ELECTRIC VEHICLE CHARGING IN THE PUBLIC RIGHT-OF-WAY CODE PROJECT

Report on the City of Portland's Code update project to enable the installation of electric vehicle chargers in the public right-of-way

PBOT
PORTLAND BUREAU OF TRANSPORTATION

POLICY, PLANNING & PROJECTS GROUP
FEBRUARY 2023

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The project team recognizes the support of former Commissioner Jo Ann Hardesty who served as Portland City Commissioner-in-Charge of the Portland Bureau of Transportation from 2019–2022.

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EXECUTIVE SUMMARY

In March 2021, the Portland Bureau of Transportation initiated a project to create new policy to enable the installation of electric vehicle chargers in the public right-of-way. This project responds to community advocacy, acknowledges electrification represents a key opportunity to reduce carbon emissions from the city of Portland's transportation system, and represents an opportunity to strategically integrate decarbonization goals with racial justice goals. Increasing public charging opportunities will alleviate a key roadblock in EV adoption: reliable access to affordable charging. Public charging is especially important for visitors in commercial areas and residents who cannot charge at home, like Portlanders who live in multi-unit dwellings or in single family homes without garages or driveways.

This report details the Portland Bureau of Transportation's process to work collaboratively across groups to update Portland City Code and Administrative Rules to set location and siting requirements for the installation of Level 2 EV chargers in the ROW in select areas of Portland. These changes are accompanied by a clear permit process for companies interested in providing public charging services.

INTRODUCTION

The City of Portland identified light-duty electric vehicle (EV) charging in the public right-of-way (ROW) as a priority and charged the Portland Bureau of Transportation (PBOT) with moving this effort forward. This project responds to community advocacy, acknowledges electrification represents a key opportunity to reduce carbon emissions from the City's transportation system, and represents an opportunity to strategically integrate decarbonization goals with racial justice and disability goals. The goal of this project is to alleviate the barrier of EV charging in EV adoption, especially for Portlanders without access to home charging, such as those in multi-unit dwellings or single-family homes without garages or driveways.

Purpose

This project aims to reduce barriers for historically marginalized communities by creating a convenient, reliable, and affordable public charging network for light-duty EVs. A major limitation to EV adoption in underserved communities initially was the cost of vehicles; however, state and federal rebates and incentives are helping to make some EVs as affordable as conventional gasoline vehicles. Now access to, and affordability of charging have emerged as key obstacles to EV ownership.[2] Many EV drivers predominantly charge their vehicles at home to maximize cost effectiveness and convenience. While homeowners can invest in home chargers and take advantage of those benefits, renters must rely on landlords to make upgrades or seek less convenient and more expensive public charging. As a result, EV ownership is low among renters and communities with low homeownership rates are disproportionately communities of color.[3] The lack of EV ownership means that charging providers often do not install public charging infrastructure in these communities. Renters in communities without public charging infrastructure are often excluded from the benefits of transportation electrification including lower fuel and maintenance costs and improved local air pollution.[4] This project aims to create a clear permit system that encourages companies to invest in a public charging network that will enable a more Portlanders to easily and affordably charge their EVs. This project is one of several citywide efforts to support EV adoption.

Municipal Role in EV Charging

There are many ways that municipalities can and should be involved in transportation electrification. The City of Portland aims to reduce barriers for Portlanders to adopt EVs by increasing access to EV charging and to provide companies interested offering EV charging services clear guidelines and an efficient regulatory process. Achieving these goals requires multidisciplinary coordination from several Bureaus.

PBOT has three primary roles within transportation electrification. First, PBOT creates transportation policies to shift behavior and reduce greenhouse (GHG) emissions. These policies have helped make Portland a pioneer on public charging and positioned the City to fill market gaps. PBOT will continue to pursue projects and grant proposals to create policies to remove barriers to EV charging, send market signals and coordinate on land use, state and federal policy. Second, PBOT partners with the private sector to provide infrastructure and low carbon

mobility options, including mobility options such as BIKETOWN, e-scooters, and the Streetcar. Finally, PBOT leverages its assets to advance City goals by allowing the installation of public EV chargers in the right-of-way and the installation of chargers for CityFleet vehicles at Smart Park garages. PBOT's role on transportation decarbonization may be periodically updated as the City makes progress on its adopted policies and goals and as the City of Portland implements charter reform.

Authorization

This project is supported by multiple adopted policies and goals, including but not limited to the following:

In 2015, via the adoption of the Portland Climate Action Plan [Resolution No. 37135], Portland City Council directed PBOT to address barriers to EV charging and to support low carbon fueling infrastructure through Action 7B: Expand Electric Car Charging Stations.[1]

In 2017, via the adoption of the City of Portland EV Strategy [Resolution No. 37255], Portland City Council directed PBOT to develop ROW priorities and policies to enable installation of publicly accessible EV chargers in strategic locations and provide clear guidelines for public and private parties through Action 9: Right-of-Way Charging.[2]

In 2017, Governor Kate Brown signed Executive Order No. 17-21 which established a statewide goal of 50,000 or more registered and operating electric vehicles by 2020.[3]

In 2019, the Oregon Legislature passed Senate Bill 1044 which expanded upon Governor Brown's Executive Order No. 17-21 by setting the following targets:

- At least 250,000 registered ZEVs on Oregon roads by 2025;
- At least 25% of all registered vehicles and at least 50% of new vehicle sales will be ZEV by 2030; and
- ZEVs will represent 90% of annual new vehicle sales by 2035.[4]

In 2016, via the adoption of the 2035 Comprehensive Plan [Ordinance 190924], Portland City Council directed PBOT to facilitate new mobility vehicles and services with the lowest climate and congestion impacts and greatest equity benefits through Policy 9.68: New Mobility Priorities and Outcomes.[5]

In 2019, the PBOT Strategic Plan 2019-2022, Moving to Our Future, was published and it directed PBOT to accelerate the conversion of EVs within the context of a transportation justice lens through Goal 2, Objective 1, Strategic Initiative H.[6]

In 2022, via the adoption of the City of Portland's 2022-2025 Climate Emergency Workplan [Resolution 37585], Portland City Council directed PBOT, the Bureau of Planning and Sustainability (BPS), and the Bureau of

[1] https://www.portland.gov/sites/default/files/2019-07/cap-2015_june30-2015_web_0.pdf
[2] https://www.portland.gov/sites/default/files/2019-07/final_electric-vehicle_report2016_web.pdf
[3] https://www.oregon.gov/gov/Documents/executive_orders/eo_17-21.pdf
[4] https://olis.oregonlegislature.gov/liz/2019R1/Downloads/MeasureDocument/SB1044/Enrolled
[5] https://www.portland.gov/sites/default/files/2019-08/09_transportation.pdf
[6] https://www.portland.gov/sites/default/files/2021/pbot-strategic-plan_2019-2024_finalfile.pdf

Development Services (BDS) to make it easier to use EVs if you cannot charge at home.[7]

In 2022, the Oregon Department of Environmental Quality (DEQ) adopted the Advanced Clean Cars II rule which will require auto manufacturers to deliver 100% new zero emission battery electric and plug-in hybrid EVs by 2035.[8]

In 2022, the U.S. Department of Energy, Department of Transportation, the Environmental Protection Agency, and the Department of Housing and Urban Development published the U.S. National Blueprint for Transportation Decarbonization: A Joint Strategy to Transform Transportation. The Blueprint describes three key strategies to achieve decarbonization: improve community design and land-use planning, increase options to travel more efficiently, and transition to zero emission vehicles and fuels. While the Blueprint acknowledges that first two strategies will contribute to reducing GHG emissions and produce significant co-benefits, it highlights that transitioning to ZEVs is expected to drive the majority of emission reductions.[9]

Building on time spent learning about best practices in other cities and tracking emerging trends, PBOT initiated this project and charged the New Mobility team with moving it forward.

[7] https://www.portland.gov/sites/default/files/2022/bps_climateactionworkplan-final-web.pdf
[8] https://www.oregon.gov/deq/rulemaking/Pages/CleanCarsII.aspx
[9] https://www.energy.gov/sites/default/files/2023-01/the-us-national-blueprint-for-transportation-decarbonization.pdf

BACKGROUND

Electric Vehicle Charging

There are several different types of EV chargers available today. Chargers are divided into three categories: Level 1 (L1), Level 2 (L2), and Level 3, or DC fast charging (DCFC). L1 charging, also known as "trickle charging" is almost always done at home as it uses a standard 120-volt outlet and charges an EV very slowly. L2 charging is used for home or public use while DCFC is only used in public settings. More information on all levels of charging available are found in Image 1, below.

