

Electric Vehicle Charging Pilot Programs

In its initial tariff filing of Puget Sound Energy’s (PSE) electric vehicle (EV) charging products and services under Docket UE-180877, PSE committed to provide progress reporting to the Joint Utility Transportation Electrification Stakeholder Group on specific items, which are represented below, as well as other measures and overall information on the program development and execution. This report provides updates on the specific metrics, as well as activities completed within each of the programs under Schedule 551 (workplace charging products and services and public charging services), Schedule 552 (single and multi-family residential charging products and services, including the residential off-peak charging service incentive), Schedule 553 (education and outreach), and Schedule 554 (low income transportation electrification programs).

This is the fourth progress report and represents activities performed from July 1 through December 31, 2020. During this period, PSE and its partners focused on construction and installation for all pilots.

Transportation Electrification Reporting Metrics

Electric vehicles in PSE’s electric service territory as of December 31, 2020	33,743
Estimated annual electric transportation load (MWh)	68,737 MWh
Estimated annual electric transportation (% of PSE total annual load in 2019*)	0.25 %
Estimated coincident peak of electric transportation load, as compared to PSE’s system peak	3.8 MW estimated during PSE’s 2019 peak
Customer participation in pilot programs, in absolute numbers and as a percentage of electric vehicles in PSE’s service territory and geographically	See discussion of customers reached in pilot-specific paragraphs below.
Electric load served through Schedules 551 and 552 products and services	392,839 kWh
Transportation electrification products and services related program costs in 2020	Operating: \$2,004,069 Capital: \$2,925,276 For further detail, see "Expenditures to Date" in last section of this report.
Load shifted to different times from pilot Schedules 551 and 552 charging products and services	Too early to measure**

Estimated cost savings associated with shifting loads in pilot Schedules 551 and 552 charging products and services	Too early to measure**
Revenues from public charging services	\$856.11

**PSE's 2020 total annual load data not yet available at time of this report.*

***Customer enrollment during this period was partially completed and the methods to shift loads to different charging times not fully implemented.*

Electric Vehicle Pilots Progress

Construction during the time period covered by this report was impacted by COVID-19 restrictions, however, responses developed by PSE and its Service Partners proved successful to keep staff, partners, and customers safe. Despite these challenges, PSE and its partners were able to make a tremendous amount of progress on all pilots. PSE completed installations and enrollment for the residential program, continued construction for projects in the multifamily and workplace programs, launched the first public charging station, and completed projects in the low income transportation electrification program.

Education and Outreach Program (Schedule 553)

Due to ongoing COVID-19 pandemic and related restrictions, PSE shifted from in-person interactions to new, digitally focused customer engagement tactics in the second half of 2020. This shift resulted in much higher customer engagement numbers in the second half of the year.

PSE Up & Go Electric executed a digital launch strategy for its first public charging station in Lacey comprised of coordinated email, social, digital advertising, media and other strategies.

Beyond the new public charging station, PSE hosted a series of “virtual events,” including live webinars during which internal EV experts and external EV owners presented information and answered attendee questions around the environmental benefits, cost savings, and fun of driving electric vehicles. PSE also produced, and launched a campaign to promote, a new “virtual test drive video” that allowed customers to learn more about EVs from the safety of their home. Finally, PSE initiated a soft launch of a new interactive web tool to improve our digital EV experience and better engage with customers online, called the Electric Vehicle guide. This replaced the EV savings calculator and provides customers a more comprehensive view of how they can save money by switching to an EV and what model would best fit their needs.

The results of these and other tactics from July through December were as follows:

