

Electric Vehicle Charger Installation Plan for Rural and Unincorporated Urban Areas of King County

June 28, 2024



King County

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II. Proviso Text¹

PROVIDED FURTHER THAT:

Of this appropriation, \$100,000 shall not be expended or encumbered until the executive transmits a rural and unincorporated urban area electric vehicle ("EV") charger installation plan and a motion that should acknowledge receipt of the plan, and a motion acknowledging receipt of the plan is passed by the council. The motion should reference the subject matter, the proviso's ordinance number, ordinance section and proviso number in both the title and body of the motion.

K.C.C. 18.22.010 establishes goals to accelerate the adoption of electric vehicles by the Metro transit department, by other county agencies and by residents. These goals include installing one hundred twenty-five EV chargers at King County-owned park and rides and one hundred fifty EV chargers in County facilities by 2030. The rural and unincorporated urban area EV charger installation plan should be based on achieving these goals and shall include, but not be limited to, the following:

A. A description of the geographical distribution of both current and planned publicly accessible EV chargers at county-owned facilities and park and rides in unincorporated King County, including in rural areas;

B. An assessment of current and future estimated demand for publicly accessible EV charging at county-owned facilities and park and rides in unincorporated King County, including in rural areas, based on community outreach and engagement, including but not limited to information on EV ownership based on the state of Washington transportation electrification fee established in 46.17.324 RCW or other sources of market analysis, and consultation with jurisdictional partners, community-based organizations, utilities, existing EV working groups or private organizations;

C. A list of potential locations for publicly accessible EV chargers at county-owned facilities and park and rides in unincorporated King County, including in rural areas, based on the identified current and future estimated demand;

D. A cost estimate, as well as a list of potential funding sources, to install EV chargers and related infrastructure at the potential locations identified in section C of this proviso, based on the identified current and future estimated demand; and

E. An implementation plan and timeline to install EV chargers and related infrastructure at the potential locations identified in section C. of this proviso, in the context of the overall implementation plan and timeline to meet the King County goal of installing one hundred twenty-five EV chargers at King County-owned park and rides and one hundred fifty EV chargers in county facilities by 2030.

¹ [Ordinance 19546](#), Section 19, Proviso P2.

III. Executive Summary

This plan provides information on the current distribution and future installation of public electric vehicle (EV) chargers in rural and unincorporated areas of King County, focusing primarily on charging potential at County-owned park and rides and other County facilities.

According to data from the Washington State Department of Licensing,² electric vehicle ownership in King County is most prevalent in denser, more populous ZIP codes. The State's recent EV charger map³ confirms that these more urban ZIP codes also tend to be the locations where more public EV charging has been installed.

Only two County-owned park and ride locations are currently situated in a rural or unincorporated area (both on Vashon Island). Mapping conducted as part of developing this plan reveals that there are 10 County-owned business locations operated by various Divisions located in rural or unincorporated areas, that might support public access charging, pending further investigation. The only other major category of properties owned by the County in rural or unincorporated areas sits within parks and natural areas, where a mapping exercise conducted by Metro and DNRP GIS staff identified the locations of numerous parking lots at parks/natural areas.

Each of the locations identified comes with its own constraints such as cell coverage, space available for dedicated EV charging stalls, paved surface, etc. Each location requires further evaluation for necessary infrastructure, in particular access to sufficient power supply, and also an assessment of actual EV charging demand by measuring who visits and how long they stay. Vandalism of equipment has been an ongoing challenge that would need funding and focused attention.

In the five years since Ordinance 19052 established the goal of installing 125 chargers at County-owned park and rides, a lot has changed in the EV sector. Based on 2019 data, the Ordinance reflects a time when public charging was much less widespread, rapid chargers (providing 125 miles of range in 15 minutes) uncommon, and when only ten EV models in the US market could exceed 300 miles of range per charge, compared to almost 30 models expected to do so in 2024⁴.

Based on this market evolution, focusing primarily on installing at park and ride locations may no longer be a strategic priority for King County's role in public charging. Instead, the Executive Climate Office recommends continuing to work with King County departments and external partners to engage in the many other charging installation programs that have also emerged, such as: Puget Sound Energy's (PSE) underserved areas public charging program; direct-to-consumer utility rebate programs for home charger installation; and state and federal grant opportunities to add chargers in more rural areas that currently have only limited charging mostly along travel corridors.

If the County chooses to broaden the focus of its public EV charging efforts, there are opportunities to explore new cutting-edge initiatives that also leverage the work of other agencies, such as: public-private partnerships with Direct Current Fast Charging (DCFC) operators on County-owned land, and options to garage and charge Contracted Services fleet vehicles at underused park and ride locations.

² WA Open Data Portal: Electric Vehicle Population Map by Postal Code [\[LINK\]](#)

³ WA Dept of Commerce Publicly Available Charging Mapping Tool [\[LINK\]](#)

⁴ Electrek article "These EVs offer the longest range in 2024, all surpassing 300 miles," Jan. 17, 2024 [\[LINK\]](#)

IV. Background

Department Overview

King County's Executive Climate Office and King County Metro collaborated on the development of this plan and worked closely with other departments and stakeholders outlined below.

As established in King County Code 2.16.025, the duties and functions of the Executive Climate Office (ECO) include coordinating the integration of climate change into County operations in partnership with executive branch departments and offices, King County cities, partners, communities, and residents; advising the Executive and the Council on climate-related policies, programs, and activities; and leading and fostering climate innovation among County agencies. The Office is located within the Executive Department.

After more than 20 years of King County advancing various climate initiatives, ECO was created in 2023 to expand and accelerate King County's response to climate change. This new office is focused on the coordination and alignment of climate work across the County, implementing the 2020-2025 Strategic Climate Action Plan (SCAP), developing the 2025-2030 SCAP, seeking external federal, state, and philanthropic funds to support achieving the County's climate goals, and expanding communication and education about climate risks and climate actions.

In July 2023, ECO filled an EV Planner position on its team, tasked with leading internal EV policy discussions, and assisting other departments/divisions (such as Metro, DNRP, FMD, Roads) in preparing for their EV transitions and charger implementation. The Planner also coordinates with a wide range of external partners to explore pilot projects, seek state and federal funding opportunities, and formalize the County's role in public EV charging.