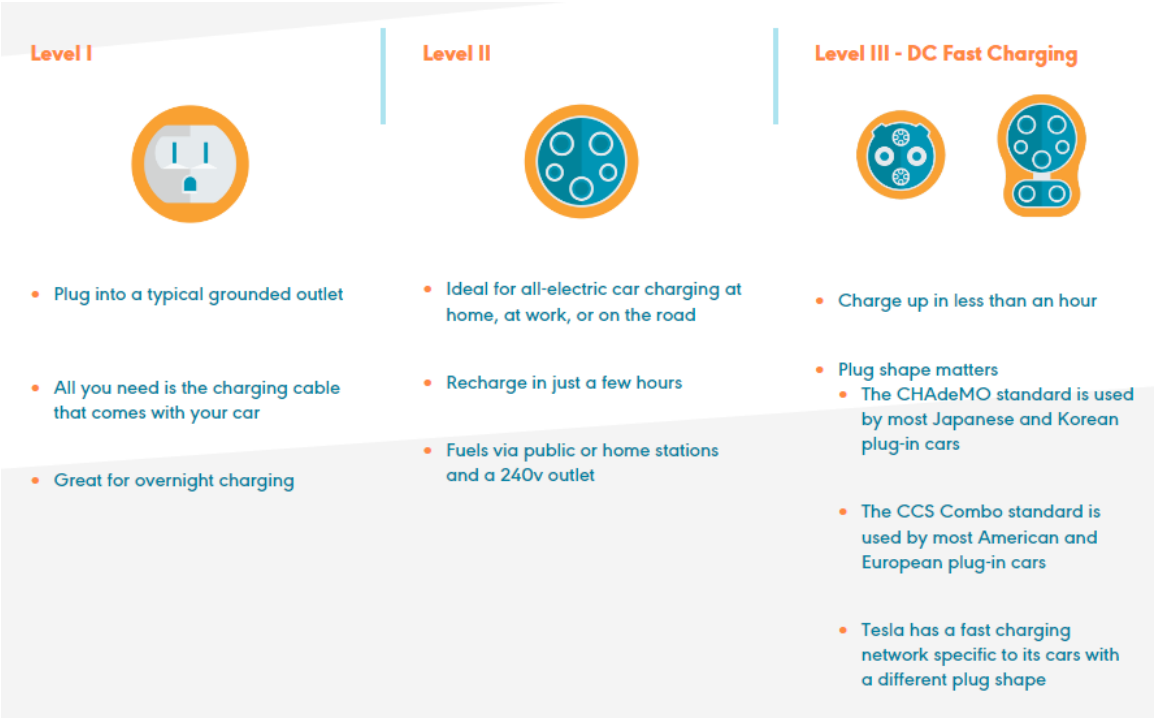

Image 1. EV charging levels[10]

There are multiple plug types that can be found at L2 and DCFC chargers.[11] Tesla has its own proprietary network with its own type of plug for both L2 and DCFC stations. All other L2 stations use the J1772 plug, which has been adopted by the Society for Automotive Engineers as the standard plug for L2 charging. There are two DCFC plugs aside from Tesla: CHAdeMo and CCS Combo. The CHAdeMO plug is used by most Japanese and Korean EVs while the CCS Combo is standard for most American and European EVs. The CCS plug is required to be used for projects funded by the new National Electric Vehicle Infrastructure (NEVI) Formula Program.[12]

This project was initiated with the narrow scope of allowing L2 charging for light-duty EVs in the ROW and did not intend to address charging for medium- and heavy-duty vehicles or for micro-mobility vehicles (i.e. e-scooters

[10] https://forthmobility.org/showcase/charging-options
[11] https://blinkcharging.com/understanding-ev-charging-plugs/?locale=en
[12] https://www.fhwa.dot.gov/environment/alternative_fuel_corridors/nominations/90d_nevi_formula_program_guidance.pdf

and e-bikes). These other charging needs may be addressed by future projects, but this project was intended to solve the specific challenge of a lack of affordable and convenient charging for Portlanders who want to transition to a light-duty EV, but do not have access to home charging. To address that specific need, L2 chargers were the most appropriate option for several reasons. First, L2 charging hardware has a lower cost upfront than DCFCs, and the associated construction costs are significantly lower as well. For example, the power requirements of L2 charging make it feasible at many existing locations across the city without requiring extensive and costly installation and infrastructure upgrades. Furthermore, the ability of L2 chargers to be mounted on utility poles means they can be installed flexibly without cutting asphalt to lay conduit and without significant new demands on the furnishing zone and the ROW. Future projects may propose to enable the installation of DCFCs in the ROW, however that was outside the scope of this project.

Charging for electric micromobility, including e-scooters and e-bikes, is still a developing field. The City has recognized the need for increased access to e-bike charging, especially for those who cannot park and charge their e-bike at home, and 2020 Bike parking code update reflects that. The code update included a requirement for an electrical outlet to be near five percent of the required bicycle parking spaces in sites with more than twenty long-term bike parking spaces are required.[13] The need for public charging for these modes is still unclear, as is the total amount of charging that would be appropriate. Additionally, some e-scooter providers are moving towards swappable batteries rather than utilizing charging stations for their fleets.[14] Given this uncertainty, it makes sense to wait to see how the market develops before implementing new policy or regulations.

Sustainability

The EV Charging in the Public ROW Code Project is one part of the City's transportation decarbonization strategy and addresses one of the several kinds of charging services needed to support electric mobility: public L2 charging for light duty EVs. Additional projects may be needed in the future to support other light-duty charging needs, to support charging for electric micro-mobility (e-bikes and e-scooters), and to reduce GHG emissions from the freight-sector, including by supporting the electrification of medium- and heavy-duty EVs. Advancing electrification is a key part in PBOT's transportation decarbonization strategy, and the transportation sector is responsible for a large share of greenhouse gas emissions – in fact, it was responsible for approximately 42% of Multnomah County's total emissions in 2020.

To advance climate mitigation and transportation justice, PBOT and BPS have developed a three-part strategy which includes reducing the miles driven, planning and building connected communities, and shifting to clean fuels and zero emission vehicles. The three-part strategy can be seen below, in Image 2.

[13] https://www.portland.gov/sites/default/files/2021/bike-parking.adopted.final-final-final.pdf
[14] https://www.reuters.com/business/autos-transportation/e-scooters-fall-head-over-wheels-battery-swapping-2022-03-24/

Image 2. The City's Design for Transportation Justice Strategy[15]

Portland has a long history of supporting transportation electrification, dating back to 2011 when Portland became the first U.S. city known to have a fast-charging EV pod in the public ROW with Electric Avenue. Electric Avenue was installed at Portland State University (PSU) campus by PBOT, Portland General Electric (PGE), and PSU.[16] While the first Electric Avenue installation had to move locations in 2015 due to nearby construction, valuable lessons were learned from the project. Those include the need to determine responsibilities for site maintenance, to agree on financial responsibility for maintenance and repairs, to offer both standard charging equipment and standard authentication from charging software, to update City Codes and permits to streamline the process, and to simplify and standardize signage.[17] These lessons helped the second Electric Avenue project, installed in the right-of-way at The World Trade Center in partnership between PBOT and PGE.

PBOT has also expanded charging opportunities in the right-of-way through a pilot program in partnership with PGE to install EV chargers on utility poles that began in early 2020.[18] The City supported the "Electric Island" heavy-duty freight charging facility built in partnership with PGE and Daimler in 2021 and will continue to prioritize the transition to clean freight.[19] In 2022, PBOT updated the City's Encroachment Manual to enable curbside charging for residents without garages or driveways.[20] The City's bike share system, BIKETOWN, recently transitioned to a 1,500 fully electric-assist bicycle fleet, has a service area of over 34 square miles, and supported

[15] PBOT PIRC Team
[16] https://www.opb.org/news/article/portland-state-launches-electric-avenue-charging-s/
[17] MacArthur, John and Colin Rowan (2012). *Charging Forward: Lessons learned from the first six months at Electric Avenue.*
[18] https://edocs.puc.state.or.us/efdocs/UAA/adv1081uaa17201.pdf
[19] https://northamerica.daimlertruck.com/PressDetail/daimler-trucks-north-america-portland-general-2021-04-21
[20] https://www.portland.gov/sites/default/files/2022/trn-8.08-encroachment-manual.pdf

560,000 trips in 2022. Additionally, more than 4 million trips have been taken during Portland's electric scooter program since 2018. Finally, Portland's electric Streetcar system provides transit service to more than 15,000 people per day, and the City works in close partnership with our regional transit agency, TriMet, which is advancing progress to decarbonize its fleet.