Measure	Result
Lacey Public Charging Station Launch	Over 7,000 visits to “Charge with PSE” landing page since launch. Launch email opened by 5,884 known EV drivers and Lacey-area EV intenders. SEM campaign has 40,247 impressions with a CTR of 3.2%. 800 views of Lacey public charging station video.
Electric Vehicle Virtual Events	961 registrations and 402 attendees across three virtual events. Answered 223 EV questions from attendees. On

	average, 84% of attendees rated the events as “excellent” or “good.”
Virtual Test Drive Video Campaign	Drove 2,211 landing page views (with 1,145 video views on the landing page), as well as 43,014 video views on social media and 485 new Up & Go Electric newsletter subscribers.
Social Media Marketing (organic and non-paid campaign only)	659 engagements (likes, comments, shares, etc) and 291 unique PSE website (pse.com/electriccars) page views.
Search Engine Marketing to attract potential car buyers to pse.com/electriccars	Accounted for 62% of web sessions and 20,703 unique page views. The entire campaign over this time garnered 449,177 impressions with a 4.3% click through rate and \$1.33 cost per click.
Community events	No metrics to share as planned events were cancelled due to COVID-19 related restrictions.
Ride and Drives	No metrics to share as planned events were cancelled due to COVID-19 related restrictions.
Monthly electric vehicle email newsletter	Enrollment in PSE’s electric vehicle newsletter increased by over 1,200 with a total of 11,036 subscribers at the end of December. The average open rate in 2020 was 43%, exactly as it was in 2019. The open rate for the EV email newsletter is far above the rate for PSE’s standard marketing emails, which tend to average only 27%.

In the first half of 2021, PSE anticipates conducting the following education and outreach activities:

- Virtual launch and promotion of additional PSE Up & Go Electric public charging stations.
- Additional virtual learning events for PSE customers, as well as a new series of virtual events targeted at PSE’s corporate partners.
- Officially launch PSE’s new online Electric Vehicle guide, the interactive web tool discussed above, with a digital promotion campaign.
- Creation of new EV-focused educational videos geared toward a social audience.
- Continued social media and online search engine marketing to promote email newsletter sign-ups and drive engagement with PSE.com.
- Stepped up outreach efforts to local EV dealerships for potential partnerships, as well as area workplaces interested in hosting an EV charging station.
- Promotion of the Up & Go Electric mobile application for customers and site hosts, showcasing the ease of utilizing PSE’s charging stations at multi-family, workplace, and public charging stations.

Transportation Electrification Technical Advisory

In addition to providing broad customer education, outreach, and awareness, PSE also supported customers interested in transportation electrification through technical advisory services. Major activities in the past six months included:

- *Fleets, School Districts, Transit, and Commercial Customers.* PSE has received growing interest from broader customer segments outside of light-duty vehicles.

- With a growing number of announcements regarding broader availability of commercial EVs, such as delivery trucks, there are many commercial customers who are considering fleet conversion to electric vehicles and looking for solutions that will provide charging infrastructure to support that transition.
- PSE developed tools to support customer interest in electric fleets, which has included a total-cost-of-ownership calculator. This tool assists with the technical tradeoffs of going electric while providing customers with tangible cost metrics for considering fleet conversion. PSE plans to advertise this further to fleets by creating a web presence, with a targeted release for late spring.
- PSE is working with a local truck manufacturer, Kenworth, to determine how it can best support the launch of Kenworth's first electric vehicles this summer.
- PSE is connecting directly with school districts who were successful in receiving grant funding for electric school buses. The first districts are now receiving vehicles, and PSE is working with them on possible options that might qualify for the Workplace and Fleet Charging Pilot. Two districts, Kitsap and Snoqualmie, are already enrolled in that program.

Residential and Off-Peak Charging Program (Schedule 552)

The residential and off-peak charging pilot completed enrollment of all participants by September 2020. The final installations were completed at a slower pace due to COVID-19 restrictions and customer availability. Customer satisfaction with the installation and onboarding process remained high, with 98% of customers indicating they were satisfied or highly satisfied with the service received, according to a post-installation survey.