King County Metro is the Puget Sound region's largest public transportation agency, committed to providing safe, equitable, and sustainable mobility, and prioritizing service where needs are greatest. In addition to its internal fleet EV chargers, Metro currently manages just over half of the County's public chargers, spread across six transit-oriented locations.

Statewide Electric Vehicle Mandates

Statewide carbon reduction initiatives like the Washington Department of Ecology's Clean Vehicles Program Rule, are helping speed up public electric vehicle (EV) adoption. Implemented in 2022, the program requires 100 percent of all new passenger cars, light-duty trucks, and medium-duty vehicles sold in the state to meet zero-emission vehicle standards by 2035.

Washington is making good progress toward this goal: in 2023, EVs accounted for nearly 19 percent of new passenger vehicles sold in the state, a nearly 6 percent increase from 2022⁵; Washington ranks second nationwide in new car market share for EVs. About half of the state's 150,000 registered EVs are located here in King County, where EVs comprise 6 percent of all registered vehicles.⁶

To partially address future charging needs, in 2021 the Legislature adopted new state building code rules requiring developers of new construction with parking to install charging at 10 percent of the available spaces, with an additional 20 percent charger-ready.⁷

⁵ Alliance for Automotive Innovation: Electric Vehicle Quarterly Report, Fourth Quarter, 2023 [\[LINK\]](#)

⁶ Seattle Times: EV Sales have soared in WA: our map shows where they're registered [\[LINK\]](#)

⁷ Washington State Legislature Electric Vehicle Infrastructure Requirements [\[LINK\]](#)

Currently two-thirds of EV charging in Washington is believed to occur in a garage or driveway,⁸ making EV adoption less feasible for residents who live in apartments with no parking provided or whose homes lack the space and electricity required to accommodate an EV charging set-up. Programs to increase EV adoption through access to chargers outside of the home are critical, including installation of curbside charging, chargers located near apartments and other community-focused public chargers. Some current and future opportunities to install more public chargers are discussed later in the funding section of this document.

The Washington Transportation Electrification Strategy, published in February 2024, identifies a number of priority actions that are needed to implement current state EV policies around EV charging in an equitable manner, including: continued funding to support charging along state routes via the ZEVIP program; expanded community charging programs through formula funding; and block grants to community-based organizations to help them design electrification projects.⁹

King County EV Policies

The transportation sector contributes 46 percent of King County GHG emissions.¹⁰ King County's 2020 Strategic Climate Action Plan (SCAP) adopted a strategy to reduce emissions from the transportation sector through reduction of car trips by sustaining and increasing transit service; focusing development in urban areas and centers; equitably pricing vehicle usage; and reducing vehicle emission through adoption of clean fuels and electric vehicles in County vehicle fleets.

State and local governments have a significant role to play in transportation sector emission reduction efforts, particularly in developing the charging infrastructure needed to support widespread adoption of EVs. King County prioritizes equity and social justice in all work, and EV adoption, especially heavy-duty diesel vehicles, provides direct public health benefits for communities adjacent to high traffic transportation corridors.^{11, 12}

King County's Strategic Climate Action Plan (SCAP) commits to the following strategy (GHG 2.10) to reduce greenhouse gas emissions: "Accelerate electric vehicle adoption that prioritizes environmental justice and equitable access to mobility solutions."¹³

GHG 2.10 encompasses several related measures, including:

- GHG 2.10.1 - "Evaluate opportunities to expand publicly accessible EV charging infrastructure at King County facilities that prioritize equitable access to shared mobility."
- GHG 2.10.3 - "Support engagement and partnerships with utilities and organizations to develop regional pilots to incent the transition to electric vehicle ownership for all sectors, through development of infrastructure, education, and grants and incentive."

⁸ National Renewable Energy Lab [\[LINK\]](#)

⁹ Washington Transportation Electrification Strategy [\[LINK\]](#)

¹⁰ Cascadia Consulting Group. (2022). *King County Communitywide Geographic Greenhouse Gas Emissions*. (Puget Sound Regional Emissions Analysis – Final Report) [\[LINK\]](#)

¹¹ King County Equity and Social Justice Strategic Plan [\[LINK\]](#)

¹² U.S. Environmental Protection Agency. (2024) *Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles: Phase 3 - Regulatory Impact Analysis* (EPA-420-R-24-006) Assessment and Standards Division Office of Transportation and Air Quality. [\[LINK\]](#)

¹³ King County Strategic Climate Action Plan [\[LINK\]](#)

Further, Ordinance 19052¹⁴ lays out goals for King County agencies related to the adoption of electric vehicles, including:

- Installation of one hundred twenty-five chargers at King County-owned park and rides by 2030.
- Installation of one hundred fifty chargers by 2030 in County facilities.

This plan primarily addresses the park and ride component of Ordinance 19052 relevant to rural and unincorporated King County. There are currently 177 charging ports installed across all King County facilities, approximately half of which are public chargers, the other half fleet-only units.

Related County Studies

- In September 2020, Metro developed a report that was submitted to the Council¹⁵ which focused on bus electrification. The report included a section on options to increase charging for electric or other zero-emission vehicles (ZEV) at County-owned park and rides, with the goal of increasing ZEV access to transit.
- In November 2020, the Department of Natural Resources and Parks (DNRP) produced a report¹⁶ exploring the initial feasibility of installing EV charging at County parks. It identified Marymoor Park and Steve Cox Memorial Park as suitable locations with sufficient electrical supply at which to consider public charging pilots. King County is currently in preliminary conversations with Puget Sound Energy (PSE) about having the utility install and operate EV chargers at several unincorporated locations including Marymoor Park.
- In July 2021, Metro completed a study of options for increasing ZEV access to transit, including an assessment of opportunities for expanding publicly accessible charging at County-owned park and ride facilities.
- In October 2021, King County's Department of Executive Services (DES) submitted the Electric Vehicle Infrastructure Analysis and Implementation Plan to King County Council.¹⁷ This study focused on six Facilities and Maintenance Division (FMD) sites with the highest concentration of fleet vehicles, including Black River, Chinook, Goat Hill Garage, King County Correctional Facility, King Street Center, and Maleng Regional Justice Center. As a follow-up to the study, FMD proposed an EV charging infrastructure (EVCI) Capital Improvement Program budget request in the 2023-2024 biennial budget to upgrade, expand, and plan for additional EV charging infrastructure. King County Council approved approximately half of the funding requested. EVCI projects for Goat Hill Garage and King Street Center are currently underway, and Black River and Chinook will begin late summer or early fall, 2024. Additional funding will be needed to complete these projects.
- DES is also managing an ongoing enterprise-wide EVCI feasibility study with consultant support, which includes developing a mapping tool to identify fleet charging gaps and help prioritize future build-out and deployment. The tool will include equity and health disparity layers to better inform charger prioritization. Thus far, the tool helped County agencies identify and prioritize sites for EVCI expansion based on fleet vehicle concentrations; the consultant is conducting assessments to develop conceptual charging plans for approximately 20 prioritized