Equity

A widespread transition to EVs has strong potential to reduce air pollution, reduce GHG emissions, and decrease transportation costs for households. There are currently major barriers to EV adoption in underserved communities, including higher upfront vehicle costs and limited access to affordable, public charging. However, State and Federal rebates and incentives are helping to make some EVs as affordable as conventional gasoline vehicles. The Oregon Department of Environmental Quality runs an EV rebate program that offers a Standard Rebate of up to $2,500 for the purchase or lease of a new EV and an income-qualified Charge Ahead Rebate of up to $5,000 for the purchase or lease of a new or used EV.[21]

As financial incentives are reducing the upfront cost of EVs, access to charging is emerging as a main obstacle. Renters have the added barrier of being unable to access the convenience and cost-effectiveness of home charging, and communities with low homeownership rates are disproportionately communities of color. In Portland, rising rents and home values mean that many low-income and communities of color have been pushed out to less-central areas of the city where vehicle ownership is often necessary due to a lack of convenient, safe, and efficient alternatives, such as rapid transit and dedicated bicycle facilities.[22] Increasing EV adoption in underserved communities where car ownership is likely to remain necessary is crucial to achieving the City's climate action and racial justice goals. Providing underserved communities convenient and affordable access to EV charging ensures that they are not left behind in the EV transition.

EV charger installations in Portland have largely been concentrated around downtown and a select few additional commercial centers, leaving many neighborhoods without convenient access to public charging. The map below in Image 4 shows that as of January 20023, most of the public EV charging in the city is anchored downtown with public EV charging options generally decreasing as one travels further north or further eastward. In Image 3, below, blue circles with lightning bolts indicate the presence of a L2 charger, green circles indicate that a station has both L2 and DCFCs, and yellow circles indicate that the station only has DCFCs.

[21] https://www.oregon.gov/deq/aq/programs/Pages/Applying-for-EV-Rebate.aspx
[22] https://nitc.trec.pdx.edu/research/project/1079

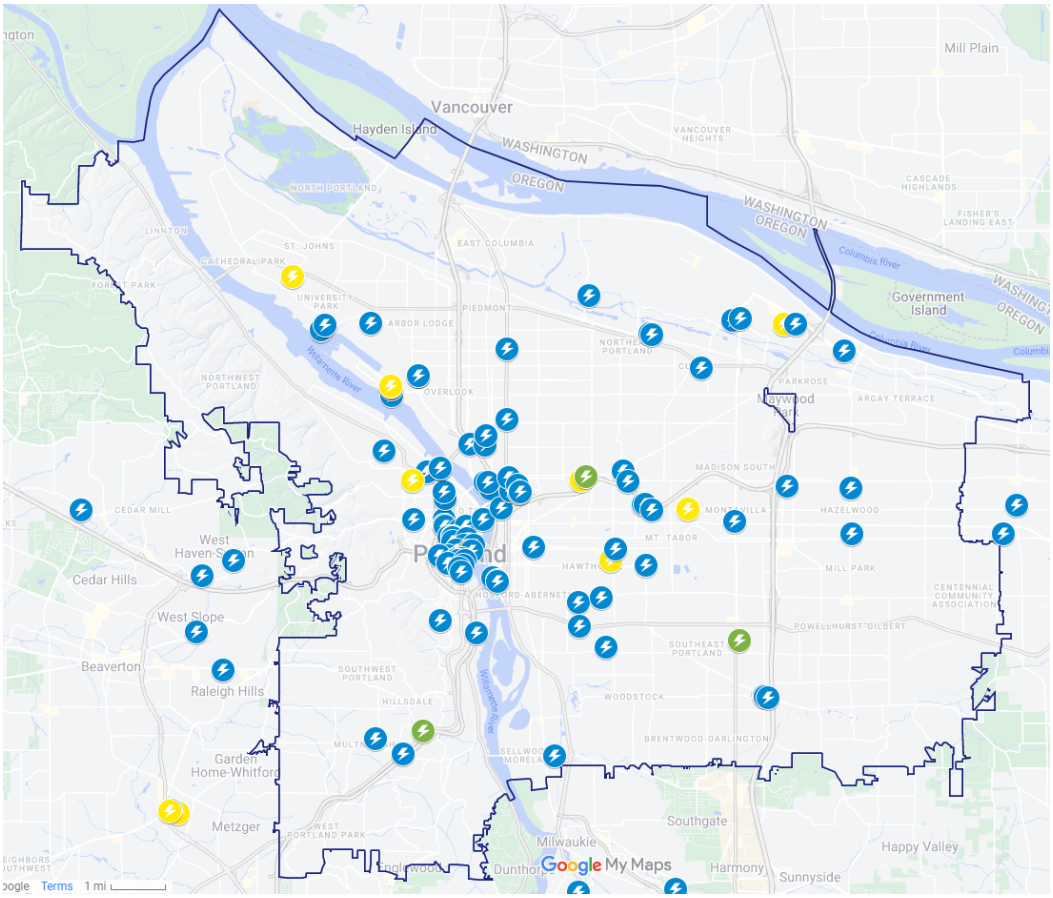

Image 3. Centers and public charging stations as of January 2023[23]

Americans with Disability Act (ADA) Access

Currently, there is limited federal and state guidelines that apply to on-street EV charging spaces. In the absence of these guidelines, PBOT staff reached out to local community stakeholders, experts, and colleagues in other cities to inform standards to make stations accessible to all. Many of these recommendations align with design recommendations for accessible EV charging stations published in July 2022 by the U.S. Access Board, an independent federal agency that issues accessibility guidelines under the Americans with Disabilities Act (ADA), Architectural Barriers Act (ABA), Rehabilitation Act of 1973, and other laws.[24]

The July 2022 publication states that, under ADA and Architectural Barriers Act (ABA) Accessibility Standards, all EV charging stations (both off-street and on-street) should comply with a series of technical requirements for floor and ground surfaces, clear floor or ground space, reach ranges, operable parts and accessible routes, among other provisions when needed.[25] Ensuring that all EV chargers comply with these accessibility standards is important since EV charging stations, unlike most gas stations in Oregon, are often unattended. All drivers should be able to use EV chargers independently, including people who have limited or no hand dexterity, limb differences, or upper extremity amputations and use adaptive driving controls.

[23] https://www.google.com/maps/d/viewer?mid=18iuPcqomTAXoLhnM6GcveY_c6FxvMlDQ&ll=45.53673776426451%2C-122.66981722668018&z=12
[24] https://www.access-board.gov/ta/tad/ev/
[25] https://www.access-board.gov/ta/tad/ev/#accessible-ev-chargers

As mentioned above, there are currently no federal requirements for a certain percentage of on-street EV charging spaces to be ADA accessible. If that changes in the future, PBOT may need to update City code and administrative rules. In the meantime, the City's proposed code update reflects federal recommendations and is intended to make most "EV charging only" spaces ADA accessible.

Balancing Demands on the Public Right-of-Way

There are considerable demands placed on public streets, specifically the furnishing zone. The Furnishing Zone, shown below in Image 4, is defined in the Portland Pedestrian Design Guide as the area that buffers pedestrians from the adjacent roadway and is where sidewalk infrastructure such as street trees, driveway approaches, signal poles, utility poles, streetlights, controller boxes, stormwater management, bicycle parking, hydrants, signs, parking meters, driveway aprons, grates, vault lids, and street furniture should be located.[26] While existing demands on the furnishing zone vary by neighborhood, some demands are projected to grow, such as the need for more street trees, which are valuable tools in mitigating the impacts of climate change. This project made an effort to carefully balance the demands of the ROW to maximize the benefits from the various projects that utilize that space to mitigate climate change.

