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**CPRG IMPLEMENTATION GRANTS COMPETITION  
COVER PAGE FOR APPLICATION**

**APPLICANT INFORMATION**

Organization	Washington County
Primary Contact Name	Laura Jackson
Phone Number	971-451-0789
Email Address	Laura_Jackson@washingtoncountyor.gov

**TYPE OF APPLICATION**      ☐ Individual Applicant      ☒ Lead Applicant for a Coalition

*If lead applicant for a coalition, provide a list of the coalition members below.*

Clackamas County Oregon, Clark County Washington
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**FUNDING REQUESTED:** *Provide total EPA CPRG Implementation Grant funding requested.*

\$ 49,144,552.00
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**APPLICATION TITLE:** *Provide the title of your proposed project.*

Energy Efficiency Improvements for Low Income Homes
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**BRIEF DESCRIPTION OF GHG MEASURES:** *Describe each GHG reduction measure contained in the application (1-2 sentences each).*

Provide energy efficiency improvements for 907 homes that will eliminate natural gas and reduce annual energy use by an average of 50% by: Installing heat pump space heaters (ducted & ductless) Installing heat pump water heaters Installing all new, U-22, windows Increasing each homes insulation to meet current energy code Air sealing each home Planting a minimum of 2 trees at each home
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**SECTORS:** *Identify the sector(s) associated with the GHG reduction measures included in the application.*

- |  |  |
|--|--|
| <input type="checkbox"/> Industry                | <input checked="" type="checkbox"/> Commercial and Residential Buildings |
| <input type="checkbox"/> Electricity Generation  | <input type="checkbox"/> Agriculture/Natural and Working Lands           |
| <input type="checkbox"/> Transportation          | <input type="checkbox"/> Waste and Materials Management                  |
| <input type="checkbox"/> Other (please describe) | <div></div>  |

**EXPECTED TOTAL CUMULATIVE GHG EMISSION REDUCTIONS**

*For all proposed measures combined, provide the estimated cumulative GHG reductions:*

**Estimated cumulative GHG reductions for 2025-2030 (in metric tons)**

5,238

**Estimated cumulative GHG reductions from 2025-2050 (in metric tons)**

21,369

**LOCATIONS:** *List the primary location(s) where the proposed measures will be implemented*

City 

Washington County & Clackamas County, Oregon - Clark County, Washington

State; Territory; Federally recognized Tribe

**APPLICABLE PRIORITY CLIMATE ACTION PLAN(S) (PCAP) ON WHICH MEASURES ARE BASED**

PCAP Lead Organization(s): 

Portland-Vancouver Metro Government

PCAP Title(s): 

Priority Climate Action Plan Portland-Vancouver-Hillsboro

PCAP Website link(s) (if applicable): 

<https://www.oregonmetro.gov/sites/default/files/202>

**List of GHG reduction measures and PCAP page reference for each measure:**

Residential Strategy 1 - page 47



2024

EPA Climate Prevention & Reduction Grant

Application for Energy Efficiency Improvements for  
Low-Income Households

## Overall Project Summary and Approach

Our proposal is to utilize Community Pollution Reduction Grant funding to directly implement reduction of local greenhouse gas emissions from residential energy use, significantly increase residential energy efficiency for low-income residents, promote growth of financial and climate resiliency for our low-income tenants, strive to eliminate natural gas in our affected properties, and mitigate the local urban heat island effect. We will do this by increasing the capacity of our municipal Asset Management programs overseeing the maintenance and repair of publicly owned housing for low-income residents. Our coalition represents three independent Housing Authorities in the Portland-Vancouver Metro area, with a combined portfolio of 907 units in need of proactive, energy efficient improvements currently outside our financial abilities. This request speaks to issues of equity and access for low-income renters to technological developments in the field of residential energy efficiency.

### Total amount of funding requested:

Number of Homes = 907

\$49,235 per home = \$44,655,750

+ \$3,901,128 Direct Staffing, Supplies, and Subcontract/Sub-award costs

+ \$587,674 Indirect & Overhead Costs

Total Costs = **\$49,144,552**

(\$54,183 per home)

### Lead Applicant:

Washington County, Oregon

Responsible for organizing the coalition and leading the application efforts. As the lead applicant, Washington County will be accountable for all funding allocations to subrecipients and verification of work performed. Annual reporting, budget monitoring, and project oversight for subrecipients all fall under this organization's purview. Washington County's Sustainability Coordinator will collect the monthly utility information from each Housing Authority needed for monitoring and tracking of energy savings and GHG emissions. In addition to managing the grant administration to sub-recipients, the Housing Authority Asset Management Program will execute the assessments, labor contracts, and installations for their portfolio of qualifying properties. By or before July 1st, 2024 Washington County will submit an Intergovernmental Memorandum of Agreement signed by all coalition members.

### Subrecipients:

Clackamas County, Oregon (Clackamas Housing Authority)

Clark County, Washington (Vancouver Housing Authority)

Each subrecipient's Asset Management program is responsible for assessing their portfolio of qualifying properties to establish a quantified scope of components. They are responsible for hiring additional personnel to accommodate this increase in capacity per the budget allotted. They are also responsible for managing the subcontractors charged with executing installations at their properties, coordinating construction schedules and verifying work performed. Each subrecipient will provide monthly financial reports to Washington County and submit all documentation required for tracking and reimbursement of funds and impacts on energy use.

The reduction measures we propose are all proven best practices to reduce residential energy consumption, utility costs, and associated greenhouse gas emissions in alignment with the stated goals of the Portland-Vancouver Metro PCAP Residential Strategy 1.

<b>Res-1: Expand existing residential energy efficiency retrofit programs, with a focus on low-income households</b>	
Emission Reductions Estimate Method:	<ul style="list-style-type: none"> <li>Residential building emissions were broken down by fuel, and energy end-uses were estimated based on US EIA <a href="#">Residential Energy Consumption Survey (RECS)</a>. The measure specifically entails adding a ductless heat pump, weatherizing, and adding more energy efficient water heaters for each housing unit.</li> <li>Assumptions for energy reduction are from the <a href="#">Northwest Power Plan</a>, residential supplement. Additional electricity use from new electric heat pumps is accounted for.</li> </ul>
Emission Reduction Estimate Assumptions:	<ul style="list-style-type: none"> <li>Household energy end-uses were estimated based on <a href="#">EIA Residential Energy Consumption Survey (RECS)</a> Table CE4.5 (2015, released May 2018) for Marine climate region housing where data was available for electricity and natural gas, and using Pacific Census Division data for propane and fuel oil.</li> <li>Measure reduction potential for the <a href="#">Northwest Power Plan</a>, residential supplement.</li> <li>Additional electricity use from new electric heat pumps is accounted for using end-use US EIA <a href="#">Residential Energy Consumption Survey (RECS)</a> data combined with current GHG inventory data.</li> <li>Applied to 26% of housing units in the MSA.</li> </ul>

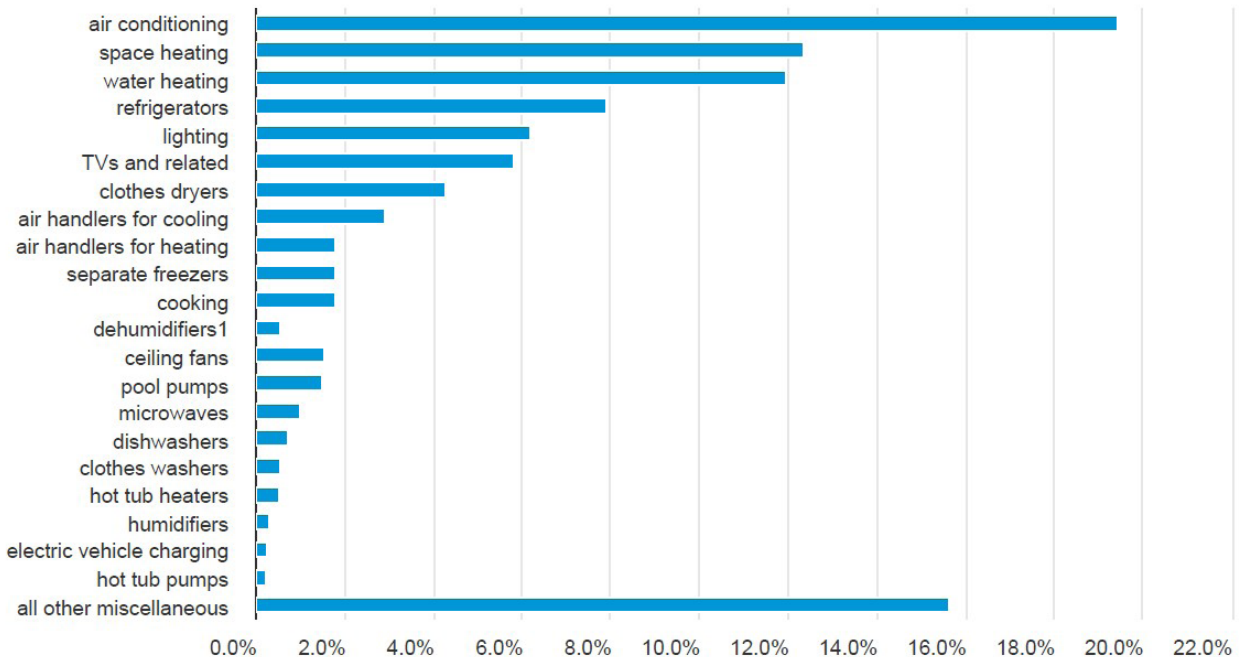
The full scope of proposed work consists of both active and passive improvements to the residence. This includes replacing outdated and inefficient furnaces (gas and electric), baseboard and zonal heaters, and water heaters (gas and electric) with the most efficient heat pump units available. This not only reduces the energy use of the home but, and equally as important, takes the foundational step necessary to support transitioning to a fully sustainable grid by transitioning off our residential reliance upon natural gas. As the graph below shows, our proposed scope of work addresses five of the top ten most energy intensive residential uses (air conditioning, space heating, water heating, air handlers for cooling, air handlers for heating), while our leveraged scope expands this to seven (refrigerators & clothes dryers). We calculate that these active measures will reduce each home's energy use by 40-60%.

The average American home is two to four times leakier than a new home built to current energy code.

Our proposed passive measures target the efficiency of the building's envelope and thus its ability to contain heat. Since buildings function as a cohesive system we must implement improvements that address both the construction and operation of the unit to maximize GHG reductions. By increasing the insulation value of the exterior wall cavity, windows, and attic insulation values to 2024 energy code standards while decreasing air leaks and drafts, we create a much more efficient indoor environment, decreasing energy usage by another 10-20% annually. Combining our active, passive, and expanded scope measures we expect a combined reduction of each home's total energy use by 45-65%.

## Residential site electricity consumption by end use, 2020

percent of total



Data source: U.S. Energy Information Administration, 2020 Residential Energy Consumption Survey

### Active measures include:

Conversion from gas to electric mechanical systems

Current estimates show that 59.8% of our units utilize gas for either their heat or water heating, or both

Replace existing space heating units with the latest heat pump technology

(SEER Value of >22 HSPF2 rating of > 10)

Replace existing water heaters with the latest heat pump technology (> 3.0 UAF)

### Passive measures include:

Increase the insulation value of the envelope to meet/exceed current Oregon residential energy code

Replace all windows and doors with more than 40% glazing, with ones having a minimum U-22 insulation value

Air seal the home's envelope

Plant 2 Trees at each property

### **Space Heating**

In most homes in our region heating is the largest energy expense and can account for up to

40% of a household's annual spending on energy costs. When combined with traditional air conditioner units these mechanical systems account for roughly 441 million tons of carbon dioxide emissions annually in the US alone. Our plan is to significantly reduce both the financial cost to our residents and the energy usage necessary to heat their homes by replacing all heat sources with high efficient electric heat pumps. This technology also allows us to provide air conditioning to all our residents at no additional cost thus improving their climate resiliency as our summer temperatures continue to increase.

Heating energy efficiency (HSPF2 rating); primary factor for heating. The higher the HSPF2 rating, the less wattage a heat pump will draw. Lower wattage also means lower electricity or kWh use per month, and lower heating costs. DOE current minimum HSPF2 rating for an air source heat pump is 7.5, we plan to install units with an HSPF rating of 10 or higher. In the air source heating cycle an HSPF2 rating of 10 would only take 1 KW to produce 10,000 btu/hr of heat (10,000 BTU/HR / 1,000 watts = 10 BTU/watt-hr).

Seasonal Energy Efficiency Rating (SEER value); primary factor for cooling. Just like the HSPF, the higher the SEER value the more efficient the unit performs. Minimum requirements for Oregon residential energy code for heat pump SEER value is 16, we will install units with a minimum rating of 22.

#### Electric Furnace to Ducted Heat Pump

Current Oregon Residential Energy code requires a minimum SEER2 rating (Season Energy Efficient Ratio v2) of 14, however the most efficient units on the market operate at an SEER2 rating of just above 30. While HSPF2 ratings range from 8 (lowest “energy efficient” unit) to 13 or above. For our upgrades we plan to install units with a SEER2 value of 22 and an HSPF2 rating of 10 or more. Assuming most of the electric furnaces in our units are ~10 years old (although the lifespan of an electric furnace is typically 20-30 years), with an average HSPF2 rating of 4.5, we will be improving the energy efficiency of the equipment by an estimated 60%. We anticipate this upgrade to be the easiest and most straightforward as the electrical capabilities are already in place, all that’s required is the physical exchange of the unit. We called several contractors to estimate the cost of purchase and installation for a unit meeting the required energy efficiency specs and came to an average estimate of \$15,500 per unit. For the 602 units with electric furnaces we anticipate a cost of \$9,331,000 to replace them with heat pump technology.

#### Natural Gas Furnace to Ducted Heat Pump

A new study shows that a typical U.S. home can cut its heating-related climate pollution by 45 percent to 72 percent by swapping out a gas-fired furnace for an efficient, all-electric heat pump. This study used a SEER value of 16 whereas we plan to install units with a minimum SEER2 rating of 22, so our planned improvements are expected to exceed the 45-72% reductions measured by this study. Our initial inventory assessment shows that we have around 254 units currently heated with gas furnaces. Replacing these units with heat pump technology will result in a significant annual reduction of local natural gas combustion and the reduction of harmful co-pollutants such as Particulate Matter, Nitrogen Oxide, Carbon Monoxide, Ammonia, and Volatile Organic Compounds. Several co-pollutants are ozone precursors, the reduction of which is increasingly important in an area striving to remain in attainment for ozone and PM. The estimates proposed Natural Gas reduction and subsequent co-pollutant reductions are listed in section 3.

This upgrade will require the termination of a gas line, which involves a plumber or a general contractor with a plumbing certification. Otherwise it shouldn’t necessitate additional amperage or electrical upgrades, but if that upgrade is necessary it’s usually included in the installation cost. Due to the addition of gas termination these installations cost a little more than replacing an electric furnace, putting our estimate for materials and labor, per unit, at \$16,000. That means that for the execution of this aspect of the scope we estimate a total cost of \$4,064,000



(Theresa Pistochini, Mitchal Dichter, Subhrajit Chakraborty, Nelson Dichter, Aref Aboud, Greenhouse gas emission forecasts for electrification of space heating in residential homes in the US, Energy Policy, Volume 163, 2022, 112813, ISSN 0301-4215, <https://doi.org/10.1016/j.enpol.2022.112813>)

#### Zonal electric heat to Ductless Heat Pump

Baseboard and cadet zonal heaters are the most energy intensive and least efficient heat sources in use.

On average, homes that use baseboard heat and window air conditioner units spend \$1300 more per year than homes with heat pumps, colder climates will see larger savings. This means each residential unit that converts from baseboard to ductless heat pump can reduce their carbon emissions by 7.6 metric tons per year. A single, 1500 watt electric baseboard heater consuming 240 volts is only enough to cover 150 square feet, so even a small 400sf studio apartment requires 3 baseboard heaters and still has no air conditioning. Whereas a single head, ductless heat pump with an HSPF value of 10 and a SEER2 value of 22, can heat the entire studio apartment using only 1200 watts/hour and cool using only 600 watts/hour. This is beyond a 70% reduction in energy usage.

This upgrade will require more labor and materials than the other heating upgrades as it includes not just the installation of new equipment, but also requires envelope penetration, and removal of wall units necessitating drywall patching and electrical reconfiguration. Ductless heat pump units cost less than ducted units for a single head, around \$7000. This is suitable for a studio or small 1 bedroom apartment, for larger units we would need to install 2 heads, so these would cost \$14,000 each. This does not include the removal of the old units or wall patching, we anticipate that to cost around \$2000 per unit. We are not sure exactly how many of the electric heat units have baseboard/zonal heaters, but our initial estimates are around 8% or 77 units. The execution of this part of the scope is expected to cost \$726,750.

#### **Water Heating**

Accounting for roughly 13% of a home's total energy use, regardless of the season, and the third most energy intensive home appliance, water heaters are seeing a surge in energy efficiency with the increased adaptation of heat pump technology. A water heater's energy efficiency is determined by the uniform energy factor (UEF), which is based on how much energy the heater uses and how much energy is used to power the water heater itself. The higher the uniform energy factor, the more efficient the water heater. Even Energy Star certified units only have UEFs ranging from roughly 0.6 to 0.95 for gas and electric models while heat pump models see a rating of up to 3.75. The units we install will have a minimum UEF rating of 3.0.

#### Electric to Heat Pump upgrade

By replacing electric water heaters with heat pumps our residents will see a significant drop in both their energy use and monthly expenses. For comparison, a typical 50 gallon heat pump water heater uses about 2.5 kWh/day (912.5 kWh/year), which is equivalent to \$137 per year at 15 cents/kWh utility rates. Contrast that with a >5 year old standard electric 50 gallon water heater that uses about 10 kWh/day (3,650 kWh/year) at an annual cost of \$547. The investment in transitioning to heat pump technology translates to an energy and cost savings of around 75% for water heating. Since this installation is replacing one ducted electric unit for another it should be simple and straightforward requiring few, if any, supporting



measures like increasing ampage or adding electrical outlets. To replace the 485 existing electric water heaters with new electric heat pump versions we estimate a cost of \$5,500 each for a total of \$2,667,500.

#### Natural Gas to Heat Pump conversion

By replacing natural gas water heaters with electric heat pump models we will remove an average of 35 therms a year per household. Of our 907 units included in this proposal we calculate 57% of units, or 515, have gas powered water heaters. According to EnergyStar.gov a current energy star approved model, 50 gallon gas tank heater, uses 188 therms per year. So, if our 515 homes had brand new, energy star rated appliances with a UEF of .9, our heat pump replacements would reduce natural gas consumption by 96,820 therms/year.

An estimate of \$6,500 per unit for the purchase and installation of a new heat pump water heater means that to fully execute this aspect of the scope will cost \$3,367,000

#### **Envelope Weatherization**

As of 2021, buildings account for 39.1% of total U.S. primary energy use and 75% of total U.S. electricity use. Much of this energy is used to maintain a comfortable indoor environment (USEIA). The building envelope consists of both transparent and opaque elements that serve as a controllable barrier to help maintain the indoor environment regardless of external conditions. The envelope also allows the exchange of light and air, as well as other transfers with the external environment when it is beneficial for the building occupants. By leveraging desirable external environmental conditions (e.g., fresh air and natural light) and mitigating the influence of undesirable conditions (e.g., moisture, hot or cold temperatures, wind), the building envelope can reduce the need for space conditioning and electric light, and thus reduce energy use associated with lighting and heating, cooling, and ventilation equipment. In turn, high performance building envelopes can significantly reduce the substantial CO2 emissions associated with energy use to satisfy heating, cooling, and lighting needs in buildings.

(Chan, W., J. Joh, and M. Sherman. 2013. "Analysis of Air Leakage Measurements of US Houses." *Energy and Buildings* 66 (November): 616–25. doi.org/10.1016/j.enbuild.2013.07.047.)

(Harris, Chioke;vLaFrance, Mark; Narayanamurthy, Ram. 2022 "Pathway to Zero Energy Windows: Advancing Technologies and Market Adoption". US Department of Energy; National Renewable Energy Lab)

(U.S. Energy Information Administration (2021). *Annual Energy Outlook 2021*. Washington, D.C. URL: <https://www.eia.gov/outlooks/aeo/>)

#### Insulation & Air sealing

Current Oregon residential energy code stipulates an attic insulation value (R value) minimum of 49, whereas homes built even 10 years ago have values almost half that. To help our residences retain heat and require less energy we plan to increase the attic, walls, and floor insulation of scattered site units as we are able. By this we mean, if a home sits on a concrete slab foundation we cannot insulate the subfloor, however if a home's foundation includes a crawl space or basement then we are able to add insulation beneath the main floor. When we add attic insulation we can also confirm that the exhaust vents are terminating outside the attic space and check for signs of water penetration. To increase the

insulation value in the walls contractors typically cut small holes in the drywall and blow in a cellulose material to fill the cavity. This is a minimally invasive and incredibly effective method for increasing the efficiency of the home's envelope. The other part of this scope is air sealing. This entails using caulk, weather stripping, door sweeps, etc to literally seal the gaps in the envelope that permit drafts, helping contain the conditioned interior air. This is by far the least expensive and most effective action any homeowner can take to reduce their home's energy use for heating & cooling. Since each home is a different size and configuration we can't establish a definitive cost for this aspect of the scope, especially since insulation is priced per square foot. Based on our industry experience and current prices, we anticipate an average cost of \$11,000 for each scattered site property.

For our multifamily properties increasing the insulation value in the envelope isn't as easy. Due to issues of access and permits we may only be able to address "attic" insulation in these buildings, however even this alone can make a noticeable difference by reducing energy usage by 12-18%. For our multifamily properties we estimate a cost of \$6500 per home. The estimate for insulation, air sealing, and general weatherization of all 907 homes comes to \$7,437,000.

### Windows

While envelope insulation values are measured in R values, with a higher value reflecting a larger degree of insulation; window values are the reciprocal of that. This means that the smaller the U value the larger the insulative properties. Studies from the Department of Energy (Sullivan) confirm that windows with higher U-values conduct more heat from inside the residence to the outside during morning and evening hours when the outside air temperature is often lower than the inside air temperature; and, a lower U-value window conducts less heat from outside to inside during summer afternoon peak cooling hours. Just like with wall cavity and attic insulation, the more we improve the insulative value of the windows the more we increase the energy efficiency of the home, reduce the operating costs, and in turn reduce the GHG emissions.

Executing this element of the scope requires the most labor and therefore the most time, we anticipate crews to take up to two days on site for a full window replacement of each unit. Since we aren't changing any of the window sizes and therefore not changing the size of the opening in the exterior wall, no permit is required. The only scheduling complication we anticipate involves coordinating the window replacements during the summer when Oregon is mostly free of rain. This is the only part of the scope that has any restraints upon the time of execution, which means it won't conflict with the implementation of the other improvements.

The quantitative aspect of this scope is the most difficult to estimate due to the variability in unit size, type, and exterior walls. Single family, scattered site units have more exterior walls and therefore more windows than multi-family units. While the exact number of windows isn't known at this time we are going to use an estimated average of 8 windows per unit. At a general cost of \$2400 for each window replacement, installation, and disposal we estimate a total of \$17,414,000. (Sullivan, R, Frost, K, Arasteh, D, & Selkowitz, S. Window U-value effects on residential cooling load. U.S. Department of Energy, United States.)

### **Tree Planting**

At each of our 417 scattered site properties we intend to plant 2-3 trees, depending upon property needs and space. Urban trees offer great promise to improve residents' daily lives and make communities more resilient to the impacts of

climate change. Benefits to residents include cleaning the air, improving mental and physical health, and mitigating the urban heat island impact during increasing summer temperatures. A recent study out of Minnesota showed how trees planted adjacent to homes contribute to a reduction of the home's energy usage in both winter and summer. In a heating dominated climate, like our region of Oregon, neighborhood trees reduce the speed of winter winds. Lower wind speeds against a house reduces the amount of heat loss through air exchange. Likewise, tree shading in the summer reduces the amount of heat entering the home directly through solar radiation and also reduces the amount of heat stored in asphalt and concrete. More trees = lower energy costs, year around. Not to mention that in just one year a mature tree will absorb more than 48 pounds of carbon dioxide from the atmosphere and release oxygen in exchange. This means that in 5 years, when our trees are "mature", they will be pulling between 87,072 - 130,608lbs of carbon out of the atmosphere every year.

We plan to engage with current tenants to inquire about their preference, providing a selection of native trees to choose from including: conifer, fruit, nut, flowering, etc - and engage with arborists to choose the best location for planting. For our multi-family properties we will plant as many trees on site as is prudent and ensure that the remaining trees are planted on other municipally owned property. We expect to spend no more than \$300 per unit for implementation of this scope element for a total cost of \$272,100.

(Philip J. Potyondy<sup>1</sup> and Gary Johnson<sup>2</sup>, Influence of Urban Tree Canopy on Single-Family Residential Structure Energy Consumption at the Community Scale in Hutchinson, Minnesota; Forestry Department Minneapolis, Minnesota)

## **Implementation**

We anticipate the first year of the five year implementation timeline to involve hiring new staff positions and conducting quantitative assessments of each property to determine, how many windows at what sizes are being replaced, what size water heaters each unit has/needs, etc. Once those numbers are solidified we will issue RFP's and prepare to begin installations in year two. Years two, three, and four will each see completion of installations in 33% of the 907 properties in the combined portfolio. This leaves us with one year in the implementation period to allow for unforeseen delays or complications. An example might be another extreme fire season that limits our ability to replace windows during the summer months due to the high exposure risk to smoke and associated air pollution.

At this time our plan for scope execution involves the lead applicant, Washington County, taking on the primary role of fiscal management, with each of the two subrecipients coordinating the contract execution and construction scheduling associated with their specific properties. This means that funding allocations will be issued as reimbursements once contractors are approved through a competitive RFP process. For instance, Washington County will approve the RFP language for Clackamas Housing Authority- to hire a contractor to exchange the 84 natural gas water heaters in their scattered site properties. Once this contract is awarded Clackamas County engages in a labor agreement directly with the winning contractor and submits paid invoices to Washington County for reimbursement. The new project manager hired by Clackamas County for the execution of this grant then coordinates the installation timeline for each property, providing verification of appliance specifications, proper installation, and termination of the gas line. This verification is included in the monthly reporting that the Clackamas County Asset Management team issues to the Washington County Financial Analyst. This process will be the same for each component of the scope, with the RFP written, issued, awarded,

and executed by the implementing authority for work to be completed on their properties. By breaking the scope down and executing implementation by component we can better maintain cost controls and budgets for each aspect. This also translates to easier reporting as the individual elements are independently priced.

We intend to issue multiple RFPs for the same scope component. This means instead of just breaking the 7,256 windows down by County, we could then break each county's window scope into 4 different RFPs. This allows smaller companies, more likely to be owned by a woman or person of color, the ability to respond because the smaller scope is more in line with their capacity. This also allows for quicker implementation as four separate companies can work simultaneously on installations during the summer months. This will be the same for the space & water heater conversions and weatherization.

We don't anticipate encountering any real barriers to implementation of these strategies as the sites are all currently under the control of the participating Housing Authorities and none of these measures require a building permit. In some situations we may need to obtain electrical and HVAC permits which can be pulled "over the counter" to maximize efficiency of service delivery. Besides the window replacements, none of these installations are impacted by the weather and can be scheduled throughout the year. In addition, none of the installations interfere with each other so there is no reason multiple scopes of work cannot be completed at the same time, on the same residence. None of these measures require tenant relocation, all the work can be performed while the unit is occupied.

#### **Demonstration of Funding Need.**

Inflation impacts everyone, even owners of Affordable Housing. Unlike other service providers however, we cannot increase the cost of our services (rent) to offset the rise in expenses since rents are set by the government based on local income. To be specific, in 2015, real estate industry experts were projecting 3.0% annual growth in multifamily property operating expenses. Instead, costs at Oregon properties zoomed up at a median annual rate of 4.0% in the seven years from 2015 to 2022, according to CohnReznick's 2023 Affordable Housing Credit Study. Cumulatively, that annual 1.0% difference had a big effect; operation expenses increased 31.6% over seven years, far more than the 23.0% most asset managers projected. In many Oregon counties, expenses grew even faster—averaging 5.51% growth per year in Marion County and 6.46% in Multnomah County. In Washington County specifically we saw a 36% increase in operations expenses for our Public Housing stock from 2022 to 2023.

On top of inflation we've experienced an increase in extreme weather events driving up utility costs along with insurance premiums. Today, customers of the largest energy provider in the Portland Metro Area (PG&E) pay 33% more for electricity than they did in 2022. All key drivers of cost growth are beyond our control as property owners. Unlike expense growth, revenues for most properties lag behind projections. Revenue shortfalls across the board are impacting already tight profit margins. Due to the pandemic rent increases and evictions were paused for a few years, resulting in financial losses and cash-flow problems still felt today. Similar to cost growth, a combination of social, economic, and policy factors contribute to the divergence from expectations.

As such, our current Asset Management programs have extremely limited capacity for proactive energy efficient upgrades. This funding would change that, it would help us not only reduce operational expenses for both the participating Housing Authorities and tenants, but also create a healthier environment and more sustainable power grid. This EPA grant is unique from all other Federal funding opportunities because it does not explicitly exclude publicly owned housing, like HUD's GRRP grant. While an increasing number of funding opportunities for residential energy efficient initiatives are coming online, the vast majority either specifically exclude Public Housing stock or only offer rebates covering less than 20% of our estimated costs. As a municipal agency, we do not pay income taxes so the multiple programs offering tax incentives for homeowners conducting these improvements also do not apply to us.

We are pursuing local and State funding options/programs for projects that involve solar installations and other interior renovations to eliminate indoor allergen and asthma triggers (Oregon Healthy Homes Grant), but neither of these opportunities provides for the full scope of energy efficient appliance improvements our properties need the most. Other programs, like the Oregon Multi-family Energy Program with an annual budget of around \$2M, also do not have the funding capacity to accommodate our request. We also looked into the new energy Efficiency and Conservation Community Block Grant, however the allocation to Washington County is only \$324,000 and thus not nearly enough to accommodate our scope. In addition, our Community Development Department has indicated that they are pursuing these funds to help support energy efficient upgrades for lower income homeowners.

One opportunity we are pursuing is with the Energy Trust of Oregon. Enrolling as a Community Partner with their organization allows us to leverage the EPA funding and expand the impact of our scope by using reimbursement for qualifying installations to purchase additional home appliances. This means replacing the refrigerator and clothes dryer with Energy Star models and replacing the stove/oven for units transitioning from gas to electric. n. As a Community Partner, Washington County has access to monetary incentives not available to market rate service providers. This means that for every electric furnace we replace with an expanded capacity ducted heat pump, we will receive a \$6000 reimbursement. Without the CPRG funding though we are unable to utilize these incentives as we cannot afford the proactive upgrades on our own. Based on preliminary estimates for heat pump space heaters, windows, and attic insulation, we conservatively calculate a total financial incentive of \$2.5M for the purchase of Energy Star appliances and fulfillment of our expanded scope achieving maximum energy savings.

### **Transformative Impact**

A hard-to-abate sector where we see very slow adoption of GHG emission reduction measures and lack of access to Energy Efficiency technology is low-income residential rental properties targeting residents making less than 60% of the local AMI. While new residential development is required to meet current energy code, bringing older housing stock up to current energy code standards is much more difficult. More than one-third of Americans rent their homes, despite living in homes that consume 15 percent more energy per square foot than owner-occupied homes," Americans who rent their homes often face significant barriers to participating in energy efficiency and clean energy programs compared to homeowners, according to a new report from the Smart Energy Consumer Collaborative (SECC). Lower income renters are the least able financially and legally to adopt energy efficient technologies to lower their GHG emissions. As the price of consumer goods

and housing costs continue to outpace the increase in wages (minimum wage has not increased in 15 years) lower income renters have little ability to increase the energy efficiency of their homes due to budgetary and legal restrictions. Renters in general cannot or make improvements to their units as contractors can legally only work with the property owner directly.

Traditionally pacific northwest residences do not have air conditioning due to the mild summer temperatures, however the past fifteen years have brought warmer and warmer weather necessitating the opening of 'cooling stations' by local governments for residents without access to air conditioning. Those who do benefit from air conditioning largely rely on energy intensive window units. An additional risk exposure for our area due to climate change is the increasing occurrence of forest fires. These events result in very dangerous air quality issues when people must take refuge in their homes. Without air conditioners providing cool, filtered indoor air, many residents, often the most vulnerable, cannot avoid exposure. By providing heat pump space conditioning units we are also providing the most energy efficient form of air conditioning to our residents, increasing their climate resiliency and protecting them from significant health risk due to air pollution.

The impact of our proposed scope doesn't just benefit the environment, it extends to our resident's bank accounts. By dramatically reducing the unit's monthly utility costs, we are increasing the financial resilience of our residents by allowing them to save over \$1000 a year. This comes at a time when local utility providers are announcing another upcoming increase in their rates by 17%.

We believe our targeted improvements over 900 properties can serve as a model for energy efficient upgrades in similar Public Housing Authorities. By documenting an implementation plan and dramatic reduction in energy use and GHG emissions we will show how these investments pay off considerably for both the local government, low-income residents, and the environment.

### **Impact of GHG Reduction Measures**

The CPRG dollars provided by EPA for this energy efficiency and electrification proposal will go directly towards emission reduction activities. The combined total of energy efficiency upgrades is projected to result in a 40-60% decrease in energy consumption and a 100% switch from natural gas to electric mechanical systems. All upgrades exclusively benefit low-income households occupying Public Housing units who are responsible for paying the monthly utility bills; a direly needed improvement to energy equity in the area.

Our methodologies for calculating energy savings are derived from manufacturer specifications for mechanical systems and appliances using federally mandated ratings. Therefore we can easily quantify the reduction in kWh by calculating the energy use based on the SEER or UEF rating of the old appliance to the new one. For estimating the passive energy savings from updating windows, insulation, and air sealing we pulled data from existing studies and reports from Energy. Gov, the Department of Energy, and the National Renewable Energy Laboratory. To translate the calculated energy savings into GHG emissions we relied upon data from market based emission factors from local electricity providers as well as standard emission factors from EPA resources such as the Wagon Wheel tool for co-pollutant estimates and EPA's Climate Leadership GHG Emissions Factor HUB for estimated GHG emissions for natural gas. 100 year IPCC 5th edition values were used to estimate carbon equivalency for methane and nitrous oxide.



A summary of the complete scope of proposed upgrades consists of:

Natural Gas Furnace to 22 SEER2 Ducted Heat Pump

Electric Furnace to 22 SEER2 Ducted Heat Pump

Zonal Electric Heat to 22 SEER2 Ducted Heat Pump

Gas & Electric water heater to UEF 3.0 Heat Pump Water Heater

Building Envelope Sealing and attic Insulation to R-49

Windows upgraded to a U value of 22 and Solar Heat Gain Coefficient of less than .5

Refrigerators and clothes dryers upgraded to energy star models, replacement of gas stoves with electric

2-3 Trees Planted at most properties

With an estimated 45-65% reduction in electricity consumption and complete conversion from natural gas energy to electricity, direct Greenhouse Gas emission reductions are estimated based on a 5 year implementation (33% of project scope per year after the first year of planning). Please see GHG Reduction Calculator for additional details. The estimates assume constant emission factors over time for the market based electricity and natural gas combustion.

2025-2030 Emissions Reduction Estimate 5,238.24 MTCO<sub>2</sub>e

### **Magnitude of GHG Reductions from 2025 through 205**

Based on the assumptions and resources outlined in section 2a related to the energy efficiency measures and conversion to GHG reductions the long term GHG mitigation impacts have been estimated. A lifetime impact of 15 years has been assumed based on the average lifetime of the equipment described above and taking into account the age of the building stock. As in the short term estimates, a rollout time frame of 5 years is assumed, upgrading 25% of the project scope per year with a 15 year expected lifetime.

The total GHG mitigation through 2050 is estimated to be 21,368.96 MTCO<sub>2</sub>e

### **Cost Effectiveness of GHG Reductions**

The cost to upgrade one unit within this project scope is estimated to be \$48,872. This cost includes labor and installation costs as well as the cost of equipment. To further stretch dollars, staff will be using additional funding from the Energy Trust of Oregon on qualifying upgrades to replace outdated appliances and procure additional energy saving items like programmable thermostats. This additional funding opportunity is not included in the cost effectiveness calculation but is noted here to demonstrate effective use of dollars to receive the largest impact to the residents.

At \$48,872 dollars per unit and with the near term GHG mitigation estimates described in section 2a the average cost effectiveness for the proposed project is estimated to be \$8,462.18 per MTCO<sub>2</sub>e in 2030 and \$2,074.36 per MTCO<sub>2</sub>e in 2050 (lifetime of the project scope). While this is more expensive than the PCAP Residential 2 strategy calculated, we believe the difference derives from their cost not including additional staff or the indirect overhead associated with execution.



## Documentation of GHG Reduction Assumptions

### GHG Emission Factors

#### Electricity

Emission factors are 2022 market based values for the region directly from electricity providers and estimated at 0.000199 MTCO<sub>2</sub>e/MWH

Emission factors are assumed to remain constant over time, implementation renewable electricity into local portfolios is not clearly established

#### Natural Gas

0.00533237 MTCO<sub>2</sub>e/therm

Emission factors are assumed to remain constant over time

Assumed 100% conversion of natural gas consumption to electricity consumption upon project completion

### Co-Pollutants (Natural Gas Combustion)

Ammonia - 20 lbs/E6FT<sup>3</sup>

Carbon Monoxide- 40 lbs/E6FT<sup>3</sup>

Nitrogen Oxides- 94 lbs/E6FT<sup>3</sup>

PM Condensable - 0.32 lbs/E6FT<sup>3</sup>

PM 10 Filterable - 0.2 lbs/E6FT<sup>3</sup>

PM 10 Primary (Filt + Cond) - 0.52 lbs/E6FT<sup>3</sup>

PM 2.5 Filterable - 0.11 lbs/E6FT<sup>3</sup>

PM 2.5 Primary (Filt + Cond) - 0.43 lbs/E6FT<sup>3</sup>

Sulfur Dioxide 0.6 lbs/E6FT<sup>3</sup>

Volatile Organic Compounds - 5.5 lbs/E6FT<sup>3</sup>

### Carbon Sequestration (Tree Planting)

2-3 trees will be planted at each upgrade location. Trees are assumed to take 5 years to reach full maturity and absorb 48 pounds of CO<sub>2</sub>e per mature tree per year. Addition of at least 1814 new trees in the urban canopy provides a carbon sequestration of 124. 84 MTCO<sub>2</sub>e after 5 years of planting.

Total carbon sequestration for 2025-2050 = 913 MTCO<sub>2</sub>e

Source: US Department of Agriculture <https://www.usda.gov/media/blog/2015/03/17/power-one-tree-very-air-we-breathe>

The basic assumptions of the project include the installation of each item listed in section 2a. The heating fuel type in each unit is known and the GHG mitigation estimates of shifting from gas to electric heat have a high level of accuracy assumed. The emissions factors for electricity are calculated using market based methodologies specific to the geography the units are located in. The electricity providers of individual units is not known, therefore the weighted average of electricity providers in the area still provides a high level of accuracy. A 45-65% reduction in energy consumption at each unit is based on all upgrades successfully being applied. This also assumes that the base level electricity consumption at each unit is

within the average range for single family and multifamily homes in the area. After estimating the total kWh saved we use the EPA Greenhouse Gases Equivalencies Calculator to translate energy savings directly into quantified GHG emissions. As discussed in previous sections the assumed timeline for GHG reductions implies a 5 year total implementation time for the project as well as a minimum 15 year expected lifetime on mechanical equipment upgrades, whereas the benefits from new windows, insulation, air sealing, and trees will long out last the mechanical equipment.

**Environmental Results**

Outputs:

- 907 heat pump space heaters (ducted & ductless units)
- 907 heat pump water heaters
- 7,256 (estimated) new U-22 windows
- 1,269,800 square feet (estimated) of interior space insulated
- 1814-2700 new trees

Outcomes:

Less air pollution, less energy consumption so less coal burned, reduced demand for natural gas, and more trees to combat warmer temperatures.

The following co-pollutant reductions are assumed for the project scope based on reduction in local natural Gas consumption. Co-pollutant emissions reductions were estimated using values referenced from the EPA Wagon Wheel Tool. Reductions values are in lbs.

Ammonia	3,507.35
Carbon Monoxide	7,014.70
Nitrogen Oxides	16,484.55
PM Condensable	56.12
PM10 Filterable	35.07
PM10 Primary (Filt + Cond)	91.19
PM2.5 Filterable	19.29
PM2.5 Primary (Filt + Cond)	75.41
Sulfur Dioxide	105.22
Volatile Organic Compounds	964.52

**Performance Measures and Plan**

The proposed performance measures to track, measure, and report our reductions in energy use and GHG emissions are pretty straightforward. Since all the documentation for the energy reductions resulting from our proposed measures are maintained by the public utility companies, we simply use each home’s monthly billing statements and records of consumption to track these changes. The Asset Management teams for each Housing Authority will receive copies of all utility billing for their properties for 2024 to establish a baseline of annual kWh and natural gas consumption for each residence, excluding months with vacancies. This information will be maintained in spreadsheets and submitted on a

regular basis to the Washington County Sustainability Coordinator for quantification and tracking. Our teams will continue recording each month's energy use through 2030 to document the lasting reductions in energy use, GHG emissions, and associated co-pollutants.

Each coalition member's Asset Management program is responsible for executing the scope of work for their portfolio of properties. Washington County however maintains ultimate control over the specific language contained in and approval of individual RFP's since, as the lead applicant, we execute financial oversight. All RFPs will be competitively bid with the lowest bidder awarded the contract provided the stipulated cost does not exceed the per unit cost estimate for the quantity specified as established in the budget. Each coalition member independently engages in a labor contract with the winning bidder(s). Washington County will track and account for the fulfillment of each labor contract within the designated time frame, providing reimbursements as requested. Since each coalition member currently has the authority necessary to implement these improvements on their properties no permission or outside approval is required. We anticipate a 2-3 month timeframe at the onset of the grant period to hire for the new positions necessary to support full implementation. Once these staff members are onboard and up to speed we will begin the assessment of each individual home in our housing portfolios. This assessment will result in a quantified scope broken down by implementation measure and county then further broken down by year with  $\frac{1}{3}$  of the properties completed every year for years 2, 3, & 4.

Right now we expect the implementation timeline will look like this:

- July 2024

- Upon notification of award each coalition member will begin the process of recruiting and hiring staff.

- October 2024 - July 2025

- Coalition members assess the individual needs of each qualifying property in their portfolio. This results in a quantified scope establishing the exact number and types of components required for implementation (e.g. number, size, and type of windows). 2024 Utility bills for each home are collected and recorded.

- August 2025

- RFPs issued for the first round of installations covering  $\frac{1}{3}$  of the 907 properties

- October 2025

- RFPs are awarded and labor contracts are signed by implementing County and contractor

- December 2025

- Installations begin

- Except for window replacements, all aspects of the active and passive measures can start implementation

- April 2026

- Scheduling for window installation begins

- June-August 2026

- First round of window installations

- August 2026

- Second round of RFPs are issued for installation of each scope element for another  $\frac{1}{3}$  of the properties

- October 2026

- RFPs are awarded for round two and labor contracts signed by implementing County and contractor.

- November 2026

First round of installations are complete, 33% of the full scope of work is complete and documentation for Energy Trust of Oregon incentives is submitted by each county PM to the Washington County PM.

- December 2026

Documentation of qualifying installations submitted to Energy Trust of Oregon by Washington County for financial incentives. Documentation for the first round of energy savings incurred by completed installations is calculated based on monthly utility bills. Second phase of installations begin.

- March 2027

First round of Energy Trust incentives received and distributed for appliance purchases in homes with completed installations

- April 2027

Scheduling for the second round of window installation begins.

- June-August 2027

Second round of window installations

- August 2027

Second round of RFPs issued for final 1/3 of the homes

- October 2027

RFPs are awarded and labor contracts signed by implementing County for final phase of installations.

- November 2027

Second round of installations are complete, 2/3 of the full scope of work is complete and documentation for Energy Trust of Oregon incentives is submitted by each county PM to the Washington County PM.

- December 2027

Documentation of qualifying installations submitted to Energy Trust of Oregon by Washington County for financial incentives. Documentation for the second round of energy savings incurred by completed installations is calculated based on monthly utility bills. The final phase of installations begins.

-March 2028

Second round of Energy Trust incentives received and distributed for appliance purchases in homes with completed installations.

- April 2028

Scheduling for the final round of window installation begins

- June-August 2028

Final round of window installations

- November 2028

Final round of installations is complete

- December 2028

Documentation of qualifying installations submitted to Energy Trust of Oregon by Washington County for financial incentives. Documentation for the final round of energy savings incurred by completed installations is calculated based on monthly utility bills.

- March 2029

Final round of Energy Trust incentives received and distributed for appliance purchases in homes with completed installations.

- November 2029

All appliance upgrades (refrigerator, clothing dryer, and gas stove where applicable) included in the expanded, leveraged scope are complete. Monthly November 2024 through December 2030, energy use at each home is documented and recorded for quantification of total energy, cost, and GHG reductions.

### **Low-Income and Disadvantaged Communities**

Our proposal exclusively benefits low-income and disadvantaged communities by directly targeting residents of Public Housing. As such, 68% of our properties are located in or adjacent to CEJST census tracts and 100% of the residents earn 60% AMI or less. The demographics specifically for Washington County Public Housing residents include:

68% BIPOC residents

25% experience a disability

65% make less than 30% of the local AMI

The Portland-Vancouver Metro area CEJST tracts impacted by our scope of work, along with the property's full address, are included in a separate spreadsheet file; "CEJST Census Tracts". While the majority of our scope of work will have an incredible impact on the individual residential units' energy efficiency and the residents' quality of life, our contribution to the urban tree canopy will directly impact the community at large. The addition of over 1,814 new trees will contribute to the creation of micro-climates creating cleaner air, cooler shade, and the absorption of around 40 tons of carbon from the atmosphere every year. Considering that the impacted CEJST tracts score very high for diesel particulate air pollution, tree planting is the most practical, cost-effective measure at our disposal to combat this risk factor. By adding a minimum of 1814 new trees to the urban canopy we are also helping to mitigate climate impacts and increase resilience to climate change by reducing the impact of the "urban heat island" effect. By reducing residential energy use and GHG emissions while also providing air conditioning to 907 homes, we are also helping to reduce the health impacts caused by exposure to extreme heat. As a benefit of reducing GHG emissions we also see a reduction in associated co-pollutants and ideally a reduction in asthma related health complications for our residents at large. All of this because we are improving the quality, comfort, and energy efficiency of our public housing.

Throughout the grant period and in years following, staff will continue to report on the estimated co-pollutant reductions from the items described in this application. The direct co-pollutant reductions described in section 3 will be identified for the scope of the project through the grant period. In pursuit of an outcomes based approach relevant benefits to pollution reduction will be reported on an annual basis through the grant period and in the following years. These metrics include but are not limited to, regional Air Quality Index (AQI) values for particulate matter and ozone and respiratory related ER visits and hospitalizations. These values will be reported in the hopes of demonstrating continued improvement in air quality and public health outcomes. While large regional variables exist in these metrics they continue to be signals of improvement for ongoing improvement projects such as those described in the scope of this grant. With improvements

scattered across a large Metro area and 2 states, the impact to regional metrics will likely be reduced and difficult to track. The goal of the proposed scope is to have a measurable impact on the energy efficiency and quality of life for our publicly owned housing and low-income tenants, prioritizing this over concentrated geographic efforts leads to a large but diluted impact that is more challenging to detect through typical channels.

