

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.



TABLE OF CONTENTS

Executive Summary.....	ES-1
1. Introduction.....	1
CPRG overview	1
PCAP overview and definitions	2
Scope of the PCAP	3
Approach to developing the PCAP	4
2. Greenhouse gas emission inventory.....	8
Results	9
Building energy	11
Transportation energy	11
Industrial process and refrigerant emissions.....	12
Waste	12
Agriculture.....	12
3. GHG emission projections and targets.....	13
Current climate policy landscape.....	13
Targets for future GHG emissions.....	16
4. Priority measures	19
Transportation measures.....	22
Residential buildings measures.....	47
Waste and materials management measures	59
5. Co-benefits analysis.....	63
Air quality co-benefits	63
Health and safety co-benefits	64
Economic opportunity and wealth building co-benefits.....	64
Resilience co-benefits	65
6. Low-income and disadvantaged community analysis.....	66
Identification of LIDACs.....	66
Engaging with low-income and disadvantaged communities in planning process	71
Broader public engagement.....	72

7. Review of authority to implement	73
8. Workforce planning analysis	75
Quality jobs initiative	75
Clean Energy Careers	76
Construction Career Pathways.....	76
Regional Workforce Equity Agreement	77
9. Coordination and outreach	78
Interagency coordination.....	78
Engaging community partners	82
Outreach plan	83
Strategies to overcome linguistic, cultural, institutional, geographic, and other barriers to participation	83
10. Next steps	85
Appendix 1. Public agency and community plans consulted	86
Public agency plans	86
Community plans	88
Appendix 2. Greenhouse Gas Inventory methodology.....	94
Protocol and inventory boundaries	94
Emissions sources	94
Summary of data collection and scaling strategy	95
Appendix 3. Measure emissions methodology	99
Greenhouse Gas emissions methodology and sources	99
Co-pollutant emissions factors and sources	102
Appendix 4. Summary of the GHG reduction measure screening process.....	103
Initial sources reviewed and screening framework	103
Measure matrix and eligibility screening.....	103
Detailed screening criteria	105
Potential PCAP measures.....	107
Final measures	114
Appendix 5. Engagement approach	115

Introduction	115
Approach	115
Key questions	116
Broader agency and public engagement	117

Appendix 6. Equity partner engagement summaries	120
--	------------

FIGURES

Figure 1: Portland-Vancouver-Hillsboro, OR-WA MSA boundaries	4
Figure 2: MSA emissions by category	9
Figure 3: Emissions by county and sector	10
Figure 4: Business-as-usual emissions and state targets for future GHG emissions (MT CO ₂ e per year) ..	18
Figure 5: Metro/TriMet Better Bus investment areas	28
Figure 6: Metro High capacity transit corridors by investment tier (2023 Metro RTP and 2023 Metro High Capacity Transit Strategy)	29
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)	30
Figure 8: Areas of the Metro region that are eligible for Transit-Oriented Development Program investment	57
Figure 9: Federally designated LIDACs in the Metropolitan Statistical Area	68
Figure 10: Federally designated LIDACs in the urbanized Metropolitan Statistical Area (detail)	69
Figure 11: Metro's public CPRG website	72
Figure 12: Quality Jobs Framework	75
Figure 13. Construction Career Pathways framework summary	77
Figure 14: Screenshot of online meeting presentation / room at the first Climate Partners' Forum meeting	80

TABLES

Table 1: Priority Climate Action Plan strategies	1
Table 2: Sectors and greenhouse gases included in this inventory	8
Table 3: Detailed emissions data by category and county	10
Table 4: Building emissions by source and sector	11
Table 5: Portland-Vancouver MSA PCAP priority measures by sector	21
Table 6: Trans-1 co-pollutant reductions	23
Table 7: Trans-2 co-pollutant reductions	26
Table 8: Trans-3 co-pollutant reductions	33

Table 9: Trans-4 co-pollutant reductions.....	37
Table 10: Trans-5 co-pollutant reductions.....	41
Table 11: Trans-6 co-pollutant reductions.....	45
Table 12: Res-1 electricity co-pollutant additions due to increased electricity use.....	49
Table 13: Res-1 natural gas co-pollutant reductions	49
Table 14: Res-1 woodsmoke co-pollutant reductions	49
Table 15: Res-1 propane co-pollutant reductions	50
Table 16: Res-1 distillate fuel oil co-pollutant reductions	50
Table 17: Res-2 electricity co-pollutant reductions	55
Table 18: Res-2 natural gas co-pollutant reductions	55
Table 19: LIDAC census tracts by county within the Metropolitan Statistical Area	66
Table 20: LIDAC census tracts, applicable measures, and associated corridors and counties for transportation measures	70
Table 21: 2022 MSA-wide community GHG inventory data collection and methodology.....	96
Table 22: Measure-specific GHG emissions methodology and sources	99
Table 23: Screening results for potential PCAP measures.....	109
Table 24: Priority measures by sector	114

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 ₂ 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

Transportation
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
Commercial and Residential Buildings
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
Materials and Waste Management
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_{2e}).

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.

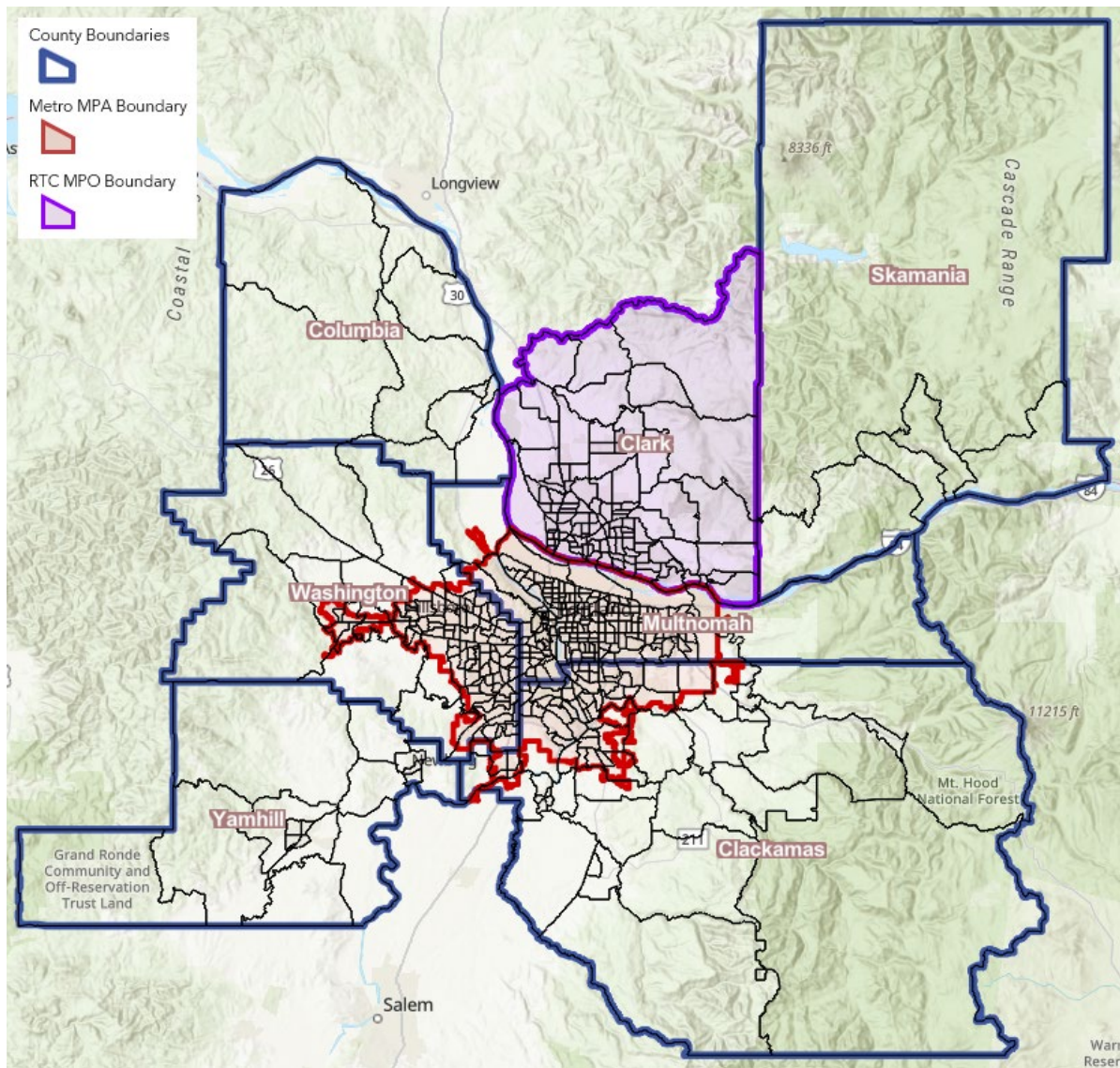
Next Steps. This PCAP is the first phase of the CPRG Planning Grants. Future planning for the CCAP is described in this section.

