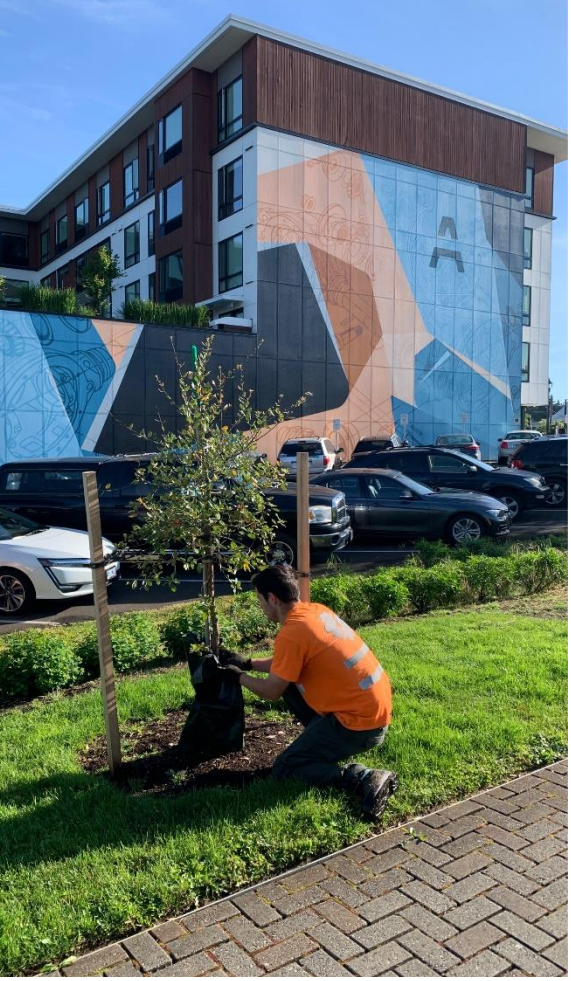

CITY OF **MILWAUKIE**

Climate Action Plan

Update Report

March 2023

MILWAUKIE CLIMATE ACTION UPDATE REPORT 2023

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CITY OF MILWAUKIE
Milwaukie Community Climate Action Plan

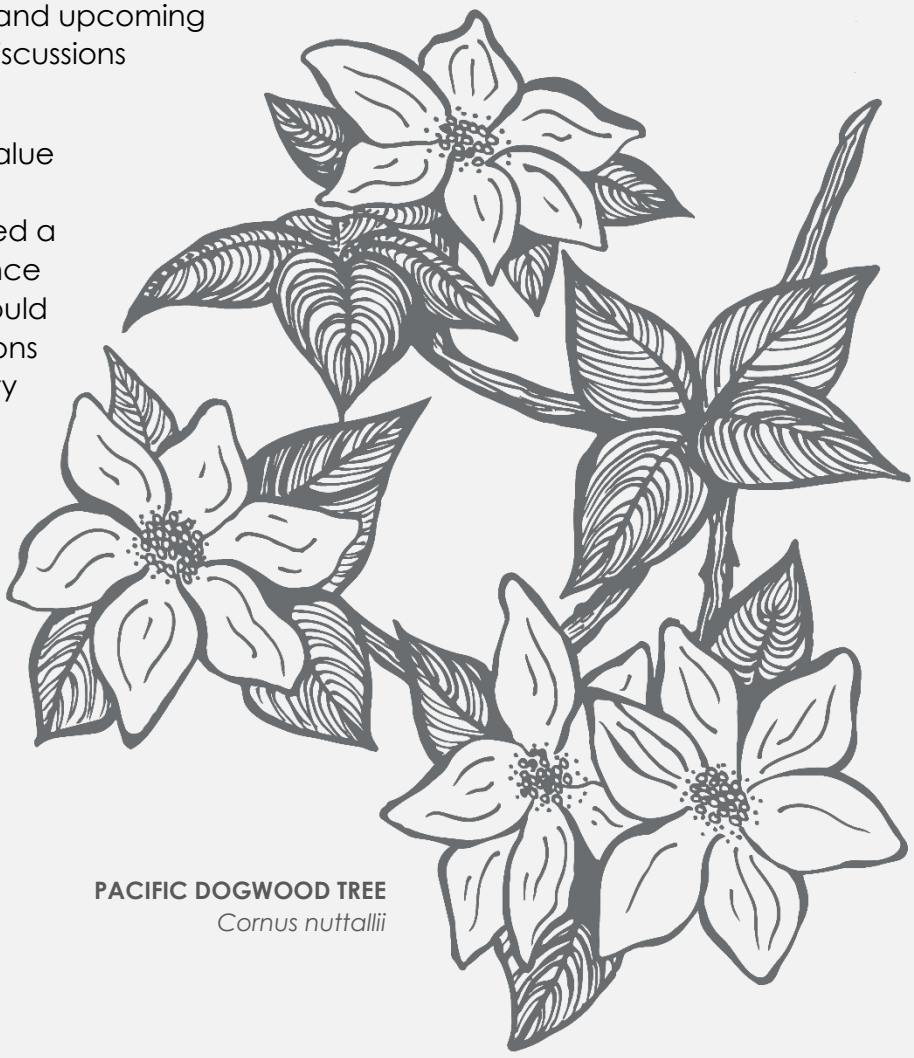
INTRODUCTION

In 2017, the City of Milwaukie adopted a community vision for the year 2040, imaging a future where Milwaukie would be '*delightfully livable, entirely equitable, and completely sustainable*'. The following year, Milwaukie adopted the Climate Action Plan (CAP), a roadmap for helping the community mitigate and adapt to the effects of climate change. This comprehensive city-led strategy identified 53 city-led actions to help Milwaukie achieve its climate goals and become completely carbon neutral by 2045.

In the years since the CAP adoption, Milwaukie has built a small climate program to implement the actions in the plan and achieve the city's climate goals for carbon emission reduction and expansion of the city's tree canopy. By right-sizing programs and strengthening relationships and collaboration with community and utility partners in Milwaukie, the city has become a regional leader in climate action and a role model for other small jurisdictions around the nation tackling climate change in their local communities.

This 2023 CAP update provides an overview of Milwaukie's developing climate program, recent greenhouse gas emission inventory, and implementation of the adopted city-led actions to reduce community emissions and prepare Milwaukie for a changing climate. The update also features completed and upcoming climate projects, along with current discussions about program funding and priorities.

Climate action has become a core value within Milwaukie's city operations and policies, and the city has accomplished a significant amount in the short time since the adoption of the CAP. This work would not be possible without the contributions of Milwaukie's elected and community leadership, residents, and businesses.



PACIFIC DOGWOOD TREE
Cornus nuttallii

TABLE OF CONTENTS

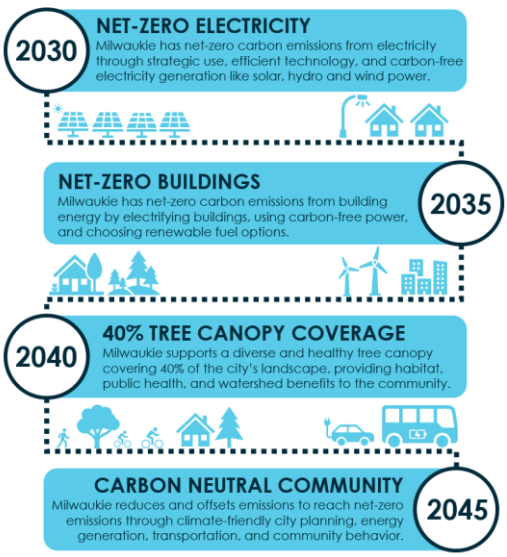
EXECUTIVE SUMMARY	**6**
2020 GREENHOUSE GAS REPORT SUMMARY	**10**
CLIMATE CHANGE IMPACTS IN MILWAUKIE	**12**
COMMITTING TO CITY-LED CLIMATE ACTION	**16**
CLIMATE ACTION IN CITY PROCESSES	**17**
COMMUNITY ENGAGEMENT	**18**
FUNDING MILWAUKIE'S CLIMATE WORK	**20**
CAP ACTION UPDATES	**22**
Building Energy and Efficiency	24
Vehicles and Fuels	37
Land use and transportation	45
Materials use, purchasing and recovery	50
Natural Resources	53
Public Health and Preparedness	60

2023 CAP UPDATE EXECUTIVE SUMMARY

Since adoption of the CAP in 2018, Milwaukie has created its own small climate program to achieve its adopted climate goals for carbon emissions and canopy coverage. By right-sizing programs and collaborating with community and utility partners in Milwaukie, the city has become a regional leader in climate action and a role model for other small jurisdictions tackling climate change.

This 2023 CAP update provides an overview of Milwaukie's developing climate program, recent GHG emission inventory, and city-led actions to reduce community emissions and prepare Milwaukie for a changing climate. The 2023 CAP update also features completed and upcoming climate projects and current discussions about program funding and priorities.

MILWAUKIE'S CLIMATE ACTION GOALS



MILWAUKIE'S EMISSION PROFILE IS CHANGING OVER TIME

GHG inventories show community emissions by main emission sources, including building energy, transportation, waste processing, refrigerants and imported goods. Comparing the recent 2020 GHG inventory to the 2016 GHG inventory, the most notable changes were a decrease in building energy emissions and an increase in transportation emissions. Considering these emission changes, Milwaukie needs to continue its work to decarbonize buildings while increasing efforts to promote emission free transportation through electric vehicles and charging infrastructure, bike and pedestrian infrastructure, and public transportation.

2020 GHG INVENTORY TAKEAWAYS

Transportation emissions increased by roughly 20%, becoming largest emission source in community

Building energy emissions decreased by 25% thanks to lower energy use and more renewable resources

MILWAUKIE HAS INCORPORATED CLIMATE ACTION INTO CITY PROCESSES AND POLICY

From city code to vehicle purchasing, considerations of climate impact are made in city processes and operations to help meet the city's adopted climate goals. Adopted strategy documents like the 2020 Comprehensive Plan, natural hazard mitigation plans (2019, 2024 pending) and utility system plans reference climate and urban forestry policies, and further institutionalize the city's commitment to climate action. In addition, new internal processes like including a statement of climate impact in city staff reports and tree accounting in city improvement projects ensure staff consider climate and urban forest impacts in all city-led initiatives.

CLIMATE POLICIES AND CONSIDERATIONS IN CITY PLANS

Adopted Plans:
Urban Forest Management Plan
Natural Hazard Mitigation Plan
Comprehensive Plan
Water Utility System Plan

Upcoming Plans:
Stormwater System Plan
Transportation System Plan

CLIMATE STAFF ENGAGE THE COMMUNITY ON PROJECTS AND PROGRAMS RELATED TO CLIMATE

Since adoption of the CAP, the city has engaged the community on a variety of programs and initiatives related to climate action. Climate engagement included in-person outreach at community events like the Home Energy Score community forum, tabling at farmers markets for climate goal awareness and tree code information, presenting to community groups, and offering sustainability tours.

Staff have created and shared outreach materials, like postcards, t-shirts, and mailers. The city has promoted climate actions through new websites and webtools, news and podcast interviews, and a variety of other printed and online media. More work is needed to expand the city's translated and culturally specific outreach materials for climate to ensure equitable engagement and educational opportunities.

UPCOMING CLIMATE PROJECTS INLCUDE A DISCUSSION ON CONTINUED CLIMATE FUNDING

Ongoing discussions in Milwaukie about climate-related projects include conversations about natural gas bans for new residential development, development of new carbon-free electricity products that align with city goals, and promotion of electric vehicles and charger installations in the community. Each of these projects are complex and involve collaborating with local utilities, community members, and city leadership. This work will need to be prioritized along with the ongoing implementation of Milwaukie's 53 city-led actions as staff reach capacity on time and resources dedicated to climate efforts in the city. To address the upcoming resource gap and a possible change to City Council's goals, the city is exploring a new climate funding mechanism to generate revenue for the implementation of climate-related programming associated with the CAP. Climate fund discussions were paused in late 2022 and will restart in spring 2023 with the new City Council.

CAP ACTION IMPLEMENTATION OVERVIEW

Of the 53 city-led actions in the CAP, the city has started implementing 40 actions and has completed 8 actions. City staff prioritized actions that could make impactful emission reductions while being cost and resource efficient. The city collaborated with a variety of stakeholders on implementation of climate actions including utility partners, community-based organizations, advocacy groups, and regional policy makers.

BUILDING ENERGY AND EFFICIENCY

The city has focused on energy-related emission reduction and has partnered with local electric utility Portland General Electric (PGE) to achieve community decarbonization goals for electricity, promote electrification, and explore new demand-side programs. Key building energy and efficiency highlights include:

- Subscription for 100% carbon-free Oregon solar electricity for city facilities and operations through PGE's Green Future Impact product.
- Adoption and implementation of a residential home energy score program.
- Adoption of a resolution to develop city code to ban new fossil fuel infrastructure connections for residential development.
- Ongoing development of a new city-aligned renewable electricity product focused on affordable utility-scale solar development.
- Coordination with PGE for multiple electrification events and Climate Collaborative educational campaigns
- Advocacy for regional legislation for building and utility-scale decarbonization, including the adopted Clean Energy for All Act (HB 2021) that requires electric utilities to decarbonize their energy mix by 2040.

VEHICLES AND FUELS

The city continues to electrify city vehicles and operations and promotes electric vehicles (EVs) and charging infrastructure through local projects, policy updates and regional advocacy. With transportation becoming the largest emission sector in Milwaukie, EV initiatives will be key in meeting local climate goals. Key vehicle and fuels highlights include:

- Purchase of 12 EV and plug-in hybrid vehicles for city operations with continued fleet transition efforts
- Adoption of renewable diesel use for city operations
- Advocacy for regional EV legislation, including a goal for 90% of Oregon vehicle sales to be zero-emission vehicles by 2035
- Installation of electric vehicle chargers across city facilities through local utility and business partnerships, including installation of Electric Avenue fast chargers, three new public chargers at city buildings, and additional city fleet chargers for city operations
- Development and adoption of electric vehicle ready code requirements for parking lots including incentives for charger installations

LAND USE AND TRANSPORTATION

Executive Order 20-04 pushed state departments to reach Oregon carbon emission goals, including the Department of Land Conservation and Development (DLCD). DLCD's Climate Friendly Equitable Community rulemaking set new development and land use standards for cities like Milwaukie to implement climate-forward development code. Combined with climate and energy policies outlined in the 2020 Comprehensive Plan, Milwaukie has been updating land use code to reflect the CAP goals and incorporating emission reduction strategies into city planning for development and transportation. Upcoming projects like the Transportation System Plan update will be significant in the implementation of CAP actions. Key land use and transportation highlights include:

- Adoption of the 2020 Comprehensive plan with numerous climate and energy policies
- Incorporation of DLCD climate rulemaking into city code, including incentives and code structure to enhance climate benefits
- Update of housing code to include more housing types to increase denser development along with new tree code to balance urban forest goals
- Continued project completion of the Safe Access for Everyone pedestrian and bikeway improvement projects
- Ongoing revisions of Public Works standards and development code for low impact development practices including stormwater and flood storage considerations

MATERIALS USE, PURCHASING AND RECOVERY

In the implementation of these actions, the city has focused primarily on the topics of construction and food waste reduction. The city contracts with Clackamas County Sustainability and Solid Waste to perform city-wide outreach and education on these topics, including recent Metro food waste collection requirements for food serving businesses and industries. The city also implements a variety of internal policies and procedures to use low-impact materials and development best practices. Key materials use, purchasing and recovery highlights include:

- Partnership with Clackamas County to share of food waste reduction outreach and educational materials, including information on upcoming food waste recovery requirements
- Promotion of composting systems by using mulch in city projects and transporting vegetative debris collected in city operations to composting facilities rather than landfills.
- Use of low impact materials like pavers and permeable concrete in city projects to showcase feasibility and study larger application.

NATURAL RESOURCES

After the adoption of the CAP, Milwaukie staff and the community Tree Board developed the Urban Forest Management plan outlining strategies to plant, protect and promote trees in Milwaukie. Milwaukie's urban forest program has since expanded to increase awareness and policies for the preservation and planting of trees. From updates and development of new tree code to increased engagement at Arbor Day events and collaboration with community partners and non-profits, Milwaukie has emphasized the importance of trees and watershed health in the city to maximize the multitude of benefits healthy and functional natural resources provide the community. Key natural resources highlights include:

- Awarded Oregon Tree City of the Year in 2020 for city urban forestry efforts
- Recurrent Tree City USA and Tree City Growth Awards for the continued implementation and development of urban forest programming in Milwaukie
- Updated the Public Tree code and adoption of a new private residential tree code for the protection and expansion of urban canopy in the city
- Created new online and printed tools and resources for Milwaukie urban forestry, including educational and tree code handouts, tree care information, and construction protection guides
- Developed a canopy analytics tool with local experts to assess socioeconomic data and canopy distribution (Branch Out Milwaukie tool)
- Aligned the natural resources staff in Milwaukie under Climate and Natural Resources Manager for optimized CAP action implementation and natural resources preservation
- Expanded stormwater programming and development requirements to meet state and local water quality and watershed health goals
- Completed the Water Supply Well Capture Zone Delineation report (2020) to ensure water quality monitoring at well sites in Milwaukie

PUBLIC HEALTH AND PREPAREDNESS

As the city sees increased impacts from climate change such as wildfire smoke, drought, heat waves, and extreme storms, the adaptation actions involved in the public health and preparedness topics become more relevant and important than ever. As the city coordinates with county and regional emergency agencies for community preparedness, city staff are assessing infrastructure for resiliency and planning for future natural hazards. More work is needed for this topic as the effects of climate change are increasingly felt in the Milwaukie region. Key public health and preparedness highlights include:

- Promotion of Ledding Library as a daytime heating and cooling shelter
- Updated the Natural Hazard Mitigation Plan in 2019 and currently developing a 2023/2024 update with climate change considerations
- Advocated for more efficient building codes which would include systems for more effective air purification
- Implementing tree canopy expansion efforts to provide public health benefits during extreme heat events and improve air quality

2020 GHG INVENTORY SUMMARY

In 2017, Milwaukie conducted a GHG gas inventory to inform its development of Milwaukie's first CAP in 2018 using community and regional data from 2016. The inventory noted that Milwaukie as a community generated 262,574 metric tons of carbon dioxide equivalent (MT CO2e) of local, sector-based emissions. For scale, this quantity of emissions is equivalent to the carbon sequestered annually by 300,000 acres of average U.S. Forest – a land area about 200 times the size of the City of Milwaukie.

