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LESSONS FROM LEADING EV CHARGING CITIES

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FOR CLIMATE AND SUSTAINABILITY
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- City of Ann Arbor
- City of Austin
- City of Boston
- City of Denver
- City of Los Angeles
- City of New York
- City of Oslo, Norway
- City of Portland, Oregon

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Executive Summary

Electric vehicle (EV) charging is critical to enabling EV adoption in your city. Public charging makes owning an EV possible for your residents who cannot charge at home, including those who live in multi-family buildings, park on the street and/or rent their home. A city has many tools to facilitate investment in charging, from directly investing in chargers, to facilitating private investment, to using building codes to encourage investment at multi-family residences and workplaces. No matter what channel(s) your city selects, partnerships play an important role in expanding charger availability, a primary impediment to EV purchases.

This report offers lessons from cities that are relatively advanced in developing public charging for their residents. Based on a June 2024 roundtable of eight early adopter cities (Ann Arbor, Austin, Boston, Denver, Los Angeles, New York, Oslo, and Portland (Oregon), it captures key takeaways for cities that are beginning to formulate their EV programs as well as advice for those operationalizing their programs.

As identified by leading cities, the report focuses on four program considerations: planning, policy, partner coordination, and funding and investments. We outline important choices and tactics for success for both cities preparing to launch their EV charging programs and those now operationalizing their programs. Every section ends with a set of questions that you can use to guide your team's thinking about your own city, whether you are in the process of setting up a plan or adjusting your existing program. While each city is unique, adapting these focus areas to fit your circumstances will help launch and scale a charging program.

Key Takeaways

Program Consideration	Pre-launch	Post-launch
Planning	Whether you begin with a formal plan or not, set operational goals and milestones that are measurable	Shift your focus to program evaluation and improvements
Partner coordination	Coordination and partnership are key – coordinate early and often with essential partners	Explore new partnerships, cement effective partnerships and continuously improve coordination efforts
Policy	Evaluate your policy framework to see where changes could accelerate installation of EV charging, public or private	Re-evaluate city policies to maximize program participation, from installers to private partners to users
Funding and investments	Match program design with the right funding sources	Determine the funding mix necessary to maintain and expand your program

Table of Contents

Pre-Launch

Your city has decided to implement an EV charging pilot or new EV charging program. Where do you start? This section captures steps early adopter cities took in designing their programs. We have distilled their experiences into best practices, examples and opportunities for cities starting to develop their EV charging plans.

The primary goal is likely to launch your city's program with an initial set of chargers, while facing pressure to get chargers in the ground as quickly as possible. To be a lasting success, your pre-launch work should also include setting charger reliability standards to minimize failed charging experiences for residents, a communications strategy so residents know where chargers are, your goals for expanding the charging network, and, critically, strategy and budget for operations and maintenance (O&M) to keep chargers in service.

Program Consideration	**Pre-launch Key Takeaways**
Planning	Whether you begin with a formal plan or not, set operational goals and milestones that are measurable
Partner coordination	Coordination and partnership are key – coordinate early and often with essential partners
Policy	Evaluate your policy framework to see where changes could accelerate installation of EV charging, public or private
Funding and investments	Match program design with the right funding sources

Program Consideration #1: Planning

Takeaway: Whether you begin with a formal plan or not, set operational goals and milestones that are measurable

Your city is ready to start developing EV infrastructure. Before launching a program, cities need to strategize what resources and locations they will need to meet city EV goals. The overall planning process should account for existing initiatives, neighborhood plans, staffing needs and promotional and marketing campaigns to share charger availability with potential users.

SET OPERATIONAL GOALS. Early adopter cities strongly suggested setting operational goals and milestones which are both city and resident focused, whether your city begins with a formal EV plan or not. For example, your city might target having a publicly-available charger within a 10-minute walk of every resident's home as well as an overarching number of chargers, such as installing 500 chargers within two years. Operational goals should be tactical in nature, a step-by-step plan to attain future aspirational goals, like reducing emissions. Clear, transparent and measurable goals also help residents, businesses, charging companies, utilities and other stakeholders understand the scope and objectives of your program and identify how to support your efforts where possible.

"Don't wait until your plan is 100% before installing chargers. Have goals identified, but parallel to that, build the infrastructure."

– City of Denver

Your city's goals can inform the basis of an electrification plan in the future if your city does not have one, or be incorporated into one or more of your sustainability, mobility, or neighborhood plans. For instance, early-adopter cities started their EV charging program as a lever to meet sustainability and decarbonization goals. Among them, half have adopted an electrification plan or are writing one.

Having a plan that sets year by year, decade by decade targets and specific actions to achieve them is far stronger than operational goals alone. Your plan can connect your goals and serve as a roadmap to achieve success. Some states are passing legislation to mandate cities to create EV plans, such as Colorado's law that requires cities and counties to develop a roadmap. Although the law does not provide specific guidance on how to build an effective plan, the plan itself serves as a signal to potential partners and adjacent municipalities.

USE GOALS TO GUIDE SITE SELECTION. Goal setting guides the site selection process by aligning program principles like charger reliability and geographic equity into the location criteria. Early adopter cities identified grid capacity, community input and equitable distribution as key criteria at the pre-launch stage. Cities used these factors to map priority locations, then considered how long people spent at each location to decide whether to install a Level 2 (L2) or DC Fast Charger (DCFC). Most of your chargers will likely be L2 chargers but having some DC Fast chargers is valuable when EV drivers need to charge quickly, or if they park too briefly in that area (e.g., 30 minutes or less). For example, cities prioritized L2 chargers in residential neighborhoods and in office districts; L2 chargers typically can charge a battery to 80% in four to ten hours. Cities also used their own real estate to install L2 charging points at community sites like libraries, parks, and district offices to expedite the installation process while spreading chargers throughout the city.

COLLECT DATA. Make your EV program evidence-based by prioritizing data collection − both the system to store the data, and the staff to manage and analyze the data. Early adopter cities indicated they wished they had spent more time setting up infrastructure to capture detailed data including EV station usage, individual charging sessions, and uptime. This is particularly important for cities that partially or fully contract out charging services. In your procurement process, be explicit in outlining what data will be sent to the city, how, in what format and with what frequency. Define penalties for non-compliance or incomplete data. Some leading cities also added an option to their existing 311 systems or a form on their public websites to enable residents to easily report charger outages.

Monitoring charger usage will help your city evaluate which chargers are highly utilized or underutilized, and where frequent problems arise. This information can then guide where to locate and how to better manage future chargers. Receiving the data is not enough; determine which city team has the skills to analyze and assess charger performance and create summary reports and recommendations for program improvement. If you do not have the right team or they lack bandwidth, consider contracting out the data analysis.

DEDICATE A TEAM. Building the right team within city government is essential. An EV program will interface with multiple city departments (including building and safety, permitting, public property, public works, housing, transportation and more.) These departments need to coordinate their activities and regulations to optimize EV program success and meet overall city goals. Early adopter cities described having dedicated staff in the pre-planning stage as critical to success. Each lead and supporting department assigned staff to the EV program, either on a part-time or full-time basis. Talking with all relevant agencies about staffing needs and the percentage of time needed (e.g., hours per week) will be helpful in securing support.

Be inclusive and reach out to both operational (e.g., transportation, planning) and non-operational (data analytics, contracting, budget) departments and teams. Your city may also need to hire new positions to fill gaps in implementation and program management capacity.

"Hire a team dedicated specifically to this project because it is difficult to manage communications and all necessary infrastructure complications across departments."

– City of Austin

CONNECT INTERNAL STAKEHOLDERS. City officials also emphasized the importance of having all the involved city departments connect early and often. Determine the lead agency and meeting frequency to maximize coordination and communication and work through agencies' differing priorities. Create an interdepartmental committee and develop a matrix of responsibilities (who's installing, who's maintaining or funding third party operations and maintenance (O&M), who's funding capital?). Consultants with technical expertise will be helpful in setting specifications and program requirements.

"Having a codified carbon neutrality plan has been a huge benefit, giving staff direction."

– City of Ann Arbor

Beyond identifying the right departments for your team, seek commitments from department heads and city leads that can commit top-down direction and leadership on EV goals and implementation. This can be useful in moving the needle on both internal and external electrification goals. In the City of Austin, the transportation department lead mandated electrification throughout the department's fleet that met departmental mission when purchasing new vehicles. Consequently, the transportation department became the most electrified of city departments due to leadership commitment.

