



2017 CITY OF PORTLAND ELECTRIC VEHICLE STRATEGY

INTRODUCTION

Portland's Climate Action Plan provides a road map to reduce carbon emissions 40 percent by 2030 and 80 percent by 2050. Land use planning, transportation policies and investments are among the most important strategies to address climate change. In Portland, the transportation of goods and people accounts for nearly 40 percent of local carbon emissions. Shifting from gasoline and diesel to lower-carbon transportation fuels, like electricity, is a key strategy to achieving Portland's climate action goals.

Portland's approach to personal mobility prioritizes safety, health, affordability and environmental quality. City of Portland staff are working to encourage people movement instead of car movement by creating a healthy connected city that enables safe and convenient walking, biking and transit use (see Figure 1). This Electric Vehicle Strategy focuses on electrification of the public transit system, shared vehicles and the private automobiles that remain in use, which is one of many strategies the City is taking to reduce carbon emissions from the transportation sector. This strategy also seeks to maximize the benefits of air quality and affordability for low-income residents and parts of Portland that are the most dependent on private vehicles.

Portland's transportation hierarchy for people movement.

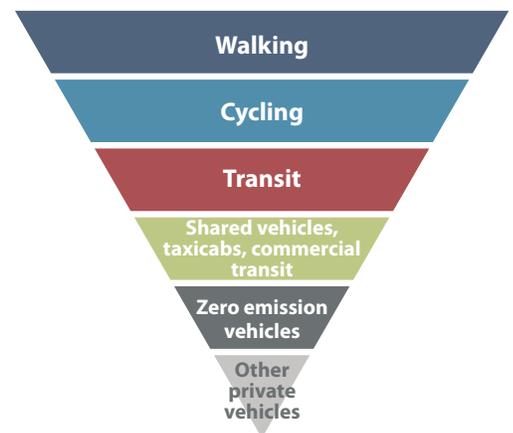


Figure 1: Portland prioritizes transportation options that reduce congestion and carbon emissions. (Source: Comprehensive Plan Policy 9.6)

In the future, significantly more people will need to travel to work and school by taking transit or biking.

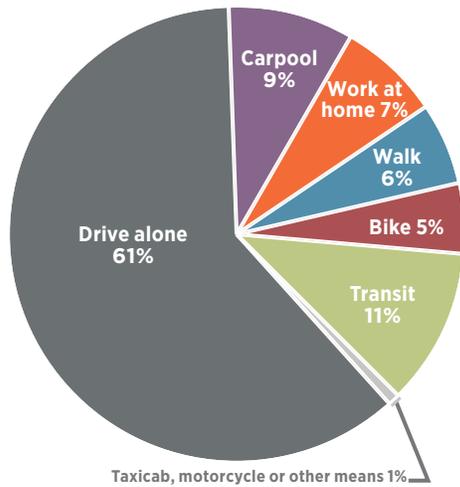


Figure 2: 2012 work commute mode share for Multnomah County (Source: American Community Survey)