In early 2022, an update to Milwaukie GHG inventory was conducted using datasets from 2020. The 2022 GHG Inventory report suggested Milwaukie generated 264,870 MT CO_2e[1] of local emissions, about 12.9 MT CO_2e per person, a slight decrease from 2016.

Milwaukie's local emissions[2] match regional cities and statewide emissions with most emissions coming from transportation, including gasoline and diesel used by vehicles to transport people and goods, as well as building energy through combustion of natural gas and electricity use to power buildings. Relatively small sources of emissions come from refrigerant usage and waste disposal.

In the 2020 GHG Inventory Report, Milwaukie's building energy related emissions decreased by roughly 25% while transportation related emission increased in the city by about 20%. Moving forward, the city should continue its efforts to decrease building emissions and expand its efforts to address increasing transportation emissions in the community.

GHG INVENTORY REPORT HIGHLIGHTS

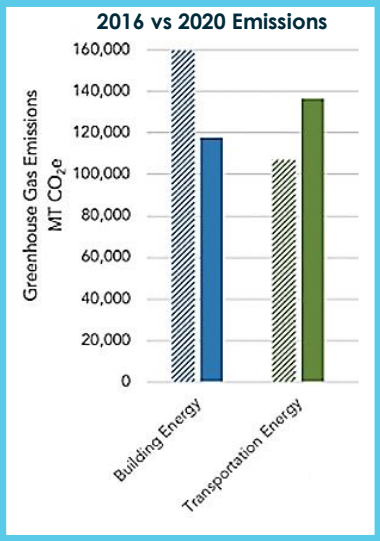
LOCAL COMMUNITY EMISSIONS DECREASED BY ~ 5%

Local community emissions:
2020: 264,870 MT CO_2e
2016: 277,384 MT CO_2e*
** Updated 2016 GHG inventory value*

THINGS TO CONSIDER:

- **The city needs to address transportation emissions by prioritizing or increasing number of transportation climate actions**
- GHG inventories are assumption-based estimates and should be used as additional guidance in emission reduction strategies
- Community behavior in response to the COVID-19 pandemic may influence results
- Updates to ODOT's data increased 2016 transportation emission estimates

TRANSPORTATION NOW CITY'S LARGEST EMISSION SECTOR



BUILDING ENERGY EMISSIONS DECREASED BY 25%

19% decrease in electricity use
38% decrease in natural gas use
Voluntary renewable products offset:
~15.3% of 2020 electricity emissions
~4% of 2020 natural gas emissions

TRANSPORTATION EMISSIONS INCREASED BY ~20%

52% of all local community emissions
92% of transportation CO_2e from gas
Local gas purchases increased in 2020
EV emissions included in Building Energy

2020 GHG Inventory available online at: milwaukieclimateaction.com

[1] Metric tons of carbon dioxide equivalent (MT CO_2e) is the conventional unit for reporting greenhouse gas emissions.
[2] Local emissions inventories (or sector-based inventories, in official terms) include emissions within the City's boundaries from energy use by homes, businesses, and vehicles as well as emissions from landfilling solid waste and wastewater treatment. It also includes emissions associated with energy consumed within the geographic boundary but not emissions from imported goods or services.

SECTOR BASED EMISSIONS IN MILWAUKIE

Transportation made up the largest category of local emissions in 2020, representing more than half of the local emissions. These emissions total roughly 137,000 MT CO_2e. Nearly half of all the fossil fuel emissions attributable to Milwaukie are from gasoline (126,000 MT CO_2e), almost exclusively for on road use. Diesel emissions (11,000 MT CO_2e) make up the rest of the transportation category.

Building energy emissions include electricity and natural gas and make up the second largest source of local emissions at nearly 118,000 MT CO_2e. Emissions from the generation of electricity (the coal and natural gas burned in power plants) make up the largest share at 85,000 MT CO_2e, and emissions from natural gas make up the remaining 33,000 MT CO_2e. These emissions also make up roughly half of all the fossil fuel emissions attributable to Milwaukie

Community refrigerants are fluid chemical compounds used in the refrigeration cycles of air conditioning systems and heat pumps where in most cases they undergo a repeated phase transition from a liquid to a gas and back again. These chemicals can be potent greenhouse gases. Refrigerant use in Milwaukie makes up roughly 3% or 9,000 MT CO_2e. This category also includes industrial processes that emit greenhouse gases, but such industrial processes are negligible in Milwaukie. Waste, including wastewater processing and solid waste disposal is the smallest emission category with 1,500 MT CO_2e.

WHAT IS MEASURED IN A GREENHOUSE GAS INVENTORY?

GHG inventories use scientific data and community statistics to estimate and track emissions from local activities and processes over time.

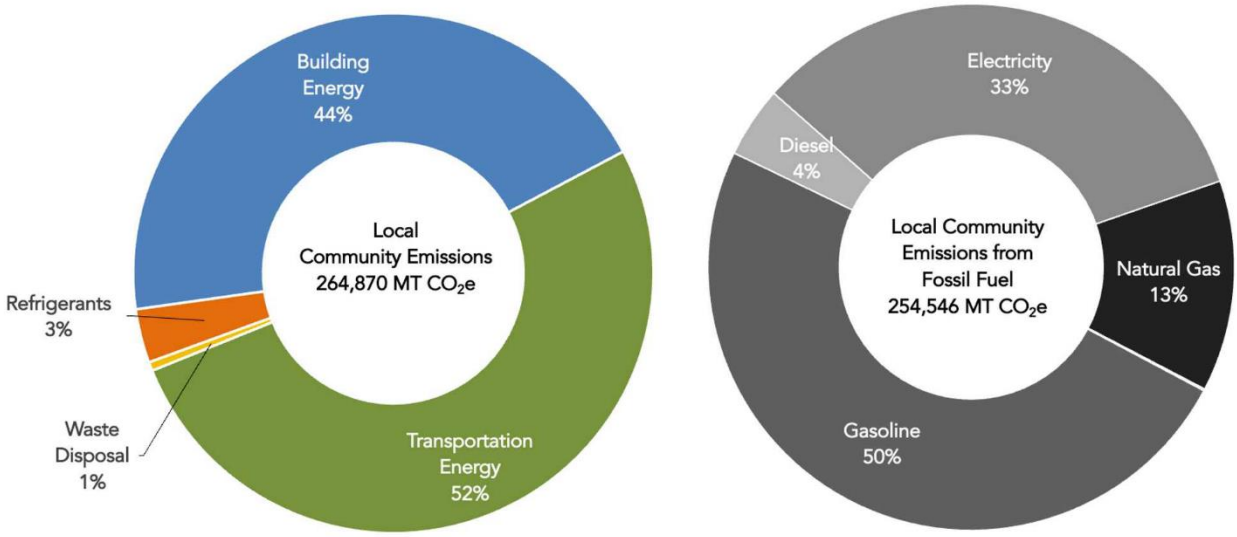
GHGs are gases that collect in the atmosphere and prevent heat energy from leaving.

GHG emissions are a measurement of the amount of a GHG released over time into the atmosphere. To make reporting and comparing emission sources easier, emissions are reported as CO_2 equivalents (CO_2e), meaning the amount of CO_2 with an equal climate impact.

Sector-based emissions measure GHGs from big community emission sources like transportation, building energy, landfills, and waste systems.

Community consumption emissions are GHGs from goods that are manufactured out of the community and are shipped in for consumption.

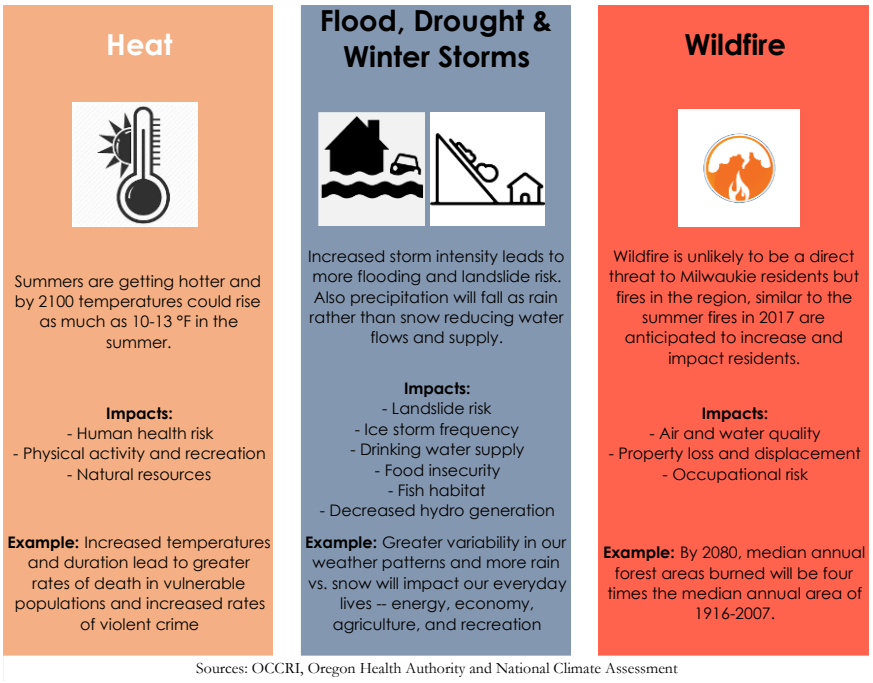
Below: 2020 GHG Inventory breakdown by sector (left) and fossil fuel (right). The electricity fossil fuel use is primarily from natural gas used to generate electricity in power plants.



CLIMATE CHANGE IMPACTS IN MILWAUKIE

The effects of climate change are impacting the Milwaukie community and testing the resiliency and adaptability of the community, infrastructure, and ecosystem. Recent community experiences have showcased the impacts Milwaukie will and are facing due to climate change.

Climate studies led by Oregon State's Oregon Climate Change Research Institute (OCCRI) and Oregon Health Authority can inform the community on changes to expect in the Milwaukie and Willamette Valley area. While the region may be less vulnerable some climate change-related impacts, Milwaukie and Oregon will still experience significant changes locally including increased heat, wildfire, and storm events. In addition, without strong action from all nations, many parts of the world could become uninhabitable due to sea level rise, flooding, unlivable temperatures, drought, or loss of drinking water supply and cascading effects to food production.

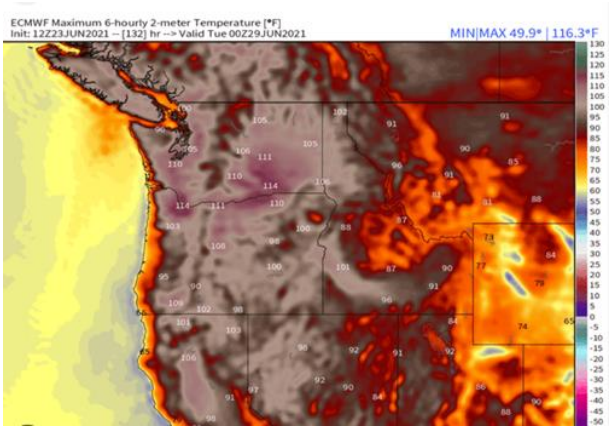


Sources: OCCRI, Oregon Health Authority and National Climate Assessment

The resilient attributes of the Pacific Northwest area compared to other regions could lead to significant climate refugee influxes in Pacific Northwest communities, including Milwaukie.

HEAT IMPACTS

Summer temperatures are expected to rise through the century. Since the adoption of the CAP in 2018, The pacific Northwest has experienced several summer events that may summers in the future. The most extreme of those events was the June 2021 heat dome.



Pacific Northwest Heat Dome of June 2021

The June 2021 heat wave which later was became identified as the heat dome stalled over the Pacific Northwest for several days in late June 2021, overwhelming the region with extreme temperatures that broke all-time records. During the last week of June 2021, an exceptional heat wave with no precedent in the modern observational record occurred across Oregon and the Pacific Northwest (Bercos-Hickey et al. 2022, Neal et al. 2022, Thompson et al. 2022, Vescio and Bair 2022, Philip et al. in press). The all-time high temperature records at multiple weather stations were

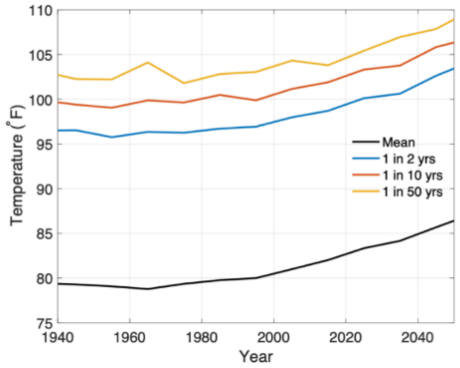
broken by several degrees. Portland's previous record of 107°F broke on 26 June (108°F), 27 June (112°F), and 28 June (116°F). Hundreds of people in the region died due to the extreme heat.

Nighttime temperatures were also extremely warm during this event, although records for warm nights were broken by smaller margins at most major weather stations (for example, 75°F at Portland, breaking the previous record of 74°F.

Research from the University of California at Los Angeles (UCLA) suggest that the heat dome event was a highly improbable 1-10,000-year event. Which begs the question, was the heat dome a result of climate change? A recent study estimated that this heat wave was about two degrees Fahrenheit warmer than it would have been without human influence on the climate (Bercos-Hickey et al. 2022), consistent with the increase in mean temperature. Thompson et al. (2022) estimated that a heat wave of similar magnitude will recur about once in six years by the end of the twenty-first century if concentrations of greenhouse gases do not decrease.

Long Term Trend – Hotter Summers

In Portland during the twentieth century, 100°F temperatures occurred about once every 10 years. By 2025, they are likely to occur about once every two years. Most recently temperatures exceeded 100°F 5 times in 2022, five times in 2021 and two times in 2020. The increasing temeratures are problematic because Oregonians are less likely than residents of most other states to have air conditioners in their homes, leaving residents more vulnerable to high heat. The warmer temeperatures have also resulted in the Oregon Occupational Safety and Health Administration (OSHA) adopting new regulations on workplace heat exposure in May 2022.



Left: Daily maximum temperature during July and August in Portland, Oregon, as simulated by the CESM1 Large Ensemble (a 35-member set of global climate models) from 1940–2050, assuming a relatively high emissions scenario (RCP 8.5). Black line, mean high temperature; colored lines, temperatures that occur once every 2 (blue), 10 (red), and 50 years (yellow). Values are based on simulated temperatures over 10 years. A bias correction was applied to yield a mean 1990–2020 high temperature that matched observations (81°F).

Source: Sixth Oregon Climate Impact Assessment, Oregon Climate Change Research Institute

Vegetation Impacts of the Heat Dome Event

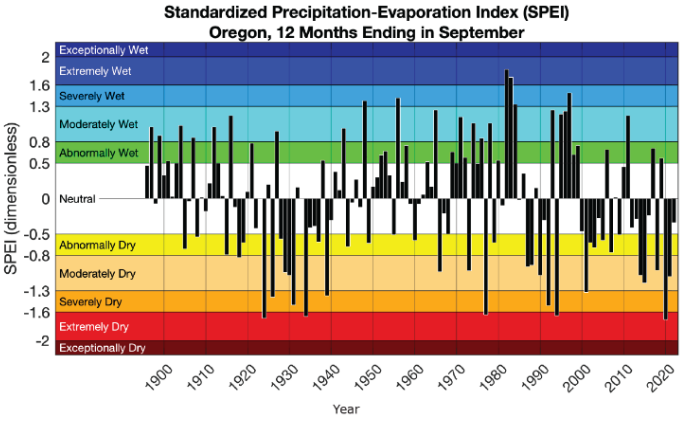
Immediately after the heat dome event there were numerous reports of widespread foliage scorch and leaf drop in multiple tree species in forests on the west side of the Oregon Coast Range and Cascade Range following the event. Western hemlock (*Tsuga heterophylla*) and western red cedar (*Thuja plicata*) seem to have been affected most strongly, but Douglas-fir (*Pseudotsuga menziesii*) and various alder (*Alnus*) and maple (Acer) were also impacted, and recent analyses have suggested the Douglas Fir population has undergone a mass mortality event in Oregon and Washington due to a combination of drought and extreme heat.

PRECIPITATION AND DROUGHT

One of the most significant changes we are already experiencing is a change in historical precipitation patterns. Milwaukie has seen predominantly rain during winters, but the winter snow in the Cascades serves as storage for our rivers, streams, and groundwater. The reduction in snowfall means that in the summer months, our rivers and streams will not have the same quantities of flowing water from the

melting snow. This lower volume of water means pressures on our drinking water supply, agricultural irrigation, habitat for fish species like salmon and trout, water supply to power hydroelectric electricity, and some favorite water recreations such as boating, fishing, and rafting.

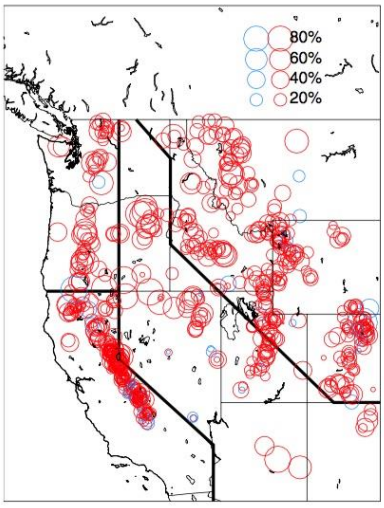
Since 2000, Oregon's precipitation has been below the 100-year average 14 times. Most of Oregon has been in a multiple-year drought, with 2020 being the most severe drought in Oregon history. Years with average or above average precipitation still showed impacts of climate change, with warming temperatures reducing the amount of precipitation falling as snow and stored in snowpack. Lower volumes of snowpack can have significant impacts on drinking water in the region, as many communities rely on slowly melting snow to keep surface drinking water sources cool and consistent. As the impacts of Oregon's droughts becomes more severe each year, vegetation and ecosystems, surface water supplies, water quality, and groundwater recharge rates are impacted, influencing the livability and ecosystem functionality of Oregon communities.