¹⁴ Ordinance 19052 [\[LINK\]](#)

¹⁵ Report required by Ordinance 19052, Section 4, C [\[LINK\]](#)

¹⁶ [\[LINK\]](#)

¹⁷ Plan required by Ordinance 19052, Section 2, B(2) [\[LINK\]](#)

sites. While these chargers will be intended primarily for fleet use, there may be potential to serve visitors to the facility and/or the public. Study outcomes are anticipated by mid-2025.

Other Active Public Charging Programs

- Seattle City Light Curbside Pilot¹⁸ – In 2023, Seattle City Light (SCL) launched a pilot program to install and operate public Level 2 EV chargers at 31 curbside locations throughout the city. Level 2 chargers deliver approximately 20-30 miles of range per hour of recharging and operate at 220-240 volts. This pilot aims to provide near-home EV charging for residents who lack off-street parking locations to charge their vehicles. Locations were chosen from almost 2,000 public nominations, reviewed by a panel, and assessed for feasibility. Drivers pay a fee for use, and adjacent parking spaces are marked as “EV charging only.” SCL plans to expand the program beyond the initial 31 locations as soon as this year.
- Puget Sound Energy Power Pole Charging Pilot¹⁹ – Puget Sound Energy (PSE) recently launched a curbside charging program as part of its *Up & Go Electric for Public* program. These chargers will be mounted on power poles, owned and operated by PSE. They will require a fee for use, and adjacent parking spaces will be marked as “EV charging only.” King County is currently in conversation with PSE to identify a handful of pilot locations that fit PSE’s criteria for underserved communities and that also align with King County infrastructure policies.
- Other right-of-way charging programs - Both SCL and PSE have other charging programs underway that install Level 2 or Level 3 (i.e. faster) chargers in public right-of-way locations in partnership with host jurisdictions. These sites often offer 4-10 charging ports and perform more like charging hubs at which numerous vehicles can park and charge at once.

Precedent at Park and Ride Facilities Elsewhere:

Different transit agencies around the country have approached access to park and ride public charging in a range of ways, with variations on cost to the driver, equipment ownership, target user, and length of stay. Metro is in frequent contact with many of these agencies.

- The LA Metro light rail/subway system provides fee-based chargers at 17 stations near the end of each line to encourage EV owners to use transit to complete their journey while their vehicle is charging.
- The Massachusetts Bay Transit Authority in Boston offers free charging at some parking lots and garages, though drivers must establish an account with the ChargePoint network in order to use them.

Methodology

This plan responds to a Proviso requesting additional information on the current distribution and future planned installation of chargers in rural and unincorporated areas of King County. It explores a range of potential installation scenarios and alternative opportunities.

King County’s Executive Climate Office and King County Metro led data collection and analysis, with guidance and feedback provided by an enterprise-wide workgroup and external consultants. Several entities provided data on charging programs, including PSE, SCL, the national Electrification Coalition,

¹⁸ Seattle City Light [[LINK](#)]

¹⁹ Puget Sound Energy [[LINK](#)]

commercial charging networks, the State Department of Commerce, and subject matter experts in other counties and states.

A mapping exercise helped identify all known, and some future, charging locations across King County, including in rural and unincorporated locations. Additionally, the plan includes reference to prior studies, including one by King County Metro on park and ride infrastructure, and one on EV charging in parks conducted by the Department of Natural Resources and Parks. Data provided by DNRP indicates that approximately 90 parking lots are located at County-owned parks and natural areas.

The County did not gather new public input to inform this plan. Rather, the plan references public input on EV charging from a range of sources, including the King County Comprehensive Plan and an ongoing public survey managed by the Washington State Department of Transportation (WSDOT).

V. Report Requirements

A. Geographical Distribution of Current and Planned Publicly Accessible EV Chargers at County-Owned Facilities and Park and Rides in Unincorporated King County

Overview of County-Owned Facilities and Park and Rides

As seen in Figure 1, King County owns 22 park and rides. It also manages an additional 19 lots owned by the Washington State Department of Transportation (WSDOT). The County-owned facilities include both parking garages and surface lots, providing from 48 to more than 1,000 parking spaces. Park and ride EV chargers are installed at dedicated parking spaces labeled as EV stalls. Per County and state policy, drivers parked in these EV stalls must plug their vehicle in to the charger while accessing transit or a Vanpool. There are only two park and rides in rural or unincorporated King County (see map shading): both are paved surface lots located on Vashon Island, with minimal electrical service for limited street lighting.

In terms of pure park and ride utilization, Metro's 2021 study²⁰ noted that the most heavily used County-owned locations at the time (95 percent or higher occupancy pre-Covid) included: Aurora Village Transit Center; Bear Creek; Bothell; Issaquah Highlands; Kenmore; Redmond; South Kirkland, and Tukwila. Post-Covid, commuting patterns have changed significantly due to modified work hours and hybrid work weeks, and the utilization depicted by the map in Figure 1 is quite different. When combined with adjusted bus service, and the opening of new Sound Transit light rail stations, including the shortened 2 Line on the Eastside (April 27, 2024), today's most heavily used park and rides (Q2 2024 data) are at different locations: Bothell (55 percent), Northgate (99 percent), Olson Place SW (49 percent), and Redmond (94 percent).

The long-standing popularity of busier park and rides may be a reason to select them for EV charging in the future, but commuting patterns continue to evolve, and will do so again as additional stations open on Sound Transit's 1 Line (August 30, 2024), and when the 1 Line and the 2 Line connect in 2025.