USE COMMUNITY CHAMPIONS. Use community champions to engage residents and share information about the program. Many leading cities said they should have done more community engagement at the beginning of their programs. Communicating the city's EV program vision and how it will benefit residents will be important in building support. Invite community members to participate and offer feedback in the location selection process. Your city can then consider community input along with DMV (Department of Motor Vehicles) data on vehicle ownership, where the city owns land to potentially site chargers, and other factors like global city and EV program goals. Partner with valued community champions and organizations that can help spread the word about the new charging program to reach more residents.

Develop a marketing and communications plan to let residents know where chargers will be located (e.g., "Coming soon, an EV charger near you" or placing stickers on the adjacent sidewalk/parking spot saying, "Future EV Charging"). If residents do not know their charging options, they could bypass the closest locations and drive further to recharge their vehicle—and feel unnecessarily frustrated about the time to get to a charger. Implement your marketing plan after chargers and related operations are in place. Consider whether local nonprofit advocacy organizations can help amplify your message.

Questions to consider during your planning process:

Building your program structure:

- What are your program goals and are they measurable? Are your goals a mix of output (number of chargers) and outcome goals (average utilization)?
- Does your city want to test different types of charging products (e.g., chargers with cords, chargers without cords; e.g., chargers with different power outputs, 7kW or 19kW)?
- What is your charging program focus? Do you plan to install on city properties, public right of way? Will you incentivize private property owners to install charging and how?
- What criteria will your city use to select your charging point locations?

Measuring program success:

- What does success look like in your city? What is a "successful" EV program?
- How will you collect charger data? With what frequency?
- If you are contracting with a third party to supply or manage chargers, does your contract ensure data access on charger use?
- Will city staff analyze data, or will an outside resource like consultants or a university manage the data analysis?

Assembling the city team:

- Which departments need to be a part of the program team? Who will serve as the lead city agency? Who is responsible for maintenance and operations?
- How many hours do you estimate needing from each supporting agency? Does this translate to one full-time staffer or several part-time staffers?
- Should your city hire consultants or technical experts to help us design the program?

Engaging with the community:

- Which engagement channels should your city use (e.g., neighborhood events, community meetings, social media, etc.)? Which can be used to solicit feedback on the EV program and potential locations?
- Which community organizations should your city partner with to share EV charging information?
- What messaging (including non-English languages) and messengers (e.g., trusted community voices) should your city use to most effectively solicit community input?

Program Consideration #2: Partner Coordination

Takeaway: Coordination and partnership are key – coordinate early and often with essential partners

Many stakeholder groups may be eager to help with EV efforts, whether they engage with the city or manage their own EV infrastructure on private property. Building relationships with different types of location owners and charging point operators (charging operators or CPOs) can help the city expand charger locations and bring funding and expertise.

ENLIST EXTERNAL PARTNERS. Cities do not need to build on their own; partners can play an important role in building out and maintaining your charging network. Essential partners include other city departments, your local utility, and private charging companies. Other partners, including commercial property owners, businesses, employers, condo owners and multi-family unit landlords can also help expand the overall network at different types of locations. Dedicating a city employee as the EV liaison or concierge can help build successful partnerships that collectively accelerate the EV program. Many cities like Los Angeles already use the concierge model to help developers navigate city permitting processes.

"Build private partnerships early. Our experience is that a city needs dedicated staff for charging partnerships with the private sector."

– City of Portland

COORDINATE WITH CITY COLLEAGUES. The city can lead, co-lead, or play a supporting role in the build out of the charging network. Among early adopter cities, internal lead departments varied from the transportation department, Mayor's Office/City Manager; climate/sustainability office; or the municipally owned utility, if your city has one. Other cities take a hybrid approach where two entities serve as co-leads, whether it is two city departments (e.g., planning and transportation) or the utility and city department (e.g., local utility and Mayor's Office). Here each co-lead offers expertise needed for the program (e.g., sustainability office coordinating citywide climate strategy with transportation department implementing green mobility efforts). The co-leads may need to establish an interagency MOU to share data and resources and to track program progress. The key is that there is a dedicated team focused on this project and with accountability.

CHOOSE YOUR STRATEGY. Cities can take multiple approaches to EV charging, from owning the chargers to outsourcing the program. Below are ways that cities have chosen to implement their program:

- The city can choose to fully manage the charging program, from purchasing, installing and maintaining chargers to analyzing charger data. Doing so may involve reassigning or hiring staff for a dedicated EV team.
- The city can purchase the chargers and outsource operations and maintenance to a CPO. Your charger purchase contract should include warranty replacement clauses for chargers repeatedly out of service; your maintenance contract should include repairs, SIM card errors, and data feeds for operators.
- Cities can choose to outsource the program entirely with a charging operator (CPO) installing, owning, operating, and maintaining chargers. If your city takes this path, include service guarantees in your contract to ensure downtime is minimal. Even if charger installation goals are met, your program could lose momentum if chargers are consistently not working.
- The city can make public property available to charging operators for charging installations at their expense.

PARTNER WITH YOUR UTILITY. Your local utility will play an important role in the success of your EV charging program. Utilities will identify locations that have sufficient power capacity to install chargers immediately and can enable additional capacity to support chargers in other locations. Installing additional power can take time, making it critical to coordinate early and often with your utility. Some utilities provide incentives for home charging and more. If you have a municipally owned utility that is leading the city's efforts, it could fund, install, and maintain city chargers on its own. Some utilities may also own land in highly trafficked areas that can host chargers. City departments can support the utility's effort by providing access to public property and expediting or waiving permit fees.

"New York City has 1.8 million private registered vehicles and is trying to fully electrify by 2050. We have a lot of chargers in the pipeline, including putting DC fast chargers into areas where the private market is not investing as much. And we still have more to do."

– City of New York

DON'T OVERLOOK OPERATIONS & MAINTENANCE. Charging operators are experts in EV charging and have taken a management role in some leading cities. Cities may lack technical expertise on EV charging hardware and may not want to own the charger assets. Partnering with charging operators can provide specialized support and reduce the program cost. A CPO may be willing to fund the installation and maintenance of chargers if given access to city property (parks, libraries, city complexes like City Hall, district offices, etc.) or private sites (parking lots, retail locations, apartment complexes, etc.) The city can also lease or sell excess, unused, or underutilized land to a CPO to provide charging access.

"We now have a maintenance contract with a local firm. Delegating clear responsibilities for maintenance to them has worked well and taken a burden off the team."

– City of Denver

SEE PRIVATE PARTNERS AS MULTIPLIERS. Private partners ranging from retail owners to landlords can help build out your city's charging network. Private partners (charging companies, residential and commercial landowners) may offer charging points in your city as a service, without city investment. In one-third of early adopter cities, most publicly-available chargers are on private property like malls and apartment buildings. Cities can aid these private efforts by removing zoning and code impediments as well as allocating staff to promptly review permits, assess grid capacity, and otherwise support private charging installation. Your city can also lower hurdles by producing a guide to installing EV charging for businesses and residents. For example, the City of Boston has online guides for workplace and residential EV charging programs (1). While small business owners may not have the individual resources to install chargers, they can partner with neighboring businesses; business districts and neighborhood business associations can pool resources to purchase chargers for their businesses.

PARTNERS CAN ALSO HELP EDUCATE. Most cities will focus on partners to expand their charging network and rely on community organizations for input and feedback on charging locations. Partners can also help educate potential buyers and charging users on issues like awareness, the charging process, and range anxiety. For example, TXETRA (the Texas Electric Transportation Resource Alliance) takes electric roadshows around the state to demonstrate EV buses, trucks, school buses, cars, etc. in parts of Texas that might not yet be familiar with the range of electric options. This effort has yielded positive responses in rural Texas school districts that are now investing in e-school buses.

Questions to consider for your partnership strategy:

Leading the charge:

- Will the city lead/co-lead the charging program or rely on private partners for installation?
- How are you engaging with your local utility? Are you co-developing a map of locations with capacity for future installation efforts?
- Which charging program model is your city implementing? Will the city own the hardware or outsource the installation and maintenance?

