



City of Philadelphia's **EV** (Electric Vehicle) Transition Strategy

MARCH 2024



City of
Philadelphia

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Executive Summary

The Bipartisan Infrastructure Law (BIL) and subsequent Inflation Reduction Act (IRA) provide unprecedented funding opportunities for infrastructure to support decarbonization of the transportation sector. This document is a strategy for Philadelphia's equitable electric vehicle (EV) transition. It aims to convert these funding programs into a robust public charging network that advances City goals for equity and climate protection while creating high quality jobs for Philadelphians.

Philadelphia is already experiencing the effects of global climate change. As extreme weather events disrupt the City and region, low-income Philadelphians bear the greatest risk and burden. The transportation sector is responsible for roughly 22% of carbon emissions in Philadelphia in addition to other harmful local pollutants. The [Climate Action Playbook](#) commits the City to reducing carbon emissions by 25% (from the 2016 baseline) and achieving carbon neutrality by 2050. The EV transition will play a key role in these reductions.

A network of reliable and publicly accessible EV charging infrastructure is critical for Philadelphia to make an equitable zero emission transition.

This EV Transition Strategy recommends actions that can be completed within a year to ensure that Philadelphia capitalizes on federal funding opportunities to electrify the transportation sector. However, building an equitable EV transition is not a transportation-specific challenge. It will require thoughtful approaches to mobility infrastructure, workforce development, policy, technology, and energy management. This plan provides deliberate and incremental actions to deploy this new technology in a way that serves and protects the most marginalized communities in the city. The goal is a safer, cleaner, and greener Philadelphia, with economic opportunity for all.

While complementary efforts are underway to advance electrification of the City's municipal fleet, ***this strategy centers on near-term actions to advance a network of publicly available EV chargers.*** It includes strategies for EV infrastructure in the public right of way, on public land, and on private property. Publicly available EV chargers are essential to advancing an equitable transition to zero emission vehicle travel and can support both municipal and private mobility.

Philadelphia's EV Transition Strategy was crafted through a collaborative process that engaged staff and leadership from over sixteen City departments and regional agencies.

Early Actions Summary

The EV Transition Strategy includes 14 strategic actions within seven overarching areas of focus.

Prioritized actions are **boldfaced**.

1. **Align for effective action**

- 1.1 **Designate an interdepartmental governance team**
- 1.2 Build city leadership and staff knowledge and support of Electric Vehicle Supply Equipment (EVSE)

2. **Define strategy and priorities**

- 2.1 **Understand current conditions and immediate objectives for EVSE**
- 2.2 Identify and manage priority locations for public EVSE
- 2.3 Identify priority EVSE projects for federal funding

3. **Align and design policies to support EVSE deployment**

- 3.1 **Introduce policies and legislation to support citywide EVSE deployment**

4. **Make zero-emission mobility more equitable and accessible**

- 4.1 Promote wider adoption of e-bikes and micromobility
- 4.2 Expand the use of shared EVs

5. **Use pilots and demonstrations to understand technology and use**

- 5.1 **Conduct pilots to inform citywide EVSE approach**
- 5.2 Release RFP/ RFPs for a citywide EVSE contract

6. **Incorporate workforce development into EVSE deployment and maintenance**

- 6.1 **Invest in EV industry workforce training programs.**
- 6.2 Train building and fire code officials in EVSE.

7. **Understand and respond to community needs**

- 7.1 **Leverage partnerships with non-governmental groups**
- 7.2 Engage the public to understand incentives and deterrents for EV adoption

Glossary

ACRONYMS:

- **AFC:** Alternate Fuel Corridor. This is a designation given to specific interstate corridors to help prioritize deployment of EV chargers through federal funding.
- **BIL:** The Bipartisan Infrastructure Law as enacted in the Infrastructure Investment and Jobs Act (IIJA) of 2021 is the \$1.2 trillion 5-year authorization providing critical infrastructure investments for transportation, communications, water, and energy.
- **CFI:** Charging and Fueling Infrastructure Grant Program. A federal grant program focused on deploying EV charging on publicly accessible corridors and public roadways, increasing accessibility to EV charging across urban and rural areas alike.
- **DCFC:** Direct Current Fast Charger. “Fast charging” allows vehicles to fully charge in less than 30 minutes
- **EV:** Electric Vehicle. A type of vehicle that is powered by electricity stored in batteries or another energy storage device. Electric vehicles represent around one percent of vehicles registered in the City of Philadelphia.
- **EVSE:** Electric Vehicle Supply Equipment. Often the acronym used to refer to charging infrastructure.
- **EVSP:** Electric Vehicle Service Provider. Delivers end-to-end EV charging, handling both charging station operations and the driver experience.
- **ICE:** Internal Combustion Engine. A vehicle that uses gasoline, diesel, or other fossil fuels for propulsion.
- **IRA:** Inflation Reduction Act. Law enacted in 2022 investing \$783 billion over 10 years in energy security and technologies to reduce carbon emissions by roughly 40 percent by 2030.
- **NACS:** North American Charging Standard. Charging connector system currently being standardized as SAE J3400 and also known as the Tesla charging standard.
- **NOFO:** Notice of Funding Opportunity. A formal announcement by a funding agency inviting competitive applications from eligible entities.
- **PECO:** The electric distribution company serving the City of Philadelphia and the surrounding Southeastern Pennsylvania counties.
- **PHEV:** Plug-in Hybrid Electric Vehicle. A vehicle that can be powered either by rechargeable battery or internal combustion engine.
- **PPA:** The Philadelphia Parking Authority is an agency of the Commonwealth of Pennsylvania that provides parking management services for the City of Philadelphia.
- **SEPTA:** Southeastern Pennsylvania Transportation Authority. SEPTA is the Philadelphia region’s public transportation authority that operates bus, rapid transit, commuter rail, trolley, and electric trolleybus services.
- **SOV:** Single Occupancy Vehicle. A motor vehicle transporting one person.