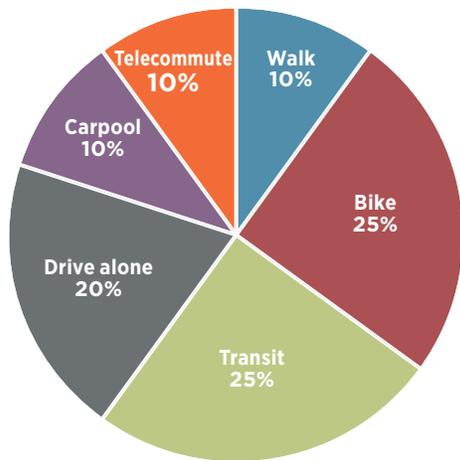
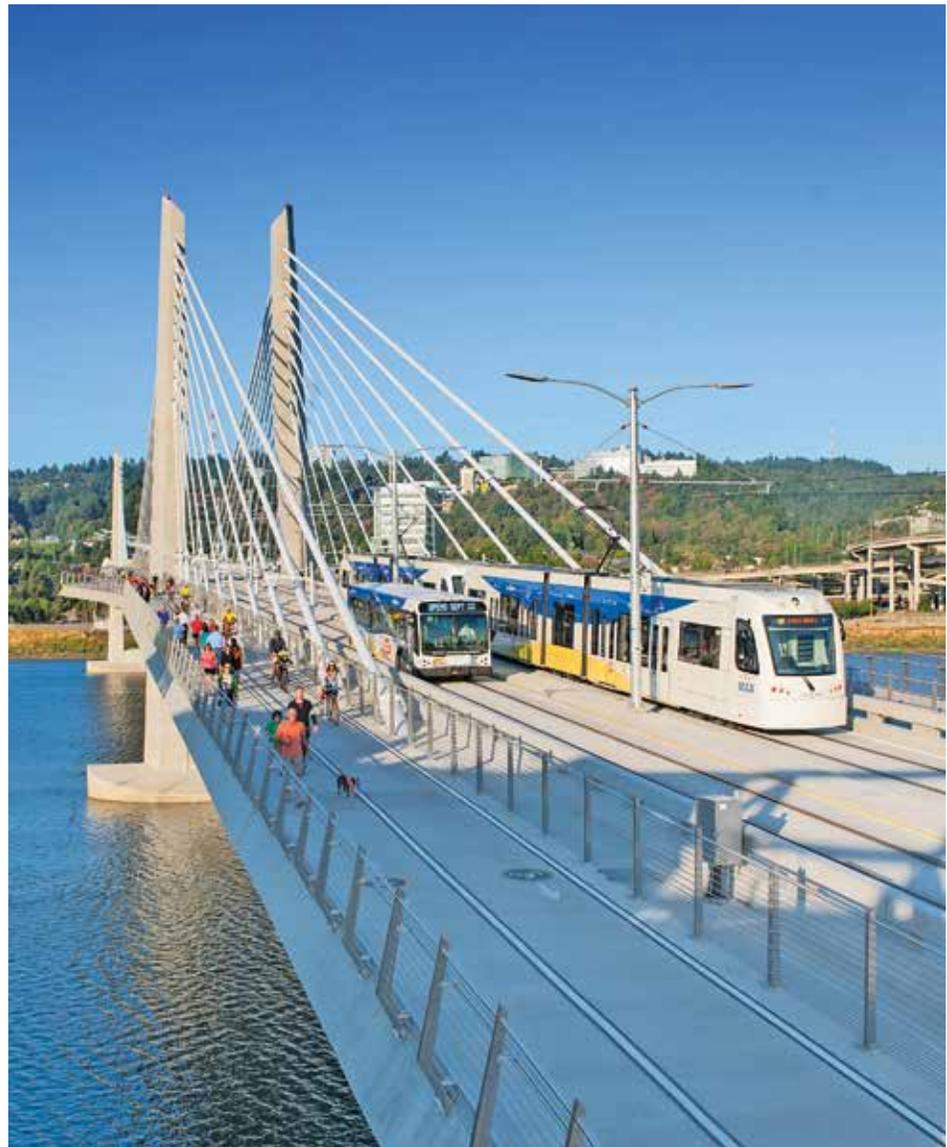


