



Municipal Fleet Action Plan Guide

Shannon Anderson,¹ Lauren Reichelt,¹ Lacey Shaver,²
and Catherine Carroll²

1 National Laboratory of the Rockies

2 World Resources Institute

The National Laboratory of the Rockies is a national laboratory of the U.S. Department of Energy, Office of Critical Minerals and Energy Innovation, operated under Contract No. DE-AC36-08GO28308.

Technical Report
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July 2026

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**National Laboratory
of the Rockies**

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NOTICE

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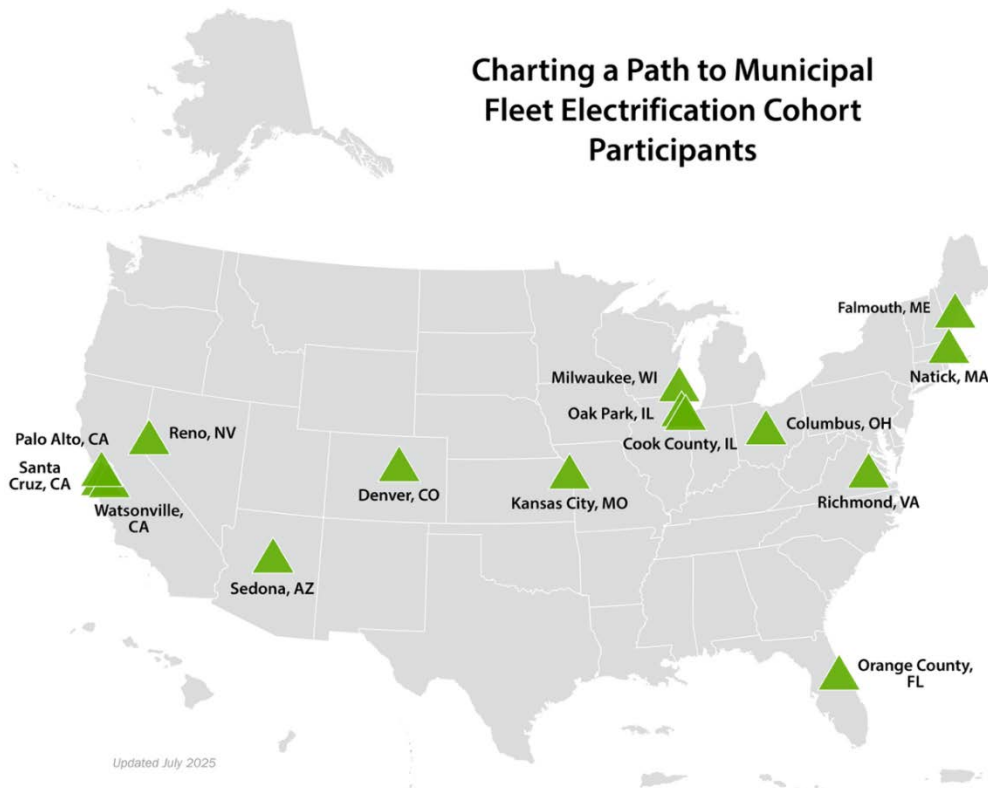
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Overview and Background

This action plan template and guide have been designed to support light-duty or medium-duty municipal fleet managers if they plan to incorporate electric vehicles into their fleets. The resource is an adaptation of content created by the National Laboratory of the Rockies (NLR), with support from World Resources Institute (WRI), for participants in the U.S. Department of Energy's Energy to Communities peer-learning cohorts offering. Fifteen participating municipalities joined monthly cohort workshops from July through December 2024 to learn and plan for their own fleet's adoption of electric vehicles. [Clean Cities and Communities](#) coalitions supported participating municipalities throughout the cohort series by conducting fleet analysis and planning activities on their behalf. This template is an adapted version of cohort activities.



Cohort workshops in this series included the following:

- **Workshop 1 - Planning for electric vehicles:** Prepared participants to participate in the cohort and to gather data needed to start the planning process.
- **Workshop 2 - Understanding vehicle and charging needs:** Provided approaches to vehicle replacement planning and phasing and evaluation of charging needs for vehicles and duty cycles.
- **Workshop 3 - Building your team and working with your electric utility:** Outlined key internal and external stakeholders, including utilities, and when and how to engage them.
- **Workshop 4 - Assessing, upgrading, and future-proofing sites:** Shared key considerations for siting chargers and strategies to minimize upgrades such as offsite charging and future-proofed infrastructure.
- **Workshop 5 - Calculating and managing costs:** This workshop total cost of ownership and strategies for managing charging costs. It included funding and financing and procurement best practices.
- **Workshop 6 - Training, operations, and maintenance:** This workshop focused on operations and maintenance considerations and workforce training needs related to vehicles and chargers.

How to Use This Guide

Municipal fleet managers can modify this template or use it as a starting place for their own planning process. There are six sections, each of which requires information gathering and analysis. Fleet managers can assemble a core project team of internal stakeholders to lead and facilitate the planning process. Please refer to Section 2 of this document for insights on how to develop this team.

This document can be used as a full plan outline, or sections can be pulled out to meet the fleet's specific needs. Complete each section in the plan template using instructions and template language as a guide. Remove both instructions and template language before finalizing a plan document.

- Instructions for each section are written in plain black text.
- Template language or section outlines are written in *red italicized text*.