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 CO₂e). 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 ₂)
Transportation	methane (CH ₄)
Waste and materials management	nitrous oxide (N ₂ O)
Wastewater	fluorinated gases (F-gases), including
Industrial Processes and Refrigerants (IPPU)	hydrofluorocarbons (HFCs), perfluorocarbons
Agriculture	(PFCs), sulfur hexafluoride (SF ₆), and nitrogen
	trifluoride (NF ₃)

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 CH₄ 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.

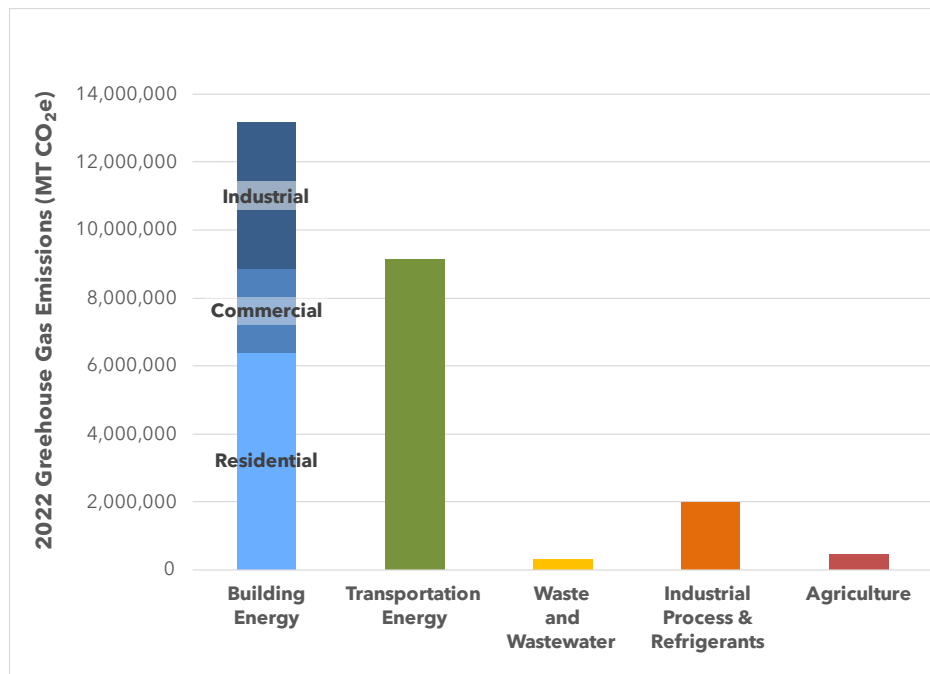
There was no existing MSA-wide inventory, so the following data are from a combination of GHG inventories within the MSA geography:

- 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 CO₂e 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

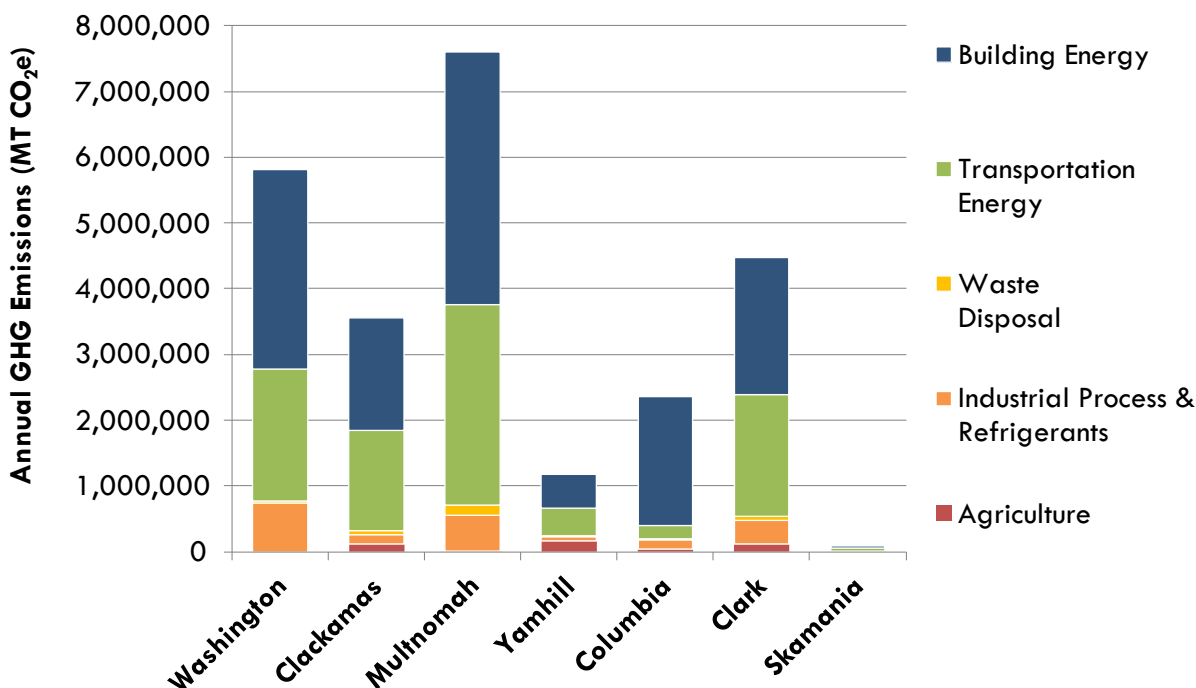


Table 3 provides detailed emissions values by sector for each county.