DEFINITIONS:

- **CARBON NEUTRALITY:** Balancing greenhouse gas (GHG) emissions produced and the amount removed from the atmosphere to zero.
- **JUSTICE40:** The Biden Administration has committed to investing 40 percent of federal investments from the BIL and IRA into disadvantaged communities that are marginalized, underserved, and overburdened by pollution.
- **MICROMOBILITY:** Small, lightweight vehicles operating at speeds typically below 25 km/h (15 mph), like e-bikes and e-scooters.
- **RELIABILITY:** The extent to which chargers provide uninterrupted service with consistent uptime and seamless access for customers.

I. Development and Use of the EV Transition Strategy

Relevant Past Efforts

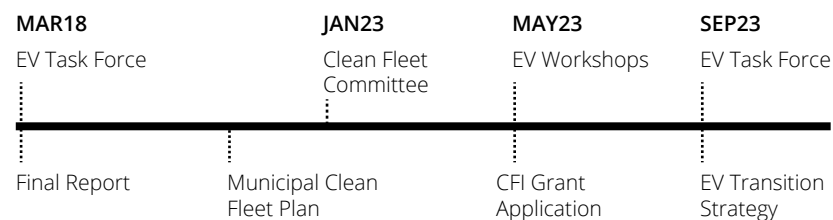
Philadelphia has examined strategies to support the transition to zero-emission vehicles in the past. In 2007, the Philadelphia City Council established the Electric Vehicle Parking Space Program (EVPS) which allowed residents to reserve curb space to install private EV chargers. Reserving public curb space for private use raised equity issues, and the regulations for this program were revised in 2018 to continue permitting at the curb without allowing for a reserved parking space.

The City of Philadelphia formed its first EV Policy Task Force in 2017. Its [March 2018 report](#) called for expanding publicly available charging infrastructure, expanding electric pedal assist bicycle options, and electrifying transit and municipal fleets. Also in 2017, SEPTA adopted its second generation sustainability plan - [SEP-TAINABLE 2020](#) - reiterating its strong commitment to climate friendly operations. In 2021, the city published its Municipal Clean Fleet plan to transition city-owned vehicles away from internal combustion engines. In 2022, SEPTA published its [Zero Emission Bus Playbook](#).

In early 2023, the city's Smart Cities team convened a series of technical workshops with over fifteen city and partners agencies. These workshops aimed to increase knowledge of EV charging

across city government, particularly given the release of federal funding opportunities. Concurrently, the city applied for the Community Charging and Fueling Infrastructure (CFI) discretionary grant program to fund reliable EV fast charging in underserved communities. The workshops and collaborative effort around the CFI grant application provided the foundation that was built upon by the EV Task Force to create this strategy.

Timeline of Committees and Task Forces



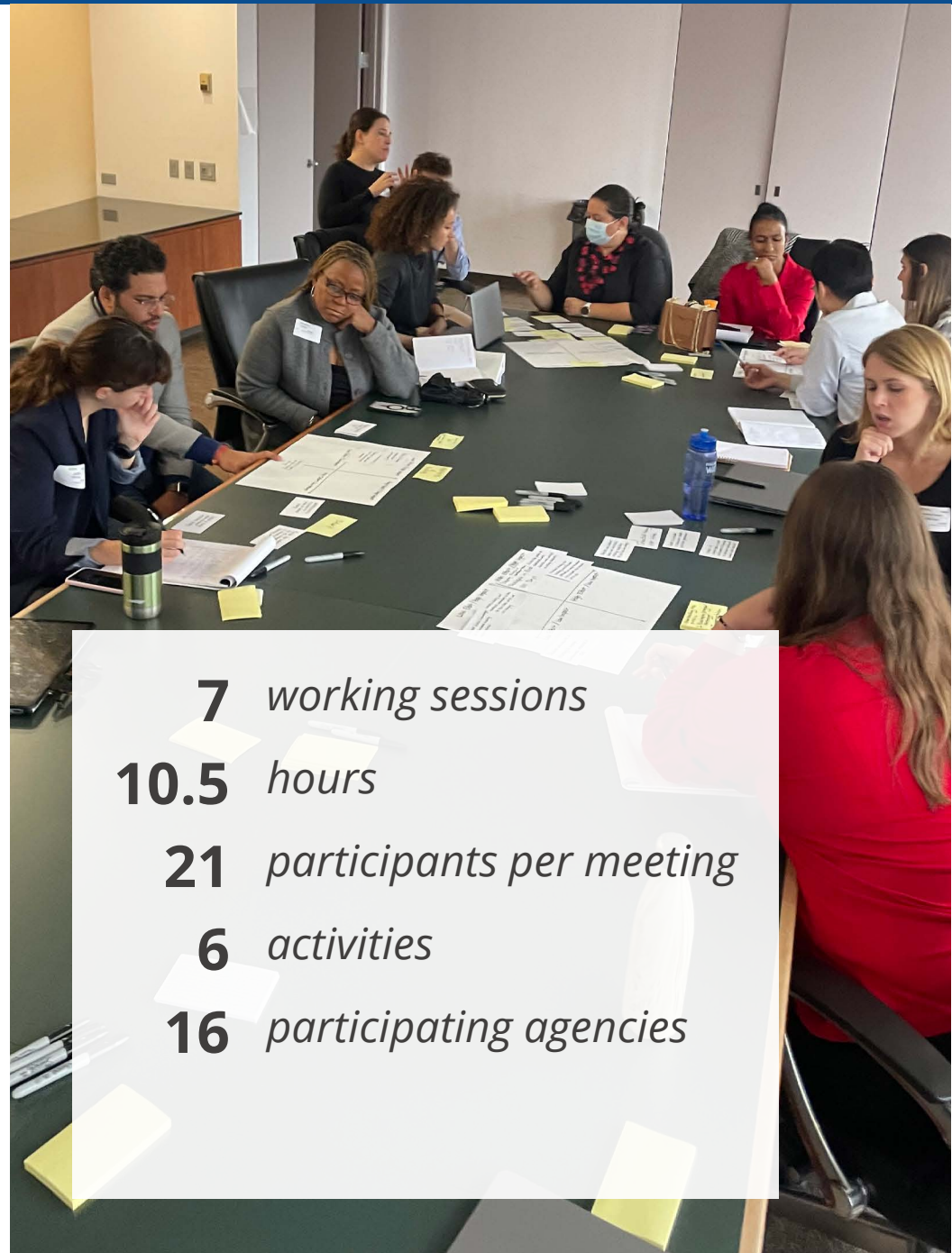
In addition to these efforts, in early 2024, the City was awarded \$1.47 million as part of the Ride and Drive Electric grant to launch the **Plug In Philly** program through the U.S. Joint Office of Energy and Transportation (funded by the Vehicle Technologies Office (VTO)). This grant will kickstart a pre-apprenticeship pilot program to recruit and train 45 diverse Philadelphians for careers in electric vehicle supplies and equipment (EVSE). The first program cohort is planned to graduate in March 2025.

