

CITY OF SEATTLE

RESOLUTION 32160

A RESOLUTION relating to the City Light Department; adopting an updated Transportation Electrification Strategic Investment Plan for the City Light Department that will guide the development of the utility’s infrastructure strategy and investment priorities related to the electrification of transportation.

WHEREAS, in its 2019 session the Washington State Legislature passed, and the Governor signed, SHB 1512 (“the legislation”) relating to the electrification of transportation; and

WHEREAS, the Legislature found that reducing greenhouse gas emissions and improving air quality can best be achieved by expediting the transition to alternative fuel vehicles, including electric vehicles; and

WHEREAS, the legislation created what was codified as RCW 35.92.450, which provides that the “governing authority of an electric utility formed under this chapter may adopt an electrification of transportation plan”; and

WHEREAS, RCW 35.92.450 also allows for an electric utility to offer “incentive programs in the electrification of transportation for its customers, including the promotion of electric vehicle adoption and advertising programs to promote the utility’s services, incentives, or rebates,” provided that “utility outreach and investment in the electrification of transportation infrastructure does not increase net costs to ratepayers in excess of one-quarter of one percent”; and

WHEREAS, the City Light Department (“City Light”) created a Transportation Electrification Strategic Investment Plan (“TESIP”), which was adopted by City Council on October 5, 2020, through the passage of Resolution 31971; and

WHEREAS, Resolution 31971 stated that City Light “will continue to review and update the Transportation Electrification Strategic Investment Plan at least every four years”; and

1 WHEREAS, City Light has now updated the TESIP for the years 2025 through 2030 (“the 2025
2 TESIP”), which will continue to guide the development and implementation of the
3 utility’s electrification of transportation infrastructure strategy and investment priorities;
4 and

5 WHEREAS, Ordinance 127145, passed by City Council on November 21, 2014, amended the
6 reporting requirements for several City departments, including removing the “review and
7 update” requirement on City Light for the TESIP from Resolution 31971, while
8 maintaining the annual reporting requirement; and

9 WHEREAS, City Light completed the review and update of the TESIP consistent with the
10 requirement in Resolution 31971 before Ordinance 127145 was passed; and

11 WHEREAS, City Light will report to City Council annually regarding the implementation of the
12 TESIP; and

13 WHEREAS, in developing the 2025 TESIP, City Light has once again undertaken broad
14 customer and stakeholder engagement across communities and sectors consistent with
15 community and state standards, including the City’s Race and Social Justice Initiative
16 and Washington’s Healthy Environment for All Act, and in collaboration with the
17 Department of Neighborhoods and the Office of Sustainability and Environment to get
18 input for the Transportation Electrification Strategic Investment Plan; and

19 WHEREAS, the 2025 TESIP draws on the findings of a strategy report City Light developed in
20 collaboration with the International Council on Clean Transportation, which informs and
21 projects the charging infrastructure needs in the light, medium, and heavy-duty vehicle
22 sectors included as Attachment B to this resolution; and

1 WHEREAS, the 2025 TESIP calls for proactive planning, early investments, and programs, and
2 will prioritize systemic, long-term solutions to achieve specific racial equity outcomes to
3 improve the lives of individuals living in environmental justice communities identified in
4 The City of Seattle Office of Sustainability and Environment’s Equity and Environment
5 Agenda; and

6 WHEREAS, the overall benefits of the 2025 TESIP will be generally distributed across the entire
7 City Light service territory and categories of customers through their rate impacts and
8 universal program offerings; and

9 WHEREAS, the 2025 TESIP is aligned with and will contribute to the success of the overarching
10 Citywide Transportation Electrification Blueprint; and

11 WHEREAS, the City Council has reviewed the 2025 TESIP; NOW, THEREFORE,

12 **BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SEATTLE, THE**
13 **MAYOR CONCURRING, THAT:**

14 Section 1. The City Council adopts the City Light Department’s (“City Light”) proposed
15 2025 Transportation Electrification Strategic Investment Plan (“2025 TESIP”), a copy of which
16 is attached to this resolution as Attachment A and incorporated by reference.

17 Section 2. The City Council requests that the General Manager and Chief Executive
18 Officer of City Light continue to consult with other City departments, stakeholders, community
19 partners, and a wide range of customers on specific initiatives, programs, services, and incentives
20 in furtherance of the 2025 TESIP. In formulating and developing its implementation strategy,
21 City Light will ensure that it upholds the values of equity, the environment, and the grid.

Adopted by the City Council the 28th day of January, 2025,
and signed by me in open session in authentication of its adoption this 28th day of
January, 2025.



President _____ of the City Council

The Mayor concurred the 30th day of January, 2025.



Bruce A. Harrell, Mayor

Filed by me this 30th day of January, 2025.



Scheereen Dedman, City Clerk

(Seal)

Attachments:

Attachment A – Transportation Electrification Strategic Investment Plan (TESIP) 2025-2030

Attachment B – Memorandum from International Council on Clean Transportation

2025 – 2030

Transportation Electrification Strategic Investment Plan



Seattle City Light



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Letter from Dawn Lindell, General Manager and CEO

At Seattle City Light, we are helping drive the groundbreaking shift towards a cleaner, more sustainable transportation future. Transportation is Seattle's leading cause of climate pollution. It accounts for nearly two-thirds of the greenhouse gas emissions in our region. Electrifying transportation is one of the most impactful steps to reach our region's sustainability goals and combat climate change.

The move away from fossil fuels to the electrification of transportation has grown rapidly in recent years and is reshaping the mobility landscape and energy systems. This shift set the stage for City Light's Transportation Electrification Strategic Investment Plan.

Adopted in 2020, the plan works to ensure all our customers can experience the benefits of electric mobility — from residential customers with electric vehicles (EVs) to businesses transitioning to electric fleets to multifamily customers looking to install EV chargers at their properties. We're also partnering with government agencies to electrify public transit, including buses and passenger ferries, and collaborating with the maritime industry to provide shore power for cruise and cargo ships.

This update to the original plan, which was developed with extensive community and industry input, builds on our work to advance the adoption of electric transportation and modernize our electric grid to serve growing electrical loads.

City Light is uniquely positioned to lead in this transition with our renewable energy sources, strong climate commitments, and customers eager to embrace innovation. This strategy guides the next five-year phase of our work to transform our region's mobility future and ensure an equitable transition away from fossil fuels. Electrification also improves the health of our communities and creates jobs.

City Light cannot undertake this journey alone. This work will require close collaboration with customers, community organizations, policymakers, and business leaders. Together, I'm confident we can successfully electrify our transportation sector, make our communities better places to live and work, and preserve our environment for generations to come. Join us in creating a shared energy future!



A handwritten signature in black ink that reads "Dawn Lindell".

Dawn Lindell
General Manager and CEO
Seattle City Light

Executive Summary

Seattle City Light is continuing to embark on the transformation of transportation. For over a century, we have been a public power provider; now, we have the honor of serving as a transportation fuel provider for our customers.

Transportation is the largest source of statewide greenhouse gas emissions and air pollution, which cause numerous negative health impacts on our communities. Electrifying transportation systems offers a significant opportunity to address these impacts while providing economic benefits to our region. Today, one in four new vehicle sales in King County are electric.¹ City Light must rise to the occasion to create a clean, renewable, and affordable energy future. We had several accomplishments during our first Transportation Electrification Strategic Investment Plan, including completing over 160 charger installations.

This updated Transportation Electrification Strategic Investment Plan describes City Light's focus areas and priorities as we continue investing in charging infrastructure, the grid, and communities. We are committed to investing in Puget Sound's transportation system to shift towards a cleaner, healthier, and more equitable environment.



INFRASTRUCTURE

City Light infrastructure investments will continue to respond to market forces and customer needs, with a strategic focus on building more charging stations, increasing equitable access to charging, and improving customer experience.

Ensure customers have equitable access to reliable, convenient public charging throughout our service area.

Public Charging

Provide rebates and technical assistance to households facing at-home charging barriers.

Home Charging

Support employee charging for small, women-owned, and minority-owned businesses.

Workplace Charging

Partner with transit providers to plan, design, and fund electrification projects.

Transit

Provide technical assistance and financial incentives for businesses, nonprofits, and public entities to electrify vehicle fleets.

Commercial Charging

Coordinate with regional maritime, railroad, and aviation industries to support electrification projects.

Non-Road Vehicles

¹ Department of Energy: <https://afdc.energy.gov/vehicle-registration>



TRANSPORTATION ELECTRIFICATION ENABLEMENT

As the electric transition accelerates, City Light will prioritize creating a ready and resilient grid and strategies to plan and manage new electric loads. Another important focus area is resourcing the transition that's underway, which will be accomplished through strategies centered on partnership and collaboration.

Raise customer awareness of time-of-use rates and managed charging technologies.

Load Management

Address the challenges of large-scale electrification with improved customer support and industry engagement.

Grid Investments

Pursue external funding for electrification projects and build community awareness of these opportunities.

Funding Resources

Coordinate with legislators, regulators, and franchise cities on transportation electrification policy.

Policy Coordination

Build career pathways and invest in initiatives supporting green jobs and local business opportunity.

Workforce Development



COMMUNITY AND STAKEHOLDERS

City Light will expand our existing commitment to and collaboration with community partners, inviting them to help shape solutions to community-identified transportation electrification priorities. A strategic focus on co-empowerment requires jointly planning a greater number of projects and outreach efforts with community partners, as well as increasing communications and engagement to support community needs.

Strengthen project partnerships with communities and stakeholders through sustained collaboration and accountability, streamlined internal processes, and improved admin support.

Community & Partnerships

Increase communications efforts, especially for overburdened communities and in-person engagements, to build relationships with and address the priorities of communities.

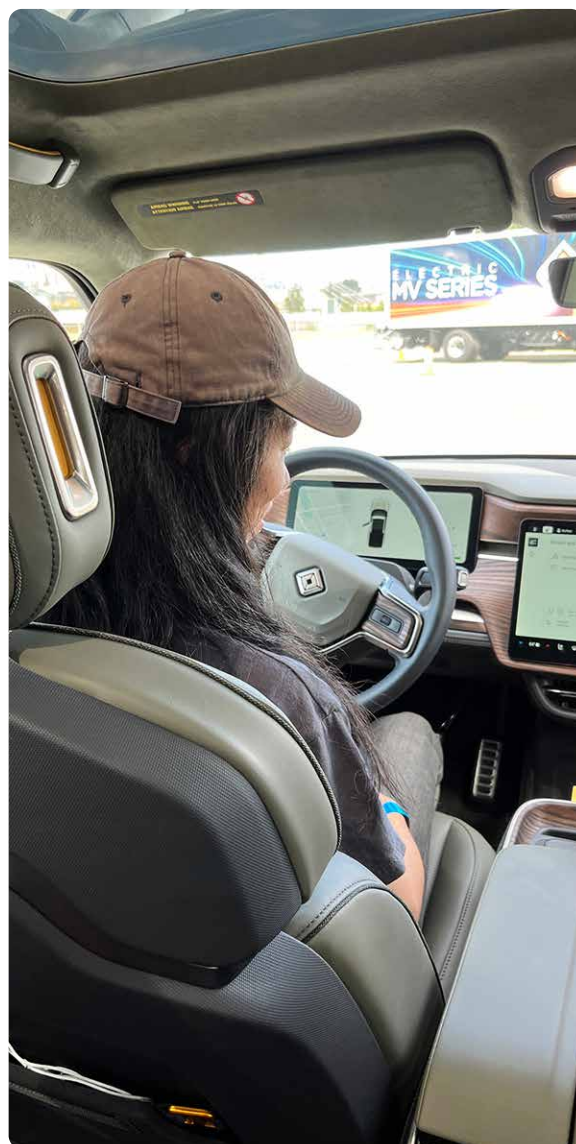
Outreach & Engagement

Context

Transportation is an essential service and a fundamental human need. As affordable housing becomes more distant from community and economic centers, human services and medical care become more diffused, and goods are increasingly procured through e-commerce, transportation is even more of an essential lifeline.²

At the same time, fossil fuel-powered transportation is the largest source of greenhouse gas emissions in Washington state and in City Light's service area. These emissions not only contribute to climate change and pollute the environment, but they also harm the health of individuals and the public at large. Diesel and gasoline emissions, which increase as demand for transportation services grow, can cause negative health impacts like asthma, cancer, and stroke.³

As a provider of low-carbon transportation fuel, City Light is uniquely positioned to promote electric transportation services that greatly reduce the impacts of climate change while supporting community prosperity and connectivity. Due to our low-carbon electric grid and the reduced tailpipe emissions and growing local economic opportunities associated with the transition from fossil fuels, transportation electrification brings a host of benefits. While the electric transition has direct and indirect benefits to all, overburdened communities and vulnerable populations stand to benefit the most.⁴



Community partner, ECOSS, attending ride and drive at Green Transportation Summit and Expo. Courtesy of ECOSS.

² Urban Institute | Upward Mobility Initiative: <https://upward-mobility.urban.org/framework/neighborhoods/transportation#>

³ HEI Panel on the Health Effects of Traffic-Related Air Pollution: <https://www.healtheffects.org/publication/traffic-related-air-pollution-critical-review-literature-emissions-exposure-and-health>

⁴ The RCW 70A.02.010 (HEAL Act) includes definitions of "overburdened communities" and "vulnerable populations." These terms are also used in the Clean Energy Transformation Act, the Climate Commitment Act, and other climate change policies and programs.

**Transportation electrification covers all services
and systems that move people and goods.**



On-road



Non-road



Rail



Aviation



Maritime

In 2020, Seattle City Council approved and adopted the first Transportation Electrification Strategic Investment Plan. Developed with input and feedback from a diverse set of stakeholders, including community leaders, public organizations, and industry leaders, this plan outlined City Light's transportation electrification strategy and investment approach for 2020 – 2024.

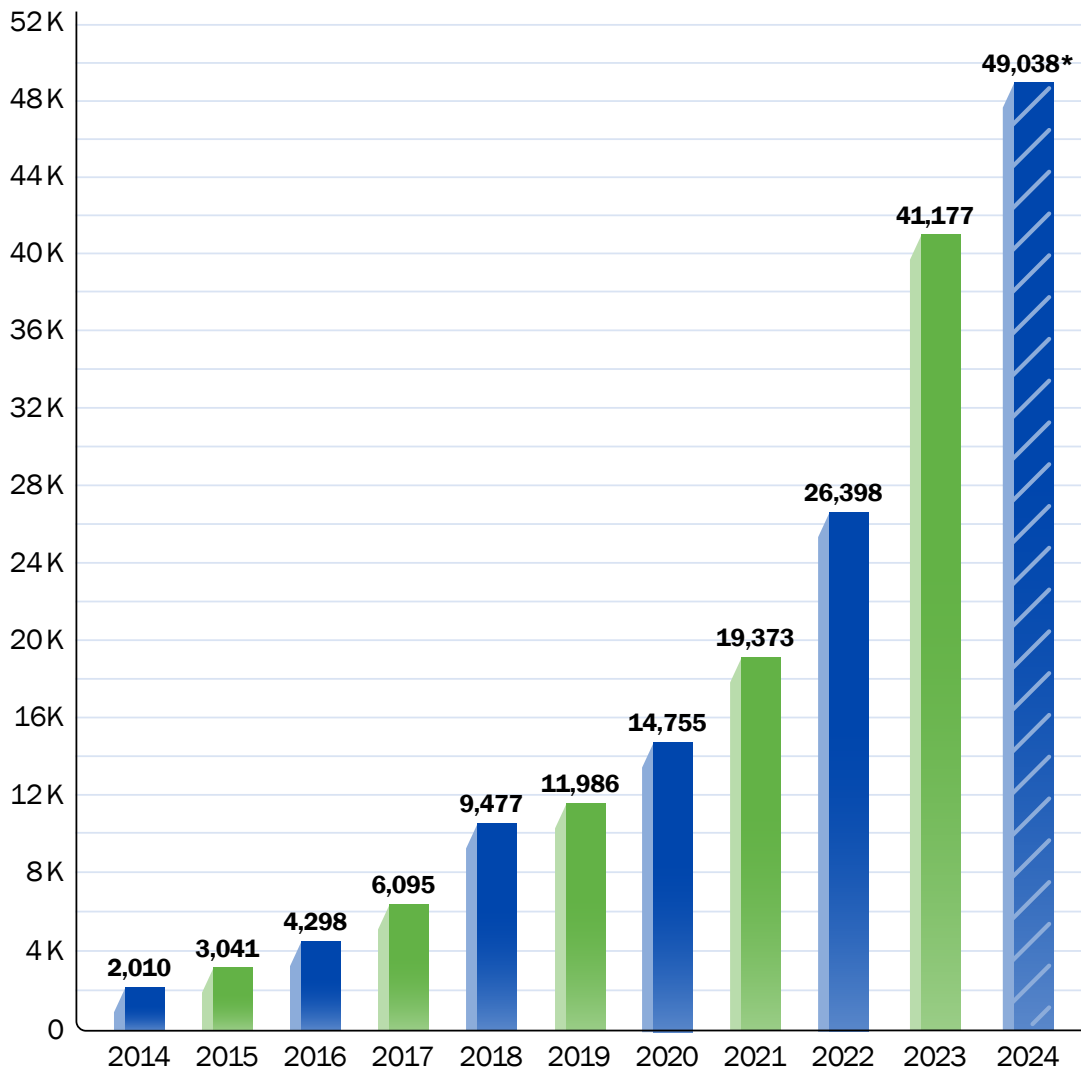
The plan highlighted specific focus areas for City Light investments, programs, policies, partnerships, outcomes, and impacts, and provided a roadmap of activities and key milestones. Now, City Light is bringing together community and stakeholder feedback, lessons learned, industry trends, market developments, and continued research to guide the next phase of our transportation electrification work.