Municipal Fleet Action Plan

[Municipality/Local government name]

Prepared by: *Add names and contact info*

Date: *Month, Day, Year*

Executive Summary

Instructions to complete this section: Writing the Executive Summary will be the final step of completing your plan once all other sections are complete. The Executive Summary should contain:

- Your municipality's purpose for incorporating electric vehicles (EV)
- Any goals and targets
- A brief description of the current fleet and suggested high-level approach to integration of those vehicles, including graphics
- Key information on how your staff uses and stores vehicles and any associated implications for this plan
- A brief description of challenges or barriers
- An overview of recommended actions, which could include:
 - Municipality adopts fleet goals and targets
 - Institute a fleet policy and procurement plan for EVs that prioritizes procurement of battery EVs and right-sizing current fleet
 - Establish a committee to support infrastructure coordination
 - Add technology to vehicles to aid in route optimization, best use of vehicles, and data collection
 - Conduct an EV suitability assessment using fleet telematics and data analysis
 - Leverage utility, state, and federal funding and tax credits to reduce costs
 - Optimize charger procurement and installation by developing and staffing a cross-organizational charging infrastructure strategy.

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Background on This Plan

Instructions to complete this section: Provide information on the creation of this plan, including authors, partners, and consultants who may have contributed to analysis and decision-making.

Glossary

Instructions to complete this section: Provide a glossary of key definitions. A starting list is below. Users should review the final plan and determine if certain definitions should be removed or added.

Example adapted from [State of Colorado Zero-Emission Vehicle Transition Plan template](#):

<i>alternative fuel vehicle (AFV)</i>	<i>A vehicle that runs on a fuel other than traditional petroleum fuel such as gasoline or diesel</i>
<i>demand charge rate</i>	<i>Additional fees that utilities charge customers for maintaining a constant supply of electricity</i>
<i>direct current fast charger (DCFC)</i>	<i>Fastest electric vehicle charger. Charges a vehicle from as low as 20 kilowatts to as high as 250 kilowatts or more.</i>
<i>electric utility</i>	<i>A corporation, agency, authority, or other instrumentality that delivers electricity to the public. Included are investor-owned electric utilities, municipal and state utilities, federal electric utilities, and rural electric cooperatives.</i>
<i>electric vehicle (EV)</i>	<i>A vehicle that can be powered by an electric motor that draws electricity from a battery and is capable of being charged from an external source</i>
<i>electric vehicle supply equipment (EVSE)</i>	<i>Equipment that delivers electricity from a source to charge a plug-in electric vehicle; also known as an electric vehicle charging station</i>
<i>fuel</i>	<i>Includes gas, diesel, compressed natural gas, electricity, or other sources of energy for vehicle operation</i>
<i>Level 1 electric vehicle charger</i>	<i>Slowest electric vehicle charger, delivers up to 2.5 kilowatts</i>
<i>Level 2 electric vehicle charger</i>	<i>Medium electric vehicle charger, delivers up to 19.2 kilowatts</i>
<i>net present value (NPV)</i>	<i>A method of calculating a return on investment. NPV is the sum of the present value of all cash inflows minus the present value of all cash outflows.</i>
<i>total cost of ownership (TCO)</i>	<i>An estimate of expenses associated with the entire life cycle of a piece of equipment, including purchasing, maintenance, and decommissioning</i>
<i>zero-emission vehicle (ZEV)</i>	<i>A vehicle that produces zero exhaust or emission of any criteria pollutant under all possible operational modes and conditions</i>

1. Goals and Timeline

Effective plans begin by clearly laying out goals and milestones and their authority. Describe any existing goals and timelines for electric vehicle (EV) integration.

Gather key stakeholders for a goal-setting conversation. This may include representatives from different municipal departments, elected officials, transit authorities, schools, and community organizations. See Section 2 (Stakeholder Engagement) for additional considerations.

Instructions to complete this section:

1. As a team, answer the following questions:
 - a. Does your municipality have an established goal or mandate for fleet electrification? What is the timeline? For example:
 - By 2030, XX% of the vehicles in the government fleet shall be zero-emission vehicles with at least XX% of the vehicles in fleet low-or-zero-emission vehicles.
 - By 2040, XX% of the vehicles in the government fleet shall be zero-emission vehicles with at least XX% of the vehicles in fleet low-or-zero-emission vehicles.
 - By 2050, XX% of the vehicles in the government fleet shall be zero-emission vehicles.
 - b. Who set the goal or mandate? Is it legally binding?
 - c. If there is not already a goal, is there support for developing a goal for fleet electrification? What might that goal include? Who would need to endorse this goal?
 - d. How does fleet electrification connect to broader municipal goals?
 - e. What is the purpose for electrifying your fleet (e.g., cost or fuel savings, career development for technicians, improved air quality, etc.)?
 - f. What progress have you made to date?
 - g. Are there other fleets within your local government, school district, or region who are electrifying their fleets? How might you coordinate or support each other's efforts?
2. Summarize your findings and record them below. Delete instructions from draft when complete.

2. Stakeholder Engagement

Municipal fleet electrification requires the collaboration and coordination of a variety of internal and external stakeholders. It is important to map and understand stakeholder interests, influence, and potential impact on fleet electrification efforts. This process can help you formulate strategies for effective communication, collaboration, overcoming concerns, and gathering support.