Partner engagement:

- Who are your potential partners and how will you engage them to support the charging program? (Include both city departments and external entities)
- Do you have a main city contact for private firms or charging operators that want to install on city or private property?
- What role do charging operators play in your EV charging program?
- Do you have regular meeting cadence for your largest or most active partners?
- How are you conducting outreach and feedback with mall operators, multi-family buildings, grocery stores, hospitals, commercial property owners, etc. to encourage EV charging on private properties?

Program Consideration #3: Policy

Takeaway: Evaluate your policy framework to see where changes could accelerate installation of EV charging, public or private

Some cities began their EV journey by setting installation goals and identifying funding. Other cities have taken more time to set a policy agenda that highlights policy levers they will use to increase EV charging throughout the city. Indeed, one early adopter city cited that a key success of its program was its toolbox of policy measures including regulations, incentives, subsidies and deployment of chargers, building codes, public procurement regulations and consistent policy over time.

Your EV policy should draw in those EV charging allies and remove unnecessary policy obstacles to installing chargers. Thus, this section highlights policies to aid private partners as code and building revisions are places where cities often focus first.

CREATE A POLICY AGENDA for your city so employees, businesses and the public understand EV charging goals. If your city does not have a policy team, the Mayor or City Manager's office may provide policy direction, which could include assigning specific departmental tasks (e.g., drafting language for ordinances that require new sites to have EV charging), outlining partnership models (e.g., relying on private charging firms for installation), and identifying the initial focus areas (e.g., residential communities, employer sites, shopping centers). If your city chooses to write a policy agenda, that agenda will often come before the planning process. Ensure that external entities that are interested in providing charging solutions or charging locations are aware of the city's focus areas and can leverage the city's position with their own efforts. Access and visibility into goals builds trust and momentum among stakeholders. A clear policy agenda can also ease concerns from private sector partners, from charging operators to shop owners and landlords, who want to contribute to your city's network but may hesitate due to the perceived (or real) barriers they may face in the installation process.

"We started by introducing public chargers in areas with high demand, mostly high-income areas, and then gradually became more equitable. You want to strike a balance between recovering costs from EV chargers and incentivizing people to actually switch to EVs."

– City of Oslo, Norway

EVALUATE THE CURRENT POLICY ENVIRONMENT and identify regulations that are a barrier to charging. Every leading city made policy changes to support their program. Most commonly these changes dealt with code, zoning, and permitting rules. These changes affected chargers on both public and private property. Once the Mayor or City Manager's office has provided policy direction, begin by having each relevant city department review its regulations to identify opportunities that would enable faster EV adoption. Ask them to highlight benefits and drawbacks of making each potential policy update. Using that list, work with the Mayor or City Manager's team to make a list of priorities in terms of updates to codes and regulations, weighing impact with time and difficulty to implement. Not every potential update will gain approval. Focus first on updates that can lead to early wins for the charging program.

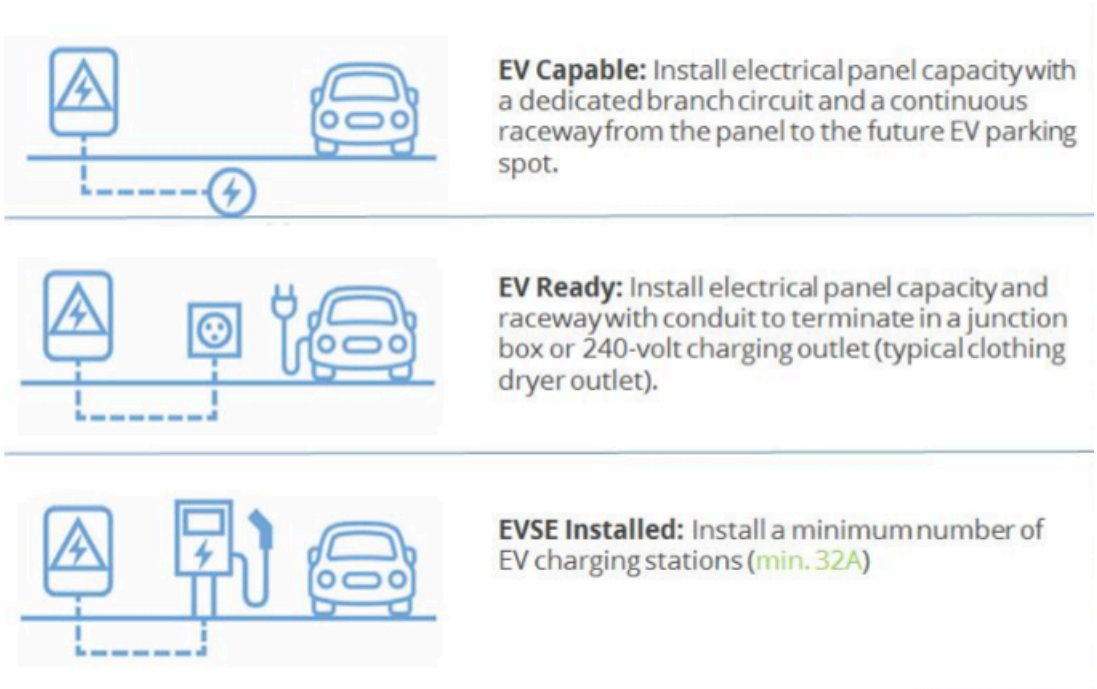
"'Right to Charge' is a home rule law in Boston that protects property owners from being prohibited or unreasonably restricted by associations from installing charging stations in or near parking spaces dedicated for their use, making it easier to own an EV."

– City of Boston

SIMPLIFY CODES to speed up EV installation at both existing and new build sites. Cities need to make two decisions: 1. How should the code address different building types as well as reference new development and existing sites? 2. Do you want to require charger-readiness or chargers themselves?

For new development, cities often negotiate with residential and commercial developers during the pre-construction stage (e.g., allocating more apartment units as affordable units can lead to variances for higher building height). Cities can do the same for EV charging points by setting or increasing the percentage of parking required for EV charging and decreasing the overall parking requirements at the site. Other cities have gone further and passed EV mandates which require proactively installing the electrical infrastructure needed for future charger installation (e.g. all new surface parking with ten spots or more are required to be charger-ready in 10% of spaces), which is significantly cheaper than retrofitting space in the future. The City of Austin is currently considering building code changes that will require all new construction to be EV Ready (i.e. new construction will require an additional 240-volt circuit for future EV charger implementation. This adds about $120 to the cost of providing a residential unit; but drastically reduces the cost of future implementation of a fast charger by a homeowner. Approving these types of mandates required more effort to implement; but also had higher impact dividends for leading cities.

Three Tiers of EV Readiness



source: https://www.orlando.gov/files/sharedassets/public/v/1/departments/edv/accc-ev-ready-commissioner-briefings_updated.pdf

Cities can also influence land use at existing infrastructure and buildings. Several early adopter cities have passed EV parking mandates for new and refurbished parking lots, garages, renovated commercial spaces, etc. These set a minimum percentage of parking spaces that must offer EV charging or be EV ready. Major renovations to commercial and residential properties are also subject to EV-capable parking requirements.

"Charging spots used to be underutilized and in the back of parking lots. Now chargers are in prime front parking spots."

– City of Austin

IMPLEMENT PROCESS IMPROVEMENTS along with code updates, to expedite private installation efforts. Leading cities recommended both policy and process updates. However, your city may prefer to wait to revise regulations until data comes in from the charging program. Instead of altering city policies and regulations prior to program launch, you can create procedures that permit waivers, expedited review for EV installations, or both. Many early adopter cities use expedited review. Permits give cities information on what types of locations (e.g., apartments, single family homes) and charging units (L2, DCFC) are being requested. Waiver approvals can require uptime percentages along with penalties for extended down times (e.g., permit approval requires 95% uptime; data feed must be established with the city; if uptime not maintained, permit can be revoked).

Questions to consider in revising policies:

Setting your policy agenda:

- Do you have a policy agenda that guides city departments on their role in the program?
- Have city departments evaluated policies that inhibit EV charging installation? Have they recommended changes?
- In setting your agenda, how have you engaged with external partners such as utilities and private property owners?
- Have you identified roles, locations, and funding to maximize your network when it launches?
- Did the public have a chance to provide input on your agenda?

Partner engagement:

- Do your policy goals conflict (e.g., reducing parking and increasing EV parking) and how do you intend to resolve them or mitigate consequences?
- How are you working with your City Council to secure support and gather feedback on code updates? Are you implementing any waivers for EV installations?
- Do you have a policy review process in place? How will you re-assess your EV policy after launch?

