

CITY COUNCIL AGENDA ITEM
CITY OF SHORELINE, WASHINGTON

AGENDA TITLE:	Discussion of the Draft Climate Action Plan Update		
DEPARTMENT:	Recreation, Cultural, and Community Services		
PRESENTED BY:	Cameron Reed, Environmental Services Program Manager		
ACTION:	<input type="checkbox"/> Ordinance	<input type="checkbox"/> Resolution	<input type="checkbox"/> Motion
	<input checked="" type="checkbox"/> Discussion	<input type="checkbox"/> Public Hearing	

PROBLEM/ISSUE STATEMENT:

An inventory of 2019 greenhouse gas (GHG) emissions from the Shoreline community revealed that the City is not on track to reach its previously-adopted emissions reduction targets through the King County-Cities Climate Collaborative (K4C), nor our updated science-based targets, which the Council committed to by joining the Cities Race to Zero/ICLEI150 campaign at the October 18, 2021 Council Meeting.

At their August 15, 2022 meeting, the City Council formally recognized climate change as an emergency that threatens the health and safety of the Shoreline community and committed to take accelerated and comprehensive action to address the climate crisis. A 2020 study identified specific elements of the Shoreline community that are most vulnerable to the impacts of climate change and recommended strategies to increase resilience to those impacts.

In alignment with City Council Goal #2, Action Step 6, staff have updated the City’s Climate Action Plan (CAP) to identify the most impactful actions the City can take to reduce community-wide GHG emissions and achieve our 2030 and 2050 science-based targets. The draft CAP (Attachment A) also includes strategies to increase community-wide resilience to climate impacts, center equity, and enhance ecosystem health. Tonight, staff are presenting the draft CAP update for Council review and discussion. The CAP is currently scheduled to return to Council for potential action on November 21, 2022.

RESOURCE/FINANCIAL IMPACT:

There will be costs to implement the strategies in the CAP update. Some funding for CAP implementation is included in the proposed 2023-2024 Environmental Services budget. However, additional funding will be needed for successful implementation of the CAP. With support from Cascadia Consulting Group, staff have developed initial cost estimates for a shortlist of ten high-priority CAP actions (“Cost Assessment,” Attachment B). Staff are continuing to refine this analysis and develop cost estimates for additional CAP actions to present in a mid-biennium budget request next year.

In addition to the ten actions identified in Attachment B, if the CAP is approved, there will be costs to the City related to several other key actions, including:

- Replacing fleet vehicles and off-road equipment with electric or alternative fuel options rather than conventional gas or diesel vehicles;
- Converting natural gas heating equipment at City facilities to electric systems;
- Increasing funding for urban forestry activities including enhanced street tree planting and maintenance, and forest restoration efforts; and
- Implementation of zero waste activities.

These activities and the associated funding needs for CAP implementation occur within a range of city departments including Public Works, Planning and Community Development, Administrative Services, and Recreation, Cultural and Community Services. Staff will continue to leverage local, state, and federal funding to implement the CAP. The CAP Implementation Plan (Attachment A, pages 61 – 82), identifies known funding sources for many of the key actions. Funding sources for several key actions are identified in the Implementation Plan and discussion section.

RECOMMENDATION

No action is required tonight. Staff recommend that Council discuss the Climate Action Plan update and provide feedback to staff on the Plan and the actions in the Plan. Staff further recommends that Council approve the Climate Action Plan update when it returns to Council for potential action on November 21, 2022.

Approved By: City Manager **DT** City Attorney **MK**

BACKGROUND

The City Council [adopted the City's current Climate Action Plan in September 2013](#), thereby committing to reducing greenhouse gas (GHG) emissions 25% by 2020, 50% by 2030, and 80% by 2050 (below 2009 levels).

In 2014, the City signed on to the King County-Cities Climate Collaboration (K4C) Joint County-City Climate Commitments, joining the County and other cities in committing to reduce community GHG emissions 80% by 2050. In early 2019, K4C member cities decided to refresh the original 2014 commitments to reflect changes in state laws, updated science and GHG inventories, and K4C membership. [In 2020, Council adopted Resolution No. 449](#), affirming support for the K4C updated 2019 Joint Commitments.

At the [October 18, 2021 Council meeting](#), Council joined the [Cities Race to Zero/ICLEI150 campaign](#), a global campaign established by the United Nations to rally and support leadership from businesses, cities, regions, and investors for a zero-carbon recovery that prevents future threats, creates decent jobs, and unlocks inclusive, sustainable growth.

As part of this campaign, the City committed to updated science-based emissions reduction targets reflecting the level of emissions reductions needed to keep global heating below the 1.5° Celsius goal of the Paris Agreement and prevent the most catastrophic impacts of climate change. Technical staff at [ICLEI – Local Governments for Sustainability](#) (ICLEI) provided Shoreline's updated science-based targets which include:

- **By 2030:** 59.5% absolute emissions reduction (communicated as 60% in public communications) and 62.5% per-capita emissions reduction, and
- **By 2050:** reach zero GHG emissions as soon as possible and no later than 2050.

'Net zero' emissions are achieved when anthropogenic emissions of GHG to the atmosphere are balanced by anthropogenic removals over a specified period.

The City's Comprehensive Plan includes [Goal NE V](#): "Protect clean air and the climate for present and future generations through significant reduction of greenhouse gas emissions, to support Paris Climate Accord targets of limiting global warming to less than 1.5° C above pre-industrial levels."

An inventory of the City's 2019 GHG emissions demonstrates that Shoreline's emissions have decreased 5% since 2009 despite population growth. This trend is not on track to meet our previously adopted GHG reduction targets, nor our updated science-based 2030 and 2050 targets.

In 2020, the City completed a [Climate Impacts and Resiliency Study](#) to identify key areas of vulnerability for the Shoreline community and public infrastructure related to the near term projected impacts of climate change and recommended strategies to increase citywide resilience to those impacts. The Climate Action Plan update builds from and advances the recommendations of that study.

Most recently, on [August 15, 2022, Council issued Resolution No. 494](#) “declaring a climate emergency and directing the City to take comprehensive and accelerated action to address the climate crisis.” Resolution No. 494 directs all City departments to take action to reduce GHG emissions and increase climate resilience in five key areas: transportation, building energy, ecosystems, zero waste, and resilience.






DISCUSSION

The draft Climate Action Plan (CAP) includes three types of actions:

1. **Mitigation:** actions to reduce sources of GHG emissions from both City operations and the Shoreline community to achieve the City’s targets.
2. **Sequestration:** actions to improve the health of local ecosystems and enhance their ability to remove carbon from the atmosphere, provide habitat, regulate the water cycle, and buffer the impacts of climate change.
3. **Adaptation:** actions to increase community-wide resilience to and preparedness for the near-term impacts of climate change, such as hotter summer temperatures/extreme heat events, air quality impacts from more frequent wildfire smoke, and increased risk of urban flooding.

The CAP includes 13 strategies and 89 supporting actions, organized into five (5) focus areas, to meet these three overarching goals (Figure 1 below). The CAP strategies and actions are described in detail on pages 43-49 in the CAP.

Figure 1: CAP Focus Areas and Strategies

	Focus Area: Transportation and Mobility (TM) <ul style="list-style-type: none"> • Strategy TM-1: Reduce community-wide driving. • Strategy TM-2: Accelerate electric vehicle (EV) adoption. 	25
	Focus Area: Buildings and Energy (BE) <ul style="list-style-type: none"> • Strategy BE-1: Electrify space and water heating for new and existing buildings. • Strategy BE-2: Increase energy efficiency of new and existing buildings. • Strategy BE-3: Increase renewable energy generation and access. • Strategy BE-4: Support affordable green buildings that conserve water and protect habitat. 	18
	Focus Area: Zero Waste (ZW) <ul style="list-style-type: none"> • Strategy ZW-1: Reduce per capita waste generation, especially wasted food. • Strategy ZW-2: Increase diversion rates and access to recycling and composting services. 	16
	Focus Area: Ecosystems and Sequestration (ES) <ul style="list-style-type: none"> • Strategy ES-1: Maintain and increase tree canopy and urban forest health. • Strategy ES-2: Increase soil sequestration in natural and landscaped areas. 	15
	Focus Area: Community Resilience and Preparedness (CRP) <ul style="list-style-type: none"> • Strategy CRP-1: Ensure that new buildings, land use decisions, and public infrastructure improvements increase resilience to current and future climate impacts. • Strategy CRP-2: Strengthen community and municipal emergency preparedness in consideration of predicted climate impacts such as extreme heat, flooding, wildfire smoke, and drought. • Strategy CRP-3: Increase community awareness of climate change impacts and mitigation and support community-based efforts that increase resilience. 	15

Plan Development

City staff contracted with Cascadia Consulting Group to assist with development of the CAP update, including technical analyses, community engagement, graphic design, and plan writing. Staff developed the initial list of actions based on several resources including the K4C climate action toolkit, ICLEI's High Impact Action Analysis provided through the Race to Zero, and the work of peer cities. Environmental Services Division staff then worked with staff from across City departments and external partners to refine the strategies and actions for Shoreline, incorporating the results of community engagement efforts throughout the process.

Several firms and partners provided supporting technical analyses, including Cascadia, ICLEI, and consultant Fehr and Peers. Throughout the process, Environmental staff coordinated with staff managing the Transportation Master Plan / Transportation Element update, and the Comprehensive Plan update, to ensure that the goals of the CAP are reflected in the relevant plans and policies where key strategies will be implemented.

Beginning in June 2021, staff conducted extensive community engagement throughout the update process to ensure that the CAP reflects community priorities and values and centers equity. The Stakeholder Outreach section below provides more details on the community engagement efforts and result.

Wedge Analysis / Emissions Forecast

As part of the Race to Zero Campaign, ICLEI staff provided a high-impact action analysis which identified three primary action pathways for the City to meet our 2030 science-based target:

1. Rapid electrification of heating systems in new and existing buildings,
2. Widespread adoption of electric vehicles (EV), and
3. A significant reduction in community-wide vehicle miles travelled (driving).

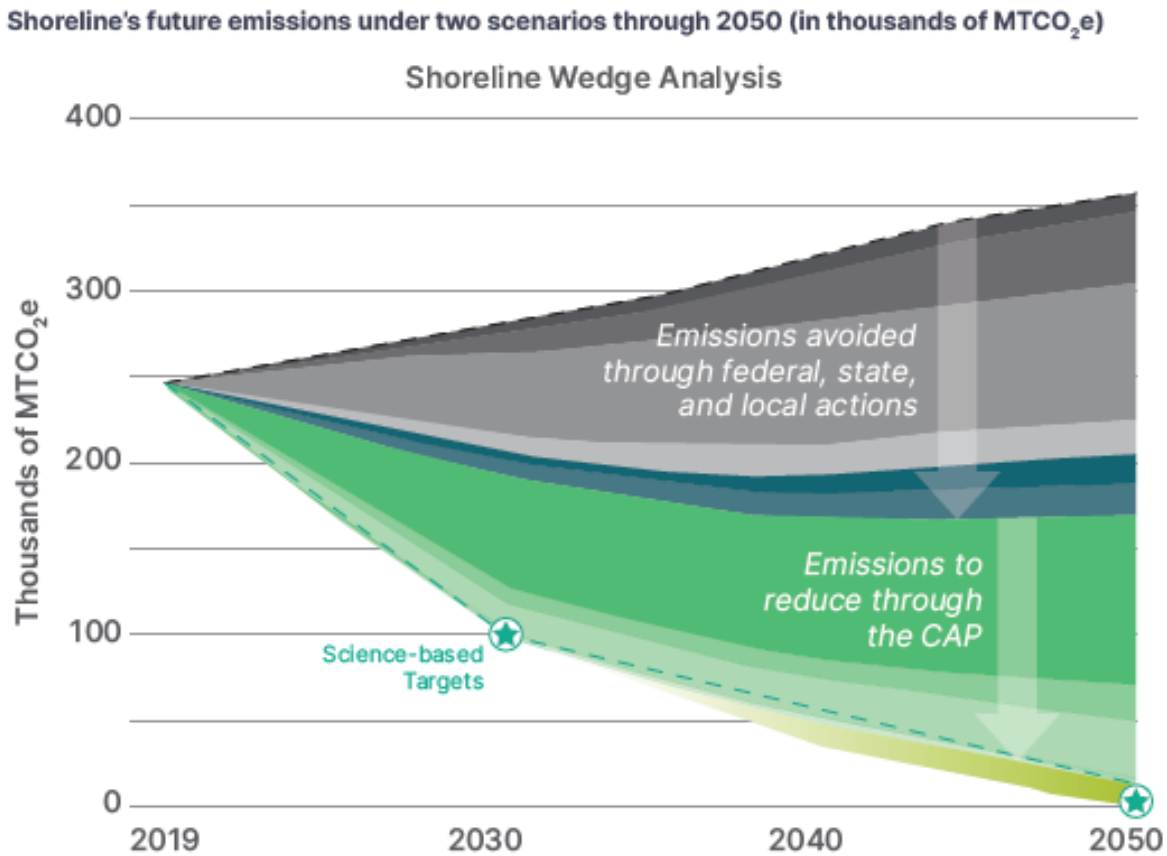
Staff worked with Cascadia Consulting Group to further model the impact of these pathways on future emissions through 2050. This "Wedge Analysis" also accounted for the impact of population growth and current federal, state, and local policies on future emissions (Figure 2 below). The full results of this analysis are shown on pages 26-27 and 140-145 of the CAP. Initial results of this analysis indicate:

- **Business As Usual (BAU) / No Action Scenario:** Without federal, state, or local climate action, Shoreline's total GHG emissions are expected to *increase* by 43% from 2019 to 2050 (an increase of 109,170 MT CO₂e);
- **Adjusted Business As Usual (ABAU) Scenario:** When considering the anticipated impacts of existing state, local, and federal policies and programs, Shoreline's total GHG emissions are expected to *decrease* overall by 32% from 2019 to 2050 (a decrease of 78,773 MT CO₂e); and
- **CAP Action Scenario:** Achieving the 2030 and 2050 targets is possible if the City takes additional action to support electrification of existing buildings, accelerate EV adoption, reduce community-wide driving and solid-waste generation and enhance forest carbon sequestration. In combination with existing

policies under the ABAU scenario, this scenario represents achieving a 96% decrease in emissions from 2019 to 2050.

These results indicate that achieving our 2030 and 2050 science-based targets is possible but depends on additional efforts to rapidly reduce emissions from existing buildings and transportation.

Figure 2. Wedge Analysis - Emissions Forecast through 2050 under three scenarios (in thousands of MT CO₂e).



- No Action Future
- Federal/State Policies
 - WA Clean Energy Transformation Act
 - WA State Energy Code
 - Federal Fuel Economy Standards
 - WA Clean Fuel Standard
- Existing Local Actions
 - Shoreline Energy Code
 - Light Rail and Transit-Oriented Development
- CAP Actions
 - Building Electrification
 - Reduce Driving
 - On-road EV Adoption
 - Waste Reduction/Recycling
 - Forest Carbon Sequestration*

**Forest carbon sequestration cannot be used to meet emissions reduction targets but can contribute toward carbon neutrality*

Prioritization / Multi Criteria Analysis

To prioritize the most feasible and effective actions that aligned with community and City priorities, staff worked with Cascadia to run a multi-criteria analysis on a short list of 35 actions. Figure 3 below shows the criteria and weighting used for this analysis. Community input from the first phase of community engagement helped shape the criteria and weightings. The results of this prioritization are shown in Figure 4 below and on pages 55-57 and in Appendix C of the draft CAP.