***Left*: Measure of Oregon Drought Intensity over Time**. *Time series of the Standardized Precipitation-Evapotranspiration Index (SPEI) for each water year since 1896 for the state of Oregon. SPEI is a measure of drought intensity and is calculated using data on how much precipitation fell (rain, snow, etc.)) as well as how fast water would evaporate from surfaces and waterbodies, considering the average temperature and wind. During water year 2020, the 12-month SPEI in Oregon was at its lowest value since 1896, making the 2020 drought more severe than any other drought in Oregon's recorded history, including the dustbowl events in the 1930's (white arrow).*

Source: Data from the PRISM Climate Group accessed via the West Wide Drought Tracker, wrcc.dri.edu/wwdt/time, with the following selections: Oregon, SPEI, 1895–2022, September 12-month; accessed 5 December 2022. Sixth Oregon Climate Impact Assessment, Oregon Climate Change Research Institute.

***Below*: Western State Snowpack Declines from 1955 to 2016 (CIRC)** *This figure shows the average snow declines across the American West, calculated by the Climate Impact Research Consortium (CIRC). Each circle represents a U.S. Department of Agriculture or California Department of Water Resources site with at least 40 years of snowpack measurements. What's being measured is snow water equivalent (SWE), or the amount of water you would get if you melted a given amount of snow. Red circles represent decreases in SWE. Blue circles represent increases. The size of any given circle denotes by how much SWE has either decreased or increased. Over 90% of snow monitoring sites with long records in the American West show declines (Mote et al. 2018).*



Source: https://pnwcirc.org/science/hydrology. This Image is licensed under Creative Commons Attribution 4.0 International (CC BY 4.0).

REGIONAL WILDFIRE RISK

The Portland metro region is fairly safe from direct burning due to wildfires, although the urban wildland interface (cities close to the boundaries of agricultural and natural resources land) is susceptible. In the past few years, however, we have experienced more wildfire in the Pacific Northwest, a condition that will increase over the next few decades.

The September 2020 Wildfires

Fresh in the region's memory are the September 2020 Wildfires. The wildfires that started on September 7th, eventually burned almost 1,500 mi2), mostly forested, including more than 11 percent of the Oregon Cascade Range.

Smoke at Milwaukie Bay Park in September 2020 wildfires

The area burned in the western Cascade Range in 2020 equaled or surpassed that in any other year for which records are reliable (Abatzoglou et al. 2021c, Reilly et al. 2022). One of the strongest and driest easterly winds recorded since 1948, combined with vegetation that desiccated over the unusually hot and dry preceding weeks, drove the rapid growth of the fires (Abatzoglou et al. 2021c, Mass et al. 2021, Evers et al. 2022). The fire weather, as measured by a combination of heat, aridity, and wind that is consistent with expansion of wildfire, was more extreme over large areas of western Oregon than recorded since 1979 (Hawkins et al. 2022).

The main wildlife risk to Milwaukie residents will primarily be air quality impacts as surrounding regions burn during the summer months. The adjacent figure provides a comparison of the Air Quality Index records set in 2017 and 2020 because of the fires. In the summer of 2017, the metro area suffered when winds brought smoke from more than 100 fires in British Columbia along with multiple Oregon and Washington fires, including the Eagle Creek Fire in the Columbia Gorge National Scenic Area.

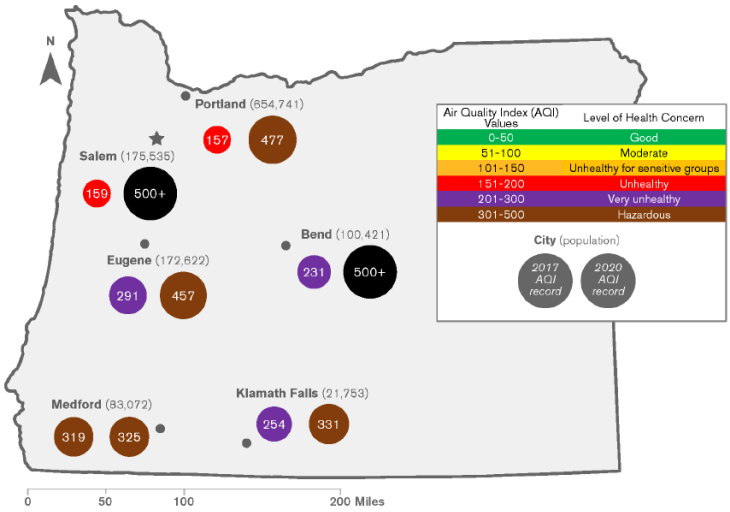


Figure 1. Air Quality Index (daily $PM_{2.5}$ and other health-related pollutants) records set in 2017 (left circle) and 2020 (right circle) in Oregon's six largest population centers.

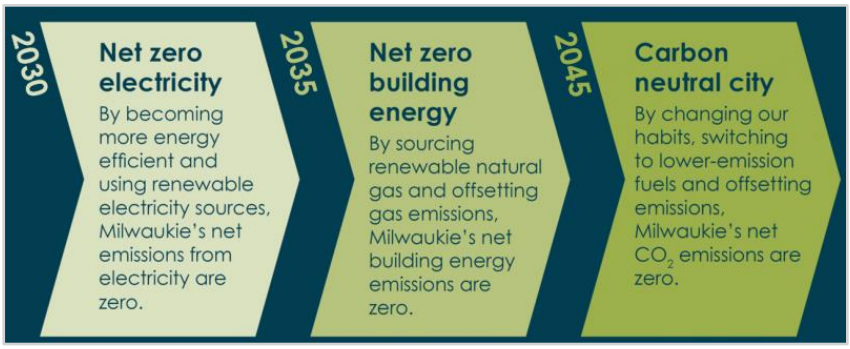
COMMITTING TO CITY-LED CLIMATE ACTION

MILWAUKIE TAKES ON CLIMATE CHANGE

Facing the threat of climate change, the Milwaukie community and city leadership formalized the city's commitment to climate action through the creation of the CAP, the city's first climate strategy document, and new city climate programming.

In 2017, community members and council engaged in the development of the **Milwaukie Community Vision and Action Plan** which included specific goals and actions focused on the planet, environment, and sustainability. In 2017 Milwaukie City Council also adopted 'climate change action' as a council goal, calling for the creation of a strategy document to direct city-led climate action efforts.

The **2018 CAP** was created shortly after through a community engagement process and unanimous adoption by city council. For the last four years, City Council has made climate action a city goal, directing council goal funding and staff resources towards reaching the climate goals outlined in the CAP.



Above: Milwaukie's current accelerated climate goals

ACCELERATING ACTION

Researchers across scientific and economic sectors continue to report on the increasing threat of climate change and the need for more aggressive carbon reduction targets to minimize the worst effects. In January 2020, City Council adopted a resolution to declare a climate emergency. This emergency declaration restated the city's commitment to climate action and accelerated the adopted climate goals by five years (shown above).

For the last four years, Milwaukie has implemented the CAP city-led climate actions to educate and inspire climate-friendly behaviors, institutionalize city climate policy, mitigate the Milwaukie community's contributions to climate change and ensure future resiliency through adaptation strategies and infrastructure.

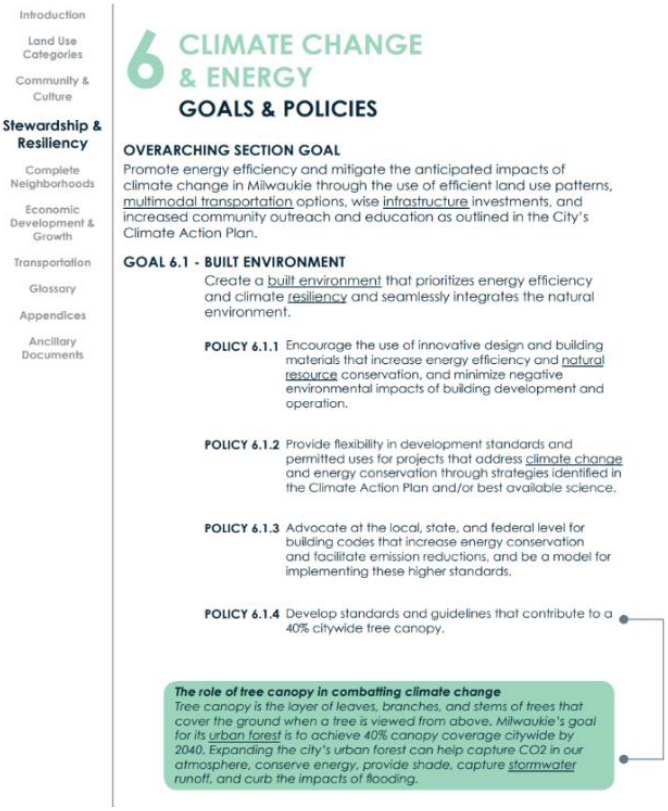
Below: Participants and local leadership at the Milwaukie Climate Action Summit (2018)

CLIMATE ACTION IN CITY PLANNING

Since the adoption of the Climate Action Plan, Milwaukie has been institutionalizing climate action in city operations and incorporating the adopted climate goals or strategies into city code, city programs, policies, and procedures.

A key element of this work is ensuring core city strategy documents address climate change and local climate goals in their analysis and recommendations. Since adoption of the CAP, the following plans and changes to City Code have included considerations to local climate action:

- Urban Forest Management Plan (2019)
- Natural Hazard Mitigation Plan (2019)
- Comprehensive Plan (2020)
- Water Utility Master Plan (2022)
- Wastewater Utility Master Plan (2022)
- Biennial City Budgets
- Transportation System Plan (starting 2023)
- Stormwater Master Plan (starting 2023)
- Land use and development code updates


Introduction
Land Use Categories
Community & Culture
Stewardship & Resiliency
Complete Neighborhoods
Economic Development & Growth
Transportation
Glossary
Appendices
Ancillary Documents
6 CLIMATE CHANGE & ENERGY
GOALS & POLICIES
OVERARCHING SECTION GOAL
Promote energy efficiency and mitigate the anticipated impacts of climate change in Milwaukie through the use of efficient land use patterns, multimodal transportation options, wise infrastructure investments, and increased community outreach and education as outlined in the City's Climate Action Plan.
GOAL 6.1 - BUILT ENVIRONMENT
Create a built environment that prioritizes energy efficiency and climate resiliency and seamlessly integrates the natural environment.
POLICY 6.1.1 Encourage the use of innovative design and building materials that increase energy efficiency and natural resource conservation, and minimize negative environmental impacts of building development and operation.
POLICY 6.1.2 Provide flexibility in development standards and permitted uses for projects that address climate change and energy conservation through strategies identified in the Climate Action Plan and/or best available science.
POLICY 6.1.3 Advocate at the local, state, and federal level for building codes that increase energy conservation and facilitate emission reductions, and be a model for implementing these higher standards.
POLICY 6.1.4 Develop standards and guidelines that contribute to a 40% citywide tree canopy.
The role of tree canopy in combatting climate change
Tree canopy is the layer of leaves, branches, and stems of trees that cover the ground when a tree is viewed from above. Milwaukie's goal for its urban forest is to achieve 40% canopy coverage citywide by 2040. Expanding the city's urban forest can help capture CO2 in our atmosphere, conserve energy, provide shade, capture stormwater runoff, and curb the impacts of flooding.

Additional areas of climate institutionalization into city policy making and processes include:

- Climate legislation updates to City Council
- Climate impact statements required on staff reports to City Council
- Quarterly City Council updates and study sessions on climate goal related topics such as electrical grid regulation and renewable energy credits
- Discussions with departments and staff on city climate goals and project incorporation
- Consideration of low impact development and practices in city improvement projects
- Consideration of consumption emissions in city purchases and sourcing

COMMUNITY ENGAGEMENT

In Milwaukie's climate programming, staff have attempted a variety of engagement tactics to increase program awareness, receive feedback, and engage the community. There are still gaps in community familiarity of city climate and urban forest programs and goals. There are also limited translated resources for climate and urban forest outreach. Ideally, the city could explore more frequent climate engagement efforts as well as focused audience engagement, but staff capacity limits these options until programs can be reprioritized to accommodate the work.

OUTREACH AND EDUCATION MATERIALS

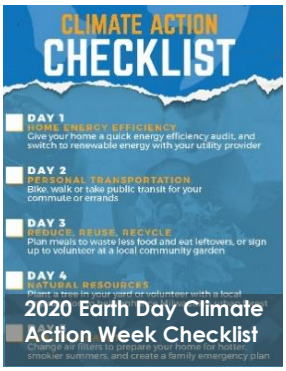
- City newsletter articles
- CAP executive summary and household/business strategies (Spanish translation available)
- CAP posters and brochures
- Tree care informational handouts
- Tree code informational handouts
- Brochures for vegetation codes
- Yard signs with project information
- Car magnets for city vehicles
- Program-specific handouts
- Climate action postcards
- Urban forest t-shirts
- Direct mailings
- Banners

LOCAL AND COMMUNITY LEADERSHIP

- Regular city council presentations and study sessions
- Staff facilitation and participation in Parks and Recreation Board and Tree Board monthly meetings
- Program presentations at neighborhood district association (NDA) meetings
- Networking with local business owners

YOUTH ENGAGEMENT

- Presentations for Clackamas School District clubs and classes
- Presentations for local colleges
- Kids arts and learning activities at city events
- Climate reading challenge for kids



2020 Earth Day Climate Action Week Checklist


2021 and 2022 Milwaukie Arbor Day Shirts


Free trees with carbon value tree tags at 2019 Library Plant Sale

Spanish household actions strategy document

2019 Electric Avenue Grand Opening event, featuring presentation from City and PGE leadership and Forth Ride and Drive event

City-hosted sustainability tour for local non-profit in downtown Milwaukie, featuring urban forest, stormwater and climate topics

Earth Day 2022 event at Willow Place Natural Area

Pumpkin painting with tree giveaway at 2022 Arbor Day

City and PGE staff featured in a video interview with KGW Hello Rose City on city's climate and urban forest efforts

Mayor Gamba presenting at Clackamas Climate Coalition with

PRESENTATIONS AND EVENTS

- Earth Day restoration events
- Arbor Day Celebrations
- Milwaukie Farmers Market Tabling
- Greenspace restoration events
- Tabling at other City events
- Hosted community forums and program informational events
- Sustainability walks and tours
- Presentations at regional conferences
- Home Energy Score expert panels and community forum
- Two Electric Tool Exchange events

ONLINE AND MEDIA ENGAGEMENT EFFORTS

- City social media posts
- Climate Action Week Facebook event
- Virtual community presentations
- Website development for climate action and urban forest resources
- Climate GIS storymap
- Educational videos for city YouTube channel
- Interviews for local newspapers
- Interviews with TV news stations
- Coordination of news channel PSAs for water quality coalitions
- Podcast interviews
- Email blasts to residents
- Online surveys
- Engage Milwaukie project pages

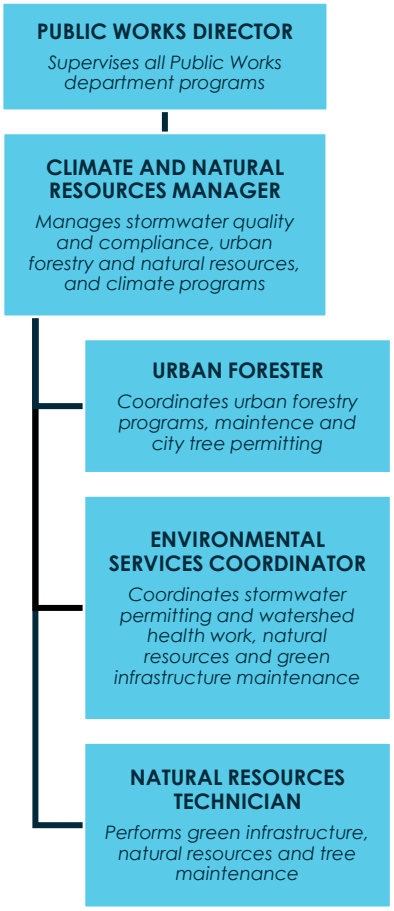
REGIONAL COLLABORATION

- Participation in multi-organizational and government workgroups
- Informational presentations for regional jurisdictions and community groups
- Networking with regional climate, urban forest, and environmental justice nonprofits
- Coordinated multi-jurisdictional outreach materials and

FUNDING MILWAUKIE'S CLIMATE WORK

EXISTING FUNDING STRUCTURE

Since adoption of climate as a goal in 2017, climate action has been renewed annually as a Council and city priority. In 2018, Council directed the city to allocate funds towards the creation of the CAP and the implementation of its programs. After adoption of the CAP in 2018, the public works department hired the city's first dedicated climate staff person to implement the strategies and actions in the CAP.



Identifying program overlap and potential opportunities to better implement the natural resource CAP goals, the city expanded the original climate position to include management of the city's natural resources team and related green infrastructure and watershed health programming. The climate and natural resources manager will continue to work under the public works director to develop and manage the city's climate and natural resource programming and initiatives.

Milwaukie's combined two-year budget for both climate and natural resources work is approximately $1.2 million dollars. Of that budget, $420,000 per biennium ($210,000 per year) is directly focused on the City's Climate programs and is funded through a combination of general funds (60%) and utility funds (40%). This budget provides for personnel expenses for the Climate and Natural Resources Manager and Urban Forester ($160,000 per year), as well as program costs for outreach and education ($50k per year). These program costs have primarily been used for contracting consultants to perform community analysis (including GHG inventories, carbon calculators, and climate fund structure options).

The remaining budget is broken down with approximately $406,000 towards stormwater quality and compliance and $377,000 towards urban forestry work focusing on public tree programs and education, and tree permit administration.

CURRENT PROGRAM RESOURCE CONSTRAINTS

As seen by the variety and number of actions in the CAP, it is no small lift to offer the breadth of programs and incentives required to reach community carbon neutrality. For each action, staff has had to build an entire program or partnership. In some cases, the city has not had the time or capacity to initiate that work.

