

# Seattle's Clean Transportation Electrification Blueprint

*Electrifying Our Transportation System*

March 2021



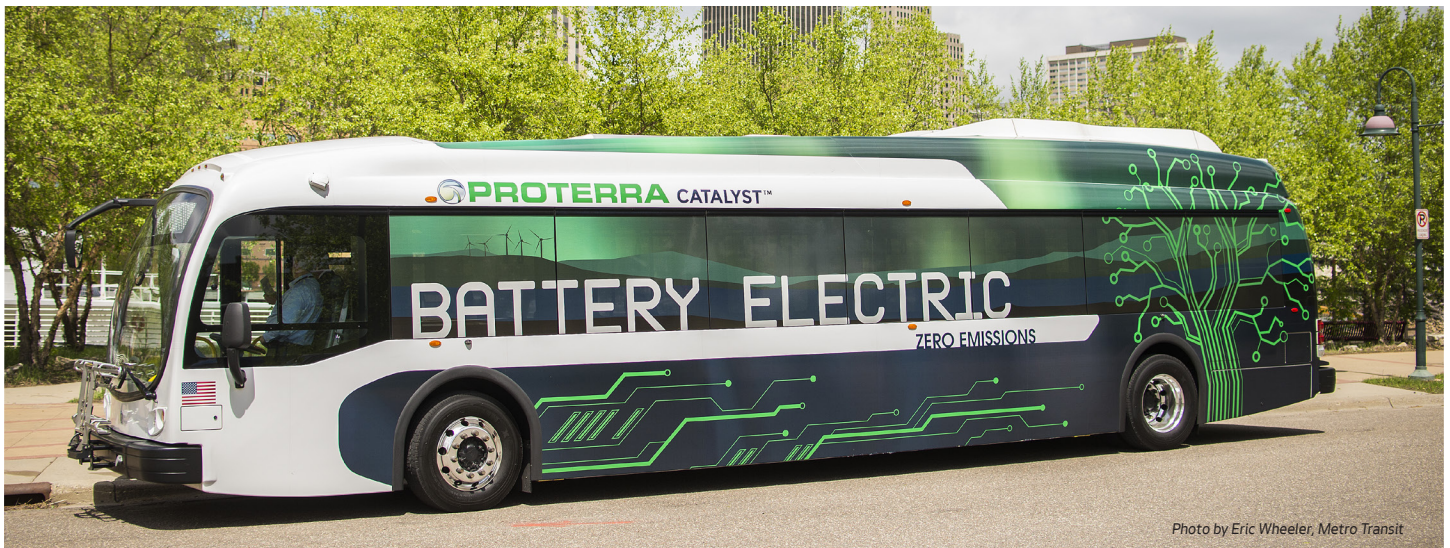


Photo by Eric Wheeler, Metro Transit

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# A Transformative Vision for our Future

*In Seattle's future, everything that moves people, goods, and services in and around the City is electrified – this is our "North Star" vision.*

Seattle will lead the transition to an electrified economy, supplying residents with clean electricity via a reliable, carbon free electric grid. In this fossil-fuel free future, the air is clean. People will take electric buses, ferries, or light rail to work, shopping and other destinations. A robust bike lane network will make it easy for Seattleites to leave cars behind and use bikes, e-scooters, and e-cargo bikes or walk. Ships at port are plugged in, every package delivered to your doorstep comes on an electric van, truck or e-bike. Silent, clean, electric trash and utility trucks will service neighborhoods.

While not all of this technology is readily available today, this blueprint lays out a path for Seattle to pursue and accelerate the new technologies necessary to electrify transportation at scale. As the City recovers from COVID-19 related impacts and evolves into the electrified urban center of the future, there will be new opportunities for workers in the electric-economy, and our current workforce will need support and training to ensure an equitable transition away from fossil fuels.