In addition to the co-benefits of pollution reduction, the residents of upgraded buildings can expect to see reduced energy costs. The project scope focuses exclusively on publicly owned properties with low-income residents. A reduced energy burden provides numerous co-benefits related to quality of life, health outcomes, and economic growth. The metric of average energy costs for the units in the project scope will be tracked and reported annually for the grant period.

### **Community Engagement**

At the outset of the PCAP process Metro conducted a literature review of MSA-specific equity- and environmental justice-focused plans and documents to create a list of documented community priorities that are relevant to this grant to identify the climate action priorities that best support marginalized communities in the MSA. From there, the project team developed an engagement approach that focused on speaking with key non-government partners that are involved in parallel climate justice work to further develop the equity-related information included in this PCAP

The Housing Authority of Washington County values the input of our residents and participants, as well as low-income community members who may need our assistance in the future. Our advisory bodies include representatives of low-income households at several levels. Our Housing Advisory Committee bylaws specify that two members must be current low-income housing residents and recipients of our rent assistance. Our Housing Authority Board of Directors also includes one seat that is dedicated to a resident of public housing or a Housing Choice Voucher recipient. Additionally, we engage our Resident Advisory Board, which is entirely comprised of low-income households who are receiving some sort of assistance in our community. These advisory committees work in combination to advise the work of the Housing Authority. In particular, our Housing Advisory Committee was presented with information about this proposal during their March 2024 meeting. Feedback from the committee was supportive, recognizing the need for energy efficient upgrades in affordable housing. Due to the meeting schedule of our Resident Advisory Board, we will engage their input as part of the implementation process. Subrecipients will also plan to engage their resident boards as planning begins. Members of these committees live in the impacted areas and are deeply familiar with the needs for improvements. Committees may be asked to provide feedback and input on targeted geographical areas or individual initiatives. Moreover, committees will be asked to advise on the communication and engagement plans with residents, to ensure accessibility and trauma-informed communication.

Renovations and upgrades in resident units can often bring anxiety, even when the changes will result in improvements. The Housing Authority of Washington County has a dedicated Community Engagement Coordinator who closely reviews communication and engagement plans, with extra consideration for reading accessibility, language requirements and the lived experiences that may lead to feelings of instability or disempowerment in processes. As we move through implementation, we will execute an engagement plan that will include written communication (letters via US mail), posted

updates, site visits, resident meetings, individual outreach, and opportunities for feedback. Project managers and our Community Engagement Coordinator will work closely with residents to empower them in decision making and ensure they are informed and in partnership at each step.

### **Job Quality**

As lead implementer, Washington County has extensive experience with contracting, procuring and executing complex federally funded projects that support family-wage jobs for our trade partners working to build and rehabilitate our critical affordable housing infrastructure. The County is both a successful implentor and a key policy contributor for emerging and women, veteran and minority-owned small businesses. This includes a deep commitment to policy development with traditionally underserved communities.

Washington County has partnered with nine local/regional community-based organizations to provide workforce development services in the transition out of the COVID-era. These ARPA-funded services include employment training, career development, and wrap-around supports that connect residents to quality jobs. The services are focused on workers displaced by the pandemic and, with a centering of equity, tailored to communities that have been marginalized. Washington County has an on-going partnership with Worksystem's Inc—the regional workforce investment board—to provide career advancement opportunities for youth and young adults in the construction trades. This program is centered on a pre-apprenticeship program that prepares participants for entering the construction industry. They also submitted a letter of support for Washington County to accompany this application.

The County's Procurement team has an FTE who represents the regional Construction Career Pathways Program connecting Black, Indigenous, Latina/o/x and communities of color in the trades with opportunities in the construction industry within the County's procurement process and beyond. Washington County participates in the Results for America Good Jobs & Equity Project as fellows focusing on strengthening our supplier diversity program. The County received a \$25,000 dollar grant from Family and Workers Fund to complete a supplier diversity assessment, launching this Spring. Through our Lottery 156 dollars we support business support organizations as members and sponsors including Latino Built, Professional Business Development Group (PBDG), National Association of Minority Contractors (NAMC), Oregon Association of Minority Entrepreneurs (OAME), and the local area and culturally specific chambers of commerce to strengthen access for businesses to connect with government contracting. The County's Economic Development Program convenes the Washington County Small Business Support Network on a quarterly basis, including dozens of business support and workforce development organizations that support the local ecosystem of small businesses and workers, many who focus on government contracting. The County hosts the West Side Open House on an annual basis for small businesses to connect with contracting opportunities at local jurisdictions as well as small business support resources.

### **Programmatic Capability and Past Performance**

Below are four recent federal grants administered to Washington County that have been successfully implemented



Project Title: Coronavirus Relief Fund (US Treasury)

Assistance agreement number : SLT0208

Federal or non-federal funding agency and assistance listing number: 21.019

Brief description: Federal funding from the Coronavirus relief program assisted with expenditures including, but not limited to: the provision of grants to small businesses to cover lost revenue caused by mandated closures, establish temporary public medical facilities and other measures necessary to increase COVID-19 treatment capacity, care expenses for homeless populations, pandemic related unemployment insurance costs.

Contact from organization that funded the assistance agreement. (No specific Contact) <https://home.treasury.gov/policy-issues/coronavirus/assistance-for-state-local-and-tribal-governments/coronavirus-relief-fund> ;

Washington County successfully expended all of the \$104M provided under this award, while maintaining compliance with regularly changing guidance and reporting requirements. We were able to successfully meet demanding reporting deadlines of 7 days after-quarters-end. These funds were part of our Fiscal-year 2020-2021 Single Audit and no material weaknesses or significant deficiencies were found. The County successfully met all quarterly reporting requirements for this award, including the final close-out report submitted in July of 2022.

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Project title: Emergency Rental Assistance 1.0

Assistance agreement number: ERA0183

Federal or non-federal funding agency and assistance listing number: 21.023

Brief description: The ERA 1 Program funding assists eligible households with rent payments, rental arrears, residential utility/energy costs, and other relevant expenses related to housing and housing stability service costs. This funding also extends to residents of Affordable Housing.

Contact from organization that funded the assistance agreement. <https://home.treasury.gov/policy-issues/coronavirus/assistance-for-state-local-and-tribal-governments/emergency-rental-assistance-program>

The County was able to successfully expend over 99.85% of the \$18.1M in awarded funds within the period of performance, which ended Dec 2022. This grant had demanding spending and obligation requirements, which the county was able to successfully meet, as well as complicated demographic and financial data reporting requirements on monthly, and then quarterly bases. We were successful in our application for additional funds, receiving approximately \$175,000 additional funds (although we requested multiple million on 3 separate occasions) through this program's reallocation process; where other jurisdictions that did not meet the stringent obligation and expenditure deadlines had their award partially de-obligated through the reallocation process. This was part of our Fiscal Year 2021-2022 Single audit, where no significant deficiencies or material weaknesses were found. This grant has been closed out.

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Project title: Emergency Rental Assistance 2.0

Assistance agreement number: ERAE0090 & ERAE0402

Federal or non-federal funding agency and assistance listing number: 21.023

Brief description: The ERA 2 Program funding assists eligible households with rent payments, rental arrears, residential utility/energy costs, and other relevant expenses related to housing and housing stability service costs. This funding also extends to residents of Affordable Housing.

Contact from organization that funded the assistance agreement: <https://home.treasury.gov/policy-issues/coronavirus/assistance-for-state-local-and-tribal-governments/emergency-rental-assistance-pr>

The county has successfully expended 95% of the \$19M in funds from this agreement and expects to expend the remaining funds in the first half of Fiscal-Year 2024-25. As with the above ERA1 grant, we have maintained tight controls on internal and external partner operations for verifying eligibility, distributions of payment, documentation and data collection, and reporting. This program was part of our Fiscal Year 2021-2022 Single audit and no significant deficiencies or material weaknesses were found. We have been successful in meeting all of our expenditure and obligation requirements under this award to avoid having any reallocation, and have successfully completed all of the quarterly financial and demographic reports required so far. This award is still in progress so no final report has been submitted.

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Project title ARPA: Coronavirus State and Local Fiscal Recovery Fund

Assistance agreement number: SLFRP0228

Federal or non-federal funding agency and assistance listing number: 21.027

Brief description: SLRF funds will be used to (1) provide the necessary assistance for households, small businesses, nonprofits, and impacted industries such as tourism, travel, and hospitality in response to the negative impact of the COVID-19 public health emergency and subsequent negative financial repercussions. (2) Cover premium pay to eligible workers of the government performing essential work during the COVID-19 pandemic, or used to provide grants to eligible employers that have eligible workers who perform essential work. (3) Provide government services to the extent COVID-19 caused a reduction of revenues collected in the most recent full fiscal year of government operations. (4) Make necessary investments in water, sewer, or broadband infrastructure.

Contact from organization that funded the assistance agreement. (No Specific Contact) <https://home.treasury.gov/policy-issues/coronavirus/assistance-for-state-local-and-tribal-governments/state-and-local-fiscal-recovery-funds>

The County is continuing to administer the ARPA-SLFRF grant through our Board-authorized 2023-2026 work plan, and have currently expended approximately 40% of the \$116M in funds with approximately two and a half years left in the period of performance. We have successfully completed and closed out over 200 subaward/subcontracts under this award within over 70 sub-projects. The County has been able to successfully navigate the complex eligibility requirements, regularly changing guidance from US Treasury, and continued quarterly and annual reporting that requires detailed reporting for subawards/subcontracts with spending greater than \$50,000, with additional programmatic and progress data points also required for each project. This program was also part of our Single Audit in Fiscal Year 2021-2022 where no significant deficiencies or material weaknesses were identified. This program is still ongoing so we have not completed a final report on this yet.

## Staff Expertise

As the lead applicant, Washington County will administer the grant funding and manage the execution of the energy efficiency reduction measures outlined in the previous scope of work. The department directly responsible for managing the finances, budget, and implementation is the Housing Authority and their Asset Management team.

The Housing Authority of Washington County was formed on August 4, 1970, by the Washington County Board of County Commissioners, to provide affordable housing opportunities to help break the cycle of poverty and improve the quality of life in our community. The goal of the Housing Authority of Washington County is to provide decent, safe, and affordable housing for low-income families, veterans, elderly, disabled and homeless persons residing in Washington County.

The Board of Directors (HABOD), made up of the members of the Washington County Board of Commissioners, plus two additional members oversees all activity, policy, and strategy of the Housing Authority. The HABOD created a Housing Advisory Committee (HAC) to advise on affordable housing and related issues. The HAC consists of 15 volunteer members representing various interest groups. HABOD members are invited to attend any monthly HAC meetings and the annual forum held in October. Currently the Housing Authority owns and operates 244 units of Public Housing and over 600 units of Affordable Housing located throughout the County. The amount of rent the tenants pay is calculated based on income, usually about 30% of household adjusted income. There are approximately 1,850 people living in our affordable housing portfolio.

Washington County's Asset Management team is led by Leslie Johnstone, with supervisory support provided by Molly Rodgers and Jill Chen. Administrative and programmatic support is provided by Adriana Moran, Andrew Crampton, Laura Jackson, and a new staff member yet to be hired (all resumes are included in the attached Appendix).

Leslie Johnstone has over 30 years of experience in property and asset management, with 23 of those years exclusively working in affordable housing. With decades of experience developing budgets and contracts in the role of leasing agent, site manager, property manager, and asset manager, Leslie has had a hand in every type of residential real estate operations. Leslie's experience with contract execution spans the range from tenant leases through to the execution and management of capital improvement projects. She directly managed a \$1.5 million rehab on 100 units in Astoria, OR and smaller projects in the \$500-\$750,000 range that included the replacement of roofing, siding, windows, decks/stairwells, concrete, and interior remodels and exterior painting. A key part of contract management is the development and tracking of budgets, which Leslie knows firsthand. Along with contract execution, construction coordination, and budget tracking Leslie is also great at managing people and leading her team. To assist in the execution of this specific scope of work a new team member will be added and provided with the support and guidance necessary to successfully implement our energy efficient installations through construction coordination and budget tracking.

As previously described, the individual elements of our proposed scope of work all fall under standard maintenance and incorporate industry proven best practices. Our team knows how to manage and execute contracts for equipment upgrades and improvements for our properties, it's what Asset Management is all about. We aren't proposing any untested, risky, or difficult strategies for these energy efficient improvements, simply the intention to proactively implement them across our property portfolios within a few years.

## Budget and Timely Expenditure of Grant Funds

Budget Spreadsheet is included in a separate file

### Budget Detail

Our sole GHG reduction strategy focuses entirely on reducing the energy consumption and GHG emissions of our public and affordable housing stock by employing standard industry best practices . This strategy consists of 5 basic elements of execution as outlined in the project summary. The individual elements we plan to execute are broken down into quantified estimates and detailed in the accompanying budget spreadsheet. All of these implementation measures maintain continuity of expenses pertaining to staff, overhead, metrics, tracking, outreach, etc and as such these expenses are only presented as total annual costs, projected over 5 years.

The proposed implementation timeline, as described in Section 3.b., includes 1 year to hire new staff and assess each property individually, followed by 3 years of installations, with the 5th year held in reserve to allow us to resolve any scheduling issues or unforeseen events impacting execution.

### Personnel

Each participating Housing Authority will add 1, new FTE, Program Coordinator, to manage the execution of all 5 implementation measures across their qualifying property portfolio. Washington County will also dedicate .5 FTE of an additional Program Coordinator to manage the implementation of the grant itself, tracking each Housing Authority's progress and processing qualifying Energy Trust of Oregon incentives to fund the expanded scope. Each Housing Authority will also utilize the services of .3 FTE Financial Analyst to provide budgetary oversight and tracking, while Washington County will utilize an additional .3 FTE for purposes of grant administration and reporting. A (.5 FTE) Sustainability Coordinator will be paid by Washington County for tracking of emissions and reductions in energy use.

The expenses associated with recruitment and onboarding of new staff is listed in the attached Budget Spreadsheet as "administration overhead". As the recruitment of each new employee will stipulate the necessary knowledge and experience required of the position (construction coordination, contract administration, and residential energy efficiency) we do not expect the need for any further training or associated expenses.

A breakdown of responsibilities over 5 years for each Project Coordinator overseeing implementation for their portfolio of properties will look similar to this:

- ¼ of their time will be spent assessing units, quantifying scope, and planning for execution

- ½ of their time will be spent scheduling and managing contractors and verifying the work completed

- ¼ of their time will be spent on RFP review, contract administration, invoicing, and communication with the lead applicant for required reporting and progress meetings

These personnel costs will be part of the subaward provided to each subrecipient as outlined in our Intergovernmental Agreement. A breakdown of the subrecipient personnel costs are included in the budget spreadsheet. Direct personnel

costs incurred by the Lead Applicant, Washington County, for the five year implementation period including a 3% annual COLA increase are below:

Washington Project Managers (1.5 FTE)	\$ 874,965
Washington Financial Analyst (0.5 FTE)	\$ 306,594
Washington Sustainability Manager (0.5 FTE)	\$ 391,921
	<b>\$ 1,573,479</b>

#### Fringe Benefits

The fringe benefits for personnel paid by Washington County includes everything from a county issued cell phone, pension contributions, health insurance, life insurance, etc. These benefits are assessed at 43.6% of salary expenses and comes to a total five year cost of **\$686,811**

#### Contractual Expenses for Execution of Scope of Work

The full detailed breakdown of the individual costs for each element of the scope are included in the Budget spreadsheet. These estimates were then used to compile a total estimate for the full scope of work per implementing jurisdiction as detailed in the attached budget spreadsheet. While the subrecipients execute their own contracts and thus the associated costs are reimbursed as part of their subaward, for clarity of budget expenditures the details of those total costs are included below. The only contracts Washington County, as the lead applicant, will engage in directly is with the winner of each RFP issued by Washington County as necessary for execution of specified scope.

Specifications for each item to be purchased and installed through contract labor are included in section 1 of the Project Narrative and summarized below. Washington County will only provide contract oversight for subrecipients with reimbursement contingent upon approval of stipulated scope, amounts, and labor standards. Contract and labor standards stipulated by the EPA are addressed in section 5 of the project narrative and agreed upon by all parties in the intergovernmental agreement. Each contract will be awarded through a competitive RFP process with the lowest bidder awarded the contract provided the stipulated cost does not exceed the per unit cost estimate for the quantity specified. As the direct recipient, Washington County will issue and award RFPs directly for work on their portfolio of properties.

Each component of the scope can be executed as an independent contract, or combined with other elements of the scope for execution by the same contractor. Each implementing authority has the power to decide how best to contract and execute their designated scope of work with the intended pace of installations meeting or exceeding 33% a year.

Washington County will provide reimbursements for payments made on approved contracts, not to exceed the total sums allotted to each entity based on cost estimates included in the table above. For instance, this means that Clackamas County, with 98 gas furnaces in their portfolio of homes, will be allotted \$16,000 for each of the 98 new heat pump furnace replacements. The estimate of \$16000 covers all expected costs required to complete these installations (component

cost, labor, installation, materials). This comes to a total reimbursement for a single or multiple contracts not to exceed \$1,586,000 or \$16,000 per unit. Likewise, for the replacement of 32 existing ducted electric furnaces in their portfolio, Clackamas Housing Authority will engage in single or multiple contracts with the lowest bidder(s) for 32 ducted heat pump furnaces at a rate not to exceed \$15,500 each or \$496,000.

Contracts will cover the purchase and installation of:

- Heat Pump Ducted Furnace or Ductless Mini-Split Heat Pump with a SEER2 value of 32 and an HSPF2 value of 10
- Heat Pump Water Heater with a UEF value of 3 or higher
- Windows with a minimum U value of 22 (or lower)
- Insulation sufficient to meet current Oregon Residential Energy Code in either batt, rigid, or cellulose form. Insulation is generally layered to achieve required R values with cellulose blown in on top of batt or rigid laid on top of rigid - so the needs of each home will differ depending upon the home's existing conditions.
- Trees that are 3-5 years old and of native species, type to be specified by occupant from a list of approved options

Contracts also cover the removal and disposal of existing components (gas furnaces, old windows, etc) along with the materials and equipment necessary to complete the installation of the replacement. Since each home in our collective portfolio is different, the scope of work involved in the installation of each element will vary. For instance, a home with a gas furnace will require termination of the gas line and (potentially) additional ampage on the circuit supporting the new heat pump unit, whereas replacement of an electric furnace with a heat pump unit will only require physical labor and materials since the existing electrical circuit (typically) has enough ampage to operate the new unit. Another example is window replacement, for single story homes window replacement does not necessitate scissor lifts or other equipment required for access, unlike a 3-4 story multi-family building where access to upper level windows will require the use of a scissor lift or other such equipment. Since windows must be replaced from the exterior of the residence each replacement will involve removal and replacement of exterior cladding. Again, this will vary from home to home as some homes may have brick cladding while others have siding or stucco. As such a definitive description of each installation is not feasible provided the inconsistent conditions of each residence. Summary versions of general conditions are provided instead.

#### Heat Pump Furnace Installations:

Removal and disposal of existing furnace. Installation of new heat pump furnace and associated wiring or electrical upgrades. Termination of gas line where necessary. This should take no more than 3-6 hours

#### Heat Pump Water Heater Installation:

Removal and disposal of existing water heater. Installation of new heat pump water heater and associated wiring or electrical upgrades as necessary. Termination of gas line where necessary. This installation should not take more than 2-5 hours.

#### Window Installation:

Removal and disposal of existing windows. Installation of new windows, reinstallation of exterior cladding. The timeframe

for new window installation at a scattered site residence can be completed in 1-2 days provided the weather cooperates. For our multi-family properties this can take up to 2 weeks depending upon the number of residences.

#### Insulation & Air sealing

The execution of this element of the scope involves several different components, including but not limited to: caulking of exterior walls, installation of weather stripping, installation of door sweeps, sealing of all ducts and seams of exterior vents. The additional installation of insulation in the attic, sub-floor, and walls is included in this contract scope. Unless the existing insulation is determined to be asbestos it's not necessary. During this process the contractor will also verify the existence of a continuous vapor barrier covering any exposed earth in the crawl space along with verification of exterior termination of all vent hoses in the attic. Depending upon the size and full extent of work required per residence the full installation time can take up to two days.

#### Trees

The planting of 2 trees at each property can be accomplished within 2 hours and requires minimal equipment.

Anticipated direct contract amounts for scope execution by Washington County shall not exceed:

408 Ducted Heat Pumps	NTE \$ 6,402,000
54 Ductless Heat Pumps (36 homes)	NTE \$ 1,809,000
444 Heat Pump Water Heaters	NTE \$ 2,400,000
444 Homes insulated & Air Sealed	NTE \$ 3,934,000
3,552 Window Replacements	NTE \$ 8,524,800
888 Trees	NTE \$ 133,200
Total Contracted Installation & Labor Costs for execution of scope	<b>NTE \$22,105,000</b>

#### Subawards

##### Indirect Costs

As a governmental entity with more than \$35M in direct Federal Funding each year, Washington County is exempt from the 10% de minimis rate for indirect charges. This means we use our internal allocation plan to establish an indirect personnel cost per county department. Washington County Housing Department has a Cost Allocation Mechanism to spread its admin and overhead costs to programs and funds under its supervision. To do this, the department takes stock of all expenses within the admin program that benefit more than one program, and distributes those costs based on personnel cost distribution of all other Housing programs and initiatives.

The indirect rate is the ratio of total amount of costs to recoup and personnel costs associated with project implementation, which in this case comes to 26% or \$.26 of every \$1.

Our total Indirect costs associated with personnel to administer this grant is calculated at a five year total of **\$587,674**



## Subawards

Per EPA's Subaward Policies as outlined in 2 CFR 200.332, the total amount of each subaward issued by Washington County to the coalition members is detailed below. The total subaward is comprised of two reimbursable parts, one subaward to cover personnel, administration, indirect, and overhead expenses, while the remaining funds are reimbursed contingent upon approval of contract expenses required for scope execution. A copy of the intergovernmental agreement stipulating terms and conditions of the subaward as executed by Washington County and agreed to by each subrecipient will be provided by the July deadline.

Adding personnel and indirect expenses ontop of the direct implementation costs, detailed on the previous page, brings the total reimbursable subawards for the subrecipients to:

Contract amounts reimbursed to sub-recipients for execution of scope:

### Clackamas Housing Authority

130 Ducted Heat Pumps	NTE \$2,082,000
145 Heat Pump Water Heaters	NTE \$882,500
23 Ductless Heat Pumps (15 homes)	NTE \$218,500
145 Homes insulated & air sealed	NTE \$1,595,000
1,160 Window replacements	NTE \$2,784,000
290 Trees	NTE \$43,500
<hr/>	
Total Reimbursable Installation & Labor Costs	<b>NTE \$7,852,750</b>
Personnel costs	NTE \$ 687,117
<hr/>	
Maximum Reimbursible Subaward	<b>\$ 8,539,867</b>

### Vancouver Housing Authority

318 Ducted Heat Pumps	NTE \$4,929,000
318 Heat Pump Water Heaters	NTE \$1,930,000
2,544 Window replacements	NTE \$6,105,600
318 MF Homes insulated & air sealed	NTE \$1,908,000
636 Trees	NTE \$95,400
<hr/>	
Total Reimbursable Installation & Labor Costs	<b>NTE \$14,986,000</b>
Personnel Costs	NTE: \$ 659,721
<hr/>	
Maximum Reimbursable Subaward	<b>\$ 15,645,721</b>

## **Expenditure of Awarded Funds**

Designated subrecipients will sign binding contracts that enumerate program requirements. HAWC will monitor the subrecipients for compliance with specific program requirements, including applicable federal requirements, such as potential conflicts of interest, workplace safety, and Davis-Bacon. In addition, HAWC will provide oversight of general management, performance goals, financial management, data collection and reporting, contractor eligibility determinations,

nondiscrimination, program outreach, timely reporting, coordination with other programs, and inspection of completed units. Monitoring will consist of both desk and on-site reviews. On-site reviews will consist of periodic site visits which will include an in-depth review of proposed installations and contractor agreements. Desk monitoring of submittals includes a review of contractual commitments, financial documentation, determination of cost eligibility, drawdown rates, and outcome/performance measurement review.

Through on-site and desk monitoring, the reviewer can determine whether the subrecipient's performance meets program requirements and improve performance by providing guidance and making recommendations if necessary. The specific purposes of monitoring are to:

- Validate the accuracy of information presented by the program participants;
- Follow-up on problems identified during the monitoring visit;
- Determine compliance for specified installations
- Evaluate the reasonableness of judgments made for those activities that necessarily involve high levels of program participant judgment;
- Ascertain the Sponsor's ability to ensure that activities carried out meet compliance requirements;
- Verify the accuracy of the program's records; and,
- Identify apparent causes of any problem(s) and offer recommendations for corrective actions.

HAWC Asset Management staff views monitoring as an ongoing process involving continuous communication with the sub-recipient and evaluation of financial records. Such a process involves frequent telephone/email contacts, written communications, analysis of reports and invoices, and periodic meetings as needed. It is the responsibility of HAWC staff to stay fully informed concerning subrecipient's compliance with program requirements and the extent to which technical assistance is needed. The overriding goal of monitoring is to determine compliance, prevent/identify deficiencies and design corrective actions to improve or reinforce subrecipient's performance. As part of this process, HAWC staff must be alert for fraud, waste and mismanagement or situations with potential for such abuse. Where possible, any identified deficiencies in need of corrective action will be handled through discussion, negotiation, or technical assistance in a manner that maximizes local discretion. Monitoring also provides opportunities to identify subrecipient's accomplishments as well as successful management, implementation, and evaluation techniques that might be replicated by other programs.

Establishing implementation timelines and review of annual RFP's will ensure that the anticipated 33% of each portfolio is on track to be completed each year.

### **Reasonableness of Costs**

All costs outlined in our estimates for installations and personnel expenses are well within the definition of "ordinary and necessary". The installations specified are standard residential upgrades and do not involve any untested, experimental, or unorthodox methods. To obtain the estimates for the purchase and installation costs we broke down each component based on what was being replaced and the quantity necessary for each home. We then conducted local market research by calling independent contractors and collecting estimates for single unit installations for each component. With that said,

we do acknowledge that our window installation estimates do not reflect actual costs of each home as at this phase we do not know the exact size, number, or location (which floor) of each window. We have used our best efforts to create an estimate inclusive of the cost of removal and disposal of old windows, equipment needed to access windows above the ground floor, and labor and materials required for repair of exterior cladding due to window replacement.

All personnel costs are derived from actual current costs for those exiting positions and their indirect and overhead expenses based on internal provisionary rates from our allocation plans.

## APPENDICIES INCLUDED

A - Portland Vancouver Metro PCAP

B - Technical Appendix

C - Washington County Staff Resumes

D - Letters of Intent

E - Letters of Support

## SPREADSHEETS INCLUDED

Budget Detail

Emissions Calculator

CEJST Addresses

Appendix A  
Portland-Vancouver-Hillsboro  
Metro Area PCAP



**DRAFT PRIORITY CLIMATE ACTION PLAN**  
**Portland-Vancouver-Hillsboro, OR-WA Metropolitan**  
**Statistical Area**

February 2024

EPA grant agreement #02J36101

## ACKNOWLEDGMENTS

### Metro project team

This PCAP was prepared by Oregon Metro for the EPA’s Climate Pollution Reduction Grant program, including the following staff:

- Eliot Rose, Senior Transportation Planner, CPRG Project Manager
- André Lightsey-Walker, Associate Transportation Planner
- Kim Ellis, Principal Transportation Planner
- Molly Cooney-Mesker, Communications Manager
- Lakeeyscia Griffin, Senior Public Affairs Specialist
- Dana Visse, Climate Analyst
- Luis Sandoval, Principal Solid Waste Planner

### Consulting team

Good Company (a division of Parametrix) is a sustainability consulting team based out of Eugene, Oregon. Of the Good Company team, Tracy Lunsford served as project manager, research analyst, and coauthor of this report. Claudia Denton, Beth Miller, Louisa de Heer, Grace Kaplowitz, and Suzy Godber served as project researchers, analysts, and coauthors. Chad Tinsley provided GIS and mapping support. Josh Proudfoot served as principal-in-charge and provided project oversight.



JLA is a public involvement firm located in the greater Portland region and provided significant support in conducting engagement with both community and agency partners as well as developing the outreach strategy. Jessica Pickul served as the engagement lead for Oregon and Adrienne DeDona served as the engagement lead for Washington.





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## ACRONYMS AND ABBREVIATIONS

Acronym or Abbreviation	Definition
ATIIP	Active Transportation Infrastructure Investment Program
BPA	Bonneville Power Administration
BIPOC	Black, Indigenous and people of color
C2P2	Construction Career Pathways Program
CBEI	Consumption Based Emissions Inventory
CAP	Climate action plan
CCA	Climate Commitment Act
CCAP	Comprehensive Climate Action Plan
CEJST	Climate and Economic Justice Screening Tool
CFEC	Climate Friendly and Equitable Communities
CIG	Capital Investment Grants program
CMAQ	Community Multiscale Air Quality
CPRG	Climate Pollution Reduction Grants
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transportation Administration
GHG	Greenhouse gas
HCT	High capacity transit
HVAC	Heating, ventilation, and air conditioning
IMI	Integrated Mobility Innovation
LIDAC	Low Income Disadvantaged Communities
MPO	Metropolitan planning organization
MSA	Metropolitan statistical area
MT CO <sub>2</sub> e	Metric tons of carbon dioxide equivalent
DEQ	Oregon Department of Environmental Quality
ODOE	Oregon Department of Energy
OSES	Oregon Statewide Energy Strategy
PCAP	Priority Climate Action Plan
PGE	Portland General Electric
RFFA	Regional flexible funding allocation
RTC	Southwest Washington Regional Transportation Commission
RTP	Regional transportation plan
SEI	Sector Based Emissions Inventory
SRTS	Safe routes to school
STBG	Surface Transportation Block Grant program
TOD	Transit-oriented development
USDA	U.S. Department of Agriculture
VMT	Vehicle miles travelled

## EXECUTIVE SUMMARY

Climate change is the defining global challenge of the twenty-first century. And as the recent increase in climate-induced wildfires and extreme weather events has demonstrated, it is likely to have significant impacts on the Portland-Vancouver-Hillsboro, OR-WA, Metropolitan Statistical Area MSA (MSA). The MSA includes seven counties (Clark and Skamania Counties in Washington and Clackamas, Columbia, Multnomah, Washington, and Yamhill Counties in Oregon).

The CPRG program, and particularly this PCAP, are focused on “expeditious implementation of investment-ready policies, programs, and projects.” This PCAP reflects this focus on implementation-ready climate measures. Cities, counties, and regional agencies across the MSA have conducted exhaustive climate planning, and Metro drew on 15 adopted or in-progress plans in creating this PCAP. This abundance of existing plans means that there is no shortage of ideas about how public agencies in the MSA can use their existing authority to dramatically reduce GHG emissions.

Metro developed this PCAP based on a strong foundation of established climate action planning and implementation in the MSA. Over the past two decades, agencies in the MSA have collaborated across all levels of government to reduce GHG emissions. As part of this PCAP, Metro conducted an MSA-wide community GHG inventory. The priority measures primarily address the sectors with the highest contributions to community-level emissions and that are within the unique role that local and regional agencies in the MSA play in reducing GHG emissions. This PCAP contains nine priority strategies to reduce GHG emissions, shown in Table 1, that support, rather than duplicate, state-level programs and policies.

**Table 1: Priority Climate Action Plan strategies**

<b>Transportation</b>
Trans-1: Implement high-capacity transit across the metropolitan area
Trans-2: Redesign streets and infrastructure to reduce delays for transit vehicles
Trans-3: Expand transit signal priority
Trans-4: Expand bicycle and pedestrian network
Trans-5: Expand use of parking pricing
Trans-6: Expand the use of clean fuels in the region’s transit fleets
<b>Commercial and Residential Buildings</b>
Res-1: Expand existing residential energy efficiency retrofit programs, with a focus on low-income households
Res-2: Fund additional energy efficiency measures in publicly funded, newly constructed affordable housing units
<b>Materials and Waste Management</b>
Waste-1: Expand the availability of residential composting programs

Implementing the measures included in this PCAP is anticipated to result in a broad range of co-benefits, including air quality improvements, improved public health outcomes, economic benefits, and increased climate resilience. Through review of community-based equity- and

environmental justice-focused plans and engagement with community partners, Metro also designed the priority measures to intentionally benefit low income and disadvantaged communities (LIDACs).

Local agencies with the capacity and existing level of planning required are preparing CPRG implementation grant applications related to the measures identified in this PCAP. More planning funds in the region could help support more local agencies to complete the comprehensive planning necessary to participate more fully in future implementation grants.



## 1. INTRODUCTION

Climate change is the defining global challenge of the twenty-first century. As the recent increase in climate-induced wildfires and extreme weather events has demonstrated, it is likely to have significant impacts on the Portland-Vancouver-Hillsboro, OR-WA, Metropolitan Statistical Area (Portland-Vancouver MSA). Both Oregon and Washington have adopted statewide climate targets that call for agencies at all levels of government to significantly reduce greenhouse gas (GHG) emissions, and local and regional agencies in the MSA have created plans and implemented projects to help meet these targets. Many of these efforts are already reducing emissions, and in the process, providing insights about how local and regional agencies can achieve deeper GHG emissions reductions in the future. Though agency partners have more ideas than ever about how to best reduce GHG emissions, there simply have not been enough resources available in the MSA to implement all of these ideas and achieve the transformative changes that are necessary to meet state and regional targets. The U.S. Environmental Protection Agency (EPA) Climate Pollution Reduction Grant (CPRG) program provides an opportunity to identify and fund implementation-ready projects that will accelerate progress toward meeting state, regional, and local climate targets.

Metro collaborated with agency and community partners from across the MSA to produce this Priority Climate Action Plan (PCAP). This PCAP identifies GHG emission-reduction measures that significantly reduce emissions, provide co-benefits such as improved health and safety, can be readily implemented by local agency partners, and are aligned with federal and state climate funding sources.

This project has been funded wholly or in part by the United States Environmental Protection Agency (EPA) under assistance agreement 02J36101 to Metro. The contents of this document do not necessarily reflect the views and policies of the EPA, nor does the EPA endorse trade names or recommend the use of commercial products mentioned in this document.

The measures contained herein should be construed as broadly available to any entity within the geographic scope of this PCAP eligible to receive funding under the EPA's CPRG Implementation Grant General Competition and other funding streams, as applicable.

### CPRG overview

The EPA CPRG Planning Grants are noncompetitive, 4-year planning grants that fund states and metropolitan areas to create plans that meet the following criteria:

- Significantly reduce GHGs and offer other co-benefits
- Can be readily implemented by agency partners
- Are aligned with federal and state climate funding sources

Metro is leading an EPA CPRG Planning Grant on behalf of the MSA. This grant will help Metro and other public agencies in the MSA create a plan that identifies near-term, high-impact

opportunities to reduce GHG emissions. Under the CPRG Planning Grant, Metro will produce two plans:

1. This PCAP, due March 1, 2024, that identifies high-priority, implementation-ready GHG emission-reduction actions that can be funded with available resources including CPRG Implementation Grants that EPA is making available to public agencies across the United States, with applications due on April 1, 2024.
2. A Comprehensive Climate Action Plan (CCAP), due late summer 2025, that includes a comprehensive inventory of GHG emissions for the MSA and a broader set of measures to reduce emissions.

## PCAP overview and definitions

This PCAP is organized into the following sections.

**Greenhouse gas emissions inventory.** The community GHG inventory follows internationally recognized community GHG inventory protocols and the processes and requirements laid out in Metro's Quality Assurance Project Plan for this grant. The inventory accounts for all significant sources of GHG emissions driven by activities taking place within the MSA's geographic boundary. All results are reported in metric tons of carbon dioxide equivalent (MT CO<sub>2e</sub>).

**GHG emission projections and targets.** This section describes the current climate policy landscape, including state and regional climate policies that impact the local agencies represented in the MSA. Both the states of Oregon and Washington are leaders in addressing climate change, and they have developed aggressive targets for emissions reductions, which are described in this section.

**Priority measures.** Priority measures included in this PCAP are organized in this section by sector (including transportation, commercial and residential buildings, and waste and materials management). This section also covers the following information for each priority measure:

- Description
- GHG reductions
- Cost-effectiveness of GHG reductions
- Co-pollutant reductions
- Implementing agencies
- Extent of implementation
- Implementation milestones
- Potential metrics for tracking progress
- Intersection with other funding
- Alignment with community priorities
- Low-income and disadvantaged community benefits analysis

**Co-benefits analysis.** Implementing the measures included in this PCAP is anticipated to provide a broad range of benefits. The co-benefits section details the anticipated co-benefits associated with implementing the priority measures including air quality improvements, improved public health outcomes, economic benefits, and increased climate resilience.

**Low-income and disadvantaged community (LIDAC) analysis.** In addition to the measure-by-measure review of LIDAC benefits, this section describes MSA-wide considerations and impacts to LIDAC communities.

**Review of authority to implement.** This section describes the current local and regional agency statutory and regulatory authority to implement all priority measures in the MSA.

**Workforce planning analysis.** This section summarizes key programs that are already underway in the MSA that can support the local and regional agencies with equitable workforce planning efforts to implement the measures in this PCAP.

**Coordination and Outreach.** The framework for intergovernmental coordination and engagement and outreach with community partners in the development of this PCAP is outlined here.

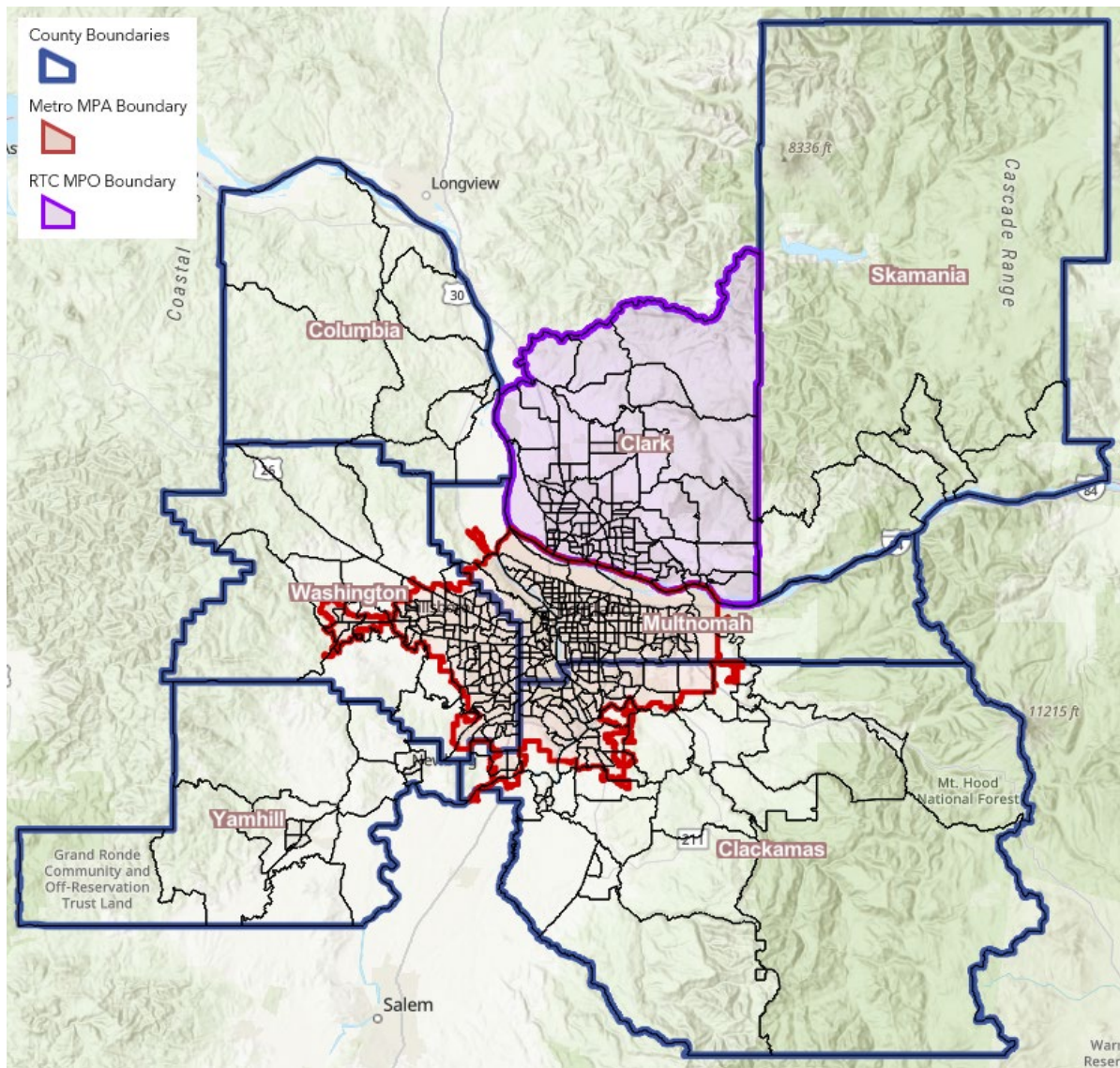
**Next Steps.** This PCAP is the first phase of the CPRG Planning Grants. Future planning for the CCAP is described in this section.

**Appendix.** This section describes the public agency and community action plans consulted to identify priority measures, methods and assumptions used for the GHG inventory, GHG emission reductions, cost estimates, co-pollutant changes from priority measures, and community engagement approach.

## Scope of the PCAP

The geographic scope of this PCAP is the Portland-Vancouver-Hillsboro, OR-WA MSA. The MSA includes seven counties (Clark and Skamania Counties in Washington and Clackamas, Columbia, Multnomah, Washington, and Yamhill Counties in Oregon), as shown in Figure 1, and over 50 cities.

**Figure 1: Portland-Vancouver-Hillsboro, OR-WA MSA boundaries**



## Approach to developing the PCAP

### Stakeholder engagement

Metro developed this PCAP by building on a strong foundation of established climate action planning and implementation in the MSA. The project team reviewed published community climate action plans, GHG analyses, and related planning documents, and involved interested individuals, agencies and organizations throughout the planning process.

The project team convened a self-nominated Climate Partners' Forum consisting of lead climate staff from local, regional, and state agencies and organizations throughout the MSA. The forum provided input on the following throughout development of this PCAP:

- Source material for this PCAP, such as relevant climate action plans and potential groups to engage.
- The screening process that Metro used to identify the measures to be included in this PCAP.
- Shared data and information to help correctly describe the measures in this PCAP.
- Interim technical memos at key points in the development of this PCAP.

Additionally, the team conducted outreach to agency partners through standing local and regional technical and policy committee meetings and convened non-agency partners and community groups focused on regional transportation and land use, equity, energy efficiency programs, and clean energy workforce development to seek input on this PCAP. This engagement is described in detail in the Coordination and outreach section.

### **Local climate action plans and comprehensive plans**

The MSA has a significant body of completed climate planning that was used to inform this PCAP. Eight cities in the region have climate action plans (CAPs). Multnomah and Clackamas counties, Metro, TriMet, and the Oregon Department of Transportation (ODOT) have adopted CAPs that affect large portions of the MSA. Additional plans covering key sectors such as transportation, waste, and energy also include relevant climate strategies. A summary of jurisdictional CAPs and additional plans consulted in the region can be found in Appendix 1. Public agency and community plans consulted.

### **Selection of priority measures**

The project team created an initial action list that included all potential actions from the climate action plans, strategies and frameworks developed by agency partners within the region. This initial list included more than 700 ideas from the different plans reviewed. After consolidating common actions that were duplicated across different plans and filtering out those that did not meet EPA's basic eligibility criteria, the team was left with roughly 50 measures, which were then screened in more detail. This screening process is summarized here and discussed in more detail in Appendix 4. Summary of the GHG reduction measure screening process.

This PCAP is an action-driven plan that highlights the measures that best reduce GHG emissions, are ready for implementation, and address co-benefits and other issues that EPA and other agencies take into account when awarding funds for climate projects. This plan focuses on projects that meet the following basic eligibility criteria from EPA's CPRG implementation grants, and measures from partner agency CAPs that did not meet these criteria were excluded from the more detailed screening:

- Are well documented in existing plans.
- Can reduce GHG emissions within 5 years.
- Are detailed enough to estimate potential GHG reductions and costs with work plans already in place.

- Are within the authority of public agencies in the MSA to implement.
- Have a clear lead applicant with the capacity to develop an application.

After this initial review of local plans, the team consulted the CPRG Planning Grant requirements and Implementation Grant evaluation criteria to develop more detailed screening criteria. This screening did not address all these requirements and evaluation criteria because several of those criteria—including those related to equity, project costs, and past grantee performance—depend upon the specific agency partners, communities, and investments covered by the application in question. This PCAP identifies measures at the MSA or subregional scale, so this screening exercise focused on the criteria that could be assessed at that scale:

- **GHG reduction readiness.** Level of definition of specific features, tasks, or milestones associated with the measure, as well as costs, roles, responsibilities, or timelines associated with each feature, task, or milestone.
- **Quantifiable GHG reductions.** Existence of a sound methodology and research to quantify the GHG reductions from this measure based on the information available.
- **Potential GHG reductions.** Sufficient detail in source CAPs and existing methodologies for quantifying GHG reductions in these plans.
- **Cost-effectiveness.** Ability to calculate cost-effectiveness for each measure.
- **Scalability.** Potential to scale the measure appropriately to benefit multiple agencies or communities within the MSA based on the extent to which each measure is captured in multiple local CAPs or in regional plans that represent collaboration among local partners. The team also considered input from the Climate Partners' Forum on priorities for their respective communities.
- **Co-benefits.** Documented co-benefits (either in research or in source CAPs) related to health, safety, air quality, resilience, and workforce development.

### **Community priorities supported by the PCAP measures**

Equitable engagement and climate justice are cornerstones of the many local and regional CAPs that are the sources of the measures in this PCAP. At the outset of the PCAP process, the team conducted a literature review of MSA-specific equity- and environmental justice-focused plans to create a list of documented community priorities that are relevant to this grant. The following community priorities are affirmed repeatedly in these documents and are supported by the measures in this PCAP:

- Transportation access and affordability (public transit, access to information, Wi-Fi, and transcreation of information or outreach materials).
- Building decarbonization, energy efficiency, electrification, weatherization, and reducing the energy burden.

- Minimizing health impacts to Black, Indigenous, and People of Color (BIPOC) and vulnerable populations (including those related to air toxics, extreme weather, ensuring food security, healthcare access, walkability, and traffic safety).
- Housing justice (climate-resilient infrastructure, access to affordable housing, anti-displacement/gentrification).
- Community resilience and partnership-building.
- BIPOC economy-building and workforce development opportunities.
- Environmental justice (mitigation and adaptation) within vulnerable areas, emergency preparedness.
- Education (youth education, multilingual materials and outreach, energy efficiency education, internet access).
- Tree canopy and access to parks and green space.

See Appendix 1. Public agency and community plans consulted for a complete list of the equity and environmental justice plans the team consulted and the priorities identified for their communities.