Table 3: Detailed emissions data by category and county

Geographic Information		Emissions (MT CO ₂ 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
Total:	2,542,407	13,459,828	9,124,944	326,086	2,008,218	472,910	25,391,987

Building energy

Building energy makes up the largest emissions category, accounting for nearly 13.5 million MT CO₂e 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 ₂ e)			Totals
	Electricity	Natural Gas	Other	
Residential	3,281,486	2,769,524	476,367	6,527,387
Commercial	962,606	1,133,337	511,586	2,607,530
Industrial	1,557,641	2,694,511	72,760	4,324,911
Totals:	5,801,733	6,597,372	1,060,723	13,459,828

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 CO₂e/MWh, compared to a regional emissions factor of 0.29 MT CO₂e/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 CO₂e/MWh in Skamania County.

Transportation energy

Transportation energy is the second-largest emissions source, responsible for more than 9 million MT CO₂e, 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 CO₂e) 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 CO₂e) while the other one million MT CO₂e 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 CO₂e and make up two percent of the MSA's total emissions. Dairy production represents 354,489 MT CO₂e of these emissions, and 102,518 MT CO₂e 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](#).

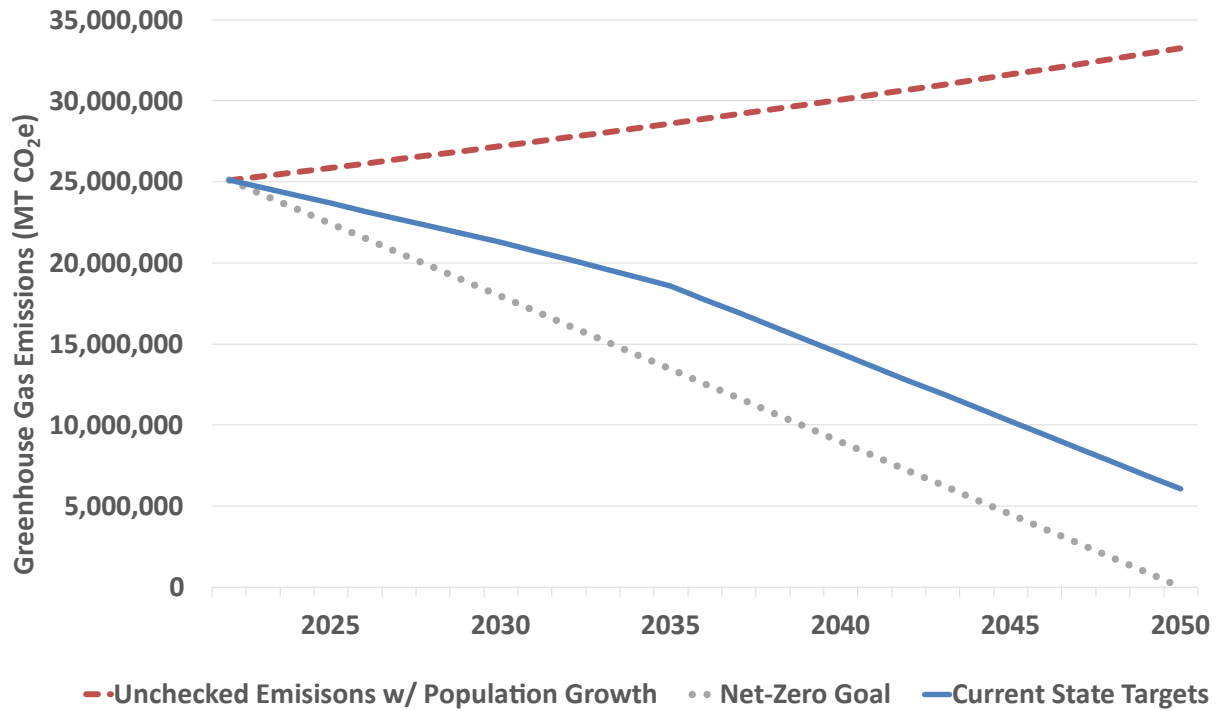
These targets are focused specifically on reducing VMT from light-duty vehicles, and the State has clarified that they are effectively VMT per capita reduction targets. This is because under Oregon's climate framework, the State is primarily responsible for reducing emissions from vehicles and fuels, 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 (CO₂) 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 CO₂e 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 CO₂e or self-funding
 - \$\$: \$1,000 - \$2,000 / MT CO₂e
 - \$\$\$: \$2,000 - \$3,000 / MT CO₂e
- **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.

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

- 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 ₂ 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 CO₂e per year.
- Up to 7,000 MT CO₂e from 2025 through 2030.
- Up to 30,400 MT CO₂e from 2025 through 2050.
- Cost effectiveness of GHG reductions: \$\$ (\$1,000 - \$2,000 / MT CO₂e)

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 _{2.5}	17	5	2
PM ₁₀	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 CO₂e per year.
- Up to 11,600 MT CO₂e from 2025 through 2030.
- Up to 50,400 MT CO₂e from 2025 through 2050.
- Cost-effectiveness of GHG reductions: \$\$\$ (\$2,000 - \$3,000 / MT CO₂e)

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 _{2.5}	28	8	3
PM ₁₀	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

