information on the benefits of installing public and/or workplace EV charging stations, along with financial and technical resources to encourage business and organization participation in Xcel Energy’s no- or low-cost commercial EV programs.</li> </ul> <p><b>Who is the Target Audience?</b></p> <ul style="list-style-type: none"> <li>Business owners</li> <li>Business employees</li> <li>Local organizations</li> </ul> <p><b>Alignment with Other Lone Tree Strategies</b></p> <ul style="list-style-type: none"> <li>Strategy M-3: Build a municipal business partnership network</li> <li>EAP B-1: Business Energy Assessment Outreach</li> <li>EAP B-2: Sustainable Business Program</li> </ul>		
Metrics of Success		
<ul style="list-style-type: none"> <li>Engage with 400 businesses/organizations by the end of 2024</li> </ul>		
Roles and Responsibilities		
<p><b>City of Lone Tree</b> <i>Role: Lead</i></p> <ul style="list-style-type: none"> <li>Lead outreach planning and implementation.</li> <li>Share information through interactions with businesses; identify potential businesses to act as liaisons, to encourage other businesses to participate, and to identify key Lone Tree events.</li> </ul> <p><i>Contact:</i></p>	<p><b>Xcel Energy’s Partners in Energy</b> <i>Role: Support</i></p> <ul style="list-style-type: none"> <li>Support outreach plan development and share best practices from other communities.</li> <li>Draft outreach collateral.</li> </ul> <p><i>Contact:</i></p> <ul style="list-style-type: none"> <li>Partners in Energy</li> </ul>	<p><b>Other Partners</b></p> <ul style="list-style-type: none"> <li>Lone Tree Sustainability Team</li> <li>South Denver Metro Chamber of Commerce</li> <li>Douglas County Community Development</li> <li>Drive Clean Colorado</li> <li>Charging installers</li> <li>Local community organizations</li> <li>Schools</li> <li>Places of worship</li> <li>Privately owned parking lots or garages</li> </ul>



## O-3: Conduct EV infrastructure outreach to businesses to benefit employees & the public

<ul style="list-style-type: none"> <li>▪ Communications Department</li> <li>▪ Economic Development Department</li> </ul>		
Key Implementation Steps and Timeline		
Action Steps		Timeline
1.	Review outreach materials developed as part of EAP effort and determine opportunities for collaboration and coordination	2023
2.	Build outreach plan: <ul style="list-style-type: none"> <li>▪ Develop branding</li> <li>▪ Identify target audiences</li> <li>▪ Determine key Lone Tree events to reach target audiences</li> <li>▪ Develop key messages (e.g., cost savings, property value)</li> <li>▪ Identify additional resources to support participation</li> <li>▪ Determine which outreach channels to use (e.g., social media, website, Green Business breakfasts, permitting process, transit ads, business association meetings)</li> <li>▪ Confirm roles for content creation and distribution</li> <li>▪ Develop timeline for distribution</li> <li>▪ Determine methods to track outreach</li> </ul>	2023
3.	Implement outreach plan and reach out to community partners who could support additional outreach  Collaborate with Lone Tree Sustainability Team and Lone Tree internal Sustainability Committee to develop small business contacts	2023
4.	Use outreach plan and lessons learned to inform future outreach	2023 and ongoing
Impact		
<p><b>EV Adoption and GHG Emissions</b></p> <ul style="list-style-type: none"> <li>▪ EV charging installations build a robust charging network, demonstrating convenient access to charging</li> </ul> <p><b>Co-benefits</b></p> <ul style="list-style-type: none"> <li>▪ Equity – Public and workplace EV charging provides charging access to EV drivers who may not have access to home charging</li> <li>▪ Accessibility – Local businesses and organizations installing public charging increases opportunities for people who live in, work in, and visit Lone Tree to charge their vehicles</li> </ul>		



### O-3: Conduct EV infrastructure outreach to businesses to benefit employees & the public

- Resilience – More installed EV charging stations provides redundancy when EV chargers may be down due to unplanned events or maintenance

#### Resource Considerations

##### Funding Needs



- No additional funding required to develop initial materials
- Will require City staff time to support material reviews and implementation

##### Potential Funding Sources



- Colorado Department of Transportation (CDOT) E-Mobility Education and Awareness Grant

#### Technical Feasibility and Considerations

- Businesses and organizations may not own their own buildings or parking areas so may require a decision from property owners or managers
- Electrical infrastructure capacity available may be limited or need upgrades at site locations

## HOW WE STAY ON COURSE



An effective plan is cyclical in nature (Figure 6) and requires flexibility and course adjustment to be successful and to sustain progress. It will be important that strategies are evaluated and updated throughout implementation to reflect advancements and new offerings from the transportation industry and Xcel Energy.

To facilitate this adaptive implementation approach, a project management team will be formed. The project management (PM) team will meet on a monthly basis. The PM team will be comprised primarily of City staff members and potential other key stakeholders, with support from Xcel Energy's Partners in Energy. The role of the PM team will be to coordinate strategies with the larger EV Action Team. The PM Team will also oversee progress tracking and provide cross-pollination and supporting resources to ensure efforts are all working toward the plan vision and goals.