**This blueprint is an opportunity to build on past successes and lessons learned to advance electrification in all sectors of transportation and make Seattle a healthy and more resilient city.**

Transportation electrification, mode shift (policies and infrastructure improvements that incentivize a switch from single occupancy vehicles to more sustainable modes like transit, biking and walking), and equitable road-pricing policies that can serve as a progressive revenue source for transit are Seattle's three central strategies to reduce emissions in the transportation sector. In addition to the actions outlined in this blueprint, the City is aggressively pursuing policies and programs to

reduce car trips and encourage more active modes of getting around like walking and biking as well as increasing transit ridership. Seattle is also evaluating equitable road pricing to decrease congestion, improve air quality, and raise revenue for increased transit and more efficient modes of transportation. Mode shift, road pricing, and transit-supporting revenue efforts are addressed outside of this plan but remain critical and complementary strategies to meet our climate goals in addition to transportation electrification.

*The City is committed to transportation electrification as part of a comprehensive response to curb transportation emissions. Meeting our goals will also require employing strategies to shift travel from internal combustion engine vehicles to active and shared modes such as walking, biking, and riding transit. These tactics, known as **mode shift**, are a core part of the Seattle Department of Transportation's investments in infrastructure such as protected bike lanes, dedicated transit lanes and programming such as the Commute Trip Reduction program and ORCA Opportunity. Based on the most recent Comprehensive Plan, **Seattle aims to reduce trips taken in a single occupancy vehicle by 65-75% by 2035.** Mode Shift represents a complementary approach to decarbonize transportation, and the city is working to evaluate and quantify the impact these activities can have in meeting our GHG reduction targets.*

# A Call to Action

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The climate crisis is upon us. From sweltering heatwaves and wildfires that choke our air, to rising seas and extreme floods washing out roads, every day we are feeling the impacts of climate change. Our transportation system, powered by fossil fuels, is responsible for sixty percent of Seattle's climate pollution. This is unsustainable. It is also profoundly immoral to continue along the path of maintaining our "transportation status quo" when we have the means to embrace a cleaner, healthier modes and technology. We must act now, both for ourselves and future generations.

In a post pandemic world, the need for a fossil fuel transition is more urgent than ever as the links between air pollution and increased COVID death rates are clear.<sup>1</sup> The COVID-19 pandemic has underscored and compounded the systemic inequities that communities of color face every day. We recognize that Black, Indigenous people and People of Color (BIPOC) have experienced the most harm from the COVID-19 pandemic so this plan centers actions that will promote a healthy, just recovery and leverage opportunities to rebuild our city prioritizing people, safety and sustainability.

Seattle has made great strides in recent years by decreasing single occupancy vehicle (SOV) trips by adding more Metro bus service, increasing transit ridership, investing in bike infrastructure, operating one of the largest electric bike share programs in the country and passing one of the biggest investments in state history to build out a comprehensive regional network for all-electric light rail.

Despite these efforts, we have not made sufficient progress decreasing emissions from transportation. Our most current GHG inventory from 2018 shows we have flat-lined on progress and only reduced transportation emissions by two percent from 2008. **We know more must be done.**

Maximizing efficient use of our roadways is a critical component to our strategy, and we will continue to prioritize more efficient modes of transportation to move people, goods and services in and around our City to reduce unnecessary car trips. For those who still need to drive, we want them driving electric. In order to meet our climate goals, *all* vehicles on the road, including passenger cars, freight trucks, delivery vans, service vehicles, taxi's, shuttles and buses must be electrified.

## **Climate justice is a central focus of this plan.**

We recognize that current and past systems have created deep inequities regarding who accrues the benefits of environmental programs and policies. We must work to address these inequities and rectify impacts in partnership with those who have been harmed the most by working together to identify and implement climate policy priorities. We have seen the COVID-19 pandemic only exacerbate these inequities and believe recovery efforts offer an opportunity for transformative change. We know we can't return to normal, because normal wasn't working.