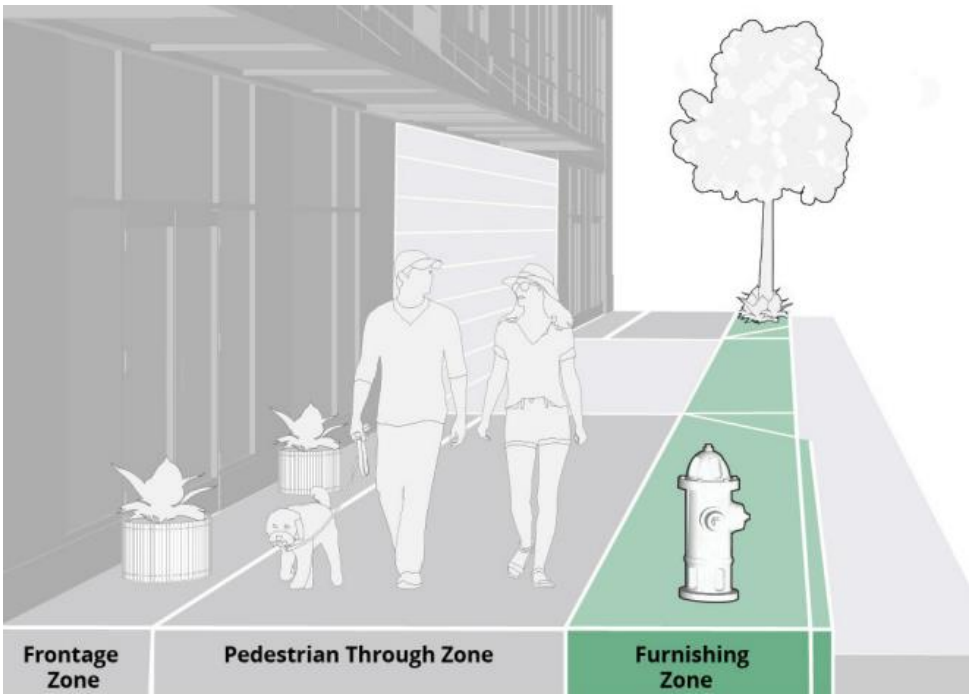

Image 4. Three Zones of the Sidewalk Corridor

Street trees help mitigate the impacts of increased rainfall and storms. Trees can decrease the total extra water running over the ground by 35% or more for small storms, and the average street tree in Portland captures almost 600 gallons of rain each year. Additionally, trees help rainwater soak directly into the ground where it is filtered

[26] https://www.portland.gov/sites/default/files/2021/pbot-pedestrian-design-guide_public-review-draft.pdf

naturally, reducing pollution picked up by stormwater and carried into streams.[27] Street trees are a valuable tool in cooling cities as the tree canopy reflects sunlight before it reaches the ground and the trees release moisture from evapotranspiration, cooling the air. Without trees, surfaces like black rooftops and asphalt absorb energy from the sun which causes higher daytime temperatures and prevents overnight cooling. This phenomenon is known as the urban heat island effect.

In Portland, temperature increases from the urban heat island effect are the highest in low-income and communities of color in the North and East parts of the city, which are also the areas that should be targeted for EV adoption as the public and active transportation infrastructure is the least accessible and they are likely to remain car owners.[28] While the urban heat island effect impacts Portlanders regularly, it also contributes to worsening events like the 2021 "heat dome," which caused three consecutive days of 108, 112, and 116 degree temperatures and resulted in at least sixty-nine fatalities due to heat in Multnomah County. Forty-two of those deaths were in the county's identified "heat islands" which are impacted disproportionately from the urban heat island effect.[29] Many heat islands in Portland are in areas that rely heavily on vehicle transportation and have worse local air pollution. Due to the importance of street trees in mitigating the effects of climate change, PBOT has worked to make sure that code updates will minimize conflicts with street trees.

[27] https://www.portland.gov/bes/stormwater/managing-rain-your-property/trees
[28] https://www.cdc.gov/pcd/issues/2016/16_0099.htm
[29] https://www.opb.org/pdf/multco-heat-report-final-06262022_1656296951051.pdf

PROCESS

To ensure coordination between teams at PBOT and with other City bureaus during this project, the New Mobility team held several Technical Advisory Committee meetings, briefed the PBOT Director Teams periodically, and engaged subject matter experts in ad hoc meetings. There were four main phases of the project: existing conditions research, building out the location framework, creating the final site design, and stakeholder engagement around the final policy.

Phase One: Existing Conditions

The first phase of the project involved surveying existing conditions, reviewing previous city and statewide EV work, engaging stakeholders, and analyzing case studies of similar projects both nationally and abroad.

The stakeholder engagement included interviews with key stakeholders from utilities, private for-hire transportation, and local electrification and sustainability leaders. From these interviews, project staff learned that both local utilities, Portland General Electric (PGE) and Pacific Power, had strong interest in developing programs to own, operate, and maintain public chargers in the ROW. In fact, both utilities expressed the opinion that EV charging had significant growth potential across their entire service area and were specifically interested in mounting the chargers on their utility poles. PGE and Pacific Power expressed that they were not only interested in providing fair and affordable service to everyone in their territory, but they are also mandated to offer equitable and reliable service and regulated by the Oregon Public Utility Commission (OPUC). This makes the utilities a good partner for providing public services since they share the City's goals of creating an equitably distributed network of public chargers and providing those services at reasonable rates. Both PGE and Pacific Power plan to include plans to collaborate with municipalities to develop public EV charging in their Transportation Electrification Plans which will be filed for approval with the OPUC in 2023.

Private for-hire companies interviewed expressed interest in electrifying their fleets to meet company-wide sustainability goals and felt that an increased network of public charging would be beneficial to those efforts. Local electrification and sustainability leaders told the project team that ROW charging was an important avenue through which to make charging more convenient and affordable for Portlanders unable to charge at home.[30] These interviews reinforced the need for new public EV charging options, in addition to on-site charging at multi-unit dwellings, findings which PBOT staff were familiar with since they heard them firsthand when participating in stakeholder engagement activities for the BPS-led "EV Ready Code Project" in 2021.[31]

To conduct a thorough analysis of existing conditions, the team mapped all publicly accessible chargers in Portland and researched the rate of adoption of EVs statewide. As of December 2022, there were 149 public EV charging stations within city limits with a total of 350 Level 2 (L2) ports and 46 DC fast charging (DCFC) ports.[32]

Driving the demand for EV chargers is a steadily growing EV adoption rate, with the number of EVs registered in

[30] EV Charging in the ROW Existing Conditions Memo, July 2022
[31] https://www.portland.gov/bps/planning/ev-ready
[32] https://afdc.energy.gov/stations/#/analyze?region=US-OR&location_mode=address&location=Portland,%20Oregon&show_map=true&fuel=ELEC&ev_connectors=J1772&ev_connectors=J1772COMBO&ev_connectors=CHADEMO&radius=15

Multnomah County growing from 834 in 2015 to 8,224 in 2021. The growth trajectory of zero-emission vehicles (ZEV) adoption is shown below, in Image 5.[33] EV adoption is expected to continue in Multnomah County and statewide. In fact, Oregon had the second most EV sales as a share of all new vehicles sold among U.S. states in 2022 with an average of about 1,000 EVs sold in Oregon per month in 2022.[34]