Program Consideration #4: Funding and Investments

Takeaway: Match program design with the right funding sources

Cities have many pathways to fund their EV launch. Depending on how quickly your city aims to expand charging locations, it may be able to secure external funding from the federal government, state, or charging operators without using any city funds. Carefully consider the tradeoffs of your funding model; resident preferences on speed (i.e. faster charging preferences); potential funding and installations from utilities and private owners; and unexpected expenses like charger repairs as you build your budget.

LEVERAGE FEDERAL FINANCING. Early adopter cities jump-started their EV charging programs with state and federal financial incentives. Cities can align program goals and funding needs to apply for several federal funding opportunities including the Bipartisan Infrastructure Law's discretionary community and corridor grant programs. Be selective in deciding what programs to target; you cannot apply for all programs nor align your plan with all funding sources. Look to leverage grant funding with other financing sources via private partners. Some grants, however, require city matching funds.

"Building coalitions of diverse communities can be useful when applying for funding. Technical assistance opportunities and coordination with regional planning entities can provide these opportunities for collaboration."

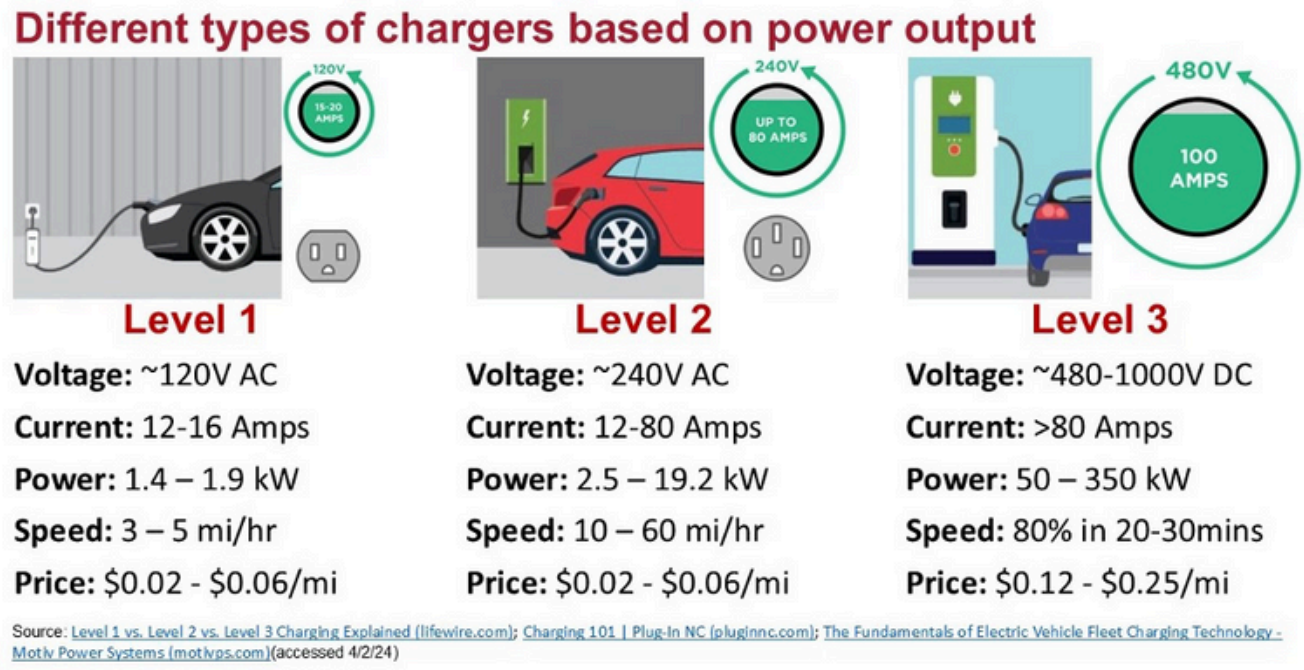
– City of Ann Arbor

CORRAL LOCAL RESOURCES. Most early adopter cities also budgeted local resources to finance their public network. Among the models your city can consider:

- Use its own budget to cover the launch
- Apply a cost recovery model where the city will fund or recoup some or all the program cost (e.g., staffing)
- Dedicate a specific revenue source to fund the program
- Use a public-private partnership model.

If the city is leading and self-funding the launch, coordinate with utilities and private partners so they can invest money and contribute physical space during the launch stage. This coordination may help avoid duplication of efforts and lead to a larger network of publicly-available chargers in a variety of settings (single family homes, multi-family, commercial centers, etc.) than if the city managed the installation on its own.

ASSESS RESIDENT NEEDS. Your program costs will also vary depending on your residents' needs and preferences. If residents' demand for public charging is driving your program launch and associated funding, it will be critical to understand your residents' willingness to pay and willingness to wait in deciding the mix between L2 and DC Fast chargers and the types of places each should be installed (e.g., residential neighborhoods, business districts). A launch with more DC Fast chargers may drive enthusiasm for EV adoption; other cities may find that it is more cost effective to install L2 chargers even if speed is important to residents. Several cities have focused on L2 chargers with their funding, relying on private partners to install chargers with faster charging speeds due to higher costs. Evaluate charger performance and, if your city is outsourcing operations, uptime guarantees as part of your procurement process; the cheapest charger in terms of upfront cost may have more downtime and longer repair times based on the experiences of other cities.



CONSIDER LETTING YOUR UTILITY LEAD. In EV charging programs, unlike most other city programs, your local utility can be the lead agency. Two early adopter cities whose utilities are privately-owned cited incentives and conversations with their utilities as a motivator in starting their programs. Creating a strong partnership with your utility, whether it is municipally-owned or not, will help the city understand the utility's EV goals, identify supporting roles, and possibly influence location criteria. Given forecasts for EV adoption across the country, utilities already may be planning infrastructure upgrades (e.g., transformers) to meet predicted demand.

Even in a supporting role, the city can still implement a smaller EV program which can install in locations that are not a priority for the utility but are considered important to the city. The city and the utility can also make an agreement to share expenses. For instance, utilities may be willing to manage charger installation using their staffing and financial resources, allowing the city to fund maintenance, thereby lowering the cost for both organizations.

LEVERAGE PRIVATE PARTNERS. Relying more on private partners to build out your city's network can reduce the city's investment costs. If the city cannot fund as many chargers as it wants at the program's start, it can allow private partners to install and maintain chargers on municipal property like libraries and parks. Since most residents' charge at home or at work, the city can work with residential property owners to alleviate some of the cost and regulatory burden with retrofitting buildings. A dedicated liaison can serve as a navigator to expedite permits, building and code reviews, etc. The city can also set up web pages that link state and federal resources like the Inflation Reduction Act, which provides tax credits for installing EV chargers (e.g., businesses get up to 6% of the cost, or up to 30% if it meets prevailing wage and apprenticeship standards. Some cities also offer their own rebates for charging stations).

USE CITY PROPERTY. Installing chargers on city property will be easier than installing curbside charging at program launch, given the additional complexities of urban design (e.g., bike lanes, bus rapid transit, parking). If curbside charging is part of your launch strategy, the city can encourage charging operators to invest in chargers by giving them free access to the public right of way for a fixed period, after which a leasing fee will apply. The city should collaborate with its CPO partner(s) on a set of locations that are acceptable to both parties, recognizing that private charging providers bring experience about what has worked in other cities. The city can also dedicate fees from existing programs (e.g., business licenses) to raise a mobility fund that will invest in EV efforts across the city.

FOCUS ON FUNDING. Preliminary discussions on stable, long-term funding sources should happen before program launch. If the city is in the process of adopting or has adopted a formal plan that includes EV charging, consider creating a funding roadmap so officials and the public understand where and how the charging network will be built. Be creative in exploring all revenue paths to create long-term stability for the program (for example, a special revenue fund from a voter-approved sales tax that funds all climate related work). Some funding paths will take longer to pursue, especially grant funding, and discussions may need to begin prior to program launch.

"Budget for maintenance!"