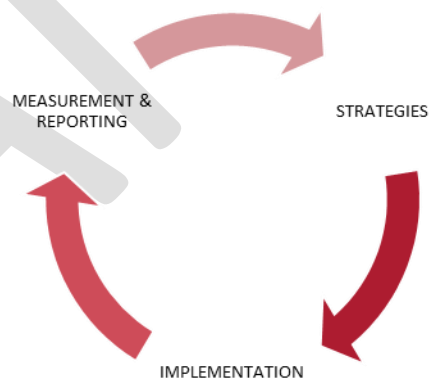


Figure 6. Actions and Tracking

Table 2: Anticipated Strategy Timeline (preliminary and subject to change)

	Q2 2023	Q3 2023	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Beyond
<b>STRATEGY BY FOCUS AREA</b>							
<b>M-1: Develop a vehicle replacement plan for City fleet</b>							
<b>M-2: Develop an electric-first vehicle procurement policy for the City</b>							
<b>M-3: Build a municipal business partnership network</b>							
<b>P-1: Develop a City-led program to encourage public and workplace charging stations</b>							
<b>P-2: Develop a streamlined permitting process for EV charging stations in Lone Tree</b>							
<b>P-3: Provide siting guidance for Level 2 and Level 3 public charging stations</b>							
<b>O-1: Develop a package of EV infrastructure resources for new development and redevelopment</b>							
<b>O-2: Conduct EV awareness and resources outreach to those who live in, work in, and visit Lone Tree</b>							
<b>O-3: Conduct EV infrastructure outreach to businesses to benefit employees &amp; the public</b>							

## Tracking and Reporting Progress

To ensure this plan remains on track, the PM team will track progress toward the plan goals on an annual basis (Table 3).

Table 3: Tracking Plan Goals

2030 Goal	Baseline	Metric	Data Source
Transition 2,800 of all vehicles registered in Lone Tree to electric vehicles by 2030	7% (835 registered EVs in March 2023)	Percent of total registered vehicles that are EVs	Douglas County Motor Vehicle and Driver License

It will be important to let the community know how things are progressing and to recognize the collaborative efforts of those involved in implementation. At critical milestones, the Implementation Team will publish updates on progress, share successes, and congratulate participants and partners through various communication channels.

### Beyond the Plan Horizon

Looking beyond the plan implementation horizon (2024), it is recommended that the plan stakeholders periodically reassess the EV goals and successes achieved over the implementation period. Based on lessons learned and new resources (e.g., anticipated state EV equity plan), the plan should be updated with any necessary goal adjustments and new strategies that reflect available technologies and other advancements. The [Xcel Energy EV Toolkit](#) can be a good resource for identifying new strategies to address unexpected barriers that may come up.



# APPENDIX A: XCEL ENERGY'S PARTNERS IN ENERGY PLANNING PROCESS



## About Xcel Energy's Partners in Energy

Xcel Energy is an electric and natural gas utility that provides the energy that powers millions of homes and businesses across eight Western and Midwestern states. Each community Xcel Energy serves has its own unique priorities and vision for its energy future. The energy landscape is dynamically changing, with communities leading the way in setting energy and sustainability goals. To continue to innovatively support their communities, Xcel Energy launched Partners in Energy in the summer of 2014 as a collaborative resource with tailored services to complement each community's vision. The program offerings include support to develop an Electric Vehicle Action Plan or Energy Action Plan, tools to help implement the plan and deliver results, and resources designed to help each community stay informed and achieve their outlined goals.

## Plan Development Process

The content of this plan is derived from a series of project management team meetings and three planning workshops held in the community, with a planning team, to understand and incorporate local EV priorities. Project management team meetings were held biweekly beginning in October 2022 and extended through April 2023.

The planning process was guided by an EV Action Team, comprised of community stakeholders including City staff, Douglas County staff, business representatives, developers, the school district and residents. The EV Action Team attended three workshops held in December 2022, February 2022, and March 2023. The first workshop served to create a shared understanding of the Partners in Energy process and to begin establishing a vision and set focus areas for the plan. Stakeholders were asked to share

Lone Tree’s core values (Figure 7), what success looks like (Figure 8), and why the city is pursuing electric vehicle action planning.



Figure 7. Stakeholder responses for Lone Tree's core values



Figure 8. Stakeholder responses for what success looks like

Workshop 2 served to fine tune these elements, help stakeholders understand available resources, set the plan goal, and draft an initial set of strategies for the plan. Workshop 3 focused on action planning and preparing for implementation for the prioritized strategies that were selected by the EV Action Team. All of the input gathered was used to develop the EV Action Plan.

The final plan was reviewed by the full EV Action Team, including the project management team and the full group of stakeholders. In addition, a public comment period was held to gather additional feedback on the plan, targeting developers in the community. After comments were collected and the plan was refined, the EV Action Plan underwent a City Council review and adoption process in May 2023.

### Plan Implementation




Partners in Energy provides 18 months of support for implementation of an EV Action Plan. This support is designed to supplement both technical analysis and support available through Xcel Energy’s other EV offerings. Services offered through the Partners in Energy team include, but are not limited to project management, communication assistance and resources, tracking and measurement, and celebration and recognition of successes. Plan development is followed by the creation of a Memorandum of Understanding outlining implementation support provided by Partners in Energy, along with the City’s commitment to implementation.