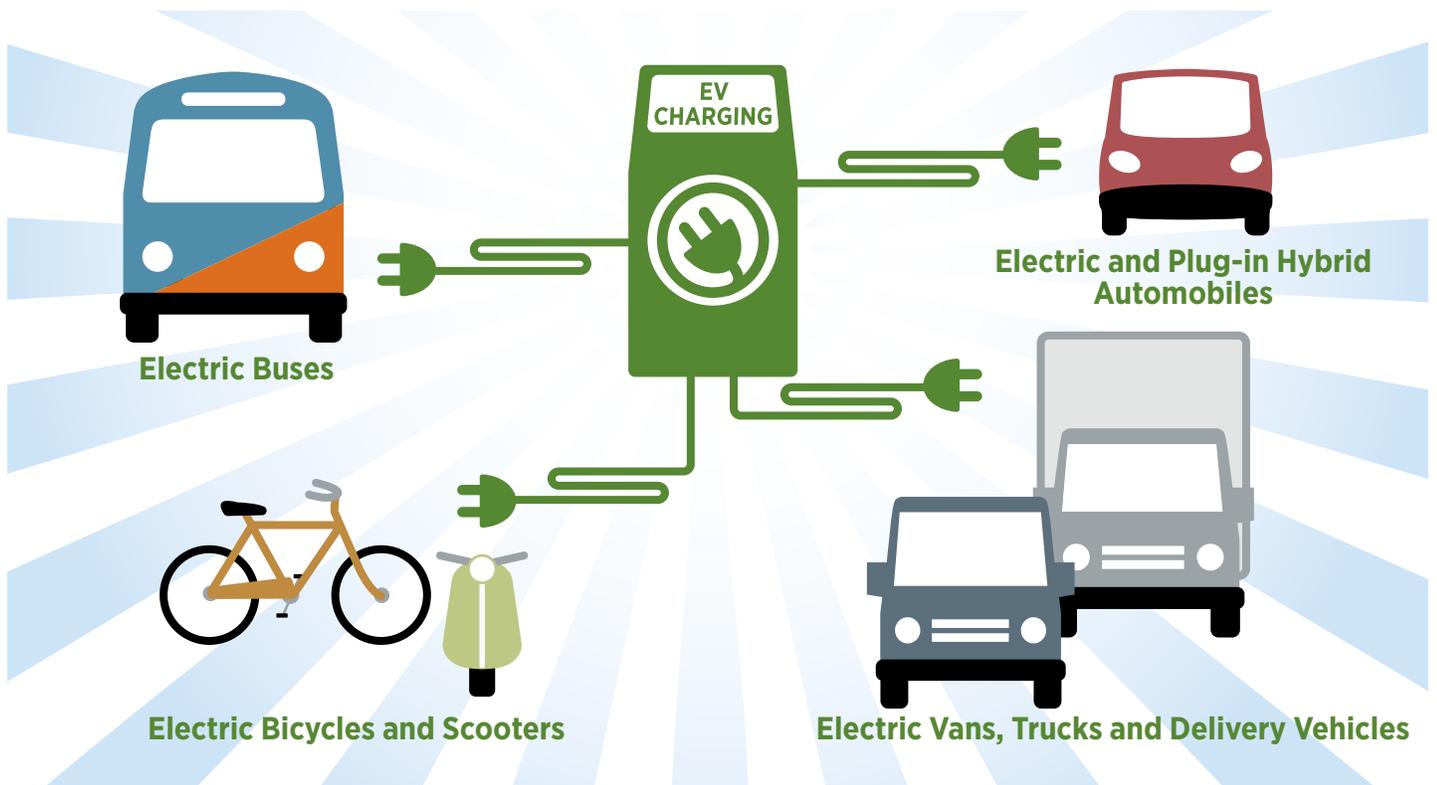
Figure 3: 2030 target work commute mode share for Multnomah County.

Portland’s Climate Action Plan also includes goals to decrease the Portland’s transportation-related carbon emissions 25 percent below 1990 levels by 2020, 40 percent by 2030 and 80 percent by 2050. To reach those goals, the current commute mode split will need to shift toward walking, bicycling and public transit, and the number of people commuting in single occupancy vehicles will need to decrease from 59 percent to 20 percent by 2030 (see Figures 2 and 3).

A growing proportion of the vehicles that remain on the road in 2030, including public transit and commercial vehicles, will need to be powered by electricity. Specifically, it is estimated that 10 to 15 percent of all non-commercial vehicle miles traveled on Portland’s roads in 2030 will need to be in electric vehicles to achieve Portland’s broader carbon emission goals. This translates into an estimated 50,000 electric vehicles in the metro area, based on average per capita vehicle miles traveled.