Climate, energy, and transportation policy significantly impact transportation decarbonization requirements and City Light strategy. Federal and state regulations designed to reduce greenhouse gas emissions and address climate change are, in turn, rapidly increasing customer demand for EVs and accelerating our investment in charging infrastructure and grid readiness.⁵



⁵ Clean Air Task Force: <https://www.catf.us/2024/08/decarbonizing-us-transportation-progress-opportunities>

ELECTRIC VEHICLES REGISTERED IN CITY LIGHT SERVICE AREA



Source: Electric Power Research Institute, *EVs in the City Light Service Area by Model Year (Cumulative)*, displaying Department of Licensing registration data through August 2024.

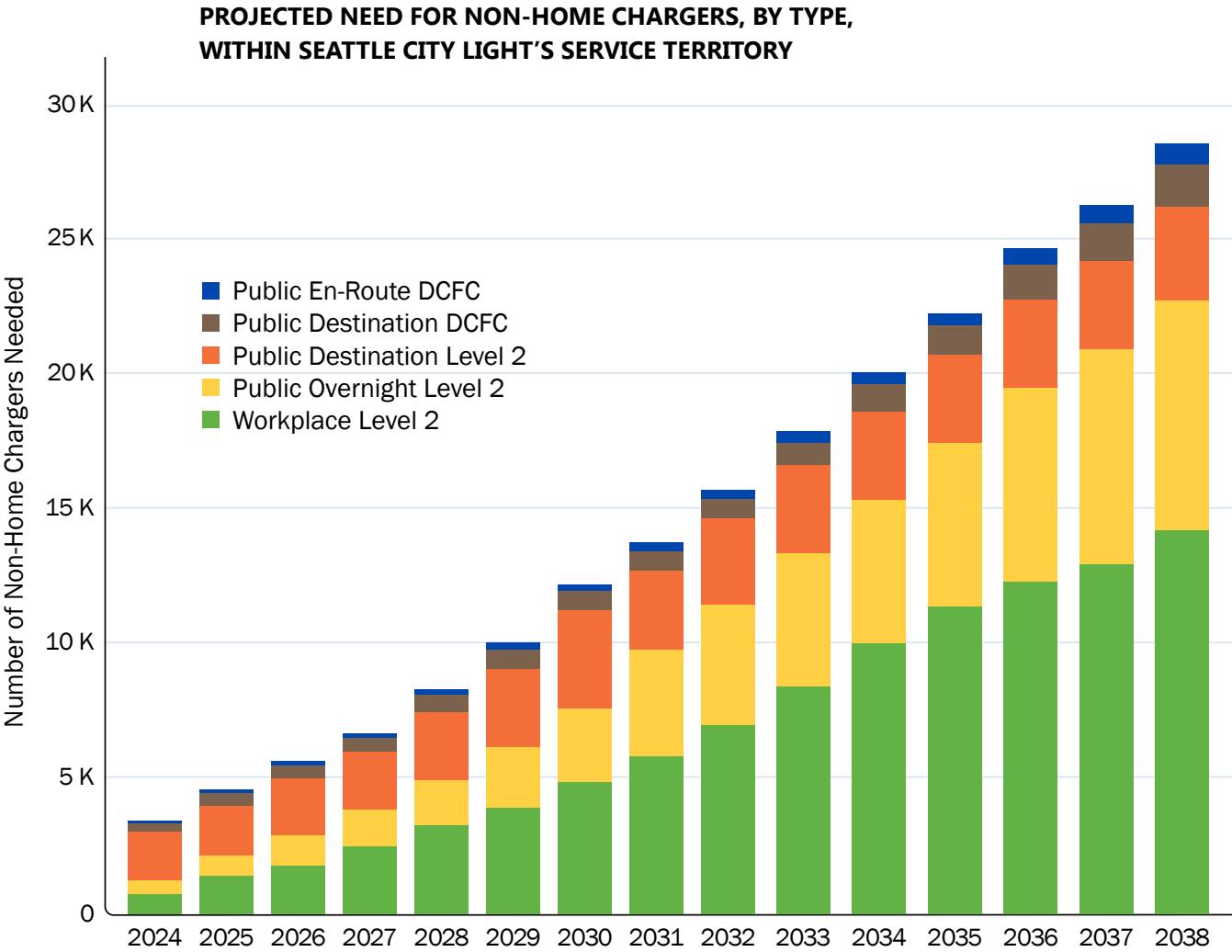
*Data shown for 2024 is incomplete and only includes registrations through August.

Over the past four years, federal and state agencies have made significant investments in decarbonization efforts, including direct consumer incentives for EV adoption and home charger installation with a focus on low-income households.⁶ As customers seek reliable and accessible information about available programs and funding, we anticipate they will increasingly turn to City Light as their trusted energy partner for support navigating incentives. There is a growing need for customer education and engagement efforts to ensure our communities are aware of and able to seize upon opportunities from the transformation.

⁶ Database of State Incentives for Renewables & Efficiency: <https://programs.dsireusa.org/system/program/wa>

To prepare for growing customer demand, City Light has been working with stakeholders to bring new research to inform our strategy. The International Council on Clean Transportation conducted a charging gap analysis of our service area to determine the number of chargers needed to support projected EV growth over time.⁷ The analysis determined our service area

will need over 700 fast chargers and over 11,000 Level 2 chargers at public and workplace locations by 2030. This corresponds to a 230% increase from the 223 fast chargers installed as of 2023 and a 620% increase from the 1,549 Level 2 chargers installed as of 2023. In addition, the analysis found our service area needs 150,000 home chargers by 2030.



Source: International Council on Clean Transportation, Charging Gap Analysis of Seattle City Light Service Territory, 2024.

⁷ International Council on Clean Transportation: <https://theicct.org/publication/powering-seattle-fleets-charging-infrastructure-strategy-for-battery-electric-medium-and-heavy-duty-vehicles-may24>

As more people and businesses switch to electric transportation services and systems, City Light faces increased demand for electricity and charging infrastructure. We continue to manage this demand with future-oriented planning on energy sources, required quantities and types, and fluctuating energy demand levels. By predicting how quickly people switch to EVs and how much charging infrastructure our service area needs to support them, we can plan where to build now to enable our customers' future energy choices.

Strategy References

Transportation Electrification includes considerations and inputs from these sources:

- Transportation Electrification Blueprint
- Seattle City Light Strategic Plan
- Grid Modernization Plan and Roadmap
- Seattle City Light Corporate Forecast
- Seattle City Light Integrated Resource Plan
- Climate Change Response Framework
- Executive Order 2022-07: One Seattle Climate Justice Actions to Reduce Emissions from the Transportation Sector
- Seattle Transportation Plan



City Light staff at the annual Duwamish River Festival.





Talking transportation electrification with Cultivate South Park. Courtesy Department of Neighborhoods.

Community Input

As a nonprofit, municipal electric utility, City Light is accountable to the needs of our customers, especially overburdened communities and vulnerable populations.⁸ By leading with our value of Equitable Community Connections, our focus is on actively involving the communities we serve in order to better meet their energy needs.

Transportation services and systems are directly related to the health, prosperity, and vitality of regions, cities, communities, and neighborhoods.⁹ Fossil-fuel powered transportation systems have a disproportionate and negative impact on overburdened communities, including localized air pollution, water and soil pollution, excess noise, traffic injuries and congestion, and impacts on the built environment.¹⁰

Community members who carry racial, social, and economic burdens have important knowledge and lived experiences that can help City Light identify top priorities for electric

transportation investment. To learn from community wisdom, we partnered with the Seattle Department of Neighborhoods and an external team of engagement experts to conduct outreach throughout our service area over the past year.

The community and stakeholder input we received through this process — as well as ongoing community engagement on electric transportation — has directly informed the investment priorities detailed in this strategy. New feedback reflects a growing awareness of the benefits of transportation electrification and an increasing demand to collaborate on future investments.



City Light staff attending a local event.

⁸ For the remainder of this document, “overburdened communities” is used to represent “overburdened communities and vulnerable populations”

⁹ American Public Health Association: <https://www.apha.org/news-and-media/news-releases/apha-news-releases/2021/community-drivers-of-health-policy-papers>

¹⁰ US Environmental Protection Agency: <https://www.epa.gov/power-sector/human-health-environmental-impacts-electric-power-sector>

In TESIP Phase 2 Outreach during August and September 2024, City Light solicited feedback from the following:

10
Seattle
Neighborhoods

500+
Community
Members

90+
Survey
Responses

9+
Place-Based
Events at Local
Festivals, Houses
of Worship, etc.

24
Distinct
Language/Cultural
Communities
Engaged

9
Engagements with
Community-Based
Organizations



City Light staff talking about electrification at the Othello Park International Festival.

KEY COMMUNITY FINDINGS

Equitable investment is an essential driver of community-level adoption.

Widespread awareness of community health, climate, and economic inequities can motivate adoption of transportation electrification — but only if communities can see meaningful progress is being made that doesn't exclude or harm the most vulnerable.

Building trust and engagement through education and outreach is a top priority.

Our communities are asking for more robust, regular, and reliable communication, education, and outreach from City Light. This includes in-language and culturally relevant approaches, more hands-on demonstrations, a focus on reliable and actionable information while addressing misinformation, and in-person engagement tailored to the needs of specific communities.

Infrastructure and career pathway investments are valued as an opportunity to strengthen community self-determination.

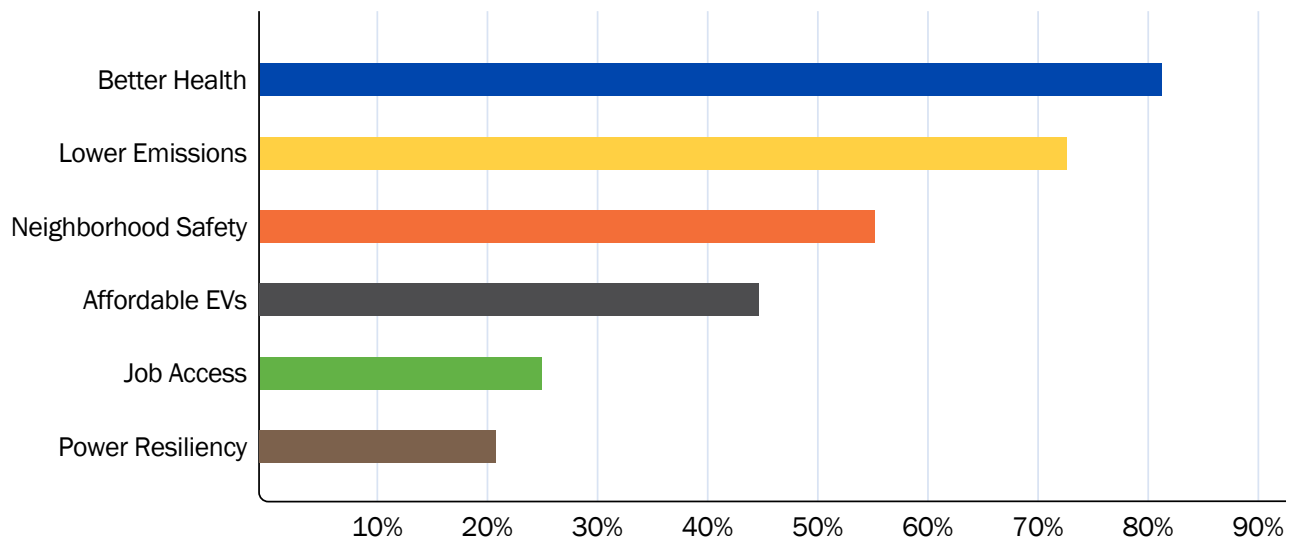
Reliable EV and electric infrastructure, including plans for maintenance and vandalism deterrence, is a priority for our communities, along with more tailored and targeted economic opportunities. Community-level partnerships are essential to design and deliver programs and projects and to ensure the investment outcomes help create more connected and resilient communities that are resourced for success.

For more detail on specific community feedback and findings, please review the engagement summary report in this document's appendix.



Talking transportation electrification at Back2School Bash hosted by Rainier Beach Action Coalition.

COMMUNITY SURVEY RESPONSES: BENEFIT PRIORITIES



Summary of 76 responses to a transportation electrification community survey. Participants were asked to rank categories of beneficial outcomes from transportation electrification investments from one to six, with one as their top priority and six as their lowest. Results show that the majority of respondents selected "better health" and "lower emissions" as their top priority benefits.

ACCOUNTABILITY AND RE-ENGAGEMENT

Community leaders and stakeholders have continually emphasized the importance of community engagement, collaboration, and buy-in to ensure the success and progress of the electrification transition. City Light is committed to remaining accountable to our communities for transportation electrification investments and working diligently to minimize harm and maximize benefits. Our community accountability plans include:

- Returning to stakeholders and community partners over the time horizon of this plan to document progress as well as challenges and opportunities to shape additional investment, policies, and partnerships.
- Engaging communities and stakeholders regularly to respond directly to existing and new priorities and explain how current work and investments are iterating based on community feedback.
- Investing institutionally in more robust communication and education strategies and activities.
- Continuing to build and maintain community-organization and community-leader partnerships for both engagement and program co-creation purposes.
- Co-creating success metrics and other mechanisms to document progress.



Installation of a City Light EV fast charger.

Investment Strategies

INFRASTRUCTURE

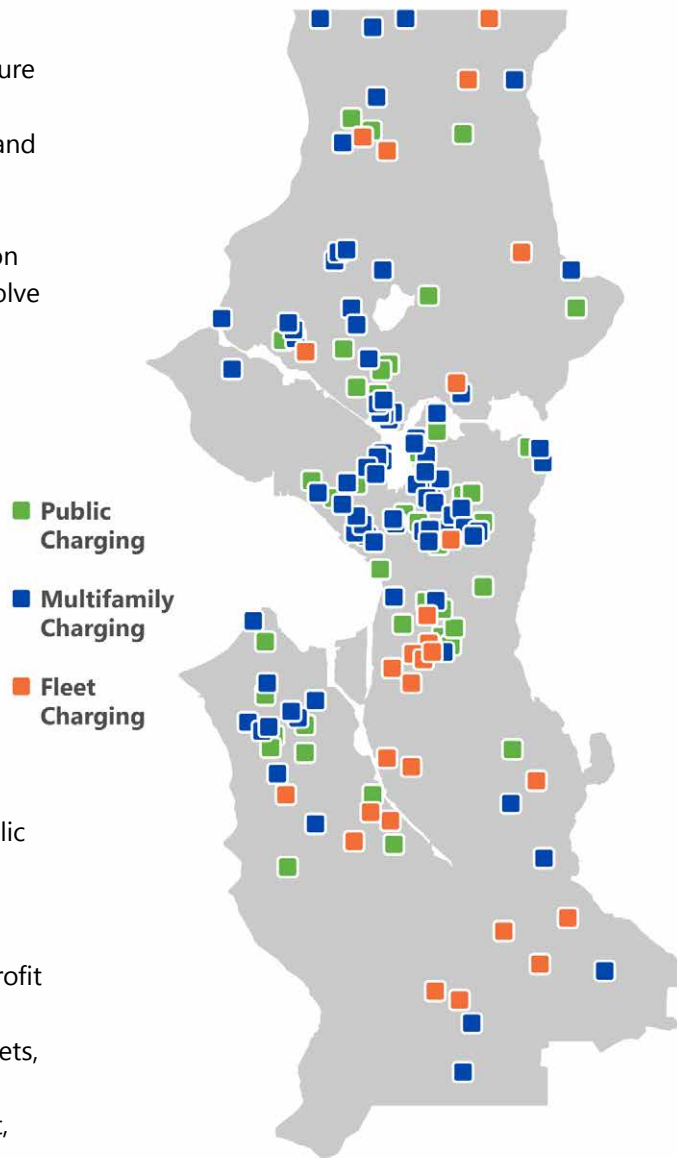
City Light has invested in EV charging infrastructure since 2018, often in partnership with regional agencies, communities and community groups, and private companies. Infrastructure must adapt to community needs, technological advances, and industry trends to support regional transportation electrification. As a result, we will continue to evolve our infrastructure investments to meet market developments and customer needs.

This section provides an overview of the areas we expect to prioritize for investments through 2030 to meet the rapidly growing need for charging as EV adoption continues to increase.

Public Charging

Public charging allows EV drivers to charge their vehicles away from home or work, meeting needs that vary from long road trips to everyday shopping. Other drivers may rely entirely on public charging if they don't have access to chargers at home or work.¹¹

While the private sector primarily operates for-profit fast chargers and Level 2 chargers at centralized, high-traffic locations (with most at grocery markets, superstores, and banks), City Light's role is maintaining and expanding access to convenient, dependable public charging — especially in overburdened communities.¹²



City Light's investments in public, multifamily, and fleet chargers since 2020, resulting in 164 projects and 448 EV charger installations.

¹² The U.S. Census Bureau estimates that as of 2023, 56% of Seattle housing units are renter-occupied and 53% of Seattle housing units are multifamily buildings with 5 or more units. Additionally, a 2024 International Council on Clean Transportation GIS analysis estimates that roughly half of the single-family homes in the City Light service area don't have off-street parking. These types of households often face high barriers to getting at-home charging and instead rely on other charging options, like public and workplace charging. United States Census Bureau: <https://data.census.gov/table/ACSDP1Y2023.DP04?q=seattle%20median%20rent>.