## APPENDIX B: STRATEGY LIBRARY



Throughout the planning process, ideas for various strategies were shared. Although these strategies were not chosen to be prioritized during the Partners in Energy implementation period, they are listed here for consideration and further development once the prioritized strategies have been completed.

## List of Strategies for Further Consideration

	<p><b>Municipal Transportation Electrification (MTE)</b></p> <ol style="list-style-type: none"><li>1. Develop a fleet charging infrastructure implementation plan</li><li>2. Develop City-funded grants for charging station development</li><li>3. Develop City policies and training to support the City's fleet electrification plan</li><li>4. Support the transition of Lone Tree schools' bus fleet to electric options (e.g., peer learning, grant funding, utility programs)</li></ol>
	<p><b>Public Charging (PC)</b></p> <ol style="list-style-type: none"><li>1. Participate in the regional or sub-regional planning and implementation process</li><li>2. Conduct outreach to local businesses to encourage installation of EV charging stations</li><li>3. Promote the public charging station network to those who live in, work in, and visit Lone Tree</li><li>4. Install public charging stations at City facilities</li><li>5. Establish design standards, including signage and safety considerations, for public charging stations</li><li>6. Develop a fee structure, for City-owned public charging stations, that can be used as a model for privately-owned public charging stations - including the possibility of free/reduced cost charging downtown</li></ol>
	<p><b>Outreach &amp; Education (OE)</b></p> <ol style="list-style-type: none"><li>1. Conduct outreach to multifamily properties, to promote the installation of EV charging stations for residents</li><li>2. Pilot an EV carshare program at a multifamily property in Lone Tree</li></ol>

## Strategy Outline Template

To further develop a strategy from the above list, using the following template, consider all aspects of what it would take to implement the strategy.

### Strategy Title

Description & Context		
<b>What is this strategy?</b> <ul style="list-style-type: none"> <li>...</li> </ul>		
<b>Who is the Target Audience?</b> <ul style="list-style-type: none"> <li>...</li> </ul>		
Metrics of Success		
Roles and Responsibilities		
<b>City of Lone Tree</b> Role: Lead or Support? <ul style="list-style-type: none"> <li>Describe specific roles &amp; responsibilities here</li> </ul> Contact: <ul style="list-style-type: none"> <li>Who is the main contact?</li> </ul>	<b>Xcel Energy's Partners in Energy</b> Role: Support or Lead? <ul style="list-style-type: none"> <li>Describe specific roles &amp; responsibilities here</li> </ul> Contact: <ul style="list-style-type: none"> <li>Who is the main contact?</li> </ul>	<b>Other Partners</b> <ul style="list-style-type: none"> <li>List potential partners relevant to the strategy here</li> </ul>
Key Implementation Steps and Timeline		
Action Steps		Timeline
1.	...	Year
2.	...	Year
3.	...	Year
4.	...	Year
5.	...	Year
6.	...	Year
Impact		
<b>What impact does this strategy have?</b> <b>Are there any co-benefits?</b>		
Resource Considerations		

## Strategy Title

### Funding Needs

- What funding needs does this strategy require?
- Replace the icon to the left with the appropriate image

### Potential Funding Sources

- Consider internal and external resources to list here (e.g., utility, state, federal funding)

### Technical Feasibility and Considerations

- Describe the context for this strategy, including relevant feasibility and other considerations

DRAFT

# APPENDIX C: ELECTRIC VEHICLES 101



Since electric vehicles (EVs) are an emerging technology that is rapidly changing, it is important to ensure that everyone has a common understanding of the technology and terminology involved. This section explains the basics of currently available types of vehicles and charging stations and the associated uses, barriers, and benefits. Note, while electric options are available for medium- and heavy-duty vehicles, the descriptions provided in this section apply primarily to light-duty vehicles, which make up most of the electric vehicle market today.

## Electric Vehicle Basics

Electric Vehicle (EV) refers to any vehicle that uses an electric motor. An EV can have a fully electric motor or can contain an internal combustion engine (ICE) that supports the electric motor. The travel range of each type is outlined in Table 4 and is described in more detail in the following sections.

Table 4. Comparison of Types of Electric Vehicles

Electric Vehicle Type	Power Source	Travel Range
Battery Electric Vehicle (BEV)	Electric Motor	80 – 345 miles
Plug-in Hybrid Electric Vehicle (PHEV)	Electric Motor + Gasoline Engine	350 – 600 miles
Hybrid Electric Vehicle (HEV)	Electric Motor + Gasoline Engine	350 – 600 miles

## Battery Electric Vehicle (BEV)

A BEV is an all-electric vehicle that does not require gasoline and, thus, has no tailpipe emissions. BEVs are fueled by plugging into a charging station. Energy is stored in the battery, to be used when the car is running. Distances a BEV can travel on a single

charge range from 80 to 345 miles, with longer distances promised in the future through continual advancements in battery technology. Recharging can take between 30 minutes and 12 hours, depending on the type of charger, size of the battery, and level of depletion in the battery (Drive Change. Drive Electric., 2019).