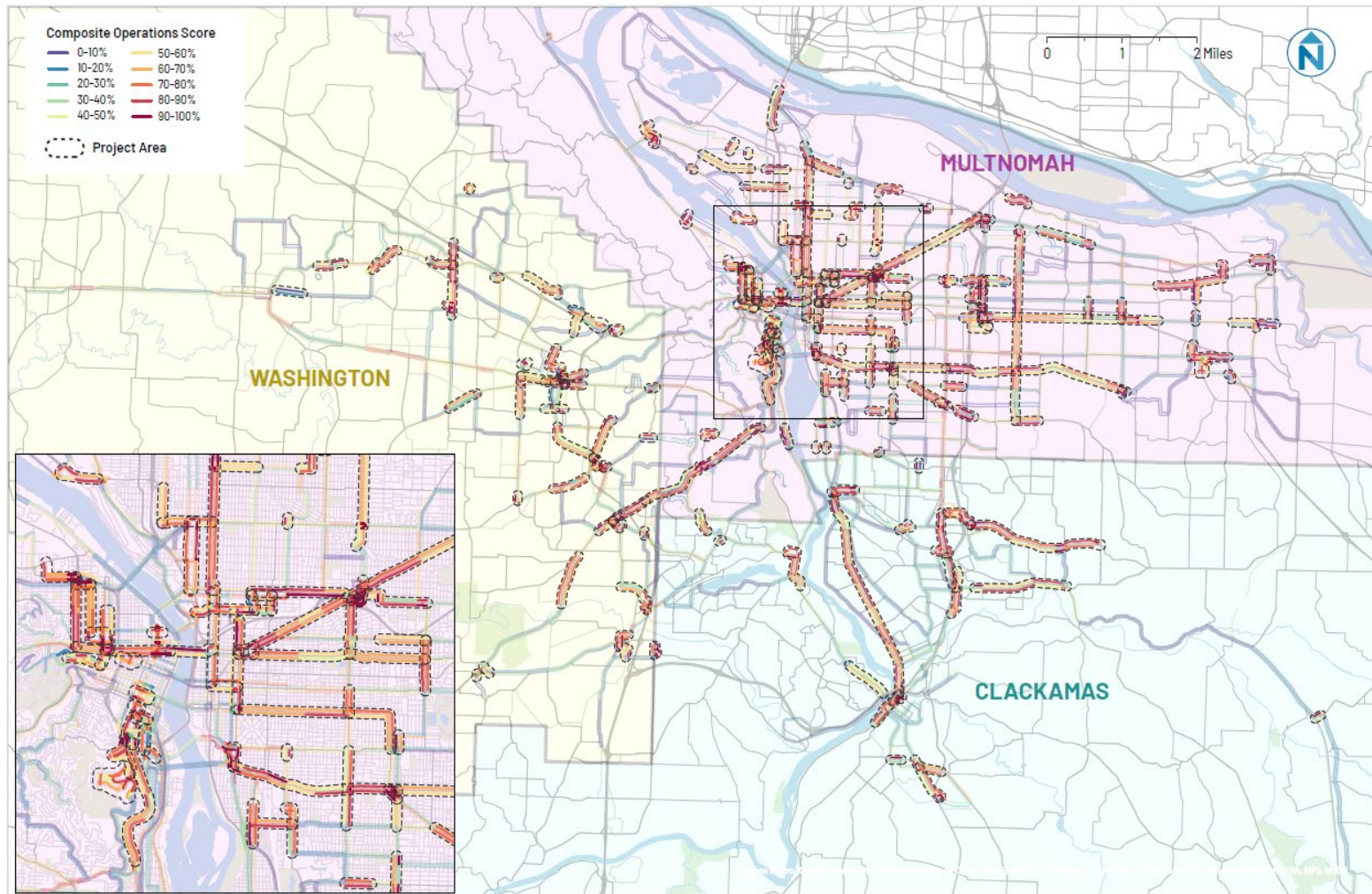


Figure 6: Metro High capacity transit corridors by investment tier (2023 Metro RTP and 2023 Metro High Capacity Transit Strategy)

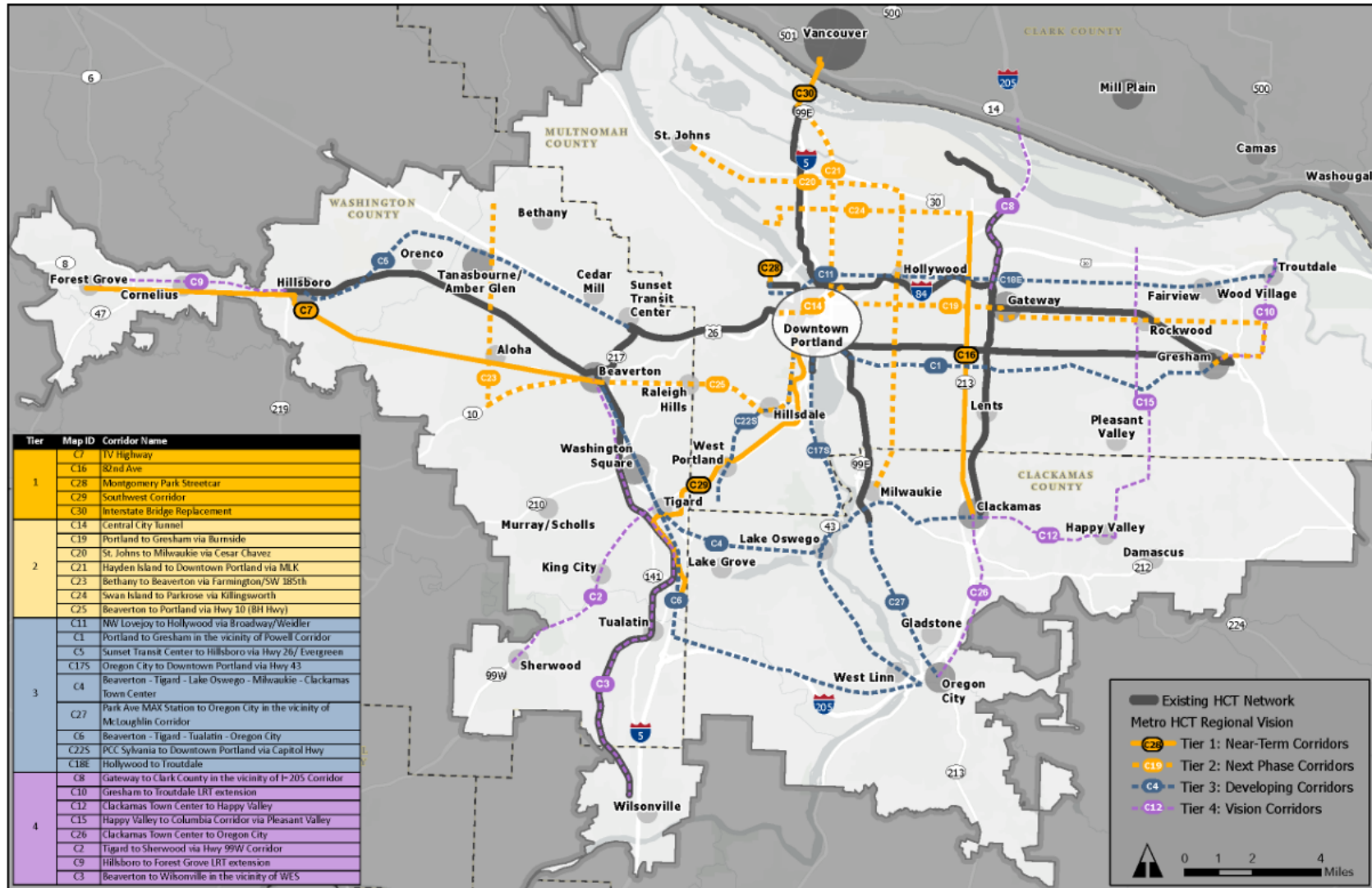
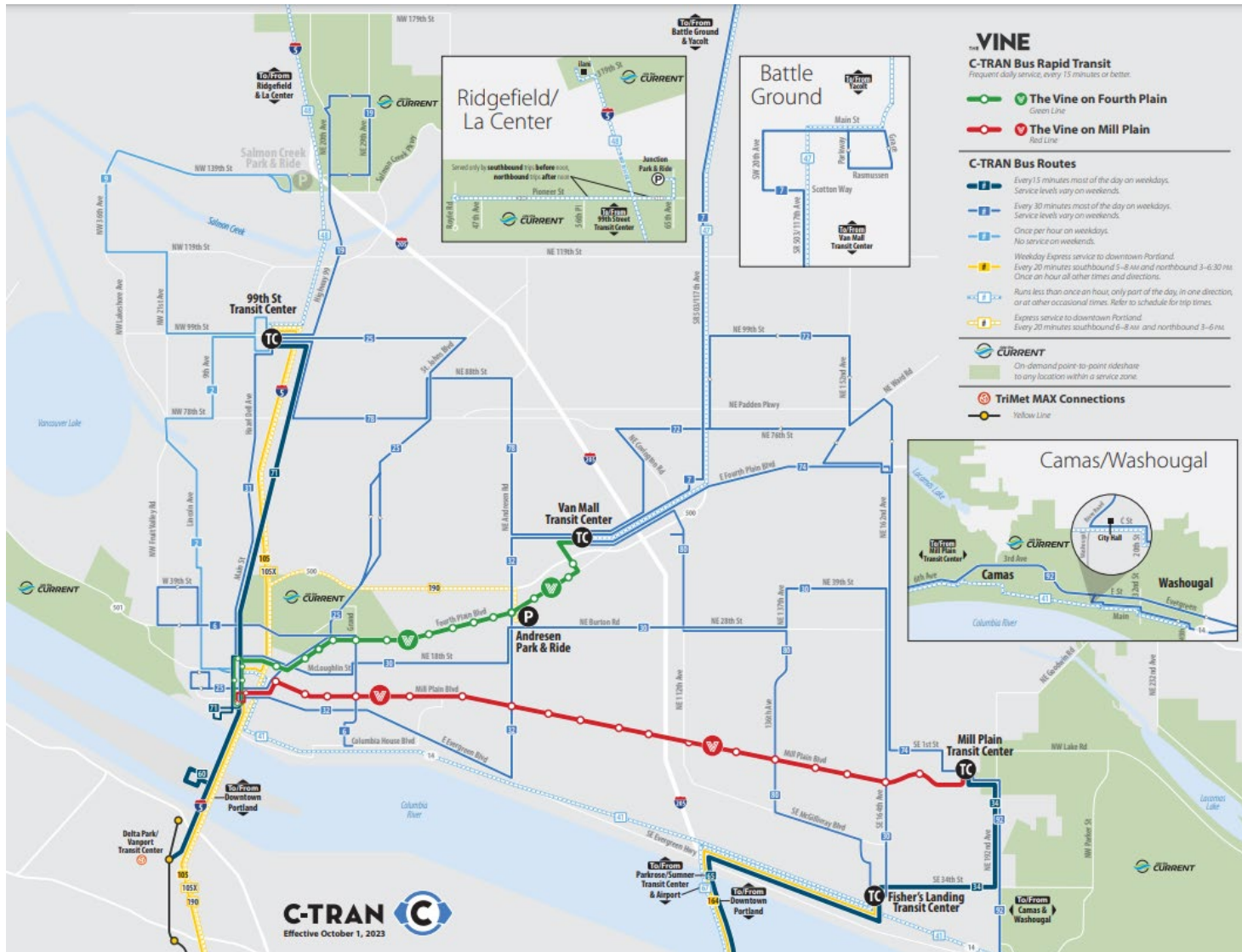