Our residents and neighbors who are least responsible for climate change and least equipped to adapt, are already disproportionately bearing the health and financial impacts of climate change. Communities of color, immigrants, refugees, people with low incomes, and limited English-proficient individuals — defined here as environmental justice communities — face significantly greater exposure to environmental hazards and toxic air pollution resulting from our consumption of fossil fuels. Research shows residents living in the Duwamish Valley community in South Seattle will die eight years sooner than other Seattle neighborhoods due to air pollution and exposure to environmental toxins.<sup>2</sup>

Environmental justice communities also experience deep inequities in the current

transportation system. Across the US, communities with predominantly white and higher-income households accrue a greater proportion of subsidies in the current transportation system and are more likely to be served by high-quality transit.

Conversely, environmental justice populations often lack access to frequent or reliable public transit, which limits access to economic opportunities including jobs, education, health care services, and grocery stores.<sup>3</sup> The high cost of fuel can be a huge burden to working families who rely on vehicles for mobility. For example, the majority of households in South Seattle spend 18 - 26 percent of their income on transportation costs, compared with households in more affluent Seattle neighborhoods who spend less than eight percent of their income on transportation.<sup>4</sup>

Electrifying transportation offers many benefits such as reduced carbon emissions, cleaner air, improved public health and reduced transportation costs. Programs must be designed in such a way that do not exacerbate current inequities in transportation, but in fact help to address them. Our programs and policies will actively work to dismantle inequities and increase

access to economic opportunities for environmental justice communities in the way we prioritize investments, design incentives, and deploy pilot projects.

Seattle has an incredible opportunity to leverage our clean electricity to power the transportation sector as a practical solution to the climate crisis. In 2005, Seattle City Light became the first electric utility in the country to achieve zero net greenhouse gas emissions. It has maintained that carbon neutral status every year since and is committed to doing so far into the future. This means anything that is electrified in Seattle results in a 100 percent reduction in carbon and tailpipe emissions. As a customer-owned, not for profit utility, City Light's electricity rates are relatively low compared to other areas of the country and can offer significantly reduced energy cost compared to gas or diesel. By leveraging City Light's carbon-free power to electrify cars, buses, scooters, bikes, vans, trucks, ferries and more, we can provide economic benefits to traditionally underserved communities through increased clean mobility options, reducing fuel and maintenance costs, mitigating climate change and improving air quality.



# Lessons Learned Since 2016

**Guided by Seattle's Equity & Environment Agenda, City staff have continued to explore how to advance racial equity in Seattle through transportation electrification.** This work included consulting with the Environmental Justice Committee (EJC), community leaders, and community-based organization facilitated outreach including focus groups, tabling events, listening sessions and surveys (in six languages).

Not surprisingly, we heard that communities want to see more electrification efforts from the City, with increasing electric bus service and increased access to electric vehicles consistently cited as top priorities. Generally, Seattle's environmental justice communities feel strongly that electrification is "good for the environment," "avoids air pollution", can help "save money on maintenance and gas," and that electric vehicles (EVs) "are good for our health."

However, a significant amount of concern was shared during the outreach as well. Feedback included the position that Seattle should focus on expanding electric transit instead of focusing on

personal vehicle ownership and that EVs are too expensive and don't feel accessible to community members.

There is strong sentiment that charging infrastructure can exacerbate gentrification and displacement and should not be placed in highly congested public spaces or compete with other modes like transit, walking or biking. Another consistent takeaway from community outreach was the desire to see green jobs created from electrification and connect employment opportunities to those Seattle residents who need living wage jobs the most.

The general sentiment expressed was that solutions that benefit the many are much more powerful than solutions that benefit the few. Collective well-being is more important than benefits for specific individuals regardless of income or geographic boundaries.



# Laying the Path for Success

This blueprint is an opportunity to build on past successes and lessons learned to advance electrification in all sectors of transportation. We will center equity in the program framework and lead with initiatives based directly on community identified priorities. Seattle will work closely with private sector partners to fill in technology gaps and push for market solutions that are equitable. We will leverage this work to support Seattle's Green New Deal and establish a clear path for the transition to a clean energy economy.