– City of Los Angeles

ENSURE RELIABILITY. While moving swiftly toward rollout, take steps to ensure chargers will be reliable at launch. Meeting the charger goal will not serve residents well if the chargers are out of service. Though newer assets often require less maintenance, it's critical to put in place an O&M plan before launch. Charging users often don't know and don't care who owns a chronically broken charging outlet; they only know that it is or is not working. A high number of outages shortly after launch could stall program momentum. Consider setting aside some maintenance funding to be used "as needed." If the program is outsourced, ensure that O&M is included in the requirements, even if it is not needed right away.

Questions to consider in funding your program:

Funding sources:

- Will the city use its budget to start the charging program, rely on grants, or use a combination of funding sources?
- If the city plans to rely on grants, do you have resources to write and assemble grant materials (in house or consultants)?
- Have you discussed funding with your local utility?
- Have charging operators expressed interest in installing chargers? Are they seeking access to public property? What are the ways in which your city will engage with charging operators, from informal outreach to formal RFQs?
- Will your program include incentives for users at the launch, like free overnight charging, and who will pay for these costs? Will incentives be capped at a certain level (dollar amount, three free charging sessions per household/card, etc.)?

Funding channels:

- Has your grants writer/team developed a timeline of available grants and timelines? Which grants require matching funds? Which grants tie to city goals?
- If self-funding, have you determined a funding model (cost recovery, fee based, etc.) for the EV program? How have you engaged with the budget office to allocate funds?
- Do you have a funding roadmap for your program? Will it be funded as a standalone program, or use pooled funds from dedicated sustainability or mobility program sources?
- Have you planned for unexpected expenses like EV charger outages and maintenance?

Post-launch: You've Launched! What Next?

Congratulations, you have launched your city's EV charging program! Your next goal should be to evaluate your incoming data streams, glean insights, and make adjustments. A top focus should be customer experience and operations. If charger reliability is lower, consumers may make different decisions about charging location, affecting their overall sentiment about EV convenience versus gasoline vehicles. Therefore, creating processes for identifying and quickly repairing broken chargers is critical.

You also want to position your city's charging program for long-term success, which requires continued access to budget and staffing resources. Your communication strategy should keep focus on the program: having the public, partners, and members of the city's team share their stories on using, installing and maintaining EV chargers can elevate awareness of your charging program and generate excitement about EVs. Plan and staff for an ongoing effort to find new partnerships and funding that will help expand publicly-available charging stations where residents need it and ensure the supply of chargers keeps pace with growing demand as more residents buy EVs.

Program Consideration	**Post-launch Key Takeaways**
Planning	Shift your focus to program evaluation and improvements
Partner coordination	Explore new partnerships, cement effective partnerships and continuously improve coordination efforts
Policy	Re-evaluate city policies to maximize program participation, from installers to private partners to users
Funding and investments	Determine the funding mix necessary to maintain and expand your program

Program Consideration #1: Planning

Takeaway: After launch, shift your focus to program evaluation and improvements

Once you have launched your city's charging program, your next goal should be to observe and make adjustments. Evaluate data from the city's chargers and resident feedback to guide the next stage of your program. The city's program team, including any close partners from outside city government, should revisit your metrics and data systems, the structure and membership of your team, and how to best gauge and gather feedback from users on their charging experience.

REVIEW INITIAL METRICS. Using your initial metrics, reassess if the program goals are still realistic and achievable on a regular basis. Your city may have "backed" into your first charger goals based on grant allowances, city budget and charger cost. Based on the data you now have, your team can recommend more accurate, more aggressive, or more lenient medium- and long-term goals. You may choose to focus on reliability if your city is experiencing many non-working chargers, on expansion if you have a high number of charging deserts, or both. Sharing the data with charger providers can help them improve their product and service levels, particularly if you are tracking data in city systems like 311. Leading cities recommend using data points to make operational improvements, adjust contractor terms, and revise metrics as more data becomes available. Review and report what is working and what is not working on a monthly or quarterly basis.

"You want to have EV-specific goals that are close in time. Right now, our goals are 'by 2050,' which is a big goal but almost too far away to think about."

– City of Portland

USE DATA. By measuring system performance using multiple KPIs, the lead agency can build a case for expanding wisely with investments informed by data from the early chargers—or could conclude that the data does not support it. Examine the effectiveness of your initial site selection by looking at your criteria and determining if they produced the anticipated results. You should also review neighborhood access and geographic equity in your current program. Even if the chargers were operational, evaluate whether they provided a good user experience. If the results were better or worse than expected, you should adjust your criteria and apply them to new locations (e.g., if parks prove to be popular locations, install chargers at more parks around the city). For leading cities, the criteria that rose most in importance after launch were community feedback and multi-family units.

"We have a very ambitious goal of neutrality by 2030. We used DOE's tool, EVI Pro Lite, to set specific goals in terms of numbers of EV chargers."

– City of Ann Arbor

Cities should also consider if they have a sufficient range of data to evaluate the success of a charging station. Think about the data you have in the context of your criteria and tie it back to your long-term goals. What other criteria can help your program and demonstrate progress to your stakeholders, including your EV drivers. Cities can consider a range of variables like uptime, number of users, distribution, chargers per 1000 residents, economic activity generated at adjacent location, etc.

ASSESS TEAM STRUCTURE. Your ongoing program team may be different from your launch team. Maintaining cross-departmental relationships remains important, but the core program support team may need to change. For example, staff that may have been available for the pre-launch effort may no longer be available. Reaching decisions on a long-term staffing model (such as staffing from current city staff, hiring a dedicated team, or contracting out part or all the services and maintenance) will help propel your EV program. The right staffing will be influenced by your funding sources, program success to date, and city preferences on whether to maintain ownership of the program. Make sure to assess technical staffing needs (e.g., data analysis) and also include external partners in status meetings and relevant program discussions.

"We doubled our team size from one person to two."

– City of Denver

COMMUNICATE, COMMUNICATE, COMMUNICATE! Communicating is not only a pre-launch activity; it also continues throughout the duration of the program. In addition to city communications staff, use community messengers to champion the city's EV program. Your residents can be a powerful force in creating word of mouth, suggesting new locations, and providing feedback on chargers themselves. Many private companies use focus groups to gather feedback on product design and experience. Cities can similarly create an opt-in community where the city can contact residents on a quarterly or yearly basis for qualitative feedback on their experience with charging. Use these sessions to uncover insights on charging location choice (e.g., are residents charging at a location further from their home base and why). Residents may use a variety of locations (or only one) because of awareness or lack thereof.

"Early on EV charging sites were chosen based on opportunity and there was very little communication with the public. For our curbside program, we conducted a citywide site analysis and engaged with stakeholders and community groups to identify locations, and we work closely with the Mayor's Office to communicate the program."

– City of Boston

Your city can also build its data infrastructure to share charging information with the public, in addition to meeting internal needs. Using your city data team, external consultants, or a data contractor, build an EV website that includes a charger location map so residents can easily locate chargers. Maps can indicate which chargers are working and available, in-use, and out of service along a trip route to ease drivers' concerns. Posting the real-time status of your city's chargers on an application programming interface (API) will help your residents and visitors successfully navigate to a working charger in your city on the first try, in whatever app they prefer to find chargers (e.g., PlugShare, Google, or Apple). Posting real-time data will be particularly valuable for attracting visitors who are road-tripping in an EV. If finding a charger is easy, they are more likely to plan a charging stop in your city—and visit city attractions and businesses while they charge. As data becomes available, use the website to share charging stories from residents and to make your storytelling more powerful (e.g., charger at x location has the highest utilization).

DON'T FORGET TO CELEBRATE! Standing up a new program is a hefty effort. Set near term EV goals and celebrate milestones (e.g., residents logged 1,000 hours of charging at x location last week). Encourage residents to take photos while they are charging and tag the city on social media. Producing an annual report sharing program results with the public can keep positive focus and drive motivation for further gains.

Questions to consider in funding your post planning process:

Measuring expectations:

- How does actual EV charging usage in your city compare to your goals? Where has the city outperformed? How can the city increase utilization rates at sites with lower usage?
- Does your city need to adjust its criteria based on resident charging patterns and charger distribution?
- Are you receiving data from charging operators (outsourced) or the chargers themselves (in-house) to make program improvements?
- Do you need to adjust contractor terms and service expectations?
- Are you ready to expand the focus of your program, or continue with the same strategy you had at the pre-planning stage?