Figure 7: C-TRAN system map (note: the Highway 99 and Fourth Plain routes that are the focus of this measure are shown as a thick green line and a thick blue line, respectively)



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 CO₂e per year.
- Up to 15,800 MT CO₂e from 2025 through 2030.
- Up to 68,300 MT CO₂e from 2025 through 2050.
- Cost-effectiveness of GHG reductions: \$\$ (\$1,000 - \$2,000 / MT CO₂e)

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 _x	2,897	269	51
PM _{2.5}	38	11	4
PM ₁₀	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 CO₂e per year.
- Up to 420,800 MT CO₂e from 2025 through 2030.
- Up to 1,823,600 MT CO₂e from 2025 through 2050.
- Cost-effectiveness of GHG reductions: \$\$ (\$1,000 - \$2,000 / MT CO₂e)

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 _{2.5}	1,006	285	116
PM ₁₀	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 CO₂e per year.
- Up to 1,000 MT CO₂e from 2025 through 2030.
- Up to 4,400 MT CO₂e 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
PM _{2.5}	2	1	0
PM ₁₀	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 CO₂e per year (lifecycle emissions¹).
- Up to 39,200 MT CO₂e from 2025 through 2030.
- Up to 170,000 MT CO₂e from 2025 through 2050.
- Cost-effectiveness of GHG reductions: \$ (less than \$1,000/ MT CO₂e)

¹ 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 CO₂e annually in lifecycle emissions.

Co-pollutant reductions

Table 11: Trans-6 co-pollutant reductions

Co-pollutant	Annual reductions (kilograms)
NOx	16,695
PM _{2.5}	129
PM ₁₀	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 CO₂e per year.
- Up to 3,566,500 MT CO₂e from 2025 through 2030².
- Up to 15,454,800 MT CO₂e from 2025 through 2050^{2 above}.
- Cost effectiveness of GHG reductions: \$ (less than \$1,000/ MT CO₂e)

² 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 ₁₀ Filterable	2
PM ₁₀ Primary (Filt + Cond)	5
PM _{2.5} Filterable	1
PM _{2.5} 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 ₁₀ Filterable	1,396,514
PM ₁₀ Primary (Filt + Cond)	1,447,002
PM _{2.5} Filterable	1,390,158
PM _{2.5} 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 ₁₀ Filterable	2
PM ₁₀ Primary (Filt + Cond)	4
PM _{2.5} Filterable	1
PM _{2.5} 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 ₁₀ Filterable	360
PM ₁₀ Primary (Filt + Cond)	793
PM _{2.5} Filterable	277
PM _{2.5} 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 CO₂e per year.
- Up to 7,100 MT CO₂e from 2025 through 2030² above.
- Up to 30,600 MT CO₂e from 2025 through 2050² above.
- Cost effectiveness of GHG reductions: \$ (less than \$1,000/ MT CO₂e)

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 ₁₀ Filterable	1
PM ₁₀ Primary (Filt + Cond)	2
PM _{2.5} Filterable	0.3
PM _{2.5} Primary (Filt + Cond)	1
Sulfur Dioxide	2
Volatile Organic Compounds	17
Source: EPA Wagon Wheel for residential natural gas heating	