Instructions to complete this section:

1. Gather your internal project team. This should include the municipal fleet manager, energy manager, sustainability coordinator, and facility infrastructure manager.
2. As a team, fully populate the [Stakeholder Mapping Template](#) (columns A-K) for all current and potential project stakeholders.
3. Develop strategies to build buy-in:
 - a. Identify all champions. Describe their role and contributions to this effort. Discuss what motivates them and how you can build on their support.
 - b. Identify those with whom you need to build buy-in. Discuss possible reasons for their reluctance or hesitation. How can you confirm and then address or overcome these concerns, such as leveraging messengers or partners? Discuss strategies to encourage and increase buy-in.
 - c. Discuss engagement strategies to build long-term institutional support for this effort. Strategies to consider:
 - i. Targeted briefings for elected officials and key leadership
 - ii. Education and listening sessions with drivers and maintenance staff
 - iii. Project advisory groups/steering committees that include key departments and external stakeholders
 - d. Discuss engagement strategies to build long-term public support for this effort. Strategies to consider:
 - i. Publish fleet electrification goals, plan, and progress reports on website
 - ii. Include community groups in fleet electrification planning or working groups
 - iii. Collaborate and share knowledge with other fleets that are electrifying
 - iv. Establish partnerships around charging, including shared charging opportunities
 - v. Communicate facilities upgrades and positive impacts
4. Develop or expand the relationship with your utility:
 - a. Identify the names of the electric utility(s) that provide power to your municipality. [The Department of Energy's U-Finder](#) can help you identify and connect with the right person at your utility.
 - i. Does your organization have an existing point of contact within the electric utility? This may be someone within your facilities team.
 - ii. Is your electric utility contact the right person to support electrification efforts? Is there an EV champion or dedicated staff working on transportation electrification at the electric utility that might want to engage?
 - iii. What is your current relationship with the electric utility? Is there history to be aware of, either positive or negative?
 - iv. What departments do you need to involve in different phases of your project?
 - b. Describe how the electric utility's rate structure and demand charges may impact the operation of EVs. Describe your municipality's strategy to minimize the impact.
 - c. Describe how the long-term goals of your municipality and the electric utility align or conflict. How might this impact your transition?

- d. If you have not yet reached out to your electric utility, set up a meeting with them to discuss your fleet electrification plans. Work with your internal utility lead, if necessary.
5. Type up a summary and record below. Delete instructions from draft when complete.

Internal Coordination

Describe which municipal departments will be instrumental for successful fleet electrification and how. Outline any staff changes or hiring requirements to support electrification, such as a dedicated position to support charger installations, operations, and maintenance. Share how you will build internal buy-in. You may want to consider administering a staff survey to understand current perspectives on EVs, understand departmental needs and concerns, and identify potential opportunities and champions.

Departments to include in this section may include fleet, facilities, general services, sustainability, transportation, public works, procurement, or a City Council/Board of Commissioners.

Electric Utility Coordination

Describe coordination you will undertake with your electric utility. Detail the following in narrative form:

- Electric utility contact
- Information on past relationship and experience
- Current electric utility rates
- Demand charges
- Potential bill changes due to electrification
- Utility make-ready and other incentive programs
- Details on conversations about changes to bill
- Details on conversations about installation and interconnection
- Strategies for managing costs
- Data sharing agreement.

Community Engagement

Describe your goals for working with the public around fleet electrification efforts. How will you communicate and engage with external stakeholders? Detail any specific engagement needs or activities you will undertake.

For example, if you have a fleet depot or facility that is located within a residential neighborhood, you may talk with those residents to share about the project, potential impacts, construction timelines, and seek insight into project implementation.

3. Fleet Landscape Analysis

Analyze current fleet data to determine which vehicles are most suitable for near-term, mid-term, and long-term electrification. Consider your vehicle replacement process and budget, vehicle availability and cost, electricity and fuel prices, charging needs, vehicle miles traveled, and emissions.

Instructions to complete this section:

With your project team, discuss your vehicle replacement process.

1. What is your current process and timing for replacing vehicles? What opportunities and challenges could this process create for fleet electrification?
2. How might this process be changed to better enable fleet electrification?
 - a. Who needs to be involved to change this process?
 - b. What steps are needed to change this process?
3. Do you have a low-emissions vehicle procurement policy?
 - a. If yes, is it working well? Why or why not?
 - i. Are there opportunities for improvement?
 - b. If no, is there interest in developing a policy? What would that take?
4. Summarize any recommendations and next steps.

Compile fleet data.

1. Complete the [Fleet Characteristics Template](#) spreadsheet. This spreadsheet is designed to gather the information needed to do a total cost of ownership calculation using Argonne National Laboratory's [TechScape tool](#) (instructions in Section 5 of this document).

Assess vehicle options and begin to prioritize vehicles for electrification.

1. Identify whether there is a suitable replacement using tools like the [Alternative Fuels Data Center \(AFDC\) vehicle search tool](#).
2. Make an initial attempt to categorize vehicles as either near-term, mid-term, or long-term candidates for electrification. You can use the column called Priority for Replacement in the **Fleet Characteristics Template**.
3. Record why you selected this prioritization using the column called Reason for Prioritization in the **Fleet Characteristics Template**.
 - a. Potential reasons could include (but are not limited to): The age or retirement year of the vehicle; emissions; suitable replacement available; cost of replacement vehicle; location where vehicle is stored overnight and ability to install needed charging; ability to meet needed charging (at overnight location, public charging, or otherwise.)

Discuss where vehicles prioritized for near-term electrification are stored and any initial thoughts about opportunities and challenges for charging at those locations.