Assessing staffing structure:

- Does your city need the same staff during the operational phase of the program compared to the launch stage?
- Are you missing key areas in your staffing mix, or can you reduce staff time for some departments now that the program has launched?
- Did your city hire, use, or contract the right technical skills for the program? (ex. data analysts, GIS analysts, etc.) Did you use in-house staff that are overcapacity or outsource work that can be brought back in the city?

Overcommunicating and engaging residents:

- How did you communicate the availability of chargers to residents? Did you use neighborhood specific organizations or community champions to announce the launch?
- What tools do you have to share charging information (ex. online maps, integration with mapping apps, etc.)?
- How are communities reacting to the charging program? Are they happy with the charging experience?

Program Consideration #2: Partner Coordination

Takeaway: Explore new partnerships, cement effective partnerships and continuously improve coordination efforts

After launching your program, the city may want to take some time to see how residents are responding to the charging program. Use this time to uncover ways to improve internal coordination and assess external partnerships. If your city has a formal partnership strategy, examine if any amendments need to be made to strengthen it. Some early adopter cities revisited their program role, knowing that no city can do all the work. Think about your network and how different types of partners can help close gaps.

MEET WITH YOUR CITY TEAM. Have your lead agency host a meeting to share successful coordination tactics (e.g., monthly meeting sync up; monthly progress report; downtime report) that should be continued as the program is operationalized and identify areas meriting adjustment going forward. Include partner feedback to understand if the current communication cadence is sufficient.

Most early adopter cities emphasized the need to continually coordinate and communicate across relevant city departments. If you did not organize an interdepartmental task force during your pre-launch planning, post-launch is a good time to consider coordination for the ongoing program team. Use technology and data visualizations to streamline information sharing (e.g., new chargers online, out-of-service chargers, total number of city chargers) if this information was shared manually in the pre-launch stage.

"We have a monthly EV Task Force meeting with all the relevant city departments, including the municipal utility."

– City of Los Angeles

COORDINATE WITH YOUR UTILITY. Strengthen the collaboration between city and utility on EVs. Understanding power needs for the transportation sector is a new area for both parties. The utility may elect to be more or less involved (e.g., serve as lead agency or provide data on grid capacity at locations). Regardless of the level of partnership, conduct a post-mortem to identify areas that are working well and areas for improvement now that the program is in place. If you co-developed locations for the first phase, discuss how the city and utility can work together to develop a longer-term roadmap that integrates planned power upgrades with potential charging locations that may need additional power capacity (e.g., the utility may be planning to upgrade, bury, or replace power lines in preferred charging locations).

This can help avoid conflicts between city and utility efforts (e.g., city creating bike lane on street with utility-installed EV charger). If you have not yet put an MOU in place for data and resource sharing, consider framing one now. Multiply funding options by discussing new funding streams that the utility and city can apply for, respectively.

"Grid planning is crucial to figure out how much electricity is necessary for EVs. We need many smart grid solutions to ensure that even if everybody is plugged in, the electricity grid can keep up."

– City of Oslo, Norway

CONTINUE OUTREACH and develop partnerships with private property owners who can offer charging at their sites. Private companies may install or host many of the chargers in your city that serve the general public or selected groups like their customers, employees, or residents of a multi-family building or development. Evaluate the city's full charging network including chargers on public and private properties, and identify places where new partners can install publicly-available chargers on private land. You may also want to assess if most privately-owned chargers are located in neighborhoods with little or no transit access, and whether chargers are readily available in transit deserts to enable another green travel option. Work with current and new private partners to understand if waivers or code revisions have encouraged installation and continue to identify ways that the city can ease installation costs and concerns. Using charger data, you should determine whether demand grew after the first charger was installed. A survey of local businesses could help you determine whether charging usage generated interest in hosting chargers from other business owners or retail property owners. Think about an annual meeting that brings both public and private partners together to celebrate and fine tune the program. Though the city is able to install in many places, chargers on private property play an important part in your city's network.

"Our goal is that everyone in NYC is within 2.5-mile drive of a DCFC. We know we will need private sector support to achieve it."

– City of New York

EXPAND YOUR PARTNERSHIP POOL and approach new partners that own property where EVs could charge. The city should continue to allocate staff to conduct outreach to healthcare facilities, parking garage owners, school districts, taxis, etc., and think how to broaden beyond initial partner categories, including through organizational partners like the local chamber of commerce or other business alliance.

Use testimonials from current private partners to encourage broader private property owner participation, and develop materials, checklists, and guides for future installers. In denser parts of the city where businesses do not have dedicated parking, think about building a coalition that can contribute to installing charging in shared parking lots, either for car charging or broader charging efforts for e-bikes or smaller delivery vans (e.g., mobility hubs). The city can also reach out to gas stations to encourage them to install some fast charging. In Oslo, former gas stations are converting to EV charging stations. Local non-profit and advocacy groups can actively promote electrification within the community and uphold program successes, etc. following city government transitions.

Questions to consider in gauging your partnership strategy:

Internal city coordination:

- What information was most valuable to relevant departments? Did departments receive information at the needed frequency? What was missing?
- Was the right staff assigned to the team to communicate within the city and with partners? Are staff from different teams needed, particularly if you are considering expansion?
- Did meetings provide enough information to all parties about the progress of the program?
- Is coordination within city government working well? Have there been any instances where one department has reallocated space reserved for future EV charging?
- Were all parties able to communicate issues and resolve them? Are more informal teams needed?
- Can some reports be auto generated and auto sent to save staff time?

Effectiveness of current partners:

- If your city's utility has taken the leading role, have they prioritized the program amid other utility goals? Is there a primary contact at the utility that the city can contact? Does the utility know who to contact at the city with their questions?
- Has the utility been responsive to questions on grid capacity and homeowner incentives, etc.?
- If private partners are leading installation efforts, how well did they meet targets for the launch? Were there targets for private property?
- Are privately funded chargers in working order and are they repaired within an acceptable time?
- How successful has the city been in engaging business owners in converting parking places for electric charging purposes? Does the city have an inventory of publicly-available charging stations on private property to measure parking gains?
- Have on-site/adjacent charging stations increased foot traffic in retail areas? Could this be used to justify or encourage other business owners to install chargers?
- How well is information being shared across partners? Did you meet with your partners after the program launched?

Exploring new partnerships:

- Is the city's current partnership model working? Are there opportunities to formalize partner outreach and materials?
- How is the city conducting outreach with property owners?

Program Consideration #3: Policy

Takeaway: Re-evaluate city policies to maximize program participation, from installers to private partners to users

Now that your program has launched, collect data from your city team (including the building and safety, housing, transportation, public works, parks, and code departments) to gauge the effectiveness of your current policy toolbox. You may want new or revised codes, or a change of direction on the types of chargers or locations.

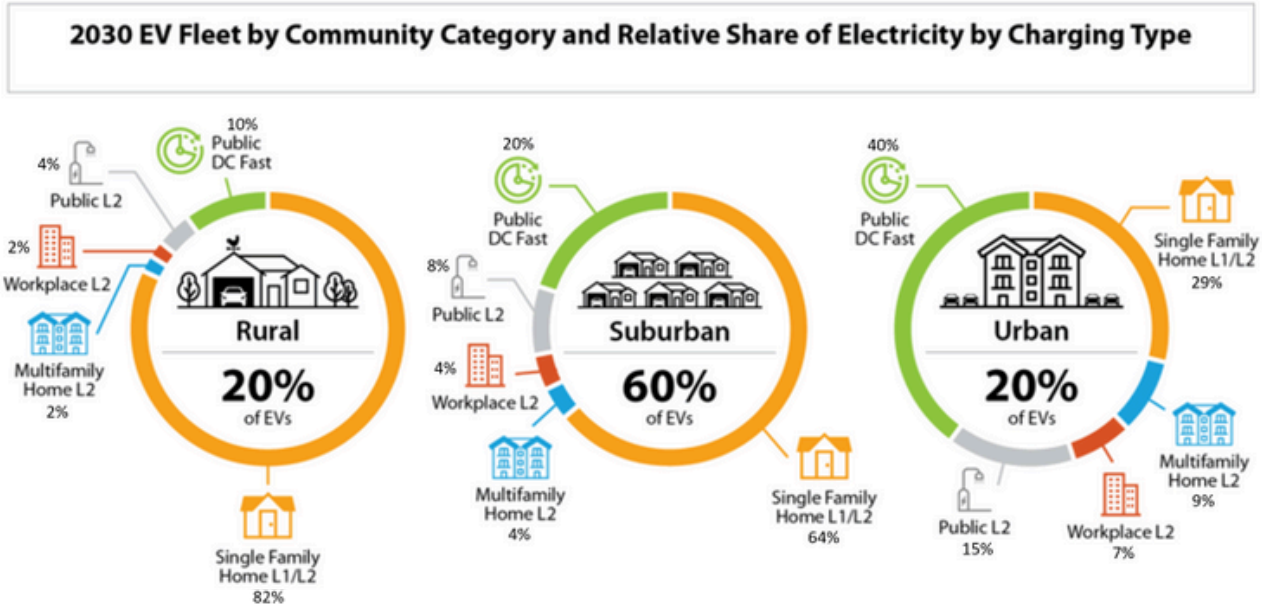
HARNESS QUALITATIVE FEEDBACK. Use both quantitative and qualitative information to assess whether program policies have been effective and met desired outcomes. Are your city's charging policies leading to the intended results (e.g., did new parking requirements deter parking garage retrofits, help increase business sales at lots with EV parking, raise development costs for new apartment buildings, etc.)? You may want to revisit and revise some policies based on feedback from installers and residents (e.g., gradually increasing the percentage of parking spaces required to have charging in large parking lots based on high shopper demand at malls). If the city did not make major policy changes before launch, consider learnings from other cities and your own data to identify important modifications to grow your program. Determine the right policy review window (e.g., a few months, a year) and adjust your policy as needed.