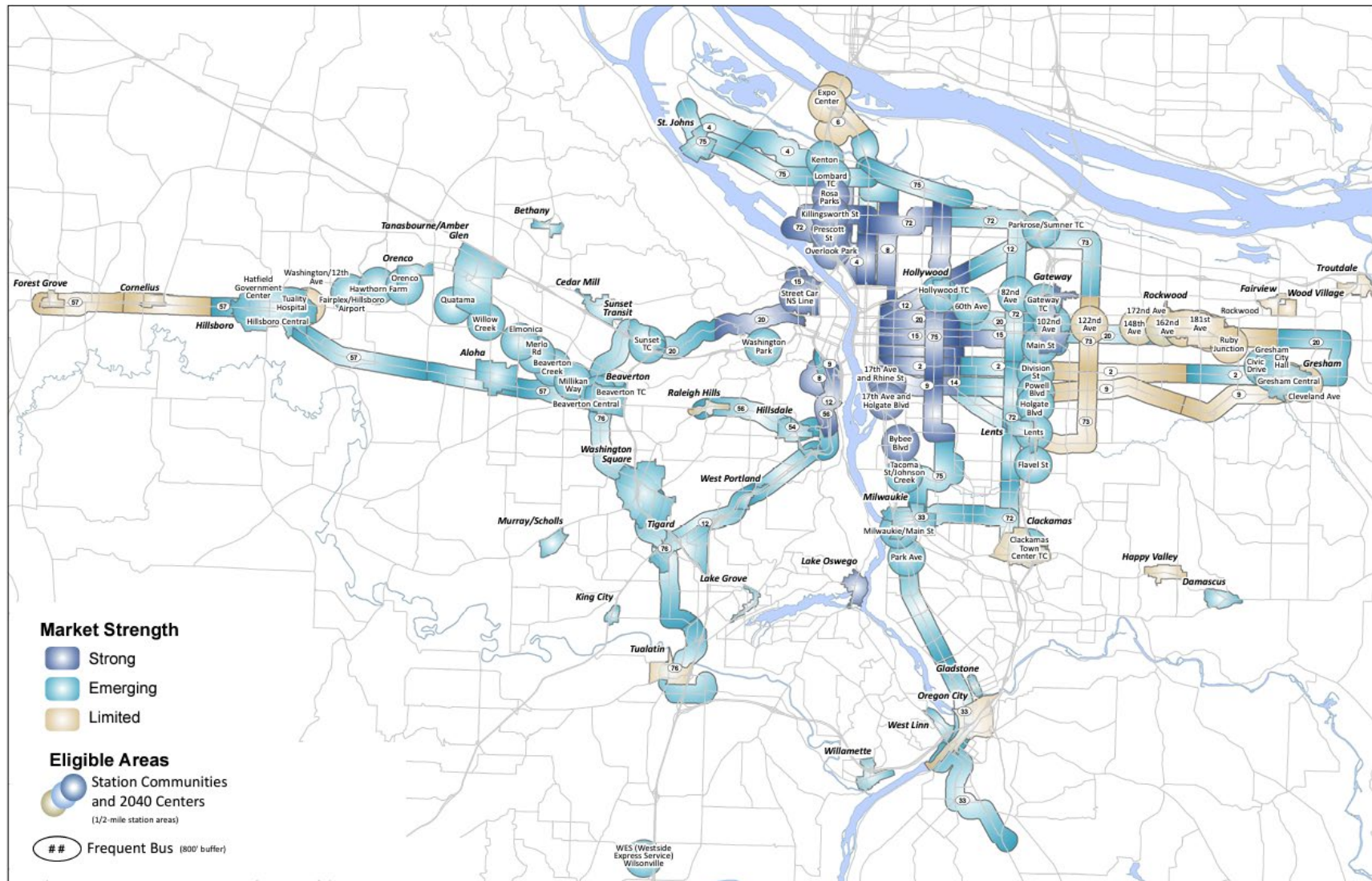
Implementing agencies

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 CO₂e per year.
- Up to 42,000 MT CO₂e from 2025 through 2030.
- Up to 182,100 MT CO₂e from 2025 through 2050.
- Cost effectiveness of GHG reductions: \$ (less than \$1,000/ MT CO₂e)

Co-pollutant reductions

It is unclear how or if anaerobic digestion would increase or decrease co-pollutants. Vehicle emissions such as NO_x, PM_{2.5}, 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