¹³ Level 2 chargers provide alternating-current (AC) electricity from the grid to the vehicle's onboard converter, which converts the electricity from AC to direct-current (DC) to charge the battery. Level 2 chargers usually operate on 240-volt, single-phase power and most commonly.

As of 2024, City Light owns and operates 25 fast chargers and 60 Level 2 chargers for public use throughout our service area. The newly deployed curbside Level 2 chargers, which provide near-home public charging for residents that rely on street parking, have proven especially useful. The locations with the highest utilization are used up to six times per day and dispense enough electricity for over 150,000 miles of travel per year.

PRIORITIES

IMPROVING CUSTOMER EXPERIENCE

City Light will replace initial fast charger investments with newer models that offer faster speeds, more reliable service, and updated technology. In addition, to address increasing vandalism to charger cables (a community-identified priority), we have joined in coalition with other local utilities, charging providers, and fleet operators to develop a coordinated response to the problem. Independently, we are developing a public charging security plan to improve site security and address vulnerabilities.

BUILDING ADDITIONAL CHARGERS

City Light's work to provide near-home public charging, such as curbside Level 2 chargers deployed in partnership with the Seattle Department of Transportation, is one of the most meaningful areas of community benefit. To ensure that residents have access to reliable, dependable charging when they need it, we will focus charging investments on gaps in the charging network. These gaps include providing chargers that:

- Benefit overburdened communities.
- Support electric car share and shared mobility.
- Increase charging opportunities at curbside locations, municipal properties, and public services such as community centers and libraries.

INCORPORATING NEW TECHNOLOGIES AND CUSTOMER PREFERENCES

EV charging continues to evolve with new and improved technologies that mitigate impacts to the electric grid and offer faster charging speeds, including chargers with integrated battery storage and other technologies. City Light will monitor these developments in consultation with industry experts and adjust our programs and offerings to adapt to transforming market and

customer preferences while considering early pilots or demonstrations to gain experience with new approaches.

OFFERING FINANCIAL INCENTIVES

The need for increased public charging in the City Light service area cannot be met solely by investments from any single organization. To ensure the entire service area has equitable access to convenient and dependable public charging, we will provide financial incentives and technical assistance to charging providers, prioritizing locations that support highly impacted communities.



City Light being interviewed by The Seattle Times about curbside level 2 chargers.



Home Charging

At-home and near-home charging are the most convenient and affordable ways to charge an EV. This convenience makes them vital pathways for electrification for residents whose commutes cannot reasonably be supported by transit or other forms of personal mobility. Single-family homes with off-street parking and spare electrical capacity are ideal for at-home charging, allowing homeowners to install chargers easily and affordably. However, homes lacking these features face high costs and challenges that disproportionately impact lower-income households. In 2024, City Light began offering instant discounts through our single-family charging program to reduce the upfront cost of installing chargers at single-family homes.

Apartments and condominiums make up 55% of the Seattle housing stock.¹⁴ Owners of multifamily homes often struggle to provide charging for renters because the required

upgrades can be expensive. While newer multifamily buildings in Seattle must include EV-ready parking, most were constructed before the rise of EVs and lack the necessary infrastructure. To address these barriers, City Light launched a multifamily charging program in 2023 to provide advisory services and rebates to install chargers for residents at these properties.



¹⁴ Seattle Office of Planning and Community Development: <https://www.seattle.gov/opcd/current-projects/housing-choices>

PRIORITIES

SUPPORTING HIGH-BARRIER HOUSEHOLDS

City Light can have the greatest impact when focused on helping customers who face economic and social barriers to obtaining at-home charging. We will prioritize offerings that address these barriers, with solutions that may include:

- Targeting outreach, assistance, and educational resources toward affordable housing properties and historically underinvested communities to help customers make informed decisions.
- Offering affordable housing properties and customers on low-to-moderate incomes higher incentives to purchase and install chargers.
- Reducing the cost to the customer for complicated and expensive charger installations and electric capacity upgrades with assistance and incentives.
- Engaging multifamily customers and single-family customers without onsite parking to identify locations for near-home public charging solutions.

OFFERING SOLUTIONS FOR AT-HOME CHARGING THAT SUPPORT OVERALL GRID RESILIENCY

City Light will work to include education on customer solutions that mitigate cumulative impacts on the electric grid and incentives that encourage these solutions, such as managed charging and time-of-use rates.

Commercial Charging

A growing number of companies, nonprofits, and government organizations in the City Light service area are planning to or are already in the process of converting their vehicle fleets to electric alternatives. These commercial vehicles frequently drive longer daily distances than personal vehicles, creating more air, noise, and greenhouse gas pollution in the process. This is especially the case for medium- and heavy-duty trucks like those involved in goods movement.

Replacing commercial vehicles with electric models has a substantial per-vehicle benefit to communities, especially in pollution-burdened neighborhoods near major thoroughfares. However, commercial fleets face unique challenges when transitioning to electric drive due to high upfront costs, limited vehicle

availability, and the need for additional electrical capacity for charging infrastructure. A fleet of heavy-duty trucks requires a significant amount of power for charging, estimated at up to 10 megawatts per location for large installations, and providing this power requires diligent planning and close coordination between the utility and the operator.

We introduced our fleet electrification program in 2022, which provides fleet assessments and rebates for commercial vehicle operators interested in vehicle electrification. The program has completed 23 fleet assessments to date, covering over 1,600 vehicles, and has provided rebates to support the installation of 91 chargers.

PRIORITIES

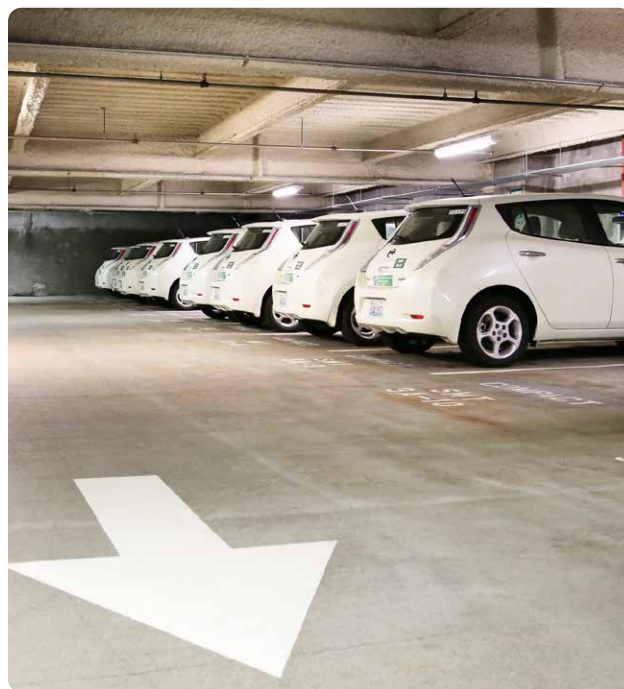
OFFERING ASSISTANCE TO COMMERCIAL CUSTOMERS

City Light can facilitate commercial charging projects by ensuring these commercial customers have the knowledge, resources, and technical assistance needed at the start of planning and design stages. We may also prioritize financial assistance for commercial charging projects that provide additional benefits to overburdened communities to ensure limited public resources provide the greatest benefit to the communities experiencing the highest levels of air and noise pollution.

Workplace Charging

An increasing number of workplaces are providing chargers in employee parking areas to support commutes. These can be beneficial for residential customers that have limitations on charging at home. Although workplace chargers are generally the same types used for public charging, they are not considered public because employers provide them explicitly for use by their employees.

Workplace charging faces challenges similar to multifamily housing charging. It is often expensive and difficult to install the infrastructure needed to support chargers in existing parking facilities that were not designed to accommodate them, and existing electrical systems at the workplaces may not have the capacity to support a large number of chargers.



PRIORITIES

OFFERING ASSISTANCE TO EMPLOYERS

City Light will develop a program to support workplaces interested in providing charging for employees, similar to programs available for home and commercial charging. This support will likely include technical assistance to ensure that property managers and owners understand the process, scope, and timeline for installing workplace charging and upgrading their electric service, if needed. This will also include financial incentives for workplace charging projects that otherwise would not be built because of financial barriers, especially for small businesses, women- and minority-owned businesses, and nonprofit organizations.

Transit

The City Light service area is served by a robust public transit system of vanpool, bus, streetcar, light rail, heavy passenger rail, and ferry service operated by King County Metro, Sound Transit, Washington State Ferries, and Kitsap Transit. Some of these services, including the Link Light Rail, Seattle Streetcar, and some King County Metro bus lines, operate entirely on electricity. Most other transit services are powered by diesel fuel and contribute to air and noise pollution in the communities they serve. These transit agencies have plans underway to electrify their services, which will improve public health and increase quality of life, especially for those who rely most on transit, while simultaneously providing lower operating costs.

Other types of transit — including private employer-sponsored bus service, scheduled and chartered motorcoach service, and school buses — are also pursuing electrification plans that provide corresponding benefits and face similar challenges to public transit electrification.

Electrifying transit requires City Light to provide substantial amounts of electricity in densely packed geographic locations and potentially upgrade the existing electric distribution system to meet demand from new electrification projects. We are also working with the Seattle Department of Transportation and transit providers to meet evolving needs for en-route charging stations.

We supported King County Metro's electrification efforts by providing engineering and technical assistance for Metro's first electric bus charging base that was completed in 2022, as well as by temporarily eliminating electricity demand charges through the utility's Commercial Charging Rate Pilot. These efforts lowered fuel costs and improved the financial viability of the project during the first years of operation. We continue to work in partnership with King County Metro to achieve their goal to fully electrify their transit fleet by 2035.



PRIORITIES

BUILDING PARTNERSHIPS FOR TRANSIT PROJECTS

City Light will continue to provide planning and technical assistance to transit providers for electrification projects and may provide financial incentives to projects that benefit communities that bear a disproportionate burden of air pollution, noise pollution, or traffic from existing transit operations. We will center efforts on community collaboration and feedback to ensure that these projects address community priorities and needs. We will also prioritize partnering with transit providers that are seeking state or federal grants to increase the chances of success and to maximize the impact of investments.

Moving to Zero Emissions: Bus Fleet Milestones



Non-Road Vehicles

City Light's service area is a major hub for non-road transportation vehicles including cargo ships, cruise ships, fishing vessels, ferries, freight rail and aviation, as well as the support vehicles and infrastructure required for operations, loading and unloading freight. Non-road vehicles are usually fueled with fossil fuels like heavy fuel oil, diesel, or kerosene and lack the same emissions control systems required for on-road vehicles. As a result, non-road vehicles contribute significantly to both greenhouse gas emissions and local air pollution.¹⁵ Electric drive is not yet feasible for many of these non-road vehicles because of their heavy weight and long distances traveled. However, these transportation systems can significantly reduce their emissions when the vehicle is stationary by providing grid power — which allows vehicles to

¹⁵ International Council on Clean Transportation: <https://theicct.org/publication/managing-emissions-from-non-road-vehicles>

shut down onboard engines while still operating all electrical systems — and electrifying support vehicles and infrastructure. Short-range non-road vehicles such as ferries and local rail can also use electric drive systems powered by battery systems or overhead wires.

The Washington State Ferries system is converting to an all hybrid-electric fleet by 2040, with the first of these new hybrid-electric ferries operating from Colman Dock in downtown Seattle.¹⁶ We have worked closely with Washing-

ton State Ferries on the project and are providing extensive engineering resources and technical assistance for the ferry charging system and the large electric service it requires. We are also providing engineering and technical resources to plan for and design the distribution system required for the Port of Seattle's new shore power system at Pier 66, which will allow cruise ships to power-down their engines while docked and avoid significant greenhouse gas and air pollution.

PRIORITIES

PARTNERING TO SUPPORT ELECTRIC SERVICE PLANNING AND DELIVERY

City Light will continue to work with customers who operate and service the maritime, railroad, and port-related industries to assist with electrification efforts. These projects require close coordination between the utility and the customer because of the large amount of power required.

TRANSPORTATION ELECTRIFICATION ENABLEMENT

As the transition to electrified transportation accelerates, a key component of our strategy is supporting the shift to clean energy. Growing transportation electrification requires City Light to pursue careful planning to build a strong and resilient grid, implement policies and programs to beneficially manage new load, augment and expand existing financial resources, and collaborate with peers and stakeholders to ensure skilled, local workers are available.

We have a systems-level approach to transportation electrification enablement. The scale of the transition requires thoughtful and collaborative strategies that keep public benefit at the center of our decision-making.



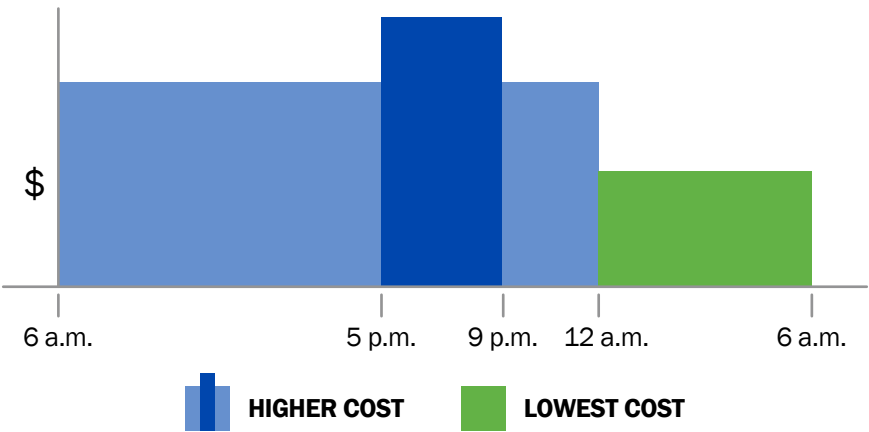
¹⁶ Washing State Department of Transportation: <https://wsdot.wa.gov/construction-planning/major-projects/ferry-system-electrification>



Load Management

Growing transportation electrification requires increasing amounts of available electricity to serve this new load while also better managing the demand for electricity in different locations and at different points in time.¹⁷ City Light must determine how to serve new electrical loads while ensuring a reliable electric grid and maintaining affordable rates. To achieve these goals, we need to manage demand and increase overall system resilience by better predicting and planning for improvements that support transportation electrification and by increasing the integration of distributed energy resources.

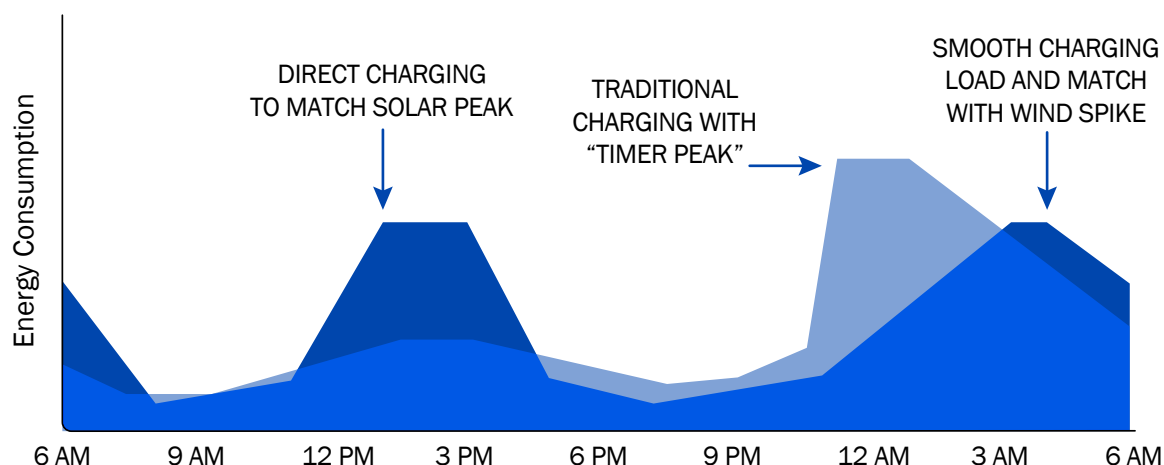
In the near term, two priority areas for City Light’s strategy are time-of-use (TOU) rates and managed charging. TOU rates offer customers lower-cost electricity when overall electricity demand is lower, which reduces customer energy bills while shifting charging to times when the grid can better handle it. Managed EV charging can also move electricity demand to optimal times of the day, by slowing or pausing charging during times of high demand or low electricity generation. On a large scale, time-of-use rates and managed charging provide more affordability benefits to customers because they can allow the utility to defer or avoid costly system upgrades and optimize generation resources, thereby keeping rates lower.



This image shows the structure of City Light’s adopted TOU rate; providing lower-cost rates at night can encourage EV charging that optimizes grid resources. Time of use rates approved by Seattle City Council in 2022.

¹⁷ Electric Power Research Institute: <https://www.epri.com/research/programs/053122/results/3002023248>

MANAGED CHARGING SCENARIO



Source: BMW of North America, 2016 with edits by Smart Electric Power Alliance, 2017. Note: The light blue area illustrates the impacts of a hypothetical TOU residential charging rate with the lowest rate period beginning at 11 p.m. and with unmanaged EV load. The dark blue area shows how managed charging could distribute charging loads across all hours and align with peaks in renewable energy generation.