Figure 3: Multi-Criteria Analysis - Criteria Definitions and Weightings






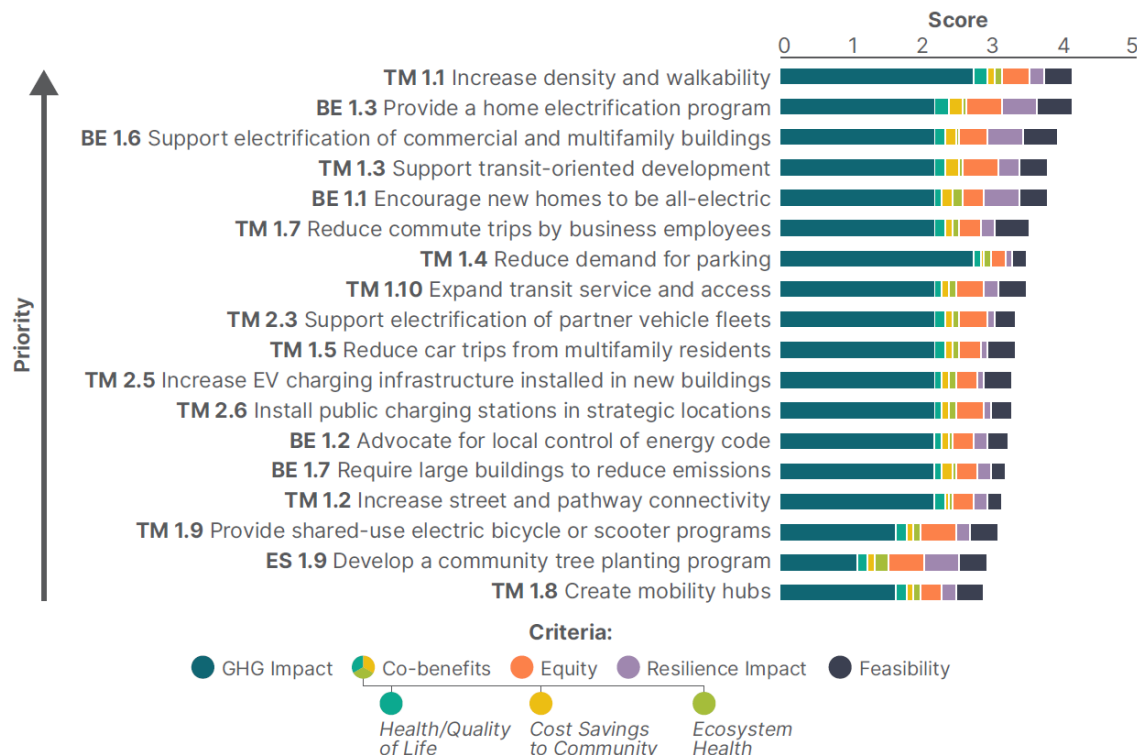
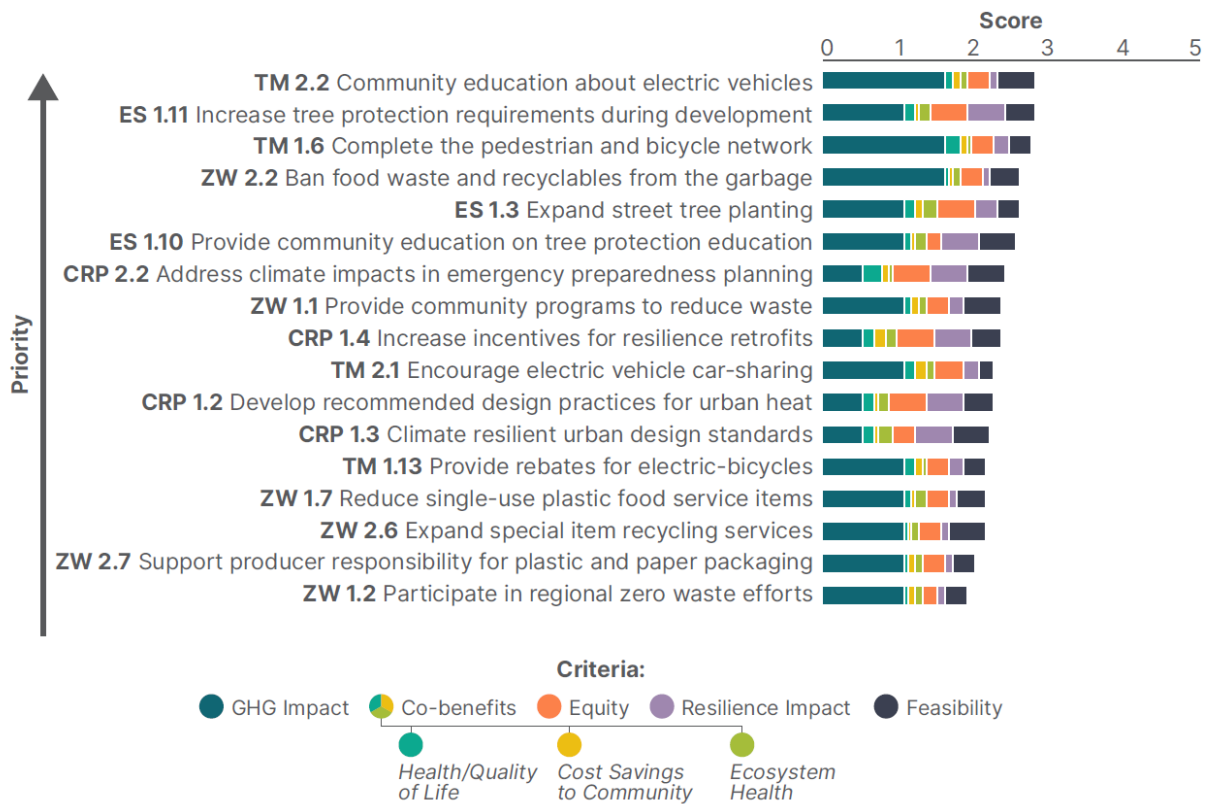
	Criteria	Weight	Definition
	GHG Emissions Impact	55%	Reduces GHG emissions
	Co-benefits	15%	Provides co-benefits related to improving health/ quality of life, providing cost savings to community, and/or supporting ecosystem health
	Equity	10%	Benefits or supports communities that face historic inequities
	Resilience Impact	10%	Increases community resilience to climate impacts
	Feasibility	10%	Is possible to implement based on level of community support and political, technical, and regulatory feasibility/barriers

Figure 4: Multi-Criteria Analysis - Results





Focus Area 1: Transportation and Mobility (TM)

Fuel use for transportation accounted for 139,781 mtCO_{2e}, or 56% of Shoreline’s GHG emissions in 2019. With the closure of the Shoreline Pool, the majority of the City’s municipal operation emissions now come from our gasoline and diesel vehicle fleet. While State and Federal fuel economy and clean fuel standards will likely reduce emissions from future transportation activities, local action is needed to significantly reduce emissions from transportation to reach our science-based targets.

Continuing to increase walkability and density, prioritize and deploy multi-modal transportation infrastructure, enhance transit service, and support transit-oriented development, are each key strategies to reduce transportation emissions. Additional high-priority actions to reduce transportation emissions include:

- Expanding commute-trip reduction programs and requirements for local employers (TM 1.7);
- Exploring options to reduce demand for parking in mixed use and commercial centers (TM 1.4); and
- Implementing transportation demand management strategies to reduce car trips by multifamily residents (TM 1.5).

Supporting and accelerating widespread adoption of electric vehicles (EV) is a second crucial strategy to reduce Shoreline’s transportation emissions. In addition to transitioning the City’s municipal vehicle fleet to electric, key actions to support community-wide EV adoption include:

- Increasing requirements for charger installations in new buildings (TM 2.5);
- Supporting installation of fast-chargers at key locations in the City (TM 2.6); and
- Supporting electrification of utility and partner vehicle fleets (TM 2.3).

Recently passed federal legislation includes grant funding for heavy duty vehicle electrification and consumer tax credits and rebates for new and used EV purchases. Significant state grant funding is also available for public fast-charging infrastructure. Both market growth and [recently passed state law](#) requiring that by 2030, all new cars registered in Washington be electric, are expected to rapidly increase EV adoption over the next decade.

Focus Area 2: Buildings and Energy (BE)

Fossil fuel use for building space and water heating is the second largest source of GHG emissions in Shoreline, accounting for 139,781 mtCO_{2e}, or 38% of emissions in 2019. By contrast, electricity consumption for the entire Shoreline community accounted for 3% of emissions in 2019.

Supporting the equitable transition of space and water heating systems in existing buildings to efficient, electric options is a crucial strategy to achieve our emissions reduction targets. Additionally, electric heat pump systems are generally more efficient than conventional alternatives, can improve comfort, and provide cooling and filtration functions, thereby increasing resilience to climate impacts such as increasing summer temperatures and wildfire smoke events.

Unfortunately, the costs to transition individual homes and buildings can be significant. To support this transition, many K4C partner jurisdictions – including Seattle, King County, Bellevue, Redmond, Kirkland, Issaquah, Redmond, and Mercer Island – provide programs to lower the up-front costs of installing efficient electric heat pumps in existing homes and non-residential buildings. These programs include [Seattle's Clean Heat Program](#), King County's [Energize](#), [C-PACER](#), and [recently announced low-cost loan program](#), Snohomish County PUD's [Energy Smart Loan Program](#) and the [Energy Smart Eastside campaign](#). Actions BE 1.3 and 1.6 are designed to support electrification of existing homes and buildings by providing financial resources, technical assistance, education, and outreach to building owners.

In addition to existing utility rebates through Seattle City Light, significant federal funding is available to support electrification of existing buildings through the Bipartisan Infrastructure Law and Inflation Reduction Act.

In 2019, Washington State passed the Clean Buildings Act which established energy performance standards for existing large, commercial buildings. However, some jurisdictions such as City of Seattle, are developing [emissions based performance standards](#) (action BE 1.7) to complement the State standards but stipulate emissions reductions, rather than only reductions in energy consumption.

While the City passed [updates to the commercial energy code in 2021](#) prohibiting the use of fossil fuels for space and water heating in new commercial buildings, the City is prohibited from making similar changes to the State residential energy code under state law. Thus, actions BE 1.1 and 1.2 are designed to *encourage* new, single-family homes to be built all-electric. The State Building Code Council is currently considering [updates to the Residential Provisions of the Energy Code](#) that would require heat pumps for new residential construction.

Focus Area 3: Zero Waste (ZW)

Waste disposal and processing only accounted for 2% of Shoreline’s emissions in 2019. However, there are significant environmental and social costs associated with the disposal of materials that could have otherwise been put to beneficial use through reuse, repair, recycling, or composting. Additionally, our emissions inventory did not account for the GHG emissions caused by goods that are consumed in Shoreline but produced elsewhere in the world. Regional analyses indicate that these “consumption-based” emissions are significant. Key strategies to reduce waste and associated emissions include:

- Requiring all businesses and residents to subscribe to composting and recycling service (ZW 2.1);
- Prohibiting disposal of food waste and key recyclable materials in the garbage (ZW 2.2); and
- Providing programs to help community members reduce waste, especially food waste (ZW 1.1).

As discussed at the [September 26th Council meeting](#), King County is leading a regional effort to achieve our existing regional goal of zero waste of resources by 2030. The actions in the draft CAP are intended build from and advance the [County’s Re+ Program work](#).

Focus Area 4: Ecosystems and Sequestration (ES)

Based on a high-level sequestration analysis, Shoreline’s urban forest sequesters approximately 13,890 mtCO_{2e} annually (Appendix D). Because the removal of atmospheric carbon is a passive process, global protocol and industry best practices do not count sequestration toward emissions reduction targets. Instead, sequestration is considered a pathway to achieving carbon neutrality, our 2050 goal. Additionally, the urban forest and other ecosystems in Shoreline play an important role in buffering some of the near-term impacts of climate change, including extreme heat and flooding.

The Ecosystems and Sequestration actions focus on increasing tree canopy cover in available and suitable areas, such as low-density residential properties, parks, and other institutional properties, and on increasing street tree planting efforts in areas of the city with identified urban heat impacts or environmental health disparities. The actions also focus on expanding our existing urban forest restoration programs, recognizing that our existing urban forests in parks and other natural areas provide immediate resilience benefits and [face a range of threats, including climate change](#). Key strategies include:

- Developing a community tree planting program for private property (ES 1.9);
- Increasing tree protection requirements during development (ES 1.11); and
- Expanding street tree planting activities in areas with urban heat impacts and environmental health disparities (ES 1.3).

Focus Area 5: Community Resilience and Preparedness (CRP)

The Community Resilience and Preparedness focus area builds from and advances recommendations from the [2020 Climate Impacts and Resiliency Study](#) and includes both short- and long-term actions.

Long-term actions focus on modifying the built environment and city infrastructure to increase resilience to projected climate impacts such as extreme heat and flooding.

Currently, capital project managers utilize a “Climate Impacts Tool” to screen their projects for opportunities to increase climate resilience. However, more work is needed to update and enhance this tool, and to develop urban design standards and recommended best practices for mitigating urban heat impacts (CRP 1.1 and 1.2). Additionally, the City could consider updating codes and design standards citywide to ensure that new development and construction projects whether public or private, increase resilience to climate impacts (CRP 1.3).

Short-term actions focus on increasing emergency preparedness resources for extreme heat, flooding, and wildfire smoke events, especially for those who are most vulnerable to these impacts or have limited access to these resources (CRP 2.1 – 2.4).

CAP Implementation

Pages 54-61 of the CAP provide the implementation plan. Environmental Services staff will lead and monitor implementation of the CAP. However, many CAP actions fall under the purview of other departments and will require significant coordination. Successful implementation will require updates to development codes and design standards, additional programming, additional staff time and budget allocation by various departments, and coordination with upcoming major plan updates including the Parks, Recreation, and Open Space Plan, Urban Forest Strategic Plan, and the Comprehensive Plan.

STAKEHOLDER OUTREACH

Beginning in July 2021, staff conducted extensive community engagement efforts to help set a vision and priorities for the CAP update and provide feedback on the potential strategies. Engagement occurred in three phases as described below and in CAP Appendix B – Community Engagement Summary.

Phase 1 – Vision Setting and Establishing Priorities

From July 2021 – February 2022, staff conducted an initial phase of engagement that included one virtual “Community Climate Conversation” event, an online survey, community presentations, and five meetings of the City’s “Community Climate Advisors,” a panel of community members with lived experience as frontline communities who were compensated for their time attending meetings and providing feedback. Together, approximately 260 community members participated in this phase of engagement.

Results from this first phase of engagement helped shape the vision and priorities for the CAP, including the following interests:

- Prioritize the most effective strategies for rapid GHG reduction;
- Ensure that we consider equity and the impact of proposed actions on vulnerable community members;
- Prioritize actions that also increase resilience to climate impacts;
- Prioritize actions that also protect and enhance public health;
- Prioritize actions that also protect and enhance ecosystem health or provide other environmental benefits; and
- Prioritize actions that also provide cost-savings to the community.

These results helped inform the criteria and weightings used to prioritize actions in the multi-criteria analysis (CAP Appendix C).

Phase 2 – Refining and Prioritizing CAP Actions

From March through June 2022, staff conducted the second phase of engagement to assess the community’s support and concern for draft strategies and actions across all focus areas that would be included in the CAP update. These engagement opportunities also served as a space for the community to identify additional strategies or actions, as well as identify equity considerations for draft actions. This phase of engagement included three virtual “Community Climate Conversation” events, an online survey and in-person poster surveying, a student climate action forum, several community presentations, and three optional meetings of the City’s “Community Climate Advisors.”

Engagement results helped shape the current iteration of the strategies and actions and added several actions to the draft. Survey and workshop results and comments also helped gauge feasibility and community support for specific actions in the multi-criteria analysis.

In general, participants were very supportive of the City’s proposed CAP actions. Based on Phase 2 engagement, the community’s highest priorities across engagement types were:

- Improving infrastructure to increase Shoreline’s walkability and bikeability;
- Retrofitting existing buildings to improve energy efficiency and electrifying where possible, and promoting electrification in new construction;
- Requiring or subsidizing composting and recycling for multi-family buildings and businesses;
- Increasing access to services for recycling difficult items; and
- Preserving existing trees and planting new ones.

The concern most expressed during engagement was around the cost of actions to individuals, which poses an equity issue. The community expressed that where possible, the actions in the CAP should provide incentives, tax breaks, etc. to assist the community with implementing high-cost actions.

Planning Commission Comments

Staff also presented the draft actions involving land use or the City Development Code to the Planning Commission at their August 18, 2022 meeting. Overall, the Commission was supportive of the CAP work, including the draft goals and strategies but provided the following specific concerns and comments:

- Appreciation for the centrality of increasing walkability and how that aligned with the Transportation Master Plan update and updated Transportation Element policies;
- Concern with the difficulty of achieving our emissions reductions targets given the amount Shoreline’s population is expected to grow; and
- Concern with the feasibility of the goal of increasing tree canopy given increasing density as our growth areas redevelop.

Park, Recreation and Cultural Services (PRCS)/Tree Board Comments

Staff also presented the draft actions pertaining to public tree management to the PRCS/Tree Board at their August 25, 2022 meeting. Overall, Board members were supportive of the CAP work including the draft strategies and actions but provided the following specific concerns and comments:

- Interest in increasing protections for existing street trees during public and private development projects;
- Concern with feasibility of creating nature patches in parks (ES 1.1) as opposed to focusing on restoration and maintenance of existing forest areas;
- Restoration/reforestation activities need to be balanced with other park uses;
- Support for more emphasis on incorporating climate-resiliency features in new and existing parks, especially to mitigate stormwater impacts and provide shade (ES 1.5 and 1.6); and
- Support for switching highly visible gas-powered equipment such as blowers and mowers used by Parks/Grounds Maintenance to electric options (TM 2.11).

Phase 3 – Draft Plan Review

Staff are currently conducting a final phase of community engagement to ensure the draft Plan reflects community priorities and feedback received thus far and to identify partners for implementation. Staff hosted a final community conversation event on September 20, 2022 and [posted the draft Plan for public comment online](#). The public comment period for the CAP update will close on October 10th. Initial feedback from both the community conversation event and public comment received thus far indicates that community priorities are reflected in the Plan, but included the following comments:

- Interest in seeing more emphasis on walkability and improving safety and convenience of multimodal transportation and public transit as the primary goal, as opposed to electric vehicles;
- Strong support for making building electrification affordable for all members of the community and partnering with Shoreline School District and other large building owners;
- Strong support for codes requiring building efficiency, electrification, and renewable energy;
- Interest in clarifying the relative importance of sequestration as opposed to GHG reduction strategies that may be in conflict (i.e. supporting increased density and expanding urban tree canopy); and
- Strong interest in more emphasis on preservation of existing trees during public and private development.

Other Stakeholder Engagement

Throughout the process, staff consulted and received input from several key external partners including:

- Recology King County;
- King County Solid Waste Division;
- Zero Waste Washington;
- Seattle City Light;
- Puget Sound Energy;
- U.S. Green Building Council;
- ICLEI – Local Governments for Sustainability; and
- K4C partner jurisdictions.

COUNCIL GOAL(S) ADDRESSED

This item addresses City Council Goal #2: Continue to deliver highly-valued public services through management of the City's infrastructure and stewardship of the natural environment, and specifically Action Step #6 under this Goal: Continue to implement the 2022-2024 Priority Environmental Strategies including implementation of Salmon-Safe certification activities, resource conservation and zero waste activities, and updating the City's Climate Action Plan.

RESOURCE/FINANCIAL IMPACT

There will be costs to implement the strategies in the CAP update. Some funding for CAP implementation is included in the proposed 2023-2024 Environmental Services budget. However, additional funding will be needed for successful implementation of the CAP. With support from Cascadia Consulting Group, staff have developed initial cost estimates for a shortlist of ten high-priority CAP actions ("Cost Assessment," Attachment B). Staff are continuing to refine this analysis and develop cost estimates for additional CAP actions to present in a mid-biennium budget request next year.