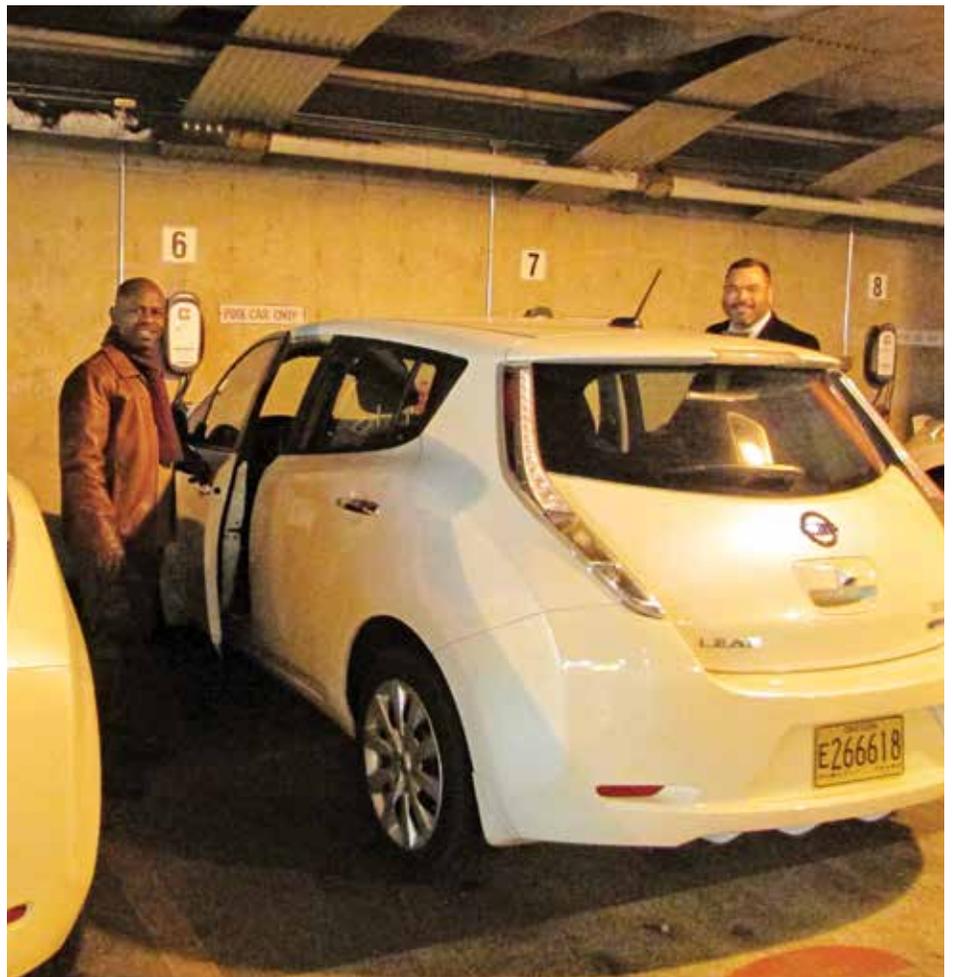
Tilikum Crossing: Bridge of the People, the largest car-free bridge in the United States, was completed in 2015. As the latest addition to our cityscape, Tilikum Crossing carries two of Portland’s electric transit choices, the Portland Streetcar and the MAX Orange Light Rail Train, as well as TriMet buses, cyclists and pedestrians.



For the purpose of this strategy the term electric vehicle includes: electric bikes (e-bikes), electric scooters (e-scooters), and electric and plug-in hybrid cars, trucks, buses and freight vehicles.

Portland’s first electric vehicle strategy, *Electric Vehicles: The Portland Way*, was developed in 2010

to prepare for the launch of the first widely available electric passenger vehicles. Almost seven years have passed and the electric vehicle market landscape has changed significantly -- for example, more than 25 electric vehicle models are available for purchase today, and many more options with significantly longer range are expected in the next few years. Similarly, the actions the City needs to prioritize to continue to support and accelerate the transition from gas- and diesel-fueled to electric vehicles has changed since the City’s first electric vehicle strategy was adopted. This updated strategy establishes the City’s current electric vehicle-related priorities and identifies the actions the City will take before the end of 2020 to further the electrification of the transportation sector.





ELECTRIC VEHICLES FOR ALL

The City is committed to creating mobility solutions that are equitable and empowering. Low-income populations and communities of color suffer disproportionately from vehicle-related air pollution, often drive less fuel efficient vehicles, tend to have longer commutes and spend a higher proportion of their income on fuel and transportation costs (PolicyLink/Prevention Institute/Convergence Partnership, 2009). Improving access to affordable transportation options is critical to improving economic opportunity, wealth building and upward mobility. Electric vehicles offer many opportunities to benefit under-served communities as Portlanders transition from fossil fuels to low-carbon transportation.

Many people hear the words *electric vehicle* and *expensive* immediately comes to mind. This association contributes to the perception that electric vehicles are only accessible to wealthy people. In reality, the two-dozen electric vehicle models available on the market have diverse price and size options. Changing the perception of electric vehicles from expensive to accessible to all income levels will help bring the benefits of cleaner, lower-cost transportation to more households, as well as accelerate the transition away from fossil fuels. People of color are expected to be the majority in the U.S. by 2044 (National Equity Atlas, 2016). This increased buying power makes people of color an important segment for increasing electric vehicle adoption numbers (The Greenlining Institute, 2016). This strategy includes actions to increase access to electric vehicles and charging infrastructure for low-income populations and communities of color.

In Portland, many low-income people and communities of color live in multi-unit dwellings, such as apartment buildings. To increase access to viable electric vehicle options for these communities, charging infrastructure must be available. To begin addressing this barrier the City will explore policy options to require new buildings, especially apartments and condominiums, to be built with the necessary conduits and electrical capacity to enable cost effective installation of charging infrastructure.