With over 53 actions listed in the plan to implement, city staff have reached a threshold where starting work on additional actions in the CAP or expanding community outreach and education initiatives is beyond current capacity. Any additional work would require procurement of additional resources or the elimination of ongoing actions to free up capacity. Since staff have already prioritized CAP actions with the greatest emission reduction benefits or community co-benefits, eliminating existing programs and projects may lead to greater gaps in reaching Milwaukie's adopted climate goals.

EXPLORING LONG-TERM CLIMATE FUNDING

When City Council adopted climate as a goal in 2022, they directed staff to explore potential options for funding Milwaukie's future climate programming. Working with consultants, staff facilitated a City Council discussion exploring a variety of funding mechanisms that could help address resource gaps and continue Milwaukie's climate programming. City Council directed staff to proceed in developing a funding framework that considered land use and associated greenhouse gas (GHG) emissions to reflect a property's relative contribution to community emissions from energy and transportation perspectives. After several discussions with City Council, it was decided to defer further discussion of climate funding until the newly elected members are in office.

In 2023, staff will present City Council with a funding structure for Milwaukie's climate programming and provide a recommended timeline for additional engagement, depending on City Council's interest.

2022 climate fund outreach graphic used to explain where revenue could be expended to help meet adopted CAP actions and goals

CLIMATE FUND ACTION TIMELINE

APRIL 2023

Pilot Article
- General info

4/18 Council Session
- Climate Financing Review
- Fee structure
- Funding opportunities

MAY 2023

Pilot Article
- General info

Attend NDA Meetings

Submit Op-ed #1

JUNE/ JULY 2023

Pilot Article

Engage Milwaukie

Submit Op-ed #2

NDA Meetings continue

June/July Townhall

July Council Session
- Discussion

AUGUST/SEPT 2023

Pilot Article
- Survey results
- Adoption/ effective date

Utility Bill Stuffer
- All customers

Council Session
- *Adoption?*

If adopted…
Fee change mailer

JANUARY 2023

CLIMATE FEE IMPLEMENTATION
JAN 1 2024

Pilot Article
- Adoption / effective date

Utility Bill Stuffer

SPRING 2024

Climate Fee Report
- *2024 Work Plan*
- *Progress Metric Establishment*

CAP ACTION-LEVEL UPDATES 2018-2022

Milwaukie's Climate Action Plan contains 53 city-led actions to reach the adopted carbon goals. A detailed overview of each action was created in the CAP development process and available online for review. Overall, Milwaukie has been extremely successful in its implementation of the CAP and institutionalization of climate actions into city processes and operations. Of the 53 city-led actions outlined in the CAP, **40 actions are in a stage of implementation, and seven actions have been completed or completed with ongoing management** (some actions split for status updates, see action status summary table).

Part of the success in implementation is due to:

- Establishing a network of regional small government staff and leadership to share ideas and feedback on right-sizing programs
- Leveraging existing utility, state, and non-profit programs for community member incentives
- Identifying incentives for customers or community partners that leverage administrative processes or staff time
- Prioritizing high emission reduction actions, even if they're less visible to the community
- Allowing flexibility in program design and implementation

ACTION STATUS LISTING:

The following action-level updates are presented by strategy area (building energy, natural resources, etc.) and will include a brief topic overview and review of significant regional updates if applicable that may affect the actions within that section. The action status of each action are listed as:

NOT STARTED: No work directly on or related to this action has been performed to date.

IMPLEMENTING: City is investing resources and attention to the action, including monitoring, engaging in regional conversations, promoting existing resources, planning, or managing active projects or programs.

COMPLETED: The main deliverable of this action has been accomplished. No more city work is expected.

COMPLETED - ONGOING: The main deliverable of this action has been accomplished but requires continued maintenance or program management.

ACTION STATUS SUMMARY TABLE

CAP ACTION TOPIC	TOTAL TOPIC ACTIONS	NOT STARTED	IMPLEMENTING	COMPLETED	COMPLETED + ONGOING
BUILDING ENERGY AND EFFICIENCY	10	-	9	-	1*
VEHICLES AND FUELS	9	1	7	1	-
LAND USE AND TRANSPORTATION	14	1	10	2	1
MATERIALS USE, PURCHASING AND RECOVERY	7	2	4	-	1
NATURAL RESOURCES	9	2	6	-	1
PUBLIC HEALTH AND EMERGENCY PREPAREDNESS	5	1	4	-	-

** Building Energy and Efficiency action related to energy scoring and disclosure has been reported as separate action statuses for residential (completed ongoing) and commercial (implementing) due to difference in programming requirements.*

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BUILDING ENERGY AND EFFICIENCY

Building energy is one the largest sectors of emissions in Milwaukie, comprising 44% of Milwaukie's 2020 local emissions. This is a decline from the 2016 GHG inventory due to progression in decarbonization efforts at the utility and state scale along with city initiatives like the actions listed below. The building energy sector encompasses the emissions from the use of fuels and energy sources to operate equipment, run lights and technology, and power heating and cooling systems. The building energy CAP actions address the carbon intensity of the energy source (electricity, methane, and other fuels) as well as the energy efficiency of the building and assets used and are a staff priority due to the significance of the emission reduction potential.

REGIONAL UPDATES

EXECUTIVE ORDER 20-04 / CLIMATE PROTECTION PROGRAM

In 2020, Governor Brown signed Executive Order 20-04, an administrative order with a wide scope to reduce GHG emissions in Oregon by at least 80 percent below 1990 levels by 2050. To address these emission targets, Oregon departments including the Department of Environmental Quality (DEQ) were tasked with implementing initiatives in their authorities. In 2021, Oregon DEQ presented the state's new Climate Protection Program. This program establishes emission caps for large emitters in the state and lowers the caps over time until emission targets are met. NW Natural and other gas utilities will be subject to these requirements.

HB 2021, HB 2475 AND HB 2842 CLEAN ENERGY AND EFFICIENCY RELATED LEGISLATION

In 2021, Milwaukie staff and other stakeholders contributed to the drafting and adoption of Oregon HB 2021. This clean energy legislation established new mandates for electricity providers to decarbonize their grid mix in Oregon to 80% by 2030, 90% in 2035 and 100% by 2040. It included additional requirements for environmental justice in utility processes, resiliency investment opportunities, and outlined structural foundations for new community renewable products (see Action BE1). Additional legislative packages passed in 2021 with impacts on energy and buildings included a bill to address low income rate protection (HB 2475) and a bill dedicating funding to home weatherization programs (HB 2842)

KEY PROJECT HIGHLIGHTS

GREEN FUTURE IMPACT

In 2019, Milwaukie advocated for the development of a new PGE renewable power product called Green Future Impact (GFI). The product offered customers with larger energy use to sign a 10- or 15-year contract with PGE to purchase renewable power from a new development to be sited in Oregon. Milwaukie was eager to participate for its operational electricity use as its existing renewable product purchase through PGE used an offset-like mechanism that didn't meet Milwaukie's goal for 100% of its energy supply to be carbon-free. After the tariff passed in 2019, the GFI product was designed and advertised a new renewable facility to be built in Oregon and connected to PGE's grid. This would satisfy the cities adopted goals with estimated lower subscription rates.

The day of the subscription release, Milwaukie and other large customers across PGE's territory sent in their requests for participation. The product maxed out its available subscriptions within minutes, and Milwaukie succeeded in getting a spot for its operational load. In 2020, Council signed a 15-year contract to subscribe to 100% of Milwaukie's operational power through GFI. In 2023, after some regulatory delays, the new solar development named 'Pachwáywit Fields' will go online.

RENEWABLE ENERGY:
Energy or fuel types that are created with 'renewable' resources. This can include solar and wind energy, but also biomass energy from burning wood which produces carbon emissions. Large hydropower is not considered renewable.

CARBON-FREE ENERGY:
Energy or fuel types that are created with no carbon emissions and consumed with no carbon emissions. This can include large hydropower but excludes biomass and biofuels due to their emissions when burned.

The new GFI product was offered at a rate almost a quarter of the cost of previous PGE renewable offerings. Milwaukie will save over $700 per month through program participation, or roughly $8,500 a year compared to its previous renewable subscription. The city will see savings of 1,377 metric tons of CO_2 and will now be powering its facilities, streetlights, and electric vehicles with 100% carbon-free power.

Next steps: Milwaukie has already executed the contract with PGE for GFI. Staff will need to monitor they city's operational power use to ensure the city purchases enough to balance its use.

COMMUNITY GREEN TARIFF

Starting in 2019, Milwaukie explored a potential new renewable energy product for investor-owned utilities like Portland General Electric (PGE) to offer the community a more climate friendly option.

The product would require customers to choose to opt-out instead of opting in to participate, avoiding the extensive outreach program required for opt-in products and incorporating community goals into PGEs customer processes. This new community renewable product would allow cities to influence where the energy comes from, incorporate new technology and community programs into the product, access cheaper energy sources through economies of scale and reduced risk for investors, and still allow for personal choice by the customer. An initial PGE survey of 380 Milwaukie customers indicated customer support for the overall concept of community-specific renewable products (full survey and PGE presentation available online).

City staff has prioritized this project because it uses our existing utility relationships and has the potential to close the gap in reaching Milwaukie's 2030 emission reduction goal. The city and PGE made progress on product design and cost modeling in 2019 and 2020, but the potential for Oregon Public Utility Commission (PUC) delay and uncertainty around program structure led to a pause in the product design in 2020 to wait for guiding legislation in the 2021 session. Milwaukie rallied other communities to advocate for the legislation, which was ultimately passed by the Oregon Legislature.

Next steps: Milwaukie is now working with regional cities, PGE, and the PUC to clarify the development and approval process and review draft language submitted by PGE at the end of 2022. In the coming years, staff will need to review and revise the proposals and develop a plan to engage the community on the potential product design and supported cost. As timelines are constantly shifting for this project, staff will create a plan for action once the product development and adoption process is clarified with the PUC.

RESOLUTION TO ELECTRIFY CITY-OWNED BUILDINGS

Through 2022, City Council held discussions regarding the climate impacts of natural gas as an energy source. A Council-led discussion, staff did not become involved until late 2022 when Council discussed the possibility of transitioning from fossil fuel infrastructure and the electrification of buildings in the community to meet the CAP's 2035 net-zero building energy goal. City Council directed staff to develop requirements for replacing aging or failing natural gas infrastructure in city-owned buildings with electric options and requiring building electrification when significant city-owned building investments occur.

In December 2022, staff presented City Council with a proposed resolution to accomplish these efforts and City Council voted to adopt the resolution to advance the decarbonization of city buildings. The resolution establishes electrification requirements and retrofits for city-owned or city-financed buildings. The resolution requires that a feasibility study for Milwaukie's buildings be performed and made replacement of inoperable fossil fuel systems with electric options effective immediately. The requirement for existing and operable fossil fuel system replacement with large city building investments or renovations would begin on July 1, 2024. The resolution also outlines exemption opportunities and flexibility to account for project and financial feasibility and consideration of alternatives to maximize emission reduction.

Next steps: Staff will prepare the feasibility study required by the resolution based on the timeline below.

CITY-OWNED BUILDING DECARBONIZATION TIMELINE

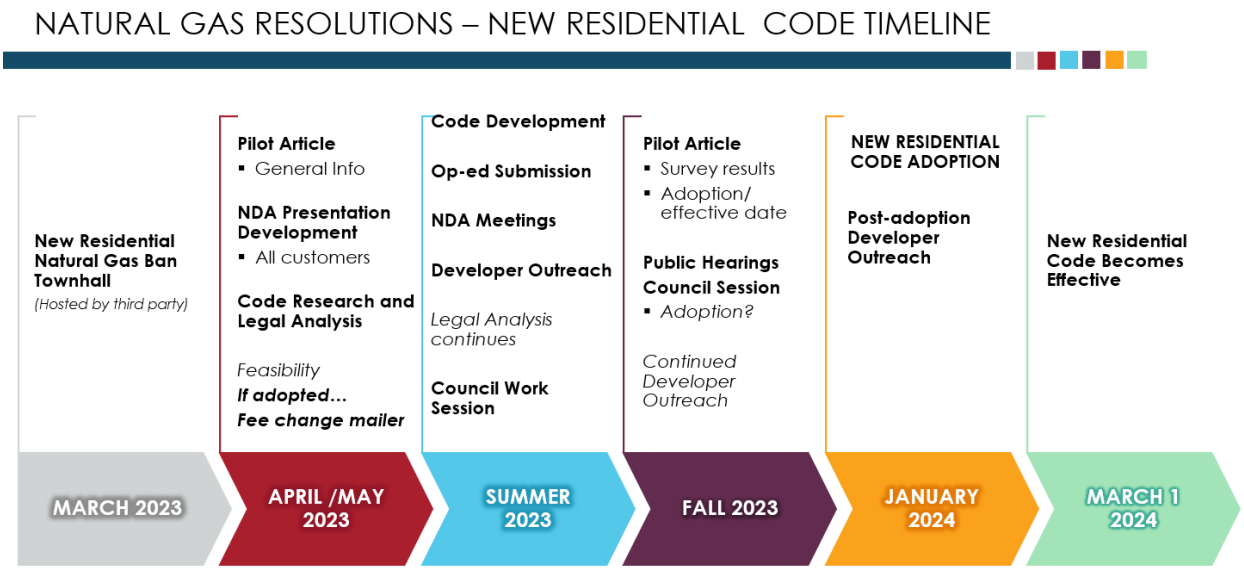
RESOLUTION TO DECARBONIZE RESIDENTIAL NEW-CONSTRUCTION

The use of and continued reliance on natural gas and other fossil fuels contributes to community emissions. As technology advances, building electrification becomes more efficient and cost effective, and when electrified buildings are powered with carbon-free electricity, the building sector is decarbonized. This will be essential to reach Milwaukie's net-zero building emission by 2035 goal. Regional conversations about phasing out emission-intensive fossil fuels and the public health impacts of natural gas on indoor air quality have also intensified. With Oregon's state-mandated building code effectively preempting local jurisdictions from modifying building code standards based on community interests, Oregon cities have historically had limited ability to influence the fuel use from buildings through building design including electrification requirements.

Cities have also been discussing the option of preventing new connections to natural gas infrastructure rather than influencing the design of the building, with the City of Eugene being the first in Oregon to develop resolutions attempting to implement this approach and adopting local code banning new connections to fossil fuel infrastructure in low-rise residential development in 2023.

In December 2022, the City Council adopted its own resolution requiring the decarbonization of residential new construction. The resolution impacts new developments of residential housing. The resolution directs city staff to develop code language to implement the ban on new connections to fossil fuel infrastructure for new residential housing and begin community conversations to explore future options to reduce fossil fuel use in commercial and industrial buildings.

Next steps: Should the City Council continue this goal and prioritize this over other policy items, or should it pass a climate fee, city staff will begin this work in 2023, starting with outreach and engagement and draft code development. This will require third-party outreach assistance and Council outreach efforts. Potential legal challenges to the code will mean further resource investment into this project.



BUILDING ENERGY AND EFFICIENCY ACTIONS

WORK WITH PGE TO BECOME "NET ZERO" FROM ELECTRICITY BY 2030

ACTION STATUS: IMPLEMENTING

Milwaukie staff work extensively with PGE and energy stakeholders to reduce electricity emissions and promote electrification. Current legislation and renewable energy products and program s bring Milwaukie closer to the 2030 goal but do not meet the city's more aggressive climate timelines. More PGE and City collaboration is needed to increase renewable energy options and address customer-side infrastructure and behavior changes required to reach the 2030 carbon free electricity goal.

IMPLEMENTATION SUMMARY:

From 2018 to 2022, Milwaukie has been building its relationship with PGE staff and coordinating on efforts to move the city towards its adopted 2030 goal. Formalized through an adopted Memorandum of Understanding in 2020, City staff and PGE coordinate on strategic outreach, like the Climate Collaborative campaign, a multi-stakeholder effort to increase awareness of the city's climate goal through online climate pledges and coordinated events and volunteerism, as well as specific events and programs to expand renewable energy and electrification.

Milwaukie is often piloting new programs with PGE due to this relationship: the Climate Collaborative, Electric Tool Exchange (gas power equipment swap), Smart Grid Test Bed (Demand response programming), Electric Avenue chargers, and utility on-pole charging have all been piloted in Milwaukie before other communities. This brings previously unavailable opportunities and incentives to the Milwaukie community and reduces barriers for PGE program research and learnings.

Sharing PGE and Dark Horse Comic's 'Climate Keepers' educational comic at the Milwaukie Farmers Market

PGE and Milwaukie staff demonstrate battery tools at the Electric Tool Exchange

The city has coordinated discussions with council and stakeholders to clarify Milwaukie's carbon goals and further define the carbon-free energy requirements needed to reach them. Milwaukie continues to lead PGE and regional stakeholders to accomplish more carbon-reduction efforts that align with this city goals.