## 2. GREENHOUSE GAS EMISSION INVENTORY

Metro has developed a community greenhouse gas inventory of priority sources of emissions. The inventory follows internationally recognized community GHG inventory protocols and accounts for all significant sources of GHG emissions driven by activities taking place within the MSA’s geographic boundary, which includes Clackamas, Columbia, Multnomah, Washington, and Yamhill Counties in Oregon, and Clark and Skamania Counties in Washington. All results are reported in annual metric tons of carbon dioxide equivalent (MT CO<sub>2</sub>e). Full methodology details can be found in Appendix 2. Greenhouse Gas Inventory methodology.

Metro’s inventory includes the sectors and greenhouse gases summarized in Table 2:

**Table 2: Sectors and greenhouse gases included in this inventory**

Sectors	Greenhouse Gases (across all sectors)
Building Energy (commercial, residential, industrial)	carbon dioxide (CO <sub>2</sub> )
Transportation	methane (CH <sub>4</sub> )
Waste and materials management	nitrous oxide (N <sub>2</sub> O)
Wastewater	fluorinated gases (F-gases), including
Industrial Processes and Refrigerants (IPPU)	hydrofluorocarbons (HFCs), perfluorocarbons
Agriculture	(PFCs), sulfur hexafluoride (SF <sub>6</sub> ), and nitrogen
	trifluoride (NF <sub>3</sub> )

Metro’s community GHG inventory categorizes emissions sources using [Greenhouse Gas Protocol’s](#) Global Protocol for Community-Scale GHG Emission Inventories (GPC), which is slightly different from the classification laid out by the EPA. The classification presented here is consistent with past inventories in the region.

**Building Energy.** Emissions from energy used or produced in a fixed location, e.g., electricity, natural gas (including fugitive emissions), propane, and fuel oil. This includes the EPA’s categories of **electricity use and generation**, **commercial and residential buildings** (only energy usage, not waste or refrigerants), and **industrial energy use** (but not non-energy industrial emissions). This category also includes CH<sub>4</sub> emissions from natural gas distribution hubs.

**Transportation Energy.** Emissions from vehicles and mobile equipment. This is similar to the EPA’s **transportation** category, but it excludes vehicle refrigerants.

**Waste and Wastewater.** Landfilled waste emissions and wastewater treatment emissions. This includes EPA’s **waste and materials management** and **wastewater** categories.

**Industrial Process & Refrigerants:** Emissions from refrigerants and other fugitive gases from industrial processes. This coincides with EPA’s **commercial, residential, and industrial buildings** refrigerant use as well as non-energy **industrial** activity such as silicon chip manufacturing.



**Agriculture.** Emissions from livestock. This coincides with EPA’s **agriculture** category. Note that land use and forestry emissions would normally be included here, but these emissions have been excluded to better align with the state’s inventories and Metro’s implementation authority.

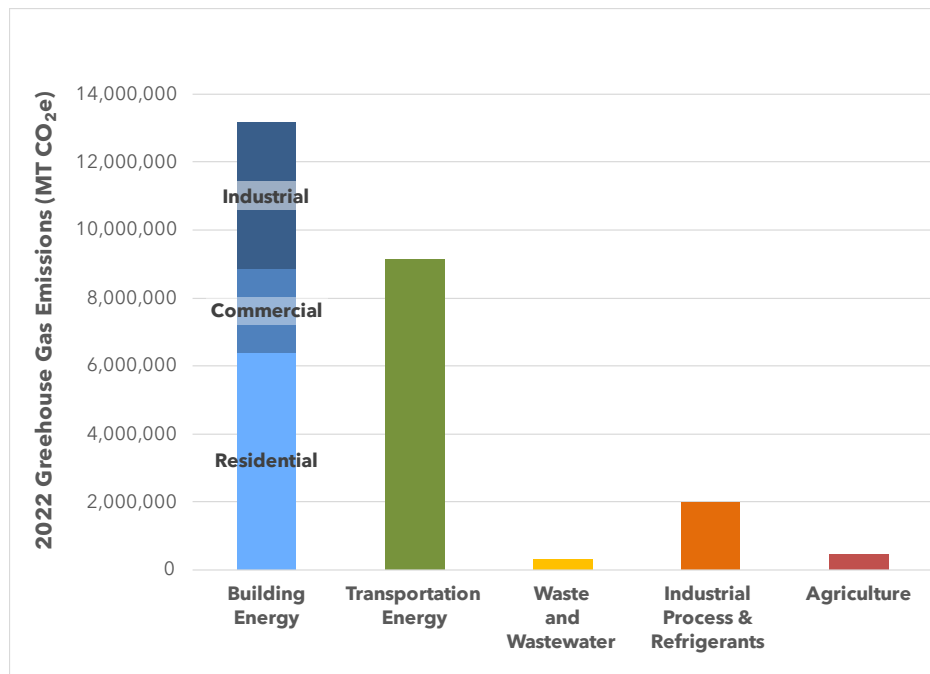
There was no existing MSA-wide inventory, so the following data are from a combination of GHG inventories within the MSA geography:

- State of Oregon 2021
- Washington County, OR 2022
- Clackamas County, OR 2019
- Multnomah County, OR 2020
- The City of Vancouver, WA 2019
- Lane County, OR 2019 (proxy for electricity use in counties without inventories)
- EPA FLIGHT
- USDA Census of Agriculture (2017)

## Results

In all, the 2.5 million residents of the seven counties in the MSA are responsible for 25,391,987 MT CO<sub>2</sub>e of emissions per year. Total GHG emissions in each of the categories described above are shown in Figure 2.

**Figure 2: MSA emissions by category**



This inventory also reports the emissions from each county, as shown in Figure 3. Multnomah County represents the largest source of emissions, and it is also the most populous.

**Figure 3: Emissions by county and sector**

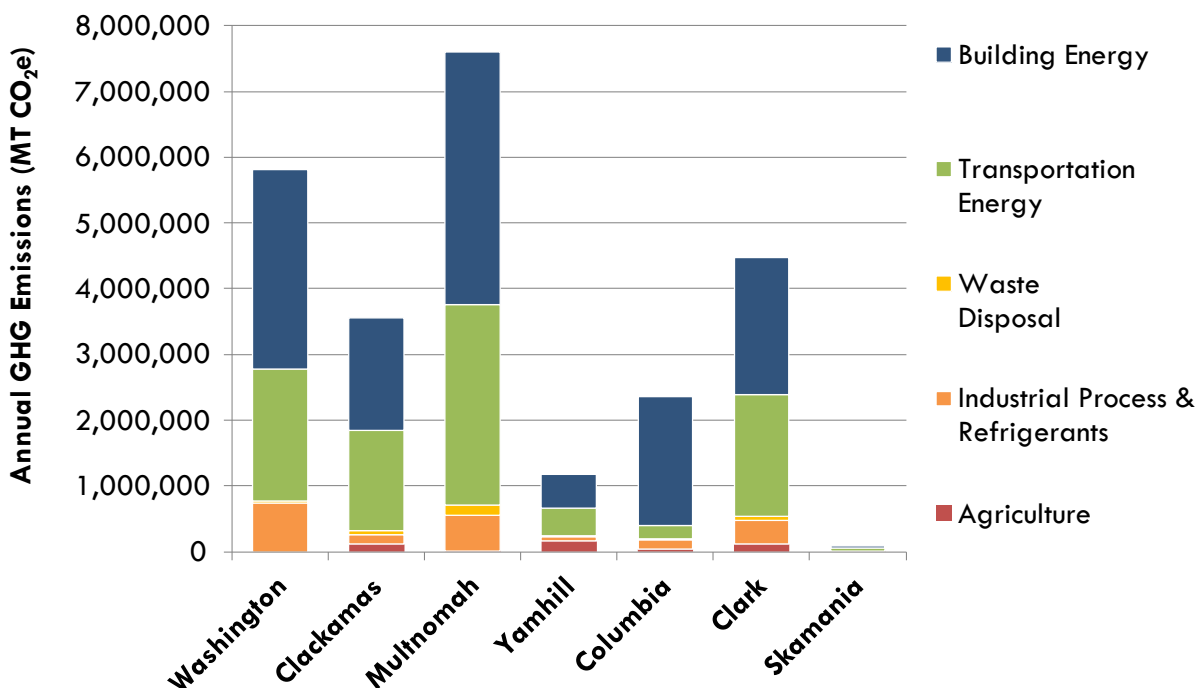


Table 3 provides detailed emissions values by sector for each county.

**Table 3: Detailed emissions data by category and county**

Geographic Information		Emissions (MT CO <sub>2</sub> e)					
County	Population	Building Energy	Transportation Energy	Waste	Industrial Process & Refrigerants	Agriculture	Total
Skamania	12,460	26,918	47,633	1,907	6,440	3,561	86,459
Yamhill	109,311	541,247	417,882	16,733	63,658	160,518	1,200,039
Columbia	53,160	1,963,628	212,821	8,138	145,259	35,190	2,365,036
Clackamas	422,739	1,789,719	1,529,584	64,712	143,061	112,439	3,639,514
Clark	516,779	2,177,620	1,851,155	57,192	367,784	110,861	4,564,612
Washington	614,267	3,042,077	2,009,951	30,738	736,069	40,591	5,859,426
Multnomah	813,691	3,918,618	3,055,920	146,666	545,947	9,750	7,676,901
<b>Total:</b>	<b>2,542,407</b>	<b>13,459,828</b>	<b>9,124,944</b>	<b>326,086</b>	<b>2,008,218</b>	<b>472,910</b>	<b>25,391,987</b>

## Building energy

Building energy makes up the largest emissions category, accounting for nearly 13.5 million MT CO<sub>2</sub>e and 53 percent of the region's footprint. Of those emissions, natural gas makes up 49 percent, market-based electricity makes up 43 percent, and other stationary fuels (such as propane and fuel oil) make up the remaining 8 percent. The residential sector accounts for the largest proportion of these emissions (48 percent), followed by stationary industrial emissions (32 percent), and the remaining 19 percent comes from commercial building activities. See Table 4 for a detailed breakdown of stationary emissions sources and sectors.

**Table 4: Building emissions by source and sector**

Sector	Emissions (MT CO <sub>2</sub> e)			Totals
	Electricity	Natural Gas	Other	
Residential	3,281,486	2,769,524	476,367	<b>6,527,387</b>
Commercial	962,606	1,133,337	511,586	<b>2,607,530</b>
Industrial	1,557,641	2,694,511	72,760	<b>4,324,911</b>
<b>Totals:</b>	<b>5,801,733</b>	<b>6,597,372</b>	<b>1,060,723</b>	<b>13,459,828</b>

The main electricity provider in the MSA is Portland General Electric (PGE). PGE has a higher emissions factor than other electric utilities in the region because as an investor-owned utility, it has limited access to the relatively low-carbon power supplied by Bonneville Power Administration (BPA), which relies heavily on hydropower. Therefore, PGE's emissions factor is 0.32 MT CO<sub>2</sub>e/MWh, compared to a regional emissions factor of 0.29 MT CO<sub>2</sub>e/MWh for the Northwest Power Pool. Publicly- or consumer- owned utilities—such as those in the counties in the state of Washington or in the far west of the MSA—have substantially lower emissions factors because they have access to BPA-supplied power; these factors are as low as 0.016 MT CO<sub>2</sub>e/MWh in Skamania County.

## Transportation energy

Transportation energy is the second-largest emissions source, responsible for more than 9 million MT CO<sub>2</sub>e, or 36 percent of total emissions. The majority of transportation emissions come from gasoline sold, as reported by the state tax records. Passenger cars are the most significant source of transportation emissions in the MSA. In Washington County, for example, passenger cars make up 81 percent of transportation emissions. Notably, these emissions do not include aviation gasoline and jet fuel from the Portland International Airport, but fuel usage from Hillsboro Airport in Washington County and Pearson Field in Clark County are included. The inventory for the CCAP will make every effort to capture these emissions.

## **Industrial process and refrigerant emissions**

This category comprises eight percent of total emissions (roughly 2 million MT CO<sub>2</sub>e) and includes both building and transportation refrigeration, as well as industrial processes that emit high global warming potential gases. High-tech manufacturing is a major industry in the MSA, and so these emissions represent roughly half of industrial processes and refrigerant emissions (one million MT CO<sub>2</sub>e) while the other one million MT CO<sub>2</sub>e are attributable to community refrigerant usage.

## **Waste**

Solid waste and wastewater represent the smallest portion of the community emissions (one percent). It should be noted that most of these emissions occur outside of the MSA boundary. The largest landfills serving the region are not within the geographic boundary of the MSA, but these emissions are included for completeness.

## **Agriculture**

Emissions from livestock production total 472,910 MT CO<sub>2</sub>e and make up two percent of the MSA's total emissions. Dairy production represents 354,489 MT CO<sub>2</sub>e of these emissions, and 102,518 MT CO<sub>2</sub>e comes from beef cattle production. The remainder comes from sheep, goats, swine, horses, and poultry. Other sources of agriculture, forestry, and land use are not included in this inventory.

Emissions from tree loss would often be included here and have been excluded from this inventory to better align with state-level reporting and to highlight the sectors that are within the MSA's control. Significant stretches of the region are forested, but these are mostly managed by federal agencies, who have oversight over the resulting emissions. We expect emissions from tree loss to be significant in the region, especially given recent increases in wildfire activity.

### 3. GHG EMISSION PROJECTIONS AND TARGETS

#### Current climate policy landscape

Over the past two decades, agencies in the MSA have collaborated across all levels of government to reduce GHG emissions. Based on this experience, Metro has developed this PCAP to reflect the unique role that local and regional agencies in the MSA play in reducing GHG emissions. The plan focuses on measures that can be led by these agencies and that support, rather than duplicate, state-level programs and policies. To understand why this PCAP focuses on the measures that it does, it is necessary to first understand the policy landscape that shapes this plan.

#### State climate policies

The Portland-Vancouver MSA spans the Oregon-Washington border. Both states are leaders in addressing climate change, and they each have an extensive body of policies, plans, and programs that inform how agencies in the MSA reduce GHG emissions. This PCAP focuses on measures that align with policy frameworks in both states, since these measures are generally highly effective at reducing GHG emissions and are most likely to be collaboratively and consistently implemented across the MSA. Fortunately, there are many areas where Oregon's and Washington's climate policies are aligned. The PCAPs from these two states contain details on all climate-related state-level policies and programs. This PCAP focuses on policies that are consistent between both states and that have the most influence on climate efforts in the MSA, including those listed below:

**Ambitious GHG reduction targets.** Similar to many other states, the Oregon Legislature established statewide GHG emissions reduction goals in 2007. The goals apply to all emission sectors—energy production, buildings, solid waste and transportation—and direct Oregon to stop increases in GHG emissions by 2010; reduce GHG emissions to 10 percent below 1990 levels by 2020 and reduce GHG emissions to at least 75 percent below 1990 levels by 2050. In 2020, Oregon added a 2035 goal of reducing GHG emissions at least 45 percent below 1990 emissions levels. In 2023, the Oregon Climate Action Commission to achieve at least a 70 percent reduction by 2040 and 95 percent by 2050. This aligns with Washington's goal—most recently affirmed in the Climate Commitment Act—of decreasing emissions to 95 percent below 1990 emissions levels by 2050, with multiple milestones along the way. These broad GHG reduction targets are the basis for a number of other climate targets that states apply to particular processes. For example, in response to a new requirement from FHWA, both Oregon and Washington have recommended short-term targets to reduce GHG emissions on the national highway system that align with the longer-term targets discussed above. In Oregon, the state sets GHG reduction targets for regional transportation plans (discussed below) that are designed to ensure coordinated progress toward meeting the climate goals above.

**Commitments to zero-emission vehicles.** Both [Oregon](#) and [Washington](#) have adopted California's vehicle emission standards that require car dealers to increase the share of new zero-emission vehicles sold in both states until 2035, at which point all new vehicles sold in both states are required to be zero-emission vehicles. Both states are also leaders in transportation

electrification and have developed statewide transportation electrification strategies (see the websites for both [Oregon's](#) and [Washington's](#) programs) and offer [incentives, rebates](#), or [tax exemptions](#) to people who purchase electric vehicles.

**Clean vehicle fuel standards.** Both Oregon and Washington have similar requirements to reduce the GHG intensity of vehicle fuels. Washington's [Clean Fuel Standard](#) requires fuel suppliers to reduce the carbon intensity of transportation fuels to 20 percent below 2017 levels by 2034. Oregon's [Clean Fuels Program](#) requires a ten percent reduction below 2015 levels by 2025, a 20 percent reduction by 2030, and a 37 percent reduction by 2035.

**Clean energy standards for utilities.** Both states require utilities to reduce the carbon intensity of their energy portfolios on the same general timeline. Washington's [Clean Energy Transformation Act](#) requires electric utilities to eliminate carbon emissions from their energy sources by 2045 (with interim targets to eliminate coal-fired generation serving Washington state customers by 2025) and to be GHG neutral by 2030. Similarly, Oregon's [Clean Energy Targets](#) bill requires the two largest investor-owned utilities serving the state to eliminate GHG emissions by 2045, with interim targets of 80 percent below baseline levels (which are defined based on 2010–2012 data) by 2035 and 90 percent by 2040.

### **Regional climate policies and processes**

There is no single overarching set of climate plans or policies for the MSA, because there is no single government agency that has jurisdiction over all communities or GHG emission sectors within the MSA. However, Metro and the Southwest Washington Regional Transportation Council (RTC) are responsible for coordinating certain planning activities within the greater Portland region and the greater Vancouver region, respectively, which combined, include over 90 percent of the MSA's residents. Both agencies are responsible for transportation planning, and Metro has a variety of other functions including land use planning, funding affordable housing, managing parks and natural areas, and overseeing the solid waste system. Climate policies are integrated into the various plans that reflect these functions. The following plans have climate-related elements that shape the measures included in this PCAP.

**Regional transportation planning and programming.** Metro and RTC are the two metropolitan planning organizations (MPOs) serving the MSA. MPOs are required by Federal regulation to maintain fiscally constrained regional transportation plans (RTPs) that identify all local, regional, and state transportation projects within their jurisdictions that are eligible for state and federal funding over a 20-year period. Required to be updated every five years, these plans include performance analyses that forecast how priority transportation projects will affect progress toward a variety of policy goals - including climate. In Oregon, MPOs are required to develop and adopt strategies that meet targets to reduce vehicle miles traveled and GHG emissions from light vehicles by 2012. These targets (which are codified in [OAR 660-044](#)) identify the percentage reduction in GHG emissions from light vehicle travel that is needed to help Oregon meet its long-term goal by 2050. The Climate Smart Strategy, discussed below, describes Metro's overall approach to meeting these targets, and each RTP update includes an analysis of the region's progress with respect to these targets.

In addition to long-term RTPs, Metro and RTC both administer transportation improvement programs (TIPs) — four-year plans, updated every two to three years, that identify how specific state and federal transportation funding sources will be allocated to specific transportation projects. Metro and RTC also create specific modal or community plans that identify in more detail when, how, and where the projects included in the RTP can be implemented in order to reduce GHG emissions and meet other regional goals. These plans enable Metro to identify transportation-related measures and implementation projects at a high level of detail, and many actions in this PCAP use these plans as a basis to identify the extent of implementation for different measures. More detailed descriptions of these plans can be found in the information on individual measures below.

**Metro Climate Smart Strategy.** As directed by the Oregon Legislature in 2009, Metro developed and adopted a regional strategy to reduce per capita greenhouse gas emissions from cars and small trucks by 2035 to meet state targets. The Climate Smart Strategy was approved by the state in 2015 and is implemented through the RTP, MTIP and local plans, continues to guide and be the focus of the region's efforts in reducing GHG emissions from transportation. New state rules adopted in 2022 require cities and counties in the region to designate walkable, compact mixed-use areas that are served by transit and other sustainable transportation options, reform parking management, plan for high quality pedestrian, bicycle and transit infrastructure, prioritize and select projects meeting climate and equity outcomes and demonstrate that land use and transportation system plan updates reduce per capita vehicle miles traveled and related GHG emissions in support of meeting regional targets. State agencies support local and regional implementation through the [Climate-Friendly and Equitable Communities Program](#).

**Metro Regional Waste Plan.** As the regional solid waste authority for the region, Metro has the responsibility to ensure that all solid waste generated in the region is managed in a manner that protects public health and safety and safeguards the environment. The [Regional Waste Plan](#) is a policy document that sets direction through 2030 to reduce the lifecycle impacts of the products that people in the region use and for ensuring the region's garbage and recycling system is resilient. Four of the 19 goals in the plan focus on reducing the environmental impacts associated with the waste system, and the plan commits Metro to monitoring GHG emissions associated with products and services consumed in the Metro region.

**Metro Affordable Housing Bond Program.** In 2018, voters in the Metro region approved a [bond measure to fund affordable housing](#) throughout the region. So far, this measure has funded over 4,300 affordable housing units. These units have been developed in partnership with city and county affordable housing authorities that serve the region. Many communities in the United States are served by local affordable housing authorities, but Metro's bond measure provides additional resources, coordination, and oversight to increase the collective impact of these local efforts. It also creates opportunities for governments to work together to reduce energy use, GHG emissions, and costs for the residents who live in these units.

**Metro Strategic Targets.** In December 2023, Metro Council adopted a set of [five-year strategic targets](#). These include targets to reduce GHG emissions across all of the agency's activities.



## How climate policies shape this PCAP

Collectively, the policies above shape the focus of this PCAP in the following ways:

- Under state and federal law, regional agencies lead collaborative transportation planning processes. **The resulting plans enable the PCAP to identify transportation measures at a high level of detail.** These transportation measures are not necessarily more sweeping or impactful than other measures in this PCAP, but they are more discrete and often include more details about the extent of implementation, alignment with other funding sources, and next steps because these details are already well established in RTPs, transportation improvement plans, and other transportation planning documents. These details enabled the project team to focus these measures on the specific projects and locations that are best positioned to reduce GHG emissions in the MSA over the next five years.
- In both Oregon and Washington, state agencies generally lead efforts to increase the supply of clean vehicles, fuels, and electricity because these efforts align their regulatory authority. Local and regional climate efforts typically focus on reducing demand for fuel and electricity, both to complement state agencies' role and because local and regional agencies have the ability to significantly reduce demand through their oversight of the built environment. In Oregon, the state explicitly requires regional agencies to meet targets to reduce transportation emissions by reducing demand for driving. This PCAP reflects this focus, and **transportation and residential measures generally focus on reducing demand for fuel and electricity.**

## Targets for future GHG emissions

The GHG reduction targets in the seven-county MSA include targets set by two different states and multiple, sometimes overlapping, jurisdictions with a range of reference years and targets.

The overarching targets for the MSA are set by the respective states. Washington's [Climate Commitment Act](#) (CCA), which applies to Clark and Skamania Counties, calls for a reduction in GHG emissions by 45 percent, 70 percent, and 95 percent below 1990 levels by 2030, 2040, and 2050, respectively. Oregon's targets were adopted by the state legislature in 2007, and they call for reductions of ten percent and 75 percent below 1990 levels by 2020, and 2050, respectively. These targets were updated in 2020 via Oregon [Executive Order 20-04](#) that added an interim GHG emission reduction goal of at least a 45 percent by 2035 and updated the 2050 goal from 75 percent to an 80 percent reduction.

MPOs in Oregon, including Metro, are required to determine whether their RTPs meet GHG reduction targets that are set by the state to maintain a path toward Oregon's GHG reduction goals. These targets use per capita vehicle miles traveled (VMT) by light-duty vehicles as a proxy for GHG emissions. This reflects the fact that the State of Oregon has the primary authority and responsibility to make fuels and vehicles that are sold in Oregon cleaner to advance Oregon's transition to cleaner, low-carbon fuels and zero and low-carbon emissions vehicles—whereas local and regional agencies are focused on reducing the demand for driving—and that meeting Oregon's ambitious GHG reduction targets is only possible through coordinated efforts to both reduce emissions resulting from the vehicle fleet and fuels and reduce the amount that



Oregonians drive. Metro's [Climate Smart Strategy](#), adopted in 2014, identifies the toolkit of GHG reduction measures that the region uses to meet these targets, and [Chapter 7](#) and [Appendix I](#) of Metro's 2023 RTP update describes the latest results of the climate analysis.

The targets for the Portland metropolitan region, which were last updated through the Climate-Friendly and Equitable Communities rulemaking, are as follows:

- A 20 percent reduction in per capita GHG emissions below 2005 levels by the year 2035.
- A 25 percent reduction by 2040.
- A 30 percent reduction by 2045.
- A 35 percent reduction by 2050.

Targets for the years 2041 through 2049 steadily increase from 26 percent to 34 percent in order to maintain progress toward the [2050 target](#).

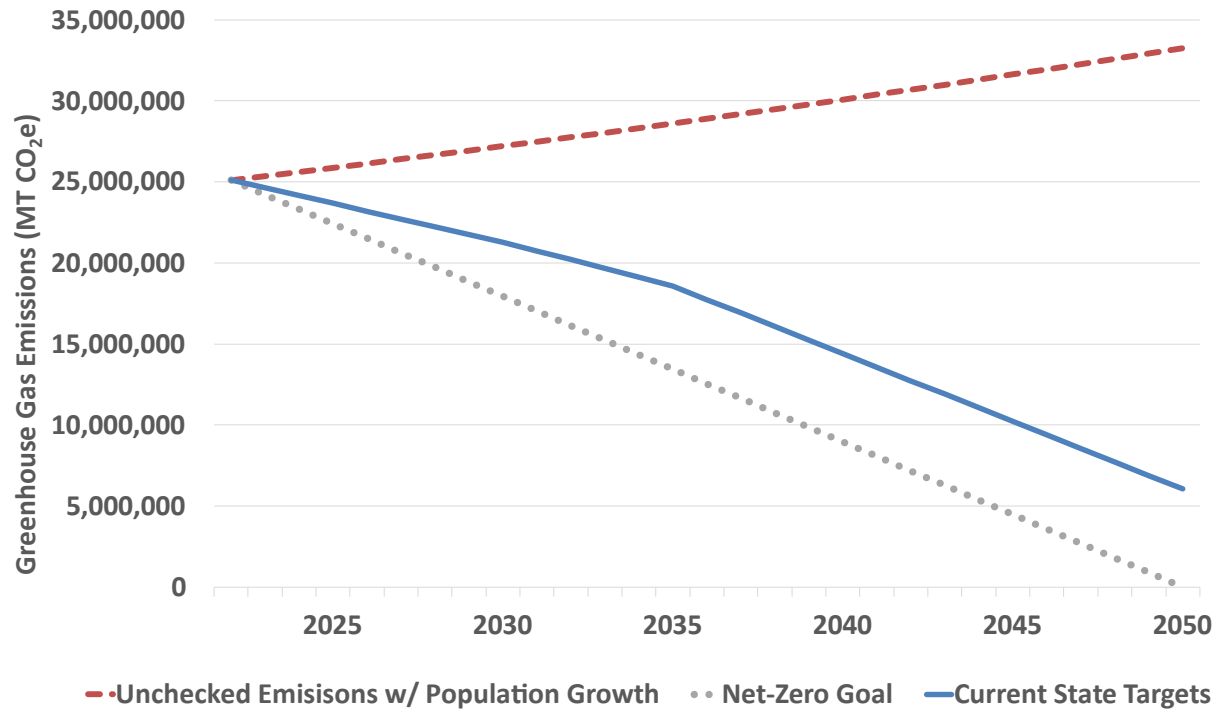
These targets are focused specifically on reducing VMT from light-duty vehicles, and the State has clarified that they are effectively VMT per capita reduction targets. This is because under Oregon's climate framework, the State is primarily responsible for reducing emissions from vehicles and fuels, whereas local and regional agencies are primarily responsible for reducing VMT. Metro is required to use State-provided assumptions about vehicles and fuels in its analysis to maintain consistency with this division of roles. [RTC's RTP](#) does not include GHG reduction targets, but it does measure the impact on per capita VMT, and it includes many projects focused on reducing the need to drive.

New Federal climate performance monitoring rules will inform future RTPs. On December 7, 2023, the Federal Highway Administration published a [final rule](#) that became effective on January 8, 2024. The rule establishes a new performance measure for on-road carbon dioxide (CO<sub>2</sub>) emissions on the National Highway System (NHS), aimed at reducing GHG emissions from transportation. Both State departments of transportation (State DOTs) and metropolitan planning organizations (MPOs) are required to establish performance targets that show a decline in GHG emissions over time. The rule does not mandate the level of reduction the targets should achieve. Rather, State DOTs and MPOs have flexibility to set targets that are appropriate for their communities and given their respective climate policies and other policy priorities. The initial targets are to be set for a 4-year period (Jan. 1, 2022 to Dec. 31, 2025). MPOs – like Metro and SW RTC - that serve overlapping urbanized areas must work together to establish a joint 4-year target for the urbanized area in addition to setting an individual MPO target. Performance reporting by DOTs and MPOs is required every two years, with new targets to be set every 4 years for future reporting periods. The Metro and SW RTC targets are anticipated to align with existing Oregon and Washington state targets.

Additionally, some cities and counties within the MSA have adopted different targets or have used different reference years. For planning and analysis under the CPRG, Metro used the current targets published by the states of Oregon and Washington. Metro does not have the authority to reconcile differing targets set by Oregon and Washington. Figure 4 shows the forecast business-

as-usual trajectory of GHG emissions for the MSA based on anticipated population growth and assuming no further action to reduce GHG emissions, the expected future emissions if Oregon and Washington state targets are implemented in their respective counties, and the additional reductions needed to achieve net-zero GHG emissions by 2050.

**Figure 4: Business-as-usual emissions and state targets for future GHG emissions (MT CO<sub>2</sub>e per year)**



## 4. PRIORITY MEASURES

The measures in this section have been identified as priority measures for the purposes of pursuing funding through the first round of CPRG implementation grants. The project team will analyze additional priorities for comprehensive climate action that are documented within the MSA further for the CCAP. This section provides the following additional details for each priority measure:

- **Description.** A brief summary of the measure.
- **GHG reductions.** These values represent the estimated GHG emission reductions from the measure, assuming the extent of implementation described for each measure is met. More details on methodology and data sources are located in Appendix 3. emissions reduction calculation methodology. GHG reductions are presented in three values:
  - An estimate of potential annual GHG emissions reductions.
  - An estimate of the potential GHG emission reductions from 2025 through 2035.
  - An estimate of the potential GHG emission reductions from 2025 through 2050.
  - **Cost-effectiveness of GHG reductions.** This figure is presented in ranges of the estimated total cost of implementation of the measure, divided by the GHG reductions estimated through 2035 to give a relative cost-effectiveness metric across all actions. It should be noted that this metric does not account for the variety of additional benefits of each action. Ratings for cost-effectiveness are based on the following ranges of GHG abatement costs:
    - \$: under \$1,000/MT CO<sub>2</sub>e or self-funding
    - \$\$: \$1,000 - \$2,000 / MT CO<sub>2</sub>e
    - \$\$\$: \$2,000 - \$3,000 / MT CO<sub>2</sub>e
- **Co-pollutant reductions.** These values represent the estimated GHG emission reductions from the measure, assuming the extent of implementation described for each measure is met. More details on methodology and data sources are located in Appendix 3. emissions reduction calculation methodology.
- **Implementing agencies.** The local agencies under which jurisdiction of implementing the measure falls.
- **Extent of implementation.** The programmatic and geographic scope of implementation for each priority measure.
- **Implementation milestones.** The major milestones required for implementation of the measure.
- **Potential metrics for tracking progress.**
- **Intersection with other funding.** Description of other major funding sources that may provide additional funding leverage, or gaps in funding related to the measure.

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- Alignment with community priorities. List of local agencies within the MSA who identified a similar measure in existing climate action plans.
- Low-income and disadvantaged community benefits analysis. Measure-specific benefits and list of disadvantaged census tracts impacted.

Table 5 summarizes the priority measures from the Portland-Vancouver MSA PCAP.

**Table 5: Portland-Vancouver MSA PCAP priority measures by sector**

Measure	Cumulative GHG emission reductions max potential (MT CO <sub>2</sub> e)		Implementing agency or agencies	Cost effective -ness
	2025–2030	2025–2050		
Transportation				
Trans-1: Increase high capacity transit service across the metropolitan area	7,000	30,400	Transit agencies	\$\$
Trans-2: Redesign streets and infrastructure to reduce delays for transit vehicles	11,600	50,400	Metro, transit agencies, cities, counties	\$\$\$
Trans-3: Expand transit signal priority	15,800	68,300	Metro, transit agencies, cities, counties	\$\$
Trans-4: Expand bicycle and pedestrian network	420,800	1,823,600	Metro, cities, counties, parks and recreation districts	\$\$
Trans-5: Expand use of parking pricing	1,000	4,400	Cities and counties	\$
Trans-6: Expand the use of electric buses in the region’s transit fleets	39,200	170,000	Transit agencies	\$
Commercial and Residential Buildings				
Res-1: Expand existing residential energy efficiency retrofit programs, with a focus on low-income households	3,566,500	15,454,800	Cities, counties, state agencies	\$
Res-2: Fund additional energy efficiency measures in publicly funded, newly constructed affordable housing units	7,100	30,600	Metro, counties, City of Portland	\$
Materials and Waste Management				
Waste-1: Expand the availability of residential composting programs	42,000	182,100	Metro, cities, counties	\$

## Transportation measures

Transportation is the single largest source of GHG emissions both in the MSA and across the United States. Statewide, transportation accounts for [35 percent](#) of GHG emissions in Oregon and [39 percent](#) in Washington. Measures to reduce transportation GHGs are essential to achieving regional climate action goals. Measures focus on implementing low-carbon fuels and on managing travel demand by making public transit and active transportation more competitive alternatives to driving. These efforts reduce GHG emissions by replacing dirty vehicles with clean ones, helping travelers shift trips from driving to more sustainable means of travel, and, over the long term, by concentrating transportation options in a way that supports compact land use patterns. Co-benefits include improved public health in communities that are nearest to transportation corridors by lowering tailpipe emissions of criteria pollutants and toxic air pollutants such as diesel particulate matter.

### Trans-1: Increase high capacity transit service across the metropolitan area

#### Description

Transportation accounts for the largest share of the MSA's GHG emissions, and local agencies have a history of collaborating to reduce these emissions. Increasing and improving transit service is identified as a critical GHG emission-reduction measure in almost every adopted local and regional CAP in the MSA. Metro's [Climate Smart Strategy](#) establishes the toolkit that local and regional agencies in Metro's planning area, which includes most of the people and jobs in the broader MSA, use to reduce transportation emissions, and it identifies investing in transit as a high-impact GHG reduction measure.

In general, this measure emphasizes that increasing or improving transit service produces the greatest and most immediate GHG reductions when investments are made in communities that either already have high rates of transit ridership or that already have the land uses and transportation characteristics to support high ridership when service becomes available. The regional transportation plans led by [Metro](#) and [RTC](#), as well as Metro's [High Capacity Transit Strategy](#) and transit plans developed by TriMet, SMART and C-TRAN identify specific transit projects that are likely to attract new riders, reduce GHG emissions by shifting trips from driving to transit, and provide related co-benefits.

These plans generally focus on three aspects of transit: increasing service, redesigning roadways to reduce delays for transit and make it safer and easier to access, and redesigning signals to reduce delays for transit vehicles. This measure focuses on the first; the following measures are focused on the latter two. Projects that increase transit service are rarely good candidates for limited-term implementation grants because these grants do not provide support to continue transit service. However, there may be cases where longer-term funding for continued operation of new service is available and where implementation grants could cover short-term funding gaps and help increase service more quickly. More importantly, the capital investments described in the next two measures—which are focused on projects that can be funded through limited-term grants—are often most effective when coordinated with service increases, and agencies may

prioritize seeking implementation funds for Trans-2 and Trans-3 in locations where funding is available to increase service.

### GHG reductions

- 1,200 MT CO<sub>2</sub>e per year.
- Up to 7,000 MT CO<sub>2</sub>e from 2025 through 2030.
- Up to 30,400 MT CO<sub>2</sub>e from 2025 through 2050.
- Cost effectiveness of GHG reductions: \$\$ (\$1,000 - \$2,000 / MT CO<sub>2</sub>e)

**Table 6: Trans-1 co-pollutant reductions**

Co-pollutant	2020 annual reductions (kilograms)	2030 constrained scenario (kilograms)	2045 constrained scenario (kilograms)
NOx	1,290	120	23
PM <sub>2.5</sub>	17	5	2
PM <sub>10</sub>	19	5	2
VOC	510	105	78
CO	10,585	4,016	2,950
Source: Metro specific factors based on MOVES3			
Co-pollutant	Annual reductions (kilograms)		
Black carbon	6		
Organic carbon	3		
Source: MOVES3, Table 2 for passenger vehicles model year 2015			

### Implementing agencies

Transit agencies are primarily responsible for designing and operating transit service. Metropolitan planning organizations play a role in identifying and planning new or increased service and by identifying and funding capital improvements that support adding service.

### Extent of implementation

This measure would be implemented within the urbanized portions of the MSA (i.e., the Metro and RTC planning areas), which are the areas of the region where high capacity transit (HCT) has the potential to shift significant numbers of trips away from driving. The analysis for this measure assumed that it would fund increased transit service on a set of high-priority frequent transit corridors that could be completed in the near term:

- Tier 1 HCT corridors identified in the [Metro High Capacity Transit Strategy](#) (excluding the Interstate Bridge Replacement Program project and Southwest Corridor Light Rail Project). Refer to Figure 6 under measure Trans-2 for a map of these corridors.
- The Highway 99 and Fourth Plain bus rapid transit extension projects are the two C-TRAN bus rapid transit projects identified in [RTC's regional transportation plans](#) that have yet to be completed and are still in need of funding. Refer to Figure 7 under measure Trans-2 for a map of these corridors.

### **Implementation milestones**

Agency partners in the MSA have the ability to increase service on existing routes within 5 years as long as the necessary funding and capital improvements are in place; this calls for coordinated implementation of this measure and measures Trans-2 and Trans-3. There are ongoing planning and implementation efforts dedicated to advancing several of the projects listed above. Metro, RTC, TriMet, C-TRAN, and cities and counties are collaborating on plans to advance the different transit corridors that are the focus of this measure. These efforts will continue throughout the next 5 years, and the efforts may support agencies in the MSA in identifying implementation projects along these corridors.

### **Potential metrics for tracking progress**

- Geographic expansion of high capacity transit service
- Increase in ridership on routes receiving new service
- Forecast benefits of adding service

### **Intersection with other funding**

Agencies in the region rely on several different ongoing revenue sources to fund transit service, including federal and state formula funds, regional payroll taxes, and transit agency farebox revenues. However, there may be cases where CPRG implementation grants could provide short-term support to increase service where longer-term funding is available.

### **Alignment with adopted climate action plans**

The Metro team identified the measures in this PCAP by reviewing all current climate action plans adopted by public agencies in the MSA (see Appendix A for a list of the plans reviewed). Of those plans, the following mentioned increasing transit service as a GHG reduction measure:

- City of Hillsboro
- City of Portland
- Metro
- Multnomah County
- TriMet

Though these CAPs are the most consistent and comprehensive documents of partner agencies' plans to reduce GHG emissions, they do not cover all communities or GHG emission sectors in the MSA, nor are they the only documents that describe the GHG benefits of this measure. Many transportation and/or transit plans developed by cities, counties, transit agencies and regional planning agencies highlight the GHG reduction benefits of increasing transit service.

### **LIDAC benefit analysis**

*LIDACs impacted by this measure*



LIDACs impacted by this measure include those within a half-mile radius of the included prioritized corridors within this measure. A list of specific corridors and LIDAC census tracts impacted by this measure is provided in the Low-income and disadvantaged community analysis section in Table 20.

*Potential benefits to LIDACs under this measure*

As identified in [Metro's 2023 Regional Transportation Plan](#), communities want more fast, frequent, reliable, and affordable transit connections throughout the Metro region. Accelerating the implementation of HCT across the metro area brings many of these benefits to LIDACs; the benefits are outlined as follows:

- **Improved access to jobs and key destinations.** Investments in improving transit service facilitate access to essential destinations including jobs, education, and healthcare for those who have limited access to a car of their own.
- **Affordable transportation.** Car ownership is expensive. Reliable public transportation offers a lower cost alternative to single-occupancy vehicles.
- **Increased access to employment.** Improved transit connectivity allows people who rely on transit to reach a greater variety of job opportunities.
- **Foster community development.** Frequent transit can contribute to community development by attracting businesses and new investments along routes with increased service. As transit hubs are developed, there may be opportunities for affordable housing, commercial spaces, and community services, thus fostering overall neighborhood improvement.

*Potential disbenefits to LIDACs under this measure*

- **Displacement and gentrification.** Adding high-quality transit service has the potential to increase property values in adjacent communities. Increased value benefits homeowners, but it disbenefits renters who have a higher risk of potential displacement. Metro and partner agencies mitigate these impacts by investing in affordable housing and providing support for community stabilization efforts. Planning work for future high capacity transit service also includes working with community partners to identify equitable development strategies to minimize and mitigate displacement pressures within the corridor.

## **Trans-2: Redesign streets and infrastructure to reduce delays for transit vehicles**

### **Description**

This measure focuses on redesigning roadways to reduce delays for transit, which allows transit vehicles to complete their routes more quickly and reliably. This makes transit a more competitive alternative to driving; more people are likely to switch from driving to riding transit, thus reducing GHG emissions. See the description of Trans-1 for more information on why improving transit service is so critical to reducing GHG emissions in the MSA.

## GHG reductions

- 1,900 MT CO<sub>2</sub>e per year.
- Up to 11,600 MT CO<sub>2</sub>e from 2025 through 2030.
- Up to 50,400 MT CO<sub>2</sub>e from 2025 through 2050.
- Cost-effectiveness of GHG reductions: \$\$\$ (\$2,000 - \$3,000 / MT CO<sub>2</sub>e)

## Co-pollutant reductions

**Table 7: Trans-2 co-pollutant reductions**

Co-pollutant	2020 annual reductions (kilograms)	2030 constrained scenario (kilograms)	2045 constrained scenario (kilograms)
NOx	2,137	198	37
PM <sub>2.5</sub>	28	8	3
PM <sub>10</sub>	31	9	4
VOC	845	175	129
CO	17,544	6,657	4,889
Source: Metro specific factors based on MOVES3			
Co-pollutant	Annual reductions (kilograms)		
Black carbon	10		
Organic carbon	5		
Source: MOVES3, Table 2 for passenger vehicles model year 2015			

## Implementing agencies

Roadway transit prioritization projects typically involve collaboration among transit agencies—which are responsible for operating transit service and building and maintaining transit-related infrastructure such stops and stations—and the city, county, or state agencies that own and operate the roadways being improved and are responsible for changes to these roadways, such as restriping travel lanes or redesigning sidewalks for better transit access. Metropolitan planning organizations play a role in identifying locations that could benefit from these improvements and designating funds for transit -prioritization projects.

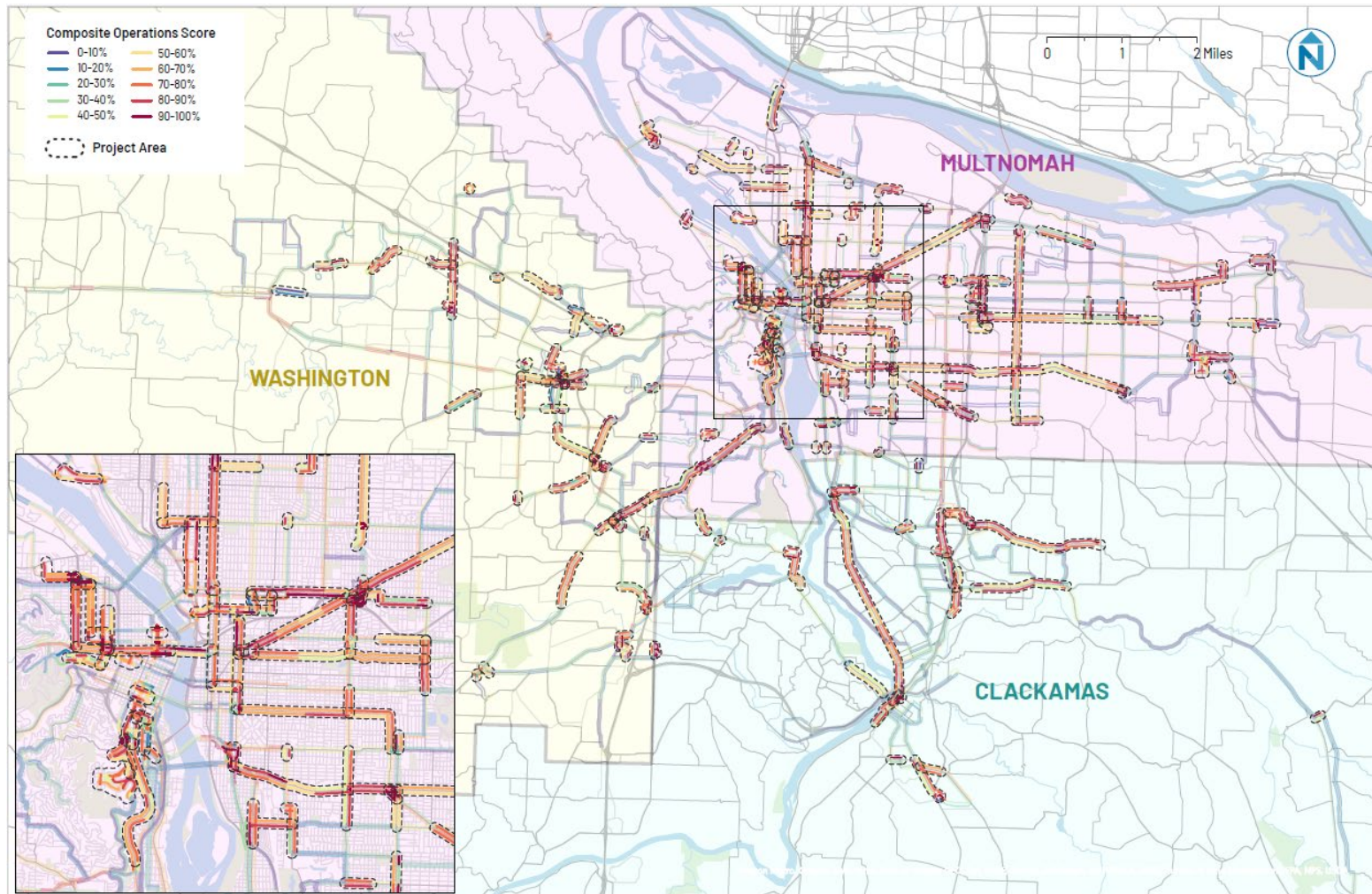
## Extent of implementation

This measure would be implemented within the urbanized portions of the MSA (i.e., the Metro and RTC planning areas), which are the areas of the region where improving transit service has the potential to shift significant numbers of trips away from driving. The analysis for this measure assumed that it would focus on improving high-priority frequent transit corridors that are unlikely to be funded through other sources:

- Areas eligible for investment under Metro and TriMet's Better Bus program, which has identified locations across the Metro region where there are near-term opportunities to improve transit speed and reliability by redesigning streets and other infrastructure. These areas are shown in Figure 5.