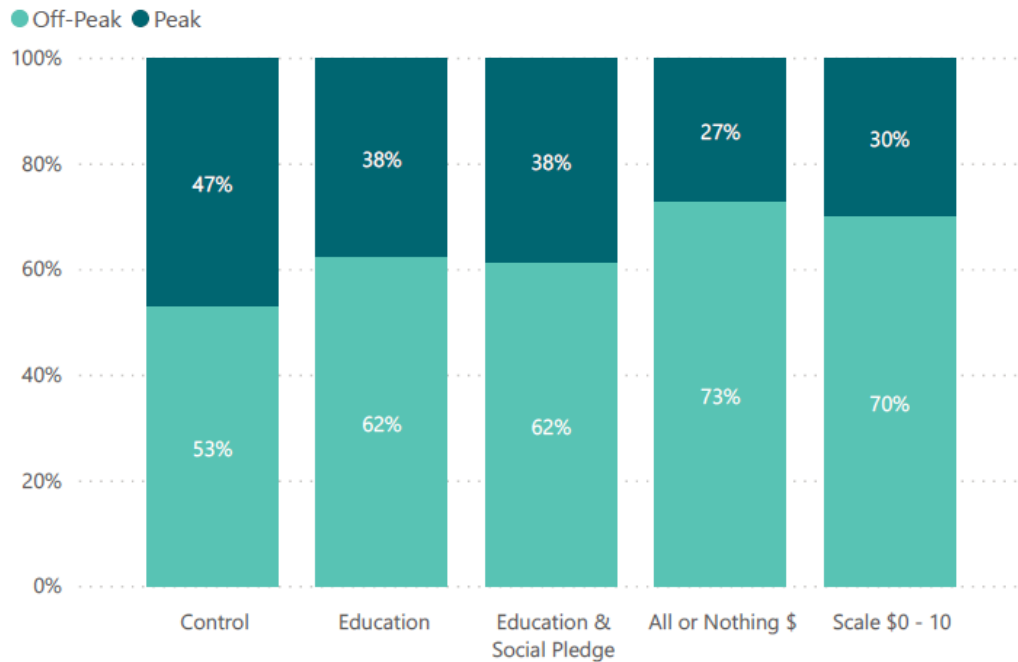
PSE completed a preliminary analysis of participant charging data between July 1 and December 31, 2020, which presents only a snapshot of what PSE is learning. As this data represents only 6 months of customer usage and does not reflect seasonality, it should not be taken as conclusive. Further, the preliminary results reflect data collected during a time of limited mobility due to COVID-19 and may not reflect "normal" charging behavior.

Below, the first graphic presents a visualization of the percentage of total kWh consumed during peak windows and off peak windows by study group. The second graphic presents the Average Weekday Load Shape by Study group at the 15 minute interval. In this visual, the "Education" and "Education & Social Pledge" groups have been combined into the "Education" category and the "All or Nothing \$" and "Scale \$0 – 10" groups have been combined into the "Financial" category.

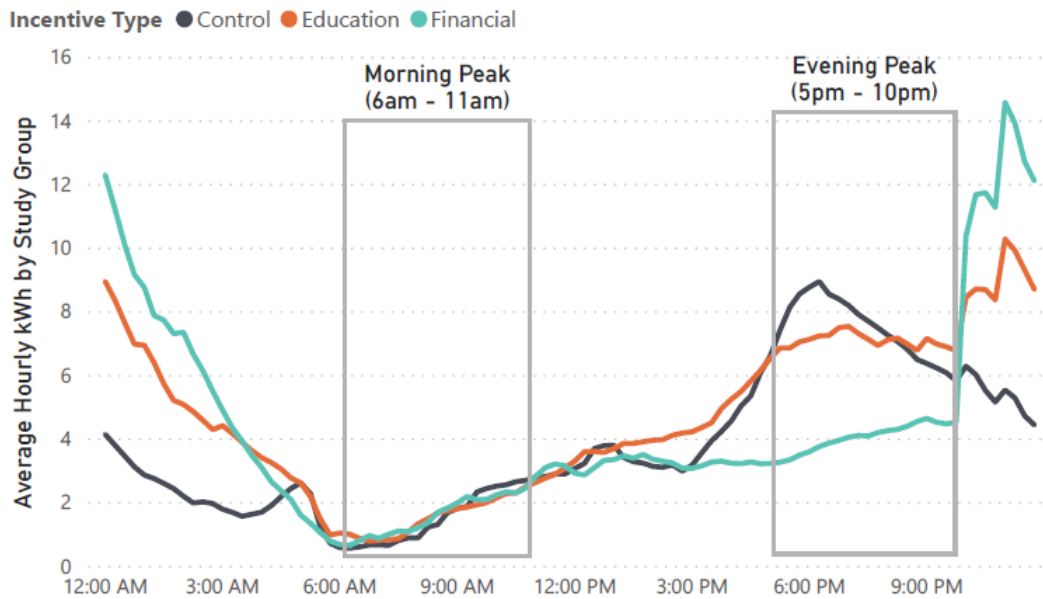
The "All or Nothing \$" and "Scale \$0-10" (the "Financial" groups) study groups demonstrated a statistically significant increase in off peak charging compared to the Control group. The "Education" and "Education & Social Pledge" groups (the "Education" groups) are not significantly different from the Control group, but are significantly different from the Financial groups. These results suggest that ongoing performance based financial incentives for off-peak charging are an effective method for encouraging EV customers to shift their charging off peak.