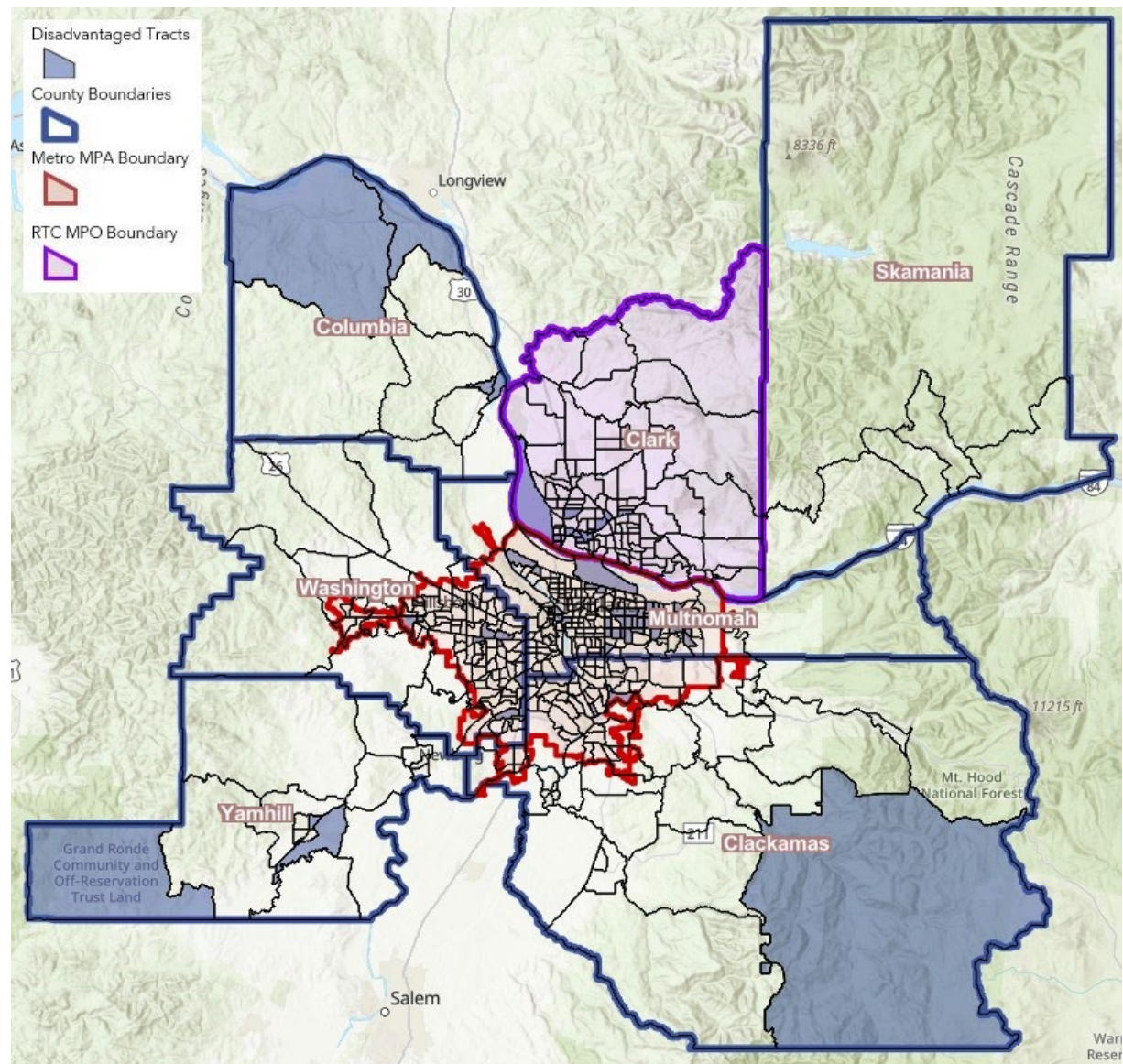
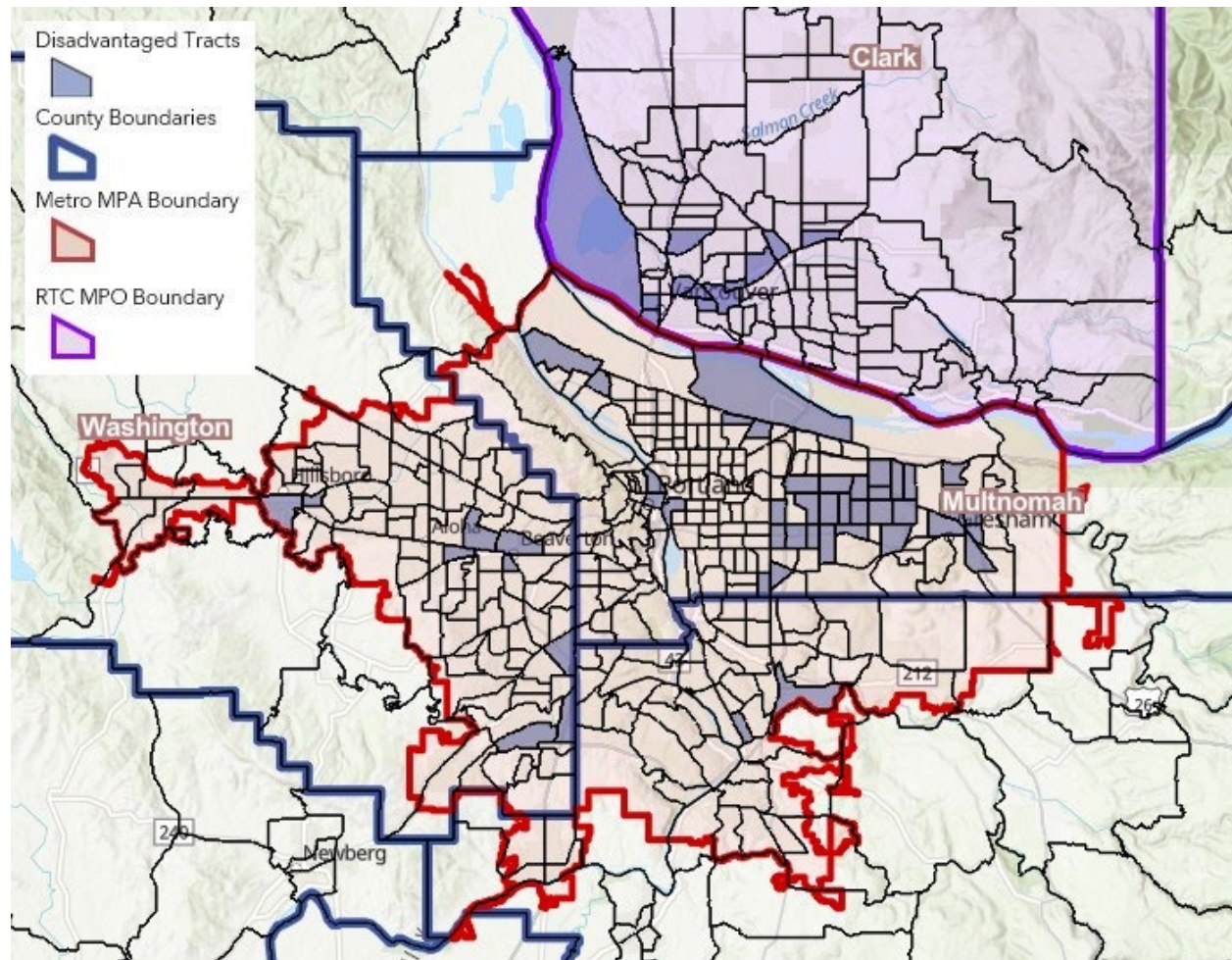


Figure 10: Federally designated LIDACs in the urbanized Metropolitan Statistical Area (detail)



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
Tier 1 HCT corridors (Metro region)		
Trans-1 Trans-3	TV Highway	41067032501; 41067032409; 41067031706; 41067031402; 41067031300; 41067031100
	82nd Avenue	41051007400; 41051007300; 41051008600 41051000602; 41051008301; 41051001602 41005022108; 41051007600
Tier 2 HCT corridors (Metro region)		
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
Tier 3 HCT corridors (Metro region)		
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
C-TRAN Bus Rapid Transit extension projects		
Trans-1 Trans-2 Trans-3	Highway 99	53011042400; 53011042300; 53011041010
	Fourth Plain Extension	53011041108; 53011041104; 53011040706
TriMet Better Bus corridors		
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 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

	Self-Sufficiency Wages	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.
	Safe Working Conditions/ Worker Engagement	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.
	Predictable Hours	A quality job offers employees predictability on the number of hours they are offered per week to minimize hardship on employees and their families.
	Comprehensive Benefits	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.
	Accessible Hiring and Onboarding Practices	A quality job offers transparent and accessible hiring and onboarding practices to ensure that employer and employee are set for success.
	Training and Advancement Opportunities	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.

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

- 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).³ 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 (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFC) and sulfur hexafluoride (SF₆), Nitrogen trifluorides (NF₃), Perfluorocarbons (PFCs), and other fully fluoridated GHGs. All gases are reported in terms of carbon dioxide equivalent (CO₂e).

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 CH₄ 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**

³ 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: https://www.oregon.gov/deq/aq/programs/Pages/GHG-Emissions.aspx .	
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 & 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 _{2e} 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>

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

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.	
Off-Road	<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.	
Airport	<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.	
Waste	
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.	
Landfill Solid Waste	<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.	
Composting Organic Waste	<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.	
Wastewater Treatment Process Emissions	<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.	
Septic Systems	<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.	
Industrial Process & Refrigerants	
Industrial Emissions	<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.	