²⁰ [\[LINK\]](#)

Figure 1: King County-owned Park and Rides

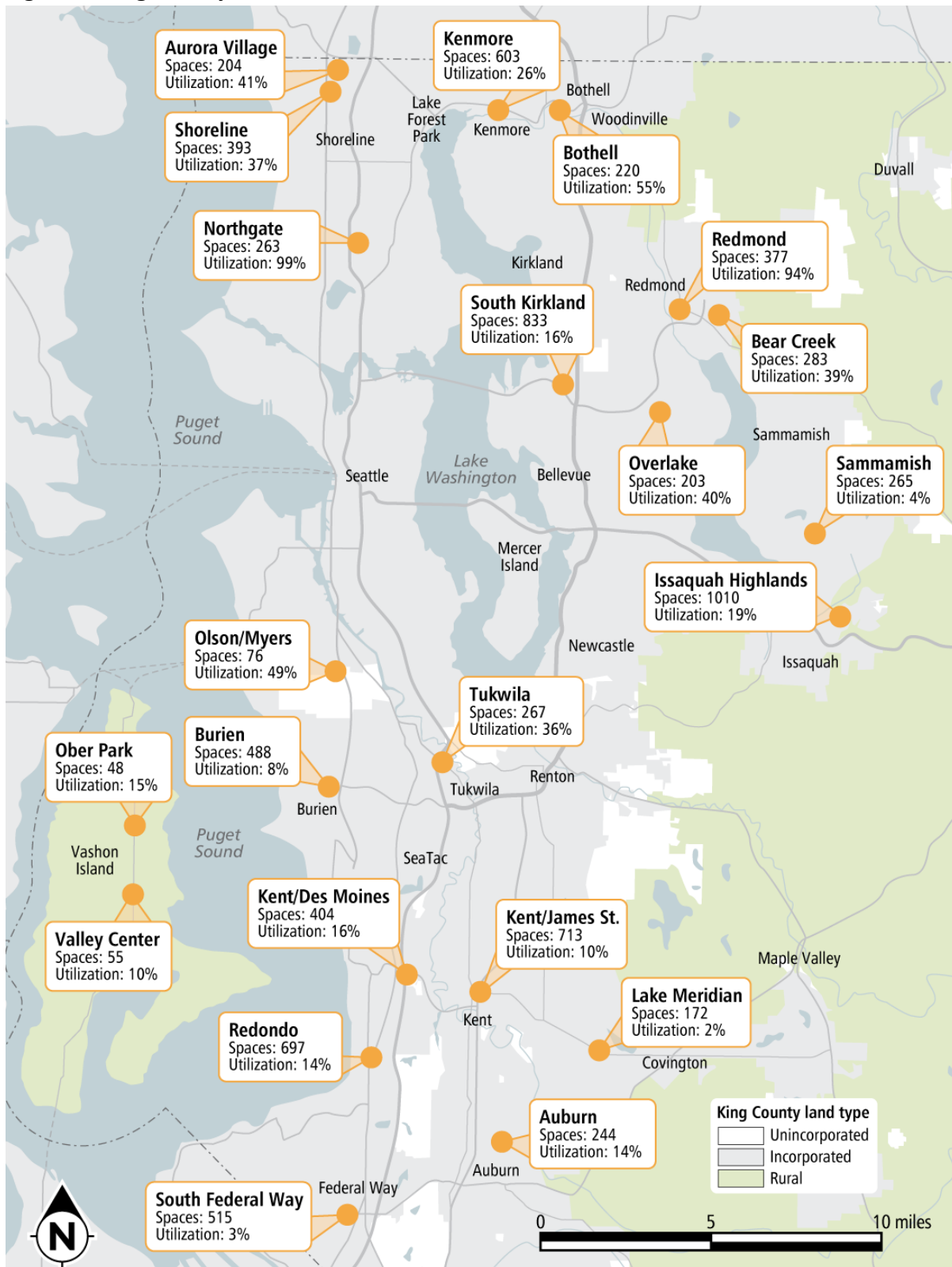


Figure 1 depicts location, capacity and utilization of King County-owned park and rides.

Electric Vehicle Charger Installation Plan for Rural and Unincorporated Urban Areas of King County

Current Publicly Accessible EV Chargers at County-Owned Facilities and Park and Rides in Rural or Unincorporated King County

King County Code (KCC) 18.22.010 establishes goals to accelerate the adoption of EVs by the Metro Transit Department, by other County agencies and by residents. These goals include installing 125 EV chargers at County-owned park and rides and 150 EV chargers in County facilities by 2030. Table 1 lists all current County-owned or managed public chargers, including at County park and rides and at County-owned facilities or buildings.

As shown, King County has 44 publicly available charging ports at park and rides out of a goal of 125,²¹ and the 77 publicly available charging ports at County facilities. In total there are 177 charging ports at King County facilities and buildings, which includes 100 fleet charging ports that are not publicly available. King County is exceeding the target of installing 150 EV chargers at county facilities by 2030.²² An EV charger can charge multiple vehicles based on the number of charging ports. Progress toward the goal is tracked based on charging ports. None of the publicly available chargers in Table 1 are at locations in rural or unincorporated areas of King County.

Table 1: Existing King County-Owned or Co-Managed Public Charging

	Number of public parking stalls at site	Number of L2 charging ports	Applies to 125 at park and rides goal	Applies to 150 at County facilities goal
Park and Rides Owned by County + Other Transit Locations				
Burien P&R	488	10	Y	Y
Issaquah P&R	1010	14	Y	Y
Fauntleroy Ferry P&R	12	5	Y	Y
S Kirkland P&R	833	9	Y	Y
Overlake P&R*	203	2	Y	N
Tukwila Sounder Station**	390	4	Y	N
Subtotal		44	44	38
Other County-Owned Facilities and Buildings				
KCIA Terminal	83	4	N	Y
Brightwater Env Edu Center***	86	8	N	Y
KC Metro Safety Training Ctr	120	6	N	Y
Goat Hill Garage	580	6	N	Y
King St Center Garage	99-210****	7	N	Y
Child & Family Justice Center	176	8	N	Y
Subtotal		39	0	39
Total Ports		83	44	77

²¹ This value reflects an updated and corrected number from the King County 2023 SCAP Biennial Report (p 63), 2023 [\[LINK\]](#). No new chargers have been installed in park and rides in 2023.