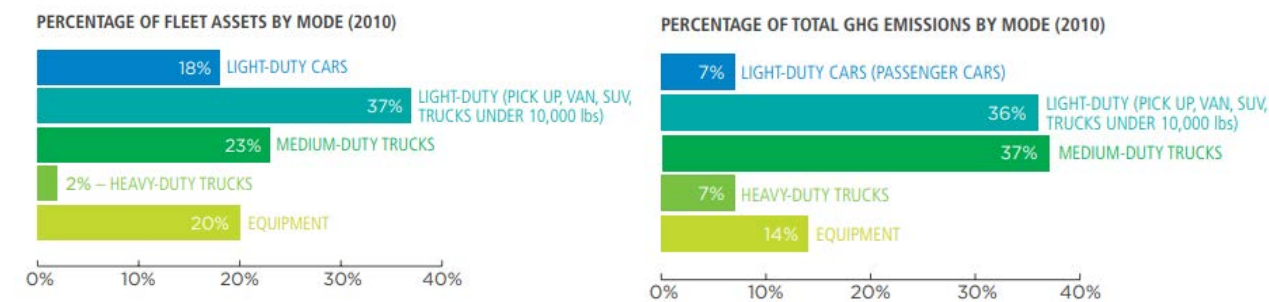
Summarize your findings and record below. Delete instructions from draft when complete.

Current Fleet Composition and Procurement Process

Describe your current fleet, vehicle types, and usage. Describe your current procurement process for new vehicles and vehicle replacement process and schedule. Include details on any EV procurement policies that your municipality already has in place. Describe how the current process supports or creates challenges for

future fleet electrification and any adjustments that might better support fleet electrification. What steps would be required to change the process, and who would be involved or crucial for that process change?

Consider adding graphics, such as these from [City of Richmond, British Columbia](#):



Schedule and Recommendations

Provide an overview of the proposed electrification schedule using your fleet assessment analysis and reflections from total-cost-of-ownership calculation and site assessment (to be completed in Sections 4 and 5.)

Include any recommendations needed to successfully achieve this schedule and a table to communicate the transition, such as the following from [Philadelphia, Pennsylvania](#).

Table 8. Fleet EV Procurement Estimates Per Year

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Sedan and Station Wagon	18	17	0	8	8	20	17	24	10	24
Radio Patrol Car	0	0	0	0	0	0	31	106	90	48
Unmarked Police Car	11	10	4	5	7	6	34	46	20	36
Sport Utility Vehicle	12	12	4	35	37	52	73	27	115	180
Pickup Truck	0	6	0	0	21	8	20	32	49	68
Cargo and Passenger Van	0	8	0	4	17	24	11	43	97	82
Total	41	53	8	52	90	110	186	278	381	438

4. Charging Infrastructure and Facilities Upgrades

Once you have compiled fleet data and started to prioritize vehicles for electrification, you can analyze charging needs for those vehicles. This requires coordination with your facilities team and electric utility.

Instructions to complete this section:

Assess charging needs for your fleet replacement plan.

1. Review the top vehicles to replace based on your Fleet Landscape Analysis in Section 3. For those prioritized for near-term electrification, identify the specific facility names and locations where the vehicles are stored.
2. For each facility, calculate the number of chargers needed for the vehicles prioritized for near-term electrification using the [Facility Charging Needs Template](#):
 - a. Use one of the Charging Needs tabs of the [Facility Charging Needs Template](#) to identify the maximum weekly mileage and the range of replacement EV of each priority vehicle to understand charging needs using telematics data.
 1. If you don't have telematics data, divide annual vehicle miles traveled by 52 (or the number of weeks your vehicle operates per year) to get weekly mileage. Insert this into the template.
 - ii. Identify the replacement vehicle's range and insert it into the template.
 - b. Use the same tab to calculate the estimated number of times the vehicle will need to be charged per week. The worksheet calculates this by dividing the weekly mileage by the total range of the vehicle.
 - i. Example: Your vehicle travels 100 miles a week and has a range of 200. It needs 0.5 charges a week to meet its basic function. This vehicle would not need to charge every day and could share a charger with another vehicle(s).
 - ii. You can add a range buffer if desired by decreasing the range. For example, you could reduce the max range to 80% as a buffer for cold weather and battery depreciation. For example, you could take a max range of 250 miles and instead use 200 miles for your calculations.
 - c. Add the number of charges needed per week per facility and identify your desired number and types (L2 or DCFC) of chargers.
3. Discuss whether each facility can accommodate near-term charging needs for vehicles that are prioritized for electrification. Insert these details into the Facility Data tab of the [Facility Charging Needs Template](#):
 - a. Is the site owned or leased?
 - b. Does the site have electrical capacity to install chargers?
 - c. Would the parking layout or other operations need to be adapted to accommodate chargers?
 - d. Is the facility located in or nearby a residential area? Does that residential area experience high pollution or noise levels? Could there be additional benefits to electrification in this area?
4. Discuss other means of charging:
 - a. Are there public chargers you could potentially use? Use the AFDC [Alternative Fueling Station Locator](#) to find nearby EV charging stations.
 - b. Could chargers be installed at other facilities where the vehicles visit regularly (e.g., city hall, police stations, municipal buildings, garages, shops)?
 - c. Are there other fleets or partners (e.g., a school district that is also electrifying) that you could coordinate with to lower the number of chargers needed?
5. Determine the estimated number of chargers needed per facility:

- a. Discuss with your team whether L2 chargers meet your needs or if DCFC would be needed, based on the analysis and discussions in the previous two steps.
- b. Calculate the number of L2 and DCFC needed per facility, based on the total charges needed per week across all vehicles at a particular location and the availability of other charging.