### **Plug-In Hybrid Electric Vehicle (PHEV)**

A PHEV provides a combination of an electric motor and a gasoline engine, and produces less tailpipe emissions than does a traditional ICE. PHEVs use energy from the electric motor until the battery charge is fully depleted, which can occur at between 15 and 50 miles, at which point the gasoline engine takes over. The distance a PHEV can travel on a single charge and a full tank of gasoline ranges between 350 and 600 miles. The battery is charged similarly to a BEV - through a plug - and the fuel tank is filled at a traditional gas station (Drive Change. Drive Electric., 2019).

### **Hybrid Electric Vehicle (HEV)**

Similar to the PHEV, an HEV has both an electric motor and a gasoline engine. In an HEV, the gasoline engine is used to power a generator, which powers the electric motor. The benefit of this set up is that the ICE can run at a constant speed and greatly increase the vehicle's fuel efficiency compared to a traditional ICE vehicle. However, the battery cannot be charged by an external electricity source, which means the vehicle always relies on the gasoline engine.

## **Charging Stations**



EV charging stations are separated into three categories based on the speed at which the vehicle is charged: Levels 1, 2, and 3. Level 3 chargers are also known as DC fast chargers. The sections below detail the appropriate application for each charger type.

### **Residential Charging Stations**

Residents have two options for charging at home. Level 1 chargers use standard 120-volt AC outlets and can take 8 to 12 hours to fully charge a depleted battery. Level 2 chargers require a 240-volt AC outlet and can fully charge a depleted battery in 4 to 6 hours. Residents can charge during off-peak hours to reduce the impact on the grid. Table 5 provides a brief explanation, along with the pros and cons of both types. All currently available EVs can use either charger type.




Table 5. Residential Electric Vehicle Charging Types

	LEVEL 1	LEVEL 2
		
<b>Electric Current (AC)</b>	120 volts; 20 amps	208/240 volt; 30 amps
<b>Charging Rate (miles range per hour of charging)</b>	2 to 5	10 to 20
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• Uses standard residential wall outlet</li> <li>• Little to no investment in infrastructure required</li> </ul>	<ul style="list-style-type: none"> <li>• Quicker charging</li> <li>• Some models have available Wi-Fi controls to allow residents to take advantage of time-of-day electric rates</li> <li>• In the case of multifamily housing, the controls could be managed by a property manager.</li> </ul>
<b>Drawbacks</b>	<ul style="list-style-type: none"> <li>• Slower charging rate, but usually sufficient for residents who charge overnight</li> </ul>	<ul style="list-style-type: none"> <li>• Requires 240 Volt outlet or hardwired charger</li> <li>• Electrician likely required to install</li> <li>• Higher infrastructure cost investment</li> </ul>
<b>Estimated Costs</b>	Low to no cost	\$500 to \$2,000 (US DOE, 2019)

### Commercial Charging Stations

Commercial Level 2 and Level 3 chargers are most appropriate for commercial applications since the EVs are generally parked for shorter periods of time than residential applications. Level 2 chargers are the same as the residential chargers and often have the option to include two charging ports at one station. Level 3, or DC fast chargers, require an industrial DC outlet of 480 volts and can charge batteries in 20 to 30 minutes. Many commercial chargers also come equipped with software that allows the user to control when vehicles are charging and may facilitate payment in public applications. Table 6 shows the advantages and disadvantages of Level 2 and Level 3 chargers.

Table 6. Levels 2 and 3 Charging Infrastructure

	LEVEL 2	LEVEL 3 (DC Fast Charger)
		
<b>Electric Current</b>	208/240 volt; 30 amps (AC)	480 volts DC
<b>Charging Rate (miles range per hour of charging)</b>	10 to 25	Up to 180
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• More economical than Level 3</li> <li>• Safe for long-term use</li> </ul>	<ul style="list-style-type: none"> <li>• Fastest charging option available</li> </ul>
<b>Drawbacks</b>	<ul style="list-style-type: none"> <li>• Slower charging</li> </ul>	<ul style="list-style-type: none"> <li>• Very expensive to purchase and install</li> <li>• Can cause degradation to EV batteries with frequent use</li> </ul>
<b>Estimated Costs</b>	\$500 to \$5,000 (US DOE, 2019)	As high as \$50,000

## Benefits of EVs

The Benefits of EVs are both environmental and economic. By replacing ICE vehicles with EVs, transportation related GHG emissions are significantly reduced and air quality is improved. As the need for imported petroleum to support transportation is decreased through the integration of EVs, domestically available fuel sources can shift into focus, resulting in energy independence and domestically regulated fuel prices. Furthermore, the individual consumer will experience lower fuel and maintenance costs with the transition to EVs and through continued advancements in battery and charging technologies. The sections below provide additional details regarding the benefits of EVs.