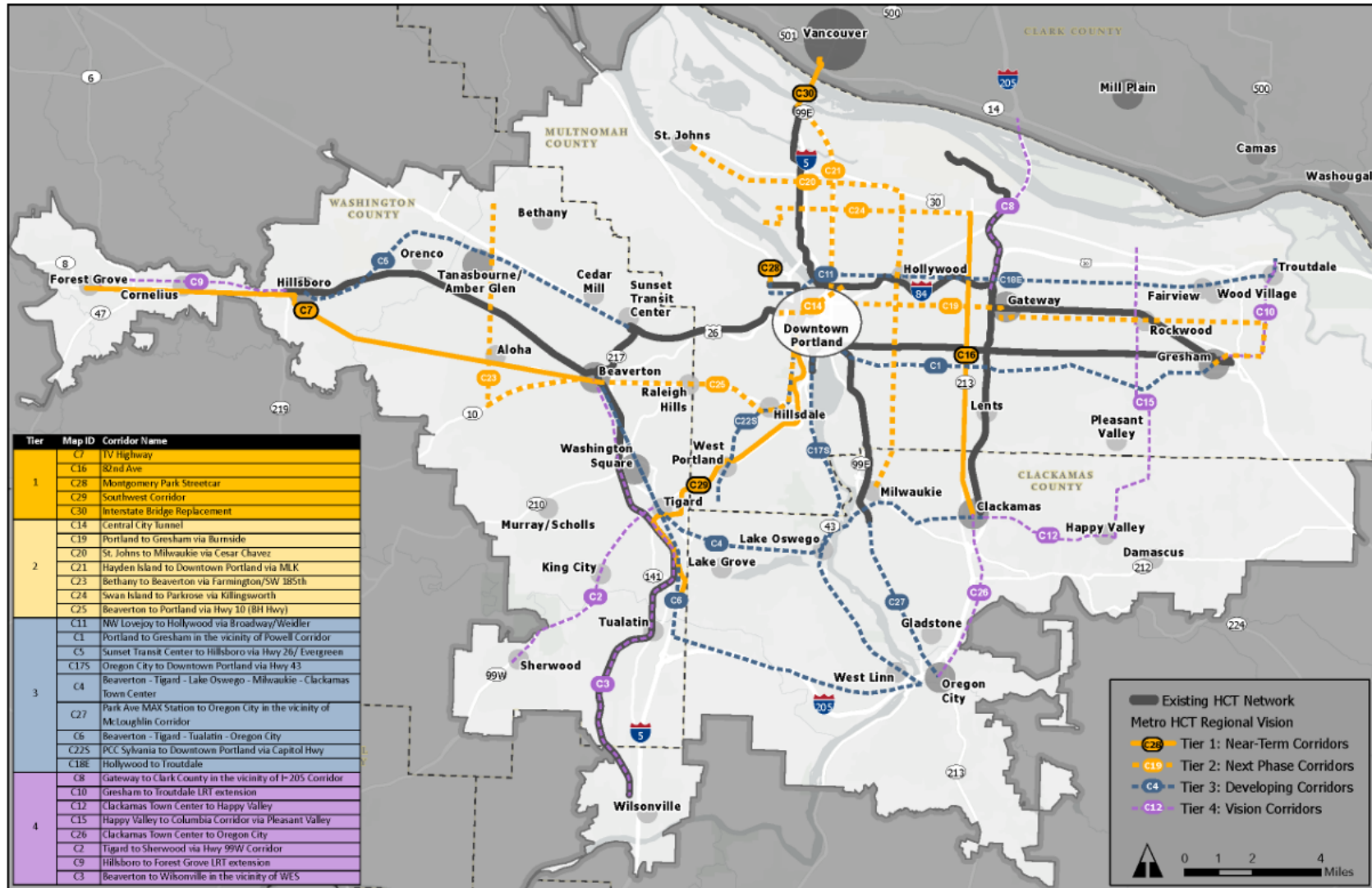
- Enhanced transit corridors identified in Metro's Regional Transportation Plan and Tier 2 and Tier 3 HCT corridors identified in the [Metro High Capacity Transit Strategy](#). These are the highest-priority transit projects in the region that are not currently being prioritized for funding from other sources. Figure 6 shows the HCT corridors by tier.
- The Highway 99 and Fourth Plain bus rapid transit extension projects are the two C-TRAN bus rapid transit projects identified in [RTC's regional transportation plans](#), [C-TRAN Transit Development Plan \(2016\)](#), and C-TRAN [High Capacity Transit System and Finance Plan](#) that have yet to be completed and are still in need of funding. These corridors are shown in Figure 7.

**Figure 5: Metro/TriMet Better Bus investment areas**

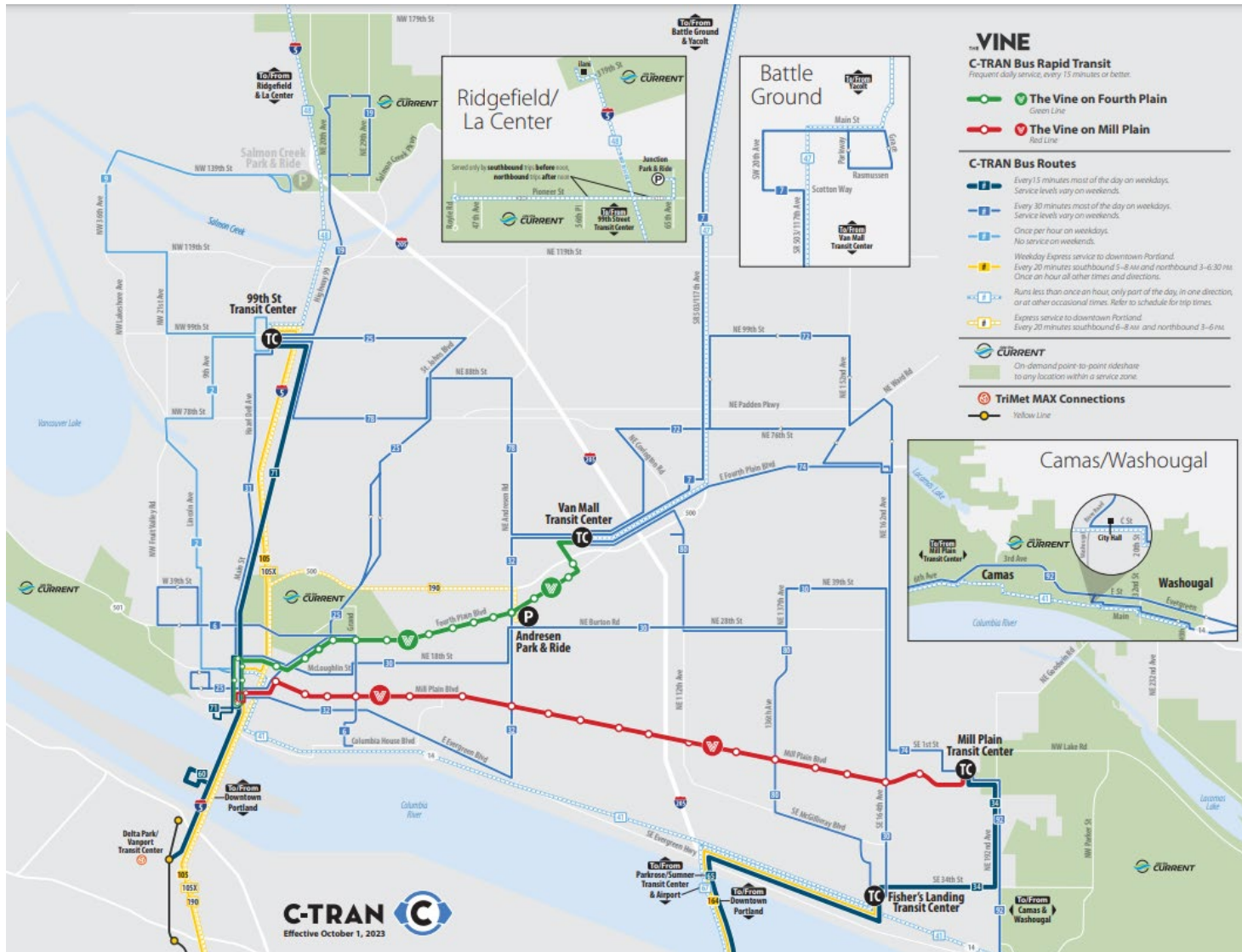




**Figure 6: Metro High capacity transit corridors by investment tier (2023 Metro RTP and 2023 Metro High Capacity Transit Strategy)**



**Figure 7: C-TRAN system map (note: the Highway 99 and Fourth Plain routes that are the focus of this measure are shown as a thick green line and a thick blue line, respectively)**



### Implementation milestones

Agency partners can implement this measure within five years wherever the necessary planning is in place, and planning for roadway prioritization projects is well underway in the metro area. As discussed elsewhere in this section, the TriMet/Metro Better Bus program is a key program for identifying, planning, and building transit prioritization projects. The program identified eligible investments by reviewing current and planned transit routes in the Metro region and identifying opportunities to reduce transit delays by redesigning roadways and signals. The planning that has already gone into these projects, as well as the planning grants offered by the Better Bus program, help to identify implementation projects that can be funded through a variety of sources. Better Bus also offers construction grants that can complete some transit prioritization projects within the region.

### Potential metrics for tracking progress

- Percent of prioritized corridors receiving transit priority design treatments.
- Change in transit delay or run times on corridors receiving transit priority design treatments.

### Intersection with other funding

There are several other funding sources that can support this measure:

- FTA [Capital Investment Grants](#) (CIG) are a critical source for supporting transit capital improvements including roadway redesigns. The selection criteria for these grants discourage agencies from using other state or federal sources to improve projects that they intend to submit as candidates for CIG funds. Metro has excluded Tier 1 high capacity transit projects from this measure because agencies intend to submit these high-priority projects for CIG funds.
- The Better Bus program, administered and funded jointly by Metro and TriMet, provides \$10 million in state and regional funds for the planning and construction of transit roadway or signal prioritization projects. This program builds on [millions of dollars in prior investments in planning and implementing enhanced transit](#) along some of the Metro region's highest-ridership corridors. Better Bus identified eligible investments by reviewing current and planned transit routes in the Metro region and identifying opportunities to reduce transit delays by redesigning roadways and signals. As of February 2024, the Better Bus program is soliciting letters of interest from potential applicants. Current program funding can support several high-priority projects but likely cannot fund all of the opportunities identified by partner agencies. Many of the projects that are eligible for Better Bus are also good candidates for other implementation grants because they are implementation-ready and high-impact; additional implementation grants would speed the metro area's progress in implementing a key aspect of its GHG reduction strategy. Metro and TriMet would coordinate on Better Bus-eligible projects that are submitted for CPRG implementation grants to ensure that these projects do not seek duplicative funding from both sources.

### Alignment with adopted climate action plans

The Metro team identified the measures in this PCAP by reviewing all current climate action plans adopted by public agencies in the MSA (see Appendix A for a list of the plans reviewed). Of those plans, the following mentioned redesigning roadways to prioritize transit as a GHG reduction measure:

- City of Hillsboro
- City of Portland
- City of Tualatin
- Metro
- TriMet

Though these CAPs are the most consistent and comprehensive documents of partner agencies' plans to reduce GHG emissions, they do not cover all communities or GHG emission sectors in the MSA, nor are they the only documents that describe the GHG benefits of this measure. Many transportation plans developed by cities, counties, transit agencies and regional planning agencies highlight the GHG reduction benefits of prioritizing transit and identify specific projects that have the potential to reduce emissions.

### LIDAC benefit analysis

#### *LIDACs impacted by this measure*

LIDACs impacted by this measure include those within a half-mile radius of the prioritized corridors within this measure. A list of specific corridors and LIDAC census tracts impacted by this measure is provided in the Low-income and disadvantaged community analysis section in Table 20.

#### *Potential benefits to LIDACs under this measure*

As identified through public engagement conducted during development of [Metro's 2023 Regional Transportation Plan](#) and [2018 Regional Transit Strategy](#), communities want more fast, frequent, reliable, and affordable transit connections throughout the Metro region. Redesigning streets and transit corridors to directly reduce delays benefit to LIDACs in the following ways:

- **Improved access to key destinations.** Investments in reducing transit delays help riders reach a greater number and variety of essential destinations including jobs, education, and healthcare in a reasonable amount of time.
- **Affordable transportation.** Car ownership is expensive. Reliable and rapid public transportation offers a lower cost alternative to owning and operating single-occupancy vehicles.



- **Foster community development.** Frequent transit can contribute to community development by attracting businesses and new investments along routes with increased service.

*Potential disbenefits to LIDACs under this measure*

- **Displacement and gentrification.** Adding high-quality transit service has the potential to increase property values in adjacent communities. Increased value benefits homeowners, but it disbenefits renters who have a higher risk of potential displacement. Metro and partner agencies mitigate these impacts by investing in affordable housing and providing support for community stabilization efforts.

### Trans-3: Expand transit signal priority

#### Description

This measure focuses on redesigning signals to reduce delays for transit vehicles. Redesigning transit signals helps to reduce delay for buses as they move through traffic. When transit service becomes speedier, more reliable, and more accessible, people are more likely to switch from driving to riding transit, which reduces GHG emissions. This measure produces similar benefits as redesigning the roadway to reduce delays for transit vehicles (see Trans-2 above), but it since it only involves upgrades to signal systems instead of roads, it is more cost-effective, applies to different parts of the metro area, and can be implemented more broadly in the near term. See the description of Trans-1 for more information on why improving transit service is so critical to reducing GHG emissions in the MSA.

#### GHG reductions

- 2,600 MT CO<sub>2</sub>e per year.
- Up to 15,800 MT CO<sub>2</sub>e from 2025 through 2030.
- Up to 68,300 MT CO<sub>2</sub>e from 2025 through 2050.
- Cost-effectiveness of GHG reductions: \$\$ (\$1,000 - \$2,000 / MT CO<sub>2</sub>e)

#### Co-pollutant reductions

**Table 8: Trans-3 co-pollutant reductions**

Co-pollutant	2020 annual reductions (kilograms)	2030 constrained scenario (kilograms)	2045 constrained scenario (kilograms)
NO <sub>x</sub>	2,897	269	51
PM <sub>2.5</sub>	38	11	4
PM <sub>10</sub>	42	12	5
VOC	1,145	237	175
CO	23,776	9,021	6,625
Source: Metro specific factors based on MOVES3			
Co-pollutant	Annual reductions (kilograms)		
Black carbon	14		

Organic carbon	7
Source: MOVES3, Table 2 for passenger vehicles model year 2015	

## Implementing agencies

Transit signal prioritization projects typically involve collaborations between transit agencies, which are responsible for operating transit service and building/maintaining transit-related infrastructure like stops and stations, and the city, county and/or state agencies that own and operate the roadways and signals being improved. Metropolitan planning organizations play a role in identifying locations that could benefit from these improvements and designating funds for transit prioritization projects. TriMet and C-TRAN, which are the two largest transit agencies serving the MSA, already have been planning for and implementing transit signal priority on many routes.

## Extent of implementation

This measure would be implemented within the urbanized portions of the MSA (i.e., the Metro and RTC planning areas), which are the areas of the region where improving transit service has the potential to shift significant numbers of trips away from driving. The analysis for this measure assumes that it would focus on improving the following high-priority frequent transit corridors:

- Areas eligible for investment under Metro and TriMet's Better Bus program, which has identified locations across the Metro region where there are near-term opportunities to increase transit speed and reliability by redesigning streets and other infrastructure. Refer to Figure 5 under measure Trans-2 for a map of these corridors.
- Enhanced Transit Corridors identified in Metro's Regional Transportation plan and Tier 1/Tier 2/Tier 3 corridors identified in the [Metro High Capacity Transit strategy](#). These are the highest-priority transit prioritization projects in the region that are not currently being prioritized for funding from other sources. Refer to Figure 6 under measure Trans-2 for a map of these corridors.
- The Highway 99 and Fourth Plain bus rapid transit extension projects, which are the two C-TRAN bus rapid transit projects identified in [RTC's Regional Transportation Plan](#), C-TRAN's [Transit Development Plan](#), and C-TRAN's [High Capacity Transit System and Finance Plan](#) that have yet to be completed and are still in need of funding. Refer to Figure 7 under measure Trans-2 for a map of these corridors.

## Implementation milestones

Agency partners can implement this measure within five years wherever the necessary planning is in place, and planning for roadway prioritization projects is well underway in the metro area. As discussed elsewhere in this section, the Better Bus program is a key program for identifying, planning, and building transit prioritization projects. The program identified eligible investments by reviewing current and planned transit routes in the Metro region and identifying opportunities to reduce transit delays by redesigning roadways and signals. The planning that has already gone into these projects, as well as the planning grants offered by the Better Bus program, help to

identify implementation projects that can be funded through a variety of sources. Better Bus also offers construction grants that can complete some transit prioritization projects within the region.

### **Potential metrics for tracking progress**

- Additional corridors with transit signal priority treatment.
- Number of transit signals upgraded.

### **Intersection with other funding**

There are several other funding sources that can support this measure:

- FTA [Capital Investment Grants](#) (CIG) are a critical source for supporting transit capital improvements, including signal prioritization. Signal prioritization is often a part of CIG projects, but there are few sources of funding to implement transit signal priority on its own, independent of broader changes to the right of way, which can make it challenging to accelerate signal priority projects in spite of their cost-effective GHG reductions. The selection criteria for the CIG program discourage agencies from using other state or federal sources to improve projects that they intend to submit as candidates for CIG funds, so this measure is focused on corridors with existing transit delay that are not currently top priorities for near-term CIG projects.
- The Better Bus program, administered and funded jointly by Metro and TriMet, provides \$10 million in state and regional funds for planning and construction of transit roadway or signal prioritization projects. Better Bus identified eligible investments by reviewing current and planned transit routes in the Metro region and identifying opportunities to reduce transit delays by redesigning roadways and signals. As of February 2024, the Better Bus program is soliciting letters of interest from potential applicants. Current program funding can support several high-priority projects but likely cannot fund all of the opportunities identified by partner agencies. Many of the projects that are eligible for Better Bus are also good candidates for other implementation grants because they are implementation-ready and high-impact, and additional implementation grants would speed the metro area's progress in implementing a key aspect of its GHG reduction strategy. Metro and TriMet will coordinate on any Better Bus-eligible projects that are submitted for CPRG implementation grants to ensure that these projects do not seek duplicative funding from both sources.
- FTA's [Integrated Mobility Innovation](#) (IMI) program funds new technology approaches that benefit mobility, potentially including transit signal priority projects. However, IMI focuses on relatively small-scale demonstrations of innovative new approaches, whereas CPRG implementation grants and the other funding programs mentioned here focus on larger-scale implementation of proven technologies, so there is minimal risk of overlap between the two.

### **Alignment with adopted climate action plans**

The Metro team identified the measures in this PCAP by reviewing all current climate action plans adopted by public agencies in the MSA (see Appendix A for a list of the plans reviewed). Of those

plans, the following mentioned redesigning traffic signals to prioritize transit as a GHG reduction measure:

- Metro
- TriMet

Though these CAPs are the most consistent and comprehensive documents of partner agencies' plans to reduce GHG emissions, they do not cover all communities or GHG emission sectors in the MSA, nor are they the only documents that describe the GHG benefits of this measure. Many transportation plans developed by cities, counties, transit agencies and regional planning agencies highlight the GHG reduction benefits of prioritizing transit and identify specific projects that have the potential to reduce emissions.

### **LIDAC benefit analysis**

#### *LIDACs impacted by this measure*

LIDACs impacted by this measure include those within a half-mile radius of the included prioritized corridors within this measure. A list of specific corridors and LIDAC census tracts impacted by this measure is provided in the Low-income and disadvantaged community analysis section in Table 20.

#### *Potential benefits to LIDACs under this measure*

As identified through public engagement conducted during development of [Metro's 2023 Regional Transportation Plan](#) and [2018 Regional Transit Strategy](#), communities want more fast, frequent, reliable, and affordable transit connections throughout the Metro region. Implementing transit signal prioritization directly reduce delays benefit to LIDACs in the following ways:

- **Improved access to key destinations.** Investments in reducing transit delays help riders reach a greater number and variety of essential destinations including jobs, education, and healthcare in a reasonable amount of time.
- **Affordable transportation.** Car ownership is expensive. Reliable and rapid public transportation offers a lower cost alternative to single-occupancy vehicles.

### **Trans-4: Expand bicycle and pedestrian network**

#### **Description**

Transportation accounts for the largest share of the MSA's GHG emissions, and agencies in the region have a history of collaborating to reduce these emissions. Every adopted local and regional CAP in the metro area includes an emphasis on completing bicycle and pedestrian networks to allow people to shift short trips from driving to other modes. Metro's [Climate Smart Strategy](#) establishes the toolkit that local and regional agencies in Metro's planning area (which includes most of the people and jobs in the broader MSA) use to reduce transportation emissions, and it identifies investing in active transportation as a medium-impact GHG reduction measure. The

regional transportation plans led by [Metro](#) and [RTC](#) identify high-priority bicycle and pedestrian infrastructure projects that are eligible for state and federal transportation funds. The current need for these projects far exceeds the resources available; this leaves an important element of the metro area's climate- and safety-related efforts unfunded.

### GHG reductions

- 70,100 MT CO<sub>2</sub>e per year.
- Up to 420,800 MT CO<sub>2</sub>e from 2025 through 2030.
- Up to 1,823,600 MT CO<sub>2</sub>e from 2025 through 2050.
- Cost-effectiveness of GHG reductions: \$\$ (\$1,000 - \$2,000 / MT CO<sub>2</sub>e)

### Co-pollutant reductions

**Table 9: Trans-4 co-pollutant reductions**

Co-pollutant	2020 annual reductions (kilograms)	2030 constrained scenario (kilograms)	2045 constrained scenario (kilograms)
NOx	77,347	7,178	1,354
PM <sub>2.5</sub>	1,006	285	116
PM <sub>10</sub>	1,124	320	130
VOC	30,585	6,317	4,677
CO	634,899	240,890	176,915
Source: Metro specific factors based on MOVES3			
Co-pollutant	Annual reductions (kilograms)		
Black carbon	367		
Organic carbon	183		
Source: MOVES3, Table 2 for passenger vehicles model year 2015			

### Implementing agencies

City, county, or state transportation agencies are responsible for planning and building most active transportation projects, which are located on the streets owned and operated by these agencies. Metro and special districts (i.e., parks and recreation districts) are often involved in planning and building longer-distance bicycle and pedestrian trails that pass through greenspaces.

### Extent of implementation

This measure would be implemented within the urbanized portions of the MSA (i.e., the Metro and RTC planning areas), which are the areas of the region where homes and destinations are closer together, and therefore where there are opportunities to reduce GHG emissions by shifting short-distance vehicle trips to walking or biking trips. The Metro and RTC regional transportation plans identify high-priority active transportation projects throughout these regions.

## Implementation milestones

Several agencies across the metro area are currently building active transportation projects, and almost every city and county has more projects planned for the future. Metro's [Regional Flexible Funding Allocation](#) (RFFA) process provides a key opportunity to implement these projects by distributing flexible federal funds to high-priority bicycle and pedestrian projects that are ready to be built, and it is often oversubscribed. A new RFFA cycle opens in 2024, which will help to identify specific active transportation projects that reduce GHG emissions and are ready for implementation as soon as additional funding is available.

## Potential metrics for tracking progress

- Miles of bicycle and pedestrian infrastructure constructed.

## Intersection with other funding

Active transportation projects are funded primarily by state and local revenues. However, there are several federal funding sources that support active transportation projects:

- Congestion Management and Air Quality (CMAQ) and Surface Transportation Block Grant (STBG) funds are formula funds that Metro and RTC allocate through their regional transportation plans (and in Metro's case, through the RFFA process described above), often prioritizing them toward active transportation projects. RTC selects active transportation projects for funding through the [Transportation Alternatives](#) program, a set-aside from their STBG funds. When projects identified through these plans and processes receive funding from other grants, Metro and RTC reprogram CMAQ and STBG funds to other transportation projects that need them.
- The [Active Transportation Infrastructure Investment Program](#) (ATIIP) is a new competitive grant program funded by the Bipartisan Infrastructure Law. The full details of this program have yet to be announced, but it is intended to fund larger-scale active transportation projects that connect key destinations. The minimum capital grant request allowed for ATIIP is \$15 million, which likely means that only a small subset of the high-priority bicycle and pedestrian projects in the metro area are good candidates for ATIIP funding since the majority of active transportation projects cost less than the grant minimum.
- Both [Oregon](#) and [Washington](#) administer Safe Routes to School (SRTS) programs that fund active transportation projects that make streets surrounding schools safer, and Metro operates a [regional SRTS grant program](#). These programs can support some active transportation projects that have climate benefits, but their limited resources and geographies (funds must be spent near schools) limit their potential to meet the needs that this measure addresses.
- Metro is the recipient of a \$2.4 million U.S. Department of Transportation [Safe Streets and Roads for All grant](#) that will fund enhanced crash data analysis and identify a list of quick-build pedestrian safety projects. This grant will be used to help transportation projects that benefit safety get more prepared for implementation, but additional resources will be

needed to complete build-out of these projects. The resulting projects will be focused on locations with high crash rates within the Metro region. These sometimes align with locations where there are opportunities for mode shift and GHG reduction, but not always, and this grant does not cover the MSA outside of the Metro region.

- A 2022 Washington law requires the Washington State Department of Transportation (WSDOT) to take [a complete streets approach](#) to designing and building state-owned roads, which effectively means that many state-led projects dedicate increased resources to bicycle, pedestrian, and transit access improvements. However, this funding is limited to state-owned roads on the Washington side of the MSA.

The Washington draft PCAP identifies expanding the WSDOT Complete Streets Program to better support active transportation improvements throughout the state as a potential CPRG implementation grant application. In the event that the cities (within the MSA) and the State of Washington submit applications for active transportation projects on overlapping facilities, Metro and RTC would coordinate with metro area applicants and the State of Washington to avoid the submission of duplicate applications.

### **Alignment with adopted climate action plans**

The Metro team identified the measures in this PCAP by reviewing all current climate action plans adopted by public agencies in the MSA (see Appendix A for a list of the plans reviewed). Of those plans, the following mentioned investing in active transportation as a GHG reduction measure:

- City of Beaverton
- City of Hillsboro
- City of Lake Oswego
- City of Milwaukie
- City of Portland
- City of Tualatin
- City of Vancouver
- Metro
- Multnomah County

Though these CAPs are the most consistent and comprehensive documents of partner agencies' plans to reduce GHG emissions, they do not cover all communities or GHG emission sectors in the MSA, nor are they the only documents that describe the GHG benefits of this measure. Many transportation plans developed by cities, counties, transit agencies and regional planning agencies highlight the GHG reduction benefits of building active transportation projects. In the Metro region, all local transportation system plans identify bicycle and pedestrian projects as priorities for a variety of reasons related to climate as well as safety, equity, and health.



## LIDAC benefit analysis

### *LIDACs impacted by this measure*

LIDACs impacted by this measure include those within the urbanized region of the MSA. A list of LIDAC census tracts impacted by this measure is provided in Table 19 in the Low-income and disadvantaged community analysis section for a list of disadvantaged census tracts within the Oregon Metro and Washington RTC regions.

### *Potential benefits to LIDACs under this measure*

As outlined in Metro's 2023 Regional Transportation Plan, enhancing the pedestrian and bicycle network brings the following benefits to LIDACs:

- **Safer streets:** traffic fatalities are rising in the metro area, particularly among pedestrians, in spite of agencies' efforts to reduce them. These crashes are concentrated in the areas where marginalized people live; according to Chapter 4 of Metro's [Regional Transportation Plan](#), 75 percent of severe crashes within the Metro region are located in Equity Focus Areas, which are the areas where people of color, low-income people, and people with limited English proficiency are concentrated within the Metro region.
- **Safe access to transit:** as discussed under measures Trans-1 through Trans-3, low-income people and other marginalized people are more likely than others to rely on transit. Many plans prioritize adding pedestrian and bicycle facilities near transit stations and stops, which is critical to helping people use transit safely and conveniently.

### *Potential disbenefits to LIDACs under this measure*

- **Displacement and gentrification.** Adding high-quality bicycle and pedestrian trails has the potential to increase property values in adjacent communities. Increased value benefits homeowners, but it disbenefits renters who have a higher risk of potential displacement. Many of the investments under this measure are smaller gap-filling projects that do not produce significant gentrification and displacement risks. When investing in high-quality trails, Metro and partner agencies mitigate potential displacement impacts by investing in affordable housing and providing support for community stabilization efforts.

## Trans-5: Expand use of parking pricing

### Description

Transportation accounts for the largest share of the MSA's GHG emissions, and agencies in the region have a history of collaborating to reduce these emissions. Research has shown that one of the most effective things that transportation agencies can do to reduce GHG emissions is to use pricing to manage demand for vehicle trips, and a growing number of major cities in the United States and Europe use pricing to limit pollution and congestion. Metro's [Climate Smart Strategy](#) establishes the toolkit that local and regional agencies in Metro's planning area (which includes most of the people and jobs in the broader MSA) use to reduce transportation emissions, and it



identifies implementing pricing as a high-impact GHG reduction measure. Other climate plans further emphasize the importance of pricing; for example the [Portland Decarbonization Pathways Analysis Technical Memo](#) finds that “demand management-focused road pricing and facility tolling, parking pricing, and parking management as a bundle are the most effective transportation strategies for reducing both vehicle miles traveled and carbon emissions.”

Pricing, as defined in these efforts, includes parking pricing, tolls on individual facilities, and systemwide fees. Efforts to implement all three types of pricing are underway in the metro area. New state transportation rules in Oregon require agencies to create plans to reduce vehicle trips in areas that are well served by transit and to consider parking pricing as one pathway to doing so. Both ODOT and WSDOT are considering implementing tolls on the I-5 Interstate Bridge Replacement Program project, which crosses the border between the two states. Finally, ODOT is planning to implement pricing along the I-5 and I-205 corridors within the Oregon portion of the metro area, and ODOT is also exploring per-mile fees as a replacement for diminishing gas tax revenues. Metro’s PCAP focuses on advancing parking pricing because unlike these other efforts, which involve several more years of planning before pricing begins, parking pricing can be implemented and begin reducing GHG emissions in the near term.

### GHG reductions

- 200 MT CO<sub>2</sub>e per year.
- Up to 1,000 MT CO<sub>2</sub>e from 2025 through 2030.
- Up to 4,400 MT CO<sub>2</sub>e from 2025 through 2050.
- Cost-effectiveness of GHG reductions: \$ (self-funding).

### Co-pollutant reductions

**Table 10: Trans-5 co-pollutant reductions**

Co-pollutant	2020 annual reductions (kilograms)	2030 constrained scenario (kilograms)	2045 constrained scenario (kilograms)
NOx	187	17	3
PM2.5	2	1	0
PM10	3	1	0
VOC	74	15	11
CO	1,539	584	429
Source: Metro specific factors based on MOVES3			
Co-pollutant	Annual reductions (kilograms)		
Black carbon	1		
Organic carbon	<1		
Source: MOVES3, Table 2 for passenger vehicles model year 2015			

### Implementing agencies

Cities are responsible for implementing parking pricing, and interest in doing so is typically limited to larger cities that are home to major business districts or other key destinations that draw lots of trips from across the metro area.

### **Extent of implementation**

This measure would be implemented within the Metro region, which is the only portion of the metro area where there is either currently priced parking or plans to expand pricing. Metro's regional transportation plan assumes that a growing number of communities in the region will have priced parking by 2045 (these assumptions are documented in [Appendix M](#) of Metro's 2023 RTP). Currently, downtown and inner east Portland are the only places in the metro area with priced parking; under the measure, parking pricing would be extended to other communities that are rich in destinations and transit service, including neighborhoods farther east in Portland and the centers of other large cities in the Metro region. This new pricing would benefit communities throughout the Metro region because it would apply to areas that draw trips from all over the region.

### **Implementation milestones**

Oregon's new [Climate-Friendly and Equitable Communities](#) (CFEC) rules require cities and counties to reduce vehicle trips in areas with high-frequency transit stations and other designated climate-friendly areas. CFEC requires cities and counties to either reduce parking requirements in new construction or implement parking pricing in these areas. During 2024 and 2025, Metro will update its [Regional Transportation Functional Plan](#) that provides detailed guidance on how state and regional policies should be reflected in local transportation plans, and some local agencies will update their transportation plans for the first time under the new CFEC rules. These developments will support implementation of parking pricing in communities throughout the Metro region.

### **Potential metrics for tracking progress**

- Expansion in priced parking
- Increase in parking price rates
- Parking revenues collected

### **Intersection with other funding**

Metro is not currently aware of state or federal funding sources dedicated to implementing parking pricing. This could be because this measure is assumed to be self-funding since once pricing is implemented, it generates revenues that can cover administration, operations, and maintenance. However, this leaves cities without many available resources to fund the start-up costs involved, which can include the costs of planning and setting rates, procuring the necessary hardware and software, and updating city code. These costs are potentially good candidates for CPRG implementation grants.

### **Alignment with adopted climate action plans**

The Metro team identified the measures in this PCAP by reviewing all current climate action plans adopted by public agencies in the MSA (see Appendix A for a list of the plans reviewed). Of those plans, the following mentioned parking pricing as a GHG reduction measure:

- City of Milwaukie
- City of Portland
- Metro
- Multnomah County

Though these CAPs are the most consistent and comprehensive documents of partner agencies' plans to reduce GHG emissions, they do not cover all communities or GHG emission sectors in the MSA, nor are they the only documents that describe the GHG benefits of this measure. Several partner agencies in the region, including ODOT, Metro and the City of Portland, have created plans that discuss the GHG benefits of parking pricing and other forms of pricing in greater detail.

### **LIDAC benefit analysis**

#### *LIDACs impacted by this measure*

For this GHG emission-reduction measure, the project team anticipates that implementation would impact all LIDACs within the Oregon Metro area. Though relatively few areas are planned to receive parking areas, the areas that will be priced are home to destinations that draw travelers from all throughout the MSA. See Table 19 in the Low-income and disadvantaged community analysis section for a list of disadvantaged census tracts within the Oregon Metro and Washington RTC regions.

#### *Potential benefits to LIDACs under this measure*

Efforts such as Metro's [Regional Congestion Pricing Study](#), ODOT's Equity and Mobility [Advisory Committee](#), and Portland's [Pricing Options for Equitable Mobility](#) study have involved extensive outreach to marginalized communities and follow-up analysis to understand the potential equity impacts of pricing, where these impacts could occur, and how these impacts could be mitigated. These efforts have consistently found that the equity benefits and impacts of pricing depend on how pricing is implemented, and that maximizing equity benefits depends largely on whether low-income travelers receive exemptions or discounts where appropriate, and on investing revenues in transit service and other affordable alternatives to priced trips. These practices are discussed, encouraged, and in some cases, required by the planning document cited above as well as in the pricing policies contained in Metro's Regional Transportation Plan.

### **Trans-6: Expand the use of electric buses in the region's transit fleets**

#### **Description**

Transportation accounts for the largest share of the MSA's GHG emissions, and increasing the number of electric and other zero-emission vehicles on the road is a cornerstone of both Oregon and Washington's climate efforts. Both states have adopted California's zero emission vehicle standards, offer rebates or tax incentives to consumers who purchase an electric passenger vehicle, and have initiatives to install electric vehicle chargers along key highway corridors. These efforts benefit the MSA, which is where a large majority of Oregon's electric vehicles are

registered, and which also has higher electric vehicle ownership rates than most communities in Washington. Metro's [Climate Smart Strategy](#) recognizes the State's role in leading the transition to electric vehicles, and identifies "support[ing] clean vehicles and fuels" as a high-impact GHG reduction measure for local and regional agencies.

At the same time, adopted climate plans from communities within the MSA highlight that opportunities for local and regional agencies to take more direct action to make vehicles cleaner, especially when it comes to addressing medium- and heavy-duty vehicles or to non-highway corridors. Greening the transit fleet is often a focus of these efforts because there are large transit fleets operating within the metro area and because doing so often supports parallel efforts to reduce GHG emissions by increasing or improving transit service. Transit agencies across the metro area have long-term efforts underway to green their fleets by replacing diesel-powered buses with buses that use a variety of clean fuels. In particular, TriMet, which provides over 90 percent of transit trips in the metro area, has adopted a [Clean Corridors Plan](#) that outlines how the agency will switch its entire fleet to zero-emission buses by 2040. The plan also prioritizes specific routes that are well suited for electric buses and where deploying these buses would best improve air quality for marginalized and vulnerable people. C-TRAN also adopted a [Zero Emission Transition Plan](#) in 2022 that aims to transition its fixed-route fleet to zero emission buses by 2040. Currently, more than 50 percent of C-TRAN's fixed-route fleet are hybrid diesel-electric buses.

In keeping with the implementation-focused nature of the PCAP, this measure focuses on purchasing enough new electric buses to fully use transit agencies' existing or planned charging capacity. Electric buses are already widely in service, whereas implementing other clean technologies such as hydrogen fuel cells can involve lengthy lead times to procure fuels and infrastructure. Focusing on replacing buses that can be powered using existing charging capacity means that electric buses added under this measure can be put directly into service without requiring costly and time-consuming upgrades to maintenance facilities.

### **GHG reductions**

- 6,500 MT CO<sub>2</sub>e per year (lifecycle emissions<sup>1</sup>).
- Up to 39,200 MT CO<sub>2</sub>e from 2025 through 2030.
- Up to 170,000 MT CO<sub>2</sub>e from 2025 through 2050.
- Cost-effectiveness of GHG reductions: \$ (less than \$1,000/ MT CO<sub>2</sub>e)

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<sup>1</sup> Transit GHG reductions are calculated as lifecycle emissions to more comprehensively account for R99 (renewable) diesel emissions, which is the fuel currently purchased by TriMet. TriMet purchases 100% renewable electricity, but upstream electricity fuel production emissions are accounted for to maintain lifecycle methodology consistency. GHG reductions for this measure would be higher if assuming a baseline of B5 diesel, which may be applicable for other transit agencies, up to 15,400 MT CO<sub>2</sub>e annually in lifecycle emissions.

## Co-pollutant reductions

**Table 11: Trans-6 co-pollutant reductions**

Co-pollutant	Annual reductions (kilograms)
NOx	16,695
PM <sub>2.5</sub>	129
PM <sub>10</sub>	795
VOC	1,218
CO	36,257
Black carbon	8
Organic carbon	8
Source: MOVES3 Table 12 for diesel transit buses, model year 2015	

## Implementing agencies

Transit agencies are responsible for procuring transit buses.

## Extent of implementation

This measure would be implemented within the Metro region, which is where the majority of TriMet service is located. TriMet is the region's largest transit agency, and also the only one that currently has enough existing charging facilities to add new electric buses into service in the near-term without first improving its facilities. The analysis for this measure assumed that TriMet would use new electric buses to serve the highest-priority routes identified in its Clean Corridors Plan.

## Implementation milestones

As of February 2024, TriMet had ten electric buses in its fleet and plans to add 24 more in 2024 with support from a federal grant. The Clean Corridors Plan establishes a framework for adding new clean buses to the TriMet fleet, so no additional planning is needed to add electric buses to service. As of June 2023, C-TRAN had nine electric buses in its fleet, as well as plans to add hydrogen fuel cell electric buses as soon as 2025 if funding becomes available, but it does not currently have enough charging capacity to add more clean buses to its fleet. [C-TRAN's Zero Emissions Bus Transition Plan](#) provides a longer-term framework to support the fleet transition on the Washington side of the MSA.

## Potential metrics for tracking progress

- Number of new electric buses added to service.
- Proportion of revenue miles delivered with electric buses.

## Intersection with other funding

Though there are many FTA programs devoted to funding new transit vehicles and facilities, these programs are oversubscribed and cannot come close to meeting the need for this large-scale, major technology and fleet transition across the country. In particular, the [Low or No Emission Grant Program](#) funds the purchase of zero-emission transit vehicles and associated facilities, but

the amount of available funding is not adequate to support the ambitious efforts to green transit in the Portland-Vancouver metropolitan area. TriMet, C-TRAN and other transit agencies regularly apply for funding from the Low or No Emission Grant Program and other sources to implement different aspects of the major undertaking of fleet transitions. Applications for CPRG implementation funding under this measure would focus on adding buses that are not likely to be funded through other programs.

### Alignment with adopted climate action plans

The Metro team identified the measures in this PCAP by reviewing all current climate action plans adopted by public agencies in the MSA (see Appendix A for a list of the plans reviewed). Of those plans, the following mentioned transit electrification as a GHG reduction measure:

- City of Beaverton
- City of Hillsboro
- City of Portland
- City of Tigard
- City of Tualatin
- TriMet
- Metro

Though these CAPs are the most consistent and comprehensive documents of partner agencies' plans to reduce GHG emissions, they do not cover all communities or GHG emission sectors in the MSA, nor are they the only documents that describe the GHG benefits of this measure. Several transit agencies and counties also identify transit electrification as a priority in their transit service plans.

### LIDAC benefit analysis

#### *LIDACs impacted by this measure*

LIDACs impacted by this measure include those within the urbanized geographies within the MSA that are most impacted by air pollutants associated with transportation. See Table 19 in the Low-income and disadvantaged community analysis section for a list of disadvantaged census tracts within the Oregon Metro and Washington RTC regions.

#### *Potential benefits to LIDACs under this measure*

Implementation of switching to low-carbon fuel alternatives brings the following benefits to LIDACs:

- **Improved air quality.** Transit electrification improves air quality by reducing the harmful effects of diesel exhaust, including asthma, heart attacks, strokes, lung cancer, and premature deaths, especially for populations living nearest to transportation corridors. Low-income travelers use transit at higher rates and transit service in the metro area often focuses on low-

income communities and communities of color, so low-income people and other marginalized groups are most likely to experience improved air quality as a result of this measure.

## Residential building measures

Commercial and residential buildings account for [34 percent](#) of Oregon's and [20 percent](#) of Washington's annual GHG emissions. Weatherization and energy efficiency are known to be some of the most effective measures to reduce operational emissions from the existing commercial and residential building stock by reducing energy use, and they also make other energy efficiency measures more effective. The measures in this PCAP focus on residential buildings, which reflects the emphasis on residential buildings in most adopted local and regional CAPs in the MSA. Commercial and industrial buildings are unevenly distributed across the metro area, and emissions and energy use patterns vary widely from site to site, whereas almost every community in the metro area has homes and can use similar approaches to reduce emissions.

### **Res-1: Expand existing residential energy efficiency retrofit programs, with a focus on low-income households**

#### **Description**

Building energy use accounts for the second largest share of GHG emissions in the MSA after transportation. Existing CAPs consistently focus on reducing emissions from residential energy use.

The MPOs, transit agencies, and other regional agencies that play an important statutory role in coordinating the transportation measures discussed above typically do not have oversight of existing buildings. Instead, county and city governments, sometimes in partnership with nonprofit organizations, manage programs assisting low-income residents with energy efficient upgrades to existing homes. There are many benefits to this locally led approach. Cities and counties know their local housing stock well and use this knowledge to develop programs that focus on the efficiency measures that are most likely to benefit their residents and reduce a home's energy use. They can also build on other engagement activities and community partnerships to ensure that low-income residents are aware of and prepared to take advantage of these opportunities.

Support is needed to defray high up-front costs for effective energy efficiency measures, particularly in older, less-efficient units. A recent [Oregon Department of Energy study](#) found that weatherization is the most common type of help needed for residents to be able to perform critical upgrades. In addition, weatherization and efficiency upgrades also help keep units cool during heat waves, making homes more resilient as climate change increases the number of extreme heat events. This measure focuses on harmonizing, expanding, and scaling up these existing programs to increase their GHG emission reductions while in a way that leverages a variety of potential funding resources and maintains the elements that have made the programs successful so far. It considers a variety of energy efficiency improvements:

- Replacing inefficient heat sources with electric heat pump furnaces and water heaters.



- Insulation and air sealing to reduce heating and cooling losses and meet current energy codes.
- Upgrading to more energy-efficient windows.
- Upgrading to more energy-efficient water heaters.
- Providing ancillary repairs that are necessary to implement the improvements listed above.

There are many existing housing units in the MSA that could benefit from these improvements, and the analysis for this measure assumes that it would be feasible to scale up existing energy efficiency programs to reduce GHG emissions in a far greater number of units than these programs are currently able to reach - up to an additional 26 percent of homes (260,000 households). It is likely that applications to implement this measure in the MSA will focus on publicly managed affordable housing units (including HUD-funded Public Housing, publicly owned affordable housing units, and affordable housing properties where local housing authorities are controlling partners). Though these units represent a small portion (roughly half a percent) of all of the housing units in the MSA, there are several reasons to prioritize making them more energy efficient:

- Eligibility for these units is typically restricted to the lowest-income households in the region (i.e., households earning 80 percent or less of the area median income), so focusing on these units maximizes equity benefits.
- Local affordable housing authorities manage and maintain these properties, which makes it easy for agency partners to identify units that are in need of different improvements, figure out which improvements are going to maximize energy savings and GHG emission reductions, and implement these improvements quickly and effectively.
- Most of these units are already using federal funds, which means that they are ready to receive additional federal grants without any administrative delays due to the application of Davis-Bacon or Build/Buy America requirements.
- The agencies that oversee these units already use a variety of state and federal funding streams to build and improve them, including many of the related funding sources discussed below. They can use this knowledge to develop implementation grant applications that support, and do not duplicate, work that is being funded with other resources.

### **GHG reductions**

- 594,400 MT CO<sub>2</sub>e per year.
- Up to 3,566,500 MT CO<sub>2</sub>e from 2025 through 2030<sup>2</sup>.
- Up to 15,454,800 MT CO<sub>2</sub>e from 2025 through 2050<sup>2 above</sup>.
- Cost effectiveness of GHG reductions: \$ (less than \$1,000/ MT CO<sub>2</sub>e)

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<sup>2</sup> Note that as emissions intensity from electricity production reduces in Oregon and Washington due to Clean Energy Targets (Oregon House Bill 2021) and Clean Energy Transformation Act (Washington Senate Bill 5116), emissions reduction potential will change.