With our clean electricity, Seattle is in a unique position to lead the nation in electrifying the transportation sector. This transformative push will require advances in how we serve electricity, how we engage residents and businesses in all mobility options, and how we ensure equitable access to new programs and services. The actions outlined in this plan will help to lead the Pacific Northwest region into a clean energy future free from the financial and health burdens of fossil fuels.

This blueprint clearly identifies our 2030 goals, challenges, and immediate steps that the City will act on to move us towards our North Star of a clean transportation system. The outcomes include reduced climate emissions, reduced air pollution, more electric mobility options, a reliable and resilient energy grid, a pipeline of green job creation, and more workforce diversity.

Ambitious, yet achievable, goals will accelerate market transformation and make it possible for Seattle to achieve a clean energy future. **The six goals aim to keep our policies and programs aligned to desired outcomes.**



# 2030 Goals

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## **100 Percent of Shared Mobility is Zero Emissions**

As shared mobility services like bikes, scooters, taxis, Uber, Lyft, carshare services and others continue to expand in Seattle, the city will ensure those options will be electric and emissions free.

## **90 Percent of All Personal Trips are Zero Emission**

By 2030, nine out of 10 trips must be walking, biking, electric transit or in an electric vehicle (or avoided all together). This will require new funding sources to support transformational infrastructure investments for expanded, equitable transit service, comprehensive bike lanes, ADA compliant sidewalks and EV charging. It will also require City actions to facilitate large-scale behavior change and policies that lead to increased density for better connected neighborhoods. Supportive State and Federal level policies, funding, and road-pricing initiatives are required to encourage mode shift, grow EV adoption and eventually phase out internal combustion engines completely.

## **30 Percent of Goods Delivery is Zero Emissions**

Goods movement is a growing cause of congestion and emissions on our roads, as more and more of the goods we buy and the food we eat are purchased online. This goal is aimed to spur the transition of private fleets to EVs and support market transformation in freight and goods delivery over the next 10 years.

## **100 Percent City Fleet is fossil-fuel free (Executive Order 2018-02)**

Continuing to lead by example, Seattle will operate a large municipal fleet with zero fossil fuels by 2030. This includes rapid fleet electrification and using biofuels like sustainable biodiesel and renewable diesel/gasoline for any vehicles that may not have commercialized electric options by that time, such as specialized medium and heavy-duty vehicles or emergency response equipment.

## **One or More 'Green & Healthy Streets' in Seattle (C40 Fossil Fuel Free Streets declaration, 2017)**

A major area of our city will have zero emissions from transportation including streets or blocks that restrict cars and promote walking, biking, electrified transit, and electric goods delivery and services.

## **Electrical Infrastructure Required to Stay Ahead of TE Adoption is Installed and Operational**

Infrastructure investments will enable a rapid transition to an electrified transportation system. Seattle City Light will work strategically to make sure the grid is reliable and built out in order to enable rapid adoption of emerging electric transportation technologies and vehicles.

# Electrification Challenges & Responsive Strategies

The aim of this effort is to electrify Seattle's transportation system rapidly and equitably. Seattle will achieve our 2030 goals when we can fundamentally shift how we prioritize revenue generation, public investments and infrastructure planning. Successfully tackling the challenges below will be critical in achieving a comprehensive systems-level transition to a fully electrified transportation system.

## **Challenge 1: Current policy and regulation framework incentivizes fossil fuel use in transportation.**

### **Current gaps:**

- While many of Seattle's current policies and regulations directly and indirectly incentivize the use of fossil fuels and private vehicles, the City has not conducted a comprehensive analysis to precisely catalog those incentives.
- There are major funding gaps to ensure an equitable and just transition to an electrified transportation system.
- Transportation GHG data is not granular enough or collected in such a way as to understand where the biggest opportunities are for emissions reductions per incentive dollar spent based on available technology and desired equitable outcomes.