## Reduce GHG Emissions

On December 12, 2015, at the United Nations Framework Convention on Climate Change (UNFCCC), the Paris Agreement was reached to “combat climate change and to accelerate and intensify the actions and investments needed for a sustainable low carbon future” (UNFCCC, 2019). In support of this effort, the Intergovernmental Panel on Climate Change (IPCC) published a report in 2018 identifying potential solutions to keep global temperature change below 1.5°C and the important role cities have in the urban transition. Among other strategies, the IPCC states that “the transport sector must reduce its final energy use by 30% and must supply the majority of energy with low

carbon fuels like electricity, hydrogen, and biofuel by 2050 in order to limit global warming to less than 1.5°C and mitigate the worst impacts of climate change” (IPCC, 2018). EVs can significantly decrease GHG emissions associated with on-road transportation, which overtook electricity generation as the largest source of GHG emissions in the US in 2017 (Environmental Protection Agency, 2019). The amount of emissions reduction depends on the electricity generation fuel mix of the local electricity grid. National trends suggest that electric utilities are improving the emissions from electricity generation at a faster rate than fuel economy is improving in ICE vehicles. EV charging can be paired with residential roof-top solar, commercial solar parking structures, and community solar to further reduce associated GHG emissions. Xcel Energy has goals to reduce carbon emissions 80% by 2030 and to be carbon free by 2050 (Xcel Energy, 2019). By transitioning to cleaner energy sources, Xcel Energy is supporting its customers in reaching their own community goals of achieving carbon neutrality.

### **Air Quality**

Ozone and fine particulate (PM<sub>2.5</sub>) air pollutants have been linked to respiratory problems such as asthma, cardiopulmonary disease, and premature death for people with chronic exposure. These pollutants are significantly reduced in the case of HEVs and PHEVs and entirely eliminated in BEVs. A study of the Houston area found that moderate to complete vehicle electrification would reduce Ozone by 1 to 4 ppb and PM<sub>2.5</sub> by 0.5 to 2 µgm<sup>-3</sup>. This change was estimated to prevent 114 to 246 premature deaths annually, significantly reduce asthma exacerbation by 7,500 cases, and reduce school loss days by 5,500 (Pan, et al., 2019).

### **Energy Independence and Cost Stability**

Over 65% of the petroleum imported to the US in 2018 was used for transportation fuel. Transitioning to EVs shifts the fuel source to more domestically available sources such as coal, nuclear, natural gas, and renewable energy. Integration of EVs is an important strategy for reducing dependence on fuel imports and isolates transportation costs from the volatile petroleum market (Office of Energy Efficiency and Renewable Energy, 2018). Figure 9 illustrates the fluctuations in gasoline and diesel prices compared to electricity prices from 2000 to 2020.

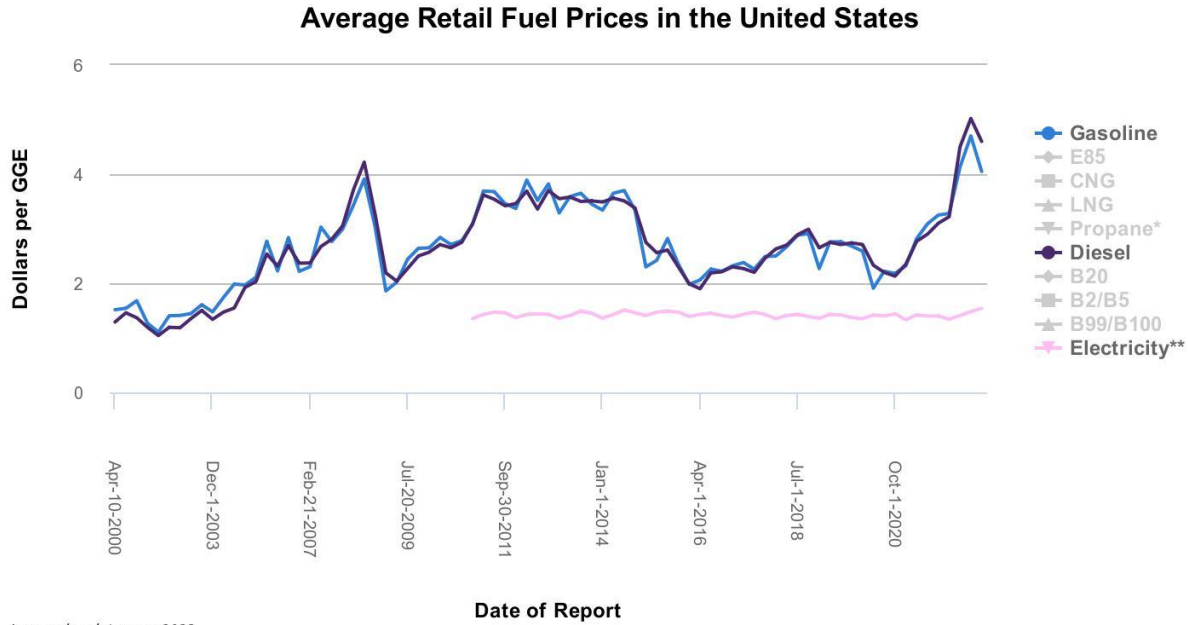
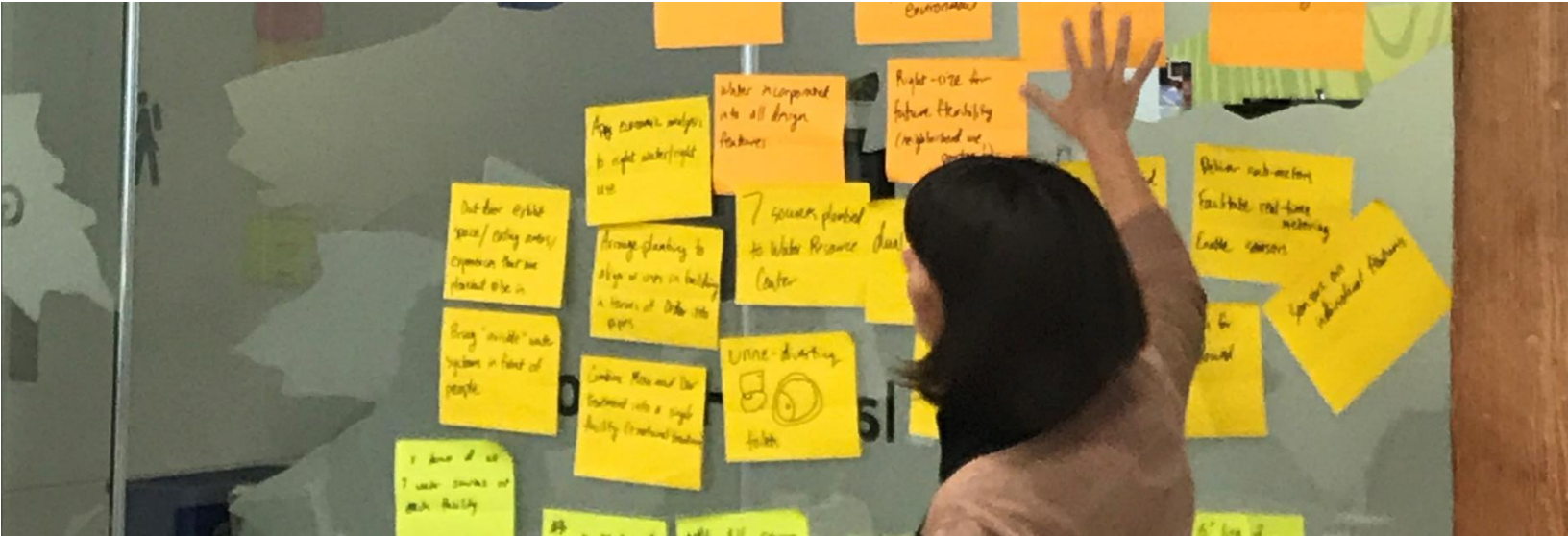