Host a discussion with the facilities team about electrification goals and potential sites.

1. Share information on municipality's goals and plans for fleet electrification:
 - a. The scale of the electrification project will influence the facility requirements. Is your goal partial fleet electrification? Full fleet electrification? Other objectives, such as vehicle-to-grid or vehicle-to-building integration, may also play a role in determining the scale of the project. Share any key dates or deadlines.
2. Discuss where vehicles are currently parked and implications for charging:
 - a. Are there sites that are well-suited for near-term electrification?
 - b. Are there any special considerations for certain locations? For example, are certain sites leased, and thus more challenging to update?
 - c. Where are these facilities located? Are they within residential neighborhoods? What is the status of relationships between these facilities and residents?
 - d. Is there a need to reconsider the vehicle parking strategy and approach to support fleet electrification?
 - e. How might you phase facility upgrades over time to manage costs?
3. Review electricity bill and discuss how facility electricity bills are handled:
 - a. How might fleet electrification impact bills?
 - b. Are there opportunities to reduce electricity demand at sites to accommodate future increases in electricity use due to charging? For example, has facility lighting been updated and resulted in additional capacity on a panel? If not, could you consider upgrading lighting to free up capacity? Could solar or battery storage help offset increases in electricity usage?
 - c. Are there site electrical capacity constraints?
 - d. Are there demand charges? How will you avoid incurring demand charges?
 - e. How will you track and manage charging costs and who will be responsible?

Conduct site assessments using NLR's EVI-LOCATE (Electric Vehicle Infrastructure - Locally Optimized Charging Assessment Tool and Estimator) tool.

1. Sign up for an EVI-LOCATE account at <https://evi-locate.nlr.gov/>
2. Gather data that will be needed for the assessment (if you have not already gathered within the [Fleet Characteristics Template](#)). Data could include:
 - a. Site addresses and boundaries for each site that you want to analyze
 - b. Number of chargers to install at each site and information on charger specifications, which can include charger level, mount type, number of ports, whether they will be networked, and any available manufacturer details
 - c. Electric utility details and assets, including transformers and service panels:
 - i. Local electric utility name
 - ii. If assessing or including transformer costs:
 1. Location, or preferred location, of existing or new transformers
 2. Amperage
 3. Power factor (conservative defaults included in EVI-LOCATE)
 4. Loading limit (conservative defaults included in EVI-LOCATE)

5. Secondary side voltage (located on transformer case)
6. Power rating (located on transformer case)
7. Existing peak power load (found within meter data).
- iii. If assessing or including service panel costs:
 1. Location, or preferred location, of current or new service panels
 2. Service voltage rating
 3. Physical capacity - Number of unused circuit breaker spaces
 - a. L1 charger requires one breaker
 - b. L2 charger requires two vertically adjacent breakers
 - c. DCFC charger requires three breakers on three different phases of 480V power.
 4. Electrical capacity (may need electrical experience to calculate)
 - a. Current rating in amps
 - b. Total peak load in kilowatts.
- iv. What, if any, bollards, signage, painting or other indicator will be used to demarcate EV parking. Research and document associated costs.
- v. Locally determined project costs:
 1. State and local sales tax percentage
 2. Contractor overhead percentage
 3. Contractor profit percentage
 4. Bond costs percentage
 5. Permits and zoning percentage
 6. Contingency cost percentage.
- d. Enter the data into EVI-LOCATE as prompted and run the analysis. Refer to the short demo videos on YouTube for detailed instructions on how to use the tool:
 - i. [Intro to EVI-LOCATE](#)
 - ii. [EVI-LOCATE Step by Step](#)
- e. After completing site assessments for all potential sites that you are considering, review the results and discuss the following questions as a team:
 - i. Which charger and service panel locations are most cost effective?
 - ii. How can you check the EVI-LOCATE results against local electric utility and site plans to ensure they don't conflict with underground utilities?
 - iii. Do the EVI-LOCATE results change your electrification plans? How?
 - iv. What outstanding questions need to be resolved?
 - v. If the results are cost prohibitive, are there public chargers along key routes or at partner facilities that could reduce the number of chargers needed for fleet electrification?

Summarize your findings and record below. Delete instructions from draft when complete.

Charging Strategy

If relevant to your audience, describe the types of charging technology available. Describe your EV charging approach for vehicles identified for near-term electrification, the technologies you plan to install, and any additional software or services required. Identify issues that will need to be addressed for long-term fleet electrification.

Add information on existing chargers, both onsite and public. If you have conducted a request for information (RFI) or request for proposal (RFP) for charging, include information on the vendors and technology you have

evaluated and any recommendations.