## Co-pollutant reductions

**Table 12: Res-1 electricity co-pollutant additions due to increased electricity use**

Pollutant	Annual added emissions (kilograms)
Annual Nitrogen Oxides	7,691
Sulfur Dioxide	4,606
Source: EPA eGRID for NWPP, 2022	

**Table 13: Res-1 natural gas co-pollutant reductions**

Pollutant	Annual reductions (kilograms)
Ammonia	208
Carbon Monoxide	415
Nitrogen Oxides	976
PM Condensable	3
PM <sub>10</sub> Filterable	2
PM <sub>10</sub> Primary (Filt + Cond)	5
PM <sub>2.5</sub> Filterable	1
PM <sub>2.5</sub> Primary (Filt + Cond)	4
Sulfur Dioxide	6
Volatile Organic Compounds	57
Source: EPA Wagon Wheel for residential natural gas heating	

**Table 14: Res-1 woodsmoke co-pollutant reductions**

Pollutant	Annual reductions (kilograms)
Ammonia	78,071
Cadmium	1
Carbon Monoxide	9,543,135
Manganese	10
Mercury	3
Nickel	1
Nitrogen Oxides	225,627
PM Condensable	50,487
PM <sub>10</sub> Filterable	1,396,514
PM <sub>10</sub> Primary (Filt + Cond)	1,447,002
PM <sub>2.5</sub> Filterable	1,390,158
PM <sub>2.5</sub> Primary (Filt + Cond)	1,440,645
Sulfur Dioxide	41,571
Volatile Organic Compounds	1,620,526
<p>Source: EPA Wagon Wheel, average for applicable indoor residential wood-burning devices</p> <p>Note that woodstoves are also a significant source of black carbon, which is not included in these calculations and is likely significant. Black carbon has a 20-year global warming potential of 4,470, and the region's location in higher latitudes increases chances of glacial deposition.</p> <p>Variables such as wood dryness, temperature, etc. create uncertainty in exact emissions.</p>	

**Table 15: Res-1 propane co-pollutant reductions**

Pollutant	Annual reductions (kilograms)
Ammonia	4
Carbon Monoxide	337
Nitrogen Oxides	1,189
PM Condensable	3
PM <sub>10</sub> Filterable	2
PM <sub>10</sub> Primary (Filt + Cond)	4
PM <sub>2.5</sub> Filterable	1
PM <sub>2.5</sub> Primary (Filt + Cond)	4
Sulfur Dioxide	5
Volatile Organic Compounds	46
Source: EPA Wagon Wheel for residential propane heating	

**Table 16: Res-1 distillate fuel oil co-pollutant reductions**

Pollutant	Annual reductions (kilograms)
Ammonia	333
Carbon Monoxide	1,666
Lead	0.4
Nitrogen Oxides	5,997
PM Condensable	433
PM <sub>10</sub> Filterable	360
PM <sub>10</sub> Primary (Filt + Cond)	793
PM <sub>2.5</sub> Filterable	277
PM <sub>2.5</sub> Primary (Filt + Cond)	710
Sulfur Dioxide	71
Volatile Organic Compounds	238
Arsenic	0.2
Beryllium	0.1
Cadmium	0.1
Chromium (VI)	0.03
Chromium III	0.1
Manganese	0.3
Mercury	0.1
Nickel	0.1
Selenium	0.7
Source: EPA Wagon Wheel for residential distillate fuel oil heating	

### Implementing agencies

Cities and counties lead implementation of this measure. See below for a discussion of existing agency residential energy efficiency retrofit programs in the metro area.

## Extent of implementation

This measure would be implemented throughout the entire MSA to fill gaps in state-level funding. Of the 500,000 homes that the State of Oregon has set out to weatherize and provide energy efficiency upgrades, it has identified funding for 13,000. This means that 487,000 homes, or 26 percent of housing statewide, have unfunded weatherization needs. The analysis assumes that 26 percent of homes across the MSA could receive partial or complete retrofits as part of a statewide effort to make up the gap between state goals and current progress.

## Implementation milestones

Implementation of this measure can begin within the first year of receiving funds. Individual municipalities already have many residential energy efficiency programs underway, so they have the necessary authority and staffing to scale up these programs if an implementation grant becomes available. Given the strong infrastructure that already exists, additional planning or program development that may be necessary for implementation would likely take less than a year.

Federally funded weatherization assistance programs (and state-funded Energy Trust of Oregon programs) that provide free energy audits for low-income homeowners are available in all seven counties within the MSA; the programs are administered either by counties, nonprofits, or public utility districts. Three agencies within the MSA offer woodstove replacement programs that provide funding for residents to replace wood-burning stoves and other inefficient heat sources with more efficient alternatives. These programs are similar, but the type and amount of funding and eligibility varies slightly among them:

- Multnomah County's [Wood Burning Device Exchange Program](#) offers incentives ranging from \$3,000 to the full cost of replacement for residents to replace woodstoves and fireplaces with cleaner heat pumps.
- Washington County's [Wood Stove Exchange Program](#) offers rebates of \$1,500 to \$5,500 for residents who replace old woodstoves or inserts with a new stove, insert, or other heating system; rebates vary by income.
- Southwest Clean Air Agency's [Woodsmoke Reduction Program](#) offers grants of \$400 to \$6,000 to help remove or replace old woodstoves or to retrofit masonry fireplaces within the agency's jurisdiction, which includes Clark and Skamania Counties within the MSA.

In addition, several municipalities in the MSA own and manage affordable housing units. The municipalities administer asset management programs that are focused on repairing and maintaining public housing units, and they have the capacity to make energy efficiency improvements to those units. These municipalities include but are not limited to Washington County, Clackamas County, Multnomah County (in partnership with Home Forward, a nonprofit housing developer), and the City of Vancouver. These municipalities could apply to scale-up their current asset management programs with additional funding dedicated to making existing municipally owned affordable housing units more efficient.

The Energy Trust of Oregon—a nonprofit funded by utility surcharges—is a partner in the implementation of energy efficiency efforts throughout Oregon and Southwest Washington, including some of the programs listed above. Local governments have a long history of partnering with the Energy Trust to deliver residential energy efficiency retrofits efficiently and effectively.

### **Potential metrics for tracking progress**

- Numbers of renovated residences
- Average energy savings per square foot
- Average building envelope tightness improvement over baseline audit
- Number of electrified appliances
- Reduction in electricity and/or natural gas demand

### **Alignment with adopted climate action plans**

The Metro team identified the measures in this PCAP by reviewing all current climate action plans adopted by public agencies in the MSA (see Appendix A for a list of the plans reviewed). Of those plans, the following mentioned conducting energy efficiency retrofits of existing housing units as a GHG reduction measure:

- City of Beaverton
- Clackamas County
- City of Gresham
- City of Hillsboro
- City of Milwaukie
- City of Portland
- City of Tigard
- City of Tualatin
- City of Vancouver
- Multnomah County

### **Intersection with other funding**

Several state and federal funding programs are aligned with this measure:

- The [Home Energy Rebate Programs](#) authorized through the Inflation Reduction Act award grants to states to develop and implement high-efficiency electric home rebate programs and to provide rebates that discount the price of energy-saving retrofits in single-family and multifamily buildings.
- The [IRS Energy Efficient Home Improvement Credit](#) provides tax credits up to \$3,200 for people who make energy-efficient improvements to their homes.

- The U.S. Department of Housing and Urban Development's [Green and Resilient Retrofit Program](#) provides direct loans and grants to fund projects that reduce GHG emissions and offer other benefits to residents of HUD-assisted multifamily properties.
- The [Healthy Homes Grant Program](#) was authorized by the Oregon Legislature in 2021. It directs the Oregon Health Authority to create a grant program to address a variety of health-related factors for low-income households earning 80 percent or less of the area median income. Funds are eligible for residential energy efficiency retrofits and other health- and safety-related improvements (e.g., radon, lead, and mold abatement; indoor air filtration; and seismic improvements); details of the program are still being determined. This program may be able to partially fund some of the energy efficiency measures described under this measure.

In addition, the State of Oregon's draft PCAP identifies woodstove replacements and weatherization assistance as priority measures. If agencies within the MSA and the State of Oregon both submit applications for residential energy efficiency retrofit projects, Metro would coordinate with metro area applicants and the State of Oregon to avoid the submission of duplicate applications. Given the diversity of relevant programs in the MSA, this may involve focusing implementation grant applications on the elements of this measure that are not addressed by state applications or on people who are less likely to be able to take advantage of the state and federal programs identified above, such as renters or affordable housing residents. Furthermore, local energy efficiency retrofit programs often provide culturally specific information on complementary state and federal programs in addition to physical improvements, so locally administered energy efficiency programs have the potential to increase utilization of the state and federal programs discussed in this section, especially among low-income residents.

### **LIDAC benefit analysis**

#### *LIDACs impacted by this measure*

For this GHG reduction measure, the project team anticipates that implementation would impact all LIDACs within the MSA. See Table 19 in the Low-income and disadvantaged community analysis section for a list of disadvantaged census tracts within all counties in the MSA.

#### *Potential benefits to LIDACs under this measure*

As identified in individual city CAPs within the Portland metropolitan area, communities are focused on shrinking the gap between systemically underserved populations and access to healthy, efficient housing. Expanding weatherization, home efficiency upgrades, and heat pump programs benefit LIDACs in the following ways:

- **Enhanced internal air quality.** Climate action plans from cities like [Beaverton](#) and [Tigard](#) recognize that weatherization improves equitable access to better indoor air quality, prevents mold that causes illness, and improves the barrier to outdoor air in cases of wildfire hazards, especially in disadvantaged communities where these residential energy retrofits can be prohibitively expensive and residents are most likely to be exposed to poor air quality.

- **Reduced energy costs.** Improved energy efficiency measures are of particular benefit to low-income and disadvantaged residents. The [City of Vancouver's Climate Action Framework](#) finds that these efforts can reduce energy bills by up to 20 percent and add cooling to homes that most often face urban heat islands and poor air quality.

*Potential disbenefits to LIDACs under this measure*

- According to organizations that currently administer energy efficiency retrofits, **low-income homeowners often end up underutilizing programs that offer energy efficiency measures** for two reasons. First, low-income homeowners often face additional cultural and linguistic barriers that make it hard for them to find out about and take advantage of existing programs. Second, homes that are older and/or less well-maintained often require basic structural repairs before energy efficiency measures can be implemented, and many existing programs do not allow funds to be used for structural repairs. Any projects implemented under this measure need to address these barriers in order to fully benefit low-income residents.

**Res-2: Fund additional energy-efficiency measures in publicly funded, newly constructed affordable housing units**

**Description**

The Portland-Vancouver MSA, like many other coastal metro areas, has experienced skyrocketing housing costs over the last 15 years, due in large part to a shortage of affordable housing. In response, agencies across the metro area have stepped up their efforts to build more affordable housing. In 2018, Metro voters approved a \$650 million bond measure with a target of funding 3,900 new affordable housing units, and so far Metro has exceeded this target, [with over 4,300 new units completed or underway](#) as of January 2024. In addition, [Metro's Transit-Oriented Development Program](#), which has funded and supported new developments near frequent transit since 1998, updated its program framework to prioritize affordable housing. On the Washington side of the metro area, the [City of Vancouver's Affordable Housing Fund](#) supports the development of affordable units in Clark County's largest city, and Vancouver [partners with other nonprofits](#) to extend this funding throughout the county.

However, making these units more energy efficient is a challenge. The high cost of land and construction in the Metro area makes it difficult to find a financially feasible pathway to developing even the most basic affordable housing units. Adding unfunded requirements to make these units more energy efficient adds to these challenges and increases costs for developers, which ultimately reduces the total number of units that will likely get built with local and regional funding. Providing additional funding for energy efficiency in new affordable housing units reduces GHG emissions and energy costs for low-income residents without increasing development costs.

This measure would provide additional funding to incentivize the development of energy-efficient affordable homes in the metro area. Not only would this address the trade-off between supply and

efficiency described above, but it is also the most effective and equitable way for local and regional agencies in the Metro region to reduce emissions from new housing. In Oregon, the state preempts local governments from adopting green energy codes, but local and regional governments maintain oversight of the affordable housing units that they fund; improving these housing units (most of which are designated for households earning 30 percent to 80 percent of the area median income) directly benefits low-income residents.

Metro's [Transit-Oriented Development](#) (TOD) program provides the most immediate opportunity to implement this measure, because the program already has partnerships and funding in place to increase energy efficiency in the affordable housing units that it supports. Metro incentivizes energy audits for these units and partners with the Energy Trust of Oregon to provide those audits. Metro has dedicated approximately \$3 million yearly in incentives for developers of higher-density, regulated affordable housing to commit to early design meetings with program partners to identify areas to increase energy efficiency. Metro would use additional funding to increase these incentives to encourage developers to exceed the state's energy code requirements by at least 15 percent through additional investments in energy efficiency. Metro currently has the authority to implement these changes to the TOD program because it is federally funded and administered by Metro and agency partners, whereas extending the Affordable Housing Bond (which has almost exhausted its funding) and altering the program framework to provide more funding for energy efficiency requires voter approval. If an initial effort to increase energy efficiency in the TOD program proved successful, Metro would seek opportunities to make similar changes to the Affordable Housing Bond in any renewal measures and coordinate with other agencies in the MSA that fund or support affordable housing to explore similar changes to their programs.

### GHG reductions

- 1,200 MT CO<sub>2</sub>e per year.
- Up to 7,100 MT CO<sub>2</sub>e from 2025 through 2030<sup>2</sup> above.
- Up to 30,600 MT CO<sub>2</sub>e from 2025 through 2050<sup>2</sup> above.
- Cost effectiveness of GHG reductions: \$ (less than \$1,000/ MT CO<sub>2</sub>e)

### Co-pollutant reductions

**Table 17: Res-2 electricity co-pollutant reductions**

Pollutant	Annual reductions (kilograms)
Annual Nitrogen Oxides	380
Sulfur Dioxide	227
Source: EPA eGRID for NWPP, 2022	

**Table 18: Res-2 natural gas co-pollutant reductions**

Pollutant	Annual reductions (kilograms)
Ammonia	64

Carbon Monoxide	127
Nitrogen Oxides	299
PM Condensable	1
PM <sub>10</sub> Filterable	1
PM <sub>10</sub> Primary (Filt + Cond)	2
PM <sub>2.5</sub> Filterable	0.3
PM <sub>2.5</sub> Primary (Filt + Cond)	1
Sulfur Dioxide	2
Volatile Organic Compounds	17
Source: EPA Wagon Wheel for residential natural gas heating	

### Implementing agencies

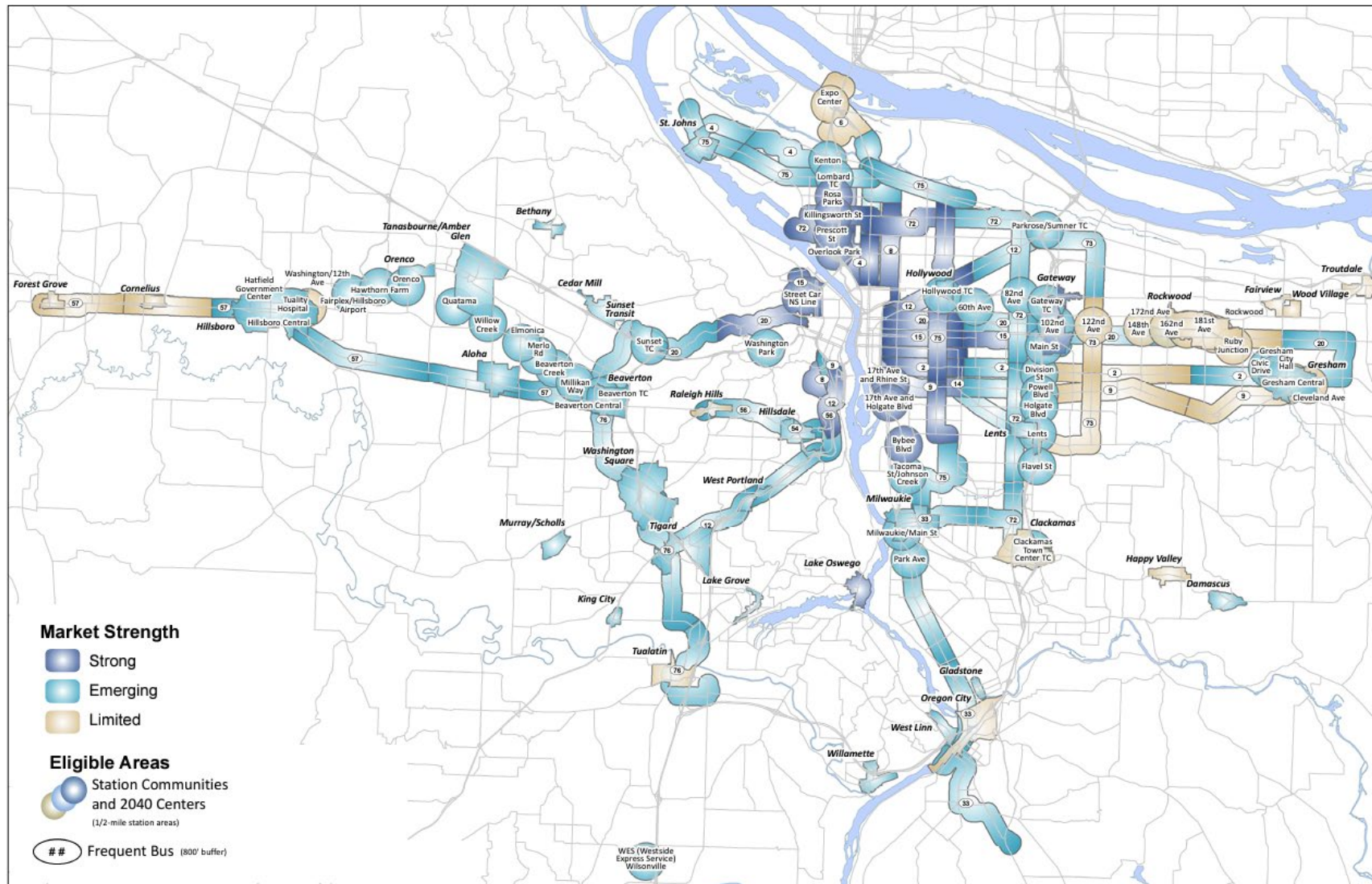
Within the metro area, Metro, counties, and selected cities all administer affordable housing programs. This measure focuses on Metro's TOD program, which funds affordable housing throughout the Metro region in partnership with local agency and non-profit partners. Though this program is administered by Metro, it enjoys the support of local agencies from across the region, who have repeatedly voted to allocate flexible federal revenues to continue funding the program.

### Extent of implementation

The analysis of this measure assumes that it would result in Metro exceeding Oregon's already ambitious baseline energy code in each of the 3,700 affordable housing units that the TOD program is expected to build throughout the region. Figure 8 shows the areas of the Metro region that are eligible for investment under the TOD program.



**Figure 8: Areas of the Metro region that are eligible for Transit-Oriented Development Program investment**



Shading indicates market strength in each area ([Metro 2023 TOD Strategic Plan](#)).

### Implementation milestones

As discussed above, Metro already has the necessary program frameworks and partnerships in place to implement this measure, as well as existing funding that is devoted to the programs that would be considered as leverage if applying for an implementation grant.

### Potential metrics for tracking progress

- [Home Energy Scoring](#) or third-party certification of finished residences.
- Use of utility benchmarking if energy rating certification is not available.
- Percentage of appliances installed that meet EnergyStar ratings.

### Intersection with other funding

Though there are several state and federal programs that fund energy-efficiency measures in housing units that are already built (see discussion above under Res-1), the only state program that funds energy efficiency in newly constructed affordable housing—the [Oregon Multifamily Energy Program](#)—is severely oversubscribed. The program provides \$2.5 million annually to incentivize energy efficiency in existing and new multifamily buildings throughout the state. The last round in fall of 2023 was only able to fund 19 of the 49 projects (38 percent) that applied, and more than half the program’s funding is directed to parts of the state outside of the MSA.

The State of Oregon’s draft PCAP identifies incentives for energy-efficient housing as a state-led measure, and it highlights affordable housing as a priority in the discussion of this measure. Metro would coordinate with the State of Oregon if the state and region apply for CPRG implementation grants to make new affordable housing units more energy-efficient to avoid duplicative applications. Given that Metro’s approach to this measure builds on a longstanding program that is tailored to the region’s housing market and needs, the risk of duplication seems low.

### Alignment with adopted climate action plans

The Metro team identified the measures in this PCAP by reviewing all current climate action plans adopted by public agencies in the MSA (see Appendix A for a list of the plans reviewed). Of those plans, the following mentioned increasing the energy efficiency of new housing units as a GHG reduction measure:

- City of Beaverton
- City of Tigard
- City of Tualatin

### LIDAC benefit analysis

#### *LIDACs impacted by this measure*

This measure would involve investing in the eligible funding areas identified in Metro’s [Transit Oriented Development Program](#), which are shown in Figure 8. However, this measure would

benefit people living in LIDAC census tracts throughout the MSA, as any low-income qualifying person can reside in these newly established housing units, and surveys conducted by Metro suggest that people from across the MSA are willing to locate in order to live in affordable unit near transit. The list of LIDAC census tracts within the MSA are provided in the section Low-income and disadvantaged community analysis.

#### *Potential benefits to LIDACs under this measure*

Similar to measure Res-1, the incorporation of energy-efficiency measures into newly constructed, publicly funded affordable housing units would provide both health and safety as well as cost benefits to low-income disadvantaged communities. The following benefits would be realized:

- **Enhanced internal air quality.** Climate action planning by cities like [Beaverton](#) and [Tigard](#) recognize that weatherization improves indoor air quality, prevents mold that causes illness, and improves the barrier to outdoor air in cases of wildfire hazards.
- **Reduced energy costs.** Improved energy efficiency measures are of particular benefit to low-income and disadvantaged residents. The [City of Vancouver's Climate Action Framework](#) finds that these efforts can reduce energy bills by up to 20 percent and add cooling to homes that most often face urban heat islands and poor air quality.

As noted above, this measure avoids the risk of reducing affordable housing supply, which is a key equity concern given the lack of affordable housing in the Portland-Vancouver MSA, that is associated with requiring affordable housing to be energy efficient,

### **Waste and materials management measures**

As discussed above, agencies across the Portland-Vancouver MSA, and particularly in the Metro region, collaborate to reduce solid waste. On one hand, this means that agencies have already taken many initial steps to reduce GHG emissions from waste by increasing recycling and diverting many reusable materials from the waste stream, and some have also begun to offer residential composting. It also creates opportunities for the MSA to achieve deeper GHG reductions in the solid waste sector, primarily by further expanding composting, which reduces GHG emissions by diverting organic and food waste from landfills.

#### **Waste-1: Expand the availability of residential composting programs**

##### **Description**

Metro plans and oversees the solid waste system for much of the metro area, working with local communities and industry partners to reduce waste while managing garbage, recycling, and composting in a safe, healthy, and cost-effective manner. This creates unique opportunities to reduce GHG emissions associated with solid waste. Regional management of the waste system creates economies of scale that enable Metro to maximize the efficiency of the region's garbage and recycling stations, identify opportunities to recycle and reuse products locally, create equitable opportunities for workforce development, and fund innovative approaches to waste

management. Though Metro's oversight is limited to its jurisdiction, Metro collaborates with counties throughout the Metro area to identify joint investments and collaborations that help to improve waste management in surrounding communities.

Metro's PCAP focuses on reducing food waste for a number of reasons. First, food production and preparation require significant resources including farmland, clean water and air, labor, energy, fertilizers, and pesticides (which have significant life-cycle impacts on the climate and on other environmental issues). Second, keeping food out of the waste stream can benefit the many people in the metro area who suffer from food insecurity. Finally, whereas recycling is available and widely used throughout the region, many communities in the region currently do not offer residential composting service. Single-family homes are the easiest to serve, but Metro estimates that 25 percent of the single-family homes in the region do not receive composting service, nor do multifamily homes, which account for 30 percent of the metro area's housing units.

This measure focuses a series of changes—including adding composting capacity, changing program rules and regulations, and providing start-up assistance to local governments—that are necessary to expand food composting throughout the Metro region. These measures mainly reduce GHG emissions by keeping food out of landfills, but they also provide opportunities to reduce the emissions associated with processing food waste.

### **GHG reductions**

- 7,000 MT CO<sub>2</sub>e per year.
- Up to 42,000 MT CO<sub>2</sub>e from 2025 through 2030.
- Up to 182,100 MT CO<sub>2</sub>e from 2025 through 2050.
- Cost effectiveness of GHG reductions: \$ (less than \$1,000/ MT CO<sub>2</sub>e)

### **Co-pollutant reductions**

It is unclear how or if anaerobic digestion would increase or decrease co-pollutants. Vehicle emissions such as NO<sub>x</sub>, PM<sub>2.5</sub>, VOCs, CO, etc., would be reduced if the waste hauling distance is reduced, which would likely happen if new composting facilities were built within the MSA. Landfill gas from landfills outside the MSA would also be decreased.

### **Implementing agencies**

Metro oversees the solid waste management system within the Metro region, and cities and counties do so in other parts of the MSA. Within the Metro region, some local agencies operate waste management facilities; Metro coordinates with these agencies in managing the region's waste.

### **Extent of implementation**

This measure would be implemented within the Metro region. The analysis is based on the assumption that this measure would extend residential composting service to all of the roughly 86,000 single-family homes in the Metro region that currently do not have it.

### **Implementation milestones**

Full-scale implementation of this measure generally involves three steps, which are feasible to accomplish within 5 years, but they would require significant funding and effort.

1. Fund new or upgraded composting facilities closer to the region. This would reduce the cost of providing new composting service to a level that makes expanding this service feasible.
2. Coordinate with local agency partners or adopt regulations to extend composting service to communities that currently lack it.
3. Support communities with new composting service by addressing the start-up costs associated with this service (e.g., new bins and signage).

Agencies may apply for smaller implementation grants to partially implement this measure; the grants focus on the first two steps.

### **Potential metrics for tracking progress**

- Percentage of new households reached with residential composting service
- Additional tons of organic waste diverted from landfill due to expanded composting.

### **Intersection with other funding**

The EPA's [Solid Waste Infrastructure for Recycling Grant Program](#), created through the Bipartisan Infrastructure Law, funds the construction of new waste management facilities. Annually, \$55 million in competitive grants is available through the program between 2022 and 2026. This is a significant potential source of funding for this measure, but the amount of funding available is not sufficient to cover the full cost of expanding composting in the region. Both Oregon and Washington's draft PCAPs include measures to expand food waste processing and recovery facilities. In the event that multiple applications are submitted for CPRG grants to implement this measure, Metro would coordinate with metro area applicants and the relevant state(s) to avoid the submission of duplicate applications.

### **Alignment with adopted climate action plans**

The Metro team identified the measures in this PCAP by reviewing all current climate action plans adopted by public agencies in the MSA (see Appendix A for a list of the plans reviewed). Of those plans, the following mentioned increasing composting to divert food waste from landfills as a GHG reduction measure:

- City of Beaverton
- City of Hillsboro
- City of Tualatin
- City of Vancouver
- Metro



- Multnomah County

### **LIDAC benefit analysis**

#### *LIDACs impacted by this measure*

For this GHG reduction measure, the project team anticipates that implementation would impact all LIDACs within the Oregon Metro region. See Table 19 in the Low-income and disadvantaged community analysis section for a list of disadvantaged census tracts within the Metro region.

#### *Potential benefits to LIDACs under this measure*

- **Increased access to affordable composting service.** Many of the communities that currently lack residential composting service are home to significant numbers of low-income and otherwise marginalized residents. Adding composting capacity would benefit these residents while potentially also reducing costs for residents who already have access to composting. Though this measure focuses on expanding composting in single-family homes, a significant increase in capacity could also allow Metro and its agency partners to extend composting service to multi-family housing units, which are more likely to be occupied by low-income residents.
- **Job creation.** The addition or expansion of anaerobic digestion at waste management facilities may provide economic benefits to residents by creating job opportunities in waste management. For these new jobs to have a positive impact on LIDACs, it is important to make sure that these job opportunities are accessible to individuals from LIDACs.

#### *Potential disbenefits to LIDACs under this measure*

- If underserved communities have historically been disproportionately affected by waste disposal facilities or landfills, introducing a new or expanded facilities may contribute to inequity. The location of new or additional infrastructure that supports these services would need to be in a location that would not negatively impact LIDACs.
- If the expansion or introduction of new equipment is costly and impacts rates, this would disproportionately impact low-income families.

## 5. CO-BENEFITS ANALYSIS

This section describes the following co-benefits for the priority measures included in this PCAP. Co-benefits were evaluated based on information in the reviewed community climate action plans, GHG analyses, and related planning documents and are defined as follows:

- **Air quality co-benefits.** There is compelling evidence to demonstrate that implementing the measures in this PCAP would reduce exposure to air pollution, which improves health.
- **Health and safety co-benefits.** There is compelling evidence to demonstrate that implementing the measures in this PCAP would improve public health or safety independent of the air quality benefits described above.
- **Economic development and wealth building co-benefits.** There is compelling evidence to demonstrate that implementing the measures in this PCAP would improve community members' spending or earning potential.
- **Resilience co-benefits.** There is compelling evidence to demonstrate that implementing the measures in this PCAP would help communities be more resilient in the face of climate change and other disasters.

### Air quality co-benefits

Measures that reduce VMT (Trans-1 through Trans-5) would also reduce air pollution and air toxics. There are many health co-benefits that align with reducing air pollution and air toxics. According to the [State of Oregon Draft PCAP](#),

*...improvements in air quality will also reduce asthma rates, heart attacks and strokes, lung cancer and premature deaths, especially in those living nearest to transportation corridors. Many communities of color and lower income communities who are at greater risk due to increased exposure to transportation pollution will benefit from this transition.*

Replacing diesel-powered buses with electric buses (Trans 6) would improve air quality by reducing diesel particulate matter. These benefits are described in the [TriMet Clean Corridors Plan](#).

*Diesel particulate matter is a strong contributor to cancer risk in the Portland metropolitan area, a focus on reducing this impact from buses would be highly beneficial. Our analysis shows that downtown Portland is significantly impacted by the cumulative influence of the number of buses that travel through the downtown area. Given the high density of residents living downtown, this is an area of concern.*

Also, according to Portland's [Climate Emergency Workplan](#), "diesel is the fourth largest source of local carbon emissions and is responsible for producing harmful air pollutants like soot (PM 2.5) These pollutants disproportionately impact the health of Black, Indigenous, and low-income community members."

Energy efficiency and weatherization (Res-1 and Res-2) would improve air quality by reducing electricity demand, eliminating natural gas combustion in the home, and preventing smoke/pollution intrusion through better air sealing. Building electrification that replaces existing natural gas appliances with high-efficiency electric appliances has shown to greatly improve indoor air quality and prevent respiratory illnesses caused by exposure to related gases (see [Scientific American](#) 1/19/23).

During energy-efficiency upgrades, there would also be opportunities to remove older and outdated heating, ventilation, and air conditioning (HVAC) equipment and destroy refrigerants with catastrophically high global warming potentials before they can be accidentally released, thus eliminating additional GHG emissions.

### **Health and safety co-benefits**

The measures in this PCAP also have additional benefits for safety and health (in addition to the health-related benefits of improving air quality, which are discussed above).

The health and safety benefits of building active transportation facilities (Trans-4) are well-documented in research. Research-based tools like the Integrated Transport and Health Impact Modelling Tool (ITHIM) document and quantify the benefits of these facilities in promoting increased physical activity and improving public health. FHWA's research on [Proven Safety Countermeasures](#) documents the reduction in fatal and serious injury crashes associated with sidewalks, bike lanes, and other active transportation facilities. Other measures that reduce VMT (Trans-1 through Trans-3 and Trans-5) provide similar benefits by generally encouraging the use of alternatives to driving (though bicycling and walking obviously involve physical activity, studies demonstrate [that public transit users get significantly more physical activity than drivers](#)) and reducing the number of vehicles on the road, which reduces the risk of crashes.

Metro's Climate Smart Strategy estimates that implementing the measures therein, which are largely focused on reducing VMT and are reflected in this PCAP, would save \$100 million per year in public health costs and save 129 lives per year by reducing pollution, increasing physical activity, and avoiding crashes.

Energy efficiency and weatherization upgrades (Res-1 and Res-2) make spaces safer and healthier by providing temperature and humidity management and reduced risk of mold. The electrical upgrades that accompany energy efficiency upgrades can identify electrical wiring hazards and reduce the risk of electrical shock, fire, or even death.

### **Economic opportunity and wealth building co-benefits**

Several of the transportation measures in this PCAP have documented economic benefits. The Metro [Climate Smart Strategy](#) links transportation improvements and a more reliable travel experience with improving access to jobs, the workforce, and goods and services, boosting business revenues as well as workers' employment prospects. According to the [Oregon Department of Land Conservation and Development](#), "Cities that lower parking mandates [e.g.,



Trans-5] have seen reduced housing costs, increased business development, and more diverse developments, with creative approaches to providing parking.” Making efficient transportation a focus (Trans-1 through Trans-4) stimulates development and generates local and state revenue. And a more optimized transportation system saves consumers, public agencies, and businesses time and money.

Energy efficiency and weatherization upgrades (Res-1 and Res-2) save residents money on heating and cooling costs which can increase disposable income and long-term housing affordability. Improved building stock is more attractive to new residents and supports the community’s economic base. Finally, the infusion of support for building maintenance and equipment would generate new economic opportunities and increase local employment, especially in construction and building renovation. According to the [City of Tigard’s CAP](#), “Every \$1 million of capital investment in renovating buildings generates an estimated 5.5 direct jobs and an additional 10.9 indirect jobs.” Additionally, improved building stock is more attractive to new residents, supporting the community’s economic base.

More generally, [Metro’s Construction Careers Pathway](#) (C2P2) program (discussed in more detail under the Workforce planning analysis section) recommends measures to provide reliable career pathways for women and BIPOC in the construction trades. Nine agencies throughout the Metro region— many of which were active participants in developing this PCAP and are likely to apply for implementation grants: Metro, TriMet, and Clackamas, Multnomah and Washington counties—have formally agreed to implement the C2P2 framework. This framework commits participating agencies to include specific clauses that implement C2P2 measures in all construction contracts for agency-led projects. This means that any implementation project led by one of the agencies mentioned above would provide significant equitable workforce development benefits.

## **Resilience co-benefits**

Investments in critical networks and routes would provide access to essential goods and services in the event of a disaster. Pedestrian and bicycle infrastructure (Trans-4) would provide viable alternative routes if roadways are damaged or blocked by an earthquake or debris.

Weatherization improvements to a home’s envelope and upgraded heating and cooling systems (Res-1 and Res-2) would provide increased comfort and safety in the face of extreme heat or cold and can prevent smoke intrusion.

Diverting more food waste and yard debris through comprehensive composting programs (Waste-1) would increase the availability of compost to improve soil conditions in landscaping and farming. It would also save space in landfills and extend the useful life of the infrastructure.

## 6. LOW-INCOME AND DISADVANTAGED COMMUNITY ANALYSIS

Implementing the measures included in this PCAP would significantly benefit LIDACs. This section identifies all LIDAC census tracts within the jurisdictions covered by this PCAP, how Metro meaningfully engaged with LIDACs in developing this PCAP, and how Metro will continue to engage into the future.

### Identification of LIDACs

Metro identified LIDAC census tracts using the Climate and Economic Justice Screening Tool (CEJST); this is the preferred tool identified by the EPA. Census tracts are labeled as “disadvantaged” if they score above the associated socioeconomic threshold (65th percentile) *and* above the identified burden threshold (90th percentile on all categories except high school education, which has a 10th percentile threshold) within in any of the eight identified burden categories: Climate Change, Energy, Health, Housing, Legacy Pollution, Transportation, Water and Wastewater, and Workforce Development.

Table 19 lists all the LIDAC census tracts, by county, within the MSA that were identified using CEJST. These tracts are anticipated to be affected by implementing the priority measures included in this PCAP which would impact either the entire MSA or a large subregion of the MSA, including:

- Res-1, which benefits all tracts included in Table 19.
- Trans-4, which benefits all tracts within the RTC/Metro planning areas shown in columns 2 and 3 of Table 19.
- Trans-5, Trans-6, Res-2 and Waste-1, which benefit all LIDAC tracts in the Metro planning area, shown in column 2 of Table 19.

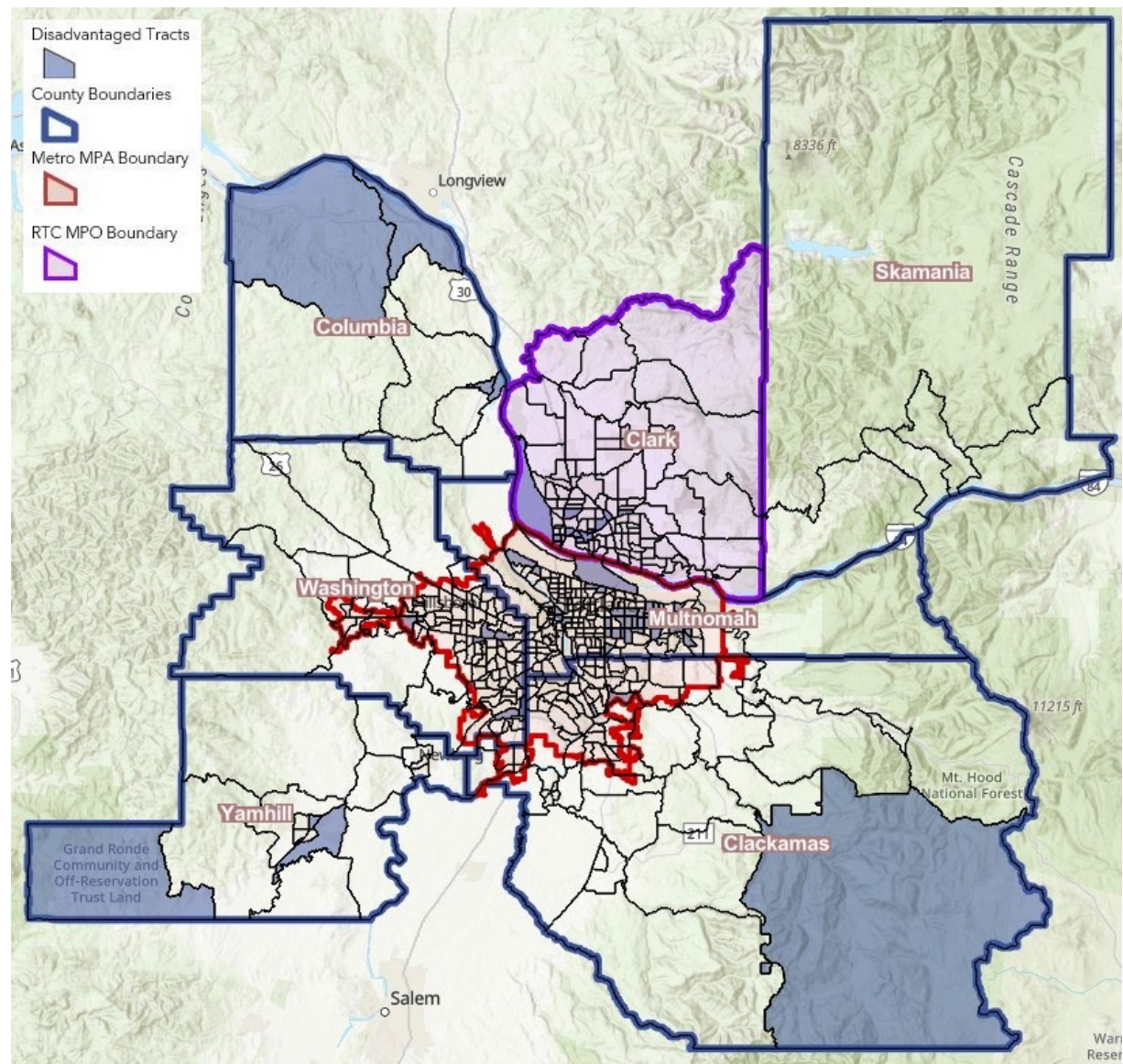
**Table 19: LIDAC census tracts by county within the Metropolitan Statistical Area**

County	LIDAC Census tracts within Metro planning area	LIDAC Census tracts within RTC planning area	LIDAC Census tracts outside of Metro and RTC planning areas
Clackamas	41005021900; 1005022108		41005980000
Clark		53011040706; 53011041005; 53011041010; 53011041104; 53011041108; 53011041111; 53011041600; 53011041700; 53011041800; 53011042300; 53011042400; 53011042700	
Columbia			41009970200; 41009970300; 41009970700; 41009970800

County	LIDAC Census tracts within Metro planning area	LIDAC Census tracts within RTC planning area	LIDAC Census tracts outside of Metro and RTC planning areas
Multnomah	41051000602; 41051001101; 41051001602; 41051004001; 41051004101; 41051005100; 41051007300; 41051007400; 41051007600; 41051008100; 41051008202; 41051008301; 41051008302; 41051008400; 41051008600; 41051009000; 41051009101; 41051009201; 41051009202; 41051009301; 41051009302; 41051009603; 41051009604; 41051009605; 41051009606; 41051009701; 41051009702; 41051009801; 41051009803; 41051010001; 41051010304; 41051010405; 41051010408; 41051010410; 41051010411; 41051010600		
Skamania	None		
Washington	41067030700; 41067031100; 41067031300; 41067031402; 41067031706; 41067032003; 41067032005; 41067032409; 41067032501		
Yamhill			41071030502; 41071030601; 41071030801

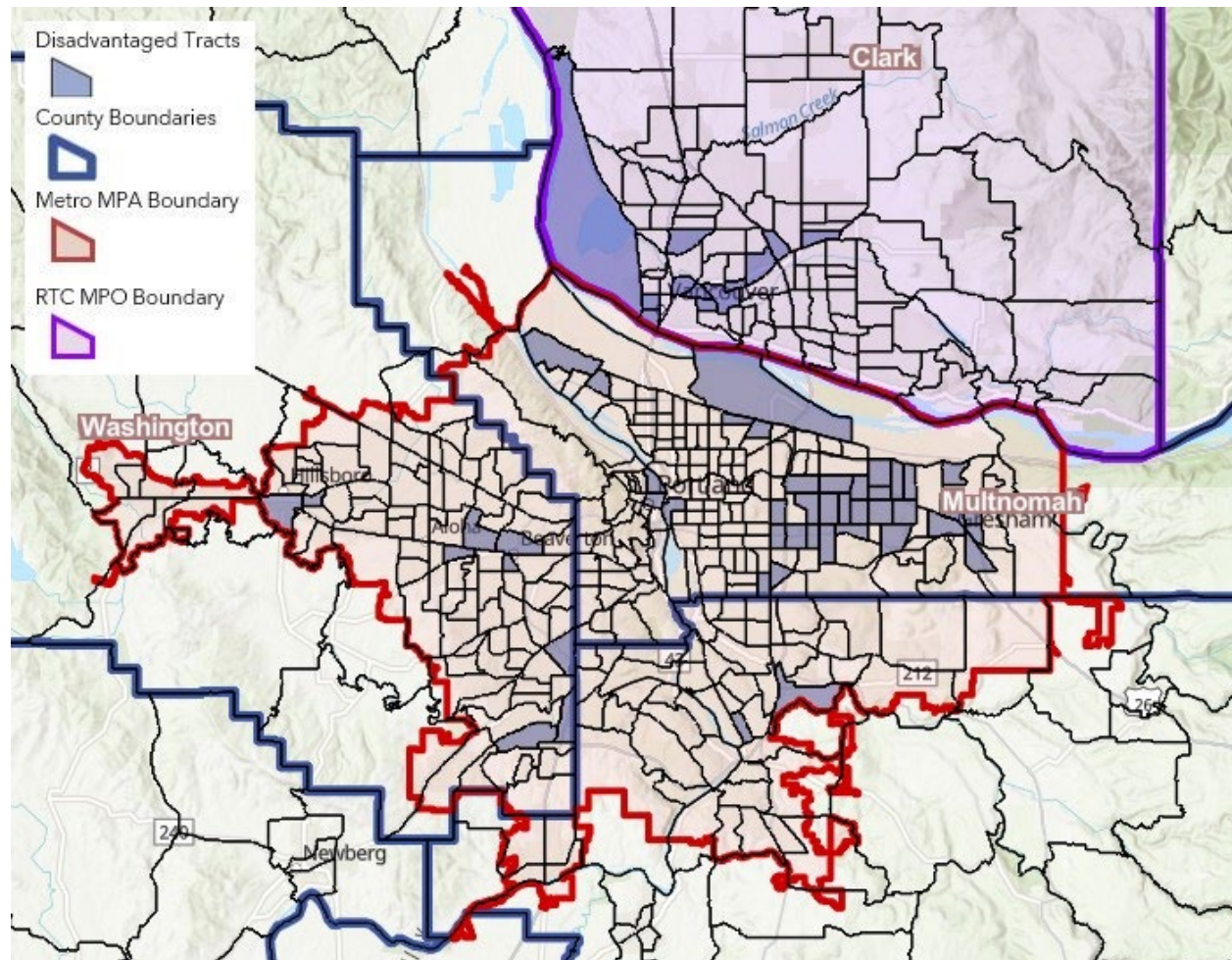
Figure 9 displays where the disadvantaged census tracts are located geographically within the MSA. Figure 10 provides a closer look at the urbanized Metro area, so the smaller census tracts in the densest part of the metro area are more visible.

**Figure 9: Federally designated LIDACs in the Metropolitan Statistical Area**





**Figure 10: Federally designated LIDACs in the urbanized Metropolitan Statistical Area (detail)**



### **LIDAC analysis for transportation measures with specific geographies**

Implementation of measures Trans-1, Trans-2, and Trans-3 is focused on transit corridors identified in plans created by MPOs and transit agencies. Some of these corridors are relevant to more than one of these measures. Table 20 identifies the specific LIDAC census tracts that benefit from investments along each of these transit corridors, as well as the measures that are relevant to each corridor.