2023 EV Task Force Process and Outcome

Throughout the fall of 2023, the City of Philadelphia's Smart Cities team assembled and convened a multi-disciplinary EV Task Force (see participants in Appendix A) comprised of subject matter experts from sixteen city agencies and external partners working on technology, transportation, planning, permitting, workforce development, public utilities, transit, law, and other relevant domains.

The goal of the EV Task Force was to diagnose the City's context and develop near-term actions to catalyze and accelerate the deployment of publicly accessible charging infrastructure for all types of electric mobility. The EV Task Force met seven times over the course of 12 weeks and identified necessary actions in each domain.

Philadelphia's 2024 EV Transition Strategy is the direct output of the 2023 EV Task Force. This document outlines key strategies the City and its partners can undertake while leveraging federal funding within 2024. This is not a long-term vision or goal-setting plan. It is a set of first steps that will lay the foundation for intentional and equitable deployment of publicly accessible electric charging infrastructure.



II. Imperative for Action

Philadelphia is getting hotter and wetter. The lowest-income neighborhoods of Philadelphia are projected to bear the brunt of heat impacts, flooding, and sewer overflows.

In 2019, Pennsylvania's Governor signed Executive Order 2019-01, which commits to reducing net greenhouse gas emissions by 26% by 2025 and 80% by 2050 (from 2005 levels). Philadelphia's [Climate Action Playbook](#) commits the City to achieving carbon neutrality by 2050. Transportation is responsible for 22% of carbon emissions in Philadelphia. According to the Climate Action Playbook, City investments to increase private electric vehicle uptake would result in greenhouse gas emission reductions of over 11 million tons by 2050.

Achieving these emissions reductions will require a collaborative and holistic approach. Efforts to transition private vehicles to EVs must be paired with policies to increase access to transportation and make walking and biking more accessible. Over the next five years, the federal government will invest billions of dollars towards green transportation infrastructure. With approach laid out in this strategy, these investments towards an equitable EV transition have the potential to decrease transportation fuel costs for residents, create workforce opportunities, and build a safer, cleaner, and greener Philadelphia for all.

Key Challenges

[Two of every three trips](#) made by Philadelphians of all income levels are made in private vehicles - residents driving themselves, driving others, or traveling as a passenger. A vast majority of these vehicles are ICEs. EV adoption in Philadelphia trails national averages, and accelerating the EV transition will require public sector support, technology advancements, and cultural shifts. Currently, broad and equitable adoption of electric vehicles faces several challenges:

THERE ARE TOO FEW PUBLIC CHARGERS IN PHILADELPHIA TODAY.

Philadelphia has roughly 650,000 registered vehicles. EV ownership has grown exponentially, from 272 in 2017 to 1,477 vehicles in 2021. Most vehicle owners lack private off-street parking and will rely on public charging. Philadelphia is in the bottom quarter of U.S. metropolitan areas in terms of the average number of public chargers available per million population.

CHARGERS ARE INEQUITABLY DISTRIBUTED.

The few existing publicly available chargers are concentrated in and around Center City and University City. Many of these are located on private properties and may not be accessible to everyone. The private chargers installed under the 2007 residential curbside policy are largely in wealthier neighborhoods of the City and serve only private EV owners.

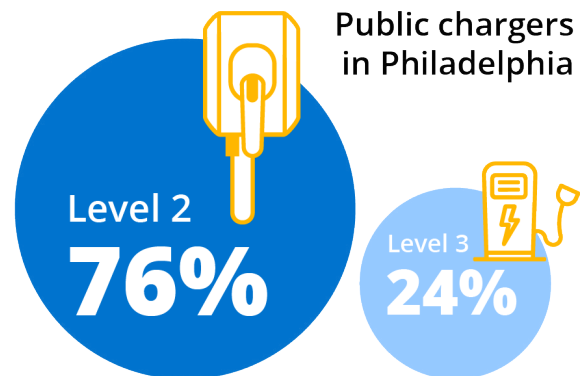
PUBLIC CHARGING FOR E-BIKES IS NON-EXISTENT.

Smaller, lower-cost electric mobility like e-bikes can play an important role in safe, clean, and equitable mobility. Many current or would-be e-bike owners or users will rely on secure on-street parking and charging. At present there are no public charging options for e-bikes.

PUBLICLY AVAILABLE CHARGING EQUIPMENT IS SLOW AND UNRELIABLE.

Internal combustion engine (ICE) vehicles can be fueled in a matter of minutes and can be reliably refueled when needed. Most Philadelphians do not have access to EV charging at home or work and need EVSE (Electric Vehicle Supply Equipment) that can charge a vehicle nearly as rapidly as a fuel pump.

Today, most chargers in Philadelphia are level 2 chargers, requiring 4-10 hours to charge an EV from 0 to 80% battery charge. Many of them go offline or are unreliable due to operational issues. There are very few level 3 fast chargers (also called DC Chargers), which can charge a vehicle from 0 to 80% battery charge in just about 20 minutes.