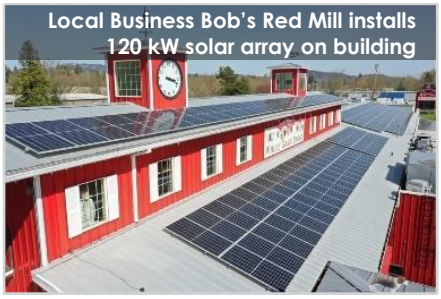
Waverly Greens Apartments in Milwaukie receives almost $100k in PGE and ETO incentives for largest residential solar array in PGE territory (400 kW)

IMPLEMENTATION HIGHLIGHTS:

Ongoing city implementation:

- Coordination of ongoing joint PGE/Milwaukie outreach events and tabling efforts at city events and farmers markets
- Participation in the Energy Trust of Oregon Strategic Energy Management Program for city facility energy efficiency
- Development of new community green tariff for Milwaukie-customized renewable energy product
- Implementation of the adopted a resolution to electrify city-owned buildings and development of a feasibility assessment
- Implementation of the adopted resolution to decarbonize residential new development including extensive intensive community engagement around code development for residential development and feasibility analysis of commercial and industrial development
- Exploration of including electrification and renewable program incentives in Home Energy Score reportcards
- Participation in upcoming reviews of PGE's Clean Energy Plan in response to state decarbonization mandates
- Continuation of PGE/City monthly meetings to coordinate projects and initiatives
- Updating of the created city climate website with program resources, plans to update with local, state, and federal electrification incentives


PGE's All-Electric Tiny Home at 2022 Milwaukie Arbor Day Celebration


Local Business Bob's Red Mill installs 120 kW solar array on building

PGE and Milwaukie Voodoo Donuts at Electric Avenue Grand Opening

Completed work:

- Contracted for 100% carbon free electricity for city operations through Green Future Impact with cost and carbon emission savings
- Held a recurring a regional workgroup for government staff focused on upcoming energy policies
- Hosted the PGE Smart Grid Test Bed, including a Milwaukie-specific community engagement coordinator located at city facilities
- Promoted solar energy in Milwaukie, with the community reaching the adopted 2.2 MW by 2021 solar goals through numerous residential and commercial installations
- Updated downtown streetlights to LED adaptive lighting units

- Completed construction of Ledding Library with solar array and participation in Energy Trust of Oregon's Path to Net Zero program
- Installation of Electric Avenue PGE EV chargers
- Assisted in the development and advocacy for the successful passage of significant climate and energy legislation, including the HB 2021 100% Clean Energy for All Act
- Coordinated with PGE on the design of the Community Climate Collaborative outreach campaign and implemented in separate campaigns in 2021 and 2022.
- Held two PGE Electric Tool Exchange events with significant community participation and tool turn in
- Created carbon accounting calculator to determine 'gap' in clean electricity to reach 2030 goal
- Included energy decarbonization policies in the 2020 Comprehensive Plan
- Hosted PGE's all-electric tiny home to demonstrate electrification technology

ENGAGE NW NATURAL TO DEVELOP STRATEGY FOR BECOMING "NET ZERO" FROM NATURAL GAS BY 2035

ACTION STATUS: IMPLEMENTING

CONCERNS AROUND NATURAL GAS AND ALTERNATIVE FUELS:
Methane gas, marketed as 'natural gas' is a primary contributor to community emissions through natural gas electricity generation, gas powered buildings and operations, and gas emitted from waste processing. When burned, natural gas produces several air pollutants impacting respiratory health. The harmful indoor air quality impacts of leaking or burned natural gas has led to numerous public health concerns around natural gas infrastructure in homes and businesses, particularly for vulnerable communities.

WHY TRANSITION AWAY FROM NATURAL GAS?
Natural gas is methane gas, which emits carbon emissions and harmful pollutants when combusted for heat and energy. The use of natural gas inside increases public health risks for vulnerable communities and continues community reliance on carbon-intensive fuel sources. As electric utilities transition to 100% carbon-free electricity by 2040, reducing natural gas use and electrifying buildings and technology where possible will lead to large reductions in community emissions and positive community health benefits.

To lower net carbon emissions from gas use, governments and utilities are looking at investing in biofuel alternatives to fracked and drilled gas. Methane gas captured from agricultural, solid waste and wastewater utility systems can be reinjected into the pipeline and marketed as renewable natural gas (RNG) due to the 'renewable' nature of the feed stock. While RNG can have valuable uses and is viewed as having less net-emissions due to the utilization of existing waste streams, RNG has equivalent emissions when burned as fracked or drilled methane gas products. Offset programs offered by gas utilities (like NW Natural Gas' Smart Energy program) typically fund the construction of anaerobic digesters on farms and wastewater processing plants to create RNG. The high cost of RNG projects combined with the low production output reduces the feasibility for use of RNG to replace current community gas consumption. As another fuel alternative option, industries have been exploring thermal gasification processes that create methane synthetic fuels through conversion of biomass like wood pulp and solid waste, as well as power-to-gas options for the creation of hydrogen through electricity and water.

In ODOE's 2018 Biogas and Renewable Natural Gas Inventory, ODOE identifies the gross potential for RNG production in Oregon when using anaerobic digestion technology is enough to meet about 4.6 percent of Oregon's total yearly use of natural gas. Using thermal gasification technology could increase this to about 17.5 percent of Oregon's total yearly use of natural gas.

To date, only one thermal gasification plant in Nevada has successfully produced synthetic crude oil from waste and is currently in the process of expanding operations to commercial scale for aviation fuels. While new locations for additional facilities are being identified across the nation, the industry faces pushback from environmental justice and community advocates due to air quality concerns. A thermal gasification plant being constructed in Oregon for the conversion of reclaimed woody debris may be facing foreclosure before operations have started. To address the feasibility challenges highlighted in recent U.S. DOE workshops on thermal gasification, US DOE has directed significant funding to research and project assistance for the biofuel industry.

IMPLEMENTATION SUMMARY:

Since the adoption of the CAP, the city and NW Natural Gas have discussed the programs and strategies that NW Natural currently or intends to offer customers to reduce the emissions they generate from burning methane gas. As Milwaukie and other climate-forward communities identify emissions sources with existing opportunities for reduction, electrification of the building sector with carbon-free electricity is repeatedly highlighted as low hanging fruit with significant emission savings. While staff City staff primarily focus program attentions on furthering electrification and carbon-free energy, outreach materials and community resources contain information on NW Natural's offset programs.

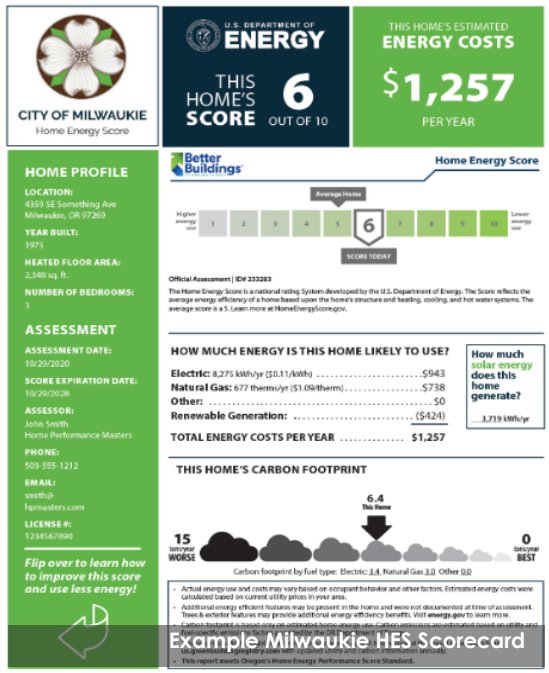
In the coming years, the city will focus more climate program resources on addressing natural gas through implementation of the two recently adopted resolutions addressing city building electrification and natural gas in new residential development. In this work, the city will have the opportunity to hold focused conversations with NW Natural and the community to discuss the challenges of building electrification for commercial and industrial buildings and identify areas of potential collaboration that meet Milwaukie's climate goals.

IMPLEMENTATION HIGHLIGHTS:

- Held multiple council presentations and public discussions on natural gas infrastructure and community carbon, resiliency, and public health impacts
- Adoption of resolution to ban new connections to fossil fuel infrastructure for residential development
- Adoption of resolution to require the systematic electrification of city-owned buildings
- Shared NW Natural's carbon offset programs in outreach materials and resident resources
- Participation in the Energy Trust of Oregon Strategic Energy Management Program for city facility energy efficiency
- Upcoming implementation of the adopted resolution to decarbonize residential new development including extensive intensive community engagement around code development for residential development and feasibility analysis of commercial and industrial development
- Included energy infrastructure language in the 2020 Comprehensive Plan which would support green hydrogen opportunities in the city

ADOPT A COMMERCIAL AND RESIDENTIAL BUILDING ENERGY SCORE PROGRAM BASED OFF OF CITY OF PORTLAND'S PROGRAM

ACTION STATUS:
RESIDENTIAL - COMPLETED/ONGOING
COMMERCIAL - IMPLEMENTING



Milwaukie HES Scorecard (example)

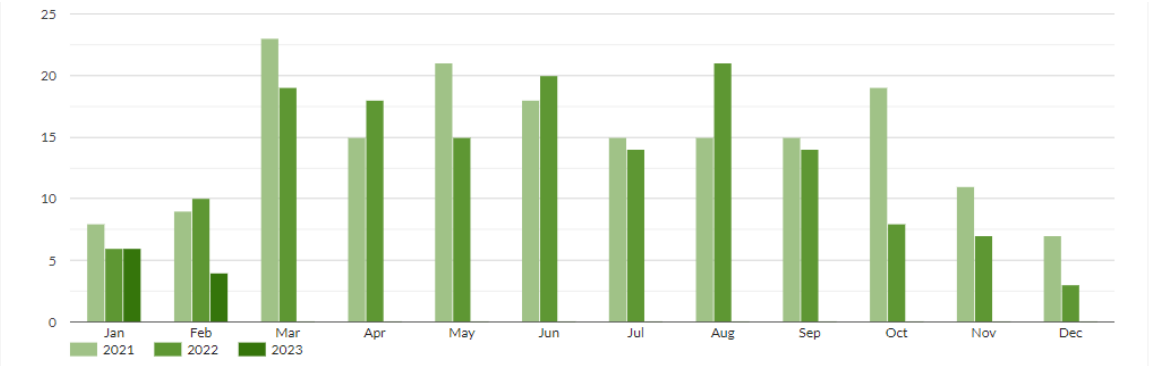
Residential Program Development:
In 2019, the city began development a residential building energy scoring and disclosure program through US Department of Energy's Home Energy Score methodology and modeled after Portland's existing program. In this program, home assets and structures are scored from 1 (higher energy use) to 10 (lower energy use) and efficiency recommendations are provided with the best return on investment. Milwaukie partnered with Oregon Department of Energy (ODOE) and Earth Advantage for program development assistance and access to resources like Earth Advantage's US Green Building Registry.

Staff informed the community through stakeholder conversations and community learning opportunities including a community forum and online webinar. In January 2020, city council passed an ordinance to adopt Residential Energy Performance Rating and Disclosure language into city code (MMC 16.40) with program implementation beginning October 2020. Milwaukie partnered with Community Energy Project, a local environmental justice non-profit with building energy programming and assistance, to perform no cost HES assessments for qualified milwaukie residents.

After adoption, Milwaukie created a Home Energy Score resource portal on the city website. Milwaukie climate staff performed monitoring and initial enforcement of the program as well as post-adoption outreach and education with real estate industry stakeholders and assessors. Monitoring and enforcement of the program reduced in late 2021 and 2022 due to unexpected home sale timelines outpacing monitoring capacity and eventual prioritization of other CAP programs. Staff are revisiting the monitoring process for 2023 enforcement.

Since adoption, the U.S. Green Building Registry has recorded 379 Milwaukie HES Scores. The average existing home energy score is 4.3 out of 10, but if HES scorecard recommended efficiency improvements are made, this could increase to an average score of 7.1. If all scored homes made the recommended improvements there would be an average of $336 annual energy cost savings, or $500 for homes scored HES 4 or below.

Milwaukie Home Energy Scores by Year (2021 – 2023)
Source: US Green Building Registry



Commercial Program Development:
Staff have engaged with Portland commercial building staff on program structure and learnings. Staff participate in regional workgroups to explore local commercial disclosure programs and stay up to date on existing program models. As Milwaukie's large commercial building inventory is low and few provide state-mandated reporting data, staff have not identified an existing working model for Milwaukie or committed resources to designing a program from scratch.

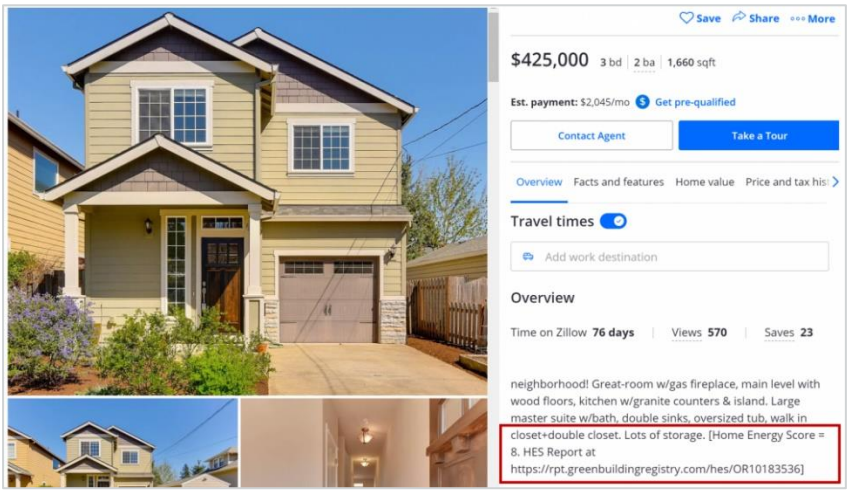
IMPLEMENTATION HIGHLIGHTS:

Ongoing:

- Outreach, monitoring and enforcement of HES program
- Evaluation of program workflow to reduce administrative resources for ongoing program management

Completed:

- Developed and adopted Residential Energy Performance Rating and Disclosure Code program framework, administrative procedures, and low income assistance program
- Held HES Community Forum with guest speakers from Oregon Department of Energy, City of Portland, and Earth Advantage to educate residents and provide opportunity for community to provide feedback and hosted two informational webinars about the Milwaukie Home Energy Score program



Left: Displaying a Home Energy Score on an online home listing advertisement

DEVELOP MICRO-GRIDS AND ENERGY STORAGE SYSTEMS IN CONJUNCTION WITH PUCHASING RENEWABLE POWER

IMPLEMENT SOLAR, BATTERY STORAGE, AND MICROGRIDS FOR RESILIENCE IN WEATHER EVENTS

ACTION STATUS: IMPLEMENTING

Addressing both microgrid and resilience related actions, the city has explored microgrid, resilience hubs and grid infrastructure improvement projects with PGE and advocated for deployment in Milwaukie. During legislative processes, staff ensure inclusion of city projects into advocacy of potential utility and state initiatives.

IMPLEMENTATION HIGHLIGHTS:

- Inclusion of resilience and storage projects into HB 2021 community green tariff program areas
- Identification of upcoming federal block grants for city facility energy resilience improvements
- Discussions with PGE on utility-specific grant opportunities

WORK WITH PGE TO IMPLEMENT DEMAND RESPONSE PROGRAMS

ACTION STATUS: IMPLEMENTING

PGE offers a wide array of demand response programs. These programs assist with balancing spikes in electricity demand at common times by incentivizing behaviors and technology that shifts energy use. PGE's Peak Time Rebate program alerts customers of expected high demand days, while Smart Thermostat and Smart Water heater programs allow the utility to slightly adjust temperatures or pre-heat or cool homes and water heaters distribute the demand over more hours.

In 2019, Milwaukie became a testbed city for PGE's Smart Grid Test Bed (SGTB) program. This pilot project selected substations in Milwaukie, Hillsboro, and Portland with diverse customer types to test demand response programs and technologies in and perform enhanced community outreach. Milwaukie hosted a PGE employed a Milwaukie-specific SGTB outreach staff person who worked out of the Johnson Creek Facility during program implementation. City staff coordinated outreach and events with the SGTB team and participated on SGTB community discussions, including PGE-led technical design and equity-focused workgroups.

PGE Smart Grid Test Bed Logos

The city and PGE continue to cross-promote information about demand response programs in the ongoing climate collaborative outreach campaigns and on the city's climate webpages.

IMPLEMENTATION HIGHLIGHTS:

- One of three pilot cities in PGE Smart Grid Test Bed program
- Hosted PGE community-focused staff at city facility and assisted in design and feedback of demand response programs offered to the community
- Continued coordination on outreach and education of demand response incentive programs in city outreach and community engagement

ACTION: ADVOCATE FOR MORE ENERGY EFFICIENT STATE BUILDING CODES

ACTION STATUS: IMPLEMENTING

As Oregon preempts local governments from setting their own building code requirements, staff have participated in Building Codes Division (BCD) workgroups as made updates to the Oregon Reach Code, a statewide option energy construction standard approved by BCD. Both the Residential and Commercial Reach Codes outline construction requirements that are more energy efficient than the state code while following state requirements of remaining fuel neutral in its requirements. Typically, the Reach Code is used as the next version of the base building code and forecasts coming changes in design requirements.

Recently, BCD has been working with building energy advocates, local governments and building sector stakeholders to develop the next version of the code and to address the emission reduction targets directed by EO 20-04. Milwaukie has participated in some technical discussions and supports building energy advocacy groups in their work to push for greater efficiency standards in the Reach Code.

In 2021, City staff and City leadership were significant advocates and conveners for the HB 2398 Reach Code bill, which would allow local governments to adopt the Reach Code as the baseline building code for their jurisdiction. Milwaukie and other jurisdictions supported this bill for its building sector emission reduction benefits and continuation of regional consistency of code language. Unfortunately, the bill did not pass that legislative session.

IMPLEMENTATION HIGHLIGHTS:

- Continued participation in Zero Energy Ready Oregon coalition for building decarbonization advocacy and policy making
- Submitted testimony for the HB 2398 Reach Code and advocated for support among regional city staff and policy makers

INCENTIVIZE PROPERTY OWNERS TO ENCOURAGE MULTIFAMILY HOUSING ENERGY EFFICIENCY UPGRADES

ACTION STATUS: IMPLEMENTING

Through Milwaukie's climate program implementation, the city has formed partnerships with a variety of energy and environmental justice organizations that offer incentives for multifamily housing energy efficiency improvements. PGE, Community Energy Project, Electrify Now, and Energy Trust of Oregon all have local incentives the city promotes in community outreach. While the city does not have its own incentive program yet, city staff have advocated for funding source inclusion in energy legislation and are monitoring upcoming federal grants for program funding opportunities.

IMPLEMENTATION HIGHLIGHTS:

- Collaborated with non-profits and energy stakeholders to promote existing incentives for multifamily housing and explore potential partnerships pending future funding

DEVELOP A COMMUNTIY SOLAR PROJECT

ACTION STATUS: IMPLEMENTING

To explore community solar project feasibility, staff worked with the Bonneville Environmental Foundation (BEF) to perform an assessment of city facilities to see if hosting a solar facility could be done. BEF concluded that city roof space was not adequate for a community solar installation. The city is exploring additional ways to develop community solar for Milwaukie, including promoting regional community solar projects and programs through partnerships with Solarize Oregon, Energy Trust of Oregon, and reginal solar developers. The city is also implementing utility-scale solar initiatives for the community through the community green tariff work with PGE and advocating for grid-wide decarbonization.