²² King County 2023 SCAP Biennial Report (p 63), 2023 [\[LINK\]](#)

**Owned by King County Housing Authority, but available to Park and Ride users*

***Ownership of these chargers soon to be transferred to Sound Transit*

****Brightwater is located 1 mile outside of the King County border*

***** Valet garage: 99 by stall count but capacity is 210 vehicles*

Planned Publicly Accessible EV Chargers at County-Owned Facilities and Park and Rides in Rural and Unincorporated King County

Currently, Metro does not have additional funding allocated for the installation of publicly accessible EV chargers at County-owned facilities and/or park and rides in unincorporated or rural King County. However, the County was recently awarded \$5.9M from the Washington State Department of Commerce EV Charging Program. Approximately one-third of this grant will fund up to 50 public charging ports at various locations across the County, including three sites in unincorporated King County: White Center (four ports), Bear Creek (four ports), and Fairwood (six ports). Contracting is still underway, but most of these chargers will be installed and available to the public within the next two years.

The award will also fund 379 ports in fleet, workplace, and multi-family residential settings. King County's own portion of the grant funding (\$1.1M) was dedicated to fleet chargers at nine worksite locations, rather than public chargers, but eight of the sites are located in overburdened areas and are therefore expected to improve local air quality.

B. Current And Future Estimated Demand For Publicly Accessible EV Charging At County-Owned Facilities and Park and Rides in Unincorporated King County

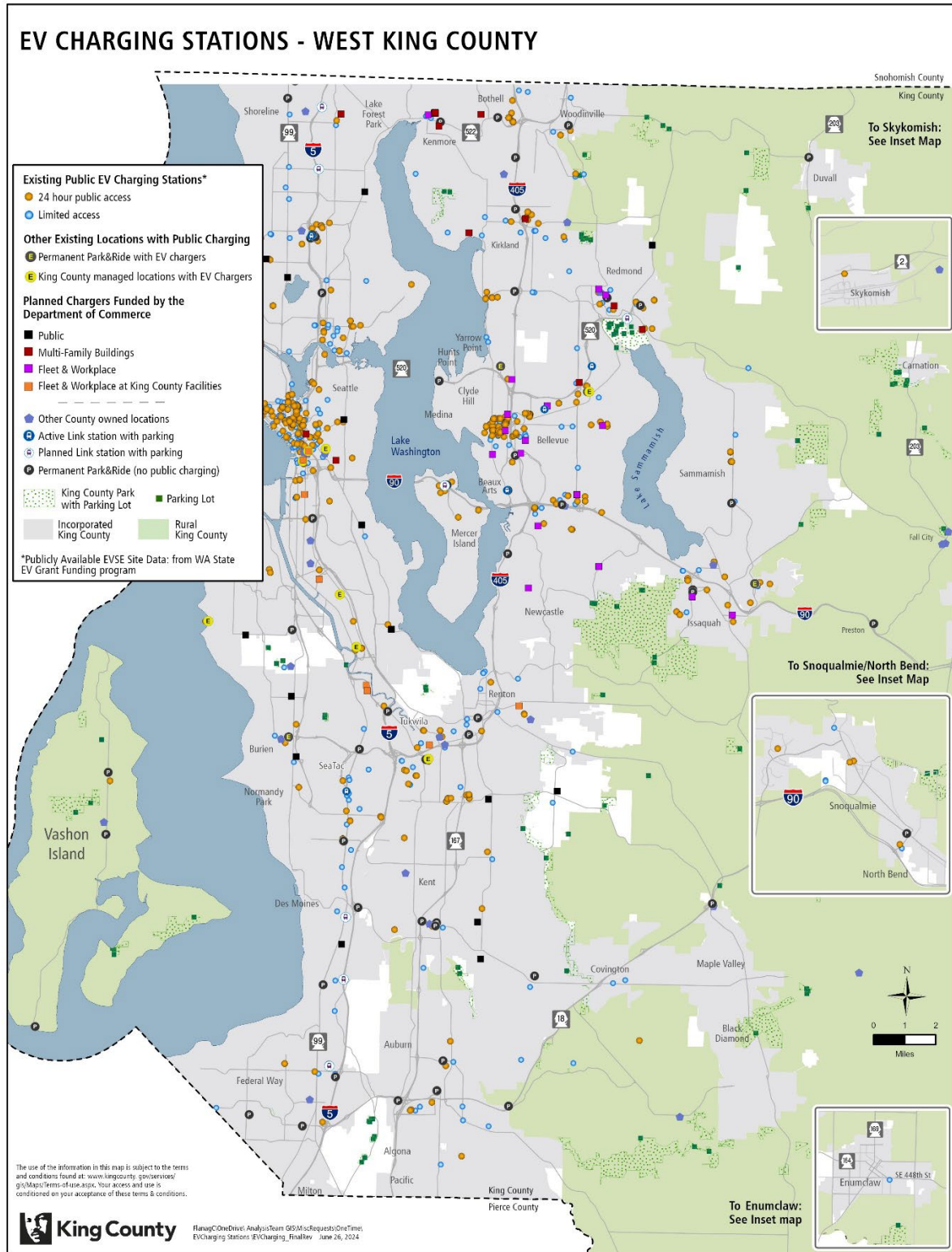
As shown in Figure 2, there are hundreds of non-county-owned publicly accessible charging ports throughout King County in addition to chargers on King County property. Management and ownership of these non-county chargers falls to a range of government agencies, local utilities, and commercial charging networks. The availability of usage data and reporting requirements on these chargers varies, and there is no centralized source of such data, making it difficult to accurately assess current demand. Since the County does not operate any chargers at county-owned facilities and park and rides in unincorporated areas, there is no current usage data for this type of installation.

Equitable Access

As a step to help promote EV use in lower income and under-resourced communities, the County could seek opportunities to invest in vehicle chargers at park and rides in those areas. From an initial review by Metro in 2020, four County-owned park and rides are located in priority census tracts from an equity and social justice (ESJ) perspective, but none of these are in rural or unincorporated King County.

- Redondo Heights Park and Ride
- Bear Creek Park and Ride
- Kent/James Street Park and Ride
- Tukwila Park and Ride

Figure 2: Electric Vehicle Charging in King County



Map depicts public charging available in King County, and selected future installations associated with Department of Commerce funding acquired by King County.