Priority Electric Vehicle Charging Areas

The City prioritizes charging infrastructure in areas of Portland that have:

- Fewer existing public charging stations.
- Limited access to frequent transit and bike routes.
- Higher proportions of multifamily housing and garage-free homes.
- Large businesses with employees commuting long distances.
- Residents with higher average vehicle miles traveled.
- Destinations (recreation sites, event venues, etc.) people tend to travel longer distances to access.



ELECTRIC VEHICLE STRATEGY: 2020 GOALS

This Electric Vehicle strategy seeks to accelerate the transition to electric vehicles, including e-bikes, to achieve the people movement hierarchy (see Figure 1, page 1), and mode share and vehicle miles traveled goals of Portland's Climate Action Plan, Comprehensive Plan and Transportation System Plan. To that end, the City seeks to accomplish the following goals by the end of 2020:

- Replace at least 10,000 gas- or diesel-powered vehicles with electric vehicles in Multnomah County.
- Increase access to electric vehicle charging infrastructure by doubling the number of Level 2 and DC Fast Chargers available to the public.
- Increase access to affordable electric vehicle transportation options for low-income populations and communities of color.
- Maximize the air quality and cost savings benefits of electric vehicles for low-income populations and communities of color.
- Add 60 electric vehicles to the City's sedan fleet to increase the percentage of electric vehicles from 20 to 30 percent. Seek options to electrify other classes of vehicles in the City's fleet.
- Prioritize the electrification of shared use vehicles, bikes and buses to reduce the need for personal vehicle ownership.
- Encourage the electrification of automated vehicles to improve safety and mobility options for people who don't drive.



ELECTRIC VEHICLE STRATEGY: 2020 ACTIONS

This Electric Vehicle Strategy identifies nearly 50 actions to be completed or significantly underway by the end of 2020. To draft this strategy, City staff received input from Portland’s transit agency, utilities, environmental organizations, staff from West Coast cities, the State of Oregon, Portland State University representatives, low-income Portlanders and local electric vehicle advocates and stakeholders. These groups helped to identify the near-term actions most likely to result in accelerating the transition from gas-powered to electric vehicles (EV). Going forward, the City will continue to work with interested parties and community-based organizations, and will develop a cross-bureau group to facilitate collaboration and implementation of the actions in this plan.

Reading the table of actions

 This symbol appearing in the first column denotes actions where the City of Portland is a direct implementer of the action, versus actions where the City plays a supporting role.

The lead bureau for each action appears in **bold** text supporting bureaus are shown in regular text.

Bureau acronyms:

BPS – Bureau of Planning and Sustainability
 BES– Bureau of Environmental Services
 CBO – City Budget Office
 PDC – Portland Development Commission

BDS – Bureau of Development Services
 BIBS – Bureau of Information Business Systems
 PBOT – Portland Bureau of Transportation
 PHB – Portland Housing Bureau

Charging Infrastructure

Owning an electric vehicle is not practical without convenient, reliable access to charging. To support the growth of electric vehicles, Portland needs to have a sufficient charging infrastructure system. Providing Portlanders with a robust and reliable charging network at home, work and in public places will reduce range anxiety (the fear of running out of electricity on the road), provide access to emergency charging and enable longer trips.

Most electric vehicle drivers charge their vehicles at home (National Research Council of National Academies of Sciences, 2015), but this can be difficult for people who rent their homes, do not have a garage or live in multifamily housing. Accessing charging from multifamily residences can be especially difficult due to the complexities of negotiating costs, installation logistics and liability issues with the landlord or site host. This Electric Vehicle Strategy includes actions to increase access to charging in buildings, parking facilities and public places. The City will explore the development of EV-ready requirements for new building construction, develop clear policies and procedures to enable publicly accessible charging and work with partners to install clusters of electric vehicle charging stations in strategic areas around Portland.