GOVERNANCE OF CHARGING INFRASTRUCTURE IS FRAGMENTED.

Different agencies across the City have the expertise and capacity for different elements of the planning, procuring, operating, and maintaining of EVSE, as well as educating the public and workforce. This has caused siloed efforts, missed synergies, slow action, and a lack of coordination.

WORKFORCE PREPARATION IS LACKING.

Electrified mobility is inevitable as major automakers phase out production of ICE vehicles. Educational and workforce development organizations must prepare for this shift to enable Philadelphians to enjoy well-paying jobs in EV design and development, battery production, and charging infrastructure.

CHARGING TECHNOLOGY AND ITS BUSINESS MODELS ARE STILL NASCENT.

EVSE technology is evolving rapidly. National standards for chargers have recently been adopted. Charger reliability remains a challenge. Public charging is still new. The protocols on how to use a public charger are still being tested and improved upon through different models across the US. Further, several business models are being tested for their long-term financial feasibility. Considering so many changes, there is limited knowledge on how community members should use the chargers, the effect of chargers within a neighborhood, their maintenance needs, cybersecurity implications and safety risks.

III. Early Actions

"The most important thing is to begin."
— Jason Fried (founder of Basecamp)

This strategy document offers near-term policy actions to ensure widespread and equitable EV adoption. The actions are designed to be accomplished within one year. Importantly, this document focuses on strategies to expand use of private electric vehicles and the charging infrastructure that supports them.





While all elements of this plan are key to a responsive and inclusive strategy, these six actions are top priorities:

- 1.1 Designate an interdepartmental governance team.
- 2.1 Understand current conditions and immediate objectives for EVSE.
- 3.1 Introduce policies and legislation to support citywide EVSE deployment.
- 5.1 Conduct pilots to inform citywide EVSE approach.
- 6.1 Invest in EVSE industry workforce programs.
- 7.1 Leverage partnerships with non-governmental partners.

1. Align for effective action.

WHAT

- 1.1 **Designate an interdepartmental governance team.**
- 1.2 Build city leadership and staff knowledge and support of EVSE.

WHY

- Currently, EVSE deployment is managed by a disparate combination of responsibilities and authorities.
- Equitable EVSE deployment will require diverse subject matter expertise.
- Governance team will ensure deployment is effective, efficient, and coordinated across agencies.
- Flexibility and communication is required to adapt to changing technologies and funding opportunities.

HOW

1.1 **Designate an interdepartmental governance team.**

- **Formalize a leadership team** with a coordinator in the Mayor's Office. Designate participation from City departments and partner organizations.

- **Establish a two-tiered working group structure** which includes a group of subject matter expert staff to develop and continuously refine recommendations and a decision-making group of Commissioners or Deputy Commissioners to ensure execution of actions.

1.2 Build City leadership and staff knowledge to support EVSE.

- **Develop a governance charter** that documents decisions, accountability, and working structure.
- **Identify champions** within City Council and City Hall, representing both leadership and staff, to drive EV advancement.
- **Engage and educate champions** through regular briefings on best practices, benefits, and City goals related to decarbonization.
- **Co-design initiatives** through discussions and/or working sessions to advance policy and planning, place-based solutions, programs, and local community engagement efforts.

2. Define strategy and priorities.

WHAT

- 2.1 **Understand current conditions and immediate objectives for EVSE.**
- 2.2 Identify and manage priority locations for public EVSE.
- 2.3 Identify priority EVSE projects for state and federal funding.

WHY

- A clearly articulated plan including goals and priorities will improve deployments of publicly accessible EVSE.
- Staff have many competing priorities.
- Abundant federal funding is available, but requires a clear vision, prioritization, and alignment.

HOW

- 2.1 **Understand current conditions and immediate objectives for EVSE.**

- **Compile and analyze critical foundational information.** The analysis should assess both high and low EV adoption scenarios and consider the place-based priorities in [CONNECT](#), Philadelphia's

commitment to equitable mobility; healthy, resilient communities; and Justice 40 Initiative goals.

- **Develop objectives,** drawn from the data analysis and prior plans and initiatives. Determine synergies for municipal fleet EVSE and publicly accessible EVSE, and distribution between public and private chargers given limited City resources. Goals should be prioritized by feasibility, tied to performance metrics, and incorporate equity, cost, accessibility, workforce, and other core considerations.
- **Develop guiding policies for deployment,** which outline the desired priority mix of charger speeds, charging levels, and compatible modes to best achieve near-term public charging objectives. Chargers should be non-proprietary and aligned with federal standards, allowing maximum flexibility and adaptability.

- 2.2 Identify and manage priority locations for public EVSE.

- **Develop a place-based prioritization framework for EVSE** to establish siting criteria. Solicit community input for site criteria to increase community acceptance and engagement. Convert criteria into distributional requirements to ensure the charging network is widely accessible, especially for residents of multi-unit dwellings who lack at-home charging access.

- **Establish or procure a platform to manage the site request and deployment process** to synthesize predetermined criteria, digital permitting, and installation tracking.
- **Identify additional resiliency and safety layers to apply to final site decisions** such as “power priority areas,” ensure electric EVSE reliability, and identify areas where power access can be prioritized in an emergency.

2.3 Identify priority EVSE projects for federal funding.

- **Inventory funding programs and eligibility.** Develop a guide to funding opportunities including discretionary federal grants and state distributed formula funding, provided by the Bipartisan Infrastructure Law and Inflation Reduction Act. Leverage compiled inventories such as the Local Infrastructure Hub.
- **Develop prioritization of projects for pursuit** by matching priority locations and/or projects with the optimal funding opportunity. The aforementioned working groups should lead this prioritization efforts.
- **Build coalitions to support funding applications.** Work with partner public entities such as SEPTA, PECO, DVRPC, and PPA to gain concurrence on projects for prioritized funding. Designate a project lead for application development.