ASSESS HOLISTIC UTILIZATION GOALS. Review beneficiaries from current EV charging placement. Before the launch of the program, your city likely made decisions on charging locations and funding sources, implemented code changes, or passed new ordinances. Review your incoming charging data and determine if more sophisticated utilization goals that break out neighborhood and location performance can be added. This will help your city verify which communities are benefiting from the program and where new chargers should be installed to close charging gaps. You may have instances where chargers have very low utilization rates but are necessary because, without them, that area would be a charging desert. Having chargers enables residents to choose an EV; and a growing used EV market plus public charging will make EVs an option for residents of all incomes.

"Our core values haven't changed since the inception of the program: equity and economic viability. As lower income households in and around our city now are acquiring EVs, we are targeting charging locations to best serve them."

– City of Portland

For your city's next stage of installations, ask if you are serving all current and potential EV owners. A city serves many types of constituents, from residents to local businesses. Reach out to partners (e.g., mixed-use buildings, school district, hospitals) to diversify publicly-available charger locations. A focus on partners may increase in this phase of the program, especially if your initial funding was largely from grants.



source: https://www.energy.gov/eere/vehicles/articles/fotw-1336-april-1-2024-60-evs-are-expected-be-suburban-areas-2030

TACKLE COMPLEXITY. Plan for installations in more complex locations by revising policy direction as needed. Your city may have started its program with charging locations that were easy to access and caused minimal disruptions to the public. Perhaps private owners created most charging points with little city involvement. As your city researches new locations, consider areas which have demand but involve more consensus, engagement, and cost. For example, curbside charging may be a valuable option in dense communities where dedicated parking is limited. However, the public right of way is often a crowded space and installing curbside chargers means that the street will be prioritized for cars for the foreseeable future. For city planners and other departments, this may affect existing multi-modal planning efforts like bike lanes and bus rapid transit planning. These programs may be managed by a private bikeshare program operator and your transit agency, with agreements in place.

Your city may have ambitious plans to dedicate entire city blocks for EV charging by starting with one charger on a street, and gradually converting all parking spots on that street to help residents in denser neighborhoods.

These examples highlight the importance of your policy direction and planning documents, which directly and indirectly can offer guidance to charging operators and other partners on acceptable locations, particularly where the public right of way is being used by other transportation modes. In these cases, where does EV charging fit in? Help departments and partners cross-reference city plans and identify new locations that enable goals to be met by all parties where possible. At times, an alternate location may need to be found to preserve existing walkability efforts, urban design, and the character of the community.

"Don't just think of EVs as vehicles, but everything from bikes to buses. We have been pushing all EV modes to ensure equitable access."

– City of Austin

INVOLVE OTHER MODES. Your city may want to expand its EV charging program to address other transportation modes. Most cities launched their program with a focus on vehicles, particularly if they did not have a formal plan. Early adopter cities with sustainability or dedicated EV plans included initiatives for other modes of transportation. These could include electrifying the city fleet, working with your transit agency on bus conversion and with your school district on electric school buses. Investigate if your existing policies help or inhibit larger vehicle conversion, as well as how they affect the attractiveness of smaller vehicles like e-cargo bikes. Portland General Electric, the public utility for Portland residents, created a competitive grant program to help local school districts electrify school buses, now in its third year. The program is funded through clean fuel credits and subsidizes the cost differential between a diesel and electric bus (2).

"If we are putting in L2 chargers, and there is already a bikeshare station, can we combine and use the same power source? Charging is part of a larger framework—we want people to bike, walk, or take transit first. We aren't investing in charging in the city core to discourage driving there."

– City of New York

Your city can create policies that encourage private or public-private investments in high-delivery, emission-free zones by allowing single site construction of a mobility hub that can charge different types of vehicles from cars to personal and e-cargo bikes. Private partners can also construct mobility hubs targeted for larger vehicle charging like electric tractor trailers, EV carsharing, taxis, and personal vehicles at the same location.

Cities may not have the expertise in charging technology, but they can provide incentives to build sites where multiple electric mobility products (e.g., bicycles, etc.) can charge. Cities can reallocate underutilized land or an existing parking lot to support mobility hub buildouts.

ENABLE EV PURCHASES. Cities can play a larger role in developing the EV ecosystem and increasing EV adoption rates. Even with a well-established and distributed charging network, cities may lag in accomplishing their goals for the percentage of vehicles that are EVs, resulting in lower charger utilization than forecast. Cities can choose to engage with their communities in additional ways beyond charger availability.

A large barrier to EV purchasing is cost. Cities can enlist their closest Council of Government or local Chamber of Commerce to build regional purchasing consortiums for potential EV buyers. Through bulk purchases, EV buyers are able to secure a better price than purchasing on their own, while sellers are able to increase their customer base. Initiatives like the Electric Vehicle Purchasing Collaborative can serve as a model (3). Some utilities offer EV rebates for car purchases, home charging stations, and reduced charging rates. Detroit's DTE Energy offers up to a $1,500 rebate for new or used EV purchases and $500 for installing a L2 home charger and enrolling in a special electricity rate plan for overnight/ weekend charging. DTE Energy also offers home charger installation services (4,5).

"We offer an EV charger rebate that increases if the charger is installed in a disadvantaged neighborhood. We use a statewide tool – the CalEnviroScreen – to determine eligibility for the increased funding level."

– City of Los Angeles

Your city can also help develop the charging market. Provide user feedback to charging operators to help them with product development and refinement. Encourage them to develop technologies and products that also work for other modes of transportation. Think about your city environment and what the appetite is to do more than support or install chargers.

Questions to consider as part of your post-launch policy strategy:

Policy assessment and effectiveness:

- Does your city have a policy review window to assess how well existing policies are working? Are there policies that have been too strict that prevented installations, or codes with loopholes?
- Have private installations focused on a limited number of locations/neighborhoods? How can the city motivate charging operators and private owners to install in other locations? Do you have staff that serves as a liaison for private partners to help them navigate city processes?
- Does the city have the right level of data at the right frequency to assess the program? Are you able to conduct neighborhood-level analyses to inform new locations? Can you access DMV data and other datasets to help with charger locations based on EV registrations?
- Which goals are most important to your city (ex. overall higher utilization rate or eliminating charging deserts and installing chargers everywhere)?
- Are certain types of residents benefiting more or less from the current program (e.g., employees due to employer installed chargers, downtown residents due to private installations)?

Policy focus:

- How does your EV program intersect with other electrification efforts? Are the same policies relevant, or do changes need to be made?
- Are you sharing data or other feedback with charging operators to help improve their products?
- Is your city focused on individual charging points or more globally focused on multiple electric mobility options? Do you have local data on residents' intention to purchase an EV (or not) in the future, commuting habits, etc.?
- Have you discussed your program with neighboring cities, regional alliances, and the Chamber of Commerce who could play a facilitation role across sectors?