Electric Vehicle Charger Installation Plan for Rural and Unincorporated Urban Areas of King County

User Fees and Impact on Demand

The County currently charges a flat two dollars per charging session, regardless of duration or amount of energy used. The fee structure therefore encourages longer stays, which can end up being well below market rate, making these quite desirable locations given that the parking is usually free. Estimates of future demand (and length of stay) based on this uncommon fee structure may not be indicative.

The County's fee has been the same since 2012, but it could be raised as high as \$5/session KCC 4A.700.700; Metro holds fee-setting authority. Most other public chargers in the region use a per-hour rate or are moving towards setting the fee based on the amount of power provided (in kilowatt-hours, kWh). Market averages in the region are currently approximately \$0.28/kWh.²³ Modern EVs will gain about 20-25 miles of range from charging on an average Level 2 charger for 1 hour and take in about 7kW of electricity (equating to \$1.96) during that period. Almost all County-owned public chargers are ChargePoint models that can be activated with an app, swipecard, or by phone call.

Estimating Demand

Keeping in mind state mandates requiring 100 percent light-duty ZEV sales by 2035, future demand for publicly accessible EV charging is expected to grow as more drivers replace combustion-powered vehicles with EVs.²⁴ At the same time, improvements in battery range may reduce the need for daily public charging, especially for EV drivers with access to some form of home charging. Due to convenience, approximately two thirds of all EV charging occurs at home²⁵ using Level 1 (120 volt) and Level 2 (220-240 volt) charging, which typically offers the lowest electricity rate; an explanation of these charging levels is provided below in Section D. Several existing sources provide partial insights into future charging demand in unincorporated King County:

- Responses to a 2022 community needs survey conducted by King County's Department of Local Services include requests for EV chargers from Bear Creek/Sammamish residents.
- WSDOT launched an interactive web map²⁶ in May 2022 to gather suggested charging locations from the general public. To date, 50 of 312 total requested charging locations within King County fall in unincorporated areas.
- During updating of the County's Comprehensive Plan, community engagement included public surveys²⁷ and other outreach. In response to a question in the Climate Change Section about ways that the County could help community members use less gasoline day-to-day, 27 percent of respondents (260 of 978) ranked "*More Electric Vehicle Charging*" as a top three choice but did not stipulate specific locations inside rural or unincorporated King County.

Future studies of potential charging locations could include public surveys of EV user groups and community organizations in rural and unincorporated King County.

²³ Puget Sound Energy [[LINK](#)]

²⁴ National Renewable Energy Lab [[LINK](#)]

²⁵ National Renewable Energy Lab [[LINK](#)]

²⁶ Washington State Department of Transportation [[LINK](#)]

²⁷ [[LINK](#)]

C. Potential Locations for Publicly Accessible EV Chargers at County-Owned Facilities and Park and Rides in Unincorporated King County

Opportunities at Park and Rides

There are few potential sites for publicly accessible chargers at County-owned park and rides located in rural or unincorporated King County because there are currently only two County-owned park and rides in such locations. The sites, both on Vashon Island, are surface lots with lighting. The electrical capacity at these two sites has not yet been evaluated as resources were directed to assess higher priority sites. Depending on the size of that electrical service, it is possible that one or two Level 2 (220-240 volt) charging ports could be installed; a service upgrade from the power utility could allow additional charger installations.

Opportunities for Charging at Other King County Facilities

Figure 2 reflects that there are only 10 potentially suitable County-owned facilities, operated by various Divisions, located in rural or unincorporated areas (marked with blue pentagons). While these have not been assessed for sufficient power supply and adequate EV parking space, any location contemplating sharing chargers with the public must keep security and vandalism top of mind, and most would likely want to keep public charging outside the perimeter fence of the facility. Sensitive facilities, such as radio towers, Sheriff's Office locations, etc., were eliminated from consideration.

The other more extensive rural and unincorporated area property holdings in the County's portfolio are parks/natural areas. The map in Figure 2 identifies, using solid green squares, the locations of approximately 90 specific parking lots at parks or natural areas that should be assessed to develop a shortlist for installation feasibility.

In its 2020 report on options for charging in parks, DNRP identified Marymoor Park and Steve Cox Memorial Park as the most suitable locations with sufficient electrical supply and significant public visitation at which to consider public charging pilots. King County is currently in preliminary conversations with PSE about having the utility install and operate EV chargers at several unincorporated locations including Marymoor Park.

Other Ways to Deliver Rural and Unincorporated Area Charging

While there may be limited installation opportunities on County-owned land, there are several other ways that the County and ECO can facilitate additional charging access for rural and unincorporated areas residents on other land. Examples include partnering with charging networks to encourage or incentivize rural installation and leveraging relationships with members of the King County-Cities Climate Collaboration (K4C)²⁸ to apply for joint funding, such as from state grants, or other federal funding sources expected in 2024 and 2025.

D. Cost Estimate and Potential Funding Sources for Installation of EV Chargers and Related Infrastructure at the Potential Locations Identified in Section C

²⁸ [\[LINK\]](#)

Cost Estimates

The following cost considerations and equipment definitions are valuable when planning for EV charging opportunities across many types of locations and correlate with the cost estimates in Table 1, below.

Level 2: The County has historically installed Level 2 chargers at public facilities, that operate at 220-240 volts: these are the best compromise between price and charging speed. Modern EVs can gain 20-30 miles of driving range during one hour of Level 2 charging. The most common rate for power delivery of these units is 7 kilowatt-hours (kWh).

Level 3: Faster Level 3 charging (also known as Direct Current Fast Charging, DCFC) can cost 10-15 times more for the equipment, but deliver 125 miles of range in just 15 minutes (depending on the vehicle). As a result, these units are often placed along highway corridors and at other drop-in locations where a quick top-up is needed. Most current state and federal standards are now requiring these units to deliver power at a rate of at least 150 kWh.

Many of today's charging stations operated by commercial charging networks at retail centers, shopping malls, and convenience stores offer both L2 and L3 options; at these sites, drivers can make a choice based on their budget and time available.