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

Refrigerant Loss	<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 & commercial, transportation, and industrial sub-sectors. Refrigerant loss is aggregated for a variety of refrigerant types and reported by ODEQ in units of CO₂e. 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>	
Agriculture	
Livestock Methane	<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

Trans-1: Increase high capacity transit service across the metropolitan area	
Emission Reductions Estimate Method:	<ul style="list-style-type: none"> Previous analysis from Metro's draft High Capacity Transit Strategy, applying same methodology to additional C-TRAN routes. Estimates for GHG emissions reductions arising from HCT implementation are derived from two main assumptions: <ol style="list-style-type: none"> Reduction in VMT from residents opting to use transit over a personal vehicle due to convenience, cost, and other factors. Prevention of additional VMT from new residents or new drivers who rely on transit instead of purchasing personal vehicles.
Emission Reduction Estimate Assumptions:	<ul style="list-style-type: none"> Metro's draft High Capacity Transit Strategy 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. Variables include weekday ridership; weekday headway (minutes); average trip length (miles). Passenger vehicle fuel economy of 23 MPG. Emissions factor of 9 kg CO₂e (rounded up) per gallon of gasoline from EPA Emissions Factors Hub. Assumes that HCT vehicles are low- or zero-emissions
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.
Trans-2: Redesign streets and infrastructure to reduce delays for transit vehicles	
Emission Reductions Estimate Method:	<ul style="list-style-type: none"> Metro's draft High Capacity Transit Strategy Tier 2, Tier 3, Better Bus, and ETC corridors from TriMet operations plus Highway 99 and Fourth Plain from C-TRAN. California Air Pollution Control Officers Association (CAPCOA) Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity: 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.
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.

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

Cost-effectiveness of GHG reductions	Cost-effectiveness estimates come from internal analysis of price per mile of street redesign.
Trans-3: Expand transit signal priority	
Emission Reductions Estimate Method:	<ul style="list-style-type: none"> Metro's draft High Capacity Transit Strategy 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. California Air Pollution Control Officers Association (CAPCOA) Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity: 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.
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.
Trans-4: Expand bicycle and pedestrian network	
Emission Reductions Estimate Method:	California Air Pollution Control Officers Association (CAPCOA) Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity : 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.
Trans-5: Expand use of parking pricing	
Emission Reductions Estimate Method:	VisionEval analysis for percent VMT reduction with Metro Regional Transportation Plan area VMT.
Emission Reduction Estimate Assumptions:	<ul style="list-style-type: none"> VisionEval (previous analysis by Metro), indicating a 2.25% reduction in VMT. Metro region passenger vehicle VMT per Metro Regional Transportation Plan. Passenger vehicle fuel economy of 23 MPG gasoline. 8.8 kg CO₂e/gallon gasoline per EPA Emissions Factors HUB.
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.
Trans-6: Expand the use of electric buses in the region's transit fleets	
Emission Reductions Estimate Method:	Generally aligns with California Air Pollution Control Officers Association (CAPCOA) Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity : 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.

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

Emission Reduction Estimate Assumptions:	<ul style="list-style-type: none"> Renewable diesel R99 CI score of 39 g CO₂e/MJ (TriMet per contract). Electricity CI score of 2.61 g CO₂e/MJ (after 100% renewable product purchase) (OR DEQ Oregon Clean Fuels Program Electricity Carbon Intensity Values for 2022) Diesel fuel economy 4.78 (TriMet) Electric fuel economy 326.33 kWh/100 miles (.3 miles per kWh) (TriMet)
Cost-effectiveness of GHG reductions	Cost estimates based TriMet research.
Res-1: Expand existing residential energy efficiency retrofit programs, with a focus on low-income households	
Emission Reductions Estimate Method:	<ul style="list-style-type: none"> Residential building emissions were broken down by fuel, and energy end-uses were estimated based on US EIA Residential Energy Consumption Survey (RECS). The measure specifically entails adding a ductless heat pump, weatherizing, and adding more energy efficient water heaters for each housing unit. Assumptions for energy reduction are from the Northwest Power Plan, residential supplement. Additional electricity use from new electric heat pumps is accounted for.
Emission Reduction Estimate Assumptions:	<ul style="list-style-type: none"> Household energy end-uses were estimated based on EIA Residential Energy Consumption Survey (RECS) 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. Measure reduction potential for the Northwest Power Plan, residential supplement. Additional electricity use from new electric heat pumps is accounted for using end-use US EIA Residential Energy Consumption Survey (RECS) data combined with current GHG inventory data. Applied to 26% of housing units in the MSA.
Cost-effectiveness of GHG reductions	Cost estimates are based on weatherization and upgrade prices estimated by Washington County Housing Authority.
Res-2: Fund additional energy-efficiency measures in publicly funded, newly constructed affordable housing units	
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 EIA RECS Table CE4.5 (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.
Waste-1: Expand the availability of residential composting programs	
Emission Reductions Estimate Method:	<ul style="list-style-type: none"> Generally aligns with California Air Pollution Control Officers Association (CAPCOA) Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity: S-2. Implement Organics Diversion Program, adjusting for local assumptions. Analysis by Metro using EPA Waste Reduction Model (WARM) v15.1
Emission Reduction Estimate Assumptions:	<ul style="list-style-type: none"> Average of 0.21 tons of food waste per household (2016 DEQ Waste Composition Study data).

	<ul style="list-style-type: none">Additional EPA Waste Reduction Model (WARM) inputs based on local context for landfilled waste vs. dry anaerobic digestions, e.g., comparison to Arlington landfill.
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	3a. Implement high-capacity transit across the metro area , 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	3b. Redesign streets and infrastructure to reduce delays for transit vehicles (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	4a. Improve multimodal access to transit stations	High	High	High	High	Med	High	Yes	Yes	Yes	Yes	No	15
6. Improve existing building energy efficiency	6a. Support weatherization and efficiency upgrades in existing residential buildings , 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	4b. Complete key gaps in the regional active transportation network identified through regional transportation plans , 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	4c. Expand Regional Safe Routes to School programs	High	High	Med	Med	Med	High	Yes	Yes	Yes	Yes	No	12
9. Expansion of anaerobic digestion and composting	9a. Expand the availability of residential composting programs 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	5a. Expand the use of intelligent transportation systems	High	High	Med	High	Med	Low	No	Yes	Yes	Yes	No	11
5. Use technology to actively manage the transportation system	5b. Expand use of parking pricing (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	7a. Implement green tariffs to fund community-wide renewable electricity usage 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	9b. Expand anaerobic digestion capacity 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	2a. Support the electrification of school bus and transit fleet and the installation of fast charging equipment	High	High	Med	Med	Med	Med	Yes	No	Yes	Yes	No	10
5. Use technology to actively manage the transportation system	5c. Implement regional congestion pricing	Med	High	High	High	Med	Low	No	No	Yes	Yes	Yes	10
8. Expand food waste reduction	8a. Expand food recovery and distribution programs , 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	4d. Expand regional transportation demand management programs (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	6b. Implement building energy scoring for commercial and residential buildings , 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	1a. Fund/incentivize charging in existing multifamily residential developments	Med	High	Med	Med	Low	Low	No	No	Yes	Yes	Yes	8
1. Support EV transition through charging infrastructure	1b. Change zoning regulations to require pre-wiring or charging at new commercial and residential developments	Med	Low	Med	Med	Med	Low	No	No	Yes	Yes	Yes	7
1. Support EV transition through charging infrastructure	1c. Install community charging on public land/streets	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	3c. Reduce fares for people who rely on transit (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	1d. Educate consumers about the benefits of electrification and alternative fuels	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

Transportation
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
Commercial and Residential Buildings
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
Materials and Waste Management
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 10th, 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.