To reduce barriers to solar installation, staff prioritize processing of solar electrical permits in the queue. In 2017, Milwaukie held a well-received community bulk-buy solar program called Solarize Milwaukie. In 2019, staff worked with Energy Trust of Oregon and Solar Oregon to offer another year of a similar program, but unfortunately this work was cancelled in 2020 due to the pandemic. Milwaukie staff have performed outreach with local stakeholders to promote solar, including past presentations at Milwaukie-based solar walking tours.

As of 2022, Milwaukie has 2.3 MW of solar, and met the community goal of 2.2 MW by 2021. Local businesses like Bob's Red Mill, residential rooftop solar arrays, and multifamily arrays like Waverly Green Apartment's 400kw array (the largest residential array in PGE territory when installed) contributed to these values.

IMPLEMENTATION HIGHLIGHTS:

- Performed assessment of city facilities for potential community solar projects
- Advocacy and development of utility-scale solar generation products, including work on HB 2021 and the developing community green tariff

Aerial view of Waverly Greens 400 kW solar array in Milwaukie (credit: OPB)

VEHICLES AND FUELS

The transportation emission sector is currently the largest emission sector in Milwaukie and Oregon. Climate actions related to vehicles attempt to influence the market for greater adoption of zero emission vehicles (ZEV), primarily electric vehicles (EVs) and plug-in hybrid vehicles (PHEV). The vehicles and fuels section addresses vehicle choice, charging infrastructure and fuels selection and resiliency.

REGIONAL LEGISLATION

EO 20-04 TRANSPORTATION IMPACTS

Executive Order No. 20-04 called for Oregon to reduce its GHG emissions to 45% of 1990 emissions by 2035 and at least 80% below 1990 levels by 2050. Its adoption led to the DEQ development of the Climate Protection Program (CPP) which increasingly caps emissions each year through private sector emission caps, resulting in a 90% decrease of emission levels by 2050. To address transportation emissions, EO 20-04 directed state agencies to:

- Strengthen Clean Fuels Program to reduce carbon intensity of transportation fuels by 25% by 2035 (DEQ)
- Implement statewide transportation electrification strategy (ODOT, ODOE)
- Enable electric utilities to increase investment in electrification (PUC)
- Prioritize transportation projects that reduce GHG (ODOT)
- State fleets transitioning to EVs, charging in public buildings (DAS)

SB 1044 OREGON ZERO EMISSION VEHICLE TARGETS

In 2019, Governor Brown signed SB 1044 into law, aligning state zero-emission vehicle goals with EO 20-04's statewide emission reduction targets and establishing ZEV targets for Oregon:

- At least 50,000 registered ZEVs on Oregon roads by the end of 2020
- At least 250,000 registered ZEVs on Oregon roads by 2025
- At least 25 percent of all registered vehicles and at least 50 percent of new vehicle sales will be ZEV by 2030
- ZEVs will represent 90 percent of annual new vehicle sales by 2035

SB 1547 TRANSPORTATION ELECTRIFICATION PROGRAMS

While adopted in 2016 before the CAP development, SB 1547 continues to influence transportation electrification by formalizing the state's commitment to EVs and broadening Public Utility Commission (PUC) abilities to allow electric utilities to develop qualified EV charging infrastructure and EV related programming using rate payer dollars.

HB 2007 AND CLEAN TRUCK RULES

In 2019 Oregon passed HB 2007 to phase out old diesel engines in qualified counties, and investment of environmental mitigation funds to support that transition. In 2021, DEQ built on this requirement with new administrative Clean Trucks Rules which adopts California's medium- and heavy-duty diesel engine standards for Oregon, including a one-time large fleet reporting requirement, a phased mandate for increasing zero emission vehicle sales (starting 2024 model year), and the Heavy Duty Low NOx Omnibus rules which require heavy duty vehicle manufacturers to comply with tougher Nitrous Oxide (NOx) emission standards, overhaul engine testing procedures and further extend engine warranties to ensure NOx emissions are reduced.

EO 17-20 AND EO 17-21 EV ADOPTION STRATEGIES

In November 2017, Governor Kate Brown signed Executive Orders 17-20 and 17-21 with specific directives to state agencies to improve energy efficiency, boost electric vehicle adoption, and support actions to reduce greenhouse gas emissions in the state. While EO 17-20 includes EV strategies like EV Ready building code, the EO 17-21 focuses on accelerating adoption of zero-emission vehicles through regulation, charging infrastructure, fleet conversion, outreach, incentives, and private sector partnerships.

According to ODOE's 2021 Biennial Zero Emission Vehicle report, the state did not meet the EO 17-21 goal of 50,000 vehicles by 2020 (there were 38,482 registered ZEVs in 2020) and the state needs additional incentives, policies, and programs to meet the next targets

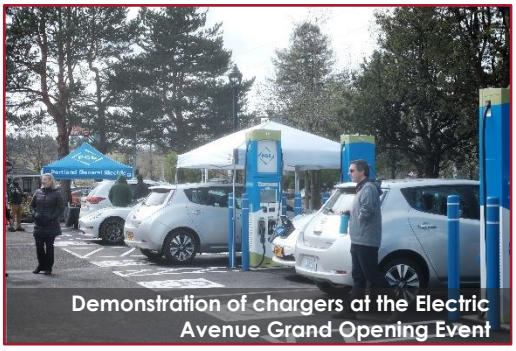
KEY PROJECT HIGHLIGHTS

ELECTRIC AVENUE

PGE's Electric Avenue charging stations provide accessible charging locations with both level 2 and level 3 charging capabilities to the public. The Milwaukie Electric Avenue was the second Electric Avenue charging infrastructure installation project performed by PGE, and showcased city and utility partnership on transportation electrification. The chargers are located on city property, but they are operated and maintained by PGE.

Milwaukie Council and PGE Leadership at the Electric Avenue Grand Opening Event

Milwaukie and PGE coordinated on a grand opening event to celebrate the completion of the project and increase EV awareness. The event was held at the charging station and featured food carts, speeches from City and PGE leadership, and a Forth Ride and Drive event where members of the community could test drive EVs around downtown Milwaukie.


Demonstration of chargers at the Electric Avenue Grand Opening Event

VEHICLES AND FUELS ACTIONS

SUPPORT OUTREACH EFFORTS TO ENCOURAGE SHIFT TO ELECTRIC VEHICLES

ACTION STATUS: IMPLEMENTING

Milwaukie has been promoting EV adoption in the community through community outreach, policy, and regional advocacy. The city has partnered on and compiled information from transportation electrification advocates like Forth Mobility, Electrify Now and PGE for community events, presentations, outreach materials, and other strategies to increase both awareness and interest in the transition to electric vehicles. Events like the Electric Avenue grand opening showcased EV technology to city residents, and attendees were able to test drive EVs through Forth Mobility's Ride and Drive activity and experience EV technology themselves.

The city also performs outreach for EV technology by being an early adopter of EV and EV technology for city operations and by partnering on high visibility charging stations like Electric Avenue and recent PGE installation of on-pole charging stations in the right of way.

IMPLEMENTATION HIGHLIGHTS:

- Supported the installation of Electric Avenue in downtown Milwaukie including an Electric Avenue Grand Opening Event featuring Forth Mobility Ride and Drive Event
- Currently coordinating with PGE for the installation of new on-pole charging stations across the city to increase charger accessibility
- Promotion of regional transportation electrification incentives and organizations on EV and electrified transportation organization resources on city outreach materials

Forth Mobility EV test drive at Electric Avenue

CREATE A PROGRAM TO INSTALL ELECTRIC VEHICLE CHARGING INFRASTRUCTURE AT MULTI-FAMILY HOUSING COMPLEXES

INCENTIVIZE WORKPLACE ELECTRIC VEHICLE CHARGING STATIONS IN PARKING LOTS

ACTION STATUS: IMPLEMENTING

In late 2022, PGE and the city coordinated on an on-pole charging project to introduce utility pole chargers in neighborhoods around Milwaukie with high levels of multifamily charging and lower access to charging infrastructure. The city also made code updates to require EV Ready design for multifamily and commercial developments including a design incentive for developers for the installation of EV charging stations in parking lots. The Transportation System Plan update in 2023 will help guide future incentive programs and will help determine the best opportunities for EV charger installations.

IMPLEMENTATION HIGHLIGHTS:

- Coordination with PGE on on-pole chargers in neighborhoods with high multifamily housing
- Adoption of EV Ready code requirements with incentives for charger installations

CONVERT DIESEL-POWERED HEAVY FLEET VEHICLES TO LOW-CARBON FUELS

ACTION STATUS: IMPLEMENTING

The city switched its diesel fuel procurement to renewable diesel fuel. Renewable diesel (also referred to as "R99", reflecting the blend rate: 99% renewable with 1% fossil fuel diesel) is a drop-in fuel, meaning no vehicle modifications are required. R-99 is 99% less emitting than fossil diesel when measured at the tailpipe of a vehicle, and 50-75% less emitting than fossil diesel considering lifecycle GHG from production. The city is also in the process of electrifying medium to heavy duty fleet vehicles as available technology emerges. Currently the city has invested in electric asphalt warmer and is exploring electric street sweepers for city operations.

IMPLEMENTATION HIGHLIGHTS:

- Transitioned to renewable diesel products instead of higher emission fossil diesel fuel
- Installed electric asphalt warmer for streets division

OPTIMIZE THE CITY'S LIGHT DUTY FLEET AND REPLACE THE LEAST EFFICIENT VEHICLES WITH MORE EFFICIENT VEHICLES

ACTION STATUS: IMPLEMENTING

City fleet Ford Mach-e

The city currently has a fleet of 88 vehicles including light duty vehicles for administrative use, medium-duty vehicles with unique power, weight or tow specifications (including utility trucks and police pursuit vehicles) and heavy-duty vehicles for construction or utility operations. The city has purchased 12 EVs and plug-in hybrid vehicles (PHEV) for light and medium duty vehicle uses, including:

- 5 Nissan Leafs for administrative use across departments
- 2 Ford Lightnings and 1 Chrysler Pacifica PHEV for Public Works
- 1 Chrysler Pacfica PHEV for City Hall
- 1 Ford Mustang Mach-e, 1 Nissan Leaf, 1 Chrysler Pacifica PHEV and 1 Tesla Model 3 for the Police Department

The city has installed Level 2 EV chargers at city facilities for fleet charging and is currently working on a project to install three public EV chargers at city buildings. The new charger installation project was sponsored by Milwaukie Business Dave's Killer Bread with a $110,000 donation. The chargers will be installed summer of 2023. In addition, a new LV2 charger will be installed at the new city hall building for operational use.


City fleet Ford F150 Lightning and Nissan Leaf

IMPLEMENTATION HIGHLIGHTS:

- Purchase of 12 EVs or PHEVs for city vehicles
- Installation of 4 city level 2 chargers, 4 additional in 2023

WORK WITH CLACKAMAS COUNTY, TRIMET AND METRO TO DEVELOP MICRO-TRANSIT FROM PARK-AND-RIDE OR LIGHT RAIL STATION TO LOCAL DESTINATIONS

ACTION STATUS: NOT STARTED

Upcoming updates to the Transportation System Master plan will allow the city to coordinate with transportation management agencies and authorities on improvements to micro-transit and public transportation in the community.

REVIEW THE LOCATION OF THE FLEET YARD AND FUEL STORAGE TO EXAMINE FLOOD VULNERABILITY. LOOK AT FUEL MOVEMENT DURING FLOOD CONDITIONS AND DIVERSIFY FUEL SOURCES TO PREPARE FOR CLIMATE EVENT-RELATED IMPORT CHALLENGES

ACTION STATUS: IMPLEMENTING

The city's transition of fleet vehicles to EV vehicles led to the installation of a variety of EV chargers at city facilities, diversifying fuel options and fueling locations. Backup generators at key city facilities provides additional resiliency to fleet operations.

To address fuel e city decommissioned its underground fuel tank at the Johnson Creek campus in 2023 and switched to an above ground renewable diesel tank while utilizing local gas stations for gasoline fuel needs. The project will reduce risk of groundwater contamination during natural hazard events.

IMPLEMENTATION HIGHLIGHTS:

- Decommissioned underground fuel tank at the Johnson Creek facility in 2023 and installed new above ground tank for renewable diesel fuels
- Continue to electrify fleet and install EV chargers at city facilities to diversify fueling capabilities and locations

Underground fuel tank excavation at JCB

Old underground tank removed

New above ground tank installed

IMPLEMENT INTERGOVERNMENTAL AGREEMENTS OR MOU'S WITH OTHER AGENCIES FOR FLEET SUPPORT IN EMERGENCIES

ACTION STATUS: COMPLETED

In 2018, the city signed the Managing Oregon Resources Efficiently Intergovernmental Agreement for use of resources between public agencies, and 2019, the city signed a Memorandum of Understanding (MOU) with the Oregon Water and Wastewater Response Network for a mutual aid agreement and support services.

WORK WITH THE SCHOOL DISTRICT AND WASTE HAULERS ON FLEET TRANSITIONS

ACTION STATUS: IMPLEMENTING

The city advocated for transportation electrification bills like SB 1044 which changes state administrative rules to allow Oregon schools to use public purpose charge funds for fleet audits and the purchase or lease of zero-emission vehicles and electric vehicle infrastructure. PGE grant programs promoted by the city including their Drive Change Fund support projects to electrify private and public transportation vehicles, including Trimet and school district buses. Staff have not held conversations with the school district to assist in project development.

IMPLEMENTATION HIGHLIGHTS:

- Advocated for legislation which opens school district funding potential for fleet electrification.
- Promote existing PGE Drive Change grant funding programs

LAND USE AND TRANSPORTATION

Actions in the land use and transportation topic address the emission impacts from landscape design and policy, particularly high intensity land uses like transportation networks, urban areas and agriculture. By establishing policy and code outlining the rules and regulations for the community, the city can influence property use, building design, and community features and site layout. This control is essential in protecting sensitive environmental resources and habitats for continued community ecosystem services.

REGIONAL UPDATES

Climate Friendly Equitable Communities Administrative Rulemaking

Milwaukie is in the process of incorporating new code requirements from Oregon Department of Land Conservation and Development (DLCD) that were developed in response to Governor Brown's Executive Order 20-04 to curb state emissions. To meet statewide emission reduction targets from the largest emission sectors, DLCD convened a Climate-Friendly and Equitable Communities workgroup to create new land use and development requirements for regions with populations over 50,000 people, including the Portland-Metro area. The rules were adopted by DLCD in July 2022 with deadlines for implementation in 2023 and 2024. Some examples of required changes to local code including:

- Removal of parking minimums for new developments in high-transit corridors.
- EV-Ready requirements for multi-family and multi-use development
- Expansion or creation of city tree code to meet connected tree canopy requirements for qualified developments constructing parking lots over one-quarter acre in size in all land use zones

KEY PROJECT HIGHLIGHTS

2020 COMPREHENSIVE PLAN UPDATE

In 2020, Milwaukie engaged the community to update the city's **Comprehensive Plan**, a 20-year strategy document outlining goals and policies for the Milwaukie community. The Comprehensive Plan included numerous policies related to sustainable buildings, housing, and development design. Incorporated in the comprehensive plan was a new Climate and Energy policy section and reference to climate action and adaption strategies across policy topics.

Planning staff engage residents at the Comprehensive Plan Open House

2020 COMPREHENSIVE PLAN UPDATE (cont.)

Paired with environmental policies and goals addressing community resiliency, natural resource mitigation and protections, the update was a major step in Milwaukie's work to become a more sustainable city and align city code with the **2017 Milwaukie Community Vision and Action Plan** and adopted climate goals and strategies.

COMPREHENSIVE PLAN IMPLEMENTATION

In 2021, planning staff began working on the first phase of code updates initiated by the 2020 Comprehensive Plan. The first phase focused on housing, parking, and tree code. Working with the Comprehensive Plan Implementation Committee, the city engaged community in a process to translate housing and parking policies in the Comprehensive Plan to code modifications. The project included mandated requirements from the new statewide housing bill **HB 2001**, adopted in 2019. The changes implemented in the phase 1 code update process expanded opportunities for denser housing and more housing types to address housing demand and affordability.

Middle Housing types considered in Comprehensive Plan Implementation

To balance community concerns about the loss of trees caused by expanded infill developments, the project included development of Milwaukie's first private tree code for private residential properties and development. The new tree code established robust standards for preserving, planting, and protecting trees during development.

Planning staff answer project questions at the Milwaukie Farmers Market

Upcoming phases of Comprehensive Plan Implementation process include code reviews of the city's commercial zoning standards, natural resources and neighborhood hubs related codes. Updating the city's Transportation System Plan begins in 2023. Combined with a separate effort to evaluate Milwaukie's stormwater utility code and public works standards in 2023-2024, Milwaukie's upcoming code updates will improve climate impacts through sustainable design of neighborhoods and infrastructure.

LAND USE AND TRANSPORTATION ACTIONS

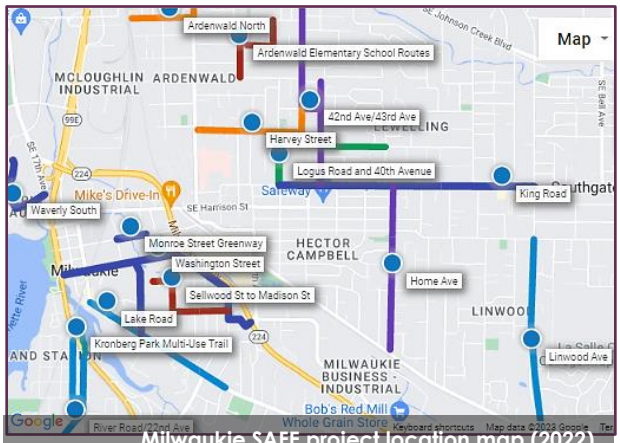
IMPLEMENT THE SAFE ACCESS FOR EVERYONE (SAFE) STREET AND SIDEWALK IMPROVEMENT PROGRAM TO EXPAND BIKE AND PEDESTRIAN ACCESS

ACTION STATUS: IMPLEMENTING

Milwaukie is currently implementing the SAFE projects to expand bike and pedestrian access and infrastructure in the community. Through the SAFE program, Milwaukie's goal is to build 27.9 miles of sidewalk and 900 ADA ramps in the community. For more information on SAFE projects, including project numbers and timelines, visit the project website at milwaukieoregon.gov/engineering/safe.