| CHARGING INFRASTRUCTURE ACTIONS: BUILDINGS | | LEAD BUREAU |
|---|--|--------------------------|
|  | 1. EV-Ready Multifamily and Commercial Buildings – Explore electric vehicle (EV) parking and charging infrastructure requirements in new multi-family and commercial construction projects that include parking. | BPS, BDS |
|  | 2. EV-Ready for Affordable Housing – Incorporate EV-ready provisions in the City’s green building policy for affordable housing. | PHB, BPS |
|  | 3. Funding for EV-Ready Affordable Housing – Seek funding to enable affordable housing projects that have parking to be EV-ready with, at a minimum, the necessary electrical capacity and conduit to enable EV chargers. | PHB, BPS |
|  | 4. EV-Ready for PDC-Supported Projects – Develop EV-ready provisions for construction projects that trigger the Portland Development Commission Green Building Policy. | PDC |
|  | 5. Funding for City Fleet Chargers – Develop a funding mechanism to address the upfront costs for new EV chargers for City vehicles in City-owned or -managed buildings. | CBO, BIBS, BPS |
|  | 6. EV-Ready and Retrofits for City Buildings – Partner with community partners and private industry to develop a strategy to retrofit strategic existing City-owned buildings and facilities with EV chargers. Consider EV-ready construction requirements for new City buildings or major renovation projects that have parking. | BIBS, all bureaus |
| | 7. Technical Assistance for Chargers – Work with utility and community partners to provide technical assistance to building managers and homeowners to install EV chargers, especially in existing buildings. | BPS |
| | 8. Engage Builders and Architects – Work with partners to develop EV charging outreach and education materials and programs targeted to builders and architects. | BPS |

| CHARGING INFRASTRUCTURE ACTIONS: PUBLIC | | LEAD BUREAU |
|--|---|------------------------------|
|  | 9. Right-of-Way Charging – Develop public right of way (ROW) priorities and policies to enable installation of publicly accessible EV chargers in strategic locations, and provide clear guidelines for public and private parties. Establish a policy for addressing abandoned EV chargers in the right of way. | PBOT |
|  | 10. EV-Ready and Retrofits for Parking Facilities – Explore the development of EV parking and charging infrastructure requirements in new and existing (public and private) parking facilities. | BPS, BDS, PBOT |
|  | 11. Public Awareness – Work with community partners to increase the public’s awareness of EV chargers through improved signage, marketing and outreach. | BPS, PBOT |
|  | 12. City Parking Facilities – Work to increase the utilization of existing EV chargers in City-owned and/or -managed parking lots and garages (e.g., SmartPark Garages). | PBOT |
|  | 13. E-Bike Parking – Explore opportunities to integrate e-bike charging infrastructure into the City’s bike parking Title 33 code update. | PBOT |
|  | 14. Major Public Works Projects – Identify opportunities to install EV chargers and/or conduits in conjunction with major public works projects in strategic locations and in streetscape planning. | BPS, PBOT, Water, BES |
|  | 15. Public Charging on Private Property – Establish policies and processes that make it easier to provide publicly accessible charging on private property and encourage private property owners to do so. | PBOT, BPS, BDS |
|  | 16. EV Signage and Parking Standards – Develop policies and standards for EV signage and parking, including parking rates, time limits and “parking while charging” restrictions. | PBOT |
|  | 17. City-Owned and Maintained Chargers – Explore City ownership and maintenance of publicly accessible EV chargers, particularly in under-served areas. | PBOT, BPS |
|  | 18. Streetlight Integration – Explore the integration of electric vehicle charging with streetlights in Portland. | PBOT |
| | 19. EV Charging Hubs – Work with public and private partners to support the installation of multi-modal EV charging pods similar to Electric Avenue around the metro area. Include e-bike charging infrastructure in these electric mobility hubs. | PBOT, BPS |
| | 20. Priority Areas for EV Charging – Work with community partners and utilities to install publicly accessible EV chargers in strategic locations. Prioritize EV chargers that serve low-income residences, including multi-family, single-family rental housing and garage-free homes. | BPS, PBOT |
| | 21. Utility Transportation Electrification Plans – Partner with local utilities to finalize and implement their transportation electrification plans. Continue to advocate for the utilities to reduce the carbon content of their supply mix. | BPS, PBOT |
| | 22. Park and Ride Charging – Encourage TriMet to continue installing and maintaining EV chargers at Park & Ride and Bike & Ride lots. | PBOT |
| | 23. Public Charging Partnerships – Work with utilities, Neighborhood Prosperity Initiative (NPI) districts and Main Street areas to install publicly accessible EV chargers. | PDC, BPS |

Fleets

Electrifying fleet vehicles offers a key opportunity to reduce carbon emissions, improve air quality, decrease long-term maintenance and operating costs, and increase electric vehicle visibility for the general public. Many fleet managers are eager to take advantage of these benefits but also face barriers:

- Unlike gas-powered vehicles, a large portion of the costs associated with fueling electric vehicles need to be paid upfront via the installation of charging infrastructure. This contributes to increased upfront costs of buying an electric vehicle compared to a gas-powered vehicle.
- Many electric vehicles have a purchase price premium and government fleets are not able to take advantage of tax credits or rebates to help offset those increased costs.
- Medium- and heavy-duty electric vehicle models are expensive and only a few are currently available on the market.
- Many fleet managers, drivers and maintenance staff have limited awareness of electric vehicles.