PSE will continue to analyze the participant charging data this year, and expects to share baseline data in the next stakeholder report.

Percentage of Total Charging by Peak and Off Peak Periods



Average Weekday Load Shape by Study Group



PSE staff completed the following activities for the residential program between July 1 and December 31, 2020:

- *Installation and maintenance in customer homes.* Customers continue to have a high level of satisfaction with PSE and its service partners, with over 98% of customers indicating they were satisfied with the service provided.
- *Monitoring performance of installed chargers.* PSE’s contracted service partners, including the charger manufacturer, Enel X, submit weekly reports to record any chargers that are

experiencing issues or errors and need to be replaced. PSE works closely with Enel X and the installer, Puget Sound Solar, to proactively communicate the need for replacement of the charger at no cost to the participant.

- *Trade Ally program enhancement.* Due to ongoing customer interest in reliable and cost-effective installation of EV chargers, PSE added EV charging services to its Trade Ally program. PSE can now provide interested customers with a list of recommended contractors who can install chargers in their homes. This program was available to customers beginning October 29, 2020 and 61 customers used the service from the go-live date through December 31 to find qualified installers for their home chargers.
- *Alternative technology pilot development.* Due to an extended contracting process, PSE determined that the planned telematics pilot would not provide sufficient benefits for the cost of the service. PSE continued working with Ford and BMW on Vehicle-to-grid integration. It is estimated that this data will be available in early 2021.

Ongoing and upcoming activities for the promotion and implementation of Schedule 552 residential EV charging projects and services in 2021 include:

- *Ongoing management of off-peak charging study.* Each participant was randomly assigned to one of the five reinforcement groups, which are provided with different incentives and monthly communications to promote EV charging during off-peak hours. Incentives are provided through credits on the customers' monthly energy bill and communications are provided via email. Customers are provided incentives after PSE has collected at least a month of data on their charging station use.
- *Establishing baseline of customer data.* PSE plans to complete the baseline analysis of customer charging data in the spring of 2021. Completing the analysis within this timeline ensures the majority of participants will have had the charger installed in their homes for at least one year. Charging activity representative of the period covered by this report is shared above.
- *Alternative technology pilots.* Following the completion of contracting and vendor onboarding, PSE plans to have access to Ford and BMW data by spring 2021.

Workplace and Fleet (Schedule 551) & Multi-Family (Schedule 552) Charging

The workplace and fleet program received 67 applications in 2020. Of those applications, 41 moved forward to a site evaluation and PSE approved 30 of the sites for construction. PSE completed a total of 17 installations in 2020. Of the properties enrolled, five are either education or education support entities, four are city or county governments, and the remaining are private businesses. Among the lessons learned from this program, PSE has noticed that larger organizations tend to have many more stakeholders involved in the decision to participate in the program. This delays the review and acceptance of site designs, service agreements, and sometimes introduces new requirements late in the process.

Interest in the multi-family program continues to be strong, and PSE received a total of 52 applications in 2020. Of the applications received, PSE approved site evaluations for 29 properties and approved installation for 23 properties. PSE completed installation for 21 of those sites and approved starting dates for two more sites in early 2021. Of the properties enrolled, 13 are in King County, five are in Kitsap County, and one each is in Island, Skagit, and Thurston counties. Three of the King County properties are part of the King County Housing Authority, and enable more access to EV charging for

affordable housing residents. Utilization of the chargers at multi-family properties has been nearly double that of workplace properties. With many companies in the area permanently shifting to remote or semi-remote work, PSE expects that the demand for charging solutions where people live will remain strong even after COVID-19 restrictions ease.