Describe your plan to expand EV charging infrastructure as your electric fleet grows. Graphics, like these from [Richmond, Virginia's plan](#), can be helpful for communication:

Table 6: EVSE Installation Schedule						
Fiscal Year	Level 1 EVSE	Level 2 EVSE	Estimated cost level 1 installation	Estimated cost per level 2 installation	Backup generator	Total Estimated Installation costs
2021	5	5	\$1000	\$3000	\$15,000	\$85,000 (pilot & site assessment)
2022	20	22	\$1000	\$3000	\$15,000	\$70,000-\$141,000
2023	40	24	\$1000	\$3000	\$15,000	\$70,000-\$162,000
2024	30	10	\$1000	\$3000	\$15,000	\$60,000-\$90,000
2025	28	15	\$1000	\$3000	\$15,000	\$125,000-\$175,000
2026	28	10	\$1000	\$3000	\$15,000	\$60,000-\$85,000
2027	30	10	\$1000	\$3000	\$15,000	\$75,000-\$90,000
2028	25	10	\$1000	\$3000	\$15,000	\$130,000-\$160,000
2029	24	10	\$1000	\$3000	\$15,000	\$115,000-\$125,000
2030	0	6	\$1000	\$3000	\$15,000	\$30,000-\$40,000

Fiscal Year										
Department	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Animal Shelter		1		2						3
Assessor		1								1
Cemetery	2									2
Courts		2	2	1		1	2			8
DIT			1							1
Emergency Communication				1			1			2
Emergency Management		1					1			2
Finance				1		1				2
Fire Department	1	5		3				3		12
Fleet Services	1	1		1						3

Facilities Information and Needed Upgrades

Describe where fleet vehicles are currently stored, who owns those sites, and any implications for electrification. Describe the prioritized sites for charger installation and how you prioritized. Share which sites were not prioritized, why, and how you will develop a long-term plan to electrify vehicles that park at these sites. Describe any relevant information about potential impacts to residents adjacent to prioritized sites.

Based upon site assessments and discussions with facilities staff and utilities, describe the required chargers to be installed, equipment and infrastructure needed, timeline for installation, and any necessary electrical infrastructure upgrades such as new transformers. If you have received quotes for the cost of upgrades, include this information.

Describe how charging infrastructure will be added and phased over time. A chart or graph can be useful for communicating this information. Include maps or visuals as relevant, for example, line maps of sites or pictures of current parking configurations and locations of potential chargers.

5. Financial Planning

Analyze the costs of vehicles and charging and develop a financial plan.

Instructions to complete this section:

Calculate total cost of ownership (TCO) for different vehicle options using Argonne National Laboratory's [TechScape tool](#).

1. Download and install TechScape by [requesting a license](#). After installation, you can access the *User Guide* by clicking the “Help” button within TechScape.
2. When you launch TechScape, select the “Market Production Vehicle Analysis” workflow.
3. Gather data for the vehicles scheduled for replacement. For each vehicle scheduled for replacement, search the TechScape database to select the most suitable replacement vehicle available on the market.
 1. The [Fleet Characteristics Template](#) in Section 3 of this document is designed to support you in gathering this data.
4. TechScape provides default assumptions for vehicle costs, fuel, maintenance, repairs, and other metrics needed for TCO. If your own assumptions are available, enter them into the tool to reflect your specific operating conditions. If not, proceed with the default cost data provided in TechScape.
5. For questions or feedback regarding TechScape, please contact the TechScape team at techscape@anl.gov

After completing your TCO analysis and the site assessment completed in Section 4 above, review the results and discuss the following questions as a team.

1. What vehicles are most cost effective? Which are least?
2. Are there ways to mitigate and manage costs such as charge management, offsite charging, complementary technology like solar and/or storage, or right-sizing fleets?
3. Do the TCO analysis and site assessment results change your fleet electrification plans? How so? Do you need to reassess your plan goals, timelines, or strategy?
4. How might you use the TCO and site assessment results to communicate with internal and external stakeholders identified in section 2?
5. How will your planned transition impact your fleet's finances in the short, medium, and long terms? Will you need to change your approach to budgeting due to this transition, such as long-term shifts in operating vs. capital budgets?
6. How will your agency fund any necessary upfront infrastructure investments?
7. Are there funding or financing opportunities that could offset upfront investments?

Identify funding and financing opportunities. As a team, identify which funding opportunities are of highest interest, using the resources below. Document the key dates for those priority opportunities and how you can prepare (e.g., analysis, engagement activities, partnership development, leadership meetings)?

1. EV infrastructure funding resources:
 - a. [Electrification Coalition EV Funding Finder](#)
 - b. Lawyers for Good Government [Elective Pay Filing Tools](#)
 - c. Atlas Public Policy [Project Finance Hub](#)
2. Local, state, and utility funding, financing, and incentive options:
 - a. Local taxes, millage, or other funding streams that could be used for municipal infrastructure
 - b. State funding programs

- c. Utility EV charging incentives, such as a make-ready program. You can use the [U-Finder tool](#) to find your utility and incentives
 - d. State and federal [tax credits](#) for EVs and EV chargers. When will you be able to file for the credits, given that the asset must first be placed into service?
3. Other alternative financing opportunities or opportunities for new revenue streams, such as vehicle-to-grid programs.

Summarize your findings and record below. Delete instructions from draft when complete.

Total Cost of Ownership Analysis

Summarize the results of your TCO analysis. Describe which fleet vehicles may be transitioned easily, and which may require more time for infrastructure planning and deployment or further technology development. Develop an estimated budget for electrification and consider communicating using graphics such as these from [Philadelphia, Pennsylvania](#).