To address these barriers and increase fleet electrification the City will: a) seek funding for charging infrastructure in City-owned buildings (see action A6), b) support TriMet’s efforts to electrify city buses, c) encourage the electrification of medium- and heavy-duty freight vehicles, and d) partner with stakeholders to electrify car-share, taxi and bike-share fleets. Additionally, Portland will lead by example and add at least 60 additional electric vehicles to the City’s sedan fleet to increase the percentage of electric vehicles from 20 to 30 percent by 2020.

| FLEET ACTIONS – TRANSIT | | LEAD BUREAU |
|---|---|------------------------|
| | 24. Bus Electrification – Support TriMet’s efforts to transition to electric buses and encourage the electrification of other people transport fleets (e.g., tour vehicles, taxis) in Portland. | BPS |
| | 25. Air Quality – Work with TriMet to use new electric buses along routes through portions of the city where air quality issues have the largest impact. | BPS |
| | 26. Integrated Transit and Shared EV Mobility – Explore options to integrate public transit and shared EV mobility options such as e-bikes, e-scooters and EV car-share vehicles. | BPS, PBOT |
| | 27. E-Bikes on Transit Vehicles – Encourage TriMet to continue accommodating e-bikes on exterior bus bike racks and on board rail vehicles in designated areas. | PBOT, BPS |
| FLEET ACTIONS – CITY FLEET | | LEAD BUREAU |
|  | 28. Clean Fuels Credits – Become a credit generator in the Oregon Clean Fuels Program for City-owned chargers. Adopt a policy to ensure that resources received from these types of credits are spent on EV-related projects. | BPS, BIBS |
|  | 29. City EV Purchasing – Establish “electric first” guidelines directing City bureaus to purchase all-electric vehicles when the vehicle usage is compatible with available electric light-duty vehicles. | City Fleet, BPS |
|  | 30. City Employee Workplace Charging – Explore workplace charging for City employees working in and parking personal vehicles at City-owned and -managed facilities. Encourage City staff who must drive to work to drive EVs. | BPS, BIBS, BHR |
| FLEET ACTIONS – FREIGHT | | LEAD BUREAU |
| | 31. Electrifying Delivery Vehicles – Support the electrification of medium- and heavy-duty vehicles used in Portland for the delivery of goods and materials. | PBOT |
| | 32. Pilot Projects – Continue to explore urban consolidation centers and support pilot projects to electrify delivery vehicles. | PBOT, BPS |

Personal Vehicles and Shared Mobility

Key barriers to electric vehicle uptake include upfront costs, accessibility and awareness. The life-cycle costs of electric vehicles are often lower than conventional gas-powered cars, making them a promising strategy to reduce transportation costs in car-dependent areas. The upfront cost of new electric vehicles can easily be \$10,000 higher, however. Most consumers need financial subsidies, such as tax credits, to overcome this cost difference. This is especially true for low-income people who often have more limited access to financing options. Used electric vehicles tend to cost less than comparable gas-powered cars and may be a great way to bring electric vehicles to low-income populations at a lower cost, as well as provide a second life for electric vehicles. This strategy includes actions to: a) increase access to used electric vehicles, b) encourage State financial incentives for electric vehicle purchases, and c) research financing options for individuals with no or damaged credit.

Another barrier to electric vehicle uptake is the lack of awareness about the performance and functionality of electric vehicles. Many Portlanders are also unfamiliar with the diversity of available models, electric vehicle purchasing incentives, or the environmental and economic benefits of electric vehicles. This strategy includes several electric vehicle-related education and outreach actions, such as supporting Drive Oregon's Northwest EV Showcase – an electric vehicle marketing and outreach initiative with a downtown Portland showroom funded by the US Department of Energy.

This strategy also calls for a community mobility assessment to ensure that electric vehicle solutions meet the needs of low-income people and communities of color. Building on the findings from that assessment, the City will work with partners to provide outreach and education programs that are targeted to under-served communities. Opportunities include: a) pop-up Northwest EV Showcase locations in East Portland, b) used electric vehicles bulk purchase programs, and c) electric vehicle car-share and e-bike pilot programs that serve these communities.