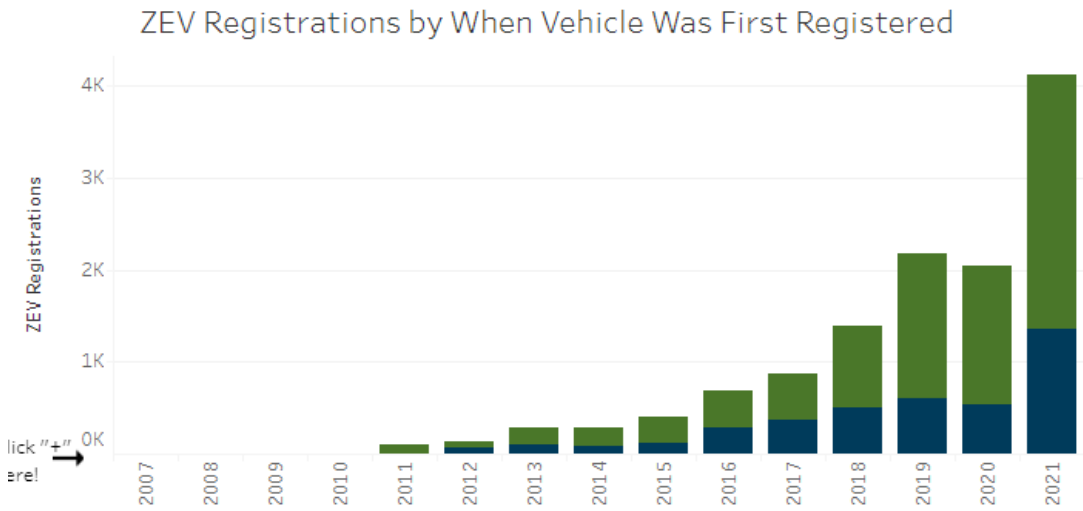

Image 5. ZEV Registrations in Multnomah County from 2007 to 2021[35]

This proposal builds on the lessons learned and successes of a PGE pilot program to install L2 chargers on utility poles in SE Portland. The two single-port L2 chargers were installed in March 2020 at SE Clinton and SE 29th Ave and at SE Clinton and SE 35th Place. The primary goals of this pilot were to identify operational considerations for deploying chargers on utility poles; to identify city operational considerations; to evaluate customer awareness; and to evaluate the economics of pole charging. Overall, the pilot program was successful, and the two pole-mounted chargers were the most utilized L2 chargers in PGE's network for most of the pandemic.[36] The main challenges faced were enforcement to keep the space open for "EV drivers only" and reliability of the charging infrastructure. [37]

The Oregon Department of Transportation's (ODOT) Transportation Electrification Infrastructure Needs Analysis (TEINA) study also helped inform estimates on future needs of L2 and DCFCs under a variety of economic scenarios.[38] Table 1, below, shows the new publicly available EV chargers needed in Portland to meet the demand ODOT estimated by TEINA in each of their three economic scenarios. The additional chargers needed were calculated based on the number of public chargers installed in the city as of December 2022.

The TEINA study used three scenarios to bracket possible trajectories for the Oregon economy and EV adoption, and while it's not yet clear which scenario best matches our current condition, they give us guard rails for minimum and maximum infrastructure needs. The "slow recovery" scenario is the most pessimistic outlook and

[33] https://www.oregon.gov/energy/Data-and-Reports/Pages/Oregon-Electric-Vehicle-Dashboard.aspx
[34] https://www.koin.com/news/oregon/oregon-is-2nd-in-the-us-for-2022-electric-vehicle-sales/
[35] https://www.oregon.gov/energy/Data-and-Reports/Pages/Oregon-Electric-Vehicle-Dashboard.aspx
[36] Interview with Shanna Brownstein and Anik Shrestha, PGE, on December 14, 2021
[37] https://edocs.puc.state.or.us/efdocs/UAA/adv1081uaa17201.pdf
[38] https://www.oregon.gov/odot/Programs/Documents/Climate%20Office/TEINA_Final_Report_June282021.pdf

involves predictions that economic activity remains depressed due to the COVID-19 pandemic through the end of 2024. The "rapid recovery" scenario assumes that the economy returns to its pre-pandemic levels by the end of 2021. The "business as usual" scenario serves as a baseline comparison for the other two scenarios and represents the trajectory of electrification if the COVID-19 pandemic had never happened. It is likely that we are currently somewhere between the slow and rapid recovery scenarios, but one thing is clear, regardless of which scenario we are in, more public EV charging is needed in the near- and medium-term to meet estimated demands.

Additional Chargers Needed in Portland to Meet Estimated Demand
(based on December 2022 conditions)

TEINA Scenario	2025			2030			2035		
	Public L2	Public DCFC	Total Public	Public L2	Public DCFC	Total Public	Public L2	Public DCFC	Total Public
Slow Recovery	13	108	121	2,069	1,466	3,535	6,000	3,582	9,582
Rapid Recovery	224	166	390	2,674	1,012	3,686	8,721	2,675	11,396
Business as Usual	499	220	719	4,433	1,134	5,567	8,077	2,499	10,576

Table 1. Additional Publicly Available Chargers Needed in Portland to Meet Estimated Demand[39]

Additionally, staff reviewed previous work provided by James Mast Consulting in 2019 on right-of-way charging, which laid a strong foundation for many of the siting conversations. Finally, case studies of similar projects in Kansas City, Missouri; Los Angeles, California; Minneapolis, Minnesota; Montreal, Canada; Paris, France; and Madrid, Spain were analyzed for lessons learned.

Next, the Project Team convened a Technical Advisory Committee (TAC) composed of staff from teams across PBOT and BPS. The TAC included experts on directly related topics, including parking and permits as well as experts on areas that may be impacted by this change, including bicycle and transit infrastructure. The first TAC meeting was held in November 2021. During this meeting, the connections between EV charging and climate goals was demonstrated, the policy context was presented, and different scenarios for ROW charging were discussed.

The TAC helped shape and narrow the scope to a deliverable policy update through discussing and confirming some staff recommendations. First was the recommendation to only allow L2 chargers, not DCFCs, in the public ROW. The power requirements of L2 charging make it feasible at many locations across the city without requiring the extensive and costly installation and infrastructure upgrades that DCFCs necessitate. Furthermore, the ability of L2 chargers to be mounted on utility poles means they can be installed without cutting asphalt and without significant new demands on the ROW.

Another key recommendation proposed by staff in this phase was to allow EV charger installations only in areas

[39] Multnomah County specific data received from Mary Brazell at ODOT via email

zoned for dense development that would have higher concentrations of multi-unit dwellings than single-family residences, and to not pursue charging along key transportation corridors at this time. This aligns with the project goals of creating a public charging network to support those unable to charge at home and to provide convenient charging to those visiting the City's commercial areas. Enabling the installation of EV chargers in the ROW along key corridors may be pursued in a future project. This siting framework was defined more fully in the second phase.

Finally, the decision was made to only allow companies that are already in the business of owning, operating and maintaining EV chargers to install EV chargers in the ROW, not individual residents, private groups, or other businesses. While this decision was based on Portland's unique conditions, lessons learned from other jurisdictions were also consulted. EV charging programs in Philadelphia, Pennsylvania and Berkeley, California that allowed residents to install EV chargers in front of their homes were both discontinued after a few years of being active. The Philadelphia program, which restricted the parking in front of the EV charger to EVs only, described program flaws of not being scalable, not meeting needs of EV owners without access to curbside parking like residents in multi-unit dwellings, and the criticism from residents that EV owners were allowed to reserve parking in front of their homes in an area where parking was scarce.[40] Berkeley's program, which received only 61 applications from 2014 through 2020, said the program's lack of success was driven by difficulty with placement, competing demands in the ROW, and the cost to the applicant for the purchase and installation of the charging infrastructure.[41]

Ultimately, there are several factors that contributed to the decision to prohibit private residents, groups and businesses from installing EV chargers in the ROW including health, life, and safety issues, liability concerns, and state utility location requirements, among others. Allowing individual residents or private groups to install infrastructure for their own use in the public ROW would essentially privatize a public space. Additionally, having a private asset in a public space raises several difficult policy questions, including who is responsible for the asset if the owner relocates and who is responsible for keeping the asset in a state of good repair. Another concern is that the infrastructural requirements of siting charging stations and the multidisciplinary coordination necessary to connect to the grid and install the asset in a public space are complex and costly and present substantial barriers. While navigating this space and financing the process might be attainable for some individuals, groups, or businesses, it is not attainable for all and could exclude many Portlanders.[42]

Phase Two: Location Framework

The second phase of the project focused on creating a location framework to guide where within the city EV chargers would be allowed to be installed in the public right-of-way. To kick off the second phase of the project, a second TAC meeting was held in February 2022 that focused on siting and equity.