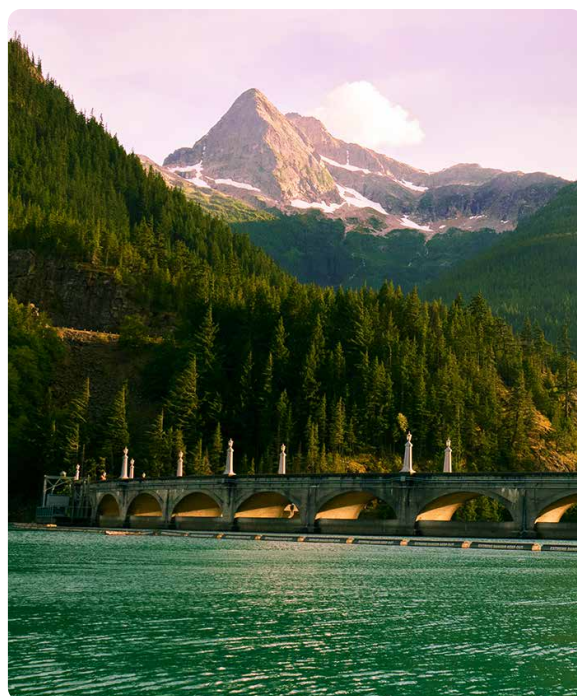
PRIORITIES

IMPLEMENTING OUTREACH AND EDUCATION TO INTRODUCE TOU RATES

City Light will conduct marketing, outreach, and education efforts to ensure all customers are aware of the availability of TOU rates (available on an opt-in basis beginning 2025 and transitioning to an opt-out basis beginning in 2026) and have the knowledge to choose the best rate option for their own use of electricity.

RESEARCHING THE VIABILITY OF ACTIVE MANAGED CHARGING

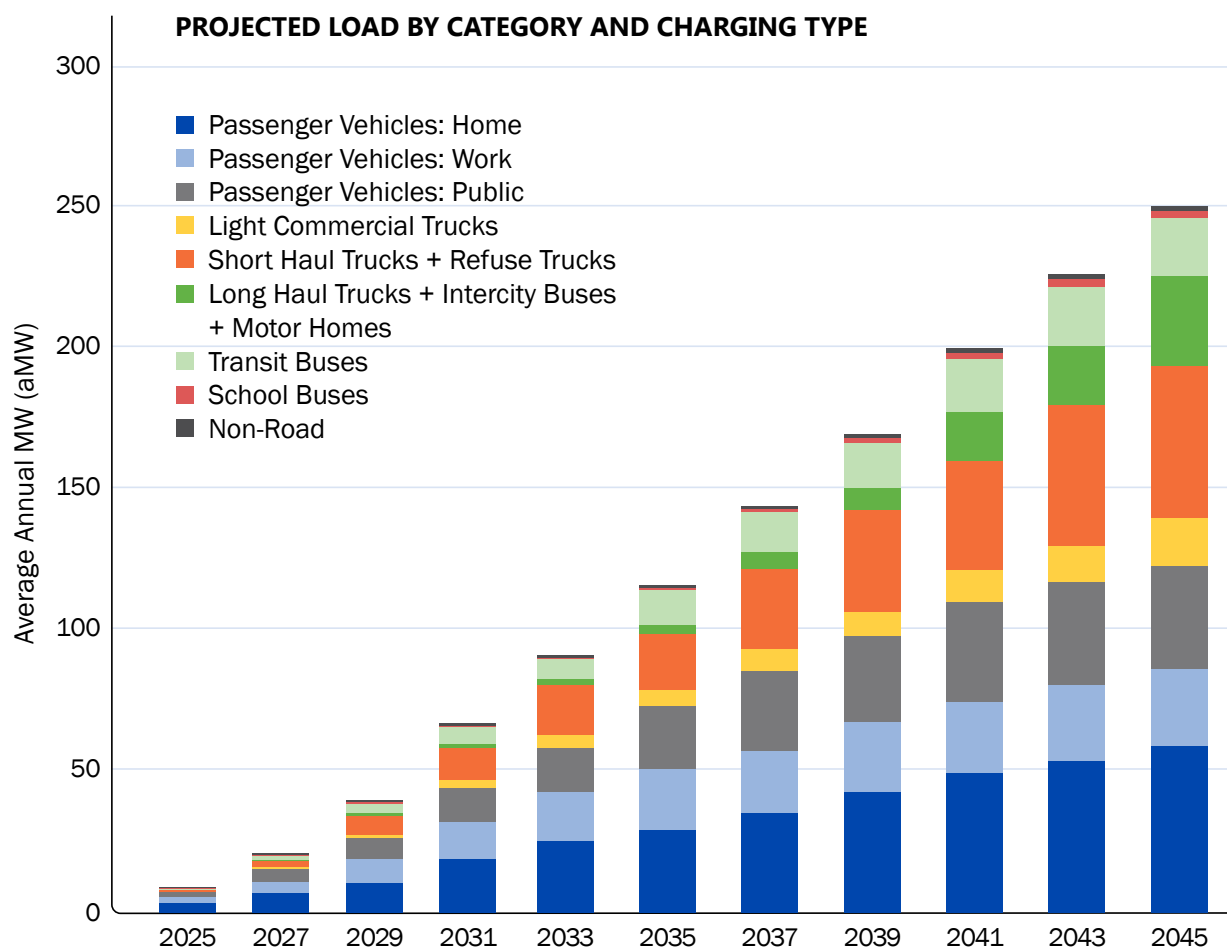
City Light will investigate integrating active managed charging options into public infrastructure. In addition, public outreach, education, engagement, and/or incentives may be part of our work to encourage public adoption of managed charging options as overall EV charging continues to increase.



Grid Investments

Transportation electrification, as well as building and industrial electrification, will require major investments in all aspects of the electrical grid, ranging from regional transmission systems to residential transformers. Current system forecasts anticipate that by 2045, transportation electrification will contribute to 20% of City Light’s total electric load; today transportation electrification contributes less than 1%.¹⁸ Like many utilities across the country facing similar external electrification forces, we are already planning, evaluating, piloting, and implementing various distribution, sub-transmission, and transmission infrastructure investments to accommodate new load and integrate it in ways that maximize benefits to customers and the grid.

To the electric grid, EVs operate like other distributed energy resources such as solar or demand response. As “batteries with wheels,” they can provide various grid services like energy and capacity resources, voltage regulation, and balancing intermittent load from renewable energy. Because of these attributes, transportation electrification is one of many variables that comprise City Light’s comprehensive and robust approach to investing in and preparing for the grid of the future.



Source: Seattle City Light, projected load forecasted by transportation category and charging type, 2024.

¹⁸City Light’s 2024 system forecast: <https://powerlines.seattle.gov/2024/09/04/strategic-plan-update-addresses-challenges-and-opportunities>

PRIORITIES

INCREASING CUSTOMER PLANNING EFFECTIVENESS THAT SUPPORTS GRID RESILIENCY

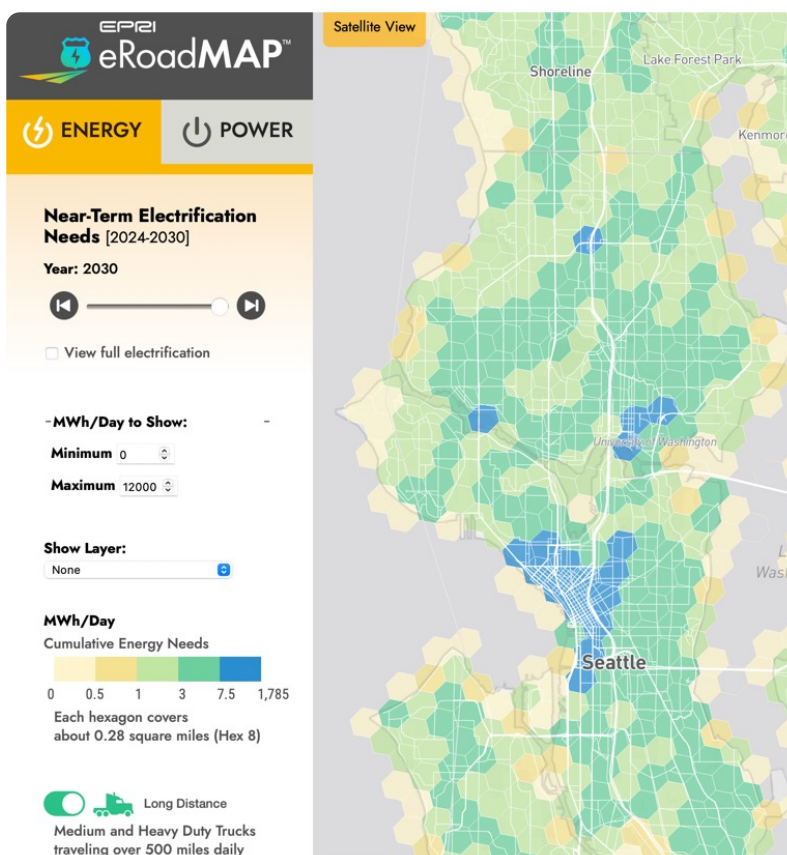
City Light is developing new modeling tools and resources to analyze electric grid capacity and load. These tools will provide a better understanding of what parts of the service area can best support new and upgraded electric services. We may create a modeling tool that will allow customers and developers to quickly determine how easily a prospective location can accommodate the additional electric load from charging.

IMPLEMENTING A CHARGER AND VEHICLE-DATA INTEGRATION INITIATIVE

With growing EV adoption, measuring the real-time, accurate dispensation of electricity to vehicles from charging stations is ever-more essential. City Light needs integrated measurement data to efficiently manage the grid, predict charging needs, ensure accurate billing, and plan for future infrastructure investments. This work also enhances customer trust and ensures we remain compliant with state, federal, and City environmental directives.

ENGAGING WITH INDUSTRY LEADERS TO PREPARE THE GRID

City Light will continue to engage with other utilities and research entities to ensure we stay ahead of the EV adoption curve. This includes partnerships such as the Electrification Research Power Institute's EVs2Scale 2030 — a three-year, public and private partnership that addresses the challenges of electrification at scale. This initiative will focus on anticipating load growth and develop processes and interactive tools to help standardize service connections.



EPPRI's eRoadMAP allows users to explore how quickly electric vehicles are expected in different regions, and identifies the power and energy needs at roughly the individual feeder level where critical utility planning occurs. This image shows the tool's forecasted energy needs for City Light's service area based on anticipated transportation electrification levels in 2030.

Funding Resources

To deliver transportation electrification programs, products, and services that meet the requirements, needs, and goals described in this strategy, City Light will need sufficient financial resources to invest in the largest transformation of the transportation sector in recent history. We will prioritize external funding opportunities to deliver transportation electrification programs, policies, and services while keeping cost impacts to customers as minimal as possible.

This work includes pursuing federal and state grant funding to enhance and scale utility and partner transportation electrification programs. In addition, Washington's Clean Fuel Standard (CFS) program will provide important resources to support the transition. CFS requires fuels used for transportation to reduce their carbon intensity from 2017 baseline levels by 20% in 2038.¹⁹ Electricity — used as a transportation fuel for the operation of EVs — has one of the lowest assigned carbon intensities within the program.²⁰ This means that City Light's role is primarily as a credit-generating entity within CFS's regulatory framework. The financial revenue generated from program credits must be spent on efforts that accelerate transportation decarbonization across the state, with an emphasis on overburdened communities.



City Light community partner, Kambo, providing public comment at a Seattle City Council committee meeting.

PRIORITIES

CONTINUING TO SEEK FEDERAL FUNDING

City Light will pursue grants that supplement funding for programs and projects identified in this strategy. These grants will help keep overall program costs and impacts to ratepayers down, expand the scope and impact of the program or project, and/or allow for the prioritization of the other transportation electrification programs.

SECURING STATE GRANTS

Similar to federal grants, City Light will pursue state funds to scale planned programs, reduce costs and save customer money, and pursue projects that otherwise lack sufficient resources.

COORDINATING AND PREPARING INTERNALLY AND EXTERNALLY FOR CFS CREDIT REVENUE

City Light will lead coordination and implementation of CFS across the City of Seattle. In addition to serving as a supportive partner to other departments participating in CFS, we will focus on internal resourcing and coordination to ensure compliance with the program. In addition, we will ensure that

¹⁹ RCW 70A.535.025: <https://app.leg.wa.gov/RCW/default.aspx?cite=70A.535.025>

²⁰ WAC 173-424-900: <https://app.leg.wa.gov/WAC/default.aspx?cite=173-424-900>.

revenue from the program supports equitable transportation electrification access priorities for our communities, including revenue-funded projects that are co-developed with community partners.

INCREASING COMMUNITY AWARENESS OF AVAILABLE FEDERAL AND STATE RESOURCES

City Light will continue to build and maintain information and awareness efforts that connect customers to relevant grants that support their decarbonization goals and accelerate the broader adoption of EVs. We may also include increasing capacity to respond to customer questions, concerns, and needs for assistance in navigating funding opportunities like tax credits.

Policy Coordination

Law and policy greatly influence transportation electrification efforts by creating the need for regulatory frameworks that promote clean energy adoption, energy end-use decarbonization, and infrastructure development. Advocating for effective policies and regulations is essential to ensure electrification efforts are equitable in making clean mobility solutions accessible and affordable for all communities.

Rules about infrastructure accessibility and interoperability, climate program operations and results, and funding programs are being developed and will continue for the coming years as markets, technology, and users change. Collaboration among utilities, regulators, and stakeholders is crucial to creating a resilient energy ecosystem, encouraging innovation and investment in cleaner transportation options, and ultimately fostering environmental sustainability and economic benefits.



Engaging industry experts at Green Transportation Summit and Expo.

PRIORITIES

ENGAGING LEGISLATORS AND REGULATORS TO PROMOTE GOOD GOVERNANCE AND RAISE VISIBILITY OF COMMUNITY NEEDS

City Light will continue to develop and promote principles for legislation and rulemaking that intersect with electric transportation adoption, maximizing the value and options for our customers and communities we serve.

PLANNING TO LEVERAGE FUTURE SEATTLE TRANSPORTATION LEVY FUNDS IN PARTNERSHIP WITH SEATTLE DEPARTMENT OF TRANSPORTATION (SDOT) AND OTHERS

City Light works with SDOT across multiple transportation electrification programs, including public charging, permitting, and supportive policies. We will continue to invest and strengthen our deep partnership with SDOT to enhance local transportation systems, including planning for implementation of joint efforts under levy EV-charging funds, which were approved in the 2024 general election.

DEVELOPING AND DELIVERING SOLUTIONS WITH FRANCHISE CITIES

City Light's service area extends beyond the boundaries of the City of Seattle. Our franchise city customers are experiencing significant population, business, and related economic activity that aligns well with policies that promote transportation electrification investments. We will strengthen and expand our advocacy for and partnerships with franchise city leaders and communities to explore transportation electrification solutions.

Workforce Development

The ongoing, widespread electric transformation of transportation systems has enormous implications for the local economy within City Light's service area. As electrification increases, skilled workers are needed to install, maintain, and upgrade charging infrastructure while growing and maintaining the electric grid. New goods and services, and new careers that support them, are a nascent but growing area of educational and economic opportunity.

We have heard from overburdened communities that increasing community self-determination is a priority outcome for transportation electrification investment. We will create thoughtful, targeted workforce- and business-development opportunities to meet community needs and priorities in this area and increase local workforce capacity to plan, build, and maintain infrastructure that matches the pace of growing transportation electrification adoption.



We offer professional pre-apprenticeship and apprenticeship opportunities to enter skilled trades careers as electricians, line workers, and cable splicers. We are also beginning to support career pathways by providing 17 women- and minority-owned firms with the tools, training, and mentorship to obtain Electric Vehicle Infrastructure Training Program Certification.

PRIORITIES

HELPING BUILD CAREER PATHWAYS TO JOBS WITH FAMILY-SUPPORTING WAGES

City Light supports the City's workforce development efforts, namely Priority Hire, and is coordinating with apprenticeship programs to strengthen pathways to energy industry jobs. As part of our commitment to fair labor practices and to ensure competitive compensation for workers involved in public projects, we will adhere to prevailing wage requirements for all contracts. This means that we will ensure workers are paid wages that align with the prevailing rates set by the state.

INVESTING IN PROGRAMS AND INITIATIVES THAT CREATE LOCAL BUSINESS OPPORTUNITY

City Light will respond to the community's priority to make it easier for local businesses and community organizations to benefit from the electric transportation transition. This includes opportunities in building new infrastructure and maintaining EVs and related services. This support may include targeting the intersection of business opportunity, local entrepreneurship, and equitable wealth building programs.



COMMUNITY AND STAKEHOLDERS

As an electric transportation fuel provider and key partner supporting the transformation of transportation systems, City Light can directly promote fair and equitable transportation outcomes for the communities that need them most.

Through ongoing engagement and partnership at the community level, we have learned about community priorities and needs that intersect directly with electric transportation solutions. Expanding our outreach, communication, and partnership efforts is a top priority for community stakeholders. As such, we are making

this work a priority element of the Transportation Electrification Strategy Investment Plan. This approach will support the City of Seattle's One Seattle initiative and, in partnership with the Department of Neighborhoods, we aim to bring more voices to the table.

To achieve these goals, we will expand existing outreach and engagement and develop new efforts that enable customers to better shape and access City Light services that reflect their needs and priorities. By investing in communication and community engagement, we can strengthen how customers shape and benefit from our services.



Community Partnerships

To best serve overburdened communities in our service area and achieve our goals for utility- and climate-related outcomes, City Light must fully understand community members' lived experiences — their needs, desires, and histories — and how utility services can provide relevant, meaningful, and effective public benefit. To do this, City Light must build relationships at the community level.

Relationships can range from informing customers of City Light actions or program opportunities to empowering communities to be stewards and architects of utility funds, operations, and service delivery. Ultimately, we must ensure that communities can meaningfully participate in shaping the solutions that address their needs and priorities — serving as partners and leaders in addressing challenges and thriving on their own terms. For those who have historically been underserved and stand to benefit greatly from investments in energy or transportation services, we need robust and comprehensive partnerships.