Figure 9. U.S. Average Retail Fuel Prices. Source: [Alternative Fuels Data Center: Fuel Prices \(energy.gov\)](https://www.energy.gov/alternative-fuels-data-center/fuel-prices)

### Lower Fuel & Maintenance Costs

While cost savings vary based on vehicle type, driving patterns, and geographic region, the average driver spends about half as much money in fuel and maintenance costs by driving an EV compared to a traditional ICE (Office of Energy Efficiency and Renewable Energy, 2019). The average US household spends about 13% of their annual income on transportation costs, while low-income households spend an average of 29% of their annual income on transportation costs (Institute for Transportation And Development Policy, 2019). The transition to EVs would result in significant savings for the individual consumer.

# APPENDIX D: XCEL ENERGY EV PROGRAMS



In 2021, [Xcel Energy's Transportation Electrification Plan \(TEP\)](#) was approved by the Colorado Public Utilities Commission (PUC). The TEP is intended to support the State's EV goals and help position Colorado as a national leader in vehicle electrification. It includes a portfolio of programs, services, and rebates - funded by Xcel Energy customers - that are designed to benefit all drivers, all customers, and the state, by helping reduce greenhouse gas emissions and air pollution while keeping electric bills low and benefiting the grid (Public Service Company of Colorado, 2021).

## Residential Programs

### Home Wiring Rebate

Xcel Energy electric service customers in Colorado who enroll in the Optimize Your Charge program and purchase an eligible Level 2 charger and/or install wiring to support an eligible Level 2 charger may apply for a rebate of up to \$500 to help cover the cost of wiring. Income-qualified customers are eligible for a higher \$1,300 rebate.

### Optimize Your Charge

The Optimize Your Charge program rewards EV drivers who agree to charge during off-peak hours with an annual \$50 bill credit.

### EV Accelerate at Home

Through the EV Accelerate at Home program, Xcel Energy electric service customers can rent a Level 2 home charger, select an off-peak charging schedule, and have the charging station installed and maintained by Xcel Energy. EV Accelerate at Home participants pay a \$13.29 per month rental fee through their Xcel Energy electricity bill and are also eligible for the Wiring Rebate and the Optimize Your Charge bill credit described above.

## **EV Purchase / Lease Rebate for Vehicles**

In addition to helping customers overcome cost barriers related to EV charging, Xcel Energy offers income-qualified electric service customers up to \$3,000 off the cost of a used EV, or \$5,500 off the cost of a new EV. The rebates are instant and non-taxable when income-qualified customers buy or lease from a Colorado-based car dealer in Xcel Energy's [EV Dealer Network](#),

## **Residential Income Qualification Requirements**

To be eligible for income-qualified programs, customers must demonstrate a household income below:

- 60% of the state of Colorado's median income
- 200% of the relevant federal poverty level
- 80% of the area median income

OR be currently enrolled in any of the following programs:

- State of Colorado Low-Income-Energy Assistance Program (LEAP)
- Energy Outreach Colorado's Colorado Affordable Residential Energy Program (CARE)
- Colorado's Weather Assistance Program (WAP)
- Xcel Energy income-qualified Demand-Side Management program
- Xcel Energy income-qualified Community Solar Gardens program
- Supplemental Nutrition Assistance Program (SNAP)
- Temporary Assistance for Needy Families (TANF) program

## **Multifamily Programs**

Xcel Energy supports home charging for those who live in multifamily housing such as apartments or condominiums and will install, own, and maintain a dedicated service connection for EV charging, including the necessary transformer upgrades, service conductors, and a new meter. Additionally, Xcel Energy will install, own, and maintain the EV Supply Infrastructure, including new service panels, conduit, and wiring between the new meter and the charger. For more information on all Multifamily Charging programs, visit the [Xcel Energy website](#).