**Table 20: LIDAC census tracts, applicable measures, and associated corridors and counties for transportation measures**

Applicable measures	Corridors/counties	Affected LIDAC Census tracts
<b>Tier 1 HCT corridors (Metro region)</b>		
Trans-1 Trans-3	TV Highway	41067032501; 41067032409; 41067031706; 41067031402; 41067031300; 41067031100
	82nd Avenue	41051007400; 41051007300; 41051008600 41051000602; 41051008301; 41051001602 41005022108; 41051007600
<b>Tier 2 HCT corridors (Metro region)</b>		
Trans-2 Trans-3	Central City Tunnel	41051005100; 41051001101; 41051010600
	Portland to Gresham via Burnside	41051010408; 41051009605; 41051009302; 41051008100; 41051001602; 41051001101; 41051010001; 41051010411; 41051010410; 41051010405; 41051009801; 41051009603; 41051009604; 41051009702; 41051009701; 41051009606; 41051009301; 41051009202; 41051009201; 41051008202
	Hayden Island to Downtown Portland via MLK	53011042400; 41051001101; 41051010600
	Bethany to Beaverton via Farmington/SW 185th	41067031100; 41067031300; 41067031402; 41067031706
	Beaverton to Portland via Hwy 10 (BH Hwy)	41067031300; 41067031100; 41051005100; 41051010600
	St. Johns to Milwaukie via Cesar Chavez	41051004101; 41051004001; 41051007300; 41051007400
	Swan Island to Parkrose via Killingsworth	41051007400; 41051007300; 41051007600
<b>Tier 3 HCT corridors (Metro region)</b>		
Trans-2 Trans-3	Portland to Gresham in the vicinity of Powell Corridor	41051010001; 41051009803; 41051009101; 41051009000; 41051008400; 41051008302; 41051008301; 41051001101
	PCC Sylvania to Downtown Portland via Capitol Hwy	41051010600
	Hollywood to Troutdale	41051009302; 41051009301; 41051009605; 41051009604; 41051009603; 41051008100; 41051010304
	NW Lovejoy to Hollywood via Broadway/Weidler	41051005100; 41051008100
	Oregon City to Downtown Portland via Hwy 43	41051010600; 41051005100

Applicable measures	Corridors/counties	Affected LIDAC Census tracts
	Sunset Transit Center to Hillsboro via Hwy 26/Evergreen	41067032501; 41067032409
	Park Ave MAX Station to Oregon City in the vicinity of McLoughlin Corridor	41005021900
	Beaverton - Tigard - Lake Oswego – Milwaukie - Clackamas Town Center	41067032005; 41067030700; 41067031100; 41067031300
	Beaverton - Tigard - Tualatin - Oregon City	41067032005; 41067032003; 41067030700; 41067031300; 41067031100
<b>C-TRAN Bus Rapid Transit extension projects</b>		
Trans-1 Trans-2 Trans-3	Highway 99	53011042400; 53011042300; 53011041010
	Fourth Plain Extension	53011041108; 53011041104; 53011040706
<b>TriMet Better Bus corridors</b>		
Trans-2 Trans-3	Multnomah	41051010304; 41051010405; 41051010410; 41051010411; 41051010408; 41051010001; 41051004001; 41051007300; 41051007600; 41051007400; 41051005100; 41051010600; 41051001101; 41051000602; 41051008600; 41051001602; 41051008301; 41051008302; 41051008100; 41051009302; 41051008202; 41051009201; 41051008400; 41051009000; 41051009202; 41051009301; 41051009701; 41051009101; 41051009606; 41051009604; 41051009603; 41051009803; 41051009605
	Washington	41067030700; 41067031100; 41067031300; 41067031402; 41067031706; 41067032003; 41067032005; 41067032409; 41067032501
	Clackamas	41005022108; 41005021900

## Engaging with low-income and disadvantaged communities in planning process

At the outset of the PCAP process Metro conducted a literature review of MSA-specific equity- and environmental justice-focused plans and documents to create a list of documented community priorities that are relevant to this grant to identify the climate action priorities that best support marginalized communities in the MSA (see a summary of plans reviewed in Appendix 1). From there, the project team developed an engagement approach (see Appendix 5) that focused on speaking with key non-government partners that are involved in parallel climate justice work to further develop the equity-related information included in this PCAP. More information on the

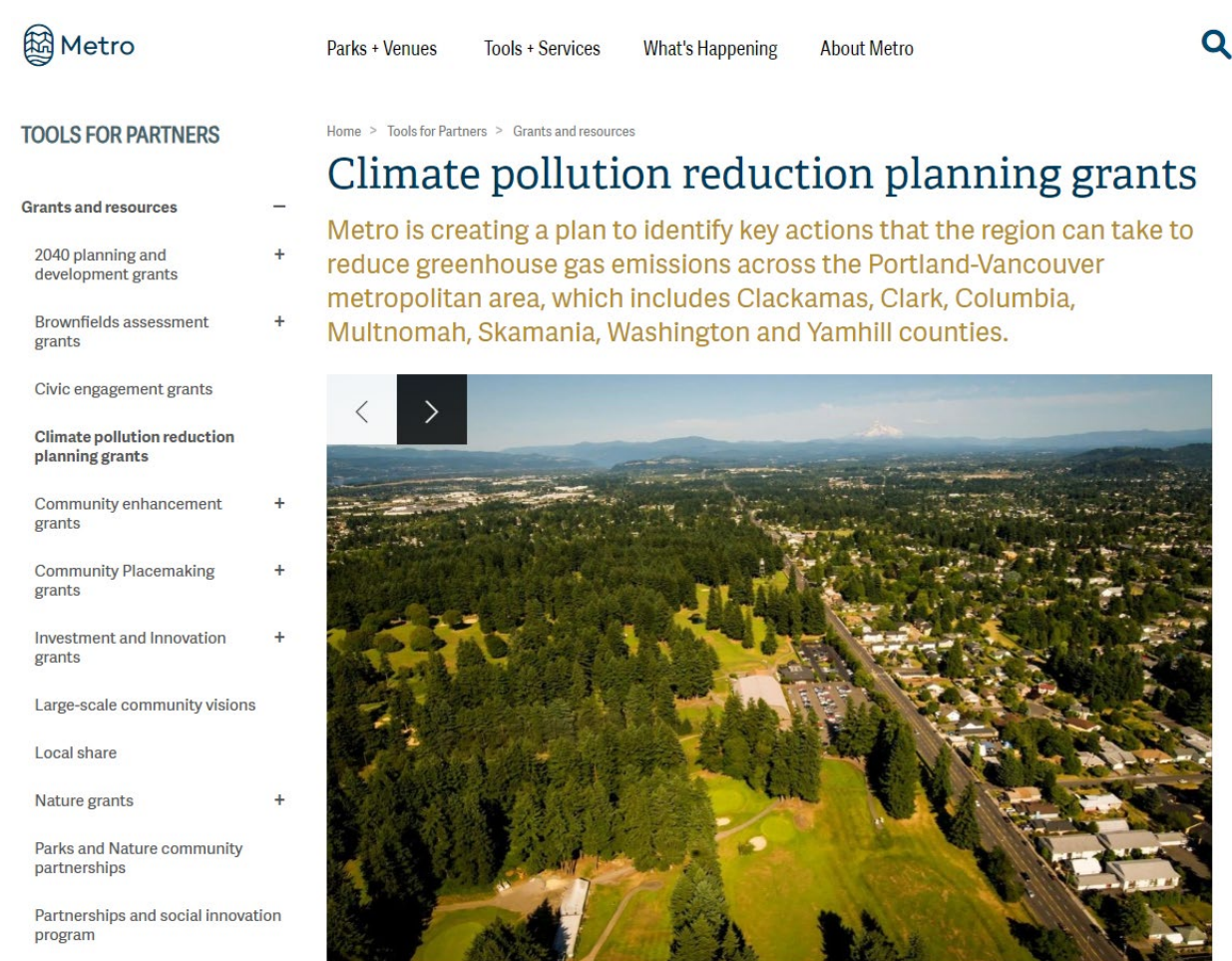


outreach plan and summaries from specific engagements with low-income and disadvantaged communities, as well as with other agency and non-agency partners, can be found in the Coordination and section of this PCAP.

## Broader public engagement

This PCAP is focused on high-priority, implementation-ready GHG emission-reduction actions, and as a result, engagement in this phase focused on those who can lead or inform the measures considered with this PCAP. Metro kept the broader public informed through the project website ([oregonmetro.gov/climategrant](https://oregonmetro.gov/climategrant) and Figure 11) and staff responded to calls and emails received about the project directly.

**Figure 11: Metro's public CPRG website**





## 7. REVIEW OF AUTHORITY TO IMPLEMENT

The CPRG program, and particularly this PCAP, are focused on “expeditious implementation of investment-ready policies, programs, and projects.” This PCAP reflects this focus on implementation-ready climate measures. Cities, counties, and regional agencies across the MSA have conducted exhaustive climate planning, and Metro drew on 15 adopted or in-progress plans in creating this PCAP (see Appendix 1 for a summary of plans reviewed).

*Metro certifies that all the measures contained in this PCAP can be implemented by local and regional agency partners under their current statutory and regulatory authority.* Because of the variety of potential implementing agencies and measures covered by this PCAP, this authority is conferred by a variety of federal, state, and local laws and documents:

Transportation measures:

- Metro and RTC have the authority to plan transportation projects and allocate transportation revenues via Oregon and Washington state law, the Code of Federal Regulations, and their respective charters.
- Transit agencies have the authority to build and operate the transit system via state law.
- State and local agencies have authority to modify, operate, and maintain the right-of-way for streets within their jurisdiction via charter or statutes.

Residential building measures:

- Local agencies have the authority to offer assistance programs to residents via Oregon and Washington state law or their charters.
- Metro has authority to fund affordable housing via ordinance.
- Certain cities and counties have the authority to fund, build, and manage affordable housing via Oregon and Washington state law or their charters.

Waste and materials management measures:

- Metro has authority to oversee the regional solid waste system via its charter.
- Local agencies have authority to manage the waste system within their jurisdictions via Oregon and Washington state law or their charters.

Agencies’ authority to implement these measures is readily apparent in many cases since most of the measures in this PCAP are already being implemented at a limited scale by selected partners. The PCAP describes these efforts and explores how implementation funding could be used to expand the partnerships, scopes, and benefits involved. Metro and its agency partners made the decision to focus this PCAP on measures that are already being partially implemented because the progress made to date on these measures often helps to clarify the necessary partners, tasks, project elements, and costs, all of which help to lay the groundwork for implementation projects with clear and achievable work plans, timelines, and budgets. This decision means that the

measures in this PCAP are all ready for implementation, but it does not necessarily mean that they are modest in scope. The PCAP draws on the strategic insights gained from existing GHG reduction efforts to identify how these efforts could be scaled up to include new partners or new emissions sources.

The detailed information on each of the measures in this PCAP reflects the fact that all of the measures are implementation-ready and often build on existing efforts in the following ways:

- The **implementing agencies** sections of each measure identify the agency partners that have the authority to implement each measure using the following categories: cities, counties, special districts, transit agencies, MPOs, and Metro (which has unique regional responsibilities that extend beyond its role as an MPO).
- The **extent of implementation** sections describe the geographic extent over which each measure would be implemented, which is often limited to certain portions of the MSA. In many cases, agencies in the MSA have conducted follow-up planning to identify specific communities or corridors where different measures would produce the greatest benefits. Even though many of these measures could potentially be implemented more broadly throughout the region, this PCAP assumes that in the short-term they would be focused on the locations that are ready for investment and would lead to the greatest GHG reductions. This PCAP refers to the underlying plans that designate these locations so that the EPA can understand the rationale behind the specific geographic focus for many of these measures.
- The **implementation milestones** sections describe processes and programs currently underway in the MSA that support implementation of each measure, and they describe how these processes and programs may inform implementation opportunities over the next five years. These sections do not include information on milestones involved in obtaining authority to implement these measures. Metro certifies that the implementing agencies identified under each measure have the necessary implementation authority.
- The **intersection with other funding** sections describe not only federal and state resources that are aligned with each measure, but also local and regional resources that could provide leverage or matching funds when seeking state and federal resources.







## 8. WORKFORCE PLANNING ANALYSIS

Public agencies and non-profit organizations within the MSA have a long tradition of collaborating to make sure that jobs created by public projects and by the emerging clean jobs economy provide career-ladder opportunities for women, low-income workers, workers of color, and other marginalized workers. The priority measures included in this PCAP would create high-quality jobs for people with different skills and educational backgrounds, spur economic growth, and enhance the quality of life in MSA. This section highlights key local strategies and commitments that help to ensure that any projects to implement the measures in this PCAP produce high-quality jobs, support strong labor standards, and help to develop a diverse, highly skilled workforce in the MSA.

### Quality jobs initiative

Three of the local workforce development boards—Worksystems, Clackamas Workforce Partnership, and Workforce Southwest Washington—partnered to launch the [Quality Jobs Initiative in 2021](#). This effort included the Quality Jobs Framework that outlines six Quality Jobs Standards and metrics to advance quality jobs and help contribute to healthy and equitable conditions and a rewarding and satisfying job experience. Figure 12 defines the strategies included in the Quality Jobs Framework.

Figure 12: Quality Jobs Framework

	<b>Self-Sufficiency Wages</b>	A quality job provides sufficient income to afford a decent standard of living. For example, jobs that offer pay consistent with established published self-sufficiency standards that consider family composition and cost of living.
	<b>Safe Working Conditions/ Worker Engagement</b>	A quality job offers employees dignity and respect and welcomes engagement in workplace operations. For example, jobs that are subject to anti-discrimination and anti-discrimination policies and provide reasonable accommodation to employees with disabilities.
	<b>Predictable Hours</b>	A quality job offers employees predictability on the number of hours they are offered per week to minimize hardship on employees and their families.
	<b>Comprehensive Benefits</b>	A quality job provides basic benefits that increase economic security, improve health and overall well-being. Quality jobs include healthcare, childcare, transportation, wellness programs, and access to retirement savings programs, among other supports.
	<b>Accessible Hiring and Onboarding Practices</b>	A quality job offers transparent and accessible hiring and onboarding practices to ensure that employer and employee are set for success.
	<b>Training and Advancement Opportunities</b>	A quality job provides opportunities to build skills and access new roles and responsibilities in a workplace. For example, quality jobs offer internal pathways to support career progression, professional development, and incumbent worker training opportunities.

Source: [PY22 Annual-Report.FINAL .pdf \(worksystems.org\)](#)

The Quality Jobs Initiative provides a common standard for defining quality jobs, guidance to employers to encourage the creation of quality jobs, and resources to support employers and the workforce.

## **Clean Energy Careers**

[Worksystems](#), the workforce development board for Multnomah and Washington Counties, launched Clean Energy Careers as an MSA-wide effort to define and build the jobs that feed into the clean energy industry. Worksystems teamed with seven community-based organizations to provide career coaching and training resources specifically targeted at the clean energy sector. The Clean Energy Careers program supports jobs in areas such as the following:

- Building homes and businesses
- Creating and bringing electricity to homes and businesses
- Transportation and public transit
- Assembling battery systems, electric vehicles, switches, controls and other components
- Natural resource management, regenerative agriculture, and forestry

Through this network of career coaching and job support, Worksystems aims to understand the workforce needs of the clean energy sector, align resources to support meeting those needs, and connect existing efforts and infrastructure to employers within the clean energy sector. Clean Energy Careers is currently recruiting workers throughout the seven-county MSA. This effort is growing, and Metro will continue to engage Worksystems as more program elements are developed and implemented.

## **Construction Career Pathways**

This regional policy framework and toolkit outlines seven critical strategies to provide reliable career pathways for women and BIPOC workers in the construction trades. The framework was developed by a public owner workgroup, with representatives from 16 public agencies, and includes input from industry and community stakeholders. With Metro leading the implementation effort, nine public agencies have formally adopted the framework:

- City of Portland
- Clackamas County
- Metro
- Multnomah County
- Portland Community College
- Portland Public Schools
- Prosper Portland
- TriMet

- Washington County

The policy framework, summarized in Figure 13, was designed to provide standardized goals and approaches while providing flexibility in implementation approaches so that both large and small agencies could adopt the policy. The framework sets consistent goals and standards for employing diverse workers across the region and for adopting agencies to provide financial investment in culturally relevant recruitment, training, and retention programs to ensure a robust supply of diverse and skilled labor.

**Figure 13. Construction Career Pathways framework summary**



Source: [Construction-Career-Pathways-Framework-case-study-20220603.pdf \(oregonmetro.gov\)](https://www.oregonmetro.gov/files/2022/06/Construction-Career-Pathways-Framework-case-study-20220603.pdf) Construction Career Pathways Framework: A case study in job creation for a just society

## Regional Workforce Equity Agreement

Stemming from the work of the C2P2, the Regional Workforce Equity Agreement is a comprehensive agreement that supports adopting public owners in implementing construction career pathways on large capital projects. Metro, the City of Portland, and Multnomah County adopted the agreement in 2022 to form one of the first multi-jurisdictional agreements in the nation. The agreement is also endorsed by most of the local unions and affiliated apprenticeship and training programs. It sets specific standards and procedures for ensuring safe, family sustaining, and quality jobs for workers, while ensuring access to women and BIPOC workers through anti-harassment protections. Additionally, an oversight structure facilitates ongoing regional collaboration and coordination.

## 9. COORDINATION AND OUTREACH

Partner engagement for development of this PCAP directly informed which measures were included in the final plan. Metro and its consultants engaged agency and non-agency partners in multiple ways: convening a technical forum of public agency staff to provide feedback on the PCAP throughout its development; presenting to standing committees that include representatives of government, business, utilities, academia and community-based organizations at key project milestones; and engaging directly with specific non-governmental organizations who are actively involved with climate work and could provide additional data and context to help detail the measures in this PCAP. This section describes the process Metro used to support robust and meaningful engagement strategies to ensure comprehensive representation and overcome obstacles to engagement, including linguistic, cultural, institutional, geographic, and other barriers.

### Interagency coordination

#### Climate Partners' Forum

Metro convened a Climate Partners' Forum that consisted of lead climate staff from local, regional and state agencies throughout the MSA to steer development of the PCAP. The forum grew out of initial conversations between Metro and partner agencies over whether the Portland-Vancouver MSA should pursue a CPRG planning grant and potential agency roles and responsibilities. Metro convened these conversations by inviting public agencies from the interested parties lists for its various climate-related technical committees, which include a wide variety of representatives from public agencies across the MSA (including several from outside the Metro region who participate in conversations about interregional issues), and worked with RTC to engage agency partners on the Washington side of the MSA. After these initial conversations confirmed broad support Metro should lead a CPRG planning grant on behalf of the MSA, Metro initially recruited Climate Partners' Forum members from among the list of participants and allowed new members to join the forum at any time to allow for flexibility as the PCAP evolved and awareness of the CPRG grant continued to spread throughout the MSA.

The forum provided input on this PCAP throughout its development, including recommending source material such as relevant CAPs and potential groups to engage; reviewing the screening process that Metro used to identify the priority measures to be included in the PCAP; sharing data and information to help correctly describe these measures; and providing input on interim technical memos at key points in the development of the PCAP.

The Metro and consultant project team facilitated three 2-hour meetings with members. These meetings consisted of presentations by the Metro team about how the team proposed to address various aspects of the PCAP requirements in the development of the plan followed by discussions where forum members would ask questions and give feedback about these proposals. Discussions with the forum focused on the measures being considered for the PCAP, data used to assess the priorities and how those measures tie into regional plans and priorities. Metro staff also followed

up with individual forum members outside of meetings to better understand priorities and feedback expressed during these conversations.

**Climate Partners' Forum participants:**

- City of Beaverton
- City of Gresham
- City of Hillsboro
- City of Lake Oswego
- City of Milwaukie
- City of Portland Bureau of Planning and Sustainability
- City of Portland Water Bureau
- City of Tigard
- City of Tualatin
- City of Vancouver
- Clackamas County
- Clark County
- Clark County Department of Public Health
- Columbia County
- Metro
- Multnomah County
- Oregon Department of Education
- Oregon Department of Environmental Quality
- Oregon Department of Transportation
- Portland Bureau of Environmental Services
- Portland Bureau of Transportation
- Portland Public Schools
- Skamania County
- Southwest Clean Air Agency
- Southwest Washington Regional Transportation Council
- TriMet
- Tualatin Hills Parks & Recreation District
- Washington County

The three forum meetings held during development of the PCAP focused on the following:

- Meeting 1 (10/23/2023). Confirming and discussing source material for the PCAP, such as relevant CAPs and potential groups to engage.
- Meeting 2 (11/21/2023). Reviewing and discussing the screening process and criteria that Metro used to identify the priority measures to be included in the PCAP.
- Meeting 3 (1/23/2024). Finalizing the priority PCAP measures and reviewing data and information related to these measures.

During the third meeting, the Metro team also debriefed the PCAP process with Forum members, surveying them about their opinions of the PCAP process and their interest in continuing to participate in the development of the Comprehensive CAP. Forum **members expressed that they understood how and why the priority measures were determined, and the majority expressed interest in continuing to participate in the PCAP.**



**Figure 14: Screenshot of online meeting presentation / room at the first Climate Partners' Forum meeting**



### **Regional advisory committee engagement**

Local and regional agencies across the MSA convene regular technical and policy committees focused on transportation, land use, and other topics relevant to this PCAP. All of these committees include public agency representatives, and several also include community representatives and/or representatives of key private-sector organizations including utilities, home builders, and businesses. Metro staff presented on the PCAP at a variety of these committees. Metro staff originally focused on delivering presentations at relevant Metro committees, and then several of the local and regional agency representatives who participate in these committees requested follow-up conversations with county coordinating committees and other subregional groups.

These presentations focused on supporting coordination among governments by ensuring that agency and non-agency partners across the MSA were well aware of the CPRG planning grant and knew how to engage with the Climate Partners' Forum and with other organizations participating in the process. The presentations also ensured that people at all levels of these organizations—including technical staff, directors and managers, and elected officials—were prepared to support



the final PCAP and any follow-up implementation grant applications. In some cases, committee members identified potential CPRG implementation grant application projects based on their draft PCAP measures and on their relevant areas of expertise, and Metro staff brought these ideas to the Climate Partners' Forum for further consideration. The Metro team presented at the following committees:

- [Metro Transportation Policy Alternatives Committee](#) (TPAC) 12.01.2023
- [Metro Technical Advisory Committee](#) (MTAC) 12.20.2023
- [Washington County Technical Advisory Committee](#) (WCCC TAC) 1.4.2024
- [Metro Joint Policy Advisory Committee on Transportation](#) (JPACT) 1.17.24
- [Clackamas County Coordinating Committee](#) (C4) - Metro Region Subcommittee 1.17.2024
- [RTC Regional Transportation Advisory Committee](#) (RTAC) 1.19.2024
- [Metro Policy Advisory Committee](#) (MPAC) 1.24.2024
- [East Multnomah County Transportation Coordinating Committee](#) - Technical Advisory Committee (EMCTC TAC) 1.31.2024
- [Metro Council](#) 2.13.2024
- [Washington County Chamber of Commerce](#) 2.13.2024
- [Washington County Coordinating Committee \(WCCC\)](#) 2.14.2024

Overall, these committees were supportive of the recommended focus of the PCAP and shared the following:

- Feedback on measures being considered, especially those related to transportation.
- Existing regional plans, programs, and data sources that should be considered in the description and analysis of PCAP measures.
- Alignment with other state- and regional-level climate work.
- Commitments to follow up with staff from members' respective agencies about potential implementation grant applications.

### **Coordination with state agencies**

The Portland-Vancouver MSA is covered both by this metro area PCAP and by the state-level PCAPs created by Oregon and Washington. Metro staff participated in monthly calls with EPA and the lead staff on these state-agency plans to identify key areas of coordination and identify key areas of focus for the state and metro area PCAPs based on their respective roles and responsibilities. These conversations helped to inform the Current climate policy landscape section above.

In addition, the Metro team followed up individually by phone and email with state PCAP leads to align data sources and quantification methodologies, discuss coordination and clarification of roles in areas where the state and MSA PCAPs overlapped, and share general progress updates.

### **Engaging community partners**

Metro led a series of meetings with community partners in December 2023 and January 2024. Metro focused on engaging community partners who are pursuing equity- and/or climate-related work that was aligned with one of the draft measures being considered for the PCAP. This approach was designed to make the best use of community partners' time by advancing climate-related priorities and initiatives that were already described in the many plans and documents that these partners have contributed to instead of duplicating prior conversations. These conversations often focused on specific measures for which public agencies were likely to pursue implementation funding and in which community partners had experience or interest, because these measures provide opportunities for agency and community partners to collaborate on implementation grant projects.

Generally, these engagements consisted of the following:

- Metro staff presented on the PCAP process and goals and on related implementation funding opportunities, including not only CPRG implementation grants but also EPA Community Change grants and relevant state funding streams.
- Staff and partners identified specific measures that involve opportunities for agency/community collaboration and/or measures with significant potential equity benefits.
- Staff and partners discussed the details of these measures, including clarifying potential equity co-benefits, identifying opportunities for community involvement, suggesting specific partnerships and implementation projects, coordinating with parallel agency and community projects, and identifying data and approaches that could be used to describe benefits.
- Staff and partners discussed partner interests and capacity for supporting implementation grant proposals.

During the two-month engagement period for the PCAP, the project team held three meetings with different organizations that focused on the areas of overlap between these organizations' work and the draft PCAP measures. Full summaries from these meetings are included in Appendix 6. Equity partner engagement summaries. Key take-aways are summarized below:

#### *Energy Trust of Oregon (01.04.2024)*

- Opportunities to use CPRG funds include preparatory work that is required for energy efficiency upgrades and prioritizing unregulated multifamily dwellings.
- Data such as utility consumption reports and regional building stock assessments can be used to broadly identify areas of benefit.

#### *Getting There Together Coalition (01.10.2024)*

- Agreement that the PCAP measures are broadly aligned with communities' needs and priorities.
- Highlighted interest in partnering and engaging in the grant process or leading other grant applications.

*Worksystems (01.11.2024):*

- Clean Energy Workforce Analysis is being developed and will be shared with Metro and the project team to inform the workforce analysis report for future grants including the CCAP.
- Worksystems can help connect agencies who are awarded implementation grants with building skills and capacity to address workforce needs with minority- and low-income contractors.

The team reached out to a greater number of groups (eight in total) to offer these engagements. Many of these groups expressed interest, but the compressed schedule for developing the PCAP, which required that much of the engagement take place over the holidays, made these engagements challenging to schedule. Many of the organizations engaged have expressed interest in continuing to stay informed about the CPRG process and potentially participating in the development of the PCAP.

## Outreach plan

The engagement strategy developed to inform development of this PCAP is included in Appendix 5. Engagement approach.

## Strategies to overcome linguistic, cultural, institutional, geographic, and other barriers to participation

### Engagement accessibility

Engagement for the PCAP was tailored to reach agencies and partners who could most directly inform the PCAP approach and was targeted via direct meeting invitations. As meetings were confirmed with participants, the project team discussed accessibility options to meet participants needs. The following accessibility accommodations were made for PCAP engagement:

- **Climate Partners' Forum meetings.** Meetings were hosted online on Zoom, which included closed captioning for participants. One participant chose to use this functionality in these meetings. Activities and discussions for these meetings allowed participants to either speak or type their feedback based on their comfort level, and meeting summaries were produced and provided to participants following each meeting to capture each discussion.
- **Engagement with community partners.** Metro hosted meetings online to better accommodate community partner schedules. Metro has a Limited English Proficiency Plan that was abided by for this PCAP. Participants at the Getting There Together meeting requested Spanish-language interpretation. The meeting included an interpreter who conducted the meeting simultaneously in Spanish through Zoom's interpretation channel

option. Consistent with Metro policy, Metro offered stipends of \$150 to community participants in this meeting in recognition of their effort and lived experience; five members requested stipends. Meeting summaries were produced at the conclusion of each meeting and are included in Appendix 6. Equity partner engagement summaries.

- **Project communications.** As part of the Limited English Proficiency Plan, Metro has a strict policy that all public materials must be written in plain language. Project factsheets and emails to partners were reviewed with this guidance in mind.

## 10. NEXT STEPS

This PCAP is the first major deliverable under the CPRG planning grant awarded to Metro. Local agencies with the capacity and existing level of planning required are preparing CPRG implementation grant applications related to the measures identified in this PCAP. Many local agencies expressed desire to lead or participate in an implementation grant application, but they had not previously been able to complete the level of planning necessary to submit a complete application on the deadlines associated with this round of funding. More planning funds in the region could help prepare more local agencies to perform the comprehensive planning necessary to participate more fully in future implementation grants.

Metro and its partners will continue the planning, engagement, and implementation actions to reduce emissions; invest in sustainable infrastructure, technologies, and practices; build our economy; and enhance the quality of life in the region. In 2025, Metro will publish the CCAP, which will establish equitable and sustainable economic development strategies that reduce emissions across all sectors. The CCAP will include near- and long-term emissions projections, a suite of emission-reduction measures, a robust analysis of measure benefits, plans to leverage federal funding, and a workforce planning analysis. In 2027, Metro will publish a status report that details implementation progress for measures included in the PCAP and CCAP, relevant updates to PCAP and CCAP analyses, and next steps and future budget and staffing needs to continue implementation of CCAP measures.

If you have questions about this PCAP or suggestions for the upcoming CCAP and status report, contact Eliot Rose at [eliot.rose@oregonmetro.gov](mailto:eliot.rose@oregonmetro.gov).

## APPENDIX 1. PUBLIC AGENCY AND COMMUNITY PLANS CONSULTED

### Public agency plans

Metro reviewed the following jurisdictional Climate Action Plans and other relevant plans within the MSA region to inform the actions outlined in this PCAP.

#### Metro

[Metro 2030 Regional Waste Plan, 2019](#): Describes Metro's waste goals and actions which are divided into five categories, which include shared prosperity, product design and manufacturing, product use and consumption, product end-of-life management, and disaster resilience.

[Metro Climate Smart Strategy, 2015](#): Describes strategy to achieve a 29 percent reduction in per capita GHG emissions while supporting job creation, economic development, financial savings for businesses and households, supporting healthier lifestyle choices, protecting the region's air and water, and making the most of investments made in the transportation system.

#### TriMet

[TriMet Climate Action Plan, 2022](#): Describes strategies to dramatically reduce operational-related GHG emissions, such as using renewable energy for all light rail operations, streetcar systems, and in all TriMet-owned and -operated facilities. The plan also includes green infrastructure elements incorporated into various projects. Additionally, the plan outlines energy saving efforts, such as use of solar powered bus shelters, LED lighting modernizations, and regenerative braking systems on hybrid buses.

[TriMet Non-Diesel Bus Plan, 2018](#): Describes actions taken by the agency for sustainability, such as investing heavily in clean diesel technology, incorporating biodiesel into its fuel, and switching to ultra-low sulfur diesel to reduce bus emissions significantly while continuing to expand service.

#### County government

[Clackamas County Climate Action Plan, 2023](#): Draft Climate Action Plan Report describes the county's goals and objectives for addressing climate change, as well as the strategies to achieve the goal of carbon neutrality. Sectors focused on include building retrofits, net-zero new construction, renewable energy generation, reducing vehicle emissions, increasing active transportation and transit use, and reducing waste emissions.

[Multnomah County Climate Action Plan Final Progress Report, 2020](#): Describes strategies and objectives to achieve 80 percent reduction in GHE emissions by 2050. Sectors considered include buildings and energy, urban form and transportation, consumption and solid waste, food and agriculture, urban forest, natural systems and carbon sequestration, climate change preparation, community engagement, outreach and education, and local governments operations.

[Multnomah County Climate Justice Framework, 2023](#): Describes a framework for supporting community-driven solutions around establishing a positive collective vision for climate justice for 2030 and beyond that is rooted in community values and shared power.

## **City government**

[City of Beaverton Climate Action Plan, 2019](#): Presents a framework for action to reduce GHG emissions and strategies to safeguard Beaverton from the effects of higher temperatures, increasing wildfire and smoke, worsening storms and increased flooding. Focuses on multiple sectors, including consumption and materials management, building energy and urban form, transportation, natural systems, community wellbeing. The plan specifies key agencies related to each climate action and the corresponding effect of the action. The report details actions already being done and specifies actions to be done by federal, state, regional, local and community agencies.

[City of Gresham Climate Action Strategies, 2023](#): Describes strategies that the City of Gresham and the Gresham community will use to respond to climate change. The strategies have been organized into seven categories based on sources of emissions and opportunities for building resilience, including buildings and energy, urban form and transportation, solid waste and consumption, community health and resilience, civil infrastructure and natural spaces, economic development and resilience, and internal city operations.

[City of Hillsboro 2035 Community Plan, 2020](#): Describes a set of actions based on input from community members in cooperation with local organizations who have agreed to share implementation responsibilities. Actions are split into sectors, including economy and infrastructure, education and community involvement, environmental stewardship, health and safety, and livability and recreation. Each action has a lead community partner to foster implementation.

[City of Lake Oswego Sustainability and Climate Action Plan, 2020](#): Describes plan for reducing transportation emissions, promoting energy efficiency, promoting water conservation, protecting natural resources, reducing exposure to toxins, reducing waste, enhancing public education, adapting to climate change, and improving employee health and engagement.

[City of Milwaukie Community Climate Action Plan, 2018](#): Describes actions for mitigating and adapting to climate change. The actions are sorted by three different identified agents of change, including actions that can be led by the City, households, and organizations to achieve climate action goals. Actions are focused on each sector including energy, transportation, and public health. City led goals entail land use and transportation planning that adapt to changing climate, materials use, purchase and recovery, and public health and emergency preparedness. Household led actions include energy efficiency upgrades and landscape design choices that improve urban heat island and green infrastructure. Organization led actions include landscaping and green build strategies to reduce impact and actions to reduce GHG emissions from business travel.

[City of Portland Climate Emergency Workplan, 2022](#): Describes priority actions and strategies to be implemented over the next three years. Sectors considered include electricity supply, buildings, transportation, industry, land use, embodies carbon/food. The plan also considers a multi-sectorial focus area that assesses impacts, such as flooding, tree canopy coverage, natural resources, green infrastructure, wildfire, health impacts of heat and smoke, resilience hubs, infrastructure planning and construction, and emergency planning.

[City of Portland Decarbonization Pathways Analysis Technical Memo, 2022](#): Tool developed to help policy makers and the public with GHG emissions forecasting and visualization of climate strategies needed to meet the community's goal of net-zero GHG emissions by 2050.

[City of Portland Pathways to Net-Zero Carbon by 2050, 2022](#): Establishes baseline and current GHG emissions by source, including electricity, natural gas, and gasoline as well as forecasts emissions reduction pathways. All emissions reduction strategies were then maximized to make estimates for further reductions to achieve net zero emissions by 2050.

[City of Portland Pricing Options for Equitable Mobility, 2021](#): A report on recommendations to City leadership as they consider if and how to move forward with new pricing strategies to advance climate, equity, and mobility goals. Strategies and actions include centering climate and equity outcomes throughout the pricing program design, developing a fee on urban delivery to reduce vehicle miles travelled and thus climate impacts, and longer-term pricing recommendations such as a locally controlled road usage charge designed to advance mobility, climate, and equity outcomes.

[City of Tigard Climate Action Report, 2019](#): Identifies 17 significant actions that constitute a pathway for Tigard, with its unique context and constraints, to become a zero emissions community. Three actions are focused on urban form, buildings, and industry; five actions relate to the City of Tigard switching to emissions free energy; six actions are transportation actions; two are waste actions; and one is a sequestration action.

[City of Tualatin Community Climate Action Plan: A Path to Net Zero by 2050, 2023](#): Actions and strategies are focused on natural systems, resources and infrastructure, health and safety, economic shifts, buildings and energy, urban form and land use, transportation, and consumption. The report also describes current, ongoing climate action efforts.

[City of Vancouver Climate Action Framework, 2022](#): Describes framework to reduce GHG emissions and build resiliency to climate change impacts by 2040. Framework organizes strategies and actions into sectors, including equity and green economy, buildings and energy, transportation and land use, natural systems and water resources, and solid waste and wastewater.

## **Community plans**

Ten community-led MSA-specific equity- and environmental justice-focused plans were reviewed for critical content to create a list of documented community priorities that are relevant to this grant. Each plan's priorities are summarized below.



### **Portland African American Leadership Forum (PAALF)**

[The People's Plan](#) 2017.

Plan priorities:

- Community resilience and community power building
- Health efforts focused on Black well being
- Housing justice and Black community
- Revitalization of Black community economy and honoring Black workers
- Environmental and just Sustainability with a focus on addressing Climate Change through Racial Justice
- Efforts directed towards youth and education with a goal of making young Black people thrive and lead
- Developing networks and spaces in the arts and culture fields that support Black brilliance
- Dismantling racist systems and building a restorative model in the administration of justice

### **Multnomah County, Coalition of Communities of Color**

[Rooted in Values Guided by Vision](#): Community-driven climate justice framework for Multnomah County, 2023.

Plan priorities and considerations are climate justice efforts which are:

- Reparative, Innovative and Resilient
- Community driven climate justice. Feedback was sought from the community on what actions they thought would help during extreme weather events and participants shared the mental, physical, and financial impacts that extreme weather events had on them.

### **Portland African American Leadership Forum, Africa House**

[Afro-Ecology Movement](#): An environmental movement for the Pan-African Communities of Portland, 2018.

Plan Priorities:

Development of an environmental justice agenda that is relevant to both African American and African immigrant and refugee communities and foster relationship across communities.

Redefinition of climate and sustainability related terms for targeted communities

- Food access
- Health
- Housing

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- Economy/workforce
- Community building and culture

### **Coalition of Communities of Color, Unite Oregon, Multnomah County**

[Cultivating Justice in a Changing Climate](#): A collection of stories and art rooted in Multnomah County's communities of color.

#### Plan Priorities:

Create a fuller and more detailed picture of the ways that climate change impacts Multnomah County's communities of color. Created to make climate justice data more accessible for community members who are on the frontlines of this issue.

Includes a list of resources (energy bill assistance, cooling centers) that were learned through surveying that BIPOC community members would like more access to and information on.

- Tree canopy
- Air toxics
- Access to parks/transit
- Walkability/traffic safety
- Energy burden

### **National Institute for Transportation and Communities (NITC)**

[Community-Based Assessment of Smart Transportation Needs in the City of Portland](#), 2018.

#### Plan Priorities:

- Affordable/accessible public transit
- Active transportation
- Smart mobility
- Bank access & privacy
- Internet access

#### Recommendations:

- Improve public transportation information, scheduling and route finding through smartphone apps
- Improve public data access such as through public Wi-Fi
- Implement policies to lower barriers to purchasing or using electric vehicles
- Expand translation for important smart mobility apps into languages other than English

## **Native American Youth & Family Center, Coalition of Communities of Color, OPAL Environmental Justice Oregon**

[Leading Together](#): Cross-Cultural Climate Justice Leaders, 2015.

Plan Priorities are supporting an Indigenous led regional climate justice campaign focused on:

- Cross-Cultural Climate Action Capacity
- Transportation Justice: Equitable funding and distribution of active transportation and transit access that produces human-scale mobility for greenhouse gas reduction and adaptation
- Housing Justice: Access for all to climate resilience infrastructure through regulatory tools implemented throughout Portland metro area jurisdictions
- Green Infrastructure: Mitigation and adaptation within vulnerable areas through community-based budgeting and contracting for implementation
- Disaster Resilience: Social cohesion and emergency preparedness through culturally specific contracting of Neighborhood Emergency Team trainings by CBOs for the Portland Bureau of Emergency Management

### **Living Cully**

[Living Cully Community Energy Plan](#), 2018.

The Living Cully Community Energy Plan creates a blueprint for preventing displacement through increased investment in energy conservation and renewable energy. It is a neighborhood-scale energy plan for Cully that describes how Living Cully has increased its focus on activities that combine climate, energy and anti-displacement goals, including:

- The NAYA-led Cully Weatherization 2.0 (weatherization that conserves energy, supports target businesses, improves health and reduces utility expenses)
- The Hacienda CDC-led Climate Action Plan Social Equity Guidance & Metrics (an implementation plan for achieving equity and carbon outcomes with the redevelopment of Hacienda CDC's Villa de Clara Vista affordable housing)
- The Habitat-led Neighborhood Revitalization Initiative (critical home repairs for low-income homeowners).

### **Zero Cities Project**

[Zero Cities Project](#): Reflections on a three-year project to engage communities and support cities to achieve equitable building decarbonization.

The project provided each community with an understanding of its built environment through a bottom-up building stock assessment in which every building in each city was analyzed and projections for floor area growth, energy, and emissions changes over time were modeled at a subsector level. Three of the cities progressed to the stage of exploring the energy and emissions

impacts of various decarbonization policies impacting different building subsectors, and for these cities a dynamic decarbonization scenario dashboard was created within their building stock assessment to support real-time analysis and comparisons of policy combinations. This analysis was paired with a community ecosystem map, which was designed to deepen knowledge of local organizations and practitioners in environmental justice and sustainability. These maps were used to identify community partners to help co-develop engagement strategies and future policies. Utilizing these tools, participants in each Zero Cities community began to pursue a work plan tied to their local context.

**Environmental Justice Priorities:**

- Anti-displacement
- Racial equity
- Environmental investments to lower-income neighborhoods
- Energy burden, education, energy efficiency
- Rental housing

**Key lessons learned:**

- Importance of building trust
- City/government accountability
- Commit to the work over the long run
- Adequately compensate community members and CBOs for their time

**Urban League of Portland**

[State of Black Oregon](#) 2015.

Report on efforts being taken to improve the State of Black Oregon categorized under the following key priorities:

- Health
- Education
- Employment opportunities and employability
- Security and wellbeing
- Prosperity and opportunity
- Community protection

**Voz**

[On the Frontlines of Climate Change](#): Voz Environmental and Justice Framework, 2017

As a member of Coalition of Communities of Color, this report by Voz connects environment and climate issues with findings and recommendations. The key areas of concern include:

- Limited access to adequate health care coverage
- Limited access to healthy, safe and affordable housing
- On the job injuries due to heavy or repetitive labor
- Food insecurity, or diet-related diseases
- Unknown exposures to workplace hazards due to language barriers and lack of training
- Racism and hostile sentiments towards immigrants
- Transit dependence

## APPENDIX 2. GREENHOUSE GAS INVENTORY METHODOLOGY

### Protocol and inventory boundaries

The Metro community inventory follows Greenhouse Gas Protocol's Global Protocol for Community-Scale Greenhouse Gas Emissions (GPC).<sup>3</sup> The GPC is focused on accounting for sector-based emissions, which can be thought of as local sources of emissions.

Emissions were calculated using Good Company's carbon calculator tool, *G3C – Community*. Emissions data sources are documented in the tool, under that Inventory Audit Trail. G3C – Community is an Excel-based calculator that documents all activity data, emissions factors, and emissions calculations used in the inventory. The audit trail catalogs all data, calculation, and resource files used to complete the inventory.

The boundary for this inventory defines the geographic area, time span, emissions sources and gases covered in the inventory. The greenhouse gas inventory presented in this report is based on 2022 data for the MSA, which includes Clackamas, Columbia, Multnomah, Washington, and Yamhill Counties in Oregon, and Clark and Skamania Counties in Washington. This inventory considers all seven recognized greenhouse gases, – carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFC) and sulfur hexafluoride (SF<sub>6</sub>), Nitrogen trifluorides (NF<sub>3</sub>), Perfluorocarbons (PFCs), and other fully fluoridated GHGs. All gases are reported in terms of carbon dioxide equivalent (CO<sub>2</sub>e).

### Emissions sources

Metro's Community GHG Inventory categorizes emissions sources by the following sectors:

- **Building Energy:** Emissions from energy used or produced in a fixed location, e.g., electricity, natural gas (including fugitive emissions), propane, and fuel oil. This includes the EPA's categories of **electricity use and generation**, **commercial and residential buildings** (only energy usage, not waste or refrigerants), and **industrial energy use** (but not nonstationary industrial emissions). This category also includes CH<sub>4</sub> emissions from natural gas distribution hubs.
- **Transportation Energy:** Emissions from vehicles and mobile equipment. This is similar to the EPA's **transportation** category, but it excludes vehicle refrigerants.
- **Waste and wastewater:** Landfilled waste emissions and wastewater treatment emissions. This includes EPA's **waste and materials management** and **wastewater** categories.
- **Industrial Process & Refrigerants:** Emissions from refrigerants and other fugitive gases from industrial processes. This coincides with EPA's **commercial, residential, and**

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<sup>3</sup> GPC has become the recommended or required standard for international reporting to CDP's Cities Survey and the Global Covenant of Mayors for Climate & Energy. The GPC may be downloaded at <https://ghgprotocol.org/greenhouse-gas-protocol-accounting-reporting-standard-cities>.

**industrial buildings** refrigerant use as well as nonstationary **industrial** activity such as silicon chip manufacturing.

- **Agriculture:** Emissions from livestock. This coincides with EPA's **agriculture** category. Note that land use and forestry emissions would normally be included here, but these emissions have been excluded to better align with the state's inventories and Metro's implementation authority.

## Summary of data collection and scaling strategy

### Existing inventories

Good Company, a division of Parametrix, completed several of the referenced community inventories in the region, specifically for Washington County, Clackamas County, and Lane County (not in the MSA, but used as a model for more rural counties in the MSA). Inventories for Multnomah County and the City of Vancouver were available online. Stationary emissions (electricity and natural gas usage), transportation, and waste emissions were taken directly from these inventories where possible.

### Scaled inventories

Yamhill County, Columbia County, Skamania County, and Clark County outside of the City of Vancouver all lack complete GHG inventories that could be referenced. These counties are substantially more rural than the counties with inventories, so effort was made to accurately estimate their emissions, especially for electricity which is a major emissions source. Good Company previously completed inventories for Lane County in Oregon's South Willamette Valley, which shares several characteristics with the un-inventoried counties. It is largely rural, spanning both agricultural and forested areas, but contains several medium sized towns outside of its main population center in Eugene-Springfield. Importantly, the electric utilities in Eugene-Springfield are separate from the rest of the county and so it was possible, given the available data, to remove Eugene-Springfield's usage and isolate the areas of Lane County that largely resemble the rural counties within the MSA. The per-capita electricity usage, after removing Eugene-Springfield, was therefore used as a proxy for the rural MSA counties and scaled by population.

It was not possible to remove Eugene-Springfield usage for natural gas, transportation, or waste data so these data were taken from per-capita estimates from Clackamas County and scaled as appropriate for population. For the full CCAP inventory it will be possible to get fuel sales, waste, and building energy usage for each of the counties in Oregon, and likely waste and building energy usage for the counties in Washington.

The data for fugitive emissions from refrigerants were scaled down from the Oregon statewide GHG inventory, and the same per-capita rates were used for all counties in the MSA.



## Internet sources

Data for industrial emissions came from the EPA Facility Level Information on GreenHouse gases Tool (FLIGHT) database. Emissions sources beyond “stationary combustion” were estimated using FLIGHT. These emissions sources include landfills, electronics manufacturing, and metal fabrication. Methane emissions from natural gas distribution centers were also included, as well as power plant emissions.

Data for county-level livestock populations came from USDA’s census of agriculture. The resulting emissions were then calculated using G3C (Good Company’s Carbon Calculator).