Despite workplace and multi-family charging having very similar construction models, PSE has found that workplace charging requires a longer onboarding process, longer installation timeline, and higher installation costs. The average installation and charger cost tends to be about \$10,000 higher for workplace & fleet properties than multifamily properties, and installation timelines take an average of 6 days longer to complete. PSE has also found that fleets considering a transition to electric may have needs that are not met by the current workplace program. Requirements range from the need to conduct more infrastructure upgrades to preference for a particular charging vendor if they already have chargers installed.

Given the strong interest in PSE's Multifamily pilot, as well as the lessons learned from the Workplace and Fleet pilot described above, PSE decided to reduce the number of sites available for the workplace & fleet program from 50 to 40 and increase the number of sites available for the multifamily program from 25 to 35. PSE projects that this change will reduce the risk of further delays or increases to budget, while allowing us to bring charging to more multifamily properties.

Process development and improvement on the multi-family and workplace charging pilots is generally completed in parallel due to the similar characteristics of the two programs. Between July and December 2020, both pilots focused on:

- *Refinement of enrollment, installation, and onboarding process.* PSE is continuing to develop and implement process improvements as new projects are installed. A small number of projects under the multifamily and workplace pilots have required upgrades, including new transformers or meters. PSE has developed and refined internal processes to more efficiently manage the request and placement of the new transformer, meter, or service.
- *Refinement of installation partner processes.* PSE worked with our contractor, Greenlots, to onboard additional installers for the multifamily and workplace programs, which has improved construction timelines. Despite COVID-19 impacts compressing installation schedules to less than six months, PSE and Greenlots were still able to install chargers at 38 locations for the multifamily and workplace programs.

Upcoming activities in the multi-family residential and workplace pilots from January – June 2021 are:

- *Participant surveys.* Throughout the life of the pilot, property owners, managers, or employers will be given bi-annual surveys to measure how they are using and managing the installed charging stations. They also will be asked to administer satisfaction surveys for their tenants or employees. PSE will launch the first surveys in early January, 2021.
- *Continue to refine processes.* As additional sites are completed and new site hosts enrolled into the pilot, PSE will use lessons learned to further refine the project approval and site host onboarding.

Public Charging Program (Schedule 551)

PSE completed construction on the Lacey public charging site and launched it to the public during a Virtual Grand Opening on September 17, 2020. Despite a four month shut down due to COVID-19, the Lacey public charging site was completed in 15 months, compared to the 18 month timeline PSE had learned from other utilities and EV charging experts. Siting conversations in other areas are progressing, albeit more slowly. At the end of 2020, PSE had compensation agreements in place with three additional site hosts and had begun moving through the design and review phase with each. Jurisdictional engagement was ongoing in four other communities. In addition to a slower negotiation process, PSE is also noticing that the majority of sites cost more than originally budgeted, primarily due to transformer upgrades and trenching requirements.

The public charging pilot key activities between July 1 and December 31, 2020, included the following:

- *Jurisdiction and site host engagement.* Site host engagement continues to experience delays due to COVID-related impacts. Many site hosts disclose that they are struggling with impacts due to shutdowns and restrictions, which are limiting their ability to focus on charging station negotiations. Following phased reopening of businesses in the summer, PSE resumed negotiations with site hosts who had needed to focus their attention elsewhere. The time it took to resume these conversations varied by site host; for some, PSE did not regain traction until late September or early October. In addition to resuming negotiations with existing hosts, PSE initiated conversations and provided presentations to jurisdictions and potential site hosts in Auburn, Kirkland, Bremerton, and Olympia.
- *Kent Public Charging Station.* Following productive conversations with a potential site host earlier in the year, PSE completed negotiations, reached a compensation agreement, completed title and survey work, and received approval for a site design. PSE submitted the construction permits and is executing legal documents. Once these documents are completed and the permit is obtained, PSE and Greenlots will be able to schedule construction.
- *Renton and Bellingham Public Charging Stations.* Similarly to Kent, PSE was able to complete site host negotiations and come to an agreement around compensation for parking stalls. In addition, PSE finished title and survey work, which informed the 50% site design. PSE has received site host approval of the 50% site designs for both locations and is developing the 90% site designs. Notably, the site host for Bellingham is the first non-profit organization the project team has worked with on this project. While all site hosts inform PSE that the lease and parking compensation cannot have a negative impact on their finances, the non-profit was explicitly clear that their margins would not allow for a loss in profit.
- *Kirkland Public Charging Station.* PSE conducted research on and initiated conversations with numerous site hosts. PSE identified an interested site host and provided a presentation about the opportunity. The site host has indicated interest in partnering to site the charging station on their property; PSE provided the site host with Business Points and a compensation offer.
- *Refinement of site host engagement and acquisition process.*