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ATTACHMENTS

Attachment A – *DRAFT* Climate Action Plan Update
Attachment B – *DRAFT* Cost Assessment

CITY OF SHORELINE

**CLIMATE
ACTION
PLAN**



TABLE OF CONTENTS

Acronyms and Key Terms	5
Executive Summary	8
Letter from the Mayor	11
Introduction	12
Climate Impacts and Vulnerabilities in Shoreline	16
Community Vision	17
Plan Development	18
Greenhouse Gas Emissions and Reduction Targets	23
Past and Current Emissions	23
Future Emissions	26
Science-Based Targets	28
Climate Strategies and Actions	30
Transportation and Mobility	33
Buildings and Energy	38
Zero Waste	42
Ecosystems and Sequestration	46
Community Resilience and Preparedness	50
Implementation Plan	54
Accountability, Monitoring, and Evaluation	54
Multi-Criteria Analysis	55
Community Support and Engagement: What You Can Do	58
Implementation Matrix	61
Appendix A: Greenhouse Gas Emissions Inventory	83
Appendix B: Community Engagement	98
Appendix C: Multi-Criteria Analysis	115
Appendix D: Sequestration Analysis	135
Appendix E: Wedge Analysis	142



ACKNOWLEDGMENTS

The City of Shoreline thanks the many groups and individuals who contributed their valuable time and input throughout this process. The City extends special recognition to community members who participated in Community Climate Conversation workshops, engaged with the project through the online surveys or in-person poster boards, and served as Community Climate Advisors.

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Randy Witt	Public Works Director
Colleen Kelly	Recreation, Cultural, and Community Services Director
Ryan Abbott	Interim Police Chief

Partners

Recology King County
Seattle City Light
U.S. Green Building Council
Zero Waste Washington
King County Solid Waste Division
ICLEI – Local Governments for Sustainability

Consultant Team

Cascadia Consulting Group
Fehr & Peers

ACRONYMS AND KEY TERMS

Carbon sequestration	The process of capturing and storing atmospheric carbon dioxide in soils, oceans, vegetation, and geologic formations. Because carbon sequestration is a passive process and does not reduce the total emissions generated by a community, it should not be considered direct emissions reductions. Instead, sequestration processes can help achieve carbon neutrality.
Circular economy	A model where products are designed to be reused or recycled, which avoids consumption of new raw materials and reduces waste, pollution, and carbon emissions.
Climate Action Plan (CAP)	A comprehensive roadmap developed by an entity that outlines specific strategies and actions that it will take to reduce greenhouse gas emissions and adapt to climate change impacts.
Climate change	The long-term change in global and regional climate patterns due to increased levels of atmospheric carbon dioxide and other greenhouse gases produced by human activities such as using fossil fuels like coal, oil, and gas.
Climate emergency	An extreme weather event caused by climate change, such as wildfire, heatwaves, flooding, and drought.
Climate resilience	The ability of a community to prepare for, respond to, and recover from climate emergencies and impacts. Improving climate resilience is essential to the health and wellbeing of residents.
Commute trip reduction (CTR) program	A Washington State Department of Transportation (WSDOT) program that promotes alternatives to driving alone under the Commute Trip Reduction Law (WAC Chapter 468-63) to improve sustainability and reduce traffic congestion. Common elements of CTR programs include transportation demand management strategies such as provision of bicycle amenities, carpool and vanpool incentives, subsidies for transit fares, and implementation of flexible work schedules.
Decarbonization	The targeted reduction of the amount of carbon dioxide (and other greenhouse gases) emitted into the atmosphere from fossil fuel intensive systems and infrastructure.
Ecological restoration	The process of helping the recovery of an ecosystem that has been degraded, damaged, or destroyed. This can include removing invasive species, planting native species, and remediating soils.

Electric vehicles (EVs) Vehicles that derive all or part of their power from electricity.

Plug-In Hybrid Electric Vehicles (PHEVs): Vehicles that run by using a combination of electricity and use of an internal combustion and plug into the electric grid to derive power.

Battery Electric Vehicles (BEVs): Vehicles that run completely on electricity using a battery that can be recharged by being plugged into the electric grid.

Electrification

The transition away from using natural gas and other fossil fuels to electricity (typically generated from renewable energy sources like solar and wind) to power homes and vehicles.

Frontline communities

Those who are most likely to be impacted by the effects of climate change. These are community members that face historic and current inequities, often experience the earliest and most acute impacts of climate change, and have limited resources and/or capacity to adapt to those impacts. They are often excluded from planning efforts even though their voices may be the most valuable because of their vulnerability to climate impacts.

In Shoreline, these communities include nonwhite community members including Black, Indigenous, Hispanic or Latino, and other identities that face current or historic inequities, people with low or no income, unhoused individuals, youth, immigrants, people with disabilities, people with limited English proficiency, and individuals from other marginalized groups.

Green Stormwater Infrastructure (GSI)

Systems where stormwater runoff is slowed, filtered, used, and/or treated using vegetation, soils, and natural processes. Examples of GSI systems include rain barrels, permeable pavement, rain gardens, and bioswales.

Greenhouse gases (GHGs)

Heat-trapping gases that warm the atmosphere such as carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O).

Greywater

Household wastewater from bathtubs, showers, sinks, washing machines, and dishwashers.

Heat pump

An energy-efficient alternative to furnaces and air conditioners that uses electricity to move heat around rather than generating it, resulting in space heating and cooling.

ICLEI – Local Governments for Sustainability

The largest global network of local governments devoted to solving the world's sustainability challenges. ICLEI's standards, tools, and programs have been utilized by Shoreline to evaluate and reduce the City's greenhouse gas emissions.

King County-Cities Climate Collaboration (K4C)	A collaboration between King County and partner cities to coordinate and enhance the effectiveness of local government climate and sustainability action.
Low-impact development	Systems and practices that use or mimic natural processes to manage stormwater runoff. Water is infiltrated into the ground or stored onsite to protect water quality and minimize flooding.
Metric ton of carbon dioxide equivalent (MTCO₂e)	A common unit of measurement that represents an amount of a greenhouse gas whose impact on climate change has been standardized to that of one unit of carbon dioxide (CO ₂), based on the global warming potential (GWP) of the gas.
Mixed-use development	Development that consists of a mix of uses such as residential, retail, commercial, office, government, and entertainment in the same building or in close proximity.
Multimodal transportation	Accessible transportation through a variety of travel modes, typically pedestrian, bicycle, public transit, and automobile modes.
Net zero	The balance of greenhouse gas emissions produced through human activities and emissions removed from the atmosphere from processes such as carbon sequestration to achieve carbon neutrality.
Science-based targets (SBTs)	Measurable and actionable greenhouse gas reduction targets based on the best available science and developed by individual local governments in collaboration with ICLEI. These targets represent each community's equitable share of GHG reductions needed to meet the Paris Agreement's commitment of keeping warming below 1.5°C. There are several established methodologies used to calculate SBTs.
Shared-use mobility	Transportation resources and services that are shared among users, such as public transit, bike and scooter shares, and rideshares.
Transit-oriented development	Walkable, pedestrian-oriented, and densely compacted mixed-use (commercial, residential, entertainment) development centered around or located near public transit stations.
Travel demand management (TDM)	Public and private programs to manage demand based on transportation supply. TDM measures are frequently directed toward increasing the use of public transportation, carpools and vanpools, and nonmotorized travel modes.
Vehicle miles traveled (VMT)	A metric used in transportation planning to measure the cumulative miles traveled by all vehicles in a geographic region over a given time period.

EXECUTIVE SUMMARY

Shoreline’s 2013 Climate Action Plan (CAP) represented the City’s commitment to reducing climate change-causing greenhouse gas emissions in Shoreline. Using new science and data, updated goals and targets, and inclusive engagement, this plan update represents the City’s renewed and ongoing commitment to climate action.

This plan outlines key steps the City can take to reduce community-wide emissions, support healthy ecosystems that sequester carbon, and ensure that the community is prepared for and resilient to climate impacts. These actions will have a wide range of co-benefits for Shoreline, such as cleaner air and water, greater ecosystem health, and cost savings from lower utility bills.

In this plan, we commit to achieving science-based targets by reducing greenhouse gas emissions by 60% emissions by 2030 compared to 2019 levels and reaching net zero emissions by 2050. The strategies and actions outlined in this plan support and advance our three overarching goals:

GOAL 1: REDUCE EMISSIONS

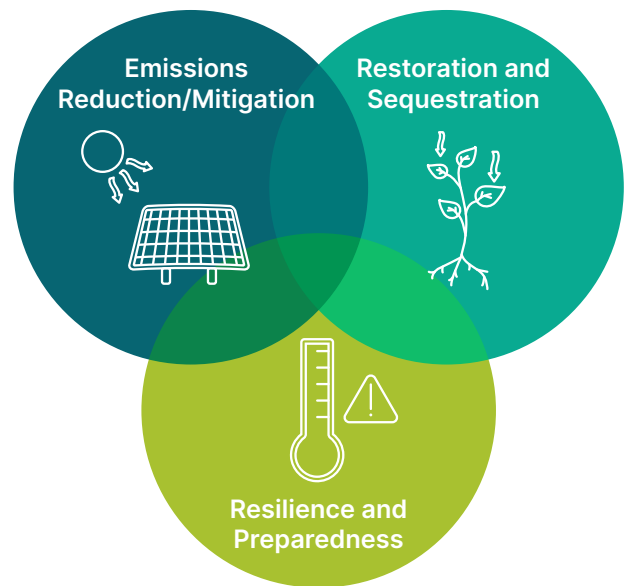
Climate change mitigation strategies limit or stop activities that are producing greenhouse gas (GHG) emissions to reach the City’s GHG reduction targets. Most of Shoreline’s emissions come from vehicle fuel use and natural gas use in buildings.

GOAL 2: ENHANCE ECOSYSTEM HEALTH AND SEQUESTRATION

Restoration and sequestration strategies improve the health of local ecosystems and their ability to remove carbon from the atmosphere, provide habitat, regulate the water cycle, and buffer the impacts of climate change.






GOAL 3: INCREASE RESILIENCE AND PREPAREDNESS

Climate resilience and preparedness strategies help protect the community from the worsening impacts of climate change, such as hotter summer days and more severe storms and ensure that everyone has access to preparedness resources, especially those who are most vulnerable to these impacts.



Focus Areas, Strategies, and Actions

We leveraged established best practices for cities to address climate change and findings from technical analyses and community engagement to shape and prioritize the strategies and actions included in the plan. The strategies below outline a pathway to achieving our three overarching goals. The table below shows the strategies grouped into five focus areas. The number of specific actions that fall under each focus area are shown on the right.

	Focus Area: Transportation and Mobility (TM)	Number of Actions
	<ul style="list-style-type: none"> • Strategy TM-1: Reduce community-wide driving. • Strategy TM-2: Accelerate electric vehicle (EV) adoption. 	25
	Focus Area: Buildings and Energy (BE)	
	<ul style="list-style-type: none"> • Strategy BE-1: Electrify space and water heating for new and existing buildings. • Strategy BE-2: Increase energy efficiency of new and existing buildings. • Strategy BE-3: Increase renewable energy generation and access. • Strategy BE-4: Support affordable green buildings that conserve water and protect habitat. 	18
	Focus Area: Zero Waste (ZW)	
	<ul style="list-style-type: none"> • Strategy ZW-1: Reduce per capita waste generation, especially wasted food. • Strategy ZW-2: Increase diversion rates and access to recycling and composting services. 	16
	Focus Area: Ecosystems and Sequestration (ES)	
	<ul style="list-style-type: none"> • Strategy ES-1: Maintain and increase tree canopy and urban forest health. • Strategy ES-2: Increase soil sequestration in natural and landscaped areas. 	15
	Focus Area: Community Resilience and Preparedness (CRP)	
	<ul style="list-style-type: none"> • Strategy CRP-1: Ensure that new buildings, land use decisions, and public infrastructure improvements increase resilience to current and future climate impacts. • Strategy CRP-2: Strengthen community and municipal emergency preparedness in consideration of predicted climate impacts such as extreme heat, flooding, wildfire smoke, and drought. • Strategy CRP-3: Increase community awareness of climate change impacts and mitigation and support community-based efforts that increase resilience. 	15

Public Engagement

Throughout the CAP update process, the City of Shoreline engaged with the community to seek feedback to inform the plan's strategies and actions. During three phases of engagement, the community participated in a variety of opportunities to help shape the plan's vision, goals, and actions to ensure they reflect community priorities, concerns, and ideas.

We hosted five virtual community workshops, nine meetings with a cohort of Community Climate Advisors with lived experience as frontline community members, two online surveys, and several in-person outreach opportunities to engage as much of the community as possible.

PRIORITIZING EQUITY

Throughout the plan development process, the City engaged directly with frontline communities and used equity as an intentional lens to develop and prioritize strategies and actions.

Implementation

Implementation of these strategies and actions will require commitment, collaboration, resources, and accountability from the City and community. All members of the Shoreline community will need to play a significant role to achieve our climate action goals. In addition, Shoreline is positioned to work in tandem with other local jurisdictions—for example, Shoreline participates as a member of the King County-Cities Climate Collaboration.



LETTER FROM THE MAYOR

Over the past decade, the Shoreline community has taken bold action to address climate change and protect local ecosystems. Since we completed our first Climate Action Plan in 2013, community members have volunteered thousands of hours to restore and protect our urban forests; we became the first city in Washington to earn Salmon Safe certification; and we passed strong energy code updates banning fossil fuel use in new, large buildings. We've also worked to ensure that we concentrate our growth in dense, walkable centers with easy access to transit, such as around the light rail station areas and along Aurora. We have also worked to ensure that new buildings are built to high environmental standards.

But despite this progress, our climate is rapidly changing, and these changes threaten the health and livability of our community and of communities around the world. The impacts of climate change that we are already experiencing – such as hotter summer days, poor air quality from wildfire smoke, and increased winter flooding – are projected to worsen in the coming decades. And we know that the people impacted most are those in our community who are already experiencing systemic racism and injustice, or who lack affordable housing or access to living wage jobs.

This Climate Action Plan update reflects our commitment to address the climate crisis and work towards a more just, resilient, and thriving future for everyone in Shoreline. This plan outlines a pathway not just to meet our climate targets, but to a future powered by clean energy, with vibrant urban centers, convenient and accessible transportation options, less waste in our landfill, cleaner air and water, and healthy, carbon-rich ecosystems and natural habitats. It leverages partnerships through the K4C; the regional investment in Sound Transit's light rail service; our access to affordable, carbon-free energy from Seattle City Light; and significant State and Federal legislation to reduce emissions and fund climate action. The plan also outlines strategies to increase community resilience and preparedness for the impacts of climate change and supports healthy ecosystems that capture carbon and provide a wide range of other benefits.

The actions in this plan are bold and implementing them will require significant effort, innovation, and partnership. But the science is clear. We need bold action to address our climate crisis. I am confident that if we continue to work together, we can create a truly sustainable and thriving future.

Mayor Keith Scully

INTRODUCTION

The City of Shoreline adopted its first Climate Action Plan in September 2013 as a strategic roadmap to guide City programs, residents, and businesses in reducing community-wide greenhouse gas (GHG) emissions. Since then, Shoreline has continued to be a regional leader in climate and sustainability work by completing regular additional GHG inventories, assessing local climate risks, and implementing key actions to reduce community emissions.

On October 18, 2021, the City of Shoreline joined the "Cities Race to Zero." In doing so, the City committed to reaching net zero emissions by 2050, in line with an overarching goal to limit warming to 1.5°C.