IMPLEMENTATION HIGHLIGHTS:

- Between 2019 and 2022, completed construction of pedestrian/bike infrastructure at:
    - Sellwood Street
    - Ardenwald Elementary School
    - 22nd Avenue & River Road
    - Kronberg Park Multi-Use Trail
    - 42nd Avenue/43rd Avenue
    - Linwood Avenue
    - Lake Road



Milwaukie SAFE project location map (2022)

IMPLEMENT "ELECTRIC VEHICLE READY" ZONING REGULATIONS FOR COMMERCIAL BUILDINGS AND MULTIFAMILY HOUSING

ACTION STATUS: COMPLETED

To comply with the mandated code changes from the Climate Friendly and Equitable Communities rulemaking, Milwaukie incorporated EV Ready requirements for commercial and multifamily developments into city code in November 2022, going above state mandates to incentivize installation of chargers. For commercial and industrial uses that provide off-street parking, at least 50% of the total number of parking spaces be EV Ready or at least 20% be EV ready with 5% of those parking spaces including an installed Level 2 or Level 3 EV charger. Multi-Unit and Mixed-Use Residential uses with five or more dwelling units where off-street parking spaces are provided, all (100%) of the parking spaces provided must be EV Ready or 40% of parking spaces provided must be EV ready and 10% of those parking spaces must include an installed Level 2 or Level 3 EV charger.

IMPLEMENTATION HIGHLIGHTS:

- Adopted Ordinance 2221 Establishing EV Charging Infrastructure Requirements in November 2022 requiring EV Ready parking spaces and allowing incentives for installation of EV charging infrastructure

PARTNER WITH METRO AND TRIMET TO INCREASE TRANSIT SERVICE, PARTICULARLY TO UNDERSERVED EMPLOYMENT AREAS

IMPLEMENT A TRANSPORTATION MANAGEMENT AGENCY (TMA) WITH AREA PARTNERS

ACTION STATUS: IMPLEMENTING

In 2023 - 2024, Milwaukie will update its Transportation System Plan which will include collaboration and with local and regional transportation planning stakeholders. The above actions will be addressed in that work along with a variety of other system-level strategies to reduce transportation emissions through urban design. In 2022, staff engaged council and community to convene a TSP Advisory Committee for the project.

IMPLEMENTATION HIGHLIGHTS:

- Initiation of the TSP update and committee formation by planning staff in 2022

IMPLEMENT PARKING PRICING IN DOWNTOWN

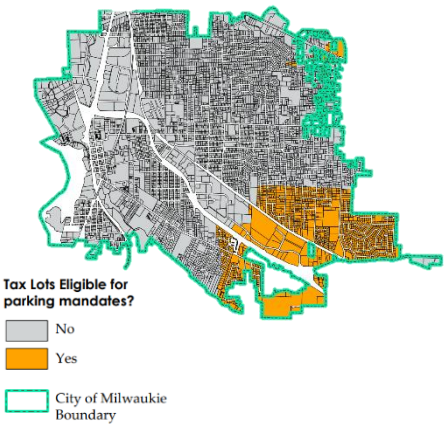
ACTION STATUS: IMPLEMENTING

The city acted to tie city-controlled parking pass rates to TriMet bus pass rates to encourage public transportation for commuters in the downtown corridor. In the upcoming Transportation System Plan (TSP) update process, Milwaukie will build on the 2018 adopted Downtown Parking Management Strategy and align 2020 Comprehensive Plan goals by exploring changes to parking pricing in the downtown corridor and make recommendations based on findings.

ACTION: LOWER PARKING RATIOS NEAR HIGH-CAPACITY CORRIDORS

ACTION STATUS: IMPLEMENTING

For Milwaukie, the implementation of the Climate Friendly Equitable Community rulemaking required the city to choose between removing parking mandates citywide or removing parking mandates only near transit corridors. In Milwaukie, 80% of the city's tax lots are in a transit corridor and eligible for the parking mandates. A majority of council supported removing the mandates city wide. Completion of the code amendments for this work and adoption of the code are to be completed before July 2023.



IMPLEMENTATION HIGHLIGHTS:

- Planning staff presented code options to Council for code amendments to remove parking mandates for most or all the city to comply with CFEC rulemaking requirements.

CONTINUE TO PROMOTE THE PURCHASE OF SIDEWALK CREDITS IN AREAS OUTSIDE OF PEDESTRIAN CORRIDORS AN DREDIRECT FUNDS TO AREAS NEEDING THIS INFRASTRUCTURE

ACTION STATUS: IMPLEMENTING

City staff continue to discuss sidewalk credit opportunities with developers during land use pre-application and pre-construction meetings with planning and engineering staff.

ACTION: INCENTIVIZE EMPLOYERS TO ENCOURAGE ACTIVE TRANSPORTATION AND TRANSIT

ACTION STATUS: NOT STARTED

City staff have not started working on potential incentives for employers.

IMPLEMENT VARIABLE SYSTEM DEVELOPMENT CHARGES TO ENCOURAGE ACCESSORY DWELLING UNIT DEVELOPMENT

ACTION STATUS: COMPLETED

To further advance city goals of increasing housing supply in Milwaukie, Milwaukie initiated a temporary pilot program open to eligible applicants who were interested in offsetting the costs for building an accessory dwelling unit (ADU). On June 16, 2020, City Council approved a limited time waiver of all city-controlled system development charges (SDCs) up to a total $23, 440 and a waiver of frontage improvements for up to ten ADUs, for a period of one year. In January 2021, the program funding had been fully allocated and no new applications have been accepted.

Additionally, the city adopted scaled wastewater system development charges (SDCs) based on residential structure footprints and is in the process for similar updates to the water utility SDCs.

IMPLEMENTATION HIGHLIGHTS:

- In 2020, City Council adopted an ADU SDC waiver program managed by Milwaukie Community Development staff. All program funding was distributed, and the program concluded in 2021.
- Adopted scaled wastewater SDCs tied to residential structure footprint

UPDATE FLOOD PLAIN MAPS WITH LOCAL GROUP COORDINATION AND FUNDING

PLAN FOR FUTURE EMPLOYMENT LAND CONSIDERING FLOOD RISK AND NATURAL RESOURCES

ACTION STATUS: IMPLEMENTING

In 2019, Clackamas County facilitated a conjoined jurisdictional effort to update FEMA-directed Natural Hazard Mitigation Plans which address risks of hazards like flooding, wildfire, air quality, and earthquakes. This work did not change the existing 2006 FEMA floodplain maps, but built

local awareness around needed changes to reflect recent flooding events and precipitation models that account for climate change. The NHMP development allows the city to access FEMA fund dollars following natural hazard events.

An update to the 2019 NHMP is underway with planned adoption in 2023. In addition to this work, the Comprehensive Plan implementation process will include future phases of work to assess Milwaukie's natural resources and riparian areas.

IMPLEMENTATION HIGHLIGHTS:

- Adopted 2019 Natural Hazard Mitigation Plan, with pending 2022 update.

RECLAIM RIPARIAN AREAS FOR FLOOD STORAGE FOR SAFETY AND PROPERTY PROTECTION

ACTION STATUS: IMPLEMENTING

The city has budgeted $50,000 of stormwater utility funds for FEMA flood mitigation grant matching. The North Clackamas Watershed Council recently published a Watershed Action Plan which could assist in future strategies to perform these projects at the city level.

IMPLEMENTATION HIGHLIGHTS:

- Budgeted $50,000 for on-site flood retention projects for stormwater benefits

PROVIDE INCENTIVES TO INCREASE FLOOD STORAGE CAPACITY

ACTION STATUS: IMPLEMENTING

Stormwater systems include built infrastructure as well as constructed green infrastructure and natural waterways that collect and hold surface water. Some incentives are available for surface water retention through stormwater infrastructure credits in development processes. The city has started assessing local stormwater code for program implementation opportunities and updating the city's Stormwater System Plan which will explore strategies like incentives for acute and chronic surface water impacts and city-wide stormwater management. In 2022, the city completed its Stormwater Management Plan update reflecting on the surface water projects and actions taken in the city so far.

In 2022, the city adopted revisions to the existing stormwater code to clarify use of funds for nature-based infrastructure including natural flood retention and storage.

IMPLEMENTATION HIGHLIGHTS:

- Submission of the 2022 Stormwater Management Plan by Public Works to DEQ outlining existing and future stormwater program needs
- Adoption of nature-based infrastructure code in stormwater utility municipal code

PROMOTE "NEIGHBORHOOD HUBS" THROUGH COMPREHENSIVE PLAN POLICIES

ACTION STATUS: COMPLETE - ONGOING

With the adoption of the 2020 Comprehensive Plan, the city included numerous policies related to the development and promotion of neighborhood hubs. In spring 2023, Milwaukie's Community Development department will begin a larger project to explore city code updates and develop new economic development programs with goals of increasing commercial businesses in identified neighborhood hub locations that are walkable. This upcoming work will include conversations with the general community as well as commercial and residential property owners on topics related to neighborhood hubs and programming.

IMPLEMENTATION HIGHLIGHTS:

- Inclusion of neighborhood hubs policies into the adopted 2020 Comprehensive Plan
- Initiation of strategic planning efforts in 2023 to explore neighborhood hub creation and economic development programs for walkable commercial businesses

Below: Excerpt from 2020 Comprehensive Plan outlining major neighborhood hub policies

8 URBAN DESIGN & LAND USE
GOALS & POLICIES

POLICY 8.1.4 Neighborhood Hubs (outside of NMU areas) Policies

a) Provide opportunities for the development of neighborhood commercial services and the provision of amenities and gathering places for residents of the surrounding area.

b) Ensure that new development is compatible with the height, massing and building form allowed by zoning on adjacent residential properties. A hub development need not be identical to the height, massing or form of buildings allowed by nearby zoning for a finding of compatibility.

c) Ensure new development contributes to a pedestrian friendly environment along the property frontage.

d) Encourage development of multi-season outdoor seating areas and pedestrian plazas.

e) Provide for a high level of flexibility in design and incentives to accommodate a variety of start-ups, temporary uses and incremental expansions and explore innovative techniques for waiving or deferring full site development and parking requirements.

f) Provide a process to allow start-up and temporary uses that take advantage of incentives and deferral programs to make a smooth transition to status as a permanent use.

What are Neighborhood Hubs?
Neighborhood Hubs are intended to provide neighborhood gathering places and locations where residents have relatively easy access to a variety of services or goods near their homes. Hubs are envisioned to vary in size and intensity.

MATERIALS USE, PURCHASING AND RECOVERY

Actions in this topic address the strategies and actions for reducing emissions related to the things community buys and uses, such as goods, food, and the major materials of regular life. These emissions are consumption driven, and strategies are focused on reducing, reusing, and recycling.

REGIONAL UPDATES

Metro Food Scraps Separation Policy

Implementation of a regional food scraps separation requirement begins March 2022 for many businesses within the Metro boundary. Businesses generating more than one 60-gallon roll cart of food scraps per week and all food service businesses will be required to separate their food scraps and keep them out of the landfill by composting, donation, or upstream prevention practices. Businesses are already required to recycle paper and plastic, metal, and glass containers. Businesses are separated into tiers of implementation with most large and medium sized businesses needing to comply by March or September 2023.

MATERIALS USE, PURCHASING AND RECOVERY ACTIONS

PROVIDE EDUCATION AND OUTREACH TO AVOID EDIBLE FOOD WASTE

PROMOTE EXISTING FOOD WASTE COMPOSTING SERVICES

ACTION STATUS: IMPLEMENTING

Milwaukie partners with Clackamas County to perform food waste, recycling and solid waste outreach and education. City resources and outreach include information about Metro County programs like the Master Recycler program. The city and county remind the community about the ability to collect food scraps in yard debris through their local haulers. With the Upcoming Metro Food Scraps Separation Policy, extensive county outreach has been performed to ensure business are able to reach compliance by the set deadlines.

Clackamas County outreach event

IMPLEMENTATION HIGHLIGHTS:

- Partnership with Clackamas County on solid waste outreach, including information about existing composting services and food waste reduction shared on city outreach platforms
- County outreach and implementation of the regional Metro food scraps separation policy for businesses going into effect in 2023

USE LESS IMPACTFUL PAVEMENT ALTERNATIVES WHEN PAVING STREETS AND SIDEWALKS

ACTION STATUS: IMPLEMENTING


Permeable surface at downtown Milwaukie Adam's Street Connector

Pervious pavement helps capture surface water and improve soils where precipitation lands, rather than moving it to other storwmater systems.

In constructing the downtown plaza in 2020, Milwaukie used surfaces on the pedestrian walkways that would allow infiltration of water between the stones.

For the first time in the city, Milwaukie installed pervious pavement as part of the Lake Road improvement project, completed in 2022. This deomnstration project highlighted the feaasibility of use of the design feature and will allow the city to monitor its functionality over time.

The Public Works construction standards now allow pervious contrete with approval in multiuse paths, and future updates will evaluate expansion of use for other construction types.

IMPLEMENTATION HIGHLIGHTS:

- Inclusion of pervious pavement in PW standards for multiuse paths
- Construction of Milwaukie Downtown Plaza in 2020 featuring surfaces that allow for infiltration
- First installation of pervious pavement in Lake Road improvement project in 2022

PROMOTE THE REPAIR OF EQUIPMENT AND MATERIALS AND BUY USED AND DURABLE BEFORE PURCHASING NEW

ACTION STATUS: IMPLEMENTING

The city partners with Clackamas County of offering events and outreach realted to wastestream reduction. Community organizations like Milwaukie Environmental Stewards Group promote and advertise additoinal solid waste outreach events, including a September 2022 Sustainability Fair in Milwaukie featuring repair activities.

In addition, the city engages in regional materials GHG reduction discussions with DEQ and employs best practices with facility and vehicle equipment to purchase used where possible. Examples include the purchase of used Nissan Leafs for city feet vehicels and a 2022 purchase of a used woodchipper from Oregon City. THe city is also reutilizing office furniture from the Advantis building puchase for the new City Hall.

IMPLEMENTATION HIGHLIGHTS:

- Promotion of fix-it fairs and reuse events held in Milwaukie (2019, 2022)
- Purchase of used vehicles and equipment for city operations

REQUIRE DECONSTRUCTION OF EXISTING PROPERTIES OR DELAYED DEMOLITION PERIODS

SHOWCASE MATERIALS MANAGEMENT PRACTICES WITH A DEMONSTRATION PROJECT

ACTION STATUS: NOT STARTED

City staff have not started exploring deconstruction requirements or demonstration of mateirals management. Recent adoption of deconstruction policies in Lake Oswego could be an opportuntiy for future city implementation.

USE MULCH AND COMPOST IN LANDSCAPING

ACTION STATUS: COMPLETE / ONGOING

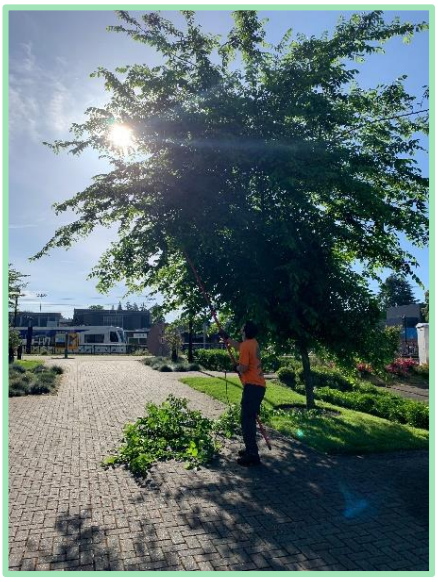
City urban forest projects and updated PW Stardards include the required use of mulch for tree planting and other vegetated landscapes where applicable. The city's landscaping services use much for city facilities. The city's purchase of a used woodchipper will allow staff to reused downed or removed trees for mulch and compost in landscaping on city facilities.

Staff chip branches for compost and mulch

NATURAL RESOURCES

Actions in this topic address the strategies and actions for monitoring and utilizing the ecosystem benefits of natural areas and ecosystems. Actions in this section are primarily adaptation actions due to the many benefits that natural systems will provide in a changing climate, including:

- Capturing carbon emissions in trees and other vegetation to balance community emissions
- Slowing precipitation and helping with groundwater infiltration as the city experiences stronger storms
- Providing habitat and refuge for local wildlife
- Creating recreation spaces for community members
- Improving air quality and blocking pollutants from roadways and urbanization
- Cooling neighborhoods and the public by shading streets, sidewalks, and buildings
- Increasing flood retention and preventing erosion from increased storms with climate change



As cities increasingly add new concrete and asphalt through buildings, roads and community infrastructure, the *Urban Heat Island Effect* increases in intensity. The Urban Heat Island Effect is the disproportionate heating of urban areas compared to the greener lands around them. Dark surfaces like streets and roofs hold in heat and release it over the day and night, making the community hotter. Increasing vegetation and trees in the community is a community's main defense against the urban heat island effect, which if left unaddressed, can have deadly consequences. In the 2020 heat dome event, some areas of Northeast Portland with little to no canopy and high asphalt cover reached up to 180°F in temperature.

PROJECT HIGHLIGHTS

Residential Tree Code

In 2022, the city adopted its first private tree code to support canopy expansion in Milwaukie under the direction of the CAP and Urban Forest Management Plan 40% canopy by 2040 goal.

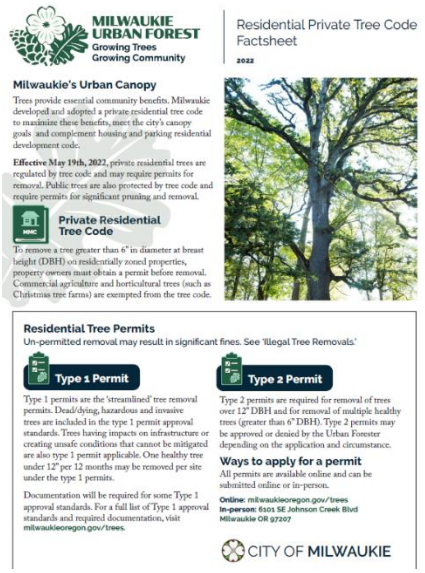
Following a public tree code update in 2020 and with the Comprehensive Plan Implementation process starting in 2021, the city started on the creation of a residential tree code that would protect trees during residential development and establish a permitting process for the protection of individual trees on residential private properties. The Milwaukie Tree Board and Public Works, including the climate and natural resources staff, led the initial development of code language to create standards for removal that were both flexible and clear and objective when needed.