### **To address these gaps, we will do the following in the next 2 years:**

- The Office of Sustainability & Environment (OSE) will work with the City Budget Office (CBO) to develop a Budget & Policy paper on how fossil fuels are incentivized at the City and propose policies that stop those actions.
- We will advocate for local, state, and federal policies that will create revenue streams to incent the purchase of EVs, e-cargo bikes, e-trucks and other modes to support a just transition to TE.
- OSE will explore local tax incentives that could benefit small and woman/minority owned (WMBE) businesses to transition fleets to EVs or e-cargo bikes.
- The City will continue to engage with environmental justice communities in a sustained way to ensure that they have the best information about City initiatives so they can provide input and make informed decisions to contribute to policy proposals led by the City. This includes a commitment to follow up and loop-back with communities to discuss how past feedback was implemented (or not and why) and provide on-going opportunities to inform and shape policies and programs.
- SDOT and OSE will benchmark data for 2030 goals including mapping out GHG emissions of major transportation sectors, and what near term electrification interventions and infrastructure investments have the best ROI to reduce emissions.

### **What success looks like:**

When Seattle no longer incentivizes or supports fossil fuels use in transportation, we will prioritize roads for moving people, goods and services in the most environmentally friendly and efficient means possible. For example, our city could repurpose street space to facilitate more bike and pedestrian opportunities for getting around. Seattle could have fewer drive-thru's or surface parking lots. City contracts and policy will incentivize electric delivery for goods and services. More businesses will have electrified fleets instead of using traditional combustion engine vehicles with tax incentives to support small and minority owned firms to transition and then benefit from the savings.

## **Challenge 2: The power grid will require upgrades and additional strategic investments and partnerships to reliably and equitably serve the additional load from transportation**

### **Current Gaps:**

- Utility resources were legally authorized for investment in transportation electrification incentive programs for charging infrastructure in October 2020 so, specific incentives and programs, including the promotion of EV adoption and advertising programs to promote the utility's services, are in the early stages of development and have not yet launched.
- Utility infrastructure and technology required to stay ahead of transportation electrification adoption is not installed and operational.
- Focused outreach and engagement must be done to understand environmental justice community priorities and needs around transportation electrification utility programs to ensure equitable outcomes are achieved.
- Strategic partnerships must be formed to spur electrification in key sectors.

### **To address these gaps, we will do the following in the next 2 years:**

- Develop and launch new utility rate-based programs, incentives, and rate structures for transportation electrification under recent legislative authority granted by Seattle City Council.
- Develop an infrastructure plan that will address grid modernization and streamline installation processes to expedite deployment and improve reliability.
- Work with priority fleets and other strategic partners to build out charging infrastructure to support electrified ferries, buses, freight trucks, refuse fleets, Port operations, and other high polluting and/or high mileage sectors.
- Engage with environmental justice communities to better understand priorities for utility programs and co-create one or more transportation electrification projects.

### **What success looks like:**

New authority granted to Seattle City light will open the door to committing resources and making investments to enable the transformation of the Seattle area's transportation ecosystem. Strategic investments will be made in grid automation and modernization. In two years, infrastructure will be deployed in strategic partnerships to kickstart the electrification of public transit charging, support freight and commercial fleets, and provide flexibility for personal mobility. Grid modernizing investments will be well underway, laying the groundwork for a grid that flexibly optimizes resources by enabling real-time smart technology interaction and is prepared to withstand growing climate impacts. This dynamically responsive and resilient next generation grid technology and architecture will be key to enabling accelerated adoption of new transportation electrification technologies and empowering customers with choices related to their energy usage.

### **Challenge 3: Electrification must happen at the systems level (beyond cars), to include everything that moves people, goods, and services in and around Seattle and facilitate more zero emission trips taken**

#### **Current Gaps:**

- Transformational investments in infrastructure, expanded equitable transit service, neighborhood density and EV charging are required to increase zero emission trip options for personal travel in Seattle.
- Changes in business models and technologies over the last decade such as transportation network companies (TNCs) and expanding e-commerce (and soon to be autonomous vehicles) have profound but largely unquantified effects on congestion, and climate impacts, yet policies and planning to mitigate impacts have lagged. Emerging technologies like automated driving systems could exacerbate these issues further.
- Transportation networks remain optimized for single occupancy vehicle (SOV) cars vs. fully accessible electrified multi-mobility.
- There are no incentives or regulations to electrify modes such as transit, ride share, ride hail, micro-mobility, services, and goods delivery.
- Vehicle technology is not yet commercialized to provide electric solutions for some transportation challenges.
- Overall adoption of privately owned EVs in Seattle remains low (approximately 3.5% overall fleet and 10% of new sales as of December 2020).