## **Multi-Family Housing with Assigned Parking**

Xcel Energy will own, install, and maintain EV supply infrastructure and charging equipment for a monthly fee when residents have dedicated parking spaces with charges tied to their utility bills.

Multifamily properties meeting income-qualified criteria or located in an high emissions communities (HEC) are eligible for an enhanced incentive of \$800 per charging station under the Assigned Parking program.

## **Multi-Family Housing with Shared Parking**

Xcel Energy will own, install, and maintain EV supply infrastructure and charging equipment for a monthly fee, with a new meter installed for shared charging equipment.

Alternatively, multifamily housing property owners may install, own, and maintain their own charging equipment from an Xcel Energy approved provider list. Xcel Energy will install, own, and maintain the EV supply infrastructure and install a new meter for the shared chargers.

Multifamily properties meeting income-qualified criteria or located in an HEC are eligible for an enhanced incentive of \$2,200 per charging station under the Shared Parking program.

### **New Construction**

New multifamily construction properties may earn a rebate for every parking spot with EV charging enabled. Xcel Energy will provide up to \$2,000 for EV Ready, EV Capable, or EV Installed ports in excess of those required by applicable building codes.

## **Commercial Programs**

### **EV Advisors**

Xcel Energy's EV Advisors are available to guide businesses through a customized EV charging plan and support identification of applicable resources and incentives.

### **EV Support Infrastructure (EVSII)**

Xcel Energy will provide no- to low-cost turn-key construction services for infrastructure at public charging sites receiving Xcel Energy commercial electric service in Colorado.

### **Charger Service**

Xcel Energy will own, install, and maintain Level 2 EV supply equipment for a monthly fee for fleet and workplace customers.

### **Critical Peak Pricing Program**

The Critical Peak Pricing program is designed to incentivize charging during off-peak hours, at times of day when cleaner generation allows for more sustainable charging. This program is available to customers receiving Xcel Energy commercial electric service in Colorado, with EV charging on a secondary voltage service where the electric power and energy is used solely for EV charging and is metered separately from other loads.

### **Income Qualified and Higher Emissions Communities (HEC) Enhanced Incentives**

Commercial customers who meet income-qualified criteria or are located in an HEC are eligible for enhanced rebates. Please visit the [Xcel Energy website](#) to learn more about income qualification criteria, HEC eligibility, and benefits.

### **Fleet Electrification Advisory Program (FEAP)**

Xcel Energy's Fleet Electrification Advisory Program begins with an analysis to help determine the best course of action for fleet electrification. In partnership with Sawatch Labs, participating in FEAP allows fleet operators to assess individual vehicles, to determine if the vehicle owner's driving needs could be met with an electric vehicle (EV). Additionally, FEAP assesses charging site suitability and estimates the cost of

infrastructure installation. Finally, FEAP helps advise on rate plans and pilot programs to lower costs. For more information visit [Xcel Energy's FEAP webpage](#).