The code set up a structure for individual tree removals through Type 1 permits for qualified necessary tree removals (no cost) and Type 2 healthy tree removal permits where mitigation was possible (fee based on tree size). The code also outlined development standards and mitigation when subdividing land or constructing additional housing units. The residential development code focuses on preserving trees, planting trees, ensuring soil volume is appropriate for new plantings, and protecting trees during construction.

With these standards, preservation mitigation fees will be required if a developer removes trees past 30% canopy cover, and planting mitigation fees will be required if the developer chooses not to plant back to 40% canopy cover.

The code was adopted and went into effect in May 2022. City staff spent extensive time on outreach to the community to raise awareness and reduce illegal tree removals which now came at a hefty penalty. Since implementation, most permits submitted for removals have been Type 1 permits for necessary removals, with Type 2 permits primarily being for optional site construction where the tree could not be saved. While there has only been one development application completed so far, more applications are in the queue for upcoming review once the applicant collects the required tree information.

As part of the private tree code development, the city invested in the creation of outreach materials for its urban forest programming and the new tree code requirement. Materials included postcards, handouts, and other resources to help the community understand the new code. The city's Urban Forester processes permits and answers community questions, using the new materials to help community understand the code and city goals around urban canopy and tree protection.



Public Tree Inventory Pilot

Contracting with Treecology, Milwaukie performed a Pilot Street Tree Inventory in 2021 to begin assessing the status of public street trees in the city. An inventory is the first step in understanding the composition, condition, and structure of Milwaukie's street trees. This pilot project inventoried areas of each neighborhood to collect inventory data for 1,325 trees and 691 vacant frontages that can accommodate around 1,270 trees. Sixty-four (64) unique genera were found, the most common was maple (Acer). The most prevalent condition was good (58%) followed by fair (37%). The trunk diameter distribution indicated a mature tree population with an adequate proportion of young and establishing trees.

City staff are now using this data to inform current and future planting projects as well as informing decisions on urban forest threats like invasive pests.

INCREASE TREE CANOPY COVERAGE TO 40% BY 2040

ACTION STATUS: IMPLEMENTING

In the CAP, Milwaukie created a goal to increase the cities canopy, the area of treetops and branches, from the 2014 coverage of 26% to an average of 40% by 2040. American Forests, an urban forest research and advocacy think tank, released recommendations that all cities aim for 40% canopy cover to maximize the benefits of trees. Their new recommendations show that cities like Milwaukie located in historical temperate forests should aim for even higher canopy values.

Recent LiDAR Data which is collected by a plane flying overhead to collect landscape information below, shows that Milwaukie has not seen significant change in the canopy since 2014, with 2019 values showing about 26-27% canopy cover. That said, in the last few years the city has ramped up plantings which may not be appearing using aerial data collection rather than more accurate on the ground inventory assessments. Since 2019, the city has expanded its public tree code (2020) and adopted a new private tree code (2022) which will better protect existing trees and require the planting of new trees. These efforts, along with expanded outreach and collaboration, will hopefully influence an upward trend in canopy coverage on the next LiDAR data collection effort.

Over the last four years, the urban forest program has created and used new tree canopy analysis tools and site inspections to increase public plantings around the city. They've added efforts to integrate tree protection into city processes (like tree removal and investment accounting for city engineering projects) and institutionalize trees as valuable public infrastructure.

After the adoption of Milwaukie's climate program, the city's urban forest work started to include more outreach and education to the community to reach the city goal. Milwaukie holds an annual Arbor Day Celebration with community tree planting and tabling, bringing dozens of volunteers and hundreds of new trees to the community.

Staff are looking at potential partnerships with community groups to offer more tree pruning and care programs in the community to lessen the barriers and concerns that come with tree ownership. As the city explores ways to generate funds for climate programming, the inclusion private tree care assistance and planting programs should be considered to maximize the climate benefits of trees and help reach the 40% canopy goal.

Friends of Trees planting yard sign at 2022 Arbor Day event

Tree code outreach at Milwaukie Farmers Market


Honorary tree planting at Willow Place Natural Area

IMPLEMENTATION HIGHLIGHTS:

- Awarded Oregon Tree City of the Year in 2020
- Achieved Tree City USA status 2017- 2022, with two Growth Awards for urban forest program expansion
- Creation of Branch Out Milwaukie for strategic tree planting
- Completion of a Public Tree Inventory Pilot
- Creation of Urban Forester position with specialized arborist training, and Natural Resources Technician position
- Creation of Urban Forest website and a suite of new informational materials, graphics and handouts for tree code awareness and urban forest outreach
- Creation and adoption of Urban Forest Management Plan (2019)
- Hosting of annual Arbor Day events and Earth Day events for planting and restoration in the community
- Creation of updated tree species list for PW Standards to promote climate adapted trees
- Development of new public tree code, emphasizing preservation of trees and developing programmatic permits and replanting requirements
- Development of private tree code for residential development and private tree removals
- Participation in regional workgroups including Connecting Canopy workgroup and Regional Habitat Connectivity Workgroups
- Collaboration with local watershed councils and non-profits for restoration projects and outreach alignment

WORK WITH THE TREE BOARD TO DEVELOP A PLANTING PROGRAM FOCUED ON SHIELDING LOW INCOME NEIGHBORHOODS FROM HEAT

ACTION STATUS: IMPLEMENTING


Friends of Trees at 2021 Arbor Day event

After adoption of the CAP, the city adopted the Urban Forest Management Plan which included strategies to plant, protect, and promote trees in Milwaukie. With the help of Tree Board, the UFMP addressed some of the ways for the city to make a positive impact on the most vulnerable communities and neighborhoods greatly impacted by climate change. The city has been coordinating planting events and including trees in street improvement projects to expand urban canopy and increase availability of low-cost planting options, but more work is needed to address the barriers of tree ownership.

In 2019, the city worked with Dr. Shandas from Portland State University to develop the Branch Out Milwaukie tool, a canopy analytics webtool that maps socioeconomic data and canopy data to show gaps in canopy coverage for vulnerable communities. The Public Tree Inventory Pilot also identified site-specific locations that would be ideal planting spots in the city. Before plantings occur, community engagement is required first so the city doesn't accidently place burdens on low-income community members by street trees in front of their homes with the expectation of maintenance.

Staff are now coordinating with local environmental justice groups and urban forest advocacy groups like Blueprint Foundation, Friends of Trees, and 350PDX to explore potential policies and programs for future city implementation. Information about this work is brought back to monthly tree board meetings for follow up discussions.

IMPLEMENTATION HIGHLIGHTS:

- Creation of Branch Out Milwaukie for strategic tree planting using socioeconomic data to explore gaps in canopy equity
- Collaboration with local environmental justice groups to explore green jobs opportunities and community canopy incentives
- Hosting of tree planting events with low-cost trees and planting assistance

REVIEW INTERGOVERNMENTAL WATER AGREEMENTS FOR SUPPLY SECURITY

ACTION STATUS: COMPLETED - ONGOING

In 2019 the city signed an MOU with the Oregon Water and Wastewater Response Network addressing utility resiliency. In 2022, Milwaukie completed an update of the Water System Master Plan to address utility resiliency and supply security agreements. Milwaukie has agreements with Portland and Clackamas River Water and is working with Oak Lodge Water Services to evaluate options for a new intertie between both systems.

ADJUST CODE TO REQUIRE ON-SITE STORAGE AND WATER FILTRATION BEFORE RELEASE THAT MEETS FUTURE CONDITIONS

ACTION STATUS: IMPLEMENTING

In 2022, the city completed a stormwater management plan update which identified gaps in programming to meet new requirements of the city NPDES MS4 stormwater permit. In 2023 and 2024, the city will review stormwater code to align city design standards with these requirements and explore potential updates to the PW Standards to require additional stormwater storage on site.

The city has started the process of updates to the Stormwater System Plan which will highlight gaps in infrastructure to meet the increasing stormwater management needs of the community. This update will include collaboration with local environmental organizations including the watershed councils to include their analysis of watershed-level strategies for flood plain and riparian area management and watershed health.

IMPLEMENTATION HIGHLIGHTS:

- Completion of the Stormwater Management Plan update (2022) highlighting code updates for stormwater management to be implemented by 2024
- Initiation of Stormwater System Plan update (2023-2024)
- Partnership with local watershed councils on watershed level analysis and strategies for surface water and floodplain health

UPDATE STORMWATER SYSTEM PLAN

IDENTIFY SEWER AND WATERWAYS VULNERABLE TO FLOODING

ACTION STATUS: IMPLEMENTING

The city has completed the 2022 Wastewater Master Plan and started the process of updating the Stormwater System Plan which will identify existing infrastructure capacity for surface water management and potential infrastructure standards and investments for increased stormwater retention and flood management. Staff are working on developing the RFQ for the plan update and the identification and convening of regional stakeholders for participation in the update process.

IMPLEMENTATION HIGHLIGHTS:

- Initiation of Stormwater System Plan update (2023-2024)
- Identified wastewater infrastructure vulnerable to flooding in adopted Wastewater Master Plan (2022)

DE-PAVE AREAS WHERE POSSIBLE TO ENCOURAGE STORMWATER INFILTRATION

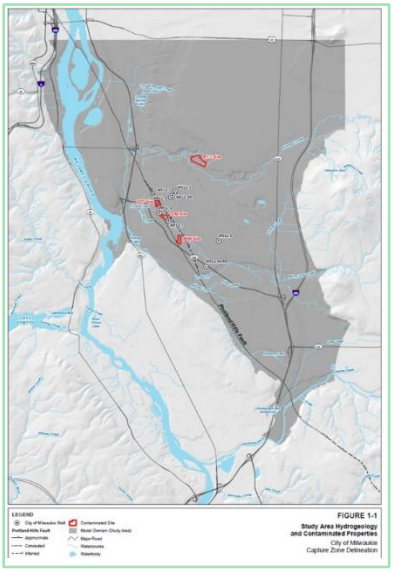
ACTION STATUS: NOT STARTED

The city has not implemented any projects to de-pave areas for stormwater infiltration. The updated Stormwater System Plan and NCWC Watershed Action Plan will help highlight potential project areas for future work.

INTRODUCE MORE MONITORING STATIONS TO PROTECT DRINKING WATER WELLS

ACTION STATUS: IMPLEMENTING

In 2019, the city conducted an evaluation of whether contaminated groundwater at three industrial sites could potentially reach the City's water supply wells. The Water Supply Well Capture Zone Delineations report consisted of two steps. First, summarize existing information about the nature and extent of groundwater contamination at each site. Second, delineate a capture zone for each City well, which is the three-dimensional volumetric portion of the aquifer that provides groundwater to the wells. By comparing the capture zones to the extent of groundwater an assessment could be made of the likelihood of contaminants reaching the City's water supply wells.



IMPLEMENTATION HIGHLIGHTS:

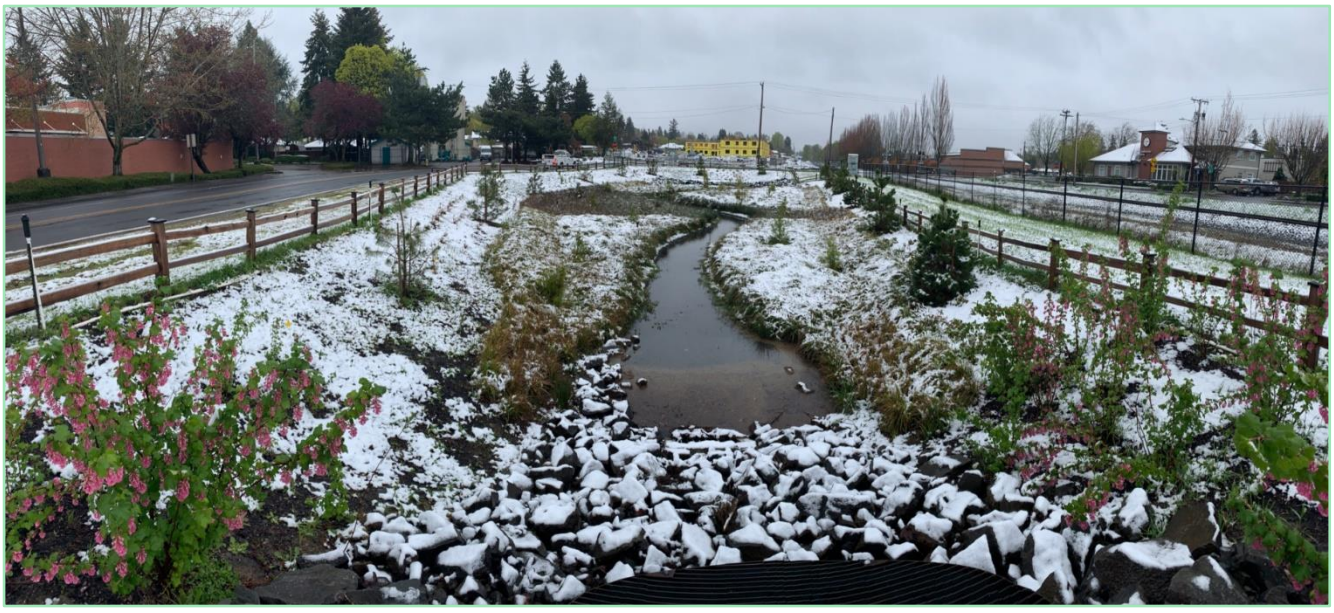
- Completion of the Water Supply Well Capture Zone Delineation report (published 2020)

DEVELOP A POTABLE/DRINKABLE WATER RE-USE PLAN

ACTION STATUS: NOT STARTED

The city has not explored the development of a water re-use plan.

Below: Stormwater facilities in Milwaukie used to capture, treat, and store street and surface water runoff



PUBLIC HEALTH AND EMERGENCY PREPAREDNESS

Acute climate events resulting from climate change include heat waves, increase wildfires in our region, decreased air quality, flooding risk and more. By 2050, almost all of Oregon will experience high-risk levels of particulate air pollution from wildfires in the warmer months. Recent natural hazard events like the extreme heat event and wildfires in the region have increased awareness and need for preparedness. These acute events must be addressed through a planned, coordinated response—being proactive and setting processes in place now will help us adapt and respond quickly when the time comes.

PROJECT HIGHLIGHTS

Natural Hazards Mitigation Plan Update

Milwaukie and other jurisdictions in Clackamas County partnered on the 2019 Multi-jurisdictional Natural Hazards Mitigation Plan - a strategy document to address the risks of natural disasters and plan for ways to mitigate the greatest impacts and create a more resilient community. The plan identifies potential hazards for the region and priorities based on severity of impact, likeliness of occurrence, and regional preparedness. Having a plan created is a requirement for jurisdictions to receive funds from the Federal Emergency Management Agency (FEMA) after a natural disaster occurs. The funding can also help with a variety of projects to mitigate risks through infrastructure improvements.

The city is now working with the County to create the 2023 NHMP. In this version of the plan, the city is advocating for greater focus on urban impacts of hazards and climate change, including flooding impacts from utility system overflows, air quality and wildlife smoke, and extreme heat.

PUBLIC HEALTH AND EMERGENCY PREPAREDNESS ACTIONS

WORK WITH PARTNERS TO SUPPORT COMMUNITY OUTREACH ABOUT HOW TO REDUCE FIRE AND FLOOD RISK

ACTION STATUS: IMPLEMENTING

Through the NHMP update, regional agencies will strategize on ways to increase community awareness and preparedness from natural hazards events, including wildfires and flood. The city has also discussed wildfire preparedness with the local parks district to address wildfire threats and safety buffers for densely vegetated areas.

WORK WITH THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) TO UPDATE FLOOD PLAIN MAPS

ACTION STATUS: NOT STARTED

FEMA has not started a process to re-evaluate flood plain maps for the Milwaukie area.

DEVELOP PUBLIC FACING FLOOD AND FIRE RISK ZONE MAPS AND IMPLEMENT SIGNAGE ON STREETS TO RAISE AWARENESS

ACTION STATUS: IMPLEMENTING

Milwaukie GIS staff created an online resource map to show current FEMA floodplains and the flood levels of the 1996 Willamette River flooding. Clackamas County Maps (CMap) also contains information on risk zones for properties in their jurisdiction.

PLAN FOR COOLING AND AIR QUALITY RELEIF CENTERS

ACTION STATUS: IMPLEMENTING

In recent years and through regional extreme storm and heat events, the need for safe refuge from excessive heat and cold has increased in priority for the community. Milwaukie and other Clackamas County jurisdictions shared information about local heat and cooling centers in their area, with Milwaukie holding a daytime cooling and warming center in the new Ledding Library during these events. As more extreme weather events occur, the city will need to strategize with community partners on the deployment of more 24/7 relief centers near key community centers and neighborhood hubs.


Ledding Library

IMPLEMENTATION HIGHLIGHTS:

- Use and advertisement of Ledding Library as a daytime cooling/warming center for community relief in extreme weather events

PROMOTE MORE SOPHISTICATED HOME AIR FILTRATION SYSTEMS

ACTION STATUS: IMPLEMENTING


Air filter after wildfire smoke event

Through Milwaukie's advocacy for more energy efficient buildings and local influence over building codes, staff have also advocated for building technologies that consider protection of indoor air quality from pollution, heat, and smoke. As buildings become more air sealed and efficient, filtration systems need to also improve to protect occupants from indoor air quality concerns.

Milwaukie also considered threats to indoor air quality from natural gas systems. In 2022, Council hosted public conversations on the public health impacts of gas combustion from stoves and gas-powered assets, leading to a resolution to ban new residential development connections to gas infrastructure for health and climate protection.

IMPLEMENTATION HIGHLIGHTS:

- Advocacy for energy efficient technology in building codes, including filtration systems
- Adoption of resolution banning new gas connections for residential development