3. Align and design policies to support EVSE deployment.

WHAT

3.1 Introduce policies and legislation to support citywide EVSE deployment.

WHY

- The City’s zoning code does not require sufficient EVSE readiness or installation.
- Policies and processes for the City’s internal EV charging strategy and deployment are decentralized.
- There is a lack of policies to support broad citywide installation of publicly accessible EVSE.
- Interdepartmental communications can be streamlined for efficient coordination of efforts.
- Collaborate with PECO to establish standardized procedures to facilitate the efficient evaluation and interconnection of proposed EV charging locations.

HOW

3.1 Introduce policies and legislation to support citywide EVSE deployment.

- **Inventory current policies and identify early policy initiatives.** Consider policy changes related to EV zoning requirements, fire code updates, permit processes, and licensing requirements. Build consensus around policies. Develop policies to guide both private sector and City installation.
- **Introduce a streamlined regulatory process to enable public EVSE deployment.** Define policy objectives and priorities for fee setting, funding, and revenue structure. Develop changes to the zoning code to include sufficient EV readiness, a clear and consistent permitting process, preferred contracting provisions, and updated fire and building codes.
- **Develop partnership structures** with selected EVSPs, community partners, and City departments. Document what each party will fund and manage in Standard Operating Procedures (SOPs).

4. Make zero-emission mobility more equitable and accessible.

WHAT

- 4.1 Promote wider adoption of e-bikes and e-micromobility.
- 4.2 Expand the use of shared EVs.

WHY

- Many Philadelphians lack off-street parking for charging at home : [72% of Philadelphia households own one or more vehicles and 89% of the housing stock is multifamily or row homes without garages.](#)
- Low-income households face barriers to EV adoption because of extremely limited access to publicly available EVSE and the upfront costs of EV purchase.
- [Most trips within the City of Philadelphia are very short distance \(less than 2 miles\)](#) and many can be made more efficiently with a smaller device or shared mobility.

HOW

- 4.1 Promote wider adoption of e-bikes and e-micromobility.
 - **Enhance public infrastructure for biking and e-biking** by continuing to invest in bike infrastructure and providing secure locations to park and charge e-bikes.

- **Encourage City staff to adopt e-bikes as a commuting option** by considering a program to provide Indego memberships as a commuting benefit and accommodating safe and secure e-bike parking and charging at municipal facilities.
- **Build on existing proposals for e-bike subsidies** to provide additional options to transportation insecure households. Include program objectives, potential management structure, staffing needs, target populations, and estimated funding needs and sources.

4.2 Expand the use of shared EVs.

- **Develop a clear strategy around shared fleet vehicles**, including how shared EVs fit into the [Clean Fleet Plan](#) and other fleet electrification efforts. Identify regulatory obstacles and flexibility for a shared fleet. Develop a small pilot of EV carshare memberships for staff use for work-related trips.
- **Ensure adequate EVSE infrastructure to support a small, public, shared EV fleet**. Shared fleets have higher utilization and thus have different charging needs. Assess to inform future planning for EVSE.
- **Collect feedback to inform expansion strategy**. Identify partners and opportunities to expand the use of shared EVs for City staff or the public.

5. Use pilots and demonstrations to understand technology and use.

WHAT:

- 5.1 **Conduct pilots to inform citywide EVSE approach.**
- 5.2 Release RFP for a citywide EVSE contract.

WHY:

- EV technology is constantly evolving.
- Consumer anxieties and challenges with charger reliability are barriers to EV adoption.
- There is limited understanding about how historically marginalized residents and neighborhoods will utilize and benefit from EVSE.
- Pilots will help inform a broader strategy for EVSE deployment.

HOW

5.1 Conduct pilots to inform citywide EVSE approach.

- **Set goals and measures for the pilot** such as utilization, uptime, or financial targets.
- **Select sites and engage area residents.** Align goals for equitable EVSE access with desired site characteristics prior to site selection. Develop outreach strategy for engagement and ensure transparency.
- **Procure, deploy, and maintain EVSE.** Employ faster procurement methods like limited solicitation, state procurement schedule, or structured partnerships.
- **Evaluate the pilot** by analyzing data and feedback. Use the evaluation to guide the decision to stop, modify, or formalize the pilot into an established program.

5.2 Release RFP for a citywide EVSE contract.

- **Determine business model or models for citywide EVSE.** Build on pilot learnings to determine optimal business models.
- **Write and release RFP.** Release RFP and select vendors for citywide EVSE deployment.

6. Incorporate workforce development into EVSE deployment and maintenance.

WHAT

6.1 Invest in EVSE industry workforce programs

6.2 Train building and fire code officials in EVSE

WHY

- Philadelphia is committed to maintaining well-paying, locally available jobs and workforce training. The Plug In Philly program, which establishes a pre-apprenticeship program for electricians to train in EVSE support, is a first step in City investment in these programs.
- Workforce development programs are critical to access PennDOT, NEVI, and Joint Office funding.
- Existing workforce development programs are siloed and underutilized by EV-related efforts.
- A significant workforce is required to install and reliably maintain EVSE.
- City officials and emergency first responders need training and experience to ensure safe EVSE installation and maintenance.

HOW

6.1 Invest in EVSE industry workforce programs.

- **Expand programs to fill gaps in the City's EVSE workforce.** The Plug In Philly program will establish a pre-apprenticeship program for Philadelphians to train for the skills needed for EVSE installation and maintenance. Continued investment in this program will be necessary to fill gaps in the current workforce.
- **Connect Plug In Philly graduates to high quality jobs.** After participants in the Plug In Philly program have completed the pre-apprenticeship program, they will need to be connected with jobs. This can be facilitated through the fostering of partnerships with regional organizations that will need trained EVSE technicians.
- **Consider options to incorporate Plug In Philly for City installations.** Develop procurement policies that consider incorporation of Plug In Philly graduates where possible.

6.2 Train building and fire code officials.

- **Inventory current training related to EVSE.** Understand how agencies assess, permit, and conduct inspections of EVSE, and how they work with other relevant organizations such as PECO, Licenses & Inspections, and Streets.