PRIORITIES

STRENGTHENING COMMUNITY PARTNERSHIPS

City Light will continue to build and expand on our existing relationships with community-based organizations (CBOs) and with individual community leaders. This strategy involves securing dedicated funding for CBO contracts, empowering them to create their own agreements, encouraging subcontracting to broaden impact, integrating CBO collaboration in transportation electrification activities, and sharing successes and lessons learned within City Light and with other City departments.

REMAINING ACCOUNTABLE TO COMMUNITY

City Light is committed to engaging communities regularly to respond directly to community priorities and demonstrate progress on shared goals through co-developed success metrics.

EXPANDING COMMUNITY RELATIONSHIPS THROUGH ADMINISTRATIVE SUPPORT

We have heard that communities new to working with City Light (or with government more broadly) need much more support and guidance at the beginning to create a clearer, less complicated, and less laborious path from initial conversation to actual work. The electrification, internal contracting, and accounting teams will continue to work on a set of tools that bridge the gap between City Light staff and new community partners. We will pilot these tools with a few CBOs before making them more broadly available for all interested organizations.

INTEGRATING EQUITABLE COMMUNITY PARTNERSHIPS

City Light will collaborate across the utility and the City of Seattle to focus on the intersection of climate change, customer needs, equity, and justice. This work may include creating a shared, co-owned understanding of how community partnerships are integrated and operationalized across bodies of work, including processes that enable community consultation on business operations and program development.

PLANNING COMMUNICATIONS AND OUTREACH IN COORDINATION WITH COMMUNITY PARTNERS

Expanding community outreach and engagement efforts — with an emphasis on specific neighborhoods, demographics, community events, and trusted community partners or organizations — is an important enabler of co-development. City Light may use strategies such as:

- Building new interactive materials, event booth features, and demonstrations that enable communities to better engage with and understand the various transportation electrification technologies, programs, utility offerings, and electric grid operations.
- Creating cohort models to better engage and resource selected community members to cultivate more dynamic and resourced relationships who in turn can be clean energy and transportation ambassadors in their respective communities.
- Researching, ideating, and developing with community co-creation models for City Light to evaluate and incorporate into planned customer program lifecycles.
- Prioritizing funding for CBO partners to increase event staffing as part of partnership work.



City Light staff engaging with community members at Infrastructure Week hosted by Utility².

Outreach and Engagement

Increased outreach communication, education, and engagement from City Light is a top priority shared by community stakeholders. Our communities have emphasized that sustained, tailored communications that help build relationships, are culturally appropriate and available in multiple languages, and address specific community questions and needs are priorities for future investment.

As customers continue to become aware of and engaged with our transportation electrification offerings, an increase in external communication efforts is needed — on both transportation electrification and core, foundational aspects of City Light’s offerings and services.²¹ Often, customers are unaware of City Light’s status as a publicly-owned utility, our low-carbon energy generation, and our work to increase climate resiliency, or they perceive underinvestment in minority-owned businesses.



Transportation electrification exhibit at the Seattle International Auto Show hosted by the Washington State Auto Dealers Association.

PRIORITIES

INCREASING COMMUNICATIONS EFFORTS

City Light will continue to invest and maintain a comprehensive and robust communications platform, strategy, and implementation to focus on reaching our overburdened communities. These activities may include:

- Dedicating more utility resources to transportation electrification communications plans and actions, including support for external communications partners, community messengers and ambassadors, and the Department of Neighborhoods.
- Creating pathways for community feedback and ideas on City Light communications to be assessed, acted upon, and evaluated in an expedient manner.
- Preparing for a more robust, targeted, and dynamic education and outreach campaign for City Light transportation electrification program activities as they scale in the near-term and tracking and following up on community requests.
- Coordinating with other City and regional communication and outreach efforts.
- Intensively communicate, market, and educate customers and communities on City Light and electric utility foundational topics, such as our resource mix, climate mitigation and adaptation, customer programming, investments in grid infrastructure, and sharing case studies post-investment.

²¹ Alliance for Transportation Electrification: <https://www.atlasevhub.com/resource/the-missing-piece-on-meeting-transportation-electrification-goals-utility-education-and-outreach-programs>

²² Seattle Department of Neighborhoods: <https://www.seattle.gov/neighborhoods/about-us>

PARTNERING WITH DEPARTMENT OF NEIGHBORHOODS TO SUPPORT ONE SEATTLE

City Light is committed to building and strengthening this foundational relationship. The Department of Neighborhoods strengthens Seattle by actively engaging all communities.²² This partnership is critical to ensure that we can build authentic relationships with Seattle communities and make connections with communities that historically have little trust in government.

INVESTING IN MORE IN-PERSON ENGAGEMENTS

In-person events are among the most effective ways to engage with our customers, community members, and businesses. These events play a crucial role in addressing barriers to charger installations, promoting available incentives, dispelling misinformation, and connecting communities to workforce opportunities. Through interactive displays and direct engagement, we demonstrate our commitment to our communities. We will increase staffing and funding to facilitate transportation electrification events and participation in existing community events. These activities may include:

- Deepening event coordination within the utility by leveraging programs, funding, and staff to participate in events to optimize resources and increase the awareness of broader utility topics to event attendees.
- Creating a community and event strategy with clear goals and outcomes. This includes investing in new booth design, construction, interactive elements, educational materials, and logistics to reflect strategic priorities.
- Exploring contracts for third-party event support, particularly staffing and design.
- Expanding market-based and trade group events.



City Light EV fast chargers at Town and Country Market in Shoreline, WA.



Seattle City Light

seattle.gov/city-light



Memorandum

To: Seattle City Light
From: Logan Pierce, Peter Slowik, International Council on Clean Transportation
Date: November 7, 2024
Re: Draft charging gap analysis of Seattle City Light service territory

This work was conducted for, with support from, Seattle City Light. We thank Landon Bosisio, Angela Song, Scott Cooper, Natalie Himmel, David Logsdon, Christopher Robertson, and Jacob Orenberg for their critical reviews and feedback on an earlier version of the work. Their review does not imply an endorsement, and any errors are the authors' own.

INTRODUCTION

Seattle is one of the leading cities in the United States in its transition to zero-emission vehicles. In 2021, the city published its Clean Transportation Electrification Blueprint that outlined several ambitious and achievable goals to reduce emission across its transportation sector and expand zero-emission mobility.¹ One such goal is for the city to have electrical infrastructure installed and operational to stay ahead of transportation electrification, and to enable the city to meet its target that electric vehicles (EVs) would represent 30% of all vehicle registrations in the city by 2030.² In 2023, EVs, which include battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs), accounted for more than one-third of new cars registered in Seattle.³ To support continued growth in EV sales, the city will need to build out a charging infrastructure network to meet increasing charging demand.

ICCT's 2021 Seattle charging gap analysis report found that achieving the city's 30% EV stock target in 2030 would require a local citywide network of over 3,000 publicly accessible (i.e., public Level 2, DC fast, and workplace chargers) and over 70,000 home chargers would be needed to support the EV transition.⁴ This memo updates ICCT's 2021 Seattle charging gap analysis, expanding the geographic scope to include six additional zip codes within the Seattle City Light territory – bringing the total number of zip codes in the analysis to 30 – and applies the newest data on electric and light-duty vehicle (LDV) registrations. We estimate home and non-home charging needs to support projected light-duty EV adoption throughout the 30 zip codes consistent with an EV growth trajectory such that EVs represent 30% of the total LDV stock in 2030. We first summarize updates to our methodology, data sources, and parameters. We follow this with a presentation of estimates for home and non-home charging needs in the 30 zip codes, between 2024 and 2038. Additionally, we assess the gap between charging deployment as of 2023 and what will be needed in later years, as well as the gap in installed

- 1 Office of Sustainability and Environment, "Seattle's Clean Transportation Electrification Blueprint" (2021), <https://www.seattle.gov/documents/Departments/OSE/ClimateChange/TE/Final%20Transportation%20Electrification%20Blueprint.pdf>.
- 2 Listed goals for changes to transportation in Seattle, Office of Sustainability and Environment, accessed June 25, 2024, <https://www.seattle.gov/environment/environmental-progress/transportation>.
- 3 Discussions with Seattle City Light staff.
- 4 Chih-Wei Hsu, Peter Slowik, Nic Lutsey, *City charging infrastructure needs to reach electric vehicle goals: The case of Seattle*, (ICCT, Washington, DC: 2021), <https://theicct.org/publication/city-charging-infrastructure-needs-to-reach-electric-vehicle-goals-the-case-of-seattle/>.

charging capacity. Results are developed at the zip code level to have a granular understanding of charging needs and EV adoption throughout the city.

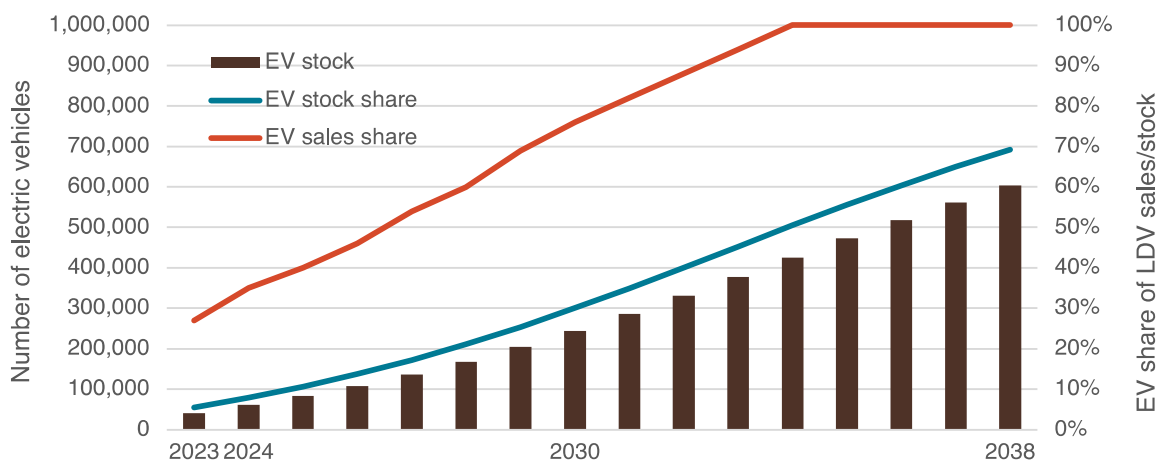
Data sources and methodology

This analysis follows the methodology from ICCT's 2024 Seattle Clean Fuel Standard credit model for estimating the growth in the stock of light-duty electric vehicles (EVs) and light-duty EV charging needs within City Light's service territory.⁵ We use an ICCT stock turnover model to project the number of EVs in City Light's service territory and the associated energy demands across the timeline of this analysis, and we used ICCT's EV CHARGE model to derive the charging infrastructure needs to support this stock of EVs.⁶ The modeling assumptions used in this analysis align with the Clean Fuel Standard credit model analysis with selected updates to key parameters, such as trajectory of EV sales and stock growth, the distribution of EVs across housing types within zip codes in City Light's service territory, the evolution of the capacity (i.e. power) of new charging infrastructure deployment, and others. These updated parameters are described in detail in this section. Additionally, we provide a brief discussion of the utilization assumptions in this analysis.

Updated parameters

The modeled EV adoption trajectory aligns with City Light's need to ensure adequate charging infrastructure to support 30% of the LDVs in its service territory being EVs by 2030. **Figure 1** illustrates this trajectory, showing the growth in the EV sales share of new LDVs between 2023 and 2038 with the red line, the resulting growth in the light-duty EV stock shown by the brown bars, and the growth in the EV stock share of LDVs shown by the blue line.

Figure 1
Assumed EV adoption trajectory in City Light's service territory between 2023 and 2038



To achieve a 30% EV stock share in 2030, EV adoption would need to grow from 27% of new sales in 2023 to 76% by 2030. This would be an accelerated EV adoption trajectory compared

5 Jane O'Malley, Nikita Pavlenko, *Seattle City Light CFS credit model*, (in press)

6 "EV CHARGE v1.2 Documentation", The International Council on Clean Transportation, access to June 25, 2024, <https://theicct.github.io/EVCHARGE-doc/>.

to Washington's statewide requirements, which align with the Advanced Clean Cars II regulation passed by the California Air Resources Board in 2022 and would see the statewide EV sales share reach 68% by 2030.⁷ Continuing along this trajectory, City Light's service territory would reach a 100% EV sales share in 2034—one year prior to the state's requirements. In 2030, a 30% EV stock share would mean about 244,000 EVs on the roads in the 30 zip codes analyzed, of which we estimate 17% would be PHEVs and the remaining 83% being BEVs. A more detailed breakdown of EV sales and stock by powertrain and citywide EV sales share and stock share are shown in **Table A1** in the Appendix.

The experience of owning and charging an EV is affected by access to home charging, which is in turn affected by the type of home one lives in and the likelihood of having access to off-street parking where either an outlet to charge from already exists or it is relatively easier to install an outlet or home charger. Each of City Light's zip codes have unique housing distributions and thus will have varying levels of access to home charging and subsequent reliance on public charging infrastructure. To properly capture this dynamic, we apply data from the U.S. Census Bureau on the zip code-level housing distributions for the zip codes in City Light's service territory that we analyzed.⁸ **Table A2** in the appendix details the housing distributions by zip code. During the early stages of EV adoption most adopters are those who are more likely to have access to convenient charging at home, particularly those living in single-family detached homes. As such, we model each zip code with a higher share of single-family detached homes, initially, and adjust the distribution as the EV stock share increases (decreasing the share of single-family detached homes and increasing the share of all other homes) until it matches the distribution shown in **Table A2** by the time a 50% EV stock share is reached.

As EV and battery technology improve, EVs will be able to charge faster but will need faster charging infrastructure that can deliver energy as fast as the EV can accept it. As such, we anticipate that over time an increasing share of higher rated power DC fast chargers will be installed to better match the specifications of newer EVs on the road and improve throughput of publicly accessible DC fast charging infrastructure. For the different types of non-home charging infrastructure considered in our analysis, which are the same charger types analyzed in the our 2024 national charging gap analysis,⁹ we model the shares of newly installed chargers by rated power over time as shown in **Table 1**.

Table 1
Assumed share of newly installed non-home chargers by type and rated power in 2024 and 2038

- 7 "Washington clean cars" Washington Department of Ecology, accessed June 25, 2024, <https://ecology.wa.gov/air-climate/air-quality/vehicle-emissions/clean-cars> & "Advanced Clean Cars II", California Air Resources Board, accessed June 25, 2024, <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/advanced-clean-cars-ii>.
- 8 U.S. Census Bureau "Selected Housing Characteristics." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP04, 2022, <https://data.census.gov/table/ACSDP5Y2022.DP04?q=DP04&g=860XX00US98057,98101,98102,98103,98104,98105,98106,98107,98108,98109,98115,98116,98118,98119,98121,98122,98125,98126,98133,98134,98136,98144,98146,98148,98155,98166,98168,98178,98188,98199>. Accessed on April 17, 2024.
- 9 Logan Pierce, Peter Slowik, *Assessment of U.S. electric vehicle charging needs and announced deployments through 2032*, (ICCT, Washington, DC, 2024), https://theicct.org/wp-content/uploads/2024/03/ID-89—Chargers-2032_final-v2.pdf.

Charger type (Level)	Share of newly installed chargers in 2024 (nominal power)	Share of newly installed chargers in 2038 (nominal power)
Workplace (Level 2)	70% (9.6 kW), 30% (7.2kW)	70% (9.6 kW), 30% (7.2kW)
Public overnight (Level 2)	100% (9.6 kW)	100% (9.6 kW)
Public destination (Level 2)	100% (9.6 kW)	100% (9.6 kW)
Public destination (DCFC)	25% (50 kW), 32.5% (150 kW), 40% (250 kW), 2.5% (350 kW)	10% (50 kW), 40% (150 kW), 42.5% (250 kW), 7.5% (350 kW)
Public en-route (DCFC)	80% (150 kW), 20% (250 kW)	55% (150 kW), 37% (250 kW), 8% (350 kW)

For Level 2 chargers we assume the shares remain consistent over time. Non-home Level 2 chargers in theory would be installed in spaces where EVs would park for an extended period where prioritizing throughput on charger is less urgent. In addition, Level 2 chargers would likely be installed at locations where there's less available power capacity which would make it difficult to install higher power Level 2 chargers. 9.6 kW chargers were selected as the most common power rating for Level 2 chargers because that aligns with the guidelines for chargers deployed in City Light's curbside EV charging program.¹⁰ For DC fast chargers in 2024 we model shares of newly installed chargers that result in a weighted average rated power of 170 kW, which is roughly equal to the weighted average rated power of DC fast charging infrastructure deployed in Seattle as of January 2024.¹¹ From there we model decreasing shares of lower rated 50 kW chargers in favor of higher rated 150, 250, and 350 kW chargers. By 2038, the weighted average rated power of public destination DC fast chargers is 198 kW and 203 kW for public en-route DC fast chargers.

Likewise, with home charging we anticipate that many EV drivers will initially charge using a standard household outlet (Level 1) in their garage or along their driveway, but that over time, as battery and charging technology improve, they will upgrade to a Level 2 home charger; also as consumer understanding around EVs develops, new EV drivers will bypass Level 1 outlets to install a Level 2 upon purchasing an EV. As such, we model a decreasing share of Level 1 home charging access in favor of more Level 2 home charging access as shown in **Table 2**.