With a transportation and land use frame in mind, the project team recommended only allowing EV chargers in the ROW within Centers as designated in the City's 2035 Comprehensive Plan, except for the Central City. As defined in the Comprehensive Plan, these Centers anchor complete neighborhoods with retail stores and businesses, civil amenities, housing options, health clinics, daycare centers, employment centers, plazas and parks, or other public gather places. They are the primary areas for growth and change and range in scale from

[40] http://www.phillyotis.com/wp-content/uploads/2018/03/Electric-Vehicle-Policy-Task-Force-Final-Report.pdf
[41] https://www.govtech.com/fs/infrastructure/ev-infrastructure-charges-into-californias-public-spaces.html
[42] https://www.portland.gov/transportation/electric-vehicles/charging-your-ev#toc-frequently-asked-questions

the downtown to small neighborhood centers. Portland has thirty-three (33) Centers fully within City limits and one, Raleigh Hills, that is partially within City limits, as shown below in Image 6, below. Feedback from TAC members confirmed the exclusion of Central City at this time due to the many competing demands on the ROW in that area and the fact that approximately one-third of the City's public chargers are located within Central City.

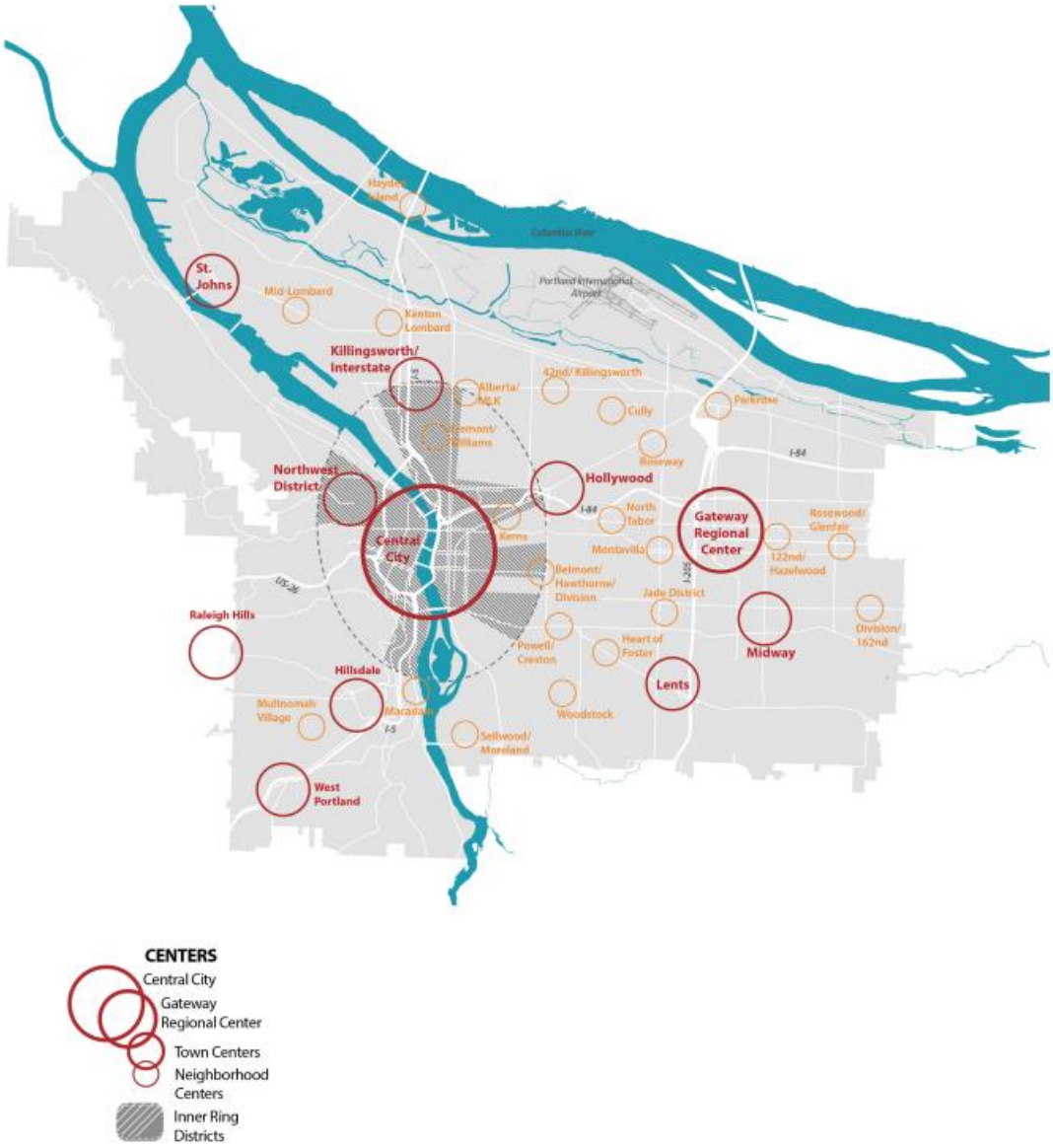

Image 6. Portland's Centers[43]

One of the key pieces of feedback received during the second TAC meeting was to site chargers on side streets "around the corner" from main streets and busier arterials rather than on the main street itself. TAC members expressed how main streets generally have more demands on the ROW and they should be excluded from EV charger installations to allow them to prioritize planned and potential transit, bicycle, and pedestrian projects.

[43] https://www.portland.gov/sites/default/files/2019-08/03_urban_form.pdf

This recommendation was particularly important since once EV chargers were installed in a location, TAC members felt that it may be challenging to relocate them in the future. Furthermore, many main streets support small businesses and the parking spaces on those main streets should be reserved for deliveries and short-term parking spaces to encourage high turnover of customers to support those businesses. Finally, main streets are those frequently activated for street fairs or other events and should be excluded from infrastructure investments like EV chargers to preserve flexibility in those key corridors. In sum, this feedback resulted in the project team determining that, at this time, EV charger installations should be limited to streets classified as Local Service Traffic Streets in the Transportation System Plan.[44]

Several potential location requirements for EV chargers in the ROW were proposed during the second TAC meeting. Rather than instituting regulations such as restricting EV chargers from being on a Bicycle Priority Street or a bus route, the TAC members cautioned being overly prohibited with regulations.

Phase Three: Final Site Design

The third phase of the project involved finalizing site-specific design and requirements. The development of these requirements involved many ad hoc meetings with subject matters in PBOT related to utility siting, parking, enforcement, traffic engineering and design, and permitting. For some aspects, like parking enforcement of "EV charging only" spaces, experts and city officials from across the country were also consulted to identify best practices.

The following guiding principles were used to shape the micro siting framework:

- Consistent with Phase Two recommendations, EV chargers should support the city's neighborhood, town, and regional commercial centers.
- The location of EV chargers in the ROW should minimize impacts and conflicts with other ROW users, such as pedestrians and bicyclists.
- EV charging only spaces should maintain consistency with existing parking district regulations and enforcement standards.
- On-street parking turnover is important to support the economic health of nearby businesses.
- When feasible, EV chargers should have the capacity to charge two vehicles simultaneously to start building "charging pods." These pods will increase efficiency in construction costs and provide greater reliability to drivers by increasing the chance that a charger will be available.
- Since the EV chargers will be installed on side streets instead of main streets, wayfinding signage indicating the availability of EV charging should be placed at the nearest intersection in both travel directions to effectively locate EV chargers.

Phase Four: Stakeholder Engagement on Proposed Policy

Once a draft of all proposed updates had been prepared, the project team shared the draft code and administrative rule updates first internally with PBOT staff, then for a citywide review. City staff from the Bureau of Development Services, the Bureau of Environmental Services, the Bureau of Planning and Sustainability, the

[44] https://www.portland.gov/transportation/planning/documents/chapter-3-street-classifications/download

Fire Department, the Office of the City Attorney, Parks & Recreation, the Portland Housing Bureau, and Urban Forestry were consulted for feedback on the draft.

The project team also engaged external stakeholders for feedback on the proposal. Groups engaged for feedback included the Northwest Parking District, disability rights advocates, and industry stakeholders. The Northwest Parking District appreciated the desire of staff to ensure this new infrastructure would fit their unique parking requirements, and, noting the need for public EV charging for the renters in the area, were overall supportive. The disability advocates were similarly supportive of the idea and appreciated that staff included suggestions for additional ways that charging stations could be made accessible if installation sites allowed. Industry stakeholders voiced that ROW charging is a new space for cities and appreciated the clear process that project staff have created. Many expressed interest in learning more about the process and noted that this could be a good example for other cities.

Feedback from these stakeholders helped shape PBOT's final recommendations to Portland City Council for changes to City code and administrative rules to enable EV chargers in the public right-of-way.