- **Identify and adopt building and fire code amendments** through local legislation, based on updated codes and NFPA standards that will promote safe utilization and deployment of EVSE.
- **Publish new training content** for code officials and inspectors to reflect requirements and risks related to EVSE. Evaluate opportunities to partner with entities seeking to implement new training, such as SEPTA.
- **Develop training oversight** to ensure it is delivered and new code amendments are followed. Consider partnering with a third party such as the State to provide oversight.

7. Understand and respond to community needs.

WHAT

- 7.1 **Leverage partnerships with non-governmental groups.**
- 7.2 Engage the public to understand incentives and deterrents for EV adoption.

WHY

- The City lacks a clear understanding of community needs and preferences.

- Common misunderstandings such as range anxiety hinder EV adoption.
- Multiple disparate agencies are involved in developing an EVSE network without formal coordination.

HOW

7.1 Leverage partnerships with non-governmental groups.

- **Identify non-governmental partners**, prioritizing those who can offer immediate support, such as PECO. Potential partners include off-street parking owners, car dealerships, universities, local businesses, major employers, institutions and other site hosts, and community partners.
- **Determine financial and operational partnership structures**. There are several potential arrangements for leveraging existing partnerships, depending on the type of entity and the desired role of the partner in advancing the EV charging ecosystem. This step may require identifying external funding sources, establishing cost and revenue sharing structures, or determining payment mechanisms between the various involved entities.
- **Define and formalize level of engagement**. Outline the anticipated level of collaboration, specify expected

contributions, and clarify the benefits resulting from the partnerships. The scope of these partnerships can include playing a part in advocating for EV adoption, facilitating community outreach, hosting EV charging infrastructure, developing EV sharing pilot programs, piloting workforce development and training programs, or promoting the use of federal rebates. Formalize the partnership through a contract.

7.2 Engage the public to understand incentives and deterrents for EV adoption.

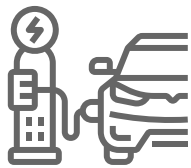
- **Plan a public engagement campaign** with specific goals, expected outcomes, and measurable metric. Develop a strategy to reach and engage diverse demographics within communities.
- **Launch the public engagement campaign**, using various communication channels such as social media, community events, workshops, and informational materials.
- **Gather and analyze community feedback** to assess campaign effectiveness, identify unaddressed concerns, adapt strategies to ensure maximum impact, and pinpoint trends that may hinder or encourage EV adoption within different segments of the community.

IV. User Guides

The following three guides represent successful outcomes of the actions. If the City of Philadelphia succeeds in implementing these strategies, the experience of each of the three users, an EV driver, a parking lot owner, and an e-bike commuter, should be as described below. There should be a clear, simple process for the end user with clear and efficient guidance from the City.

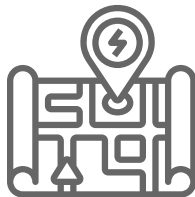
Public ROW Charging

A driver needs to charge their EV in the ROW



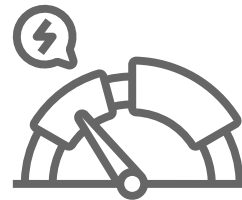
NEED TO CHARGE

The user is low on battery or needs to recharge.



FIND A CHARGING STATION

The user searches for available charging stations nearby using a platform to locate the nearest and most suitable charging point in the public ROW.



PARK & CHARGE

The user parks their electric vehicle at the designated point, connects the charger, and initiates the charging process.



PAY

The user pays for the charging services either through an app, membership, credit card, or other payment methods.

Publicly available, Private space Charging

A parking lot owner wants to provide charging to customers



PRELIMINARY ASSESSMENT

A parking lot owner considers installing a charging station as a service for their patrons. The owner finds all the City and utility requirements to install a charging station in one space, including space considerations, signage, and best practices.



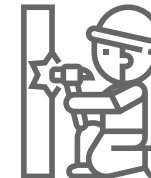
UTILITY COORDINATION

The parking lot owner engages with PECO to understand the specifications and procedures required to connect the charging station to the utility grid.



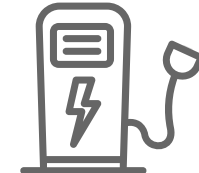
PERMITTING PROCESS

Following the guidelines and requirements, the owner submits the necessary documentation and information to the City authorities to obtain the essential permits for installing the charging station in their parking lot.



INSTALLATION

Once permits are secured, the owner procures the necessary charging technology or contracts with an installation service provider to set up the charging station within the parking lot.



OPERATION AND MAINTENANCE

The parking lot owner will operate the charging station and ensure its functionality for patrons using electric vehicles. The City will conduct periodic checks and verifications to ensure the station meets safety and regulatory standards.

Electric Micromobility

An e-bike rider commutes to work



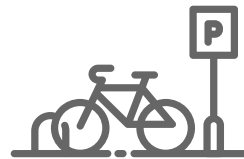
ROUTE PLANNING

The rider retrieves their e-bike from the secure room in their multi-family building. They use a mobile app or map to plan the best route considering the interconnected network of bike lanes, traffic conditions, and preferred roads to reach their workplace efficiently.



COMMUTE

The rider benefits from the electric assistance to pedal comfortably, especially on hilly streets. The rider follows the City's traffic regulations while riding and feels safe during the journey.



ARRIVING AT WORKPLACE

Arriving at workplace, the rider parks the e-bike in a designated area, ensuring it's securely locked. The cyclist parks on one of the plentiful safe charging spaces offered, charging their e-bike for the commute back.



RETURN HOME

Repeating the earlier steps in reverse, the rider pedals home, utilizing the e-bike's electric assistance as needed.



PARKING AND CHARGING

The rider arrives home and securely stores and parks their bike.



Source: Adobe Stock

Appendix A

Early Actions Needs, Partners, Benefits, and Metrics

The following table summarizes the resource needs, partners, anticipated benefits, and measures of success identified by the Task Force.