Battery L3: A recent development in fast charging technology is a unit that uses an onboard storage battery to dispense power at Level 3 speeds and recharges itself using a more conventional Level 2 (i.e., 220-240-volt) power supply. An early manufacturer of this model is FreeWire²⁹ whose chargers can serve up 2,000 miles of range per day. Another newer company offering this solution, and manufacturing the equipment locally in Seattle, is Electric Era.³⁰ This type of charger is much less expensive to install than conventional Fast Charging equipment, which typically requires significant utility upgrade work and/or a new transformer. In addition to providing resilience by offering charging during power outages, battery-enabled units could make fast charging feasible at many more rural locations with constrained power supply.

Solar L2: Another newer option that provides enhanced resilience in emergencies, and that also requires no connection to the grid whatsoever, is a solar-powered Level 2 charging station. These self-contained chargers can be delivered by truck and installed in less than an hour. Using an onboard battery to store solar energy, this charger can provide up to 265 miles of range per day and can support several vehicles at once. One widely recognized manufacture for this equipment is Beam.³¹

E-Bike Charging: As E-bike ownership continues to expand in the region, there is the potential that some users may want to park their bike securely at a park and ride or transit center, and then continue their journey by bus or train. These bikes are too large and heavy to transport on Metro's bus-mounted bike racks. While parked, a subset of users may be interested in recharging their E-bike using a 120-volt outlet, though charging anywhere other than home or work is still uncommon.

²⁹ [\[LINK\]](#)

³⁰ [\[LINK\]](#)

³¹ [\[LINK\]](#)

Table 2: 2024 National Estimations of Average EV Charger Project Costs

Charging Equipment	Hardware Cost	Number of Charging Ports	Max Number of EVs Served per 24 hours	Install Cost	Total Hardware & Install Cost	Network & Support Cost/Year
Level 2 @7kW	\$6-8,000	2	24 (2-hour session)	\$5-15,000	\$11-23,000	\$500
Level 3 (aka DCFC) @150kW	\$50-75,000	1	96 (15-minute session)	\$30-75,000	\$80-150,000	\$300
Battery L3 @150kW	\$85-100,000	2	20 (15-minute session, with recharge cycles)	\$20-45,000	\$105-145,000	\$500
Solar L2 @4kW	\$75,000	1-6	1-6 (4-hour session)	\$0	\$75,000	\$0
E-Bike Charger @0.5kW	\$200-500	1	24 (1-hour session)	\$500	\$700-1,000	\$0

The table above is based primarily on information gathered by consulting firm ICF in 2022,³² that aggregated findings from four other recent installation cost studies conducted by various non-profit research organizations such as the International Council on Clean Transportation (ICCT), the National Renewable Energy Laboratory (NREL), Rocky Mountain Institute (RMI), and the Environmental Defense Fund (EDF). These estimated the cost of EV charging infrastructure deployment, including the cost of equipment, installation, needed utility upgrades (e.g., grid interconnections), permitting, etc. While the data has been adjusted somewhat to reflect increased equipment and labor costs since 2022, it is very important to note King County’s own experience with its most recent charger installs has led to total installation costs in some cases nearly double the total costs enumerated in Table 2.

Funding

In addition to state grants such as those from the Department of Commerce and Department of Ecology, other federal funding sources for EV adoption are expected in 2024 and 2025. The Federal Highway Administration’s Charging and Fueling Infrastructure (CFI) grant program recently awarded \$40 million to four projects in northwest Washington and reopened for a second round on May 30, 2024.³³ The National Electric Vehicle Infrastructure Formula Program (NEVI) has allocated \$71 million to Washington over the next five years and will generate other funding opportunities as the state builds out its program.³⁴

³² [\[LINK\]](#)

³³ US Department of Transportation Federal Highway Administration [\[LINK\]](#)

³⁴ Washington State Department of Transportation [\[LINK\]](#)

E. Implementation Plan and Timeline to Install EV Chargers and Related Infrastructure at the Potential Locations Identified in Section C

While there appears to be limited potential for installing publicly accessible EV charging at County-owned park and rides or other facilities in rural and unincorporated King County, a number of other opportunities to meet the County’s existing goals to improve access to non-urban charging are listed below.

Table 3: Implementation Plan Action Items

Action Item	Lead/Support	Progress and timeline
Refresh analysis of Steve Cox Park and Marymoor Park installations	DNRP/ECO	Steve Cox Park: 2024 Q4 Marymoor Park: Coordination with Utilities (PSE) in process
Develop shortlist of DNRP parking areas for deeper study	DNRP	2024 Q4
Complete Enterprise-wide Electric Vehicle Charging Feasibility Study	DES	2025 Q2
Conduct site and power feasibility at Vashon Park and Rides (in collaboration with PSE)	Metro/ECO	2025 Q4 at the latest – 8-12 months sooner if conducted by PSE
Pursue State and Federal funding to install in rural/unincorporated King County areas	ECO	Ongoing State: <ul style="list-style-type: none"> • Dept Commerce grant: contracting underway³⁵ • Dept Ecology grant: awaiting next cycle³⁶ Federal: <ul style="list-style-type: none"> • Dept Energy: letter of interest submitted (May 20, 2024)³⁷ • EPA: researching proposal; due July 25, 2024³⁸ • FHA CFI: researching proposal; due Aug 28, 2024³⁹
Continue partnerships with K4C and others for joint charger proposals	ECO	Ongoing
Initiate conversations with commercial charging networks on joint funding proposals	ECO	Ongoing partnership coordination underway, especially for potential CFI proposal.