Outcomes

This project will culminate with Portland City Council approving updates to Vehicles and Traffic Code Section 16 and directing PBOT to update the administrative rules TRN-8.08 and TRN-10.19 and to operationalize the project. PBOT's process to implement the project will result in a new permit process for private companies to install EV chargers in the public right-of-way.

Code and Administrative Rule Updates

The first step towards enabling the installation of electric vehicle chargers in the public right-of-way the update to Portland Vehicles and Traffic Code Chapter 16.20 Public Right-of-Way Parking which the project team will take to Portland City Council in February 2022. After that, the project team will finalize updates TRN-8.08-Encroachment Manual, TRN-10.19-Utility Permits in the Right-of-Way, and the Parking Management Manual.

Chapter 16.20 Public Right-of-Way Parking will be updated with a new section, Chapter 16.20.290, to reflect the creation of an EV Charging Zone. The section will require vendors to obtain a revocable permit to be able to dedicate, sign and stripe the parking spaces as "EV Charging Only." The full update can be seen in Appendix A.

Upon direction from Portland City Council, PBOT will update both TRN-8.08 and TRN-10.19. TRN-8.08-Encroachment Manual will be updated to reflect that EV chargers are an allowable encroachment in the right-of-way. The Encroachment Manual already included a section on EV charging, C.22-Electric Vehicle Charging, which held the regulations for the EV cord cover allowance. This new allowance will be added in Section (2) Electric Vehicle Charging Stations in the Public Right-of-Way. The full update can be seen in Appendix B.

TRN-10.19-Utility Permits in the Right-of-Way will be updated to show that EV charging stations are allowed above ground structures on City streets and will include a new EV charging section with the requirements for siting and installing an EV charger in the public ROW. The full update can be seen in Appendix C.

Upon direction from Portland City Council, PBOT will also update the Parking Management Manual to include Electric Vehicle Zones. A draft of the EV Charging chapter in the Parking Management Manual is included in Appendix D as an example of what the future changes may look like. The Parking Management Manual will be updated separately from the other code and administrative rule updates contained in this document. The content of the chapter has not been finalized but it is included here to give greater context for the type of parking regulations expected to govern the EV Charging Only spaces created in Title 16.

NEXT STEPS

Portland City Council will hear the proposed code updates on February 22, 2023. Once the code is approved, PBOT will work to operationalize the program. This will include first finalizing the changes to the Administrative Rules in Appendix B and C in this document. Then the next step will be to work with companies to negotiate the required permits and legal agreements that will enable them to install infrastructure in the public right-of-way. Once that is complete, PBOT will then begin accepting permits.

The Portland Bureau of Transportation will report back to City Council by June 30, 2024 with the progress of the policy, any challenges faced, and any further changes to City Code that may be required so the program continues to run efficiently and achieves City Council's goals to decarbonize the transportation system.

Appendix A. Proposed Updates to Title 16

Language to be **added** is underlined.
Language to be **deleted** is shown in ~~strikethrough~~.
Language to remain the same is indicated by plain text.

Chapter 16.20 Public Right-of-Way Parking

16.20.290 Electric Vehicle Charging Zones

A. Electric vehicle (EV) Charging Zones are established to prevent any vehicle that is not actively using the EV charger from parking in the space. All on-street parking spaces with EV chargers installed will be designated as an EV Charging Zone and only vehicles actively charging their EV shall be permitted.

B. A permit to establish an EV Charging Zone may be approved by the Portland Bureau of Transportation provided the permit applicant possesses a franchise or privilege granted by the City of Portland, obtains the necessary permit(s), and makes the required improvements to the parking space(s).

C. Parking in a space designated as an EV Charging Zone shall be restricted to EVs or plug-in hybrid vehicles that are actively charging, which is defined as being plugged into the EV charger.

Chapter 16.90 Definitions

16.90.111 Electric Vehicles

A. “Active EV charging” or “EV charging” is defined as an EV or plug-in hybrid vehicle that is plugged into the EV charger.

B. “Electric vehicle (EV)” is any battery-powered vehicle, either all-electric or plug-in hybrid vehicles.

C. “Electric vehicle (EV) charging zone” is a parking space with an adjacent EV charger where only vehicles actively charging their EV shall be permitted to park.

C. “Electric vehicle supply equipment (EVSE)” or “EV charger” is any infrastructure related to EV charging, including the station and port.

D. “EVSE port” provides power to charge only one vehicle at a time. There can be multiple EVSE ports at an EVSE station.

E. “EVSE station” or “EV charging station” means a site that has one or more EVSE ports at the same address or location.

F. “Level 1 charging” is an EVSE station that provides charging through a 120-volt alternating current (AC) plug.

G. “Level 2 charging” is an EVSE station that offers charging through 208–240-volt electrical service.

H. “Level 3 charging,” is an EVSE station also known as direct-current fast charging (DCFC), that enables rapid charging. To meet federal standards published in the National Electric Vehicle Infrastructure (NEVI) Program, these chargers should have a minimum power output of 150 kilowatt.

Appendix B. Proposed Updates to TRN-8.08

Language to be **added** is underlined.
Language to be **deleted** is shown in ~~strikethrough~~.
Language to remain the same is indicated by plain text.

C.22 - Electric Vehicle Charging

(2) Electric Vehicle Charging Stations in the Public Right-of-Way
~~Privately owned and maintained electric vehicle charging stations may be allowed in the public right-of-way through a separate policy, currently under development. Contact the Portland Bureau of Transportation (503) 823-7002 or www.portlandoregon.gov/transportation) for most current information.~~
Organizations that possess a franchise or privilege granted by the City of Portland may be permitted to install EVSE stations in the public right-of-way, provided they obtain the required permits.

Glossary

- Alley - A facility primarily intended to provide access to the rear or side of lots or buildings in urban areas and not int ended for through vehicular movement.
- Bus Zone - The area of the Sidewalk Corridor adjacent to a bus when stopped at a marked bus stop, running the length of the bus, necessary for passenger loading and unloading.
- Curb Zone - The area of the Sidewalk Corridor between the Furnishing Zone and the roadway as defined in Table A on page 7.
- Design District - Areas subject to Design Review as defined on the Zoning Map of the Comprehensive Plan and in Title 33.
- Design Review - Review by the Bureau of Development Services to ensure that facility design meets design parameters for development and preserves the conservation, enhancement, and continued vitality of the identified scenic, architectural, and cultural values of each Design District or area and the quality of development near transit facilities.
- Electric Vehicle Supply Equipment (EVSE) - Any infrastructure related to EV charging, including the station and port.
- Frontage Zone - The area of the Sidewalk Corridor between the ~~Through~~ Pedestrian Through Zone and the property line as defined in Table A on page 7.
- Furnishing Zone - The area of the Sidewalk Corridor between the Curb Zone and the ~~Through~~ Pedestrian Through Zone as defined in Table A on page 7.
- Encroachment - Any private structure installed within the Right-of-Way.
- Major Encroachment - Any of the following specific encroachments, as defined in Transportation Administrative Rule TRN 8.01, Encroachments in the Public Right-of-Way:
    a. sky-structures
    b. building projections or extensions not covered by Title 16, Title 24 or Title 32
    c. arcades
    d. underground walkways
    e. malls or parking

f. other structures for the movement of people or goods, excepting items regulated as utilities

- Private - For the purposes of this rule, "private" is defined as a facility not owned by the Bureau of Transportation, Bureau of Water Works or the Bureau of Environmental Services, or a facility that is owned by a Franchise Utility but not allowed though the franchise agreement.
- Right-of-Way - The area between property lines of a street, easement, tract or other area dedicated to the movement of vehicles, pedestrians and/or goods.
- Sidewalk - An improved facility intended to provide for pedestrian movement; usually, but not always, located in the public right-of-way adjacent to a roadway. Typically constructed of concrete. (See Standard Construction Specifications.)
- Sidewalk Corner Obstruction-Free Area - The space between the curb face and the lines created by extending the adjacent property lines (or boundary lines of the public sidewalk easements) to the curb face.
- Sidewalk Corridor - The area behind the curb face of a street and including the area designated for the Curb Zone, Furnishing Zone, ~~Through~~ Pedestrian Through Zone and the Frontage Zone as defined in Table A on page 7.
- Structural Review - Review by either the Bureau of Development Services or the Bureau of Transportation to ensure conformance of a structure with City standards and governing codes.
- ~~Through~~ Pedestrian Through Zone - The area of the Sidewalk Corridor between the Furnishing Zone and the Frontage Zone as defined in Table A on page 7.