Table 2
Assumed share of home Level 1 and Level 2 charging

Year	Share of homes with Level 1 charging	Share of homes with Level 2 charging
2023	34%	66%

¹⁰ "Curbside Level 2 Electric Vehicle Charging", Seattle city light, accessed June 25, 2024, <https://www.seattle.gov/city-light/in-the-community/current-projects/curbside-level-2-ev-charging>.

¹¹ Eco-Movement (counts of installed electric vehicle charging infrastructure in Seattle, accessed April 2024)

2024	32%	68%
2025	30%	70%
2026	28%	72%
2027	26%	74%
2028	24%	76%
2029	22%	78%
2030	20%	80%
2031	18%	82%
2032	16%	84%
2033	14%	86%
2034	12%	88%
2035	10%	90%
2036	8%	92%
2037	6%	94%
2038	4%	96%

We estimate about one-third of home chargers in 2023 are Level 1 home chargers with the remaining being Level 2 chargers. By 2030, we project just one-fifth of home chargers are Level 1 and that by 2038 less than 5% are.

Early EV adopters in 2024 typically have relatively higher home charging access. As the EV market expands to drivers without home access to charging, there will be more demand for public charging and less overall access to home charging. Meanwhile, another segment of the population who have the ability to charge at home will increasingly choose to do so as they look to have more convenient and lower cost charging to public chargers. We weighed the power of the first trend higher, anticipating an initial and gradual decline in rates of home charging access at both single-family and multifamily homes before 2030, as shown in **Table 3**.

Table 3
Assumed home charging access by housing type

Year	EV stock share	House	Apartment
2024	7.4%	89%	54%
2030	30%	77%	43%
2038	68.3%	69%	59%

A proxy for home charging access is having a driveway where there's a greater likelihood of being near an outlet or the electrical service where a home charger install would be relatively easy. We examined GIS data from City Light on the number of single-family homes in its service territory with driveways and found that roughly only half have driveways. We assume home charging access will trend towards access to off-street parking via driveways over time, as such we model continued decline in home charging access for single-family homes from 2030 to 2038. If relatively more or less people park off-street in residential neighborhoods, relatively less or more curbside charging infrastructure would be needed, respectively. As for multifamily homes, we model a rebound and increase in access to home charging from 2030 to 2038, assuming that investment and supporting policies to make home charging access more equitable between single- and multifamily homes will take place. Under the National Electric

Vehicle Infrastructure Formula program and the Charging and Fueling Infrastructure program, Seattle can apply for billions of dollars in federal grants to make investments in community charging projects, like retrofitting multifamily homes to install charging infrastructure.¹² Authorities having jurisdiction in Washington can also adopt building codes and streamline permitting processes, among a slew of other policies, to support the expansion of charging at multifamily homes in Seattle.¹³

In addition to estimating the number of chargers needed in each zip code to support the modeled EV adoption trajectory, we want to assess where the gaps in charging deployment in City Light's service territory are. To do so we examined a dataset from Eco-movement of the stock of chargers deployed in each of the zip codes included in this analysis. **Table 4** and **Table 5** summarize the public charger stock in City Light's service territory by rated power level through 2023. These data are input as the charger stock as of 2023 in the model. Because there's uncertainty as to the types of locations and/or use cases for the chargers in Eco-movement we designate all chargers as public destination chargers for the purposes of our analysis.

Table 4
Level 2 charger stock in City Light's service territory through 2023 (Eco-movement)

	3.7 kW	7.4 kW	11 kW	22 kW	43 kW
Counts	21	1418	106	3	1
Share	1.4%	91.5%	6.8%	0.2%	0.1%

For Level 2 chargers, we only use the data in **Table 5** to establish the public Level 2 charger stock in City Light's service territory through 2023. Future year power distribution is informed by City Light's curbside charger program guidelines for Level 2 chargers to be offer at least 9.6kW. If the average Level 2 charging power were relatively higher or lower than this value, relatively fewer or more chargers would be needed, respectively.

Table 5
DCFC charger stock in City Light's territory through 2023 (Eco-movement)

	25 kW	50 kW	150 kW	250 kW	350 kW
Counts	4	62	72	64	21
Share	1.8%	27.8%	32.3%	28.7%	9.4%

For DC fast chargers, we calculate the weighted average power deployed in City Light's service territory to be around 170 kW. We use that value as the baseline for the weighted average of the assumed power distribution of newly installed DC fast chargers. The assumed charger power distribution in future years shifts towards higher power chargers, resulting in an increase in the weighted average power of DC fast chargers, as summarized in **Table 1**.

Charger utilization

12 "Technical Assistance and Resources for States", Joint Office of Energy and Transportation, accessed June 25, 2024, <https://driveelectric.gov/states>.

13 Logan Pierce, Anh Bui, *Electric vehicle charging at multifamily homes in the United states: barriers, solutions, and selected equity considerations*, (ICCT: Washington, DC, 2024), <https://theicct.org/publication/promoting-equity-ev-transition-barriers-and-solutions-to-charging-at-multi-family-homes-us-apr24/>.

Fundamental to estimating charging infrastructure needs is the amount of daily utilization (i.e. the hours per day a charger is actively supplying energy) each charger gets. Different analyses can assume more or less utilization that would lead to comparatively fewer or greater charging needs, respectively. In this analysis we apply utilization assumptions consistent with those in the Seattle CFS analysis, as shown in **Table 6**.

Table 6
Assumed charger utilization by charger type (consistent with assumptions in the Seattle CFS analysis)

Year	EV stock share	Workplace Level 2	Public overnight Level 2	Public destination Level 2	Public destination DCFC	Public en-route DCFC
2024	7.4%	4.1 hours	5.3 hours	5.7 hours	3.1 hours	3.1 hours
2030	30%	4.6 hours	5.8 hours	7 hours	4 hours	4 hours
2038	68.3%	4.8 hours	6 hours	7.4 hours	4.3 hours	4.3 hours

Consistent with the findings in Bauer et al. 2021, utilization increases logarithmically with increasing EV stock share.¹⁴ Over the course of the analysis we assume utilization grows from as little as 3.1 hours per day (13%) to up to 7.4 hours per day (31%) depending on the type of charger. These assumptions, while more bullish than the utilization assumed in our national charging gap analysis, reflect relatively higher EV adoption in Seattle when compared with most of the country.¹⁵ That said, these assumptions are by no means outside the bounds of real-world observed charger utilization. In Q1 2024, EVgo reported nationwide utilization of its DC fast network at about 19% (4.6 hours), whereas our assumptions for DC fast charger utilization in Seattle increase to 18% by 2038.¹⁶ Likewise, curbside Level 2 chargers in New York City have been reported to have utilization as high as 72% in 2024, or 17.3 hours per day.¹⁷ We estimate higher utilization for Level 2 chargers than for DC fast chargers in Seattle, but utilization remains below 30% (7.2 hours/day) until after 2030.

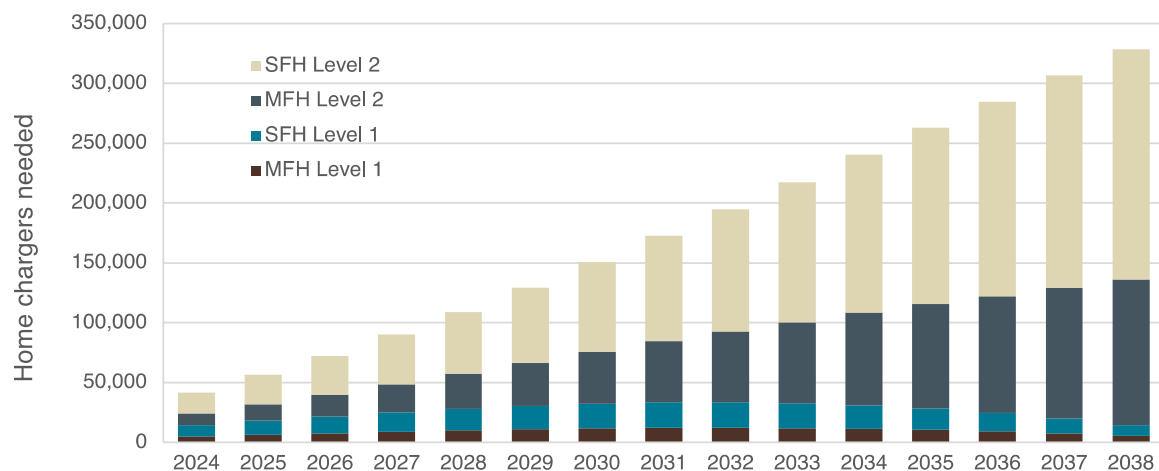
Results

This section summarizes the analytical findings of this work. First, we present the City Light service territory home and non-home charging needs by type. We then compare the resulting charging needs in 2030 with existing public charging deployment as of 2023 to understand City Light's progress towards meeting the estimated charging deployment needs. Lastly, we share maps of City Light's service territory and the non-home charging and power needs by zip code, to better visualize which regions charging and power needs are greatest.

- 14 Gordon Bauer, Chih-Wei Hsu, Mike Nicholas, Nic Lutsey, *charging up America's: assessing the growing need for US charging infrastructure through 2030*, (ICCT: Washington, DC, 2021), <https://theicct.org/publication/charging-up-america-assessing-the-growing-need-for-u-s-charging-infrastructure-through-2030/>.
- 15 Logan Pierce, Peter Slowik, *Assessment of U.S. electric vehicle charging needs and announced deployments through 2032*, (ICCT, Washington, DC, 2024), https://theicct.org/wp-content/uploads/2024/03/ID-89—Chargers-2032_final-v2.pdf.
- 16 "EVgo Doubles Down on Commitment to Begin NACS Deployments in 2024," EVgo, accessed June 25, 2024, <https://www.evgo.com/press-release/evgo-doubles-down-on-commitment-to-begin-nacs-deployments-in-2024/>.
- 17 "NYC's curbside EV chargers are popular—and often blocked," *autoblog*, March 30, 2024, <https://www.autoblog.com/2024/03/30/nycs-curbside-ev-chargers-are-popular-and-often-blocked/>.

Figure 2 shows the estimated number of home chargers needed in City Light’s service territory from 2024 to 2038, broken down by the type of home, single-family or multifamily home, and by the level of the home charger, Level 1 or Level 2. An estimated 42,000 home chargers will be needed by the end of 2024 which grows to about 150,000 in 2030 and almost 330,000 by 2038. About 36% of the chargers we estimate will be needed at multifamily homes in 2024, which slightly increases to 37% in 2030 and 39% in 2038; the remaining home chargers will be installed at single-family homes. Where home chargers are ultimately deployed will depend on the housing type distribution and the housing stock throughout the City Light’s service territory. **Table A3** in the appendix provides a detailed breakdown of the home charging needs by zip code in 2030.

Figure 2
Projected need for home chargers within Seattle City Light’s service territory, 2024 through 2038

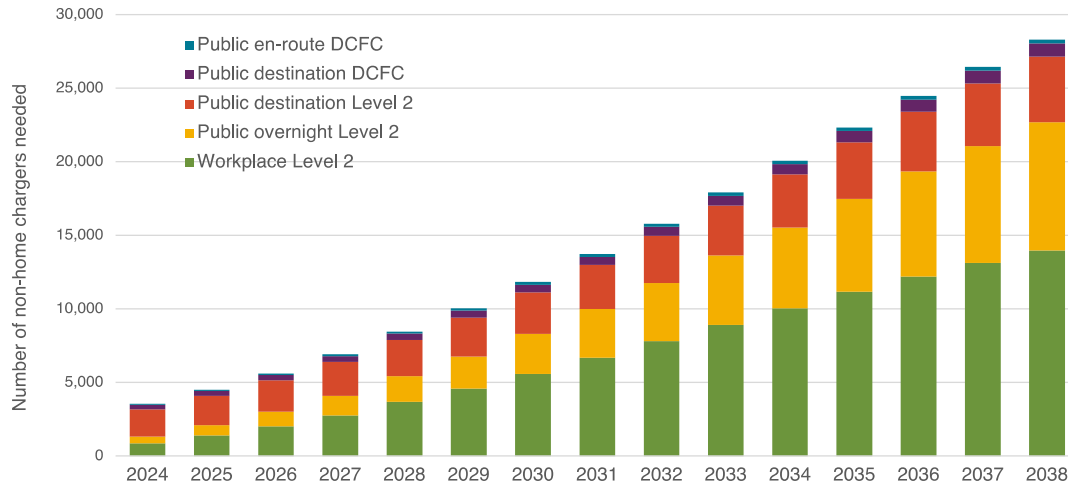


As mentioned in the section discussing updated parameters, we anticipate Level 1 home charging will become less prevalent over time as EV drivers opt to upgrade their existing Level 1 outlet to a Level 2 charger, and as new EV drivers bypass Level 1 charging to install a Level 2 charger upon purchasing an EV. While the share of Level 1 home chargers decreases over time, in accordance with **Table 3**, the absolute number of Level 1 chargers is expected to increase as the growth of City Light’s EV market outpaces the shift away from Level 1 chargers towards Level 2 chargers. This trend tops out in 2032 and the number of Level 1 chargers decreases thereafter as the pace of growth of Seattle’s EV market settles.

Home charging needs in Seattle are far greater than the needs for non-home chargers, however as Seattle’s EV market moves away from early adopters, who are more likely to have home charging access, demand for non-home charging infrastructure at workplaces and other public locations will increase. **Figure 3** shows the estimated non-home chargers needed in City Light’s service territory from 2024 to 2038. We estimate approximately 3,600 non-home chargers will be needed by the end of 2024, almost double of what has been installed as of the end of 2023.¹⁸ Non-home charging needs increase to about 12,000 by 2030 and about 28,000 in 2038.

¹⁸ Eco-Movement (counts of installed electric vehicle charging infrastructure in Seattle, accessed April 2024)

Figure 3
Projected need for non-home chargers, by type, within Seattle City Light's service territory, 2024 through 2038



We estimate most of the non-home chargers needed will be Level 2 chargers at workplaces, on curbsides in residential neighborhoods, and in other public locations. Workplace chargers are expected to account for most of the non-home Level 2 chargers needed because of the convenience they offer commuting EV drivers, particularly those without home charging. About 5,600 workplace Level 2 chargers will be needed by the end of 2030, representing about 47% of all non-home chargers and 50% of non-home Level 2 chargers in that year; these needs increase to about 14,000 chargers in 2038 representing 49% of all non-home chargers and 51% of non-home Level 2 chargers. Public overnight Level 2 chargers comprise the second largest need for chargers with about 2,700 chargers needed in 2030, or 23% of all non-home chargers and 24% of non-home Level 2 chargers; by 2038 about 8,700 public overnight Level 2 chargers will be needed representing 31% of non-home chargers and 32% of non-home Level 2 chargers. Like workplace chargers, public overnight chargers can supplement a lack of home charging access, serving as a proxy for a home charger when deployed in residential neighborhoods.

Public destination Level 2 chargers, installed at a variety of sites, make up the remaining non-home Level 2 chargers needed. Because we assume all the existing non-home Level 2 chargers, as of 2023, are public destination, these initially account for 63% non-home Level 2 chargers, but then grow slowly with less than a 10% year-over-year increase in the number of chargers each year analyzed, whereas public overnight and workplace chargers initially see triple digit and then double digit percentage year-over-year increases in chargers through at least 2036. About 2,800 public destination Level 2 chargers are needed in 2030, representing 24% of non-home chargers and 25% of non-home Level 2 chargers, and by 2038 about 4,500 public destination Level 2 chargers will be needed, representing 16% of all non-home chargers and non-home Level 2 chargers alike.

As of 2023, 13% of non-home chargers in City Light's service territory are DC fast chargers, which reflects the charging behavioral preference for EV drivers to use slower charging that is often cheaper and more convenient. We expect this preference will persist as EV adoption increases, and by 2030 we estimate 6% of non-home chargers needed in City Light's service territory will be DC fast chargers, decreasing further to 4% by 2038. Most of these chargers will

be public destination DC fast chargers rather than public en-route chargers, indicating most DC fast chargers will be used to support daily charging needs, supplementing those lacking, or with limited, home charging access. In 2030, about 500 public destination and 200 public en-route DC fast chargers will be needed, and by 2038 about 900 and 250, respectively.

As with home chargers, where these non-home chargers are deployed throughout Seattle will depend on the characteristics of each region such as the amount of EVs, commute patterns, and access to home charging (or the lack thereof). **Table A4** in the appendix details the non-home charging needs in each zip code, by type, in 2030.

To better understand City Light’s progress towards meeting its communities’ charging infrastructure needs we compare charging deployment as of 2023 with targets in later years. **Table 8** summarizes the total number of Level 2 and DC fast chargers deployed as of 2023, consistent with the findings from Eco-movement presented in **Table 5** and **Table 6**, as well the estimated number of Level 2 and DC fast chargers needed in 2030 and the relative gap between those numbers.