Table 11. Total Fleet Transition Costs, 2021-2030 - Without Incentives

	Capital costs		Operating costs		Total costs	
	Total - ICE	Total - EV	Total - ICE	Total - EV	Total - ICE	Total - EV
Sedan and Station Wagon	\$4,120,000	\$4,561,000	\$447,000	\$256,000	\$4,567,000	\$4,817,000
Radio Patrol Car*	-	-	\$11,907,000	\$10,498,000	\$11,907,000	\$10,498,000
Unmarked Police Car	\$5,765,000	\$5,518,000	\$657,000	\$362,000	\$6,422,000	\$5,880,000
Sport Utility Vehicle	\$16,276,000	\$19,537,000	\$1,531,000	\$783,000	\$17,807,000	\$20,320,000
Pickup Truck	\$7,255,000	\$10,349,000	\$475,000	\$251,000	\$7,730,000	\$10,600,000
Van Cargo and Passenger	\$11,573,000	\$12,708,000	\$700,000	\$390,000	\$12,273,000	\$13,098,000
Total	\$44,989,000	\$52,673,000	\$15,717,000	\$12,540,000	\$60,706,000	\$65,213,000
Difference (total)		\$7,684,000		-\$3,177,000		\$4,507,000
Difference (%)		17%		- 20%		7%

*Because Radio Patrol Cars are not part of the Capital Budget, their cost of purchase is included within the Operating Costs.

Table 12. Total Fleet Transition Costs, 2021-2030 - With Incentives

	Capital costs		Operating costs		Total costs	
	Total - ICE	Total - EV	Total - ICE	Total - EV	Total - ICE	Total - EV
Sedan and Station Wagon	\$4,120,000	\$3,136,000	\$447,000	\$256,000	\$4,567,000	\$3,391,000
Radio Patrol Car*	-	-	\$11,907,000	\$7,679,000	\$11,907,000	\$7,679,000
Unmarked Police Car	\$5,765,000	\$3,734,000	\$657,000	\$362,000	\$6,422,000	\$4,096,000
Sport Utility Vehicle	\$16,276,000	\$14,068,000	\$1,531,000	\$783,000	\$17,807,000	\$14,851,000
Pickup Truck	\$7,255,000	\$8,258,000	\$475,000	\$251,000	\$7,730,000	\$8,509,000
Van Cargo and Passenger	\$11,573,000	\$9,777,000	\$700,000	\$390,000	\$12,273,000	\$10,167,000
Total	\$44,989,000	\$38,972,000	\$15,717,000	\$9,721,000	\$60,706,000	\$48,693,000
Difference (total)		-\$6,017,000		-\$5,996,000		-\$12,013,000
Difference (%)		- 13%		- 38%		- 20%

*Because Radio Patrol Cars are not part of the Capital Budget, their cost of purchase is included within the Operating Costs.

Funding and Financing

Describe how fleet transition will impact the municipality's finances in the short, medium, and long terms and any projected changes in budgets, including shifts in operating versus capital budgets. Describe how your municipality will fund the upfront investments required to electrify your fleet. Describe potential funding opportunities that could support fleet electrification, including federal, state, and electric utility sources and vehicle manufacturer incentives. Describe any tax credits that could be used to bring down the cost of vehicles and charging infrastructure. Include information on the steps needed to access these incentives.

Provide recommendations for how to successfully access financing, funding, and/or tax credits.

6. Operations and Maintenance

EVs will require new skills and training to operate and maintain. It is important to develop a plan to train your employees and others who will be essential for successful deployment.

Instructions to complete this section:

Review the following training resources for ideas and plan the trainings you will require for your drivers, technicians, and first responders. In the table below, outline the personnel, skills, and training and credentials required to maintain and operate the EV fleet and infrastructure.

Personnel Type	# of Personnel	Current or Anticipated Skills Gap	New Skills Needed	Associated Trainings / Certifications

1. General Resources:

- a. The U.S. Department of Energy’s Federal Energy Management Program maintains an [EV Champion Training Series](#), which includes video trainings on EV technology, financial considerations, EVSE, and driving EVs.
- b. The Occupational Safety and Health Administration (OSHA) sets [electrical standards](#) for workplace safety which may be applicable, including OSHA 1910.132 which requires hazard assessment of mechanical, shock, chemical, and electrical explosion (arc flash). Mitigation of hazard can come from design, work practices, or personal protective equipment (PPE).
- c. [SAE International](#) is a source for engineering standards related to electric vehicles. They develop standards for charging, safety, and more.

2. EV Technician Resources:

- a. The National Institute for Automotive Service Excellence (ASE) offers [xEV High-Voltage Electrical Safety certifications](#) that were developed to serve as a guide, sharing existing industry standards, concepts, and practices followed by individuals working in the automotive, truck, and commercial electrical industry.
 - i. [xEV Electrical Safety Awareness Certification \(Level 1\)](#) is designed for anyone who may encounter an EV in the workplace. This includes an individual who performs tasks in proximity of electrified propulsion vehicles in sales, service, repair, and/or related environments.
 - ii. [EV Technician Electrical Safety Certification \(Level 2\)](#) is for a service professional, technician, or specialist who has received high-voltage electrical training, has demonstrated skills and knowledge related to the construction, operation, and repair of electrically powered high-voltage vehicles, maintains an electrically safe working area, and uses required PPE. They have also received safety training to identify the hazards and reduce the associated risk.
 - iii. ASE also offers a [Light Duty Hybrid/Electric Vehicle Specialist \(L3\) Test](#).