Strategic Action	Resource Needs	Anticipated Benefits	Success Measures
1. Align for effective action			
1.1 Designate an interdepartmental governance team.	<ul style="list-style-type: none"> Hiring or reallocating dedicated staff Staff time for participation and coordination 	<ul style="list-style-type: none"> Develop and share expertise Enhance coordination and collaboration Increase ownership and accountability Demonstrate City ownership and accountability 	<ul style="list-style-type: none"> Number of meetings Actions/steps accomplished
1.2 Build City leadership and staff knowledge and support of EVSE.	<ul style="list-style-type: none"> Staff time to engage with City Council and City Hall Collateral to distribute to champions 	<ul style="list-style-type: none"> Increase legislative support and expedite processes Increase budget allocation from different departments 	<ul style="list-style-type: none"> Number of bills approved within a defined timeline Number of meetings and participating groups or staff

Strategic Action	Resource Needs	Anticipated Benefits	Success Measures
2. Define strategy and priorities			
2.1 Understand current conditions and immediate objectives for EVSE.	<ul style="list-style-type: none"> Designation of lead staff and department(s) Staff time for participation Senior leadership capacity for adoption 	<ul style="list-style-type: none"> Minimize pushback and solicit support from community, City Council, and leadership Align to identify funding opportunities Better articulate needs and refine how goals are communicate 	<ul style="list-style-type: none"> Grant applications submitted vs. number of grants awarded
2.2 Identify and manage priority locations for public EVSE.	<ul style="list-style-type: none"> Technology platform ArcGIS and staff time for spatial data analysis Staff time to manage the platform and requested sites Staff time for community engagement 	<ul style="list-style-type: none"> Direction for partnerships and signal the private sector to shape the market Align infrastructure for future City and non-City work Better alignment with economic development strategy 	<ul style="list-style-type: none"> Charger utilization Number of EVSE installed Population with new access to charging
2.3 Identify priority EVSE projects for federal funding.	<ul style="list-style-type: none"> Grants manager Staff time to vet resources and compile funding opportunities Staff time to align priority projects with funding opportunities Staff time for stakeholder engagement Consultant assistance may augment staff time 	<ul style="list-style-type: none"> Improved coordination and expedite action among involved agencies, departments, and partners Increase appeal to concession vendors Better network and planning increasing the flexibility to meet J40 requirements 	<ul style="list-style-type: none"> Amount of funding won in a defined period of time Ability to make decisions within a defined timeline

Strategic Action	Resource Needs	Anticipated Benefits	Success Measures
3. Align and design policies to support EVSE deployment			
3.1 Create a policy roadmap for Citywide EVSE deployment.	<ul style="list-style-type: none"> Staff time for researching current state and practices and policies in peer municipalities Staff time to determine budget and revenue needs and constraints Staff time for drafting legislation and policy Grants and funding 	<ul style="list-style-type: none"> Improved coordination and alignment around policy priorities and mechanisms Streamline permitting and data tracking across departments Prioritize interconnected uses including curb use, hierarchy and typology Modernized codes that reflect current priorities 	<ul style="list-style-type: none"> Allocated funding Number of staff needed to run operations

Strategic Action	Resource Needs	Anticipated Benefits	Success Measures
4. Make zero-emission mobility more equitable and accessible			
4.1 Promote wider adoption of ultralight duty EVs.	<ul style="list-style-type: none"> Street space Staff time to develop plan and determine budget Staff time for stakeholder engagement and education 	<ul style="list-style-type: none"> Decarbonize short trips Make transportation more accessible Fill in first and last mile travel 	<ul style="list-style-type: none"> Ridership Transit connections added Congestion and number of vehicles on the road Theft Safety
4.2 Expand the use of shared EVs.	<ul style="list-style-type: none"> Off-street or curbside space Staff time for program administration and carshare operator management 	<ul style="list-style-type: none"> Lower costs and other barriers of entry to the EV ecosystem Increase accessibility Public leadership: help shape the market, to encourage a more equitable approach 	<ul style="list-style-type: none"> Congestion/traffic Municipal fleet carbon footprint Utilization of shared EVs Municipal trips or vehicles replaced

Strategic Action	Resource Needs	Anticipated Benefits	Success Measures
5. Use pilots and demonstrations to understand technology and use			
5.1 Conduct pilots to inform citywide EVSE approach.	<ul style="list-style-type: none"> Funding from BIL and IRA and other programs Staff capacity to implement the pilot 	<ul style="list-style-type: none"> Test community engagement strategies Test compliance and enforcement Prevent expensive mistakes Better understanding of revenue incentives and public-private partnership structures 	<ul style="list-style-type: none"> Equitable EVSE distribution in underserved areas EVSE utilization and turnover Grid impact Number of chargers/station Number of City Council complaints and community feedback

Strategic Action	Resource Needs	Anticipated Benefits	Success Measures
6. Incorporate workforce development into EVSE deployment and maintenance			
6.1 Invest in EVSE workforce training programs.	<ul style="list-style-type: none"> Many resources will be established through Plug-in Philly Staff time for identifying gaps and researching best practices Staff time for engagement with employers and career seekers Staff time to identify oversight partner 	<ul style="list-style-type: none"> Economic mobility for Philadelphians who are employed in the EVSE industry Increased quality of operations and maintenance for chargers around the City 	<ul style="list-style-type: none"> Increased average salary and other job quality metrics Number of trained and/or certified workers Number of jobs Increased uptime and reliability Increased union registrations
6.2 Train building and fire code officials.	<ul style="list-style-type: none"> Staff time for identifying gaps and researching training best practices. Staff time for developing training models, writing manual Staff time to identify oversight partner 	<ul style="list-style-type: none"> Safer charging infrastructure Increased knowledge of safety risks 	<ul style="list-style-type: none"> Number of city officials trained on EV Number of devastating fires, casualties, response times, and property losses