Program Consideration #4: Funding and Investments

Takeaway: Determine the funding mix necessary to maintain and expand your program

Every city has its own characteristics, and the charging program should reflect these dynamics. Large urban cities may pursue more curbside and multi-family unit chargers. Suburban communities may prioritize incentives for home charging. The city can facilitate a successful, long-term funding strategy that meets your city's needs and continues to encourage EV adoption by expanding the network of chargers.

USE DATA FROM YOUR CURRENT CHARGERS in working with your budget office and City Council partners to continue investing in the EV program. After launch, your initial funding may be low or has run out. Perhaps your city launched a pilot EV program that needs to be renewed or developed into a fully-fledged program. Using data from the chargers you have already deployed, the lead agency can strengthen its budget ask by including current charger usage across the city (e.g., do initial chargers have 20% citywide utilization rate exceeding the national average of 8% in 2022? Do only 25% of neighborhoods have chargers today, leaving many charging deserts?) The agency can also share if the budgeting should be reallocated (e.g., more funding for staff vs. less for chargers; in-house charger purchases vs. outsourcing operations), and factor in private installations.

"In 2006 we started the deployment of curbside chargers (L1 and later L2) that were free and took a financial loss. From 2019 we included a modest user payment, and most chargers are now paid back in 3-5 years. We want high utilization at all locations, topping 30% on 24-hour publicly available chargers.

For fast charging, we have had public-private partnerships with different private providers since 2016. A key question is how much revenue are private companies willing to share with the public sector? Normally the fast chargers are paid back in 1-4 years."

– City of Oslo, Norway

If the initial program was entirely grant-funded, work with your grants team or grant consultants to identify upcoming funding opportunities. Evaluate the geographic distribution of your chargers and relative usage to pursue funding designed to address inequities in access (e.g., J40 funding). Data collection efforts will also help with grant applications which ask for metrics as part of compliance requirements.

KEEP UP PARTNER COORDINATION. If your city is not the program lead, work with external partners like your utility or charging operators to continue expanding the network. Charging operators and other partners like retail and residential property owners are more likely to make investments in high traffic areas where they expect higher demand. Since these are places where many residents spend time, cities can take a strong secondary role by supporting their efforts through policy support and regulations. As a supporting agency, the city can also choose to make investments in places where partners will not install (e.g., the city can use its assets, like the public right-of-way, or permit fees to build revenue to install chargers where the market will not invest on its own). While expanding the network is important, study how city-owned chargers' outcomes (if available) compare with privately-owned, publicly-available chargers in the city. A city can set standards for chargers installed using its funds or its real estate, like the public right of way. For example, the city may require a high reliability rate (e.g., minimum percentage of successful charge attempts) and demand expedited repairs by setting a minimum uptime percentage.

BUDGET FOR O&M. Whether your city chooses to maintain or expand its charging investments, it still needs to allocate funds for operations and maintenance. The beginning of your program likely focused on getting chargers online with maintenance receiving less attention. However, chargers will only encourage residents to purchase or transition to EVs if those chargers are reliably working—which means being prepared to identify and repair broken chargers quickly. If your city did not have an O&M plan during the launch stage, create one now, possibly using the same funding source for installation. If your city has an existing O&M plan, assess how well it is working and if your planned budget is adequate or needs a boost.

REVIEW YOUR COST STRUCTURE. Data can also inform your permanent program cost structure. Early adopter cities considered multiple program models from cost recovery, contracting out the entire program due to lack of internal expertise, funding through special bonds or specific fees, or a mix of several models. Based on initial investments and funding, your city should now have actual charger costs versus initial estimates. The city can create or revise the program model that distributes costs and accounts for other program fees.

"Much of our EV charging infrastructure installation has been driven by opportunistic grant funding, limiting where and how we deploy stations. We have come a long way to diversify our funding, using capital funds, utility incentive programs, and state and federal grants allowing us to be more strategic about where we are putting charging stations."

– City of Boston

UPDATE YOUR INVESTMENT APPROACH. Cities can also change their investment approach. Perhaps a lack of in-house expertise means a refocus on supporting external partners rather than city-led installations. Or some cities may choose to focus on installing a limited number of L2 chargers, with outside entities building additional L2 and DCFC charging locations. Some leading cities are discussing the possibility of L1 chargers (like a standard electrical outlet) for overnight residential charging in locations where there are barriers to promptly installing L2. Cities could also expand their involvement in the program by hiring dedicated engineering teams. Whatever approach your city selects after reviewing initial charger performance and related program management, confer with your budget office on expected program costs.

Questions to consider during your post-launch funding period:

Budgeting for success:

- Do you have data you can share with the budget office as you formulate your ask?
- Do you have benchmarks to help city staff and your City Council evaluate program performance? (e.g., 10% utilization may seem low, but the national average was 8% in 2022 according to a McKinsey report. 6).
- Is outside funding being routed to the city or from the city to support the program and will this continue?
- How does privately funded charger performance compare with city-led installations? Are there lessons from privately funded chargers that the city can use in its next contract?

EV program expenditures:

- How aggressive is your expansion strategy? Are you doubling your chargers, and doubling the budget size? Are there cost efficiencies that can be applied from the pre-launch stage?
- Will the city play a more active role in the post launch stage; or less active, requiring less funding?
- Did your city have an O&M budget during the launch phase? Did you exceed that budget?
- How often are chargers non-operational, requiring repair and city funds? Are the same chargers malfunctioning, or are different chargers down across the city? If you contract out repairs, do they require replacement of the entire unit or are they able to provide parts and supplies to repair the unit at a cheaper cost?

Conclusion

EV charging is new territory for cities. And cities are learning along with utilities, local property owners, and local businesses who can help build out a city's charging network. As new EVs become more affordable and the used EV market grows, cities will play a central role in making buying an EV a viable option for their residents. To do so, cities will need to work across sectors to develop a reliable publicly-available charging network that conveniently serves all its residents. As you plan, maintain, or expand your program, talk to other cities. Visit them. Test their chargers. Learn from each other.

In bringing early adopter cities together to gather and distill their experiences into this report, we aimed to streamline your research so your city can launch your program more quickly than working on your own. We hope this report offers you "shortcuts" that have been tested in early adopter cities that will help you plan a successful charging program.

Glossary

L1: Level 1 charging involves plugging the vehicle into a standard residential 120-volt (120V), or 1kW, AC outlet. Level 1 chargers can take 40-50+ hours to charge a BEV to 80 percent from empty and 5-6 hours for a PHEV (7).

L**2:** Level 2 equipment offers higher-rate AC charging through 240V (in residential applications, equivalent to a clothes dryer plug) or 208V (in commercial applications) electrical service, and is common for home, workplace, and public charging. Typical power outage is between 7 kW – 19 kW. Level 2 chargers can charge a BEV to 80 percent from empty in 4-10 hours and a PHEV in 1-2 hours (6).

L3: Direct current fast charging (DCFC) equipment offers rapid charging. Voltage is between 400 V – 1000 V and typical power outage is between 50 kW – 350 kW. DCFC equipment can charge a BEV to 80 percent in just 20 minutes to 1 hour. Most PHEVs currently on the market do not work with fast chargers (6).

NEVI: The U.S. Department of Transportation's (DOT) Federal Highway Administration (FHWA) NEVI Formula Program provides funding to states to strategically deploy electric vehicle charging stations. EV charging stations must be non-proprietary, allow for open-access payment methods, be publicly- available or available to authorized commercial motor vehicle operators from more than one company, and be located along designated FHWA Alternative Fuel Corridors (AFCs). Funding is available for up to 80% of eligible project costs (8).

CPO: Charging Point Operator, which may own a charger or operate it for the owner on a contractual basis.

EV capable: EV capable areas have an installed "raceway" (the enclosed conduit that forms the physical pathway for electrical wiring to protect it from damage) and adequate panel capacity to accommodate future installation of charging station(s) (9).

EV ready: EV ready includes EV Capable plus installation of dedicated branch circuit(s) (electrical pre-wiring), circuit breakers, and other electrical components, including a receptacle (240-volt outlet) or blank cover needed to support future installation of one or more charging stations) (8).

EVSE: Electric vehicle supply equipment, commonly known as EV chargers, supply electric power to EVs to recharge the vehicle's batteries. EVSE systems include the electrical conductors, related equipment, software, and communications protocols that deliver energy efficiently and safely to the vehicle (10).

Endnotes

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