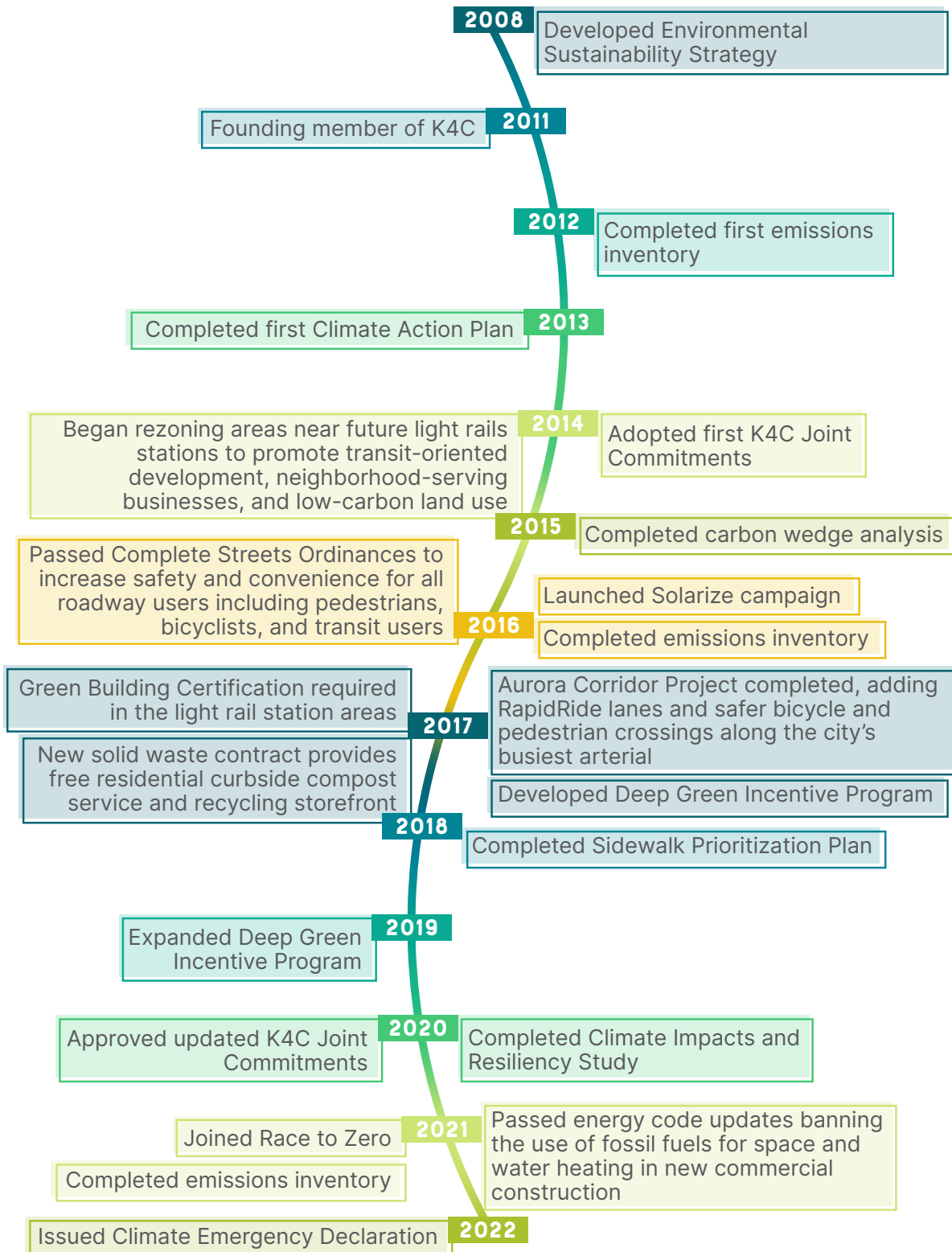
The Race to Zero is a global campaign established by the United Nations that motivates and provides resources for cities and other entities to reduce GHG emissions, which are responsible for our changing climate, according to science-based targets.

On August 15, 2022, the City Council issued Resolution 494 to officially declare a climate emergency, recognizing that the climate crisis threatens the health and livability of our community and of communities around the world. This resolution directed the City to take action to reduce GHG emissions to reach our science-based targets, while protecting and restoring ecosystems, increasing resilience to climate impacts, and centering equity in both planning and implementation.

The City of Shoreline continues to be a leader in regional efforts to reduce emissions and prepare for climate change. Shoreline is a founding member of both the King County-Cities Climate Collaboration (K4C) and the Puget Sound Climate Preparedness Collaborative. In 2019, we affirmed our continued commitment to this regional approach by approving the updated K4C Joint Commitments that outline actions and policies to meet our shared regional climate targets. Through the K4C and other partnerships, the City aligns its work with best practices from peer cities, advances regional solutions to climate change, and leverages regional opportunities and resources.



These commitments build on Shoreline’s existing environmental stewardship and further solidify the City’s role as a leader in climate action. Examples of the City’s previous climate action work include the following:



The Shoreline Climate Action Plan (CAP) update sets new targets and establishes a vision for a low-emissions, resilient, and equitable Shoreline that reaches **net zero emissions** by 2050. This CAP update focuses on the most impactful actions that the City can take to reduce community-wide emissions, including emissions from municipal operations, given the urgent need to reduce emissions by 2030 to slow the impacts of the global climate crisis.

In addition to reducing community-wide emissions, this plan will also support healthy, functioning ecosystems and will increase resilience in the face of climate impacts. These actions will have a wide range of additional benefits for Shoreline, such as cleaner air and water, greater ecosystem health, and lower utility bills. The strategies and actions in this plan were designed to support and advance Shoreline’s three overarching goals:

NET ZERO EMISSIONS

For Shoreline to achieve its goal of net zero emissions by 2050, the amount of greenhouse gases emitted into the atmosphere must equal the amount removed. Emissions can be removed from the atmosphere through natural processes like ecosystem carbon sequestration or from actions like purchasing Renewable Energy Certificates.

GOAL 1: REDUCE EMISSIONS

Mitigation strategies limit or stop activities that are producing greenhouse gas emissions. Most of Shoreline’s emissions come from vehicle fuel use and natural gas use in buildings.

GOAL 2: ENHANCE ECOSYSTEM HEALTH AND SEQUESTRATION

Restoration and sequestration strategies improve the health of local ecosystems and their ability to remove carbon from the atmosphere, provide habitat, regulate the water cycle, and buffer the impacts of climate change.

GOAL 3: INCREASE RESILIENCE AND PREPAREDNESS

Climate resilience and preparedness strategies help protect the community from the worsening impacts of climate change, such as hotter summer days and more severe storms, and ensure that everyone has access to preparedness resources, especially those who are most vulnerable to these impacts.

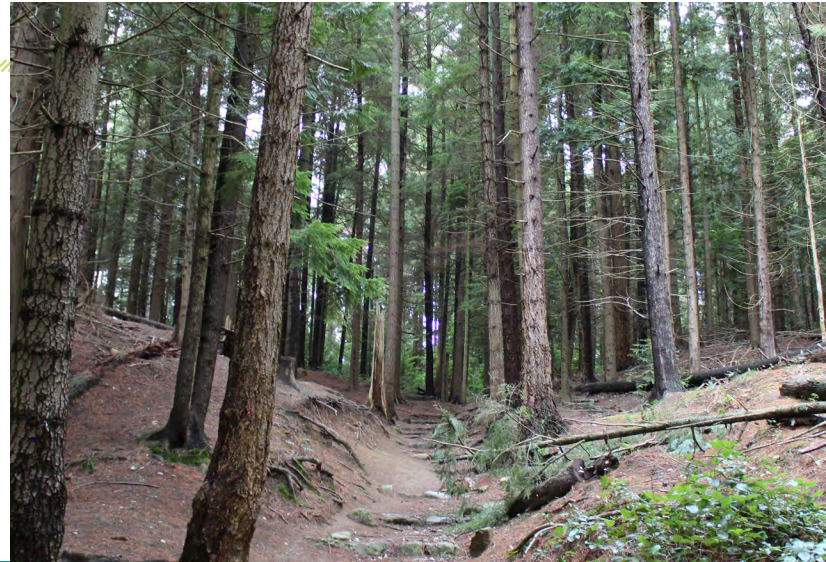
All three of these goals are essential to address the current climate crisis and ensure that Shoreline continues to be a thriving and resilient community.



CAP Organization

SECTION 1: CONTEXT

This plan begins by setting the context for Shoreline's Climate Action Plan. It introduces climate impacts and vulnerabilities, the plan development process, current and future emissions, and Shoreline's emissions reduction targets.



SECTION 2: ACTIONS

The Climate Strategies and Actions section of this plan details the actions that Shoreline will take to achieve its three goals of reducing emissions, increasing sequestration, and improving resilience.

SECTION 3: IMPLEMENTATION AND APPENDICES

The end of this plan explores implementation considerations and includes appendices that elaborate on the analyses used in this process.



SECTION 1: CONTEXT

CLIMATE IMPACTS AND VULNERABILITIES IN SHORELINE

Shoreline—along with communities around the world—is already experiencing the impacts of a changing climate. Like other cities in the Puget Sound region, Shoreline is experiencing rising average temperatures, more frequent extreme heat days, more frequent and severe wildfires and wildfire smoke exposures, and increased localized flooding from short, intense storm events. These impacts affect **frontline communities** most, which in Shoreline include Black, Indigenous, Hispanic, Latino, and other identities that face current or historic inequities, youth, and people with disabilities, who are unhoused, work outside, or have existing respiratory conditions.

In 2020, the City assessed the vulnerability of Shoreline’s community, environment, and infrastructure to various climate change impacts. Vulnerability describes whether and how systems and people are affected by climate impacts and the extent to which they can adapt to climate impacts. Understanding what, and who, is most vulnerable in Shoreline helps the City prioritize people and systems that are most at risk from climate change.

The assessment found that key areas of vulnerability include **low-lying areas, sensitive ecosystems, buildings and development, heat-related illness, and air quality**. The CAP update builds from this assessment by creating and prioritizing actions that address the greatest climate risks and key vulnerabilities.

Shoreline is already experiencing impacts from climate change, including:

TEMPERATURE

The average year in Puget Sound is currently 1.3°F warmer than historic averages.



By the 2050s...

- ⬆️ Average annual temperature will be 4.2°F to 5.5°F warmer.
- ⬆️ The hottest summer days will be 4.0°F to 10.2°F warmer.

PRECIPITATION

Extreme rain events in Western Washington have increased moderately.



By the 2080s...

- ⬆️ Annual precipitation will increase at least 6.4%.
- ⬆️ Rainstorms will be more intense.
- ⬆️ Winters will be wetter and summers drier.

PUGET SOUND HYDROLOGY

Puget Sound rivers have lower summer streamflows and streamflow peaks, leaving them drier in late summer and fall.



By the 2080s...

- ⬆️ Summer streamflows will be even lower.
- ⬆️ Flooding risk will increase during fall, winter, and spring.

By the 2080s, the Tolt and Cedar River watersheds (which supply Shoreline’s drinking water) will have less snowpack to source water from.

We have an opportunity to keep these impacts from getting much worse, but we need to act now to significantly reduce our greenhouse gas emissions.

COMMUNITY VISION

Shoreline’s vision for a resilient and sustainable community is rooted in the priorities and values we heard from community members throughout the CAP update process. Themes we heard from Shoreline’s community helped us to describe a community vision of a holistic and bold response to climate change that reduces emissions, promotes nature-based solutions, and works to increase resilience. This work must continue to prioritize and center the voices of community members, especially those most vulnerable to the impacts of climate change.

Building on the community’s priorities, **SHORELINE WILL...**

Reflect the priorities of all community members and center equity and affordability in CAP actions.

Be a regional leader in setting ambitious climate targets and implementing strong actions to achieve goals.

Recognize opportunities for collaboration and coordination across City departments and planning efforts related to climate action.

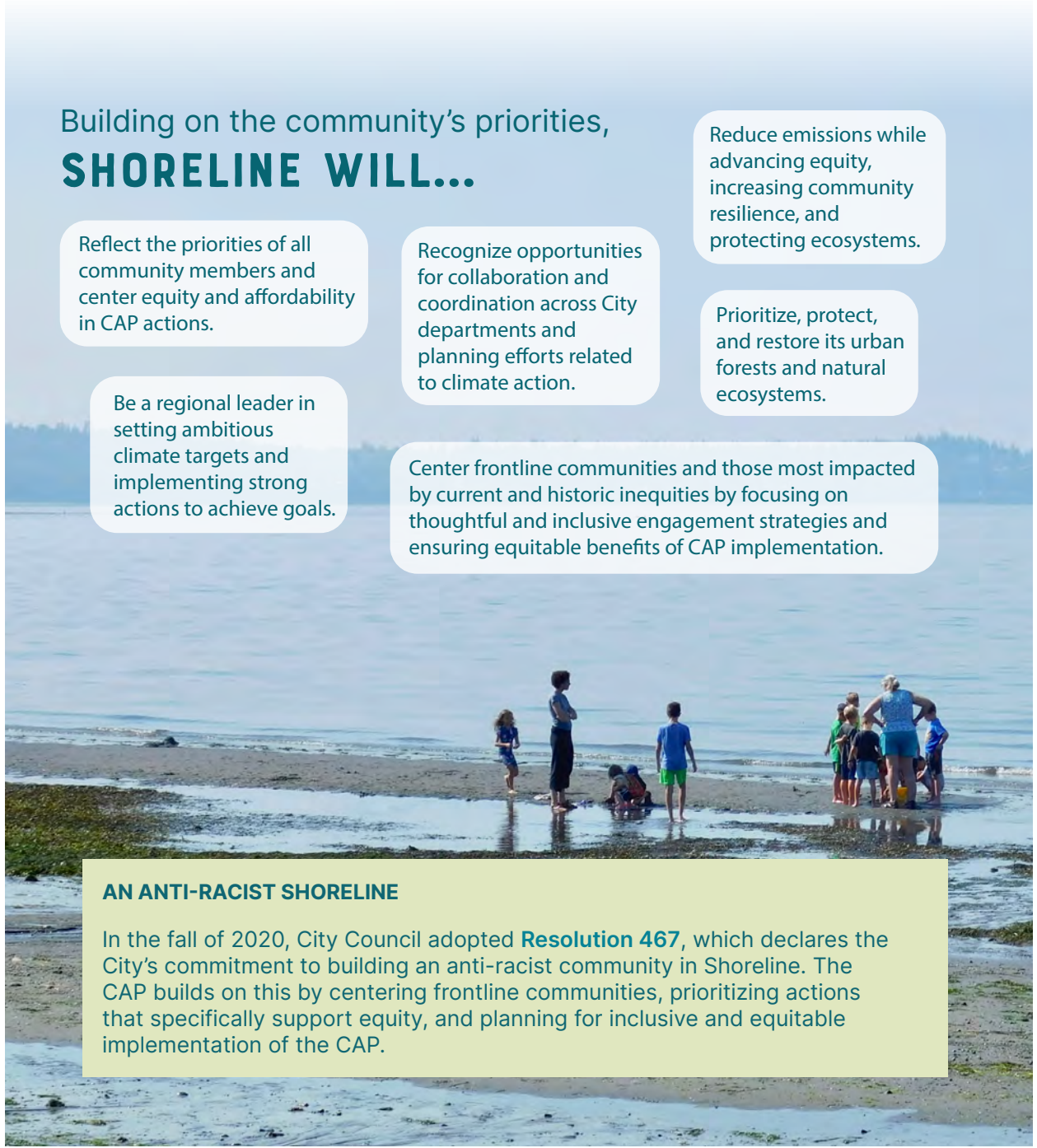
Center frontline communities and those most impacted by current and historic inequities by focusing on thoughtful and inclusive engagement strategies and ensuring equitable benefits of CAP implementation.

Reduce emissions while advancing equity, increasing community resilience, and protecting ecosystems.

Prioritize, protect, and restore its urban forests and natural ecosystems.

AN ANTI-RACIST SHORELINE

In the fall of 2020, City Council adopted **Resolution 467**, which declares the City’s commitment to building an anti-racist community in Shoreline. The CAP builds on this by centering frontline communities, prioritizing actions that specifically support equity, and planning for inclusive and equitable implementation of the CAP.



PLAN DEVELOPMENT

We have designed this plan to align with and build upon local and regional strategic initiatives and planning efforts that are already underway or currently in development. Many plan actions were developed through collaboration with the City staff leading these efforts. Key City plans, initiatives, and programs aligned with the CAP include:

- **Comprehensive Plan:** Provides the basis for the City's regulations and guides future decision-making. The plan includes climate-related elements which the CAP will support, including the goal of limiting global warming to less than 1.5°C above pre-industrial levels, supporting the Paris Agreement's climate action target.
- **Transportation Master Plan (TMP):** The TMP is the long-range plan for Shoreline's transportation network. The current TMP update prioritizes safety, equity, multimodality, connectivity, climate resilience, and community vibrancy when planning transportation improvements.
- **Climate Impacts & Resiliency Study:** Completed in 2020, this study recommends prioritization of green infrastructure, retrofits, and resilience measures which the CAP builds from.
- **Surface Water Master Plan:** Guides the City's Surface Water Utility to address drainage and water quality challenges associated with growth, increasing regulations, and aging infrastructure.
- **Urban Forest Strategic Plan** and **Green Shoreline 20-Year Forest Management Plan:** Establish priorities for on-the-ground urban forest management and restoration programs.
- **Parks Recreation and Open Space (PROS) Plan:** Defines priorities for Parks investments, acquisitions, and programs and is set to be updated soon.
- **King County's RE+ Plan:** Will outline key strategies for cities, counties, businesses, and communities to implement the County's 2019 Solid Waste Comprehensive Plan goal of zero waste of resources with economic value by 2030.



To ensure that the strategies and actions outlined in this plan are rooted in the latest climate science, aligned with regional targets and best practices, and tailored to reflect the community's priorities and perspectives, we took an iterative approach that included **quantitative and qualitative processes**. As a result, this plan update not only builds on our prior climate work, but also builds on current efforts, including:

- **Carbon wedge analysis:** Analyzes Shoreline's future GHG emissions based on multiple scenarios, including a "no action" future, a scenario that includes current climate policies, and a scenario that considers existing and future local climate actions that Shoreline can implement. For more details on this analysis, see "**Future Emissions.**"
- **Carbon sequestration analysis:** Analyzes Shoreline's tree cover to understand the annual carbon sequestration rate across the city, as well as air and water quality benefits. This analysis was conducted using the United States Department of Agriculture (USDA) Forest Service's i-Tree Canopy software. For more details on this analysis, see "**Appendix D: Sequestration Analysis.**"
- **Multi-criteria analysis (MCA):** Ranks actions qualitatively based on multiple criteria that represent Shoreline's priorities. The MCA evaluated 35 actions from Shoreline's action list. The MCA assigns numerical scores to each criterion to arrive at an overall priority score for each action. For more details on this analysis, see "**Multi-Criteria Analysis.**"
- **Cost assessment:** Evaluates the cost to the City and community for specific actions. The cost assessment evaluated 10 actions to understand costs as a measure of feasibility. For more details on cost and other implementation considerations, see "**Implementation Plan.**"



These processes are described below as individual steps in a chronological approach:



STEP 1: INITIAL CONTEXT SETTING

We conducted initial outreach and engagement to understand the community's priorities and concerns. To create a holistic picture of our current context and priorities, we referenced the City's 2019 GHG Emissions Inventory and completed an updated wedge analysis, and carbon sequestration analysis.