## Data collection and methodology.

**Table 21: 2022 MSA-wide community GHG inventory data collection and methodology**

Emissions Category	Category Description
Stationary Energy (Buildings)	
Residential Energy	<i>These categories include direct emissions from natural gas, fuel oil, and propane combustion by the residential, commercial, and industrial sub-sectors within the MSA’s geographic boundaries. Also includes the emissions from grid electricity used by the same sub-sectors for the same geographic boundaries. This also includes electricity generation (in natural gas plants) within the boundaries and fugitive natural gas from the distribution hubs (separate from general fugitive natural gas estimated as a percentage of usage).</i>
Commercial Energy	
Industrial Energy	
For Clackamas and Washington Counties, Electricity and natural gas data were provided by local electric utilities and the natural gas utility, Northwest Natural. Electricity and gas data included information on retail sales; participation in renewable electricity and carbon offset programs; and local electricity generation from privately owned residential and commercial PV solar installations. This utility data is considered highly accurate. Residential and commercial fuel oil and propane use was estimated using Oregon state-level per capita fuel usage data downscaled by each county’s population. Emissions factors for natural gas, fuel oil, and propane are from U.S. EPA’s emissions factors hub and The Climate Registry’s 2018 Default Emissions Factors and are considered highly accurate. Electricity location-based emissions factors are taken from EPA eGRID 2018 data for the Northwest Power Pool (NWPP) sub-region. Market-based electricity accounting emissions factors for electric utilities are taken from Oregon Department of Environmental Quality’s report titled, <i>2010 – 2018 Greenhouse Gas Emissions from Electricity Use</i> . Online at: <a href="https://www.oregon.gov/deq/aq/programs/Pages/GHG-Emissions.aspx">https://www.oregon.gov/deq/aq/programs/Pages/GHG-Emissions.aspx</a> .	
Fugitive Natural Gas System Emissions	<i>Fugitive loss of natural gas from the local product distribution system.</i>
Northwest Natural Gas reported a 0.14% system leakage rate for Washington and Clackamas Counties. Note that the Northwest Natural Gas reported rate is less than half of the protocol default proxy value of 0.3%.	
Transportation	
On-Road Energy	<i>Direct emissions from gasoline and diesel for passenger &amp; freight transportation.</i>
Fuel sales data for gasoline, diesel, propane, and CNG for the counties was provided by the ODOT Fuels Tax Group. Complete inventories were available for Washington, Multnomah, and Clackamas counties. Clackamas County per-capita MTCO <sub>2e</sub> emissions from fuel sales (gasoline and diesel) were scaled up for Yamhill, Columbia, Clark, and Skamania counties to estimate their on-road transportation emissions.	
Transit	<i>Direct emissions from gasoline and diesel for passenger transit transportation.</i>

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Data was collected from TriMet, C-TRAN, and other local transit providers, which provided fuel volume data by fuel type. Transit types included bus, light rail, and paratransit. Data received is considered highly accurate.	
<b>Off-Road</b>	<i>Direct emissions from gasoline and diesel for off-road vehicles such as construction equipment, etc.</i>
The <i>Oregon Nonroad Diesel Equipment Survey and Emissions Inventory</i> is used to report emissions for each of the Oregon counties. The report provides a 2017 total emissions values for the counties which were used as a proxy for 2022 emissions and is therefore considered moderately accurate. Each Oregon county has a report, which were scaled up by population to estimate emissions for counties in Washington.	
<b>Airport</b>	<i>Direct emissions from aviation fuel (aviation gasoline and jet fuel)</i>
Fuel sales for the Hillsboro Airport in Washington County and Pearson Field in Clark County are included here, but data from the Portland International Airport or any other, smaller airports were not available.	
<b>Waste</b>	
For Yamhill, Columbia, Clark, and Skamania counties, the total waste emissions (including solid waste, compost, and wastewater) were scaled up by population based on Clackamas County results.	
<b>Landfill Solid Waste</b>	<i>Fugitive methane emissions from mixed solid waste generated in the community regardless of disposal location.</i>
Activity data for wet short tons from local haulers and the EPA FLIGHT database were used to extract total waste and emissions for the waste generated within each county and accepted at the destination landfills. These emissions were then pro-rated by each county's production.	
<b>Composting Organic Waste</b>	<i>Fugitive methane and nitrous oxide emissions from composting of organic wastes (wood, yard debris, and food). It should be noted that while composting does produce emissions, they are significantly less than if the same material were landfilled. Also, land-application of compost increases soil carbon sequestration. That benefit is not currently accounted for in GPC methodology.</i>
Compost facility data was available from Oregon DEQ using 2018 reporting; 2019 data was not available. This activity data is considered highly accurate.	
<b>Wastewater Treatment Process Emissions</b>	<i>Fugitive nitrous oxide emissions from discharge of treated effluent (wastewater).</i>
Wastewater treatment plant process emissions for biogas combustion and effluent discharge are calculated using data provided by Clean Water Services in Washington County as well as Clackamas County staff and external agencies. In Clackamas County, data was collected for the following wastewater treatment plants: Canby, Tri-County, Kellogg Creek, and Hoodland. The following were calculated for facilities as appropriate depending on their operations. For biogas combustion data included square cubic feet per day of biogas and the percent methane in the biogas. For effluent discharge the data included kilograms of nitrogen discharged per day. Emissions calculations for nitrification/denitrification are based on community population data from Portland State University's Population Research Center. This activity data is considered highly accurate.	
<b>Septic Systems</b>	<i>Direct emissions from the combustion of biosolids (wastewater).</i>
Septic fugitive emissions are estimated using the number of residents in the county not served by centralized sewer service. Average emissions factors for residential septic systems are provided by the U.S. Community GHG Protocol. This activity is considered highly accurate.	
<b>Industrial Process &amp; Refrigerants</b>	
<b>Industrial Emissions</b>	<i>Emissions from industrial processes that release greenhouse gasses from processes other than stationary energy use.</i>
The industrial sub-sector was gathered from the EPA FLIGHT. Only non-stationary emissions were considered. This same process was used to gather data for landfill emissions and for power plant and natural gas distribution systems.	

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<b>Refrigerant Loss</b>	<i>Fugitive loss of refrigerants from building and vehicle air conditioning systems.</i>
<p>County-specific data for fugitive refrigerant loss is not readily available and would be very time consuming to collect. Therefore, activity data for fugitive refrigerant loss is estimated using Oregon state-level data attributed to each county on a per capita basis, including for the counties in Washington. Activity data for state-level fugitive emissions from refrigerants, aerosols, and fire suppression systems is reported in the Oregon Department of Environmental Quality's (ODEQ's) Oregon Greenhouse Gas Inventory. Oregon's GHG inventory includes refrigerant loss for the residential &amp; commercial, transportation, and industrial sub-sectors. Refrigerant loss is aggregated for a variety of refrigerant types and reported by ODEQ in units of CO<sub>2</sub>e. The industrial sub-sector was gathered from EPA FLIGHT. Refrigerant activity data is estimated from State of Oregon totals and therefore is considered as having mid-level accuracy.</p>	
<b>Agriculture</b>	
<b>Livestock Methane</b>	<i>Fugitive methane emissions from livestock enteric fermentation and manure management.</i>
<p>Activity data for livestock taken from USDA's 2017 census of agriculture for all counties. Emissions factors (per head of livestock for various breeds) are taken from ICLEI's U.S. Community Protocol, Appendix G. Activity data is considered highly accurate.</p>	

## APPENDIX 3. EMISSIONS REDUCTION CALCULATION

### METHODOLOGY BY MEASURE

This appendix explains the methodology and assumptions used for developing the estimated greenhouse gas (GHG) and co-pollutant emissions reduced for the measures included in this priority climate action plan.

#### Greenhouse Gas emissions methodology and sources

All emissions factors are from [EPA Emissions Factors Hub](#) unless otherwise noted, using IPCC AR5 GWP values.

**Table 22. Measure-specific GHG emissions methodology and sources**

<b>Trans-1: Increase high capacity transit service across the metropolitan area</b>	
Emission Reductions Estimate Method:	<ul style="list-style-type: none"> <li>• Previous analysis from Metro's draft <a href="#">High Capacity Transit Strategy</a>, applying same methodology to additional C-TRAN routes.</li> <li>• Estimates for GHG emissions reductions arising from HCT implementation are derived from two main assumptions: <ol style="list-style-type: none"> <li>1. Reduction in VMT from residents opting to use transit over a personal vehicle due to convenience, cost, and other factors.</li> <li>2. Prevention of additional VMT from new residents or new drivers who rely on transit instead of purchasing personal vehicles.</li> </ol> </li> </ul>
Emission Reduction Estimate Assumptions:	<ul style="list-style-type: none"> <li>• Metro's draft <a href="#">High Capacity Transit Strategy</a> Tier 1 corridors (except Southwest Corridor, Interstate Bridge Replacement, and Montgomery Park Streetcar) from TriMet operations plus Highway 99 and Fourth Plain from C-TRAN.</li> <li>• Variables include weekday ridership; weekday headway (minutes); average trip length (miles).</li> <li>• Passenger vehicle fuel economy of 23 MPG.</li> <li>• Emissions factor of 9 kg CO<sub>2</sub>e (rounded up) per gallon of gasoline from <a href="#">EPA Emissions Factors Hub</a>.</li> <li>• Assumes that HCT vehicles are low- or zero-emissions</li> </ul>
Cost-effectiveness of GHG reductions	The cost-effectiveness was estimated by using internal agency estimates of the cost of per revenue-mile service increases for bus lines.
<b>Trans-2: Redesign streets and infrastructure to reduce delays for transit vehicles</b>	
Emission Reductions Estimate Method:	<ul style="list-style-type: none"> <li>• Metro's draft <a href="#">High Capacity Transit Strategy</a> Tier 2, Tier 3, Better Bus, and ETC corridors from TriMet operations plus Highway 99 and Fourth Plain from C-TRAN.</li> <li>• California Air Pollution Control Officers Association (CAPCOA) <a href="#">Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity</a>: T-27. Implement Transit-Supportive Roadway Treatments. Adjusting percent of routes for a more accurate percent of revenue miles, applying reductions to community gasoline use in the Tri-County and Clark areas by transit agency.</li> </ul>
Emission Reduction Estimate Assumptions:	CAPCOA methodology calculates percent reduction in VMT, and therefore fuel, from vehicle travel in community; assumed equivalent to gasoline emissions in Oregon tri-county and Clark County areas by transit agency.

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Cost-effectiveness of GHG reductions	Cost-effectiveness estimates come from internal analysis of price per mile of street redesign.
<b>Trans-3: Expand transit signal priority</b>	
Emission Reductions Estimate Method:	<ul style="list-style-type: none"> <li>Metro's draft <a href="#">High Capacity Transit Strategy</a> Tier 1 (except Southwest Corridor, Interstate Bridge Replacement, and Montgomery Park Streetcar), Tier 2, Tier 3, Better Bus, and ETC corridors from TriMet plus Highway 99 and Fourth Plain from C-TRAN.</li> <li>California Air Pollution Control Officers Association (CAPCOA) <a href="#">Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity</a>: T-27. Implement Transit-Supportive Roadway Treatments, adjusting percent of routes for a more accurate percent of revenue miles, applying reductions to community gasoline use in the Tri-County and Clark areas by transit agency.</li> </ul>
Emission Reduction Estimate Assumptions:	CAPCOA methodology calculates percent reduction in VMT/fuel from vehicle travel in community; assumed equivalent to gasoline emissions in Oregon tri-county and Clark County areas by transit agency.
Cost-effectiveness of GHG reductions	Cost effectiveness estimate based on per-line cost to install transit signal priority.
<b>Trans-4: Expand bicycle and pedestrian network</b>	
Emission Reductions Estimate Method:	California Air Pollution Control Officers Association (CAPCOA) <a href="#">Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity</a> : T-18 Provide Pedestrian Network Improvement and T-20 Expand Bikeway Network.
Emission Reduction Estimate Assumptions:	Applies reductions to community gasoline use/emissions in the Tri-County and Washington state/RTC areas by jurisdiction.
Cost-effectiveness of GHG reductions	Cost estimates based on regional transportation plan estimates.
<b>Trans-5: Expand use of parking pricing</b>	
Emission Reductions Estimate Method:	VisionEval analysis for percent VMT reduction with Metro <a href="#">Regional Transportation Plan</a> area VMT.
Emission Reduction Estimate Assumptions:	<ul style="list-style-type: none"> <li>VisionEval (previous analysis by Metro), indicating a 2.25% reduction in VMT.</li> <li>Metro region passenger vehicle VMT per Metro <a href="#">Regional Transportation Plan</a>.</li> <li>Passenger vehicle fuel economy of 23 MPG gasoline.</li> <li>8.8 kg CO<sub>2</sub>e/gallon gasoline per EPA <a href="#">Emissions Factors HUB</a>.</li> </ul>
Measure-Specific Activity Data and Implementation Tracking Metrics:	VisionEval assumption adjustments of areas that are assumed to have priced parking in the RTP 2045 constrained scenario.
Cost-effectiveness of GHG reductions	This program is expected to generate net revenue, and so costs were not estimated.
<b>Trans-6: Expand the use of electric buses in the region's transit fleets</b>	
Emission Reductions Estimate Method:	Generally aligns with California Air Pollution Control Officers Association (CAPCOA) <a href="#">Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity</a> : T-30. Use Cleaner-Fuel Vehicles Transit vehicle methodology adjusted for percent revenue miles converted (instead of percent of fleet) for higher accuracy and calculated a reduction in lifecycle emissions based on local CI scores for 100% renewable electricity (assumes BPA average upstream emissions) and R99 diesel fuel (TriMet context). Remaining emissions were assumed to be from electricity generation, but may also be adjusted for hydrogen fuel generation.

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Emission Reduction Estimate Assumptions:	<ul style="list-style-type: none"> <li>Renewable diesel R99 CI score of 39 g CO<sub>2</sub>e/MJ (TriMet per contract).</li> <li>Electricity CI score of 2.61 g CO<sub>2</sub>e/MJ (after 100% renewable product purchase) (OR DEQ <a href="#">Oregon Clean Fuels Program Electricity Carbon Intensity Values for 2022</a>)</li> <li>Diesel fuel economy 4.78 (TriMet)</li> <li>Electric fuel economy 326.33 kWh/100 miles (.3 miles per kWh) (TriMet)</li> </ul>
Cost-effectiveness of GHG reductions	Cost estimates based TriMet research.
<b>Res-1: Expand existing residential energy efficiency retrofit programs, with a focus on low-income households</b>	
Emission Reductions Estimate Method:	<ul style="list-style-type: none"> <li>Residential building emissions were broken down by fuel, and energy end-uses were estimated based on US EIA <a href="#">Residential Energy Consumption Survey (RECS)</a>. The measure specifically entails adding a ductless heat pump, weatherizing, and adding more energy efficient water heaters for each housing unit.</li> <li>Assumptions for energy reduction are from the <a href="#">Northwest Power Plan</a>, residential supplement. Additional electricity use from new electric heat pumps is accounted for.</li> </ul>
Emission Reduction Estimate Assumptions:	<ul style="list-style-type: none"> <li>Household energy end-uses were estimated based on <a href="#">EIA Residential Energy Consumption Survey (RECS)</a> Table CE4.5 (2015, released May 2018) for Marine climate region housing where data was available for electricity and natural gas, and using Pacific Census Division data for propane and fuel oil.</li> <li>Measure reduction potential for the <a href="#">Northwest Power Plan</a>, residential supplement.</li> <li>Additional electricity use from new electric heat pumps is accounted for using end-use US EIA <a href="#">Residential Energy Consumption Survey (RECS)</a> data combined with current GHG inventory data.</li> <li>Applied to 26% of housing units in the MSA.</li> </ul>
Cost-effectiveness of GHG reductions	Cost estimates are based on weatherization and upgrade prices estimated by Washington County Housing Authority.
<b>Res-2: Fund additional energy-efficiency measures in publicly funded, newly constructed affordable housing units</b>	
Emission Reductions Estimate Method:	Using results from Res-1 for the average household, EIA RECS was used to further estimate multi-family housing energy consumption and emissions.
Models/Tools Used:	N/A
Emission Reduction Estimate Assumptions:	<p>Earth Advantage Gold standard achieves an average 15% energy efficiency improvement over standard multifamily construction.</p> <p>Builds on household energy consumption estimates for Res-1.</p> <p>Multi-family housing energy consumption was estimated based on <a href="#">EIA RECS Table CE4.5</a> (2015, released May 2018) using housing unit type data.</p>
Cost-effectiveness of GHG reductions	Cost estimates based on internal estimates of reaching Earth Advantage Gold standard.
<b>Waste-1: Expand the availability of residential composting programs</b>	
Emission Reductions Estimate Method:	<ul style="list-style-type: none"> <li>Generally aligns with California Air Pollution Control Officers Association (CAPCOA) <a href="#">Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity</a>: S-2. Implement Organics Diversion Program, adjusting for local assumptions.</li> <li>Analysis by Metro using EPA <a href="#">Waste Reduction Model (WARM)</a> v15.1</li> </ul>
Emission Reduction Estimate Assumptions:	<ul style="list-style-type: none"> <li>Average of 0.21 tons of food waste per household (2016 <a href="#">DEQ Waste Composition Study</a> data).</li> </ul>

	<ul style="list-style-type: none"><li>Additional EPA <a href="#">Waste Reduction Model (WARM)</a> inputs based on local context for landfilled waste vs. dry anaerobic digestions, e.g., comparison to Arlington landfill.</li></ul>
Cost-effectiveness of GHG reductions	Estimate based on Metro analysis of per-household costs.

## Co-pollutant emissions factors and sources

The following sources provided emissions factors used to calculate the co-benefits of the reduction in co-pollutants for priority measures.

- [EPA Wagon Wheel](#) for residential wood smoke, natural gas, propane and distillate fuel oil sources, March 2023.
- [EPA eGRID Summary Data](#) for NWPP for electricity, 2022.
- MOVES3 for passenger vehicles, using Metro-specific factors.
- [MOVES3](#) table 2 for passenger vehicles for co-pollutants not listed under Metro resource.
- [MOVES3](#) table 12 for diesel transit bus model year 2015, Oct 2021.



## APPENDIX 4. SUMMARY OF THE GHG REDUCTION MEASURE SCREENING PROCESS

This appendix provides a summary of the screening process Metro underwent to determine the final nine priority measures included in this PCAP.

### Initial sources reviewed and screening framework

Metro used the following approach to establish an initial list of GHG reduction measures, create criteria for screening the measures and ensure alignment with community priorities:

- **Initial list of measures:** The project team reviewed publicly available CAPs developed by local agency partners in the MSA to populate an initial list of GHG reduction measures. Metro chose to compile and select priority measures for this PCAP from the list of existing GHG reduction measures, as these often include detailed work plans, budgets, and estimates of GHG reductions and other benefits allowing the PCAP to efficiently meet EPA requirements and ensure effective implementation.
- **Establishing screening criteria:** The project team reviewed CPRG Implementation Grant eligibility criteria and requirements, to define screening criteria to identify the highest potential GHG reduction measures.
- **Centering community priorities:** Additionally, the project team reviewed existing equity- and environmental justice-focused plans and documents created by regional entities and community-based organizations to understand and define equity-related criteria to apply to the screening process and ensure alignment with community priorities.

### Measure matrix and eligibility screening

The project team populated an initial list of over 700 GHG reduction measures from the materials reviewed and put them in a Measure Matrix. The project team accomplished the following in the Measure Matrix:

- **Categorization of measures:** The project team sorted measures into the following categories and highlighted common opportunities and challenges to addressing different GHG emission sectors:
  - Transportation energy switch
  - Land use, mode shift, & VMT reduction
  - Building energy sourcing
  - Building energy efficiency
  - Major materials shifting
  - Consumption reduction & recovery
  - Miscellaneous

- **Standardization of measures:** The project team grouped like measures and determined standardized descriptions of commonly referenced measures that were described differently across the CAPs.
- **Scaling measures to the MSA level:** The project team assessed how measures could be implemented at the MSA scale, including identifying regional plans that could serve as a basis for scoping and scaling up referenced measures.
- **Noted additional screening considerations:** The project team noted information from CAPs relevant to GHG mitigation potential, equity and stakeholder considerations, co-benefits, authority to implement and agency implementation roles as well as readiness, data, and quality.

This first consolidation effort yielded just over 50 measures to review further. To narrow down the list and prioritize measures for inclusion in the PCAP, the project team applied the following basic eligibility criteria and questions to filter out many measures that did not meet core CPRG requirements:

- **Mitigation potential:** Could this action potentially reduce GHGs within the next 5 years if implemented?
- The project team evaluated the measures based on this criterion and screened out many potential strategies from the source CAPs, including measures that were exclusively focused on climate adaptation or resilience and those that could not feasibly be implemented within five years due to policy, technology or resource constraints.
- **Community-scale reductions:** Does this action reduce GHG emissions among the broader community?
- EPA requires PCAPs to include inventories of community GHG emissions and actions to reduce these emissions; addressing GHG emissions from agencies' operations is optional. Generally, community emissions account for a much larger share of GHG emissions than agency emissions, but CAPs often include many agency-related actions that are "low-hanging fruit" where agencies can exercise leadership by example. The project team screened out actions focused exclusively on reducing agency operations – making exceptions for strategies that produce community-scale GHG reductions by greening large fleets or buildings, such as the transit fleet.
- **Local agency authority:** Do local agencies currently have the authority to lead implementation of this action?
- To evaluate this criterion, the project team considered whether agency partners within the MSA are already implementing the action or are identified as leads in existing CAPs, and if agencies have the authority to lead this action under current policies and regulations.

After standardizing and consolidating similar measures and removing those that did not meet the basic eligibility screening criteria, there were 21 measures that were reviewed further in an in-depth screening process.

## Detailed screening criteria

The project team used the evaluation criteria described in the CPRG Planning Grant Requirements and the CPRG Implementation Grant Notice of Funding Opportunity for the final screening process; although not all criteria were used at this stage – including those related to equity, project costs, and past grantee performance, which depend upon the specific agency partners, communities, and investments – because this PCAP is specifically focused on identifying measures for implementation at the MSA-wide scale.

The project team created a standardized weighting process that scored each criterion with a value between 5 and 15 out of a total of 250 evaluation points. These criteria, along with their definitions and rating scales, are described below.

### GHG reduction criteria

GHG reductions account for the largest share of points available in the CPRG Implementation Grant evaluation criteria. GHG reduction criteria include:

**Readiness:** Is the measure described at the level of detail that EPA is requesting for the PCAP and for CPRG implementation grant applications? The project team rated this criterion based on the level of detail provided in CAPs and the project team's knowledge of how similar projects have been implemented. Rating scale is as follows:

- **High:** Plan describes specific features, tasks, and/or milestones associated with the measure as well as costs, roles/responsibilities, and/or timelines associated with each feature, task, and/or milestone.
- **Medium:** Plan describes specific features, tasks, and/or milestones associated with the measure in a way that will enable applicants to develop more detailed application information.
- **Low:** Plan provides little to no detail on how the measure would be implemented.

**Quantifiable:** Are the GHG reductions from this measure easy to quantify based on the information available? The project team rated this criterion based on the extent to which anticipated GHG reductions from measures were quantified and if measures, based on knowledge of the tools and methodologies that are available, could easily to quantify anticipated emissions reductions. Rating scale is as follows:

- **High:** Plan includes detailed, sound, and replicable GHG reduction estimates for the measure.
- **Medium:** Plan does not quantify GHG reductions for this measure in detail, but established tools/methodologies are available to estimate GHG reductions for this measure.
- **Low:** Source plans do not quantify GHG reductions for this measure and there are no known tools/methodologies for doing so.

**GHG reductions:** What is the estimated range of potential GHG reductions? The project team rated this criterion based on GHG analyses in source CAPs and used expert judgement to account

for the various methods and level of detail for quantifying GHG reductions in these plans. The initial screening focused on rating GHG reductions for each measure relative to other strategies in the plan. The PCAP includes detailed estimates of the GHG reduction potential for each measure included.

- **High:** Existing plans and professional experience have demonstrated the measure shows significant near-term potential for GHG reductions with actions that are feasible under current conditions.
- **Medium:** Existing plans and professional experience have demonstrated the measure shows some near-term potential for GHG reductions with actions that are reasonable to implement.
- **Low:** Existing plans and professional experience have demonstrated that there are significant barriers to near-term potential for GHG reductions with actions that are reasonable to implement.

**Cost-effectiveness:** What is the estimated cost per metric ton of potential GHG reductions? The project team rated this criterion based on GHG and cost analyses in source CAPs and used expert judgement to account for the various methods and level of detail used to quantify costs in these plans. The initial screening focused on rating cost-effectiveness for each measure relative to other strategies in the plan. The PCAP includes ranges of cost-effectiveness for each measure included.

- **High:** Existing plans and internal estimates show that investment in this measure yields cost-effective GHG mitigation under current conditions.
- **Medium:** Existing plans and internal estimates show that investment in this measure yields higher cost GHG mitigation under current conditions.
- **Low:** Existing plans and internal estimates show that investment in this measure yields very high cost GHG mitigation under current conditions, or conditions do not yet exist for this investment to be cost-effective.

**Scalability:** What is the potential to scale the measure up to benefit multiple agencies/communities within the MSA? The project team rated this criterion based on the extent to which each measure is captured in multiple local CAPs or in regional plans that represent collaboration among local partners. The project team also considered the results of the October Climate Partners' Forum survey, which allowed members to identify strategies that are priorities for their agencies. Finally, the project team used its professional judgment to highlight strategies that produce greater GHG reductions when implemented at scale. The project team scored this criterion as follows:

- **High:** this measure appears as a priority in 3+ source CAPs or CPF survey responses, or the action supports implementation of a state-mandated climate policy, and the project team believes there is potential to scale it up across the MSA based on the background resources reviewed.
- **Medium:** action appears as a priority in 1-2 source CAPs or CPF survey responses and the project team believes there is potential to scale it up across the MSA based on the background resources reviewed.

- **Low:** this action does not appear to be a priority for multiple agency partners, nor does it appear scalable to the MSA.

### Equity criteria

Equity benefits are worth 35 points in the CPRG implementation applications. EPA is evaluating two different aspects of equity: whether the application overlaps a federally identified Low Income / Disadvantaged Community (LIDAC) and whether there is evidence that the project will serve the needs of that community. The Metro project team did not evaluate the former since the PCAP assumes that all strategies will be implemented across the entire MSA and does not attempt to forecast which specific communities within the region will be covered by implementation applications. The screening instead focused on assessing strategies' alignment with community needs using a single criterion.

**Alignment with community feedback:** Does this action present opportunities to increase equity? The project team rated this criterion based on alignment with marginalized community members' priorities as documented in community-led climate justice plans and/or regional outreach and planning efforts.

- **High:** the measure aligns with priorities expressed by community members through community-led climate justice plans and/or regional outreach and planning efforts focused on identifying the priorities of marginalized people.
- **Medium:** the source CAPs include engagement or analysis that identified this measure as benefiting equity.
- **Low:** The measure has not been described as an equity priority in relevant local, regional, or community-based plans.

### Co-benefits

The CPRG implementation applications require applicants to estimate co-benefits related to health, safety, air quality, resilience, and workforce development, and the project team included screening criteria to address these benefits. The project team rated each of these criteria based on a combination of the information that source CAPs provided on these co-benefits and on the project team's knowledge of other efforts to document the co-benefits of common GHG reduction strategies. Each criterion in this category received a **yes/no** rating rather than a low/medium/high rating, both to reflect the relative lack of detail involved in the screening and to correctly reflect the value of these criteria, which are weighted lower than the GHG reduction and equity criteria in the implementation grant application evaluations.

The project team then summed the total points across all criteria for each measure to develop total scores.

### Potential PCAP measures

Table 23 summarizes the 21 measures that were screened for inclusion in the PCAP, including:

## Priority Climate Action Plan for the Portland-Vancouver MSA (EPA Grant # 02J36101)

- The standardized categories in which the measures were organized
- Results for [GHG reduction screening criteria](#)
- Results for [equity screening criteria](#)
- Results for [co-benefit screening criteria](#)
- Total scores

The initial 16 measures the project team recommend for inclusion in the PCAP are shown in normal shading; measures the project team recommend considering for the CCAP are shaded in light gray.

**Table 23: Screening results for potential PCAP measures**

Category	Measure	Readiness	Quantifiable	GHG reductions	Cost effectiveness	Scalability	Aligned w/ feedback	Health	Safety	Air quality	Resilience	Quality Jobs	Total score
3. Make transit convenient, frequent, accessible, and affordable	<b>3a. Implement high-capacity transit across the metro area</b> , including the Metro High Capacity Transit Strategy, C-TRAN High Capacity Transit Routes, and other high-priority regional transit expansions	High	High	High	Med	Med	High	Yes	Yes	Yes	Yes	Yes	15
3. Make transit convenient, frequent, accessible, and affordable	<b>3b. Redesign streets and infrastructure to reduce delays for transit vehicles</b> (e.g., on regional Enhanced Transit and Transit Priority corridors)	High	High	High	Med	Med	High	Yes	Yes	Yes	Yes	Yes	15
4. Make biking, walking and active transportation safe and convenient	<b>4a. Improve multimodal access to transit stations</b>	High	High	High	High	Med	High	Yes	Yes	Yes	Yes	No	15
6. Improve existing building energy efficiency	<b>6a. Support weatherization and efficiency upgrades in existing residential buildings</b> , providing incentives for common energy efficiency measures. Consider retrofits of other publicly owned buildings in cases where emissions reductions are significant and well-documented.	High	High	High	Med	Med	High	Yes	Yes	Yes	Yes	Yes	15



Priority Climate Action Plan for the Portland-Vancouver MSA (EPA Grant # 02J36101)

Category	Measure	Readiness	Quantifiable	GHG reductions	Cost effectiveness	Scalability	Aligned w/ feedback	Health	Safety	Air quality	Resilience	Quality Jobs	Total score
4. Make biking, walking and active transportation safe and convenient	<b>4b. Complete key gaps in the regional active transportation network identified through regional transportation plans</b> , prioritizing high-demand areas, transit station walksheds, regional centers, high injury corridors	High	High	Med	Med	Med	High	Yes	Yes	Yes	Yes	Yes	14
4. Make biking, walking and active transportation safe and convenient	<b>4c. Expand Regional Safe Routes to School programs</b>	High	High	Med	Med	Med	High	Yes	Yes	Yes	Yes	No	12
9. Expansion of anaerobic digestion and composting	<b>9a. Expand the availability of residential composting programs</b> by expanding requirements to offer these programs in the Metro region	High	High	Med	Med	Med	High	Yes	No	No	No	Yes	12
5. Use technology to actively manage the transportation system	<b>5a. Expand the use of intelligent transportation systems</b>	High	High	Med	High	Med	Low	No	Yes	Yes	Yes	No	11
5. Use technology to actively manage the transportation system	<b>5b. Expand use of parking pricing</b> (including implementation of Oregon CFEC requirements)	High	High	High	High	Med	Low	No	No	Yes	Yes	Yes	11

Priority Climate Action Plan for the Portland-Vancouver MSA (EPA Grant # 02J36101)

Category	Measure	Readiness	Quantifiable	GHG reductions	Cost effectiveness	Scalability	Aligned w/ feedback	Health	Safety	Air quality	Resilience	Quality Jobs	Total score
7. Support community-wide adoption of renewable electricity	<b>7a. Implement green tariffs to fund community-wide renewable electricity usage</b> with options to opt-out and assistance for low-income residents.	Med	High	High	High	Med	Low	No	No	Yes	Yes	Yes	11
9. Expansion of anaerobic digestion and composting	<b>9b. Expand anaerobic digestion capacity</b> by investing in new facilities and/or better coordinating the use of existing facilities	High	High	Med	Med	Med	High	No	No	No	No	Yes	11
2. Fuel switching for agency operational use	<b>2a. Support the electrification of school bus and transit fleet and the installation of fast charging equipment</b>	High	High	Med	Med	Med	Med	Yes	No	Yes	Yes	No	10
5. Use technology to actively manage the transportation system	<b>5c. Implement regional congestion pricing</b>	Med	High	High	High	Med	Low	No	No	Yes	Yes	Yes	10
8. Expand food waste reduction	<b>8a. Expand food recovery and distribution programs</b> , particularly food waste reduction education programs for residential, commercial and food production sectors.	High	High	Med	Med	Med	Low	Yes	No	No	No	Yes	10

Priority Climate Action Plan for the Portland-Vancouver MSA (EPA Grant # 02J36101)

Category	Measure	Readiness	Quantifiable	GHG reductions	Cost effectiveness	Scalability	Aligned w/ feedback	Health	Safety	Air quality	Resilience	Quality Jobs	Total score
4. Make biking, walking and active transportation safe and convenient	<b>4d. Expand regional transportation demand management programs</b> (e.g., Metro Regional Travel Options program, Get There SW WA)	High	High	Med	Low	Med	Med	Yes	No	Yes	Yes	No	9
6. Improve existing building energy efficiency	<b>6b. Implement building energy scoring for commercial and residential buildings</b> , with performance targets for new construction and major renovations	High	Med	Med	Med	Med	Med	No	No	No	No	Yes	9
1. Support EV transition through charging infrastructure	<b>1a. Fund/incentivize charging in existing multifamily residential developments</b>	Med	High	Med	Med	Low	Low	No	No	Yes	Yes	Yes	8
1. Support EV transition through charging infrastructure	<b>1b. Change zoning regulations to require pre-wiring or charging at new commercial and residential developments</b>	Med	Low	Med	Med	Med	Low	No	No	Yes	Yes	Yes	7
1. Support EV transition through charging infrastructure	<b>1c. Install community charging on public land/streets</b>	Med	Med	Med	Med	Low	Low	No	No	Yes	Yes	Yes	7

Priority Climate Action Plan for the Portland-Vancouver MSA (EPA Grant # 02J36101)

Category	Measure	Readiness	Quantifiable	GHG reductions	Cost effectiveness	Scalability	Aligned w/ feedback	Health	Safety	Air quality	Resilience	Quality Jobs	Total score
3. Make transit convenient, frequent, accessible, and affordable	<b>3c. Reduce fares for people who rely on transit</b> (i.e., decrease costs of low-income fare / youth transit passes)	High	Med	Med	Low	Low	High	Yes	No	No	No	No	7
1. Support EV transition through charging infrastructure	<b>1d. Educate consumers about the benefits of electrification and alternative fuels</b>	High	Low	Low	Low	Low	Low	No	No	No	No	No	2

## Final measures

Table 24 below summarizes the finalized measures, arranged according to the priority sectors identified by EPA. The final measures are a consolidation of the initial 16 measures identified in the detailed screening process, refined through feedback from potential implementing agencies. The project team refined many measures to better reflect potential implementation measures and a few measures were ultimately excluded after internal conversations regarding feasibility.

**Table 24: Priority measures by sector**

<b>Transportation</b>
Trans-1: Implement high-capacity transit across the metropolitan area
Trans-2: Redesign streets and infrastructure to reduce delays for transit vehicles
Trans-3: Expand transit signal priority
Trans-4: Expand bicycle and pedestrian network
Trans-5: Expand use of parking pricing
Trans-6: Expand the use of clean fuels in the region's transit fleets
<b>Commercial and Residential Buildings</b>
Res-1: Expand existing residential energy efficiency retrofit programs, with a focus on low-income households
Res-2: Fund additional energy efficiency measures in publicly funded, newly constructed affordable housing units
<b>Materials and Waste Management</b>
Waste-1: Expand the availability of residential composting programs

## APPENDIX 5. ENGAGEMENT APPROACH

This engagement approach was updated December 12, 2023 and is included here in its finalized form.

### Introduction

Metro is planning to participate in and lead a series of meetings with agency and non-agency partners between December 2023 and February 2024 to inform the PCAP and to gather feedback to support agency-led grant applications.

By the time engagement for the PCAP begins, the PCAP will be well into development and the actions will have been screened to identify what may be most competitive for the region. Therefore, engagement will focus largely on getting the best information we can to support agencies with their grant applications.

These conversations will focus on:

- Reviewing the overall goals for the PCAP and subsequent CCAP funding opportunities.
- Discussing the strategies and actions that are rising to the top in the PCAP and where there's alignment with their priorities and planning efforts.
- Confirming that the strategies and actions are implementation-ready, have the appropriate level of detail and definition; and are effective in meeting the grant's goals.
- Discussing partner interests and capacity for supporting funding proposals.

### Approach

The project team will engage with local and state agencies and organizations in the Portland-Vancouver metropolitan statistical area (MSA), which includes Clackamas, Clark, Columbia, Multnomah, Skamania, Washington, and Yamhill counties.

The engagement for this effort is evolving quickly and must be responsive to supporting PCAP grant applications. PCAP engagement will be phased as such:

#### December 2023 - January 2024

Implementers and partners:

- **Agencies:** Oregon Department of Environmental Quality (DEQ), Washington Department of Ecology, Washington Department of Commerce, WSDOT, ODOT
- **Community and environmental organizations implementing climate projects:** Energy Trust of Oregon, Zero Coalition (*members include NW Energy Coalition, Climate Solutions, Community Energy Project, and The Environmental Center*), Getting There Together (*members include APANO, Verde, Hacienda CDC, Unite Oregon, and Neighbors for Clean Air, Imagine*

*Black*), Forth, Fourth Plain Forward, Ride Connection and Earth Advantage, Community Cycling Center, 1000 Friends.

- **Utilities:** Portland General Electric, Clark County Public Utilities and NW Natural
- **Other:** Community Energy Project, Clean Energy Fund, Neighbors for Clean Air, SW Clean Air

### January - February 2024

Approvers:

- **Climate policy stakeholders:** Oregon League of Conservation Voters, Oregon Environmental Council, Identity Clark County, Tualatin Soil and Water Conservation District, Columbia Land Trust, and Lake Oswego Sustainability Network.
- **Regional technical committees:** TriMet Transit Equity Advisory Committee, TPAC, RTAC, MTAC, SW Washington Regional Transportation Council, Columbia County Citizen Transportation Advisory Committee, Skamania Technical Advisory Committee, Yamhill Area Transit Advisory Committee, and Clark County Bicycle and Pedestrian Advisory Committee.
- **Community-based organizations focused on climate and equity advocacy:** Centro Cultural, REACH, Community Action of Washington County, Lake Oswego Sustainable Network, Tualatin Soil and Conservation District
- **Green workforce sector:** Worksystems, SW Washington High-Tech Council, BlueGreen Alliance, Columbia River Economic Development Council, Skamania County Economic Development Council, East Vancouver Business Association, Hispanic Chamber of Commerce, Washington County Chamber and Sustainable Northwest, C2P2.
- **Stakeholder coalitions led by Climate Partner Forum partners:** Multnomah County REACH program led by ACHIEVE Coalition, Yamhill Community Action Partnership, Rebuilding Together Washington County, and Columbia County Community Action Team.
- **Housing:** Vancouver Housing Authority, Prosper Portland, Mid-Columbia Housing Authority and Northwest Oregon Housing Authority.

### Spring/summer 2024 (CCAP Engagement)

Other regional climate and equity stakeholders: frontline community-based organizations, community sustainability networks, state and national environmental advocacy groups, and the larger public.

### Key questions

Discussion questions will be tailored for each meeting and audience, however the following set of questions will be generally discussed at each meeting.



- Do the categories of actions identified for the PCAP align with your priorities?
  - What equity considerations related to the strategies are important to your community?
  - What elements of projects in these areas would your community like to see or benefit from?
  - What fatal flaws have you seen in existing programs that prevent your community from fully benefiting from them?
- Of these actions, which seems to be the highest priority for the near-term or are implementation ready?
  - Do you have any strategies or recommendations for how specific actions would be implemented?
- Is your agency or organization interested and have capacity to assist with supporting the funding proposals?

### **Broader agency and public engagement**

The PCAP is focused on high-priority, implementation-ready GHG reduction actions that can be funded with available resources, and as a result, engagement in this phase must be focused on those who are able to lead or inform the actions considered with the PCAP.

That may mean that not all potential partners or agencies will be included in the earliest conversations regarding the PCAP actions, and yet we are committed to engaging all potential partners as early as it makes sense to ensure a successful CCAP process.

We are also committed to keeping the public informed through regular updates on the project website and through project email updates. Once the CCAP process kicks off, there will be broader public engagement opportunities.

## Full list of members for coalition engagements

### ZERO Coalition

- NW Energy Coalition
- New Buildings Institute
- Earth Advantage
- Climate Solutions
- SERA
- Portland Bureau of Planning and Sustainability
- City of Milwaukie
- City of Tigard
- Electrify Now
- Opsi Architecture
- Scott Edwards Architecture
- Green Hammer
- HARKA
- BORA Architecture and Interior
- GreenSavers
- Rooted Homes
- Community Energy Project
- Birdsmouth
- MCAT Metro Climate Action Team
- The Environmental Center
- SSIA
- Electrify
- 350 Deschutes
- Passive House Northwest
- Blue Green Alliance
- Dream Home Building and Design
- Northwest AeroBarrier
- Oregon League of Conservation Voters
- Lake Oswego Sustainability Network
- Latino Built
- Salazar Architect
- Central City Concern
- Multnomah County
- MacDonald Miller Facility Solutions
- NEEA
- Sierra Club Oregon
- Department of Environmental Quality
- Elevate Energy
- Solar Oregon
- Green Energy Institute at Lewis and Clark Law School
- City of Ashland
- City of Bend
- City of Hood River
- The Climate Reality Project
- 350 Eugene
- Fossil Free Eugene
- Portland General Electricity

## **Getting There Together**

- OPAL Environmental Justice Oregon
- Verde
- Onward Oregon
- The Street Trust
- Oregon Walks
- YWCA of Greater Portland
- Oregon Trails Coalition
- Virginia Garcia Memorial Health Center
- Safe Routes Partnership
- Participatory Budgeting Oregon
- Adelante Mujeres
- Rosewood Initiative
- East Portland Action Plan
- APANO
- Urban League of Portland
- Rivergate Transportation Advocacy Group
- St. Johns Center for Opportunity
- Center for Sustainability Economy
- Go by Bike
- Portland Forward
- Alta Planning + Design
- North by Northeast Community Health Center
- Disability Rights Oregon
- Washington County Bicycle Transportation Coalition
- Climate Solutions
- Friends of Gateway Green
- Bienestar
- Unite Oregon
- Oregon Environmental Council
- AARP in Oregon
- Urban Greenspaces Institute
- Community Cycling Center
- Welcome Home Coalition
- 1000 Friends of Oregon
- Housing Oregon
- Portland African American Leadership Forum
- No More Freeways
- Cascadia Partnership
- Lloyd EcoDistrict
- Sunrise Movement PDX
- Hacienda CDC
- Coalition of Communities of Color
- BlueGreen Alliance Oregon
- Amrapali
- YWCA Greater Portland
- Community Partner for Affordable Housing
- City Repair
- American Heart Association
- Neighbors for Clean Air

## APPENDIX 6. EQUITY PARTNER ENGAGEMENT SUMMARIES

The following is a summary of the equity partners engaged, how they were included in the process, and plans for future engagement.

### ***Equity Partner: Getting There Together***

**About:** Getting There Together (GTT) is a coalition consisting of over 50 community-based organizations that was formed in 2017 to advocate for transportation and infrastructure investments in the Portland region that reduce disparities in wealth, health, education, jobs, and access to services. Metro routinely engages Getting There Together in other plans and processes because of the collective expertise and diversity of perspectives represented on the coalition. GTT includes front-line organizations that directly serve communities as well as policy advocates, which means that it is well-positioned to make strategic recommendations about how processes like CPRG can best benefit the MSA's marginalized residents.

**PCAP Engagement:** It was a priority to include Getting There Together in the PCAP process because the coalition includes many of the groups that are most active in climate justice work around the MSA. In particular, Metro wanted to ensure that the description of equity benefits in this PCAP correctly reflected prior input from these groups.

The project team engaged Getting There Together by working directly with their partner coordinator to schedule a meeting with their membership. An online meeting was held on January 10<sup>th</sup>, 2024 that included representatives from the following organizations who are all focused on climate justice issues:

- Getting There Together Coalition
- OPAL
- Community Cycling Center
- Lloyd Eco District
- Unite Oregon
- APANO
- Adelante Mujeres
- Street Trust
- 1000 Friends of Oregon
- Verde
- Oregon Environmental Council
- Oregon Walks

Metro and project staff provided an overview of the CPRG process and timeline and reviewed the draft climate action strategies being considered for inclusion in the PCAP. The conversation included:

- Participants asked clarifying questions regarding the CPRG planning and implementation grant processes.
- Participants discussed the types of projects that might move forward to apply for implementation grants under the recommended PCAP strategies and provided feedback on how to strike a balance between maximizing equity benefits and addressing other implementation grant evaluation criteria.

**Commitment to Future Engagement:** Metro informed participants how they can learn more about what's being included in the PCAP and ways to stay involved while the plan is being developed. Metro acknowledged that this meeting would be the first of many needed conversations with this group and committed to inviting them to future meetings for the CCAP. Additionally, Metro offered to connect GTT members with implementation grant applicants so that they could explore partnering on projects that serve the communities in which they work.

### ***Clean Energy Partner: Energy Trust of Oregon***

**About:** Energy Trust of Oregon, which is a non-profit funded through utility fees, is a key partner in implementing many current programs that help people and businesses in Oregon and Washington reduce their energy use and access renewable energy – including the many programs discussed above that focus on serving marginalized communities.

**PCAP Engagement:** It was a priority to include Energy Trust of Oregon in the PCAP process because of their experience administering clean energy and energy efficiency programs that serve marginalized communities in the MSA. This means that Energy Trust is well-positioned to identify opportunities to expand these programs to benefit more people using CPRG implementation grants and other resources.

Metro and its consultants engaged Energy Trust of Oregon through an online meeting on January 4, 2024. Metro and project staff provided an overview of the EPA CPRG process and reviewed the draft PCAP action screening process and results. Participants discussed existing programs, opportunities to scale up or supplement existing services, equity considerations, partnerships, and data availability.

Conversation takeaways:

- Existing programs are limited as they often do not fund the basic repairs that older buildings often need before they can receive energy efficiency upgrades. This is a gap in service that CPRG funds could support.
- It has been difficult to engage with residents of unregulated multifamily dwellings.
- Using consumption reports from utilities can help identify broadly the areas that may benefit from upgrades, but those data cannot be used for targeted outreach.

- The best way to reach communities that need the upgrades the most is through community-based organizations (CBOs), but there are communities without dedicated CBOs, while CBOs in other communities are overwhelmed with partnership requests.

**Commitment to Future Engagement:** Metro informed participants how they can learn more about what's being included in the PCAP and ways to stay involved while the plan is being developed. Metro committed to inviting them to future meetings for the CCAP and provided their contact information and encouraged further conversations with all participants about ways to tie the grants to their priorities.

***Clean Energy Workforce: Worksystems, Inc.***

**About:** Worksystems is a non-profit that develops policies, programs and services that are delivered through a network of local partners to help people get the skills, training and education they need to go to work or to advance in their careers.

**PCAP Engagement:** It was a priority to engage Worksystems in the PCAP process because as the PCAP was being developed, Worksystems was engaged in a parallel workforce analysis that helps to define the clean energy sector and identify strategies to build skills and capacity within the clean energy workforce, with a focus on supporting minority-owned businesses.

Metro and its consultants engaged the Clean Energy Sector Lead on the Business Services Team at Worksystems online on January 11, 2024. Worksystems provided an overview of their Clean Energy Workforce Program. Metro provided an overview of CPRG and the climate action strategies being considered for inclusion in the PCAP. The group discussed workforce analysis needs for the CPRG process and how Worksystems could support the process and opportunities for partnership.

The following summarizes the key takeaways from the meeting:

- Worksystems has a workforce analysis draft coming up in May or June of 2024 and can share it with Metro to help inform the workforce analysis under the CCAP.
- Clean energy workforce needs are hard to anticipate as it is intersectional and each sector is transitioning at different stages.
- The contracting process with small and minority-owned businesses continues to be a hurdle to enter the clean energy work market.
- Implementing the Regional Workforce Equity Framework on any future projects that implement the strategies in the PCAP ensures that those projects provide meaningful career advancement opportunities for marginalized workers.
- Even with the Workforce Equity Framework in place, implementation projects do not provide these opportunities unless small and minority-owned businesses are aware of upcoming contracts and prepared to bid. Worksystems can help spread awareness of contracting opportunities among these businesses if agencies notify them in advance that these opportunities are coming.

**Commitment to Future Engagement:** Metro informed Worksystems how they can learn more about what's being included in the PCAP and ways to stay involved while the plan is being developed. Metro committed to inviting them to future meetings for the CCAP and provided their contact information and encouraged further conversations with all participants about ways to tie the grants to their priorities.



## Appendix B

Technical Methodologies,  
Calculations, & Assumptions

## Washington County Technical Appendix

### *GHG Reduction Estimate Method*

As an implementation application under the Oregon Metro region PCAP, Washington County Oregon estimated GHG reductions for this application using the same methods and data that were used to estimate the benefits of Measure Res-2 in the Oregon Metro and Portland-Vancouver MSA's PCAP. The scope of implementation is updated to reflect scope specific details from this application. Washington County's method is described below and draws on methodology from Metro's application and PCAP.

1. Estimating the average reduction in energy use and greenhouse gas emissions that funding for energy efficiency measures would achieve.
2. Applying average reductions to the average GHG emissions for single family and multifamily units using emission factors specific to each of the three counties within the applications geographic scope.
3. Scaling the benefits on assumptions of the number of multifamily and single family units upgraded in each county.

### *Measure Implementation Assumptions*

The following implementation assumptions are used in project scope calculations

#### Number of units impacted by the project (Calculator Table 13.)

- Washington County - 264 Single Family 180 MultiFamily
- Clackamas County- 145 Single Family
- Clark County- 318 MultiFamily

#### Assumed rate of implementation (Calculator Table 13.)

The scope of work includes energy efficiency upgrades to units in all three counties described. Each of the project partners will be identifying contractors to perform work in line with local requirements. This implementation style will allow for work to be completed in parallel. The assumed timeline for the five year requirement includes, one year of planning, three years of implementation in which 33% of the scope will be completed in each year, and one year for any remaining projects to be finalized.

#### Lifetime of Project Scope

Based on building age and the equipment proposed in the scope of work, the estimated lifetime for the project is 15 years.