Car-share and bike-share programs offer a unique avenue for Portlanders to become familiar with electric vehicles, while at the same time reducing carbon emissions and helping to eliminate the need for personal car ownership. The City will work with partners to encourage the electrification of car-share programs (e.g., ReachNow) and ride-sourcing companies (e.g., Uber and Lyft), and seek funding to partially electrify the BIKETOWN bike-share system.

| PERSONAL VEHICLES AND SHARED MOBILITY ACTIONS | | LEAD BUREAU |
|--|---|-----------------------|
|  | 33. BIKETOWN Electrification – Continue to explore opportunities to partially electrify Portland's BIKETOWN bike-share program. | PBOT |
| | 34. EV Showcase – Support Drive Oregon's Northwest EV Showcase initiative, including helping to market the EV group purchase program, seeking funding to support the initiative and collaborating to develop the physical space. | BPS |
| | 35. Mobility Needs Assessment – Work with partners to leverage existing community mobility needs assessments and conduct additional engagement as necessary to ensure that EV solutions meet the needs of low-income populations and communities of color. | BPS |
| | 36. EV Incentives and Pilot Projects – Work with partners to develop programs and incentives to reduce the barriers to EVs for low-income populations, communities of color and individuals with no or damaged credit, such as vouchers, instant rebates and EV car-share and e-bike pilot projects. | BPS, PBOT, PHB |
| | 37. Purchasing Process Assistance – Support community partners such as Drive Oregon to help low-income Portlanders navigate the incentives, financing and decision-making process of buying or leasing new or used EVs. | BPS |
| | 38. Private for Hire Vehicle Electrification – Encourage taxi, car-share and ride-sourcing companies (such as Uber and Lyft) to utilize EVs in their fleets. Explore incentives to increase shared electric mobility options, particularly in areas with limited transportation options. | PBOT, BPS |

Innovation and Information

Electric vehicles continue to change and improve as new innovations are introduced into the market. Over the next five years, the distance that can be driven per charge (range) will increase, purchase prices will decrease and more used electric vehicles will be available. This strategy includes actions to research and track new technology, electric vehicle car sales, demographics, vehicle-miles-traveled and commute trends to inform investment and policy priorities for the electrification of the transportation system.

| INNOVATION AND INFORMATION ACTIONS | | LEAD BUREAU |
|---|---|------------------|
|  | 39. Investment and Policy Decisions – Develop and utilize the best available information (e.g., charger location, EV car sales, demographics, vehicle-miles-traveled) to inform investment and policy priorities for the electrification of the transportation system. | BPS, PBOT |
| | 40. Data Tracking and Sharing – Work with Oregon’s Department of Environmental Quality and Portland State University to track and share data on the number of zero emission vehicles registered in Oregon and Multnomah County. | BPS |
| | 41. Smart Cities – Partner with public and private stakeholders to integrate EVs into Smart Cities projects. | PBOT, BPS |
| | 42. Autonomous Vehicles – Seek opportunities to pilot electric autonomous vehicles (AVs). | PBOT, BPS |

Economic Development

The electric vehicle industry provides opportunities to contribute to Portland’s economy through job creation and local business development. This strategy includes actions to: a) connect local electric vehicle manufacturers, suppliers and customers to large regional and national companies, b) provide electric vehicle-related employment opportunities for underemployed or unemployed residents, and c) support Portland’s leadership in clean technologies.

| ECONOMIC DEVELOPMENT ACTIONS | | LEAD BUREAU |
|---|--|-----------------|
|  | 43. Employment Opportunities – Build resources to connect small- to medium-sized EV manufacturers with employment opportunities for qualified underemployed and unemployed residents. | PDC |
|  | 44. Opportunities for People of Color – Track effectiveness of EV economic development efforts in extending business and employment opportunities to people of color. | PDC |
|  | 45. Marketing – Continue to market Portland’s leadership in clean technologies utilizing Portland’s “We Build Green Cities” brand to drive EV business development, relocation and expansion opportunities. | PDC |
|  | 46. Business Development Assistance – Prioritize business development visits and technical assistance to EV-related companies with middle-wage employment opportunities. | PDC |
|  | 47. Business Opportunities – Organize supply-chain and investor matchmaking events and trade show participation opportunities for existing EV firms to increase financing, sales and export opportunities. | PDC |
| | 48. EV Sector Networking – Work with Drive Oregon, TriMet, Metro and Greater Portland Inc. (GPI) to increase networking among local EV manufacturers and customers. | PDC |
| | 49. EV Conferences – Support efforts to bring major EV conferences to Portland. | PDC, BPS |

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