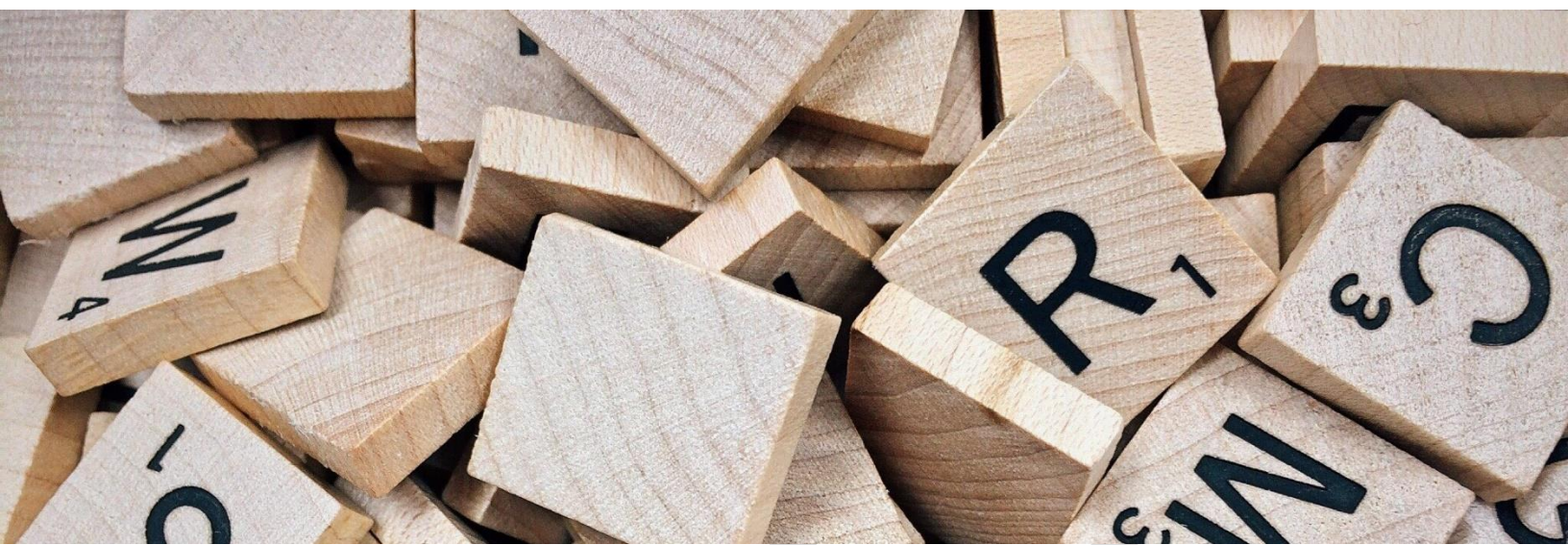
### **Small Business Rebate**

Customers can receive up to \$2,500 per port, with a maximum of three ports, to offset wiring costs to install EV infrastructure. For more information, visit [Xcel Energy's EV charging for small business website](#).

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## APPENDIX E: GLOSSARY OF TERMS



**Amps:** The measurement of the amount of electrical energy “flowing” through a charger. This is determined by the electrical load required by the equipment and can vary over time.

**Battery Electric Vehicle (BEV):** An all-electric vehicle, fueled by plugging into an external charger, that has no tailpipe emissions. Requires low maintenance costs.

**Direct Current (DC):** The form of electricity where the current only flows in one direction. This is the type of electricity that batteries supply and require to charge. EV chargers must convert the supplied AC electricity to DC power.

**Electric Vehicle (EV):** A vehicle that uses an electric engine for all or part of its propulsion.

**EV-Ready Codes:** Local government codes that require installation of a 40-amp, 208/240-volt dedicated branch circuit (similar to electric dryer or oven) and a circuit terminating in a receptacle, junction box, or EV charging station at certain parking facilities (Southwest Energy Efficiency Project, 2023).

**Electric Vehicle Supply Equipment (EVSE):** Infrastructure (e.g., chargers, electrical supplies) required to support EVs.

**Energy Burden:** Percentage of gross household income spent on energy costs.

**Fleet Electrification:** Replacing internal combustion engine vehicles with equivalent electric vehicles in a public or business fleet.

**Greenhouse Gases (GHG):** Gases in the atmosphere that absorb and emit radiation and significantly contribute to climate change. The primary greenhouse gases in the

earth's atmosphere are water vapor, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and ozone (O<sub>3</sub>).

**Heavy-Duty Vehicles:** Commercial vehicles over a minimum Gross Vehicle Weight Rating (GVRW) of 8,500 lbs.

**Hybrid Electric Vehicle (HEV):** Contains both an electric motor and a gasoline engine. The gasoline engine powers a generator that charges the electric motor. No external battery charger is used. Runs at a constant speed, which increases fuel efficiency.

**Internal Combustion Engine (ICE):** Traditional vehicle engine that uses the direct combustion of gasoline, diesel, or other fuels.

**Kilowatt-hour (kWh):** The amount of electricity being sent to the EV battery from the charger in one hour. This is calculated by volts times amps divided by 1,000.

**Level 1 Charging Station:** Uses a standard 120-volt AC outlet and can take 8 to 12 hours to fully charge a depleted battery; intended for residential use only.

**Level 2 Charging Station:** Uses a 220-volt or 240-volt AC outlet and can fully charge a depleted battery in 4 to 6 hours; can be used in both residential and commercial settings.

**Level 3/DC Fast Charging Station:** Uses an industrial 480-volt DC outlet and can charge a battery to 80% in 20 to 30 minutes; used in commercial settings where the anticipated charge time is limited (e.g., supermarket, gas station); will be used on Alternative Fuel Corridors, a national network of major thoroughfares supporting EVs and other alternative fuels.

**Light-Duty Vehicles:** Passenger cars with a maximum Gross Vehicle Weight Rating (GVRW) of 8,500 lbs.

**Micromobility:** Transportation using lightweight vehicles such as bicycles or scooters, including electric bicycles and scooters, often used to travel short distances.

**Plug-in Hybrid Electric Vehicle (PHEV/PEV):** Contains both an electric motor and a gasoline engine. An external plug is used to fuel the electric motor. The electric motor is used until the battery is depleted; at this point the gasoline engine takes over. Lower tailpipe emissions than traditional ICE and longer ranges than most BEVs.

**Range Anxiety:** Fear of running out of power in an EV before reaching a charging station or desired destination.

**Range Per Hour (RPH):** A measurement of the number of miles an EV can travel on one hour of charge. This is generally applied to EV charging stations and expressed in terms of typical EV efficiency.

**Vehicle Miles Traveled (VMT):** A way of measuring integration of EVs and associated reduction in GHG emissions by considering electric miles that replace traditional vehicle miles.

**Volts:** A measurement of the force pushing the flow of energy through a charger. This measurement is determined by electricity supply. Standard household outlets provide 120 volts; outlets for dryers or other high-powered household equipment supply 240 volts.

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