- PSE has further refined the site host engagement and acquisition process; and developed a compensation process based on market research, acknowledging that their parking spaces have value.
- In addition, since parking is constrained at many properties PSE is also open to negotiating the number of parking spaces. Initially, PSE approached site hosts seeking six parking spaces, with the option to secure two additional spaces in the future, for a total of eight spaces. PSE has learned that flexibility with this requirement is crucial to successfully site charging stations, and since has reduced the number of parking stalls to a minimum of four spaces, which still allows for redundancy of two DCFC and two Level 2 (L2) charging ports. This tactic has allowed PSE to move forward with siting at two different properties thus far.
- The execution of the legal documents takes a significant amount of time, as it involves a substantial amount of negotiation with several different stakeholders. To mitigate this risk to project schedules, PSE has begun introducing all of these documents early in the process with the site host and if possible, the lender.
- *Continue to log lessons learned.* PSE has continued to learn about the challenges around installing public charging stations and has made process improvements where possible. We have learned that some jurisdictions have parking codes where converting stalls to electric vehicle charging subtracts from the overall number of stalls attributable to the property, rather than simply transforming them. As PSE encounters installation challenges such as these, we provide direct feedback to those jurisdictions and offer suggestions around making parking and building codes more “EV-friendly.” We also continue to learn more about how to partner in the market where PSE can provide the most support. Through our conversations, PSE has learned that national-level companies prefer to work with charging networks that can support all locations, rather than those only in PSE’s service area. We are continuing to evaluate this feedback in our location selection and for future programs.

Upcoming activities in the Schedule 551 public charging station pilots during January – June 2021 are:

- *Local siting, acquisition, and construction.* PSE will continue to engage with municipalities, local stakeholders, and property owners to identify and secure suitable sites for public charging stations. During the siting process, PSE will work closely with the site owners, EV drivers, and local stakeholder communities to ensure that the sites will support transportation electrification in these areas. When a site has been identified in each priority area, PSE will work with the land or property owner to design, permit, and construct the project while coordinating closely with the municipality to follow all permitting and construction requirements. PSE plans to complete construction on four additional sites in 2021 and to secure the remaining sites for construction in 2022.
- *Public session fee updates.* At the time Electric Schedule 551, Electric Vehicle Non-Residential Charging Products and Services, was approved, PSE committed to review session fees every three years, at a minimum, to ensure prices are still in line with market costs. In a recent review, PSE determined that the established fees were below the market average. PSE will be filing an update to those fees by mid-March 2021.

- *Siting Model Update.* PSE committed to updating the public charging station siting model annually to ensure it takes into account all existing and recently installed charging infrastructure. PSE will continue to monitor changes in market conditions within the selected geographic areas and shift focus as necessary if a site has not yet been secured for public charging station installation.

Priority	Geographic Area
1	Kirkland
2	Bremerton
3	Bellevue
4	Mount Vernon
5	Issaquah
6	Bellingham
7	Lacey
8	Renton
9	Kent
10	Olympia
11	Auburn
12	Dupont
13	Puyallup
14	Maple Valley
15	South Hill

Low Income Electric Vehicle Transportation Pilot Projects (Schedule 554)

In late 2020, PSE launched its first set of low income pilot projects designed to promote equitable access to electric mobility and the distribution of resulting environmental, social and economic benefits. As low income service providers' roles in their community fluctuate along with the evolution of the COVID-19 pandemic, usage patterns of the EVSE and corresponding EVs may be different in the near term than we expect to see in the future. While we have begun tracking benefits, a more accurate picture of these benefits may start to form in mid to late 2021.