#### **To address these gaps, we will do the following in the next 2 years:**

- Explore equitable road pricing as a funding mechanism to increase zero emission trips taken.
- Update the City's Comprehensive plan to include transformational changes in neighborhood density to promote more walkable, connected and car free communities.
- Strongly advocate for State and Federal policies and funding that promote electric modes of transportation, EV rebates and phase out fossil fuel powered vehicles.
- Develop a roadmap for all shared and micro mobility (including AVs) to be electric by 2030.
- Explore pathways to permit or track goods delivery in Seattle to create a baseline for 30% of goods delivery to be electric by 2030.
- Partner with goods delivery companies to pilot new electric delivery modes on Green & Healthy streets and bring more electric delivery options to market.
- Make charging more accessible in multi-family residential areas, Parks and Community Centers.
- Dedicate one or more Seattle streets or blocks to walking, biking, electric mobility and electric goods delivery while closing it to general purpose internal combustion engines.
- Support King County Metro Transit's commitment to prioritize initial deployment of its battery bus fleet in communities who are disproportionately impacted by air pollution and climate change.

#### **What success looks like:**

Two years from now, the City will be able to measure and report the impact of our work and continue to build on our early successes in electrifying new modes as they come online. We will have demonstrated that personal travel, goods delivery, and shared mobility are achievable at scale by electric modes in Seattle. These initiatives will allow us to lay important groundwork for fast acceleration over the coming decade.

## **Challenge 4: The workforce in the EV-related occupations in our region is less diverse than nationally, and many of the more diverse occupations are projected to decline in the short-to-medium term<sup>5</sup>**

### **Current Gaps:**

- There are negative growth projections due to offshoring and automation.
- There is a lack of training and training components that would meet the demand for highly-specialized workers in the field, nor are the training programs amenable to diverse populations.

### **To address these gaps, we will do the following in the next 2 years:**

- Conduct an analysis of jobs and wages of those directly employed by the fossil fuel industry as well as related industries. Create a job forecast accounting for changes in jobs, taking into consideration automation and the future of work.
- Partner with labor unions and employers to track measurable outcome-based indicators of workforce diversity in recruitment, training, and retained employees.
- Interview regional businesses that manufacture zero emission vehicles or supply chain components to assess and support inclusive growth.
- Seek funding for training initiatives, and organize existing City capacity, directed to underserved populations.
- Create proposal to convene and innovate together with key partners in industry, public sector and education, to ensure a pipeline of qualified professionals for the rapidly changing industry.

### **What success looks like:**

The transition to electric vehicles (EVs) will lead to thriving new industries and job opportunities, creating new small-and medium-sized companies that have been excluded from the existing supply chains, along with potential shifts in jobs for those working in fossil fuel vehicle industries. Federal, state, and local support through resources and policies that provide worker education and retraining, along with policies that encourage the growth of an electric vehicle market, can secure Seattle's foothold in these emerging industries while minimizing job disruptions.

### **Endnotes**

1 - Covid-19 PM 2.5 A national study on long-term exposure to air pollution and COVID-19 mortality in the US; Wu, Nethery, 2019, Harvard T.H. Chan School of Public Health

2 - Duwamish Valley Cumulative Health Impacts Analysis: Seattle, WA; Gould, Cummings 2013

3 - Moving to Equity: Addressing Inequitable Effects of Transportation Policies on Minorities; Sanchez, Stolz, Jacinta 2003

4 - Center for Neighborhood Technology's Housing & Transportation Index; <https://htaindex.cnt.org/map/>

5 - Drive Clean: The Electric Motor Vehicle Industry in Oregon and Washington; Seattle Jobs Initiative Jan.2020