Table 7
City Light’s non-home charging gap between 2023 and 2030

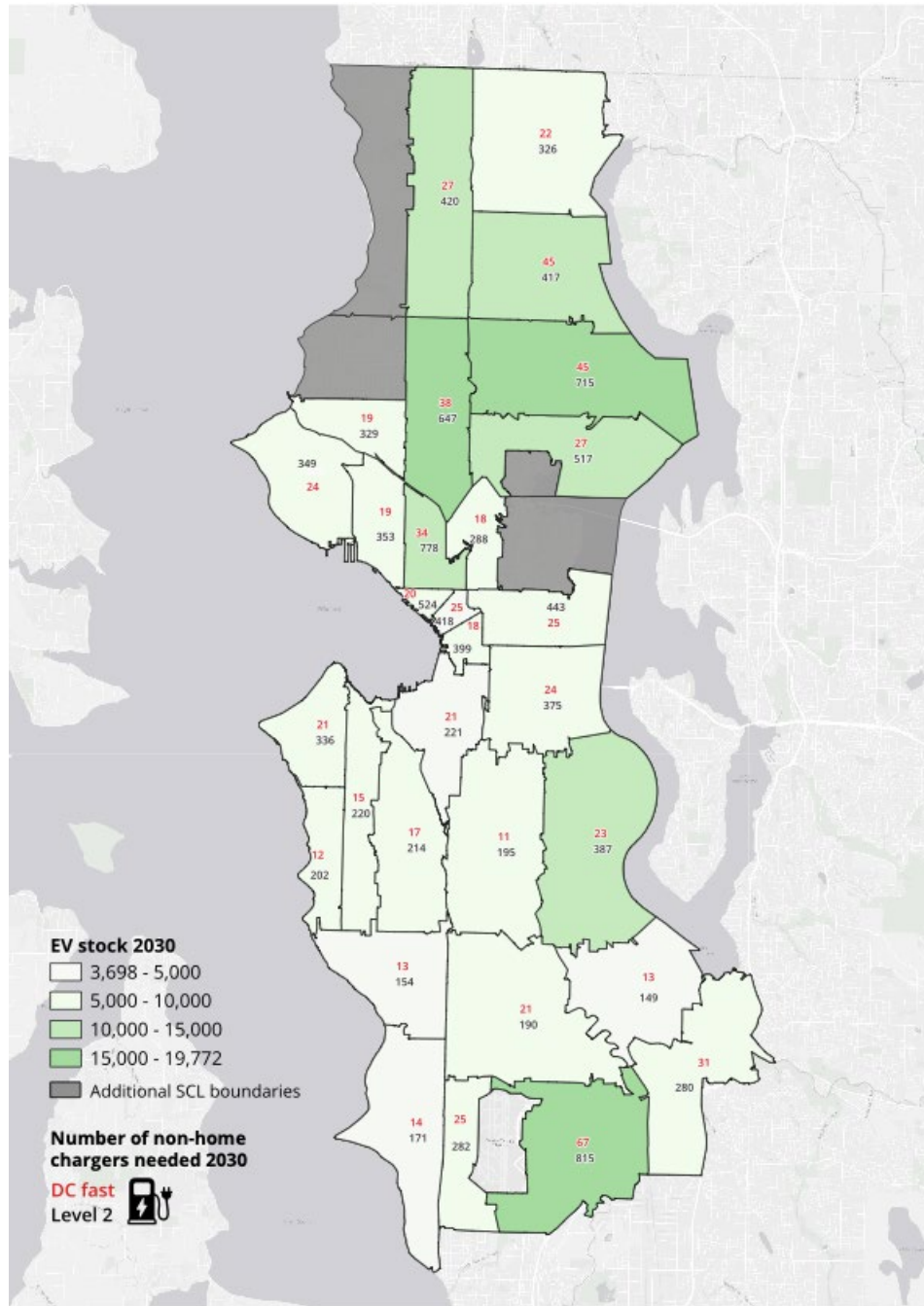
Non-home Level 2			Non-home DCFC			Total non-home		
Number of chargers			Number of chargers			Number of chargers		
2023	2030	Gap	2023	2030	Gap	2023	2030	Gap
1549	11,114	7.2x	223	734	3.3x	1,772	11,848	6.7x

As shown, the number of Level 2 chargers in City Light’s service territory would need to increase more than sevenfold and the number of DC fast chargers would need to more than triple by 2030 to satisfy estimated non-home charging needs. Overall, non-home charging needs would need to increase nearly sevenfold. **Table A5** in the appendix details the Level 2 and DC fast non-home charging gaps in each zip code. In practice, and as will be discussed later in the section, the precise number of chargers needed can be adjusted if there is sufficient capacity to support energy demands of EVs in City Light’s service territory. Fewer higher power chargers can be deployed in lieu of many slow chargers if so desired, and EV drivers can be reasonably expected to adjust their charging behavior accordingly.

Figure 4 depicts a map of City Light’s service territory. The map shows the Level 2 (in black) and the DC fast (in red) non-home charging needs, in 2030, in each of the zip codes analyzed. Each zip code is shaded green in accordance with the size of the EV stock estimated in each region in 2030; the darker the region, the greater the stock of EVs. A few of the regions that are shown in gray have been omitted from the analysis. 98112 (includes parts of Washington Park, Madison Park, Denny Blaine, Montlake, and Stevens), 98117 (includes parts of Olympic Manor, North Beach, Sunset Hill, Phinney Ridge, Loyal Heights, Whittier Heights, Crown Hill, and Greenwood) and 98177 (includes parts of Blue Ridge, Broadview, and Shoreline) were omitted for lack of vehicle registration and sales data, 98154, 98164, and 98174 were omitted because they are too small to analyze—each contain a single city block in Downtown Seattle, and 98195 was omitted because it is wholly comprised of the University of Washington. Seattle-Tacoma International Airport is left blank because it is not part of City Light’s service territory, instead receiving power from the Port of Seattle.¹⁹

19 “Airport Tenant Utilities”, Port of Seattle, accessed August 1, 2024, <https://www.portseattle.org/page/airport-tenant-utilities>.

Figure 4
Map of Seattle City Light service territory with non-home charging needs and EV stock estimates, by zip code, in 2030



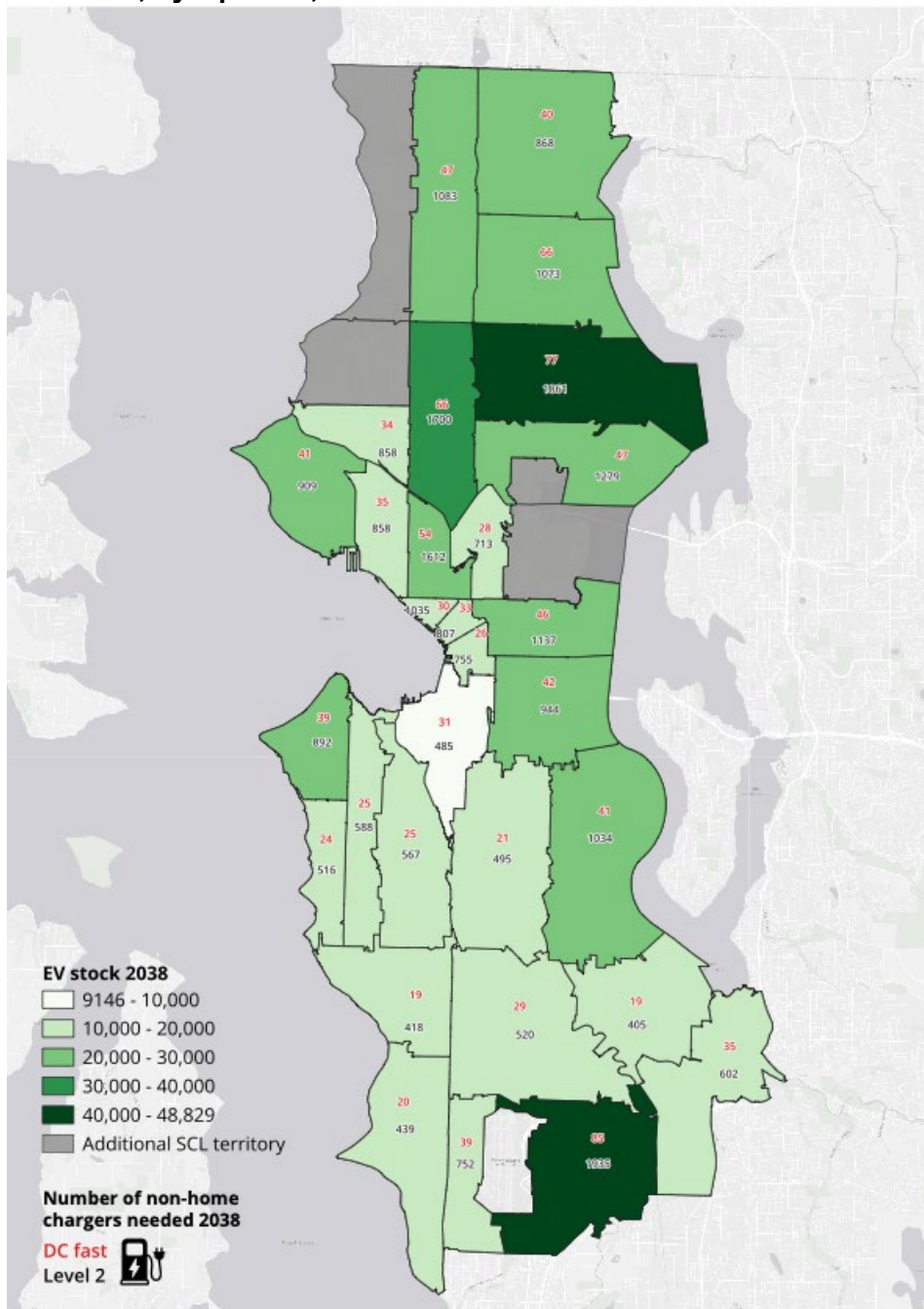
In 2030, Seattle is modeled to reach a 30% citywide EV stock share comprised of about 244,000 EVs. The stock of EVs in each zip code ranges from about 3,700 to about 20,000. The top 10 zip codes by EV stock, most of which are in the northern part of Seattle and City Light's service territory, except for 98188 near Seattle-Tacoma International airport, together account for about half of the EVs in 2030 with the remaining 20 zip codes representing the other half.

The top 10 zip codes by total non-home chargers needs mostly overlap with the top 10 zip codes by EV stock, showing the correlation that where there are more EVs there will also need to be more non-home chargers. 98101 and 98121 are outliers in this regard, having the tenth

and the fifth-most non-home chargers needs, respectively, while being ranked 26th and 17th, respectively, in EV stock. These regions are unique in that they are centrally located in downtown Seattle and thus are projected to have large numbers of workplace chargers to support EV drivers that commute into these regions. **Table A6** in the appendix presents the results above alongside rankings for each zip code by projected EV stock and estimated charging needs.

Figure 5 shows the same map of City Light's service territory overlayed with the non-home charging needs and estimated EV stock, by zip code, in 2038. As shown, there is a significant uptick in EV adoption among all regions as the map is notably darker than **Figure 4**.

Figure 5
Map of Seattle City Light service territory with non-home charging needs and EV stock estimates, by zip code, in 2038



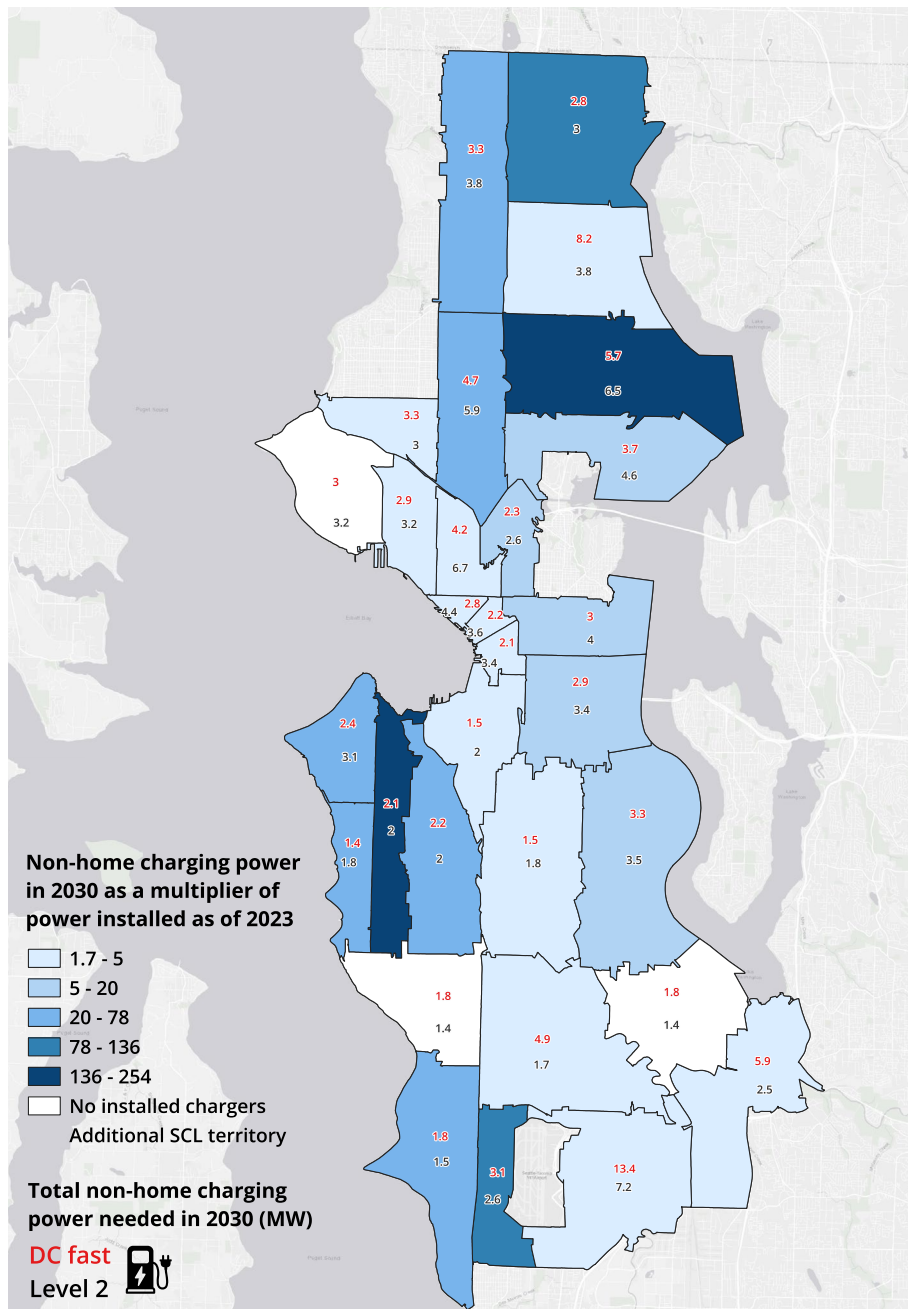
In 2038, the EV stock and stock share in City Light's service territory are about 600,000 vehicles and about 68%, respectively. Zip code EV stocks range about 9,000 to about 49,000. The trends in EV adoption persist from 2030 as the regions with the greatest adoption in 2030 are the same in 2038, and these are the regions with the greatest non-home charging needs.

The findings of relative number of Level 2 and DC fast charging needs are based on the best available data of how EV drivers charge, but changes in charging behavior could lead EV

drivers to meet their charging needs using different chargers than what's been modeled here. Given this possibility, it's important to understand the amount of power (i.e. capacity) that is needed for non-home charging. The capacity needed, along with our assumptions for utilization, reflect the amount of energy that will satisfy the charging needs of vehicles that reside in, and travel to, each region in City Light's service territory.

Figure 6 shows the non-home charging capacity needed in each of the zip codes analyzed. DC fast non-home charging capacity needs are labeled in red and Level 2 non-home charging capacity needs are labeled in black, both in MW of power needed. Regions are shaded blue in accordance with the scale of growth in capacity between what is installed as of 2023 and what is needed in 2030. Darker regions have a larger gap between the amount of capacity needed and what is already installed. The white regions indicate zip codes where no non-home charging has been installed as of 2023. As before, the gray regions show other zip codes in City Light's service territory that have been omitted from this analysis.

Figure 6
Map of Seattle City Light service territory with estimated non-home charging capacity needs



The regions that require the most non-home charging capacity generally do not need to grow their capacity too much relative to what is installed as of 2023. As previously discussed, these regions tend to also have the greatest amount of EV adoption indicating that chargers are being deployed where EVs are owned and driven. The one outlier in this regard is 98115, which has only 48 kW of non-home power installed as of 2023 and will need to grow to over 12 MW by 2030—a 2,540% increase, which is the largest gap. The zip codes where no non-home chargers have been installed yet have relatively less non-home charging capacity needs than

the other zip codes. 98146 and 98178 in the southern part of City Light's territory have the second lowest and the lowest capacity needs, respectively, and 98199 is ranked 15th out of 30. **Table A7** in the appendix presents the data in **Figure 6** alongside the rankings for each zip code by both capacity needed and the size of the capacity gap.

Key Findings

This memo assesses the charging infrastructure deployment gap and projected charging infrastructure needs of 30 zip codes within City Light's service territory through 2038. We draw the following reflections from the analysis:

- **Continued EV market growth requires continued charging deployment.** By 2030 Seattle endeavors to have 30% of its light-duty vehicle registrations be EVs. This could lead to about 244,000 EVs across City Light's service territory. We estimate that an EV stock of this size will require more than 150,000 home chargers to be installed at single- and multifamily homes, as well as 12,000 non-home chargers at workplaces (~5,600 Level 2 chargers), residential curbsides (~2,700 Level 2 chargers), alongside highways (~200 DC fast chargers), and at other public locations (~2,800 Level 2 chargers and ~500 DC fast chargers). The number of Level 2 and DC fast non-home chargers deployed would need to increase by more than sevenfold and triple, respectively, from what's installed as of 2023; overall, the total number of non-home chargers deployed in City Light service territory would need to increase by nearly sevenfold.
- **Charging needs in Seattle will continue to grow in tandem with growth in its EV market.** By 2038, the stock of EVs across City Light's service territory could grow to over 600,000 vehicles or about 68% of registered light-duty vehicles. This stock could require about 330,000 home chargers and 28,000 non-home chargers.
- **Charging needs vary across Seattle by zip code in accordance with trends in EV adoption.** We find that future non-home charging needs in City Light's service territory are concentrated in areas where EV adoption is projected to be the highest. Primarily throughout the northern region of City Light's service territory and near Seattle-Tacoma International Airport. Likewise, estimated non-home charging capacity is greatest in zip codes with high EV adoption. That said, zip codes with lower EV adoption have been somewhat overlooked in terms of charging deployment, having relatively larger gaps in capacity that will need to be filled to support projected EV adoption.