The low-income pilot key activities between July 1 and December 31, 2020, included the following:

- Installed a dual port L2 charging station and deployed a corresponding Chevy Bolt in partnership with Opportunity Council's Home Improvement Department and Building Performance Center serving Whatcom, Island and San Juan counties. This EV will be utilized for audit, inspection, and project coordination needs during the course of delivering weatherization projects to low-income households.
- Installed a dual port L2 charging station and deployed a corresponding Kia Niro in partnership with HopeSource in Kittitas County. This EV will be utilized for audit, inspection and project coordination needs during the course of delivering weatherization or other social projects to low-income households.

- Installed a 50kW DCFC charging station for use by the Muckleshoot Indian Tribe's Transportation Department. Due to long manufacturing lead times, the electric shuttle that corresponds with this EVSE will be delivered in early 2021.
- Installed a single port L2 charging station at both Algona City Hall and Pacific City Hall. These installations will expand and electrify King County Metro's Community Van program. King County Metro is providing Nissan Leafs for this pilot and community usage will begin in early 2021.
- Co-created benefits tracking strategies with pilot participants to measure benefits in the following areas: carbon abatement, EV education and outreach, total cost of EV ownership, service expansion to low-income households, and additional social and safety impacts.
 - In September through November 2020, Opportunity Council reported:
 - 37 trips totaling 902 miles. Trip purposes spanned weatherization, rural rehabilitation, mail services, COVID safety and EV training
 - 12 new drivers trained on EV and EVSE usage
 - In October through December 2020, HopeSource reported:
 - 34 trips totaling 1,252 miles. Trip purposes spanned weatherization, energy assistance, food, housing and homelessness, and other support service outreach.
 - 18 new drivers trained on EV and EVSE usage. There was some initial reluctance among staff to choose the EV when making trips due to unfamiliarity with charging protocol, but one-on-one training is helping to overcome that barrier and staff usage has accelerated.
 - Note: While some projects are launching in the middle of a quarter, all projects will ultimately be aligned with the traditional quarter schedule for aggregated reporting purposes
- PSE was awarded a Department of Commerce Electrification of Transportation Systems grant to bring an EV car share service to income-eligible seniors at Senior Housing Assistance Group's Auburn Court location.

Upcoming activities in the Schedule 554 projects during January through June 2021 are:

- Upon delivery of the Muckleshoot's electric shuttle, PSE will work with the tribe to launch the expanded transportation service to community members traveling between the White River Amphitheatre and downtown Auburn.
- Launch Community Van usage at Algona City Hall and Pacific City Hall. This shared electric transportation model will provide a net new service through increased mobility and access to community resources.
- Negotiate a grant contract with Department of Commerce and begin installation of a dual port L2 charger at Senior Housing Assistance Group's Auburn Court.
- Re-engage with potential pilot participants for the non-emergency medical transportation, electric school bus and low-income weatherization fleet use cases to move these projects towards final project design and EVSE installation.

- Continue tracking benefits quarterly as projects come online and develop an aggregate dashboard of pilot benefits.
- Continue to participate in Hopelink’s local mobility coalition meetings and conversations with mobility service providers to stay apprised of the evolving mobility landscape, community needs and preferences, and potential future partnerships.
- Consider if there is a more inclusive and accurate way to refer to these pilots. Our current pilot title references the critical need to serve our low-income communities and their service providers. However, we are looking deeper at what it means to serve both low-income and underrepresented communities. While there is overlap, we want to ensure both our phrasing and approach is inclusive.

Expenditures to Date

Total operating expense in 2020 across all programs was \$2,004,069. Costs included in this area were related to program development across all of the programs, including PSE labor, overhead costs, and outside services. Operating expenses also included work related to the Education and Outreach program.

Capital expenditures in 2020 were \$2,925,276. This included final information technology development costs for the public, multifamily, and workplace programs, purchase and installation of chargers, and applicable PSE labor, labor overheads, and outside service contractors. PSE has encountered higher installation expense than originally estimated, particularly for the public and workplace programs. While PSE is doing all we can to mitigate these higher costs, we do anticipate that total pilot costs will run higher than originally projected once all installations are complete.