## *GHG Reduction Estimate and Assumption*

### Fuel Type and Household Energy Consumption

This application draws on the regional average household energy consumption provided in the Metro PCAP. Metro's data for residential energy consumption by fuel type was shared for the purposes of this application and was gathered from regional utilities. This information is provided on a per single family and per multifamily basis. Estimates are shown in Table 14. Basic estimates include 7124.91 kWh and 258.78 therms per single family household and 2840.27 and 126.34 therms per multifamily household.

### Emission Factors

Emission factors for natural gas combustion came from the EPA Emissions Factors Hub assuming IPCC AR5 global warming potential values for carbon dioxide equivalence. Electricity emission factors however, were market based calculations on a county level provided through the Metro PCAP and GHG Inventory. The market based calculations consider the relative emission factors of each electric utility in the county. All emission factors are included in Table 14. of the GHG calculator.

### Reference Case Scenario

The business as usual case for the scope of this application assumes that the publicly owned housing units described will receive upgrades as traditional funding mechanisms allow. Publicly owned housing does not receive funding through typical housing channels and is often lacking in high energy efficiency measures. The publicly owned housing units described will continue to operate and produce emissions at a likely higher rate than the conservative average estimates described in this application. If units receive upgrades they will be to minimum standards while the upgrades in the application describe more high quality and energy efficient upgrades. This also implies that the utility paying residents of these dwellings will continue to pay a higher than average cost for energy utilities.

### *Measure Specific Activity Data*

Energy savings are assumed to total 40% when all upgrades have been applied. The following upgrades contribute to the assumed reduction.

- Natural Gas Furnace to 22 SEER2 Ducted Heat Pump
- Electric Furnace to 22 SEER2 Ducted Heat Pump
- Zonal Electric Heat to 22 SEER2 Ducted Heat Pump
- Gas & Electric water heater to UEF 3.0 Heat Pump Water Heater
- Building Envelope Sealing and attic Insulation to R-49

- Windows upgraded to a U value of 22 and Solar Heat Gain Coefficient of less than .5
- Refrigerators and clothes dryers upgraded to energy star models, replacement of gas stoves with electric
- 2-3 Trees Planted at most properties

In addition to the energy efficiency component of the savings, it is assumed that natural gas space and water heating will be converted to electricity. When these activities are considered the following reductions are estimated: 10,278,404 kWh and 454,640 therms.

### *GHG Emissions Reduced*

As identified in previous sections GHG reductions were calculated by first utilizing regional average values for single family home and multi family home annual energy consumptions. Emission factors were generated using a market based approach for each county and natural gas emission factors were taken from EPA standard values. A 40% overall energy reduction is assumed for the total impact of the energy efficiency upgrades proposed in this application. These values were scaled to the level of the project scope and applied to the 2030 and 2050 timelines identified in the application requirements.

## Appendix C

### Washington County Staff Resumes

## Molly C. Rogers

2939 NW Raleigh Street, Portland, OR 97210

503-502-9052 - [mollyrogers2@gmail.com](mailto:mollyrogers2@gmail.com)

### **PROFESSIONAL EXPERIENCE**

**7/29/22 – Present: City of Portland Housing Bureau, *Interim Director***

**1/22/19 – 7/28/22: City of Portland Housing Bureau, *Deputy Director***

- Executive leader of the Portland Housing Bureau (PHB), a \$300M annual budget and 80+ FTE organization, whose mission is to solve the unmet housing needs for underserved Portlanders. Lead the planning for and implementation of PHB's key strategic priorities—voter-approved Portland's Housing Bond (\$258M), Portland's share of the first regional voter-approved Metro Housing Bond (\$211M), and the integration of Supportive Housing (\$100M annually for County). Within four years of my tenure, PHB fully committed the Portland Housing Bond in 15 projects or 1,859 units (goal was 1,300), allocated Metro Bonds in 20 projects or 1,541 units (1475 was goal), and added 1,390 Supportive Housing units to pipeline, leveraging Federal, State and local sources.
- Represent the PHB to the public, elected officials, other bureaus, jurisdictions, committees, community groups, and organizations. Negotiate Intergovernmental Agreements with local and regional government entities, including Prosper Portland, the Joint Office of Homeless Services, and Metro for housing bond and services integration.
- Responsible for the timely processing of grant and loan applications, contract and Intergovernmental Agreement executions, and compliance with statutory and regulatory requirements, as well as HUD guidelines for the housing production and neighborhood preservation arms of the agency, from goal setting, resource mobilization, and Consolidated Plan alignment through implementation. Funding sources include CDBG, HOME, HOME ARP, APRA, Construction Excise Tax, Short Term Rental Fees, General Obligation Bonds, and Tax Increment Financing.
- Supervise the Production, Preservation, Policy and Planning, Communications, Supportive Housing, and Homeownership Teams (9 direct reports, 36 indirect); establish team objectives and work planning; set personal development targets for staff, including coaching, training, and performance management. Ensure coordination and integration of PHB's policies, production and programs.

**5/3/11 – 1/16/19: Home Forward (Housing Authority of Portland), *Director of Asset Management and Housing Policy***

- Responsible for the high-level, strategic direction of Oregon's largest affordable housing portfolio of over 6,500+ units within 100+ properties of Affordable Housing, Public Housing, Low Income Housing Tax Credits, Section 8, and commercial assets, valued at \$900M in 2019.
- Directed and approved \$75M in annual operating budgets from over 100 affordable housing, public housing and commercial properties, which supported 250 FTEs, \$10M in economic opportunity for construction companies, and over 10,000 residents. Made strategic recommendations on acquisitions, dispositions, capital planning, cash flow, resident services, debt financing, property management, financial reporting and analysis, and all other issues related to long-term viability and sustainability. Ensured compliance with all applicable Federal, State and local laws, regulations and policies.
- Co-led Public Housing Preservation initiative, converting 2,400 public housing apartments to Section 8 RAD platform and recapitalizing its physical condition using multiple Limited Partnerships and LIHTCs, bringing in millions in additional Federal, State and local resources. Advanced housing policies across departments while serving as the Home Forward representative on various state, regional and local policy committees and legislative initiatives. Housing Alliance co-lead of HB 2002 advancing preservation resources and policies through the Oregon legislature.
- As a manager of 7 direct reports, Increased portfolio annual cash flow from \$2.5M to 9M and secured millions in competitive local and state preservation resources.

**2/21/06 – 5/2/11: Housing Development Center, Portland, OR, Asset Management Director**

- Designed and launched the award-winning Asset Management and Portfolio Preservation (AMPP) 18-month curriculum, from which dozens of Oregon and Washington nonprofits graduated and significantly improved their regulated affordable housing portfolios to better meet mission and financial goals.
- Awarded HUD technical assistance contract from Community Development and Planning; became HOME certified to conduct HOME and HUD technical assistance and trainings for affordable housing developers and owners. Consulted with and provided technical assistance to dozens of housing clients in the western region of the U.S., including Washington, Idaho, Colorado and Oregon, to restructure or rehabilitate non-performing properties, improve systems, train staff and boards, and augment capacity in asset management. Captured millions in grants for non-profit and clients to preserve 25 properties and three portfolios, including King County and the State of Washington.
- Led the Streamlining Compliance in Oregon Initiative, presented on a national panel between USDA RD, HUD and the IRS, and garnered federal recognition from HUD. Negotiated a multi-party agreement between State of Oregon, the Oregon Participating Jurisdictions and lenders to share inspection, tenant and financial reports to reduce the administrative burden and resident impact of multiple funders monitoring projects.
- As part of the Executive team, managed a team of four, an operating budget of \$500,000, and over 30 contracts, ensuring grants management for each one.

**1/20/03 – 4/21/06: City of Portland Bureau of Housing and Community Development, Program Manager and Analyst**

- Managed the implementation of a regional Homeless Management Information System (HMIS), a web-based client tracking system for agencies located across four Participating Jurisdictions and 50 service agencies. Administered a housing first program, facilitated an oversight body of service and housing providers, and implemented a guarantee fund.
- Negotiated common evaluation and outcome measures across four jurisdictions and determined program efficacy and best practices through performance measures for homeless programs.
- Wrote major portions of the City's 10-year Plan to End Homelessness, the McKinney Continuum of Care, and other federal applications that brought millions in grants to local non-profit organizations. Analyzed data for funding allocations, program outcomes and program improvements for homeless programs in Portland.

**9/01 – 9/02 City of New York Department of Homeless Services, New York, NY**  
*Rental Assistance Program Manager*

**9/00 – 9/01 Alliance for Community Enhancement, New York, NY**  
*First Executive Director of nonprofit subsidiary of Columbia University*

**EDUCATION**

**1999-2001 Columbia University School of International and Public Affairs (SIPA), NY**  
*Master of Public Administration, Concentration in Community Development and Advanced Quantitative Techniques, May 2001*

**1993-1996 Macalester College, St. Paul, MN**  
*Bachelor of Arts in Anthropology and Sociology, May 1996*

**1992-1993 Santa Clara University, CA**

**AWARDS/CERTIFICATES**

<b>2015</b>	Portland Business Journal's 40 Under Forty Honorable Mention
<b>2010</b>	HOME certified trainer from HUD
<b>2009</b>	NeighborWorks approved consultant
<b>2009</b>	Certified Housing Asset Manager (CHAM®) designation from Enterprise, LISC, and NeighborWorks
<b>2006</b>	Washington Mutual, Property and Asset Management Best Practices Award
<b>2001</b>	Recipient of 'Voice of Conscience' Award from Columbia University SIPA
<b>2000</b>	Selected as an Emerging Leader from the National Congress for Community Economic Development
<b>1997</b>	University of St. Thomas, Mini MBA Certificate for Non-Profit Management
<b>1996</b>	Macalester College, Jane Addams Award and Outstanding Senior Award for Applied Sociology

**COMMUNITY ACTIVITIES (2005-2023)**

- Chair of PHB's Housing Investment Committee
- Commissioner, Portland Housing Advisory Committee
- President, New Columbia Homeowners Association
- President, Housing Development Center Board of Directors
- Co-Chair, Oregon Housing Alliance Preservation Workgroup
- Member, Oregon Housing Authority Association
- Member, PHB's Mandatory Relocation Assistance Committee
- President, Center Commons Homeowners Association
- Board Member, Association of Oregon Community Development Corporations
- State Policy Council Member, Oregon Opportunity Network
- Advisory Committee Member, Willamette-Columbia United Way



**JILL T. CHEN**  
408 NW Rainier Terrace  
Portland, OR 97210, USA  
+1.503.799.2586 (mobile)  
[jilltchen@gmail.com](mailto:jilltchen@gmail.com)

Experienced strategist and implementor with 25+ years of success in governments, non-profits and for-profits, executing complex programs through public-private-philanthropic partnerships. Established manager with proven track record of change management, collaboration, and implementation. Leader in affordable housing and homelessness, place-making property redevelopment, financial inclusion, and economic development. Deep understanding and relationships with government institutions/ bureaus, housing and homeless advocates, affordable housing owners, funders and investors, resident/supportive service providers, and community stakeholders.

**HOUSING AUTHORITY OF WASHINGTON COUNTY / DEPT. OF HOUSING SERVICES** Hillsboro, OR  
**Assistant Director, Housing Services** 2024-Current

Provide strategic leadership and manage the teams responsible for real estate development and asset management, provision of federal and local rental assistance, and housing policy and planning. Overall, the teams consist over 60 staff.

Oversee daily operations of the housing team with planning, budgeting, implementation, and coordination within the agency and across its partners including federal, state, regional and local agencies. Provide integration across the housing and homeless spectrum with innovative solutions, developing new partnerships and leveraging new sources of funding.

**PORTLAND HOUSING BUREAU (PHB)** Portland, OR  
**Housing Investment & Portfolio Preservation (HIPP) Manager** 2018-2024

Currently member of PHB leadership team, developing Portland's Housing Production Strategy in conjunction with other bureaus using City resources and levers to optimize housing development across the income spectrum in-line with the City's priorities, strategies and policies.

Manage the City's investments in multifamily, affordable housing production for rental and home ownership, including goals under the ***\$258 million Portland Housing Bonds, on track to exceed targets by 43%***, and the City's \$211 million allocation under the ***Metro Housing Bonds, on track to deliver all commitments with over \$50 million remaining***, as well as Federal CDBG and HOME and local TIF and CET. Work closely with elected officials, oversight committees, housing developers/owners and service providers to expand affordable housing and services.

- **Management & Leadership:** Enabled a doubling of affordable housing production with minor increase in staffing by rebuilding team, streamlining processes and documentation, removing obstacles, developing partnerships and effectuating reasoned decision-making. Managing pipeline of 40+ projects in predevelopment, construction and lease-up using over \$400 million in PHB funds covering 4000+ new affordable units including 900+ PSH units, costs totaling over \$1.5 billion.
- **Relationships:** Partner across city, county, Metro, state and federal agencies/bureaus for policy and funding alignment. Collaborate with Joint Office of Homeless Services and Home Forward in the planning, development and lease-up of newly created PSH by removing barriers and aligning

processes. Develop opportunities for innovative solutions and partnerships with developers, OHCS, HUD, Metro, other agencies and commercial lenders and investors.

- **Communications:** Represent PHB in public forums and community meetings with housing stakeholders, government officials and partner agencies. Shape and lead the dialogue on key issues affecting affordable housing such as private activity bonds, low-income housing tax credits, preservation, indirect incentives, and code/policies affecting housing development. Present to PHB and Metro oversight and advisory committees, Housing Oregon, Oregon Housing Alliance, Preservation Working Group and Central City TIF Exploration Group. Ensure timely and effective communications of programmatic information, new opportunities, new policies, and guidelines.
- **Initiatives & Innovation:** Identify new strategies, government levers and funding opportunities to address housing crisis and develop pilot initiatives. Lead on initiatives related to ARPA, acquisitions and real estate development, and housing production. Structured \$60 million facility with Portland Clean Energy Fund and expanding its use into rehabilitation. Initiated and leveraging Congressional Directed Spending earmarks for affordable housing. Negotiating increased Metro PSH funds and Multnomah County general funds for last gap solutions. Review and advise proposed legislative and code changes affecting housing development and homelessness.
- **Diversity, Equity & Inclusion:** Developed requirements for projects' equity narratives for all solicitations to focus on developer's equity practices, outreach to communities of color, role of culturally specific development partners, provision of culturally appropriate services, and equity in contracting targets. Update and pilot financing products to meet needs of smaller, culturally specific developers. Raised the PHB's Equity in Contracting (DMWESB) targets to 30% for construction and established soft costs target of 20%.

**PORTLAND HOUSING BUREAU (PHB)**  
**Housing Portfolio Finance Coordinator**

Portland, OR  
2016-8

Manage key programs and projects for PHB in the development and rehabilitation of affordable, multifamily rental and home ownership projects. Managed the Risk Management Pool which mitigated unforeseen affordable housing owners' risks associated with PSH. Coordinated PHB funding solicitations for the 2017 Fast Starts and 2018 PSH solicitation. Collaborate and work with other agencies and partners in the development of multi-jurisdictional projects such as the SW Corridor Equitable Housing Strategy. Team representative in PHB's Equity Council and development of PHB Racial Equity Roadmap.

Representative Projects: First Portland Housing Bond transaction, the Ellington, a \$47 million acquisition which converted to an integrated PSH project; financed the Louisa Flowers, the largest high-rise affordable housing project consisting of 240-unit in the Convention Center; financed Kilpatrick/Kenton, a 30-unit condo, for-sale to previously displaced low-income residents under Portland's N/NE Preference Policy.

**PORTLAND DEVELOPMENT COMMISSION (CURRENTLY PROSPER PORTLAND)**  
**Lending & Investment Manager**

Portland, OR  
2014-6

Provided overall direction for PDC's loan and investment programs and led newly created underwriting team. Developed strategies that leverage the City's resources as "gap" financier. Developed new products and consolidated different programs for financing real estate development projects and business expansion opportunities with a focus on quantifying public benefits while upholding PDC sustainability. Responsible

for relationship development, due diligence, and asset management. Partnered with other City bureaus, federal agencies, and commercial and philanthropic funders. Key projects included:

- ***Small Businesses/Start-Ups***: expanded and leveraged use of EDA Federal funds to focus on unbankable, start-ups and growing small businesses, mitigated risks through tailored program.
- ***Mini Micro Loans***: in collaboration with MESO and technical assistance providers developed a credit-builder loan program of \$100-\$2500 for low-income entrepreneurs.
- ***Lents Revitalization***: led PDC financial support that optimized public benefits and leveraged public and private resources, grants, tax credits and transit-oriented funds for four transformative redevelopments in low-income neighborhood.
- ***Neighborhood Prosperity Initiative Opportunity Fund***: structured property acquisition of Sugar Shack, a strip club, by three non-profits that demonstrated proof-of-concept and led to the creation of a community-led, property acquisition financing with structured milestones.

Represented PDC in conferences, seminars, and meetings. Selected to join PDC's Equity Council and Operations Steering Committee and participated in the City's Cooperative Leadership Institute.

**GRAMEEN FOUNDATION USA**  
**Senior Program Advisor, Capital Markets & China**  
**Director, Capital Markets**

Washington, DC  
2007-13

Leveraged Grameen resources in social enterprises to scale impact and advance charitable mission. Mentor and train regional teams for business development, project selection, due diligence, negotiations, risk mitigation and portfolio monitoring. Lead restructurings and workouts on longstanding legacy investments.

As Director, led investment strategy and managed team of eight plus a dozen staff/volunteers across US, Asia, Sub Saharan Africa, and Latin America. Proven track record with:

- ***Growth Guarantees***: Expanded guarantees to \$35 million with unique USAID "umbrella". Each dollar guarantee leveraged over 3x in loans, totaling over \$250 million in funding over program life.
- ***Fairtrade Access Fund***: Initiated debt fund for Fair Trade certified coops and smallholder farmers with technical assistance through mobile apps. Built internal and external interest to pursue fund.
- ***Pioneer Fund***: Oversaw launch of \$7 million proprietary capital for convertibles, debt and equity for early-stage enterprises using innovation and technology to reach rural poor.
- ***China Program***: Developed strategy for China. Managed relationships with partners. Pioneered novel, forward-donation contracts to recycle grant funds. Designed curriculum and trained microfinance CEOs & CFOs in creating investible business plans.

Responsible for overall department performance including program development, fundraising, marketing and communications, impact assessment and portfolio management. Managed relationships with Board, joint venture partners, co-investors, donors, and external/internal stakeholders.

**ABN AMRO BANK N.V.**  
**Director & Group Vice President, Cross Border Structured Finance**  
**Vice President, Project Finance**

Chicago, IL  
2000-2004  
1998-2000

Worked with local and global sponsors, public-private partnerships, development finance institutions, government officials and investors. Partners included OPIC, EXIM and Export Credit Agencies. Arranged and raised over \$1 billion in financing which generated over \$10 million in income and fees.

- Financed infrastructure, transportation, oil extraction/refining and tourism projects in Indonesia, Jamaica, Thailand, Pakistan, Turkey, Cameroon, India, and other emerging markets.
- Managed \$500+ million portfolio of loans and agented deals; trained junior staff.
- Structured and mitigated country and credit risks for emerging market investments and trade.
- Resolved structural and legal issues, negotiated sponsors' scope, arranged 3<sup>rd</sup> party guarantees and credit support, reviewed documentation and syndicated/marketed transactions.
- Created innovative financing structures, such as the \$80 million Pakistan Trade Enhancement Facility with IFC, which was replicated and evolved into IFC's \$3+ billion Global Trade Finance Program.

**Vice President, Project Finance**

Hong Kong, 1997-8

Led newly created team of three that developed and expanded energy and infrastructure transactions in China including the first Build, Operate and Transfer power project. Led due diligence, credit approvals and negotiations of \$50+ million in direct loans for market-leading transactions.

**INTERNATIONAL FINANCE CORPORATION / WORLD BANK GROUP  
Investment Officer**

Beijing, 1996-7  
Washington, DC, 1992-6

Structured limited recourse loans and direct equity investments in East Asia. Worked in automotive, electronics, pulp/paper, food processing and building materials sectors.

- Developed projects with sponsors, reviewed proposals and marketed IFC business services.
- Led project appraisal, financial analysis, transaction structuring and term sheet negotiations.
- Coordinated engineering, legal, environmental, and social due diligence, credit and Board approvals, syndication, project documentation, and satisfactory conditions of drawdown.
- Managed sale of select listed and unlisted Korean equities to generate maximum capital gains.
- Trained two new Chinese Investment Officers in Washington, DC. Developed due diligence materials and trained four staff in Beijing. First IFC Investment Officer stationed in China.

**PEPSI COLA INTERNATIONAL / PEPSICO WORLD TRADE  
Manager, Finance**

Somers, NY  
1990-92

Managed Finance and Administration of structured countertrade and barter transactions. Five direct reports. Countertrade businesses in agriculture, commodities and processed foodstuff totaled over \$100 million in annual turnover from Mexico, China, India, Tanzania, and other countries.

**DELOITTE & TOUCHE, Management Consulting  
Senior Consultant  
Associate Consultant**

New York, NY  
1989-90  
1987-89

Focused on Corporate Finance and Business Strategy for airlines, general manufacturing, grocery chains and financial institutions. Worked in leveraged/management buyouts and mergers and acquisitions.

## EDUCATION

### UNIVERSITY OF PENNSYLVANIA, THE WHARTON SCHOOL

**MBA**, major in Finance and concentration in Strategic Planning

**Wharton Public Policy Fellow**

Philadelphia, PA

May, 1987

Summer, 1986

### DUKE UNIVERSITY

**BA**, Honors, dual major in Political Science and Comparative Area Studies

Durham, NC

May, 1983

## ADDITIONAL INFORMATION

**COMMUNITY ACTIVITIES:** - Executive Committee, Finance Committee Chair, Strategic Planning Committee, **Micro Enterprise Services of Oregon (MESO)** focused on empowering and financing underserved minority and female microentrepreneurs  
- Advisory Board, Center for Real Estate, **Portland State University**  
- Occasional Lecturer, Affordable Housing, PSU  
- Former Board member, Executive Committee & Treasurer, **Lan Su Garden**, a classical Ming Chinese garden and cultural hub

**OTHER:** Mandarin Chinese, fluent

# Adriana Morán Sifre

| Cell: 503-443-5550 | Email: [adrianamoran18@gmail.com](mailto:adrianamoran18@gmail.com)

## **SUMMARY**

Polished bi-lingual Washington County Interim Asset Manager with extensive knowledge of Low Rent Public Housing Program's regulations, policies, procedures, and maintenance operations. Experience in property management, records, compliance; well informed and up to date on federal, state, and local landlord/tenant laws. The Housing Asset Manager directs, monitors and oversees the physical, fiscal and regulatory operations of Housing Services' Affordable and Public Housing assets; supervises property managers; oversees management agents and service providers; coordinates and monitors on-site inspections, files audits and housing asset development reports; compiles and assists in development of the public housing and affordable housing operating budgets; compiles, analyzes and presents data and reports; and verifies compliance with financing obligations. Dynamic, self-directed, team-player with experience leading, coordinating, collaborating, and contributing to Washington County Housing teams. Strong oral & written communication skills, and effective advocate for equity and inclusion practices in public service.

## **PROFESSIONAL EXPERIENCE**

### **Interim Asset Manager**

**3/2024 - Present**

#### **Washington County Government, Hillsboro, OR**

- Diligently monitor, coordinate, and oversee the physical, fiscal, and regulatory operations of DHS's housing assets and properties. This includes on sight inspections, negotiating leases, compiling operating budgets, and conducting audits.
- Manage and assist in the analysis of real estate assets to determine immediate, short term and long-term capital needs to preserve the assets.
- Oversee on-site property inspections to evaluate the physical condition and results of property maintenance activities; identifies and resolves deficiencies according to Department of Housing Services (DHS) and Housing and Urban Development (HUD) policy guidelines; schedules and oversees capital improvement or maintenance requirements.
- Manage the selection of external program and project personnel, including technical and financial consultants. Manage the preparation of Requests for Quotes, Requests for Proposals and procurement of consultant and financing services related to housing development. Manage and administers consultant and financing contracts.
- Assist in creating a positive and supportive work environment; enforce a safe workplace; establish a culture of teamwork and communication; creates a workplace that promotes the organizational values of workplace diversity, equity, and inclusion; and actively promotes an environment respectful of living and working in a multicultural society.
- Monitor, interpret and implement changes in regulatory requirements for funding programs; prepare and submit annual compliance reports, contracts, and related documentation; assess assigned properties' liability, risk and exposure and coordinates with appropriate DHS staff to determine whether properties have adequate insurance coverage.
- Apply an extensive knowledge of Landlord/Tenant Law, Fair Housing Regulations, and Real Estate Brokerage to solve complex operational problems.

- Ensure DHS staff members are trained on Landlord & Tenant Laws; manages the grievance process according to regulations; collaborates with police and neighborhoods to resolve community issues and promote good neighbor status.
- Review monthly reports and financial statements for each property; analyze performance against annual operating budget; reviews monthly reports and financial statements for compliance with bond indenture requirements, tax credit requirements and economic performance; report noncompliance when it occurs; recommend and initiate operational changes to meet performance projections.
- Manage the public housing portfolio including all staff, capital fund reporting, communication with HUD and all other related reports and duties essential to remaining in compliance with HUD regulations regarding the public housing programs.
- Represents DHS in public forums, board meetings, housing advisory committee meetings, and in court-related issues involving lease violations.

**Occupancy Specialist II, Housing Authority of Washington County  
Washington County Government, Hillsboro, OR**

**2/2019 – 3/2024**

- Effective Administration of Federal Housing Program Policies, Procedures and Operational Practices: Experience in coordinating, and administering federal/state housing programs including Low Rent Public Housing, Specialty Housing, Transitional Housing and Family Self Sufficiency Program. Trained to conduct inspections, interviews, rent and utility calculations. Maintains rapport with Program participants, staff, landlords, vendors, neighbors, community members and other associated stakeholders.
- Operations, Asset and Case Management: Schedules and conducts annual and interim redeterminations of eligibility following established guidelines and procedures. Reviews and reconciles payment schedules, ledgers, and other financial documents. Manages program specific databases. Organized coordinator with experience evaluating & reporting, leading, and training customer service teams, supporting organizational goals.
- Bi-Lingual Washington County Government Interpersonal Skills: Supportive, inclusive, and respectful communicator with cool demeanor under pressure. High-volume call experience assisting employees and the public with continued occupancy policies, codes, and process inquiries.
- Proven experience establishing goals and objectives for providing advanced level support to residents and staff using Word, Excel, and County business platforms such as Yardi, Permits Plus, Accela & Granicus. Prepares complex documents and forms; creates edits & proofreads forms, memos & reports.

**Administrative Assistant II, Washington County HHS, Solid Waste & Recycling  
Washington County Government, Hillsboro, OR**

**12/2016- 2/2019**

- Provided information accurate to employees & the public related to code compliance with rules, regulations & functions.
- Effectively partnered with other departments & and all levels of organization. Implemented file, index, archiving & record keeping systems.
- Processed & prepared a variety of Court documents according to established procedures or statutes.
- Received quarterly payments from all haulers in Washington County.

- Examined & resolved errors following agency procedure on reports, forms, payments, and other material.
- Managed complaints received by the public, referring them to the appropriate staff if needed.

#### **Head Cashier/ Customer Service Team Lead**

**Lowe's, Hillsboro, OR**

**5/2013- 11/2016**

- Management of store customer service desk, staff coordination & scheduling.
- Independent responsibility for execution of store opening and closing procedures.
- Training & mentoring- Customer Service Associates
- Supervised team of 10 front end staff.

#### **EDUCATION**

**B.A. Mayor in Arts with a in Minor Criminal Justice (Criminal Investigation) - June 2003**

Interamerican University of Puerto Rico, Guayama

#### **CERTIFICATES**

**Public Housing Manager – Dec 2022**

#### **COMMITTEES**

**Project Champions Team – 2022 to present.** *The purpose of the Project Champion Team (PCT) is to advise and support mobilization of equity work within the Department of Housing Services, which is tasked by Washington County to:*

- *Partner with the Office of Equity on best practices*
- *Innovate and test models that could be scaled out to other County departments.*



# ***LESLIE L. BARKER JOHNSTONE***

*Tel. (503)789-7477, Email: Pinkie7@Gmail.com*

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## **SKILLS**

### **Computer/Software**

Microsoft Suite  
Paycom  
UKG Ready  
Yardi  
AMSI  
One Site  
AppFolio  
Builder Trend  
SiteLink

### **Marketing**

Internet Advertising (ILS)  
Content Creation  
Branding  
Leasing  
Resident Retention  
Resident Communications  
Market Surveys  
Sign Design

### **Financial**

Budgeting/Forecasting  
Vendor Setup  
Financial Reporting  
Capital Improvement Planning  
Ledger Audits

### **Operations**

Adaptable  
Adheres to Policy  
Recruiting/Hiring  
Staff Training  
Employee Evaluations  
Team Building  
Motivation of Staff  
Swift Problem Resolution  
Client Communications  
Excellent Written and Oral Communications  
Requests For Proposal  
Clear Expectations  
Maintenance Management  
Conflict Resolution  
Crisis Management  
Bidding Process/Scope  
Creation of Policies

### **Multifamily Properties**

Conventional Housing  
HOA  
Affordable Housing:

- LIHTC
- HOME
- Rural Development
- HUD
- Section 8 Voucher

Commercial Rentals  
Landlord-Tenant Law (Oregon primarily)  
Property Inspections  
New Property Setup  
Capital Improvement Oversight

## **EDUCATION**

### **UNIVERSITY OF PORTLAND**

*Bachelor of Science*

Secondary Education with Language Arts endorsement

## **WORK EXPERIENCE**

### **HT INVESTMENT PROPERTIES/CREATIONS NW, 2/2023-11/2023**

#### *Portfolio Manager*

- Supervise the operations of 10 rental properties, 2 storage facilities, and 2 commercial buildings in Oregon for private developer/builder/owner
- Create and implement policies for growing company
- Cover vacant Human Resources and Marketing positions until filled

### **PRINCETON PROPERTY MANAGEMENT, 2005-2023**

#### *Portfolio Manager, Shareholder*

- Supervise the operations, marketing, financial performance, maintenance, and staffing of up to 22 rental properties covering Portland/Vancouver, Willamette Valley, Coastal region, Central and Eastern Oregon
- Prepare and present annual supplemental training classes for all employees
- Reposition troubled properties within 12-18 months to remove them from lender watch lists while increasing market value by \$1-\$3 million dollars for sale or refinance/funding of capital improvements

### **GUARDIAN MANAGEMENT, 1999-2005**

#### *Community Manager, Transition Specialist, Compliance Director, Trainer, Portfolio Manager*

- Community Manager of 288-unit apartment/extended stay hotel community. with staff of 19 while Increasing net operating income by \$66,000 per month and maintaining overall occupancy average of 96%
- Performed Transition Specialist duties including on-boarding of new communities and staff from Salem, OR to Bellingham, WA
- Supervise affordable housing compliance staff of four, working in LIHTC, RD, HUD, HOME, and BOND housing programs while performing as corporate trainer for all new hires (including coordination of legal forms and policies) and implementing new software roll-out of Yardi software to all communities in five states
- Portfolio Manager over various affordable housing properties throughout Central and Eastern Oregon owned by private, institutional, and non-profit clients

### **CTL MANAGEMENT, 1993-1999**

#### *Leasing Agent, Assistant Manager, Community Manager*

- Begin as Leasing Agent, and with exemplary performance, move through the ranks to Community Manager
- Practice kaizen-style methods of operations
- Train directly with Robert Randall, Sr.

### **LAKE OSWEGO SCHOOL DISTRICT, 1992-1993**

#### *Junior High Language Arts and Electives Teacher*

- Taught three periods of 7<sup>th</sup> grade Language Arts and elective courses for 7<sup>th</sup> and 8<sup>th</sup> grade in Leadership and Journalism
- Participated in the Oregon Writing Project

# Andrew Crampton

1115 SW Market #410 • Portland, OR 97201 • (503) 580-4644 • andrewcrampton7@gmail.com

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## EDUCATION

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### Master of Real Estate Development

Portland, OR

Portland State University School of Business; June 2018

### Project Management Certificate

Portland, OR

Portland State University; February 2012

### Bachelor of Science: Planning, Public Policy, and Management

Eugene, OR

- Minor in Business

University of Oregon; June 2010

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## EXPERIENCE

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### Development Manager, Housing Authority of Washington County

Hillsboro, OR

*Housing Authority of Washington County*

December 2022- Present

- Promoted in December 2022 to serve as lead on the development team of the Housing Authority of Washington County and the Washington County Department of Housing Services.
- Managing the Authority development division on acquisition, redevelopment, renovation, and pursuit of ground-up new construction opportunities.
- In addition, the Washington County Department of Housing Services is the funding entity for \$113 million in regional Housing Bonds, and we have partnered by funding 11 projects consisting of over 875 homes, served as lead for the pass-through funding of four projects.

### Development Coordinator

Hillsboro, OR

July 2020- December 2022

- Project Manager completing acquisition and conversion of 54-unit former Aloha Inn into PSH
- Project Coordinator assisting with acquisition of former Econo Lodge and conversion to shelter
- Received HOME award for 120-unit development in partnership with a community college, I provided financial pro forma, feasibility analysis and funding application for the award
- Supported four projects receiving Metro Affordable Bond funding, including writing funding application, negotiating terms of funding, and supporting project closing
- Provided due diligence feasibility analysis on new development opportunities for the Authority

### Development Services Planner

Hillsboro, OR

*City of Hillsboro Planning Department*

January 2013- Present

- Reviewed development projects and managed land use entitlement process
- Assisted with City Housing Policy, including implementation of regional Housing Bond
- Interfaced with public, developers, community groups, and partner agencies
- Presented at public hearings and community meetings

### Project Analyst

Salem, OR

*Oregon Judicial Department*

August 2010- December 2012

- Provided project coordination for Oregon eCourt technology project
- Lead informational presentations and developed coaching plans for court staff
- Communicated project progress and status reports to senior level managers and court staff

**Community Outreach Intern**

*City of Eugene Public Works Department*

Eugene, OR

May - August 2010

- Assisted with SmartTrips community outreach program

# Laura Cole Jackson

503-384-8588 lauracolejackson@gmail.com

linkedin.com/in/laura-cole-jackson

Engaged and informed advocate for sustainable development in the built environment. I bring a wide variety of experience from construction and project management, business operations, and real estate finance, to graphic design, Architecture, and client relations.

## EDUCATION

Master's of Science in Real Estate, Portland State University

Graduate Certificate in Real Estate Investment & Finance, Portland State University

Master's of Architecture, University of Oregon

Bachelor's of Fine Arts Memphis College of Art

## Selected Employment History

### Executive Director (June 2019 - Current)

#### RenovatePDX (501c-3), Oregon

- Assist low and moderate income homeowners with issues of habitability, life-safety, code compliance, and energy efficiency
- Create design solutions, identify issues of remediation, interpret building code, construction coordination, permitting processes, contract management, estimates, etc.
- Plan, fund, and execute free community events
- Oversee day-to-day operations of the nonprofit including budgets, program development, board management, website and graphics, etc.

### Research Fellow (May 2022 - Current)

#### Portland State University, Oregon

The Center for Real Estate produces a Quarterly Research Journal analyzing issues related to the Industrial, Retail, and Residential sectors. I focused my research entirely on housing production, policy, and affordability

- Collect and interpret Data as it pertains to local housing production and residential permit volume
- Research and write independent policy analysis covering regional and state issues

**Lead Designer (July 2016- February 2017)****Dyna Design-Build, Seattle, Washington**

- Managed creation of design solutions and permitting of residential projects including remodels and new construction.

**Designer (November 2014 - October 2015)****Anderson Shirley Architects, Salem Oregon**

- Assisted in the advancement of projects in various capacities and stages of development, from site documentation and drafting to design solutions, permitting, and project coordination

**Graduate Student (June 2010 - September 2014)****University of Oregon, Eugene**

- Completed the course of study focused on Architecture Design & Construction, Urban Planning, and Sustainability

**Events & Operations Manager (August 2008-June 2009)****Oregon College of Oriental Medicine, Portland**

- Planned, organized, and executed all events for the college, student body, and board
- Maintained 3 department budgets and the operations manual

**Research Fellow (July 2005- February 2006)****Architecture for Humanity, Bozeman, Montana**

- Contributed to the research, writing, and editing of the publication Design Like You Give a Damn, a survey of humanitarian architecture
- Participated in the program conception and execution for our multifaceted response to Hurricane Katrina

**SOFTWARE**

- Adobe Photoshop, Illustrator, InDesign, & Acrobat
- Microsoft Word & Excel • Sketch-up
- Auto-Cad
- Tableau
- ArcGIS
- Argus

## Appendix D

### Letters of Intent from Coalition Members



March 22, 2024

Michael S. Regan  
Administrator of the Environmental Protection Agency  
1200 Pennsylvania Avenue, N.W.  
Washington, DC 20460

Dear Administrator Regan:

The Housing Authority of the City of Vancouver ("VHA") is in full collaboration and support of the Housing Authority of Washington County's proposed Climate Pollution Reduction Grants Program application to the United States Environmental Protection Agency.

The proposed scope of work and targeted population in Washington County's application reflects our regional priorities of increasing low-income resident's access to energy efficient technologies while also increasing their financial resiliency by reducing their monthly expenses.

As a designated subrecipient and active member of this coalition, VHA fully intends to participate in the execution and implementation of the declared scope of work on our publicly owned and managed housing if granted. We recognize our role as project manager includes overseeing the proposed upgrades to our units, responsibility for contract execution with subcontractors, invoicing, reporting, and tracking the progress and associated expenses.

Our participation in this collaboration will provide VHA access to leveraged funding from the Energy Trust of Oregon which also serves Southwest Washington, Clark Public Utilities, the State of Washington's Housing Preservation Program, and Washington State University's Community Solar Expansion Program allowing VHA to scale the impact of energy efficiency upgrades within our portfolio. We will work with Washington County to facilitate the cross-state funding for this expanded scope as well by submitting documentation of product installation and associated costs. Likewise, we will comply with all efforts to document each property's energy usage before and after the improvements for tracking of actual reductions in kWh and GHG emissions.

Our Climate Pollution Reduction Grant application provides an opportunity for a regional approach to reducing greenhouse gas emissions. This unique partnership brings together three public housing authorities serving three counties in two states. Most importantly an undertaking of this magnitude will have profound impacts on the residents we serve and the greater Portland-Vancouver region. If you have any questions please feel free to reach out to VHA's Chief Real Estate Officer Victor Caesar at [vcaesar@vhausa.com](mailto:vcaesar@vhausa.com) or 360-993-9578.

Sincerely,

Andy Silver  
Chief Executive Officer

2500 Main St., Vancouver, WA 98660  
Phone (360) 694-2501 | TTY 711 | Fax (360) 993-9594  
[www.vhausa.org](http://www.vhausa.org)



March 21, 2024

Molly Rogers  
Director, Department of Housing Services  
Washington County  
Adams Crossing MS, 63 161 NW Adams Ave., Suite 2000  
Hillsboro, OR 97124

Dear Director Rogers,

The Housing Authority of Clackamas County is pleased to support the coalition application led by Washington County for an Environmental Protection Agency (EPA) Climate Pollution Reduction Implementation Grant (CPRG) to fund energy efficiency retrofits in publicly owned affordable housing units.

The Portland-Vancouver metro area has experienced skyrocketing housing costs over the last 15 years. We need to both create more affordable housing units and maintain the ones that we have in order to enable as many people as possible to take advantage of the walkable neighborhoods, high-quality transit service, and access to jobs and amenities that our metro area offers. This project, which will provide energy efficiency retrofits for 907 units of affordable housing throughout the metro area, will provide cost-effective GHG reductions while reducing monthly utility costs for members of Low-income and Disadvantaged Communities. It will allow public agencies to provide comprehensive energy efficiency improvements to many older, less-efficient homes, thereby reducing GHG and pollutant emissions as well as increasing residents' climate and economic resiliency. These updates are critical at a time when the utilities serving the region plan to increase rates by 17 percent in the near future.

The proposed scope of work and targeted population in Washington County's application reflects our priorities of increasing low-income resident's access to energy-efficient technologies while also increasing their financial resiliency by reducing their monthly expenses.

We will work with Washington County to facilitate the funding for this expanded scope as well by submitting documentation of product installation and associated costs. Likewise, we will comply with all efforts to document each property's energy usage before and after the improvements for tracking actual reductions in kWh and GHG emissions. Our participation in this collaboration also provides us access to leveraged funding from the Energy Trust of Oregon that we otherwise would not have, allowing us to expand the impact of energy efficiency upgrades to include appliances.

This opportunity provides an incredibly rare funding source for these essential, proactive upgrades allowing us to increase equity and access to the latest technology for Low-Income residents. Thank you for your consideration.

Sincerely,

*Toni Karter*

Toni Karter  
Executive Director

*Healthy Families. Strong Communities.*

## Appendix E

### Letters of Community Support



March 22, 2024

Molly Rogers  
Executive Director  
Housing Authority of Washington County  
Adams Crossing MS, 63 161 NW Adams Ave., Suite 2000  
Hillsboro, OR 97124

Dear Director Rogers,

The City of Vancouver is pleased to support the coalition application led by Washington County for an Environmental Protection Agency (EPA) Climate Pollution Reduction Implementation Grant (CPRG) to fund energy efficiency retrofits, with a focus on publicly owned affordable housing units.

As the second largest city within the Portland-Vancouver MSA, Vancouver has been a leader in Southwest Washington on carbon emission reductions. The City's climate goals, adopted in 2021, call for carbon neutrality for both municipal operations and the broader community by 2040. The MSA's Priority Climate Action Plan (PCAP) is well aligned with the Vancouver Climate Action Framework and this application would implement PCAP measure Res-1: Expand existing residential energy efficiency retrofit programs, with a focus on low-income households.

Two of the Vancouver City Council's strategic budget priorities are climate and equity, and this application truly exists at the intersection of the two. The Portland-Vancouver metro area faces a housing crisis, like many communities along the West Coast. More housing, and especially more publicly owned affordable housing, is a key instrument for providing workforce housing and preventing increased incidents of homelessness. By focusing on existing affordable housing units, this application allows those members of the Low Income and Disadvantage Communities to realize the benefits of energy efficiency retrofits through lower monthly utility costs.

This application will allow public agencies to provide comprehensive energy efficiency improvements to many older, less-efficient homes, reducing GHG and pollutant emissions and increasing residents' climate and economic resiliency. Our region continues to experience the impacts of climate change – hotter summers, colder winters, and increased exposure to wildfire smoke – and this application will ensure that our lowest income residents aren't disproportionately impacted.

Thank you for your full and fair consideration of this grant.

Sincerely,

A handwritten signature in black ink, appearing to read "Aaron Lande". The signature is fluid and cursive, with the first name "Aaron" and last name "Lande" clearly distinguishable.

Aaron Lande  
Program and Policy Development Manager



600 NE Grand Ave.  
Portland, OR 97232-2736  
oregonmetro.gov

March 22, 2024

Molly Rogers  
Executive Director  
Housing Authority of Washington County  
Adams Crossing MS, 63 161 NW Adams Ave., Suite 2000  
Hillsboro, OR 97124

Dear Director Rogers,

Metro is pleased to support the coalition application led by Washington County for an Environmental Protection Agency (EPA) Climate Pollution Reduction Implementation Grant (CPRG) to fund energy efficiency retrofits in publicly owned affordable housing units.

As the metropolitan planning organization (MPO) for greater Portland, Metro works to ensure that agencies across the region meet state and regional climate goals by reducing greenhouse gas (GHG) emissions. Metro led the development of the Priority Climate Action Plan (PCAP) for the Portland-Hillsboro Vancouver metropolitan statistical area (MSA), and this application would implement PCAP measure Res-1: Expand existing residential energy efficiency retrofit programs, with a focus on low-income households.

The Portland-Vancouver MSA has experienced skyrocketing housing costs over the last 15 years. We need to create more affordable housing units - and we must also maintain the units we have. Our goal is to enable as many people as possible to take advantage of the metro region's walkable neighborhoods, high-quality transit service, and access to jobs and amenities. This project, which will provide energy efficiency retrofits for 907 units of publicly owned affordable housing throughout the metro area, will provide cost-effective GHG reductions while also reducing costs for members of Low Income and Disadvantaged Communities. It will enable public agencies to make energy efficiency improvements to many older, less-efficient homes. This will save residents money – which is especially critical at a time when our region is facing utility rate increases of nearly 17 percent.

Metro convenes agency partners to share information and promote best practices and administers a variety of programs that fund affordable housing programs and capital projects. As a partner on this project, Metro would provide opportunities for agencies across the metro area to learn about this effort and discuss how it could inform other efforts to retrofit existing affordable housing and lower energy costs for low-income residents in the region. Thank you for leading this important grant application.

Sincerely,

A handwritten signature in cursive script that reads "Catherine Ciarlo".

Catherine Ciarlo  
Planning, Development, and Research Director



**Our Mission:**

To coordinate a regional workforce system that supports individual prosperity and business competitiveness.

**Executive Board**

**James Paulson**

Chair

Owner

JMPDX LLC

**Travis Stovall**

Vice-Chair

Executive Director

eRep

**Lori Stegmann**

Multnomah County

Commissioner

**Roy Rogers**

Washington County

Commissioner

**Carmen Rubio**

City of Portland

Commissioner

**David Fortney**

Workforce Development

Planner/Manager

PGE

**Caryn Lilley**

Controller/HR Director

KGW Media Group

**Paul Brown**

President

Cinder

**Josh Hall**

State Labor Liaison

Oregon AFL-CIO

March 22, 2024

Molly Rogers

Director, Department of Housing Services

Washington County

Adams Crossing MS, 63 161 NW Adams Ave., Suite 2000

Hillsboro, OR 97124

Dear Director Rogers,

Worksystems, Inc. is pleased to support the coalition application led by Washington County for an Environmental Protection Agency (EPA) Climate Pollution Reduction Implementation Grant (CPRG) to fund energy efficiency retrofits in publicly managed affordable housing units.

Worksystems, Inc. is a 501(c)3 non-profit organization that pursues and invests resources to improve the quality of the workforce in Multnomah and Washington Counties in Oregon. As the local workforce development board for the Portland metro area, we design workforce development programs delivered through a network of community-based partners to help people get the skills and training needed to go to work and advance in their careers. Our area of focus is developing partnerships and programs to help underserved populations overcome poverty and increase prosperity through career-track employment.

In 2022 we were awarded a Portland Clean Energy Fund (PCEF) grant by the City of Portland to prepare BIPOC and low-income residents for clean energy careers. As part of this work, we are developing a targeted sector strategy for the clean energy sector and have hired a dedicated staff person for clean energy work, that has begun the buildout of a clean energy career coaching network and an industry panel made up of labor, employers, CBOs and training providers to help inform the regional workforce investment needs for this sector.

This project, which will provide energy efficiency retrofits for 907 units of publicly-owned affordable housing throughout the metro area, will be an important step enabling our region's transition to cleaner energy. Worksystems is excited to support this project by leveraging the public workforce system to ensure that the economic opportunities resulting from this work are equitably accessible to all in the Portland Metro Area.

Sincerely,

A handwritten signature in black ink, appearing to read "Patrick Gihring", written over a light blue rectangular background.

Patrick Gihring – Chief Program Officer