STEP 2: DEVELOP INITIAL SET OF STRATEGIES AND ACTIONS

City staff prepared a set of plan actions based on feedback from the context setting phase, current best practices and best available science, synergies with existing plans and policies, and opportunities for regional alignment.

STEP 3: REFINE STRATEGIES AND ACTIONS

The community reviewed the set of actions and had provided feedback on specific actions via Community Climate Conversations, meetings of the Climate Advisory Committee, and a public survey. We then refined the draft actions to align with community feedback.

STEP 4: CONDUCT QUANTITATIVE ANALYSES OF A SHORT LIST OF ACTIONS

We conducted a multi-criteria analysis (MCA) for a short list of 35 high priority actions, which were selected by City staff and informed by community input. The MCA provided a ranking of actions based on the following criteria:

- GHG emissions impact
- Resilience impact
- Feasibility
- Equity
- Co-benefits

For more details on this analysis and the scoring results, see “[Multi-Criteria Analysis](#)”.

We then selected 10 actions to be analyzed using a cost assessment, which provided further information about the anticipated costs and the potential cost savings of these actions for the City and community. The analysis relied on published literature, research, case studies, and expert opinion.

STEP 5: FINALIZE ACTION LIST

Based on the results of this process, City staff further refined and finalized the plan’s action list. To the extent possible, the strategies and actions reflect community priorities and concerns and integrate the results of the quantitative analyses.



ONGOING: COMMUNITY ENGAGEMENT

In addition to these technical analyses, we solicited feedback to shape the CAP's strategies and actions. This work ensured that the plan reflects community priorities. Throughout three phases of engagement in 2021-2022, community members participated in numerous engagement opportunities to provide input on the plan's vision, strategies, and actions by sharing their priorities, concerns, and ideas.

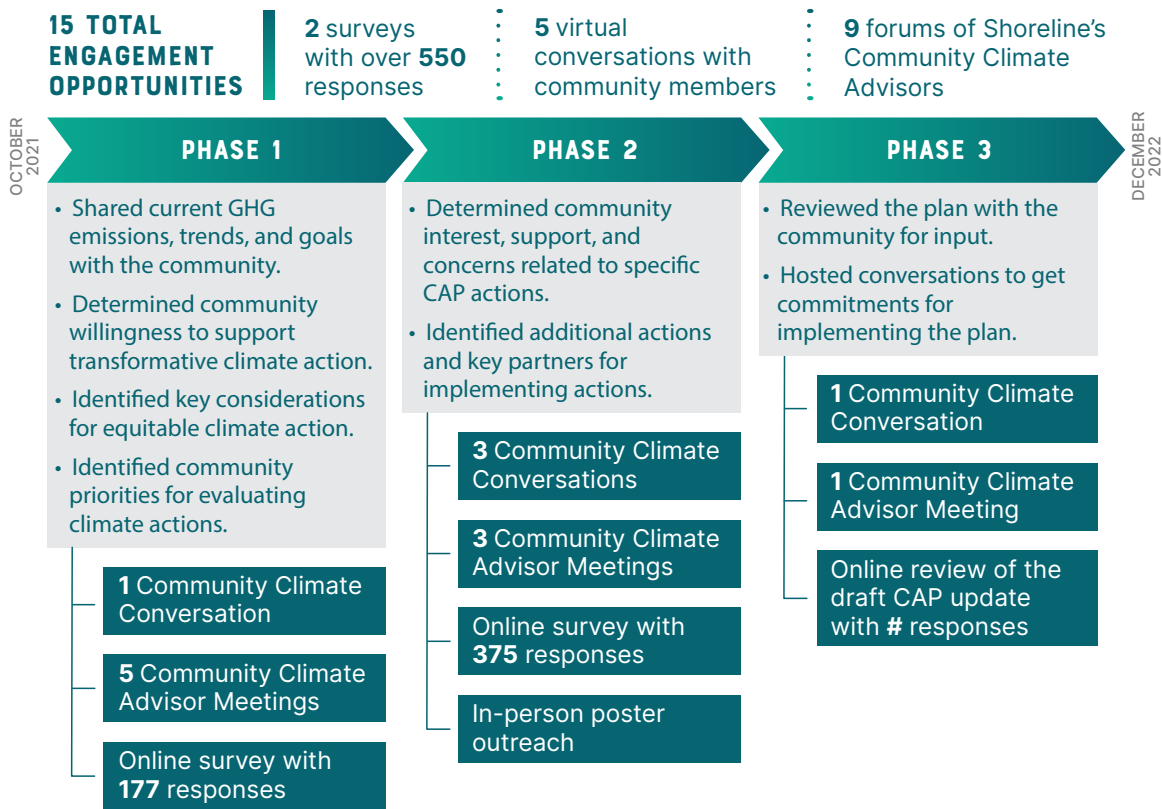
The public engagement process was one of several ways we worked to center equity in the planning process. At the start of the planning process, we hired a panel of community members to serve as Community Climate Advisors to guide both the plan development and community engagement efforts. When selecting advisors, we prioritized community members from diverse and underrepresented backgrounds and lived experiences. We also provided multiple ways for community members to engage with the planning process. These efforts included online conversation events, in-person outreach at community events, "pop-up" in-language displays at locations serving frontline community members, and translated online surveys. The aim of these efforts was to include the voices of those most vulnerable to climate impacts or who have previously been underrepresented in City planning processes.

To gain greater participation in engagement opportunities, we used a variety of outreach strategies, including in-person promotion at community events, placement of posters and yard signs around Shoreline, and information in the City's Currents newsletters. For more information about our engagement efforts and a list of outreach strategies we used, see "[Appendix B: Community Engagement.](#)"

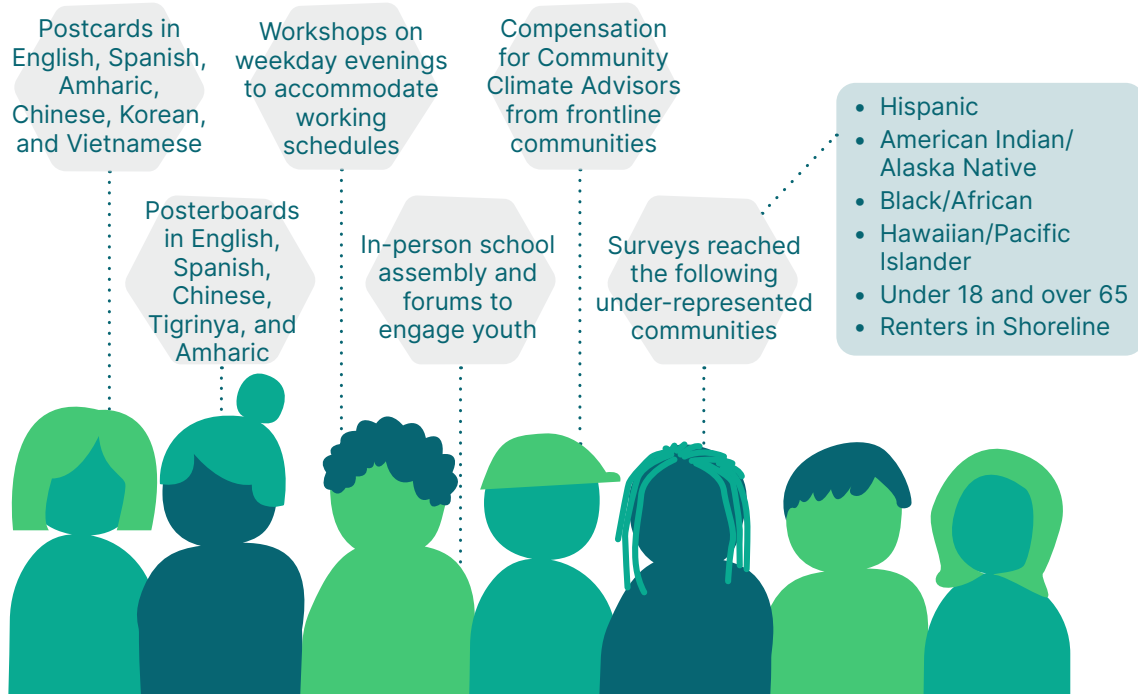
COMMUNITY CLIMATE ADVISORS

The City's Community Climate Advisors are a panel of community members with lived experiences in frontline communities who were compensated for their time attending meetings and providing feedback. The Advisors' goal was to ensure that this process prioritized frontline communities' perspectives and engaged community members that the City does not have existing relationships with. This which helped create a meaningful, effective, and inclusive process.





The City's tailored approach to CAP engagement resulted in a wide representation of Shoreline's community. Equitable and accessible engagement practices included:



GREENHOUSE GAS EMISSIONS AND REDUCTION TARGETS

Past and Current Emissions

Understanding Shoreline’s current and historic GHG emissions—heat-trapping gases that warm the atmosphere—is crucial for effective climate action planning. Shoreline has completed GHG inventories for 2009, 2012, 2016, and 2019, which allows us to compare how emissions have changed over time and where most of our community-wide emissions originate.

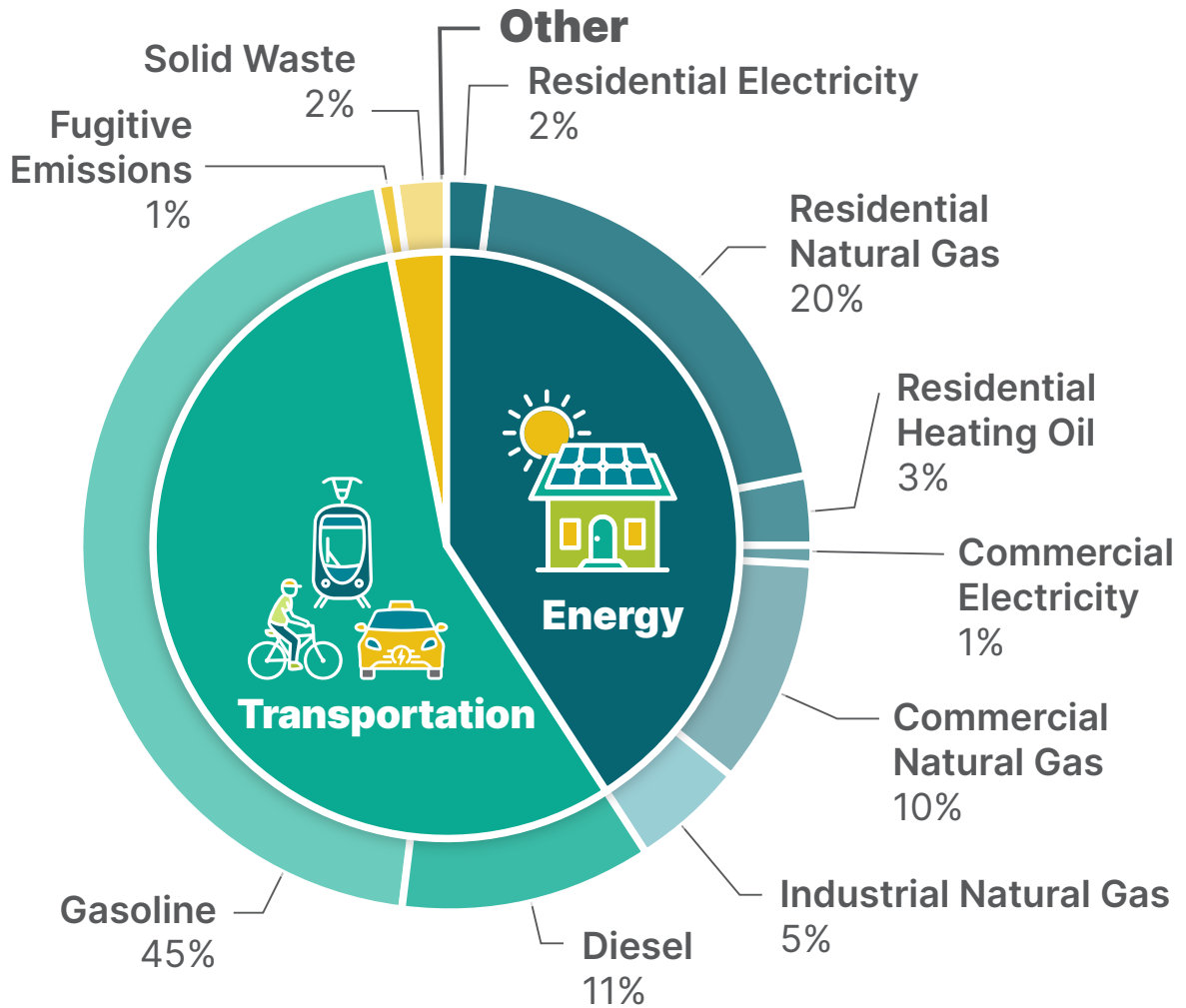
These inventories tracked emissions from the three main greenhouse gases, carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) that originated or occurred within Shoreline’s boundaries, such as from fuel use in buildings and cars. The inventories do not include emissions from the production and consumption of goods and services that occur outside of Shoreline, which can be significant.

- In both 2009 and 2019, the majority of emissions came from **transportation** and **residential natural gas** use (45% and 20% of 2019 emissions, respectively).
- Between 2009 and 2019, GHG emissions **decreased by 5%**, even as Shoreline experienced an increase in population.
- Per capita emissions (total emissions divided by the number of people living in Shoreline) **decreased by 10%** between 2009 and 2019.
- Some of these emissions reductions are due to **higher energy efficiency**, **fewer homes using oil heat**, **fewer miles driven** per person, and **less solid waste** sent to the landfill.

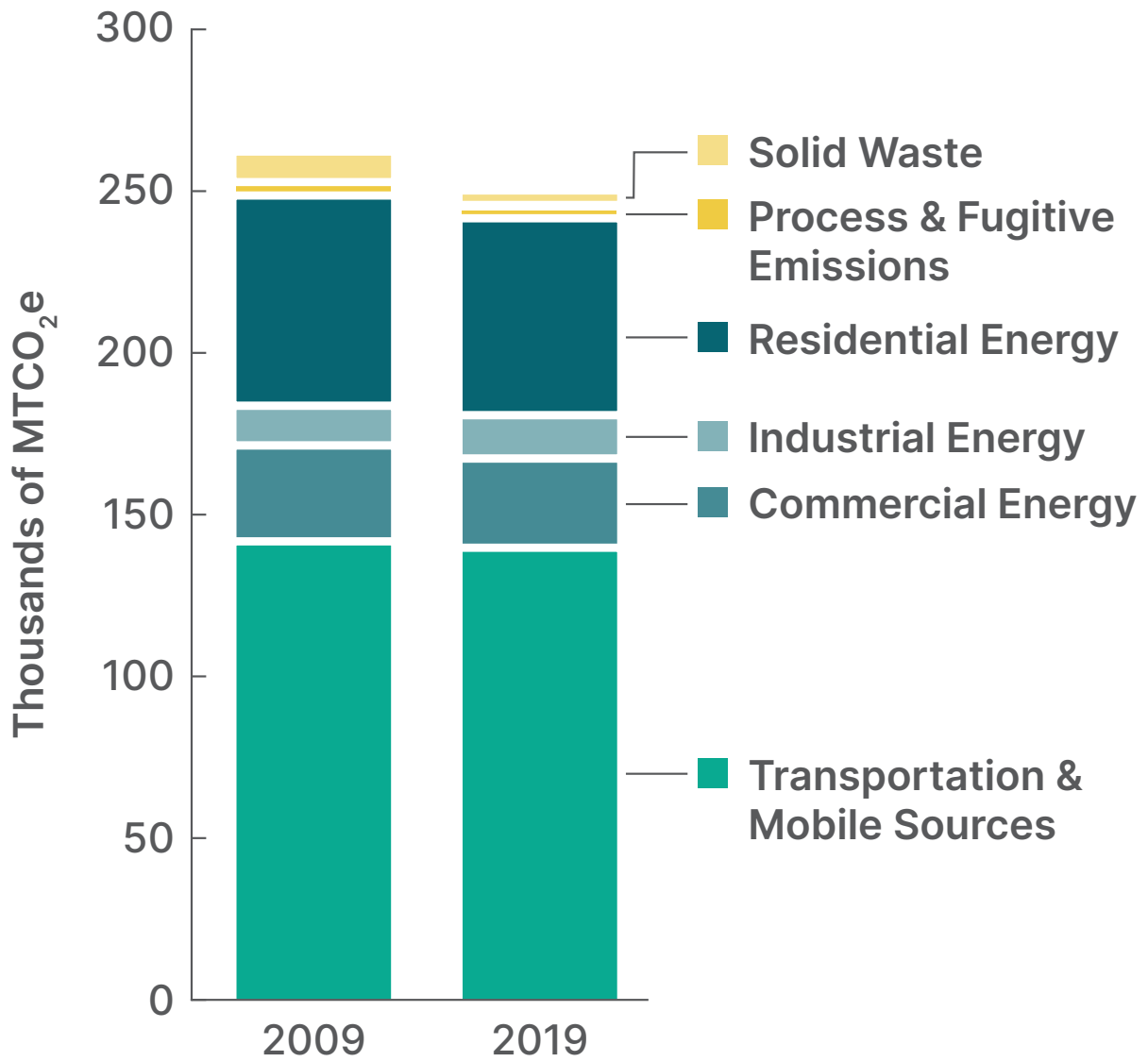
For more details on Shoreline’s emissions, see “[Appendix A. Greenhouse Gas Emissions Inventory](#).”