³⁵ Dept of Commerce Electric Vehicle Charging Program [\[LINK\]](#)

³⁶ Dept of Ecology Charge Where You Are Grant Program [\[LINK\]](#)

³⁷ Dept of Energy Communities Taking Charge Accelerator Grants [\[LINK\]](#)

³⁸ EPA Clean Heavy Duty Vehicles Grant Program [\[LINK\]](#)

³⁹ FHA Charging and Fueling Infrastructure (CFI) Discretionary Grants Program [\[LINK\]](#)

Explore structure of public-private partnerships with third-party providers	ECO/Metro	Ongoing partnership conversations to inform P3 structures
Expand tracking of public charging to understand future rural/UKC demand	ECO	Research for non-proprietary usage data underway
Explore potential online charger request tool or map	ECO	Exploration underway to assess benefit of joining surveys by others (e.g. PSRC) vs. launching King County’s own
Promote and communicate existing SCL and PSE Utility rebate programs	ECO	Ongoing as they become available

Notes on Public-Private Partnership

Metro conducted a Public-Private Partnership (P3) study in partnership with the University of Washington and published a report titled Charging Forward: Evaluating Public-Private Partnerships for Electric Bus Base Conversion to Support a Zero-Emission Fleet.⁴⁰ The study found that employing a P3 approach can reduce upfront capital costs and accelerate development for publicly owned infrastructure projects. In exchange for assuming the risk for project financing and delivery, a private entity will have the opportunity to recover its investment and potentially profit with a revenue stream for an agreed-upon operational period. A potential partnership design could include the County leasing land or individual parking stalls to a third-party provider. In exchange for the profits (if any) from the charger, the partner company may install, own, operate, and maintain all aspects of the charging operation.

One vendor that has become known for offering this business model is Electrify America⁴¹ which installs chargers in the public domain – typically, their interest tends to focus more on locations with mixed use, and that offer other retail services and amenities in the surrounding area, along with easy access to suitable power supply. As a result, these installations are less likely to focus on rural areas. Another organization, Adopt A Charger,⁴² gathers funding and donations in order to install chargers in tourist destinations that are free to use by the public. These are often installed in national parks and at other attractions, but the program has recently begun an expansion into the King County region.

To implement these programs, such arrangements may require changes in County code that would allow greater flexibility in the commercial use of park and rides, or on other County-owned land. The County may also wish to amend its code to expand which departments can set user fees and collect revenue. Early conversations are underway to explore P3s as such partnership arrangements may require new financing and contractual mechanisms.

Additional Opportunities

Beyond the action items listed in Table 3, and public-private partnership opportunities, there may be other novel approaches and pilot programs that could potentially expand access to public charging in the future.

⁴⁰ [\[LINK\]](#)

⁴¹ [\[LINK\]](#)

⁴² [\[LINK\]](#)

- Metro’s Contracted Services programs such as Metro Flex, Community Van, vanpool, and vanshare could consider ways to utilize chargers available overnight at park and rides for domiciling and charging.
- As E-bike ownership continues to expand in the region, there is the potential that some users may want to park their bike at a park and ride or transit center, and then continue their journey by bus or train. These bikes are too large and heavy to transport on Metro’s bus-mounted bike racks. While parked, a subset of users may be interested in recharging their E-bike using a 120-volt outlet, though charging anywhere other than home or work is still fairly uncommon, and equipment may be difficult to secure from theft.
- The charging industry is evolving and there could be new technologies that could facilitate charging in more rural areas. Some of these technologies may provide additional resilience in the event of power outages and other emergency events. As these technologies emerge they could be evaluated based on cost, utilization, and other key criteria.

Operation and Maintenance

- Regardless of the programs implemented, the following maintenance and operational issues must be considered to ensure user satisfaction.
- Malfunctions and uptime – to effectively operate any new charging equipment, a maintenance plan would be necessary to ensure reliable availability to the public. The County would likely contract for this service, with strict provisions around the maximum duration of malfunctions, response times, required uptime percentage, etc.
- Vandalism – Metro has experienced repeated vandalism of current chargers at park and rides, and the issue continues to be a significant problem experienced by other providers across the region. New solutions will be necessary to reduce the rate of equipment vandalism, and these may include:
 - Reinforced equipment
 - Chargers with cords that spool back into the unit when not in use
 - Monitored or staffed locations
- Parking stall enforcement – the County needs to decide how it will enforce improper parking in EV-only stalls, and who has authority to issue citations.

VI. Conclusion

EV charging infrastructure along Washington's rural state highways and interstates is developing quickly, while public charging in rural and unincorporated areas away from major travel corridors is developing at a slower pace due to lower demand and lower housing density.

State grants and building code requirements will help further charging access in these locations in addition to programs offered by utilities like Puget Sound Energy and Seattle City Light.

Given these and other programs, the extensions in average EV range, and rapidly evolving charging equipment, staff recommend steering away from park and rides as the main focus of the County's public EV charging efforts. There are only two County-owned park and rides in rural King County, and both are located on Vashon Island. The potential to add chargers there could be further explored in an assessment of the electrical capacity as well as the potential demand for chargers.

Park and rides are intended to provide access to transit, as specified in County code, therefore users tend to park for longer hours while they take the bus to work, school, or other destination. This means that drivers are leaving EVs to charge for prolonged periods which precludes use by anyone else. Charging could be provided as an incentive for transit users recognizing that the chargers will be occupied for long periods and not used as efficiently as possible; Metro would want to assess how any expanded EV charging proposal integrates into other current and planned parking program rules. If the chargers installed at park and rides are also intended to be available to non-transit users, County policy would need to be adjusted to allow new business uses.

An additional, and currently unresolved, challenge with unmonitored charging in general is repeated vandalism. For example, following many months of downtime due to prior vandalism, the chargers at the Burien Park and Ride were just vandalized again, mere weeks after repair.

To fully assess the level of future charging demand and potential opportunities in rural and unincorporated areas, further public survey work may be necessary. The other widespread County-owned properties in rural areas are approximately 90 parking lots at parks and natural areas; given the significant number, and the expected time a full assessment would take, these are still under study in order to develop a shortlist for a feasibility evaluation. Criteria would include factors such as: power availability, lighting, paved surface, parking utilization, cell coverage, and other considerations. In the interim, the County should leverage a 2020 DNRP study on EV charging in two selected park locations.

If the focus on park and ride charging is reduced, this may be an opportunity for the County to leverage or promote charging programs led by others, while exploring new cutting-edge initiatives, public-private partnerships with fast charger operators on County-owned land, and options to garage and charge Metro Contracted Services vehicles at underused park and ride locations.

With the addition of an EV Planner position to the Executive Climate Office, there is also the opportunity for the County to pivot more towards a role as lead applicant for state and federal EV charger funding, in order to pass awards through to local cities, CBO's, and other climate partners working on decarbonizing transportation. The County can help promote current utility rebate programs for single-family homeowners and multi-family building managers, while also targeting installations at public locations that meet the needs of residents who live in condos and apartments that do not, or cannot, offer charge-at-home options.