Charging infrastructure planning and deployment is complex and involves coordination between government and municipal agencies, private sector charging companies, and utilities. Recent ICCT research has documented announced charging investments and utility actions to help accelerate charging deployments nationwide.²⁰ Further research can investigate how Seattle might leverage additional outside resources from public, private and utility sector investments to fill gaps in charging deployment, as well as how the city can prioritize its own funding to deploy chargers in underserved communities and communities to advance EV and charging access and equity.

20 Logan Pierce, Peter Slowik, *Assessment of U.S. electric vehicle charging needs and announced deployments through 2032*, (ICCT, Washington, DC, 2024), https://theicct.org/wp-content/uploads/2024/03/ID-89—Chargers-2032_final-v2.pdf.

Appendix

Table A1 summarizes the EV adoption projection from 2024 through 2038 applied in this analysis. EV sales, stock, sales share, and stock share, by powertrain (i.e. BEV or PHEV), are shown for each year.

Table A1
EV sales and stock projections, 2024 through 2038, modeled in this analysis

Year	BEV sales	PHEV sales	Total EV sales	EV share of new vehicle sales	BEV stock	PHEV stock	Total EV stock	EV share of vehicle stock
2023	10,143	1,962	12,105	27%	33,027	8,407	41,434	5%
2024	16,406	3,174	19,580	35%	49,150	11,477	60,626	8%
2025	19,000	3,676	22,676	40%	67,736	15,010	82,746	11%
2026	21,192	4,100	25,292	46%	88,339	18,915	107,254	14%
2027	25,013	4,839	29,853	54%	112,533	23,491	136,024	17%
2028	27,897	5,397	33,295	60%	139,314	28,545	167,859	21%
2029	32,116	6,213	38,330	69%	169,933	34,332	204,265	25%
2030	35,336	6,836	42,172	76%	203,311	40,627	243,938	30%
2031	38,110	7,373	45,483	82%	238,861	47,312	286,172	35%
2032	40,930	7,919	48,849	88%	276,480	54,387	330,867	40%
2033	43,253	8,368	51,621	94%	315,548	61,760	377,308	45%
2034	45,762	8,854	54,616	100%	356,096	69,437	425,533	51%
2035	45,661	8,834	54,495	100%	395,261	76,877	472,137	56%
2036	46,103	8,920	55,023	100%	433,295	84,134	517,429	60%
2037	46,638	9,023	55,661	100%	469,922	91,143	561,065	65%
2038	47,366	9,164	56,530	100%	504,994	97,870	602,864	69%

Table A2 details the housing distributions, by dwelling type, for the 30 zip codes analyzed in City Light's service territory. Initially, we adjust the distribution in each region to have a greater share of single-family detached homes because early adopters are more likely to live in single-family homes. As the EV stock share increases, we decrease the share of single-family homes and increase the share of all other housing types until the distribution matches the shares shown below, once a 50% EV stock share is reached.

Table A2
Housing distribution by zip code and dwelling type for zip codes considered in analysis

Zip code	Housing shares ²¹				Neighborhoods within ²²
	Single-family detached	Single-family attached	Multifamily home	Other home	
98057	25%	3%	72%	1%	West Hill, Renton, Valley
98101	1%	0%	99%	0%	Downtown Seattle, Pike Place Market, Denny Triangle, First Hill
98102	13%	5%	81%	1%	Portage Bay, Montlake, Eastlake, Capitol Hill
98103	39%	10%	51%	0%	Greenwood, Phinney Ridge, Fremont, Wallingford, Green Lake, North College Park
98104	1%	0%	99%	0%	Downtown Seattle, Pioneer Square, First Hill, Chinatown-International District
98105	33%	3%	64%	0%	Laurelhurst, Windemere, Ravenna, Wallingford, Bryant, University District
98106	52%	11%	36%	1%	Riverview, North Delridge, Highland Park, High Point, South Delridge, Highline
98107	26%	11%	62%	1%	West Woodland, Fremont, Ballard
98108	63%	11%	25%	1%	Beacon Hill, Georgetown, South Beacon Hill, New Holly, South Park, Southern Heights
98109	10%	2%	87%	0%	East Queen Anne, North Queen Anne, Lower Queen Anne, Westlake, South Lake Union
98115	62%	4%	34%	0%	View Ridge, Ravenna, Wedgwood, Roosevelt, Lake City, Maple Leaf, Sand Point
98116	43%	8%	50%	0%	Alki, North Admiral, Genesee
98118	64%	7%	29%	0%	Seward Park, Columbia City, Rainier Beach, Brighton, Dunlap, South Beacon Hill
98119	24%	4%	71%	0%	North Queen Anne, Lower Queen Anne, West Queen Anne, Interbay
98121	2%	0%	98%	0%	Pike Place Market, Denny Triangle, Belltown
98122	21%	5%	74%	0%	Madrona, Leschi, Mann, Minor, Capitol Hill
98125	48%	3%	49%	0%	Lake City, Maple Leaf, Pinehurst
98126	57%	9%	34%	0%	Fauntleroy, North Admiral, Gatewood, Fairmount Park, North Delridge, Roxhill, High Point
98133	43%	6%	50%	1%	Shoreline, Haller Lake, Bitter Lake
98134	0%	0%	100%	0%	SoDo
98136	69%	5%	26%	0%	Fauntleroy, Seaview, Gatewood, Fairmount Park
98144	43%	12%	45%	0%	Leschi, Mt Baker, North Beacon Hill, Atlantic
98146	70%	3%	27%	1%	Salmon Creek, Arbor Heights, Highline, Northeast Burien
98148	42%	3%	56%	0%	Five Corners, North Hill, Sunnyside, Manhattan
98155	70%	4%	25%	0%	Sheridan Beach, Horizon View, Brookside, Shoreline, Turtle Rock
98166	67%	1%	31%	0%	Three Tree Point, Maplewild, Normandy Park, Seahurst, Gregory Heights, Five Corners, Lake Burien, Linde Hill Park, Downtown Burien
98168	61%	2%	35%	2%	Highline, Northeast Burien, Foster Heights, Riverton, Allentown, Southern Heights, Tukwila, Cascade View, Cedarhurst, Latona-SeaTac
98178	74%	2%	23%	1%	Rainier Beach, West Hill
98188	36%	3%	57%	4%	Tukwila, Thorndyke, McMicken Heights, Angle Lake shore Acres Tukwila South, Riverton Heights, McVan-McMicken Heights, Rancho Vista, Outlying SeaTac
98199	60%	7%	33%	0%	Briarcliff, Southeast Magnolia, Lawton Park, Interbay

Table A3 details the estimated home charging needs in each zip code, in 2030, by type. Variations in the numbers of home chargers needed reflect differences in EV adoption and the number of residential units and the housing distribution in each zip code.

21 Numbers in table are rounded.

22 Neighborhood information received from <https://www.homes.com>.

Table A3
Estimated home charging needs in 2030, by level and housing type, for zip codes in City Light's service territory

Zip code	SFH Level 1	SFH Level 2	MFH Level 1	MFH Level 2	Home total
98057	305	897	376	1,109	2,687
98101	44	165	451	1,706	2,366
98102	227	830	458	1,673	3,188
98103	1,368	5,041	734	2,708	9,851
98104	39	136	474	1,690	2,339
98105	707	2,625	633	2,348	6,313
98106	633	2,365	183	680	3,861
98107	545	2,046	457	1,719	4,767
98108	660	2,475	108	401	3,644
98109	307	1,164	920	3,497	5,888
98115	2,163	8,051	560	2,083	12,857
98116	739	2,734	375	1,387	5,235
98118	1,336	4,972	270	1,004	7,582
98119	372	1,377	461	1,702	3,912
98121	67	252	599	2,275	3,193
98122	486	1,807	675	2,511	5,479
98125	910	3,362	452	1,671	6,395
98126	688	2,549	178	659	4,074
98133	896	3,343	466	1,740	6,445
98134	0	0	343	1,357	1,700
98136	686	2,500	118	430	3,734
98144	852	3,153	361	1,336	5,702
98146	593	2,194	106	391	3,284
98148	631	2,468	398	1,557	5,054
98155	1,193	4,441	199	740	6,573
98166	530	1,965	124	457	3,076
98168	609	2,321	163	621	3,714
98178	603	2,256	88	329	3,276
98188	1,211	3,624	864	2,587	8,286
98199	1,044	3,916	257	961	6,178
Total	20,444	75,029	11,851	43,329	150,653

Table A4 details the estimated non-home charging needs in each zip code, in 2030, by type. Variations in the number of chargers reflect differences in EV adoption, access to home charging, or the lack thereof, and the housing stock distribution.

Table A4
Estimated non-home charging needs in 2030, by type, for zip codes in City Light's service territory

Zip code	Public overnight Level 2	Public destination Level 2	Workplace Level 2	Public destination DCFC	Public en-route DCFC	Public Level 2 total	DCFC total	Level 2 total	Non-home total
98057	71	95	114	26	5	166	31	280	311
98101	77	214	127	21	4	291	25	418	443
98102	81	66	141	12	6	147	18	288	306
98103	169	109	369	26	12	278	38	647	685
98104	81	180	138	13	5	261	18	399	417
98105	132	119	266	18	9	251	27	517	544
98106	52	37	125	11	6	89	17	214	231
98107	92	55	182	13	6	147	19	329	348
98108	41	46	108	7	4	87	11	195	206
98109	163	343	272	24	10	506	34	778	812
98115	188	96	431	30	15	284	45	715	760
98116	89	52	195	15	6	141	21	336	357
98118	91	62	234	14	9	153	23	387	410
98119	88	95	170	14	5	183	19	353	372
98121	103	258	163	15	5	361	20	524	544
98122	125	86	232	18	7	211	25	443	468
98125	106	78	233	38	7	184	45	417	462
98126	54	33	133	9	6	87	15	220	235
98133	105	87	228	18	9	192	27	420	447
98134	66	49	106	18	3	115	21	221	242
98136	48	36	118	8	4	84	12	202	214
98144	92	77	206	16	8	169	24	375	399
98146	36	22	96	8	5	58	13	154	167
98148	84	44	154	17	8	128	25	282	307
98155	77	50	199	14	8	127	22	326	348
98166	39	34	98	9	5	73	14	171	185
98168	47	33	110	15	6	80	21	190	211
98178	34	22	93	8	5	56	13	149	162
98188	186	289	340	58	9	475	67	815	882
98199	93	45	211	16	8	138	24	349	373
Total	2,710	2,812	5,592	529	205	5,522	734	11,114	11,848

Table A5 details the number of deployed non-home chargers in each zip code, as of 2023 and the number of non-home chargers needed in 2030 to measure the gap in relative charging deployment.

Table A5
Gaps in non-home charging deployment, by zip code, between existing chargers as of 2023 and needed chargers in 2030

Zip code	Level 2	DCFC
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	2023	2030	Gap	2023	2030	Gap
98057	58	280	4.8	22	31	1.4
98101	184	418	2.3	21	25	1.2
98102	32	288	9.0	0	18	—
98103	31	647	20.9	2	38	19.0
98104	151	399	2.6	5	18	3.6
98105	63	517	8.2	5	27	5.4
98106	9	214	23.8	1	17	17.0
98107	13	329	25.3	13	19	1.5
98108	22	195	8.9	5	11	2.2
98109	278	778	2.8	4	34	8.5
98115	6	715	119.2	0	45	—
98116	10	336	33.6	1	21	21.0
98118	12	387	32.3	6	23	3.8
98119	57	353	6.2	8	19	2.4
98121	219	524	2.4	15	20	1.3
98122	33	443	13.4	10	25	2.5
98125	28	417	14.9	28	45	1.6
98126	4	220	55.0	0	15	—
98133	36	420	11.7	1	27	27.0
98134	26	221	8.5	14	21	1.5
98136	10	202	20.2	0	12	—
98144	33	375	11.4	2	24	12.0
98146	0	154	—	0	13	—
98148	3	282	94.0	1	25	25.0
98155	8	326	40.8	0	22	—
98166	12	171	14.3	1	14	14.0
98168	6	190	31.7	15	21	1.4
98178	0	149	—	0	13	—
98188	205	815	4.0	43	67	1.6
98199	0	349	—	0	24	—
Total	1549	11,114	7.2	223	734	3.3

Table A6 details the Level 2, DC fast, and total non-home charging needs and EV projections in 2030, in each zip codes analyzed and consistent with the results in **Figure 4**. It also provides rankings by EV stock and by the total number of non-home chargers needed showing there's generally overlap between the areas with greatest EV adoption and where most non-home chargers are needed.

Table A6
Estimated non-home charging needs, by type, and EV projections by zip code

Zip code	Level 2	DC fast	Total non-home chargers needed	Ranking by number of non-home chargers needed	EV stock	Ranking by size of EV stock
98057	280	31	311	19	5,108	24
98101	418	25	443	10	4,675	26
98102	288	18	306	21	5,728	19
98103	647	38	685	4	15,823	3
98104	399	18	417	11	5,331	22
98105	517	27	544	5	10,793	5
98106	214	17	231	24	5,637	20
98107	329	19	348	17	7,730	14
98108	195	11	206	27	5,094	25
98109	778	34	812	2	10,697	6
98115	715	45	760	3	19,772	1
98116	336	21	357	16	8,332	13
98118	387	23	410	12	10,924	4
98119	353	19	372	15	6,780	16
98121	524	20	544	5	6,193	17
98122	443	25	468	7	9,466	9
98125	417	45	462	8	10,152	7
98126	220	15	235	23	6,007	18
98133	420	27	447	9	10,044	8
98134	221	21	242	22	3,698	30
98136	202	12	214	25	5,544	21
98144	375	24	399	13	8,981	12
98146	154	13	167	29	4,570	27
98148	282	25	307	20	7,405	15
98155	326	22	348	17	9,450	10
98166	171	14	185	28	4,473	28
98168	190	21	211	26	5,159	23
98178	149	13	162	30	4,446	29
98188	815	67	882	1	16,506	2
98199	349	24	373	14	9,419	11

Table A7 details the public Level 2, workplace Level 2, DC fast, and total non-home charging capacity needed in 2030 in the zip codes analyzed, consistent with the results in **Figure 6**. The gap is a measure of the total non-home charging capacity needed in 2030 divided by the non-home charging capacity than has been installed as of 2023. Capacity installed as of 2023 can be calculated by dividing the total capacity needed by the gap. Rankings of zip codes by both the size of the gap and the total non-home capacity needed are provided for reference. Total non-home capacity needed may not sum precisely because of rounding.

Table A7

Estimated non-home charging capacity needed, by charger type, and charging capacity gap for zip codes in City Light's service territory in 2030

Zip code	Public Level 2 capacity needed (MW)	Workplace Level 2 capacity needed (MW)	DCFC capacity needed (MW)	Total non-home capacity needed (MW)	Gap	Ranking by size of gap	Ranking by total non-home capacity needed
98057	1.5	1.0	5.9	8.4	1.7	27	6
98101	2.4	1.1	2.2	5.7	1.9	23	18
98102	1.4	1.2	2.3	4.9	19.5	11	22
98103	2.7	3.3	4.7	10.6	27.9	8	5
98104	2.2	1.2	2.1	5.5	3.8	19	20
98105	2.3	2.4	3.7	8.3	6.7	14	7
98106	0.8	1.1	2.2	4.1	31.3	7	23
98107	1.4	1.6	3.3	6.3	2.5	21	14
98108	0.8	1.0	1.5	3.2	3.8	18	28
98109	4.3	2.4	4.2	10.9	4.4	16	4
98115	2.7	3.8	5.7	12.2	254.0	1	2
98116	1.3	1.7	2.4	5.4	39.2	6	21
98118	1.4	2.1	3.3	6.8	6.8	13	11
98119	1.7	1.5	2.9	6.0	3.1	20	16
98121	3.0	1.4	2.8	7.2	2.0	22	8
98122	1.9	2.1	3.0	6.9	5.2	15	10
98125	1.7	2.1	8.2	11.9	1.9	24	3
98126	0.8	1.2	2.1	4.1	137.0	2	24
98133	1.8	2.0	3.3	7.1	23.0	10	9
98134	1.1	0.9	1.5	3.5	3.9	17	25
98136	0.8	1.0	1.4	3.2	43.6	5	27
98144	1.6	1.8	2.9	6.3	17.5	12	13
98146	0.6	0.8	1.8	3.2	—	—	29
98148	1.2	1.4	3.1	5.6	78.1	4	19
98155	1.2	1.8	2.8	5.8	78.3	3	17
98166	0.7	0.9	1.8	3.3	24.7	9	26
98168	0.8	1.0	4.9	6.6	1.7	26	12
98178	0.5	0.8	1.8	3.1	—	—	30
98188	4.1	3.0	13.4	20.5	1.7	25	1
98199	1.3	1.9	3.0	6.2	—	—	15
Total	50.0	49.5	103.4	202.9	2.8	—	—