Sources of Shoreline's community-wide greenhouse gas emissions in 2019 (249,180 MTCO₂e)



Comparison of Shoreline's community-wide emission sources in 2009 and 2019



Future Emissions

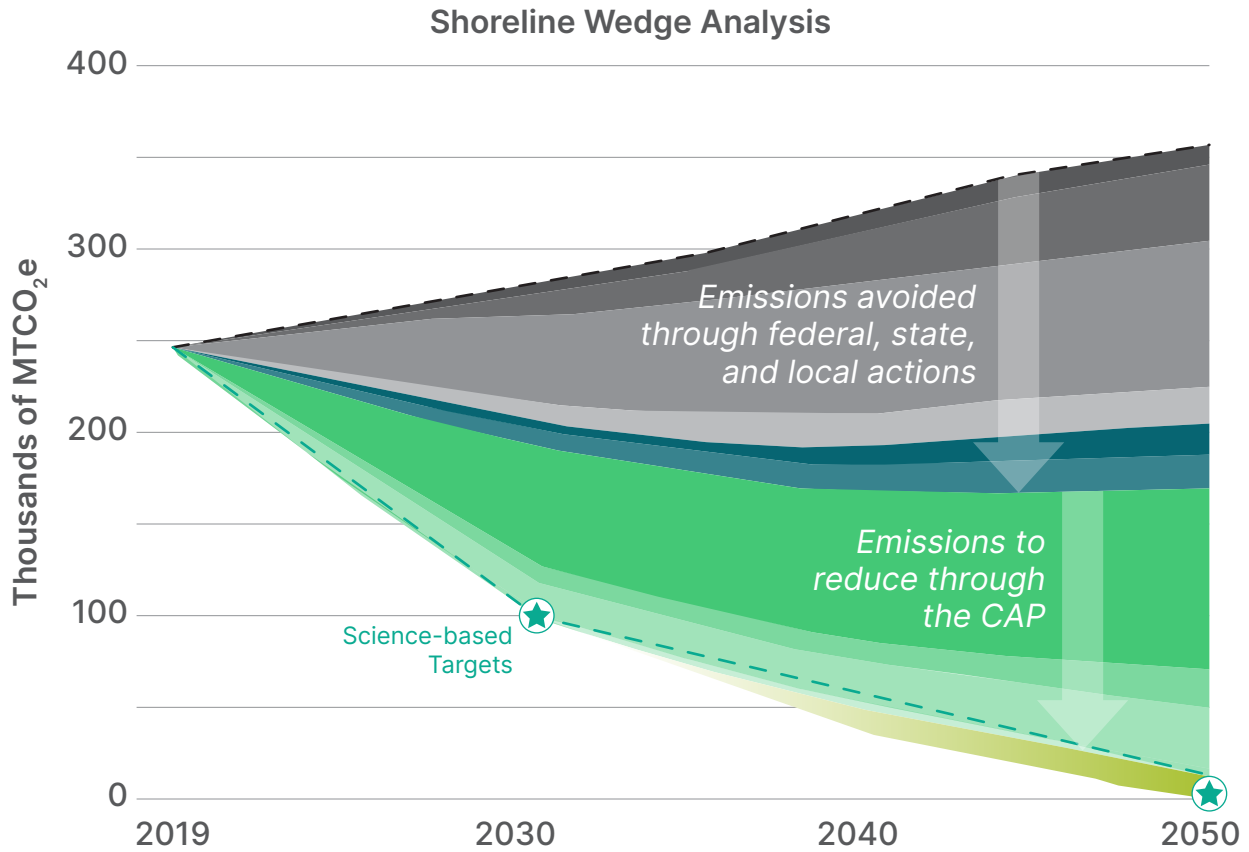
Based on the 2019 GHG Emissions Inventory and expected housing, population, and employment growth rates, we forecasted Shoreline’s future emissions from 2019 to 2050 under the following scenarios:

- **No action future:** Without federal, state, or local climate action, Shoreline’s total GHG emissions are expected to increase by 45% from 2019 to 2050.
- **Current policy and action future:** When considering the anticipated impacts of current state, federal, and City policies, Shoreline’s total GHG emissions are expected to decrease by 59% from 2019 to 2050. The following policies were modeled to understand the anticipated impacts on GHG emissions:
 - **Clean Energy Transformation Act (CETA):** Requires all electric utilities in the state to eliminate coal-fired electricity from their state portfolios by 2025 and be GHG neutral by 2030.
 - **State Energy Codes:** Require new buildings to become increasing more energy-efficient, incrementally moving towards achieving a 70% reduction in annual net energy consumption by 2031 (compared to a 2006 baseline).
 - **WA Clean Fuel Standard (HB 1091):** Requires a 20% reduction in the carbon intensity of transportation fuels by 2038, compared to a 2017 baseline, beginning January 1, 2023.
 - **Corporate Average Fuel Economy (CAFE) standards:** Regulates light- and heavy-duty vehicle fuel economy standards (how many miles the vehicle can drive per gallon of fuel).
 - **Shoreline Energy Code:** Increases energy efficiency and prohibits fossil fuel use for space and water heating in new commercial and large multifamily buildings.
 - **Light rail and transit-oriented development:** Emissions reductions associated with existing and planned multi-modal transportation investments and land use decisions to center growth in areas in proximity to future light rail stations and other high-capacity transit.
- **Additional actions future:** When considering the impacts of existing local climate actions and the implementation of key CAP actions, in addition to state and federal policies, Shoreline’s total GHG emissions are expected to decrease by 96% from 2019 to 2050.



For a more detailed report of this analysis and the assumptions used, see [“Appendix E: Wedge Analysis.”](#)

Shoreline's future emissions under two scenarios through 2050 (in thousands of MTCO₂e)



-- No Action Future

Federal/State Policies

- WA Clean Energy Transformation Act
- WA State Energy Code
- Federal Fuel Economy Standards
- WA Clean Fuel Standard

CAP Actions

- Building Electrification
- Reduce Driving
- On-road EV Adoption
- Waste Reduction/Recycling

Existing Local Actions

- Shoreline Energy Code
- Light Rail and Transit-Oriented Development

- Forest Carbon Sequestration*

*Forest carbon sequestration cannot be used to meet emissions reduction targets but can contribute toward carbon neutrality

These projections highlight the importance of local climate action to meet Shoreline's targets. Shoreline and other cities cannot rely solely on federal and state legislation to meet their climate goals. Past, present, and future community-wide emissions lay the foundation for the development and prioritization of Shoreline's climate actions.

Science-Based Targets



Through the actions defined in this plan, the City aims to significantly reduce Shoreline’s GHG emissions that are driving climate change.

While Shoreline has had commitments to reduce community-wide emissions since our first CAP in 2013, this current plan is based on updated science-based targets (SBTs). The 2013 CAP included targets of reducing GHG **emissions 25% by 2020, 50% by 2030, and 80% by 2050 (below 2009 levels)**.

In 2021, K4C adopted GHG reduction targets that are consistent with those established by the King County Growth Management Planning Council. These targets called for a **50% GHG reduction by 2030, 75% by 2040, and 95% and net zero by 2050** compared to 2007 levels.

The City joined the Cities Race to Zero in 2021 and committed to reaching updated SBTs. The Race to Zero is a campaign by the United Nations to reduce global emissions 50% by 2030 and reach net zero emissions by 2050. This is the level of emissions reductions needed to keep global heating below the 1.5° Celsius goal of the Paris Agreement¹ and prevent the most catastrophic impacts of climate change.

As part of our Race to Zero commitment, the City agreed to calculate and adopt Shoreline-specific GHG reductions targets that reflect the Shoreline community’s fair share of achieving the 1.5° threshold. The City worked with ICLEI – Local Governments for Sustainability to calculate Shoreline’s SBTs based on the City’s 2019 GHG Emissions Inventory using the World Wildlife Fund’s One Planet methodology.

Science-based GHG reduction targets are “measurable and actionable environmental targets that allow cities to align their actions with societal sustainability goals and the biophysical limits that define the safety and stability of earth systems.”

Through evaluation of Shoreline’s 2019 emissions profile, the City determined that new SBTs will be to achieve a 60% emissions reduction by 2030 and net zero emissions by 2050 compared to a 2019 baseline.

Summary of GHG emissions reduction targets as a percentage of baseline emissions

Jurisdiction	Baseline Year	2030	2040	2050
United States	2005	50–52%	-	Net zero
Washington State	1990	45%	70%	95% + net zero
King County–Cities Climate Collaboration (K4C)	2007	50%	75%	95% + net zero
City of Shoreline (adopted SBTs)	2019	60%	TBD	95% + net zero

¹ The Paris Agreement. United Nations. Retrieved from <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

While Shoreline’s SBTs are more aggressive than K4C’s recently adopted targets, Shoreline can leverage K4C’s increased commitment to regional climate action to:

- Align with peer cities in King County.
- Stay up to date on regional climate action efforts and collective progress.
- Seek inspiration and guidance from other K4C members with similar local contexts.
- Support local opportunities for synergistic policies and programs.
- Keep pace with the region while benefiting from knowledge of peer cities who may be further ahead in climate action and implementation.

In addition to these community-wide targets, this plan continues to advance the City’s existing commitment to lead by example and **reach net zero emissions from municipal operations by 2030**.

To track progress toward Shoreline’s SBTs, the City has developed key performance indicators (KPIs) for the plan’s strategies. See the **“Implementation Matrix”** for KPIs and other implementation considerations.



SECTION 2: ACTIONS

CLIMATE STRATEGIES AND ACTIONS

Drawing on existing plans and actions, community priorities and feedback, the 2019 GHG Emissions Inventory, and the Climate Impacts & Resiliency Study, we developed a list of climate actions to meet the three main goals of this plan:

GOAL 1: REDUCE EMISSIONS

Limit or stop activities that are producing greenhouse gas emissions to achieve our science-based targets of a 60% reduction by 2030 and net zero by 2050 (compared to a 2019 baseline).

GOAL 2: ENHANCE ECOSYSTEM HEALTH AND SEQUESTRATION

Improve the health of local ecosystems to maximize their ability remove carbon dioxide from the atmosphere, provide habitat, regulate the water cycle, and buffer the impacts of climate change.

GOAL 3: INCREASE RESILIENCE AND PREPAREDNESS

Protect the community from the worsening impacts of climate change through resilient infrastructure, emergency preparedness, and community participation.

Community Priorities

Developing these strategies and actions was an iterative process. Community members voiced their priorities, concerns, ideas, and feedback about the overall CAP goals and specific actions through four Community Climate Conversation workshops, two online surveys, several in-person events using posters, and eight meetings of the Community Climate Advisors.

The Shoreline community prioritized environmental equity and climate resilience as the top criteria the City should use when evaluating actions. Community members also identified public health, cost savings and affordability, and other environmental benefits as important to consider during action evaluation. For more details on community engagement and feedback, see **“Appendix B: Community Engagement.”**



Actions to achieve the three goals of reducing emissions, enhancing ecosystem health and sequestration, and increasing resilience and preparedness are grouped into the following five focus areas and associated strategies:



Focus Area: Transportation and Mobility

- Strategy TM-1: Reduce community-wide driving.
- Strategy TM-2: Accelerate electric vehicle (EV) adoption.



Focus Area: Buildings and Energy

- Strategy BE-1: Electrify space and water heating for new and existing buildings.
- Strategy BE-2: Increase energy efficiency of new and existing buildings.
- Strategy BE-3: Increase renewable energy generation and access.
- Strategy BE-4: Support affordable green buildings that conserve water and protect habitat.



Focus Area: Zero Waste

- Strategy ZW-1: Reduce per capita waste generation, especially wasted food.
- Strategy ZW-2: Increase diversion rates and access to recycling and composting services.



Focus Area: Ecosystems and Sequestration

- Strategy ES-1: Maintain and increase tree canopy and urban forest.
- Strategy ES-2: Increase soil sequestration in natural and landscaped areas.



Focus Area: Community Resilience and Preparedness

- Strategy CRP-1: Ensure that new buildings, land use decisions, and public infrastructure improvements increase resilience to current and future climate impacts.
- Strategy CRP-2: Strengthen community and municipal emergency preparedness in consideration of predicted climate impacts such as extreme heat, flooding, wildfire smoke, and drought.
- Strategy CRP-3: Increase community awareness of climate change impacts and mitigation and support community-based efforts that increase resilience.

How to Read These Sections

Each focus area section provides an overview of the topic's relevance and importance to the plan, followed by tables listing the climate strategies and actions within the focus area. Each action has an "action ID number," which is comprised of the focus area abbreviation, associated strategy number, and action number (e.g., TM 1.1 is the first action within the first strategy of the Transportation and Mobility focus area).

Strategy

Targets: If developed, targets specific to each strategy will appear here.

ID	Action	Benefits
Action ID number	Action name and description	Potential benefits of action (see icons below)

Benefits*



GHG emissions reduction potential: Action has a high potential to reduce GHG emissions



Public health/quality of life: Action has a high potential to improve public health or quality of life



Cost savings/affordability: Action has a high potential to provide cost savings or increase affordability for the community



Ecosystem health: Action has a high potential to support ecosystem health and natural systems



Equity: Action has a high potential to benefit communities that face historic inequities



Resilience: Action has a high potential to address key climate risks and improve climate resilience for the community



Feasibility: Action has a high feasibility potential (technically, politically, fiscally, and socially)

**Benefit icons are included only if the action was evaluated in the multi-criteria analysis and received a score of 4 or 5 for the given benefit.*

Other actions would also result in many of these benefits but were not evaluated at this time. See "[Appendix C: Multi-Criteria Analysis](#)" for more details on the analysis.

TRANSPORTATION AND MOBILITY



Transportation is Shoreline’s largest greenhouse gas emissions source, accounting for **56% of total community-wide emissions in 2019**. Most of these emissions come from gasoline use in passenger vehicles. The City has already taken important steps toward reducing these emissions by investing in infrastructure for walking, biking, and taking transit, and by supporting dense, transit-oriented development within walking distance of frequent transit and businesses.

The current update to the City’s Transportation Master Plan (TMP) will continue to guide transportation investments over the coming decades with goals of improving safety, increasing equity and climate resilience, supporting multimodal connectivity, and enhancing community vibrancy. Together, these investments are expected to significantly reduce transportation emissions as shown in the wedge analysis. See “[Appendix E: Wedge Analysis](#)” for more details on the assumptions regarding emissions reductions from transportation actions.

However, additional efforts are needed to reduce emissions from transportation to meet our science-based targets. To complement the TMP and achieve the necessary emissions reductions in this sector, the CAP actions aim **to reduce community-wide driving and accelerate the adoption of electric vehicles (EVs)**. Because Shoreline has access to plentiful, affordable carbon-free electricity from Seattle City Light, replacing conventional gasoline- and diesel-powered vehicles with electric alternatives is a key strategy for decarbonizing Shoreline’s transportation.

Community Priorities

Transportation and Mobility priorities identified by the community include:

- Increase walkability and bikeability
- Create more safe sidewalks and improve existing sidewalks
- Provide incentives for electric vehicle adoption
- Support climate-friendly transportation in a way that makes it more convenient than less sustainable alternatives

“

I would love to see more of a City push for creating biking/ walking paths closer to the light rail. Shoreline has the opportunity to lead by showing other cities how to become truly less dependent on cars, but it won't happen unless we invest in actual safe spaces that take foot and bike and other mode of transportation away from the roads with heavy car traffic.”

– Survey respondent

”

STRATEGY #1: REDUCE COMMUNITY-WIDE DRIVING.

Targets:

- Reduce miles driven per person 20% by 2030 and 50% by 2050 compared to 2019 levels.





ID	Action	Benefits
TM 1.1	<p>Increase density and walkability</p> <p>Study and implement land use and transportation policies to increase density, increase walkability, and encourage business development so that basic and desirable amenities are available by walking from more residences.</p>	
TM 1.2	<p>Increase street and pathway connectivity</p> <p>Increase street and multimodal connectivity where it supports the City's connectivity objectives. Identify funding and acquire mid-block right-of-way and street connections to increase multimodal connectivity in the King County [Candidate] Countywide Centers (148th St. Station Area, 185th St. Station Area, Shoreline Place, and Town Center).</p>	
TM 1.3	<p>Support transit-oriented development</p> <p>Continue to encourage transit-oriented development that incorporates affordable housing through land use and transportation policies and infrastructure. Partner with transit agencies and private developers to encourage redevelopment of Park and Ride locations for transit-oriented development projects that incorporate affordable housing.</p>	
TM 1.4	<p>Reduce demand for parking</p> <p>Continue to study and implement policies that reduce demand for parking in mixed-use and commercial centers and encourage transportation modes other than driving. Focus especially on limiting off-street, surface parking to reduce urban heat.</p>	
TM 1.5	<p>Reduce car trips from multifamily residents</p> <p>Continue to incentivize Travel Demand Management (TDM) strategies to reduce car trips from residents at new multifamily developments through the Deep Green Incentive Program. Explore and implement options to increase TDM incentives and requirements for new development.</p>	
TM 1.6	<p>Complete the pedestrian and bicycle network</p> <p>Fund and implement a connected network of safe, comfortable, welcoming, and low-stress bicycle facilities, sidewalks, and trails for pedestrian and bicycle travel that connects to schools, commercial destinations, transit stops, and essential services. Identify funding opportunities for bicycle infrastructure.</p>	

ID	Action	Benefits
TM 1.7	<p>Reduce commute trips by business employees</p> <p>Enhance and expand the City's Commute Trip Reduction (CTR) Program to encourage and require CTR activities across the city for major employers and within the City for internal employees. Possible strategies could include ridesharing programs, carpool matching, telecommuting, and employer-sponsored vanpools.</p>	
TM 1.8	<p>Create mobility hubs</p> <p>Create shared-use mobility hubs to enhance cross-community travel by transit, ride-share, electric vehicles, bike-share, and scooter-share and any means other than driving a traditional gas/diesel vehicle alone.</p>	
TM 1.9	<p>Provide shared-use electric bicycle or scooter programs</p> <p>Partner with King County or other cities to pilot electric bike- or scooter-share programs. Partner with community groups to pilot an e-bike library where bikes are available to low-income community members without requiring smartphone technology and a credit card to access.</p>	
TM 1.10	<p>Expand transit service and access</p> <p>Partner with Metro Transit, Sound Transit, Community Transit and/or WSDOT to increase transit service and access to encourage greater ridership. Improve cross-city transit connections, especially to the new light rail stations, explore flexible micro-transit service. Expand subsidized or discounted transit programs and increase education to encourage greater use of them.</p>	
TM 1.11	<p>Increase bicycle parking infrastructure</p> <p>Conduct a citywide bicycle parking inventory and increase bicycle parking, especially near businesses and amenities. Provide public and/or employee bicycle parking at all City facilities.</p>	
TM 1.12	<p>Provide bicycling education programs</p> <p>Host cycling education and encouragement programs in support of achieving Silver-level Bicycle-Friendly Community certification.</p>	
TM 1.13	<p>Provide rebates for electric-bicycles</p> <p>Incentivize E-bike ownership through a bulk purchase or rebate program.</p>	
TM 1.14	<p>Regional road usage fees</p> <p>Explore and advocate for regional road usage fees and regional pricing strategies for parking.</p>	

STRATEGY #2: ACCELERATE ELECTRIC VEHICLE (EV) ADOPTION.