Appendix B. Proposed Updates to TRN-10.19

Language to be **added** is underlined.
Language to be **deleted** is shown in ~~strikethrough~~.
Language to remain the same is indicated by plain text.

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Exceptions to Above Ground Structures Regulations:
City Bureau and Private utility infrastructure allowed to be placed above ground, but are exempted from the AGS policy are as follows:

1. Electrical power, telecommunication, or OCT poles
2. Fire hydrants
3. Water Quality Sampling Stations
4. Natural Gas or Air Relief Valves
5. Signals and Street Lighting equipment
6. Portland City Streetcar facilities or TriMet facilities installed under IGE with the City of Portland Bureau of Transportation
7. Natural Gas meters, if the placement of the meter is attached to and within 1 foot of a building face and meets the Americans with Disabilities Act criteria for placement
8. Electric vehicle charging stations

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H. Electric Vehicle Charging Stations

The installation of electric vehicle (EV) charging stations in the public right-of-way is allowed for organizations that possess a franchise or privilege granted by the City of Portland as described in Title 17.56.005 and requires a Street Opening Permit. The proposed charging station must meet all requirements as described below.

The permittee shall be liable for any and all damages to any person who is injured or otherwise suffers damage resulting from the infrastructure. Permission for said infrastructure to exist in the right-of-way may be revoked per PCC 17.56.060 Relocation and Discontinuation of Facilities. Upon written notice of permit revocation, the permit holder shall remove any permitted infrastructure from the public right-of-way and return the street area in which the removed infrastructure was located to the satisfaction of the Director and/or City Engineer.

1. General Requirements
    a) EV chargers in the public right-of-way shall only be used for Level 2 (L2) charging (208 – 240V), not direct current fast charging (DCFC).
    b) EV chargers shall comply with all relevant local building code standards and sections of the National Electric Code.
    c) The installation of EV chargers shall minimize impacts and not conflict with other right-of-way users, including pedestrians, bicyclists, public transit riders, and others.
    d) EV chargers shall have adjacent parking spaces signed for “EV Charging Only” and only EVs actively charging shall be permitted to park in these spaces.

e) In design districts, EV chargers in the public right-of-way may be subject to Design Review.
f) Permit holder must comply with all parking requirements.
g) Permit holders will be required to participate in a program to help advance equitable access to EV charging as defined in the permit or lease agreements.

2. Placement Criteria
   a) EV chargers shall be:
      i. Located within the designated bounds of Gateway Regional Center, a Town Center, or a Neighborhood Center, and
      ii. Located on a Local Service Traffic Street.
   b) EV charging stations shall not conflict with the following transportation uses. An EV charging station shall:
      i. Not be on a street with active or planned streetcar lines, as defined in the Portland Streetcar System Concept Plan or future plans,
      ii. Not impede the operation of any TriMet vehicle or the use of any related infrastructure, and
      iii. Not protrude into a roadway or bike lane.
   c) All EV charging stations shall be located:
      i. On a city-maintained street,
      ii. On a street with a curb, and
      iii. In an area where parking is currently allowed, either metered or unmetered.

3. Clearance Requirements
   a) All EV chargers shall be:
      i. A minimum of twenty-five (25) feet from an intersection, as measured from the back of the sidewalk corridor,
      ii. A minimum of five (5) feet from an alley or driveway, as measured from the curb cut,
      iii. A minimum of twenty (20) feet from a stop sign,
      iv. A minimum of ten (10) feet from a fire hydrant,
      v. A minimum of five (5) feet from any Water Bureau infrastructure,
      vi. A minimum of five (5) feet from each end of a BIKETOWN docking station,
      vii. A minimum of three (3) feet from each end of a bicycle rack, although removing and/or relocating bicycle racks to adjacent right-of-way may be approved at the sole discretion of PBOT once all applicable fee(s) have been paid,
      viii. A minimum of three (3) feet from light poles, utility poles, and traffic signals, excluding any utility poles being utilized for the installation of the EV charger,
      ix. A minimum of thirty (30) feet from a bus stop, MAX Transit Platform, Streetcar Transit Platform, or TriMet Lift stop, as measured from the bus stop sign counter to traffic flow.
   b) EV charger installations shall maintain a minimum of a three (3) foot Pedestrian Through Zone in all scenarios and are encouraged to provide a six (6) foot Pedestrian Through Zone when feasible.
   c) When possible, EV chargers should be within five (5) feet of the property line extended.
   d) To provide ADA accessibility, all EV chargers shall:
      i. Be located on a block face with an ADA compliant curb ramp,

ii. Not present impediments to safe and efficient pedestrian passage, nor hinder ADA access. A minimum of a three (3) foot pedestrian through zone shall be maintained to ensure access although a six (6) foot pedestrian through zone is preferred when feasible,

iii. Not be placed within the middle 50% of the sidewalk adjacent to the on-street parallel parking space because this would obstruct entry to and exit from the vehicle,
Be installed as close to the edge of the face of the curb as possible and no farther than ten (10) inches away from the face of the curb,

iv. Be placed so that the side of the EV charger with the critical operable parts is not facing the street or curb,

v. Be surrounded with ground space that is a minimum of thirty (30) inches by forty-eight (48) inches. Grass, curbs, wheel stops, and bollards may not be located within the ground space. Ground space is defined in the Americans with Disabilities Act and should adhere with their criteria for firmness, stability, slip resistance, and slope,

vi. Have additional clear floor or ground space for a forward approach and turning space when feasible.

4. Permittee is solely responsible for ensuring the safety of existing street trees.
    a) EV chargers shall not be placed so that street tree sites impede ADA access.
    b) The permittee shall contact the City Forester prior to commencing work if conflicts with trees or root systems are possible within permit area. Permittee must obtain City Forester's approval prior to cutting any tree or root system.

5. EV chargers shall not impact utility infrastructure.
    a) EV chargers shall be a minimum of three (3) feet from light poles, utility poles, and traffic signals, excluding any pole the charger is mounted upon.
    b) Permit Holder shall not tie into city conduits for lights and signals.
    c) EV chargers shall not cover maintenance holes or handholes.
    d) EV chargers shall not be located within stormwater planters or swales.

6. Exceptions for charger locations that do not meet one or more of the above requirements can be made if the applicant can satisfactorily demonstrate, through the Design Exception process, that no other option is feasible. Applying for a Design Exception does not guarantee approval. Exceptions are granted only for a specific site; they are not transferrable from one permit to another. An approved design exception will be required prior to permit issuance.

Appendix D. Draft EV Chapter in the Parking Management Manual

EV Charging Only parking space requirements:

- All EV Charging Only spaces shall be:
  - No less than 8’ wide and 20’ long,
  - Painted with white stripes outlining the space and
  - Painted with the words “EV only” in the space.
- The permit holder shall pay PBOT for completing the initial painting and striping of the space as well as any future maintenance that is needed.
- All EV Charging Only spaces shall be four (4) hour time limited during the hours when parking is time limited.
  - In areas where parking is already managed, EV chargers shall only be allowed in spaces that are already limited to four (4) hour stays and hours when parking is time limited shall reflect the rules of the surrounding area.
  - In areas where parking is not managed, the EV Charging Only parking space shall default to a four (4) hour stay between the hours of 8:00 am and 6:00 pm.
- As stated in Chapter 16.20.290, parking in EV Charging Only spaces is permitted only for electric vehicles and plug-in hybrids actively charging, which is defined in Chapter 16.90.111.
  - Any vehicle found occupying an EV charging only space while not actively charging is subject to fine and tow under Title 16.10.050.
- All EV Charging Only spaces shall be signed with the following:
  - A local sign stating time allowance, and
  - A local sign stating the space is for EV charging only with the language that violators are subject to fine and tow.
- When feasible the federal EV signage with directional arrows should be placed at the nearest adjacent intersection in both travel direction as an effective means of wayfinding.
- The permit holder shall pay PBOT for the initial installation of all related signs as well as any future maintenance of those signs that is needed.

PBOT

PORTLAND BUREAU OF TRANSPORTATION