Strategic Action	Resource Needs	Anticipated Benefits	Success Measures
7. Understand and respond to community needs			
7.1 Leverage partnerships with non-governmental groups.	<ul style="list-style-type: none"> Staff time to manage relationships 	<ul style="list-style-type: none"> Increased visibility and public trust Greater support for competitive grant applications Consent to use partners' parking to prevent relying only on municipal lots Alleviate burden for the City by delegating some tasks and costs Engaged employers and enhanced talent pipeline Deeper understanding of activities and priorities of other groups Resolution to concerns around ADA and residential charging, and accessibility 	<ul style="list-style-type: none"> Public perception Amount of funding and number of grants awarded Number of engaged partners Amount of shared costs and infrastructure Uptime and other reliability metrics Number of publicly available EVSE on private property Compliance with regulations and restrictions for charging and parking

7.2 Engage the public to understand incentives and deterrents for EV adoption.	<ul style="list-style-type: none"> ▪ Staff time to plan, conduct, and review engagement ▪ Funding ▪ Consultant assistance may augment staff time 	<ul style="list-style-type: none"> ▪ Department of Planning and Development ▪ Mayor's Office of Public Engagement ▪ Sustainability Office ▪ Community partners 	<ul style="list-style-type: none"> ▪ Community buy-in and better program design. ▪ Rather than City driving the deployment, communities advocating for preferred EVSE locations ▪ Greater and more equitable distribution of electric mobility ▪ Easier and faster deployment 	<ul style="list-style-type: none"> ▪ Number of meetings and attendance ▪ Number and distribution of EV registrations ▪ Number of calls or emails to Council ▪ Increased demand for EVs ▪ Increased charger permit applications
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Appendix B

Summary of EV Task Force Participants

Name	Title	Department/Organization
Aidan Rhianne	Broadband & Smart Cities Project Manager	Office of Innovation and Technology (OIT)
Akshay Malik	Director of Smart Cities	Office of Innovation and Technology (OIT)
Alex Skowron	Carbon and Energy Data Analyst	Aviation Department
Altoro Hall	Advanced Industries Director	Department of Manufacturing and Distribution
Anna Kelly	Senior Policy Advisor for EV and Parking	Office of Transportation, Infrastructure, and Sustainability (OTIS)
Candice Fontaine	Workforce Solutions Representative	Philadelphia Works
Charlotte Shade	Program Manager, Renewable Energy	Office of Sustainability
Christopher Puchalsky	Director of Policy and Strategic Initiatives	Office of Transportation, Infrastructure, and Sustainability (OTIS)
Christopher Shelley	Smart Mobility Coordinator	Office of Innovation and Technology (OIT)
Dominic McGraw	Deputy Director, Energy Services & Operations	Office of Sustainability (OSS)
Emily Duncan	Manager of Busines Innovation	SEPTA
Emily Yates	Chief Innovation Officer	SEPTA
Hunter Conforti	Construction Engineer I	Streets Department
James Kellet	Deputy City Solicitor, Regulatory Law Unit	Law Department
Jeffrey Tan	Building Plans Examination Engineer I	Department of Licenses and Inspections (L&I)
Justine Bolkus	Senior Director, Strategic Initiatives	Commerce Department

Name	Title	Department/Organization
Kelley Yemen	Director of Complete Streets	Office of Transportation, Infrastructure, and Sustainability (OTIS)
Kisha Duckett	Assistant Chief Engineer	Streets Department
Laura Antinucci	Deputy City Solicitor	Law Department
Lily Reynolds	Director of Federal Infrastructure Strategy	Office of Transportation, Infrastructure, and Sustainability (OTIS)
Linda Bradley	Director of Parking Management	Philadelphia Parking Authority (PPA)
Melissa McMullen	City Planner	Aviation Department
Michael Devigne	City Planner II	Streets Department
Michelle Brisbon	Assistant Chief Highway Engineer	Streets Department
Miriam Cherayil	Smart Infrastructure Project Manager	Office of Innovation and Technology (OIT)
Nathan Grace	City Planner II	Philadelphia City Planning Commission (PCPC)
Nidhi Krishen	Deputy Director of Climate Solutions	Office of Sustainability
Sabria Fountain	Program Representative	Philadelphia Works
Sean Greene	Manager, Office of Freight and Clean Transportation	Delaware Valley Regional Planning Commission (DVRPC)
Stefanie Green	Senior Manager, Workforce and Business Resources	Philadelphia Energy Authority
Thomas Bonner	Senior Manager, State Government Affairs	PECO
Travis Kniffin	Senior Legal Assistant	Law Department
Wei Chen	Graduate Civil Engineer	Streets Department

Appendix C

CFI Grant Application

Philadelphia Interconnected Solutions to Accelerate Alternative Fuel Transportation

The City of Philadelphia submitted a joint application for both the Community Charging and Fueling Program and the Alternative Fuel Corridor Program to seek funding for the planning, community engagement, pre-deployment, and installation of multi-modal electric vehicle chargers in select Philadelphia Justice40 neighborhoods and four dual port DCFC charging stations at the Philadelphia International Airport.

The Community Charging and Fueling Program seeks to implement a pilot demonstration in three recreation centers to accelerate the delivery of an electrified and alternative fuel transportation system that is convenient, affordable, reliable, equitable, accessible, and safe.

The Alternative Fuel Corridor Program seeks to eliminate an EV charging desert and enable accessible and affordable public EV charging stations along the Alternative Fuel corridor along I-95.

Community Program Budget

Phase	Budget
Planning, Engagement, and Feasibility Study	\$ 1,850,000
Pre-deployment	\$ 1,800,000
Deployment	\$ 2,800,000
Operations and Maintenance	\$ 2,000,000
Total	\$ 8,450,000

Alternative Fuel Corridor Program Budget

Phase	Budget
Planning and Coordination	\$ 20,000.00
Design	\$ 327,814.78
Construction	\$ 2,433,185.22
Total	\$ 2,781,000.00



Source: Adobe Stock