Targets:

- Achieve 30% electric passenger and light-duty vehicles and 1% electric heavy-duty vehicles on the road by 2030.
- Achieve 95% electric passenger and light-duty vehicles and 50% electric heavy-duty vehicles on the road by 2050.
- Replace all operationally feasible light and medium-duty vehicles and off-road equipment in the City fleet with electric by 2030.
- Replace all operationally feasible heavy-duty vehicles and off-road equipment with low-emission alternatives by 2050.

ID	Action	Benefits
TM 2.1	<p>Encourage electric vehicle car-sharing</p> <p>Partner with regional jurisdictions and businesses to provide an EV car share program in the community.</p>	
TM 2.2	<p>Community education about electric vehicles</p> <p>Provide community education and outreach to increase EV adoption and promote existing incentives for EV purchases.</p>	
TM 2.3	<p>Support electrification of partner vehicle fleets</p> <p>Secure grant funding or update contract provisions to support fleet electrification by schools, businesses, utility, and transit partners such as Shoreline School District, North City Water District, and Recology.</p>	
TM 2.4	<p>Provide rebates for electric vehicle purchases</p> <p>Work with the State, Seattle City Light, and regional jurisdictions to offer more rebates and incentive programs for residents and businesses that purchase EVs. Partner with regional jurisdictions and local businesses to increase access to rebates.</p>	
TM 2.5	<p>Increase EV charging infrastructure installed in new buildings</p> <p>Strengthen our existing EV-ready ordinance to increase the percentage of required EV-ready stalls for new buildings. Consider requiring installation of a minimum number of charging stations in addition to electrical capacity for all new multifamily residential and commercial construction and during major renovation of parking lots/ structures.</p>	

ID	Action	Benefits
TM 2.6	<p>Install public charging stations in strategic locations</p> <p>In alignment with regional efforts through WSDOT and Seattle City Light, expand the public EV charging network by assessing gaps and supporting installation of charging stations for public use on business, institutional, City, and utility properties in key areas. Install charging stations for public use at City facilities open to the public such as parks and recreation centers wherever feasible.</p>	
TM 2.7	<p>Encourage charger installation at commercial and multifamily buildings</p> <p>Promote existing incentives and resources such as C-PACER for building owners to add EV charging infrastructure, especially in multi-family and affordable housing buildings.</p>	
TM 2.8	<p>Electrify the City fleet</p> <p>Purchase and deploy make-ready Battery Electric Vehicles (BEVs) to transition the City’s vehicle fleet to electric by 2030 for all operationally feasible vehicles. As needed, delay purchasing replacement vehicles until BEV options are available and affordable. If BEVs are not available for necessary replacements, consider plug-in hybrid options.</p>	
TM 2.9	<p>Electrify the City’s heavy-duty vehicles and equipment</p> <p>Replace the City’s heavy-duty vehicles with electric options where operationally feasible. Alternative low-emission fuels may be considered if electric options are not operationally feasible.</p>	
TM 2.10	<p>Increase charging infrastructure at City facilities</p> <p>Increase electrical capacity and charging infrastructure at City facilities to ensure adequate capacity for fleet and employee EV charging.</p>	
TM 2.11	<p>Electrify the City’s off-road equipment</p> <p>Replace City gasoline or diesel-powered off-road equipment (blowers, mowers, chainsaws, generators, etc.) with electric models as operationally feasible.</p>	

BUILDINGS AND ENERGY



Energy use in buildings is the second highest source of GHG emissions in Shoreline, accounting for **42% of total community-wide emissions in 2019**. These emissions come mainly from using natural gas or heating oil for heating homes and buildings.

By comparison, electricity is a minor source of emissions because Shoreline's provider, Seattle City Light, generates carbon-free electricity, primarily through hydropower and other renewable sources. By banning the use of natural gas heating in large new buildings in Shoreline, we have already made progress in reducing emissions from buildings. However, more action is needed to reduce emissions from a broader set of new buildings, as well as existing homes, commercial, and multi-family buildings. The following actions aim to **increase energy efficiency, increase renewable energy generation and access, and support affordable, green buildings**.

Community Priorities

Buildings and Energy priorities identified by the community include:

- Continue to electrify buildings and invest in renewables
- Provide incentives to help make the transition from fossil fuels more feasible
- Focus on both retrofitting existing construction and requiring all-electric new construction

“

“If we believe that climate change is a crisis worth addressing, and that natural gas contributes to it, new buildings should not use natural gas. Both a ban for new construction to use natural gas, and a program to retrofit existing homes are required.”

– Survey respondent

”

STRATEGY #1: ELECTRIFY SPACE AND WATER HEATING FOR NEW AND EXISTING BUILDINGS.

Targets:

- Phase out heating oil use by 2030.
- Reduce natural gas usage 60% by 2030 and 98% by 2050.
- Utilize electricity for space and water heating and cooking in all City facilities by 2030.

ID	Action	Benefits
BE 1.1	<p>Encourage new homes to be all-electric</p> <p>Provide education, technical assistance, and incentives to encourage and incentivize construction of all-electric new single-family homes. Possible incentives include reduced permit fees, additional development benefits, property tax exemptions, and/or rebates.</p>	
BE 1.2	<p>Advocate for local control of energy code</p> <p>Advocate for legislative changes to allow local updates to the Residential Provisions of the Washington State Energy Code so the City can require residential building electrification and increase energy efficiency for new residential construction.</p>	
BE 1.3	<p>Provide a home electrification program</p> <p>In collaboration with utilities and local jurisdictions, develop a residential home energy program to provide education, technical assistance, and financial assistance to replace gas and oil heating systems with electric heat pumps, improve home efficiency, and install renewable energy systems. Options include a rebate program, bulk-purchase retrofit campaign, or other financing mechanism. Prioritize low-income households for assistance and incentives.</p>	
BE 1.4	<p>Explore heating oil tax</p> <p>Explore taxing heating oil providers to fund electrification and weatherization assistance for low-income households.</p>	
BE 1.5	<p>Provide incentives for electric appliances</p> <p>Coordinate with utilities and regional partners to provide incentives for replacing gas and propane appliances in homes, businesses, and apartments with efficient, electric options.</p>	
BE 1.6	<p>Support electrification of commercial and multifamily buildings</p> <p>Promote existing financing mechanisms and incentives to convert gas and oil heating systems at commercial and multifamily buildings to electric space and water heating at low upfront cost. Partner with regional utilities and jurisdictions to provide technical assistance and outreach to building owners to encourage electrification. Develop new incentives as needed with a focus on low and middle-income residential buildings. Pair electrification measures with efficiency retrofits and renewable energy installation.</p>	
BE 1.7	<p>Require large buildings to reduce emissions</p> <p>Study and implement emissions-based building performance standards to reduce fossil-fuel use in commercial and multi-family buildings larger than 20,000 square feet. Standards should complement benchmarking and performance requirements under the State Clean Buildings Act and be accompanied by technical assistance for building operators.</p>	

ID	Action	Benefits
BE 1.8	<p>Support job training</p> <p>Partner with educational institutions to provide job training for electric heat pump system installation and energy efficiency retrofits.</p>	
BE 1.9	<p>Electrify City facilities</p> <p>Replace existing natural gas heating systems with electric systems at all City facilities at time of major renovation or replacement, with a goal of electrifying heating systems at remaining facilities by 2030. Include efficiency retrofits and solar PV installation in retrofits/remodels where feasible to offset energy costs.</p>	

STRATEGY #2: INCREASE ENERGY EFFICIENCY OF NEW AND EXISTING BUILDINGS.

ID	Action	Benefits
BE 2.1	<p>Improve energy efficiency of new large buildings</p> <p>Adopt local amendments to the Commercial Provisions of the 2021 Washington State Energy Code that increase energy efficiency.</p>	
BE 2.2	<p>Support energy efficiency projects at large buildings</p> <p>Promote existing financing and incentive programs such as King County's C-PACER program, the Clean Building Accelerator, NEEC's Building Operator Certification, state grants, or the Early Adopter Incentive Program, for energy efficiency retrofits at large commercial/multifamily buildings and schools.</p>	

STRATEGY #3: INCREASE RENEWABLE ENERGY GENERATION AND ACCESS.

ID	Action	Benefits
BE 3.1	<p>Incentivize solar or renewable energy installations</p> <p>Provide incentives for installation of on-site renewable energy systems on residential and commercial buildings and for community solar projects (projects that allow community members to purchase a portion of the renewable energy produced from solar installations on large buildings). This could include streamlined permitting, development benefits, rebates, or bulk-purchasing program. Focus on increasing access to renewable energy by low-income households.</p>	

ID	Action	Benefits
BE 3.2	<p>Increase requirements for new buildings to include solar panels</p> <p>Adopt local amendments to the commercial provisions of the WSEC that encourage on-site renewable energy systems for new commercial and multifamily buildings.</p>	
BE 3.3	<p>Support renewable energy at affordable housing projects</p> <p>Provide resources, assistance, and financing for new affordable housing to be net zero energy (a building that produces enough renewable energy to meet its own annual energy consumption).</p>	
BE 3.4	<p>Support biogas pilot projects</p> <p>Support development of local and regional biogas resources, including anaerobic digestion of food scraps.</p>	

STRATEGY #4: SUPPORT AFFORDABLE GREEN BUILDINGS THAT CONSERVE WATER AND PROTECT HABITAT.

ID	Action	Benefits
BE 4.1	<p>Increase requirements for sustainable building practices</p> <p>Adopt local amendments to the Washington State Building Code Council that encourage sustainable building practices such as water efficiency, rain and greywater harvesting and reuse, efficient system designs, and green stormwater infrastructure.</p>	
BE 4.2	<p>Green building policy for City buildings</p> <p>Develop a green building policy for City facilities and capital improvements that includes minimum energy efficiency standards and use of low-embodied carbon materials.</p>	
BE 4.3	<p>Expand incentives for sustainable building practices</p> <p>Evaluate the City's Deep Green Incentive Program to identify opportunities to expand participation and support further decarbonization, water and energy efficiency, habitat protection, and climate resilience.</p>	

ZERO WASTE



Solid waste disposal accounted for **2% of Shoreline's community-wide emissions** in 2019. Most of these emissions are from waste generation and the associated transportation of waste to landfills and other waste facilities. Currently, 70% of the waste that Shoreline and other communities send to the King County landfill could be composted or recycled instead.

While recycling and composting are key strategies, reducing the amount of waste we create is even more impactful. Although the direct emissions from Shoreline's waste are relatively small, the production, consumption, and disposal of goods generates significant emissions beyond what is measured in our GHG inventory. Wasting resources also has negative environmental and societal impacts, as natural resources are depleted to create new products and vulnerable communities often particularly impacted by food insecurity or pollution from waste disposal facilities. Preventing food waste and rescuing surplus edible food are key strategies to both reduce emissions from solid waste and to support a sustainable thriving, circular economy.

As part of the King County solid waste system, Shoreline participates in a joint regional goal of **achieving zero waste of resources with economic value by 2030**. Shoreline's actions in this sector aim to **increase composting and recycling** and **reduce overall waste generation**.

Community Priorities

Zero Waste priorities identified by the community include:

- Reduce waste of all types
- Educate residents about recycling and composting to increase participation in these programs
- Expand recycling and compost services to be accessible to single and multi-family residences
- Facilitate expansion of recycling services to accept more hard-to-recycle items

“

I'd love to see more upstream requirements and incentives to donate edible food, make companies pay, and make composting easier to access for all community members. We need more than outreach & education to turn the tide.”

– Survey respondent

”

STRATEGY #1: REDUCE PER CAPITA WASTE GENERATION, ESPECIALLY WASTED FOOD.

Targets:



- Reduce per capita waste generation by 2030.

ID	Action	Benefits
ZW 1.1	<p>Provide community programs to reduce waste</p> <p>Continue utilizing grant funding to provide waste reduction programs and education for the community with a focus on food waste prevention. Options include enhancing local food rescue and donation network, expanding King County's "Repair Café" program, supporting tool libraries, or other community-based activities to reduce waste.</p>	
ZW 1.2	<p>Participate in regional zero waste efforts</p> <p>Implement key strategies from King County's RE+ plan to achieve zero waste of resources with economic value by 2030.</p>	
ZW 1.3	<p>Support food rescue networks</p> <p>Utilize grant funding to support and enhance local food rescue and donation networks that connect excess food with those needing food.</p>	
ZW 1.4	<p>Develop a deconstruction ordinance</p> <p>Implement a deconstruction ordinance in partnership with King County.</p>	
ZW 1.5	<p>Waste reduction in City operations</p> <p>Identify opportunities for waste reduction and supply reuse/donation in City operations. Switch to digital for all internal and external paper use where feasible.</p>	
ZW 1.6	<p>City sustainable purchasing</p> <p>Support internal implementation of the Environmentally Preferable Purchasing Policy through training of City staff on waste reduction and sustainable procurement practices and toxic chemical reduction.</p>	
ZW 1.7	<p>Reduce single-use plastic food service items</p> <p>Support programs and policies to reduce the use of single-use food serveware, especially plastic.</p>	
ZW 1.8	<p>Explore every-other-week garbage collection</p> <p>In support of King County's Re+ plan, explore solid waste service models that incentivize waste reduction and diversion, such as every-other-week garbage service.</p>	

STRATEGY #2: INCREASE DIVERSION RATES AND ACCESS TO RECYCLING AND COMPOSTING SERVICES.

Targets:

- Facilitate access to composting and recycling services for all residents and businesses by 2030.
- Achieve a 70% diversion rate by 2030 and 80% by 2050. Shoreline’s diversion rate is the percentage of waste that Shoreline prevents from reaching landfills, through reduction, reuse, and recycling and composting programs.

ID	Action	Benefits
ZW 2.1	<p>Require compost and recycling service at business and multifamily properties</p> <p>Require recycling and compost service for businesses and multifamily properties and provide technical assistance to help businesses and multifamily properties compost successfully. Implement compost requirements for food businesses in accordance with HB 1799.</p>	
ZW 2.2	<p>Ban food waste and recyclables from the garbage</p> <p>Study and implement source separation requirements for basic recyclable materials, compostable paper, and food waste for residential and commercial generators.</p>	
ZW 2.3	<p>Community food waste drop off</p> <p>Provide drop-off locations for residential food waste on a pilot basis.</p>	
ZW 2.4	<p>Provide equitable recycling and composting education</p> <p>Provide education, technical assistance, and resources to encourage food scrap composting by residents, businesses, and other key audiences. Ensure equitable access to waste education through multi-lingual and targeted, culturally relevant campaigns and resources.</p>	
ZW 2.5	<p>Support anaerobic digestion pilot projects</p> <p>Explore the feasibility of small scale, distributed anaerobic digestion facilities and local use of fuels and by-products. Support and coordinate pilot projects.</p>	
ZW 2.6	<p>Expand special item recycling services</p> <p>Use grant funding to expand special item recycling services for key materials such as polystyrene foam and plastic film. Increase equitable access to these services by providing education and technical assistance for key audiences.</p>	

ID	Action	Benefits
ZW 2.7	<p>Support producer responsibility for plastic and paper packaging</p> <p>Support State legislation for extended producer responsibility systems to increase recycling of consumer packaging and other key materials.</p>	
ZW 2.8	<p>Increase recycling and composting at City facilities</p> <p>Ensure all City facilities have recycling and/or composting containers for both public and staff use, as appropriate. Enhance employee education on site specific recycling and composting practices.</p>	

ECOSYSTEMS AND SEQUESTRATION



Shoreline’s trees, forests, and other ecosystems are some of our community’s greatest assets. As we reduce community-wide GHG emissions, we also need to support the ability of Shoreline’s trees and soils to sequester—or draw down—carbon from the atmosphere.

Because the removal of atmospheric carbon is a passive process, we cannot count sequestration as direct emissions reductions; instead, sequestration is considered a pathway to achieving net zero emissions. An analysis of carbon sequestration and storage estimated that Shoreline’s trees sequester approximately 13,890 metric tons of CO₂ equivalent (MTCO₂e) from the atmosphere every year. This is equivalent to about 6% of the community’s annual emissions. See “[Appendix D: Sequestration Analysis](#)” for more details.

In addition to helping us reach net zero emissions, healthy ecosystems provide a wide range of interconnected benefits and vital services by improving air quality, providing shade and protection from heat, reducing flooding, improving mental health, offering recreation opportunities, and supporting habitat for local wildlife.²

While Shoreline is experiencing significant growth and development, we are working to restore urban forests in our parks and open spaces; improve street tree maintenance; protect the health of our streams, lakes, and Puget Sound by improving stormwater management; and ensure that new development benefits the environment. The actions in this focus area aim to **increase sequestration, tree canopy, and urban forest health**, with a focus on addressing urban heat and protecting the most vulnerable in our community.