- b. [Weber State University](#) offers online training and in-person boot camps for the ASE xeV certifications.
 - c. The Electric Vehicle Standards Council is an industry-led effort to create the global standard for EV technician education, EV product safety, and EV retrofits and builds. EVSC maintains [Certified Electric Vehicle Technician Standards](#).
 - d. The Electronics Technicians Association (ETA) International also offers EV technician [Competency Requirements](#) and certification programs. [Certification](#) is for individuals interested in attaining training from an ETA International-approved EV school. In this program students will develop skills in safety, troubleshooting, and repairing of EVs. Due to the high voltage and safety issues involved, technicians are required to receive specialized training in both knowledge and hands-on skill items.
3. EV Charging Resources:
- a. SAE International has produced a certification program to establish and verify the skills and knowledge of technicians who maintain, repair, and operate EV charging stations. The [Electric Vehicle Supply Equipment \(EVSE\) Technician Certification](#) is granted to technicians who have successfully completed a comprehensive training program and passed an exam on the [EVSE Technician Standards and Body of Knowledge](#). Available training programs are listed on SAE's website.
 - b. The [Electric Vehicle Infrastructure Training Program \(EVITP\)](#) provides training and certification for electricians installing EVSE. The website includes a database to find trained contractors.
4. First Responder Resources:
- a. The U.S. Department of Energy's Alternative Fuels Data Center maintains a comprehensive list of first responder trainings and resources on their website of [Electric Vehicle Safety Training Resources for First and Second Responders](#).
 - b. The National Fire Protection Agency (NFPA) produces fire and life safety standards covering a wide array of risk exposure, including electrical safety. The organization offers [free resources for EV safety, emergency response guides for specific vehicles](#), and more.
 - i. [NFPA 70E](#) sets safety requirements for any worker exposed to 50 volts or more. Workers exposed to 50 or more volts must be trained to be "Qualified Electrical Workers" according to the Standard. Training is offered by [NFPA](#) and many others, and workers can receive certification as a [Certified Electrical Safety Compliance Professional \(CESCP\)](#).

Discuss the following prompts as a team:

1. What is your approach to training employees to meet the new skill requirements (e.g., in-house training, "train the trainer," registered apprenticeship, third-party training)?
2. Do you have internal champions or leaders that can become early adopters and/or help you to build out a training program?
3. How will your agency assess the skills of existing employees?
4. Will you need to hire new staff to fill specific skills gaps?
5. What steps will you take to prevent displacement of the existing workforce? How will you engage current workers in the development of your fleet transition plan?
6. Does your regional [Clean Cities and Communities](#) coalition offer relevant trainings, or can they help connect you to local and regional training programs and resources?
7. How will training be funded?
8. Are there any potential barriers to implementing your training plan?

Identify operational planning needs. As team, discuss the following and document your answers:

1. What procedures do you need to establish to ensure charging success?
2. How will you ensure that vehicles are charged when needed and ready for duty?
3. Who is responsible for tracking and monitoring charging?
4. Do you need a charge management system to manage charging costs?
5. How will you avoid peak charging times and demand charges?
6. How will you track and manage electricity costs? Who will be responsible?
7. Do you need to develop new charging protocols and train staff on them (e.g., charging cord/cable management)?
8. How might your fleet electrification plans impact day-to-day operations? Will you need to modify any of your operations (e.g., vehicle duty cycles, parking patterns, timing/handling of maintenance, performance tracking of vehicles with telematics, processes for vehicle issues or downtime, safety protocols, cybersecurity risk assessment, or other standard operating procedures)?
 - a. If so, how will those be updated and who will be responsible? Do you have the data needed to optimize operations?
9. Do you need an ongoing EV fleet working group or committee to support successful planning and deployment?
10. Do you need to make any changes to your vehicle replacement policy to support your fleet electrification goals and enable streamlined decision-making?
11. Do you need a fleet telematics system to track operations?

Summarize your findings and record below. Delete instructions from draft when complete.

Training

Describe the skills, training, and certifications needed to operate and maintain an EV fleet. Describe your municipality's training goals, approach to training, and how you will plan for and procure necessary trainings. Identify potential workforce gaps and how you will work to upskill and avoid displacement of existing workforce. Provide recommendations and costs as possible. See this table from [Richmond, Virginia](#).

Fiscal Year	Equipment	Licenses	EV/PHEV Technician Training	Staff Driver Training	Total Training and Equipment Expenses
2021	\$50,000	\$3,000	\$20,000	\$2,500	\$75,500
2022	\$10,000	\$3,000	\$15,000	\$2,500	\$30,500
2023	\$10,000	\$3,000	\$15,000	\$2,500	\$30,500
2024	\$10,000	\$3,000	\$15,000	\$2,500	\$30,500
Annually 2025-2035	\$10,000	\$3,000	\$15,000	\$2,500	\$30,500

Charge Management

Describe your municipality's approach to managing charging. Describe who will be responsible for charging vehicles, who will be responsible for maintenance, and how you will handle any downtime or issues. Describe any necessary standard operating protocols to be created and implemented.

Will additional analysis or charge management software or services be needed, and how will you monitor and manage electricity costs and adjust your charge management plan over time?

Data and Performance Tracking

Describe your municipality's approach to performance management and tracking. Describe the staff and teams required to measure and track performance, and any necessary telematics purchases or IT upgrades.

7. Conclusion, Summary, or Next Steps

The conclusion, summary, or next steps section should complete your report and leave your reader with an understanding of your overall goals and approach to fleet electrification. It may also include immediate next steps.

Instructions to complete this section:

Restate the purpose of your fleet electrification plan and your overall fleet electrification goals. Summarize your high-level strategy by tying together the sections in this plan outline. If possible, lay out your next steps to begin acting on your plan.