Community Priorities

Ecosystems and Sequestration priorities identified by the community include:

- Preserve existing trees and plant new trees
- Replace heat island areas such as turf fields and rubber crumb fields
- Protect existing trees during sidewalk construction
- Provide education for homeowners who manage their yards, arborists, developers, and youth
- Update zoning to include tree retention and replanting language and strengthened codes

“

“Green roofs and other creative ways to add vegetation in dense urban areas is a must. A healthy ecosystem and wildlife habitat is more than just one single tree on a street corner.”

– Survey respondent

”

² Ecosystem Services & Biodiversity (ESB). Food and Agriculture Organization of the United Nations. Retrieved from <https://www.fao.org/ecosystem-services-biodiversity/background/en/>

STRATEGY #1: MAINTAIN AND INCREASE TREE CANOPY AND URBAN FOREST HEALTH.

Targets:

- Increase urban forest sequestration 5% by 2050 compared to 2019 levels.
- Restore 240 acres of urban forest by 2039.

ID	Action	Benefits
ES 1.1	<p>Create nature patches</p> <p>Inventory areas within City parks where degraded non-forest habitat, lawn areas, or other under-used areas can be converted to forest habitats. Identify the most promising sites to increase tree canopy and implement planting projects.</p>	
ES 1.2	<p>Expand forest restoration efforts</p> <p>Continue to expand the acreage in Parks under ecological restoration through the Green Shoreline Partnership and regional carbon credit programs.</p>	
ES 1.3	<p>Expand street tree planting</p> <p>Complete an inventory of citywide street tree assets to assess replanting needs and identify key sites available to plant additional street trees. Identify planting opportunities in areas with documented urban heat island effects or environmental health disparities and conduct focused street tree planting efforts in these areas.</p>	
ES 1.4	<p>Increase urban forestry funding</p> <p>Increase staff resources and funding for urban forestry activities including restoration, planting, and maintenance. Explore the creation of a dedicated staff restoration crew and plant nursery for street and park planting projects.</p>	
ES 1.5	<p>Climate resilient parks design</p> <p>Include landscape features and amenities that increase tree canopy, carbon sequestration potential, and climate resilience in the design of Parks projects and City Facilities.</p>	
ES 1.6	<p>Acquire parks and open spaces</p> <p>Continue to utilize park bond, grant, and conservation funding programs to acquire and preserve properties for use as parks and natural areas. Consider habitat value, biodiversity, equity, and climate resilience when prioritizing open space acquisitions.</p>	

ID	Action	Benefits
ES 1.7	<p>Update street tree list and planting practices</p> <p>Review and update the street tree list, Green Stormwater Infrastructure planting requirements, and planting practices to ensure new plantings are resilient to climate change impacts, to expand urban forest canopy, and to maximize sequestration and urban heat mitigation. For example, consider sourcing plant material from nurseries in hotter and drier areas to increase survivability with increasing summer temperatures for City planting projects.</p>	
ES 1.8	<p>Utilize forest carbon credits</p> <p>Offset remaining emissions from municipal operations by 2030 using carbon credits generated through local forestry projects.</p>	
ES 1.9	<p>Develop a community tree planting program</p> <p>Develop a program to provide trees for planting at schools, churches, institutions, businesses, or residential properties in Shoreline along with training in tree planting and care focusing on identified urban heat islands and environmental health disparity areas.</p>	
ES 1.10	<p>Provide community education on tree protection education</p> <p>Provide education and resources for private property owners and arborist companies to encourage tree retention, care, and planting of additional trees on private property. Consider promoting habitat certification programs, conservation easements or other conservation programs to encourage protection of existing natural areas on private and institutional property.</p>	
ES 1.11	<p>Increase tree protection requirements during development</p> <p>Identify opportunities to increase tree retention and canopy cover on private property during development, especially in areas with documented urban heat impacts or environmental health disparities and implement recommendations. Segue with efforts to increase climate resilience in urban design standards below.</p>	
ES 1.12	<p>Fund habitat projects on private property</p> <p>Adapt the City's Environmental Mini Grant and Soak It Up programs to support the creation of habitat features that enhance stormwater management and carbon sequestration at schools, churches, and other large, privately-owned open spaces in the City. Include educational features in projects where possible.</p>	
ES 1.13	<p>Enhance tree-related code enforcement</p> <p>Increase monitoring and enforcement of survivability for trees planted during private development.</p>	

STRATEGY #2: INCREASE SOIL SEQUESTRATION IN NATURAL AND LANDSCAPED AREAS.

ID	Action	Benefits
ES 2.1	<p>Increase requirements for compost usage in new construction</p> <p>Study and implement requirements that increase compost use for soil amendment in private development and City projects. Pilot the use of biochar and mycelia-inoculated compost mixes to increase soil health in City projects.</p>	
ES 2.2	<p>Provide community compost education and resources</p> <p>Provide community education and resources Provide education and a bulk purchase program to encourage compost use as a soil amendment in private landscapes at schools, businesses, churches, homes, and other private property in the city.</p>	

COMMUNITY RESILIENCE AND PREPAREDNESS



Climate impacts, such as higher temperatures and more frequent wildfire smoke, are already happening in Shoreline. Frontline communities experience these impacts most severely and often have less access to resources and services to prepare and adapt to them.

Climate change highlights and amplifies existing social and racial injustices. A person’s vulnerability to climate impacts is influenced by a range of factors, such as race and ethnicity, wealth and income, lack of English proficiency, existing health conditions, and access to healthcare.³ It is especially important to center frontline communities in planning for the impacts of climate change.

The actions in this focus area build off the City’s 2020 Climate Impacts & Resiliency Study and focus on addressing the impacts of urban heat, wildfire smoke, and flooding on vulnerable community members. These actions will **increase resilience** to current and future climate impacts, **strengthen emergency preparedness** in consideration of predicted climate impacts, and **increase community awareness of climate change impacts and mitigation strategies**.

Community Priorities

Community Resilience and Preparedness priorities identified by the community include:

- Implement resilience actions such as creating cooling centers, resilience hubs, shelter services, and more affordable housing
- Prevent cost increases to renters that result from actions that upgrade buildings
- Model these actions for the community in City buildings and programs



What does a resilient community look like to you?

“A community that has infrastructure and services in place to adapt to climate change.”

– Workshop participant

“A diverse community of people and healthy habitat for all, that can thrive and survive as life goes on.”

– Workshop participant



³ *An Unfair Share: Exploring the disproportionate risks from climate change facing Washington state communities.* UW Climate Impacts Group, UW Department of Environmental and Occupational Health Sciences. 2018. Retrieved from <https://cig.uw.edu/projects/an-unfair-share/>

STRATEGY #1: ENSURE THAT NEW BUILDINGS, LAND USE DECISIONS, AND PUBLIC INFRASTRUCTURE IMPROVEMENTS INCREASE RESILIENCE TO CURRENT AND FUTURE CLIMATE IMPACTS.

Targets:

- Decrease urban heat island impacts and address identified flooding and drainage issues by 2050.

ID	Action	Benefits
CRP 1.1	<p>Expand Climate Impacts Tool usage</p> <p>Continue to implement recommendations from the Climate Impacts & Resiliency Study, including use and refinement of the Climate Impacts tool to inform planning of City capital improvements and development of land use policies. Develop a process to regularly update data on climate-related vulnerabilities including urban heat, surface water vulnerabilities, and environmental health disparities.</p>	
CRP 1.2	<p>Develop recommended design practices for urban heat</p> <p>Develop a list of recommended design practices for private development and City capital projects to increase resilience to urban heat impacts and surface water vulnerabilities and update regularly based on best available science. Practices may include trees, green stormwater infrastructure, reduced impervious surface area, cool roofs, green corridors, or high-albedo pavement.</p>	
CRP 1.3	<p>Climate resilient urban design standards</p> <p>Review and update codes and design standards to increase citywide resilience to climate change. For example, modify design standards to encourage reduced impervious surfaces, retention of mature trees, increased tree planting, and increased green stormwater infrastructure on private property and in the City right-of-way during development. Consider specific requirements for development in areas with identified urban heat impacts, surface water vulnerabilities, or environmental health disparities.</p>	
CRP 1.4	<p>Increase incentives for resilience retrofits</p> <p>Increase incentives and promotion of green stormwater and urban forest retrofits on developed properties, with emphasis on areas prone to urban heat and flooding or identified environmental health disparities. Segue with related urban forest efforts.</p>	
CRP 1.5	<p>Community “nature-scaping” education</p> <p>Provide more support and education to encourage private landowners to adapt to and mitigate climate change via "nature-scaping," natural yard care, green stormwater retrofits, and habitat restoration on their property (see CRP-1.4 and ES-1.12 above).</p>	

STRATEGY #2: STRENGTHEN COMMUNITY AND MUNICIPAL EMERGENCY PREPAREDNESS IN CONSIDERATION OF PREDICTED CLIMATE IMPACTS SUCH AS EXTREME HEAT, FLOODING, WILDFIRE SMOKE, AND DROUGHT.

Targets:

- Increase access to preparedness resources for extreme heat, wildfire smoke, and flooding by 2024.

ID	Action	Benefits
CRP 2.1	<p>Provide preparedness resources for heat, wildfire smoke, and flooding events</p> <p>Increase equitable access to emergency preparedness resources for vulnerable populations and areas, especially those related to flooding, extreme heat, and wildfire smoke. Develop and distribute tools and resources for the community to stay safe during extreme heat or wildfire smoke events. For example, consider providing filter-fan kits for vulnerable populations.</p>	
CRP 2.2	<p>Address climate impacts in emergency preparedness planning</p> <p>Collaborate with Emergency Management staff to identify gaps in emergency management services, City operations, and planning related to climate impacts.</p>	
CRP 2.3	<p>Provide community cooling centers</p> <p>Develop a plan to provide community cooling centers for extreme heat events in partnership with local community groups and organizations.</p>	
CRP 2.4	<p>Create neighborhood resilience hubs</p> <p>Assist Emergency Management staff to support development of neighborhood resilience hubs and community resource mapping efforts.</p>	
CRP 2.5	<p>Increase access to garden space</p> <p>Support the creation of community gardens and increase access to community garden space, especially for low-income, immigrant, and other vulnerable populations.</p>	
CRP 2.6	<p>Increase shelter and housing services</p> <p>Continue to increase shelter services and affordable housing.</p>	

STRATEGY #3: INCREASE COMMUNITY AWARENESS OF CLIMATE CHANGE IMPACTS AND MITIGATION AND SUPPORT COMMUNITY-BASED EFFORTS THAT INCREASE RESILIENCE.

ID	Action	Benefits
CRP 3.1	<p>Provide mini-grants for community climate projects</p> <p>Focus our Environmental Mini-Grant program exclusively on projects that either reduce GHG emissions or build community climate resilience and increase funding for community-driven projects.</p>	
CRP 3.2	<p>Provide community education on climate action</p> <p>Provide community-based education and engagement activities to increase awareness of climate impacts and opportunities for action.</p>	
CRP 3.3	<p>Create a CAP implementation advisory board</p> <p>Create a community advisory board to guide CAP implementation and increase community ownership and participation and build partnerships with community organizations, businesses, and other groups.</p>	
CRP 3.4	<p>Create a community ambassador program</p> <p>Create a neighborhood and youth ambassador program to train and give people the tools and resources to work with their peers to implement many of the actions identified in this plan and create green job training opportunities for youth from frontline communities.</p>	

SECTION 3: IMPLEMENTATION AND APPENDICES

IMPLEMENTATION PLAN

The strategies and actions in this plan move us toward a low-emissions, resilient, and equitable Shoreline. To ensure that this vision is realized, **we need to ensure that we implement the actions in this plan successfully**. The City of Shoreline will lead the implementation of the plan, but success will depend on partnership and collaboration with residents, businesses, and other community partners.

Accountability, Monitoring, and Evaluation

The City of Shoreline’s Environmental Services Program Manager will oversee the implementation of the Climate Action Plan. This will include:

- Overseeing future **GHG inventories** to monitor emissions reductions and evaluate progress toward plan targets.
- Reporting to the City Council on the **progress and challenges** associated with plan implementation.
- Developing **recommendations** for new or ongoing programs, services, practices, and priorities related to reducing emissions, increasing sequestration, and improving resilience.
- Ensuring optimal **coordination** between City departments and **integration** with other plans and planning efforts.








Just as this document is the product of updating the 2013 Climate Action Plan, this plan update is a living document and will continue to evolve. As the City monitors progress toward plan targets, we will adjust or add climate strategies and actions as needed to stay on track to meet emissions reduction goals.



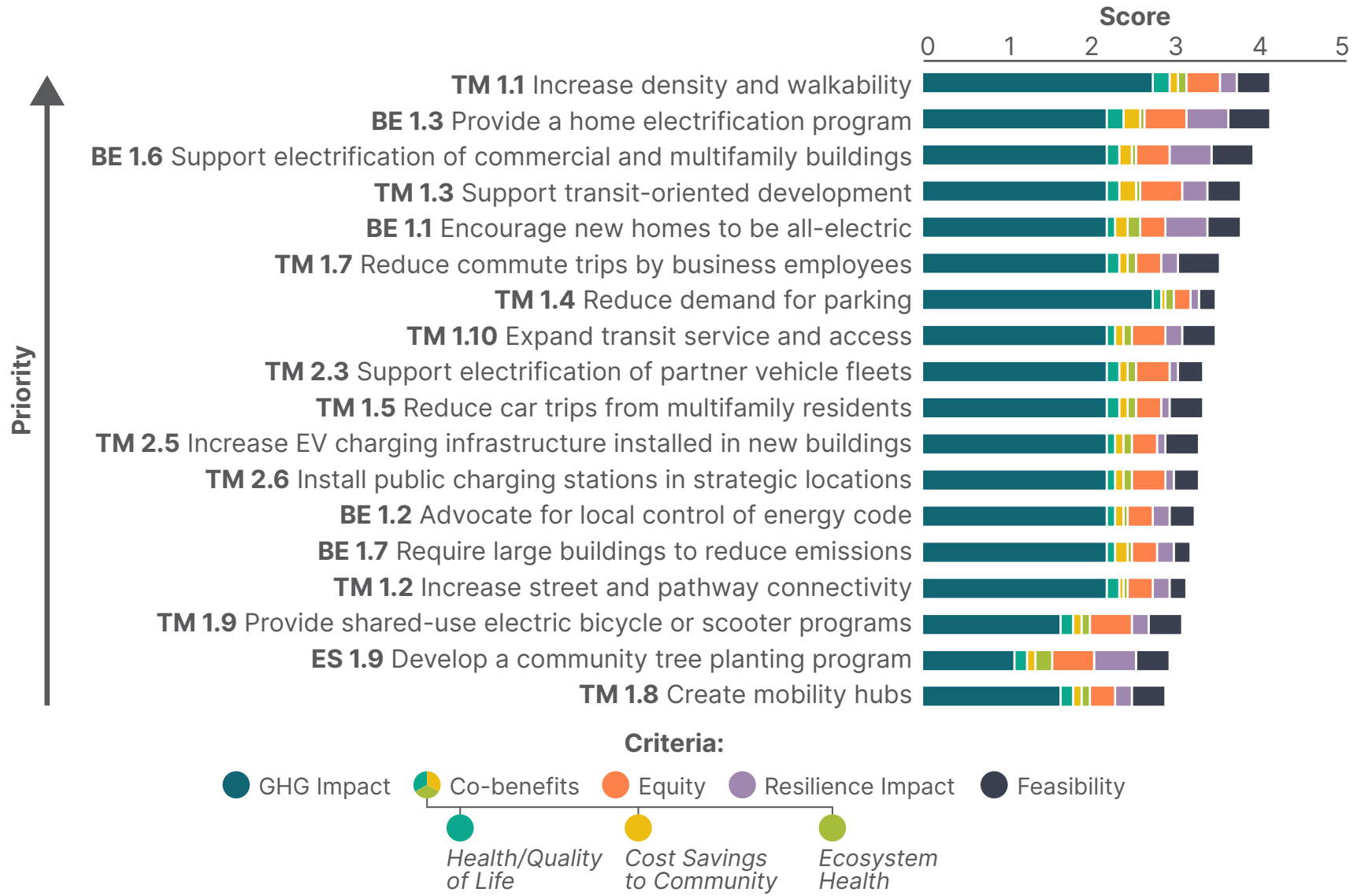
Multi-Criteria Analysis

To guide action implementation, we conducted a multi-criteria analysis (MCA) for a short list of 35 high-priority actions, selected by City staff and informed by community input. The MCA provided a ranking of these actions based on the following weighted criteria.

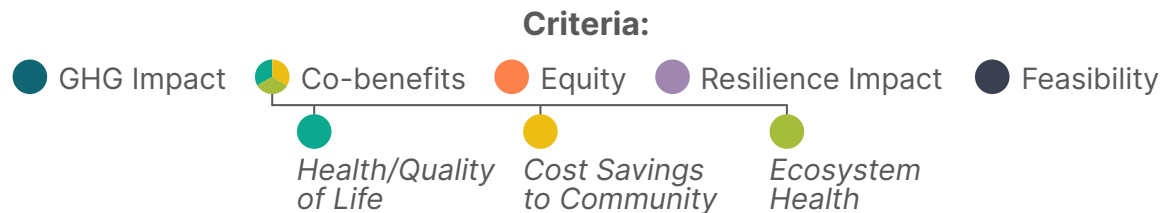
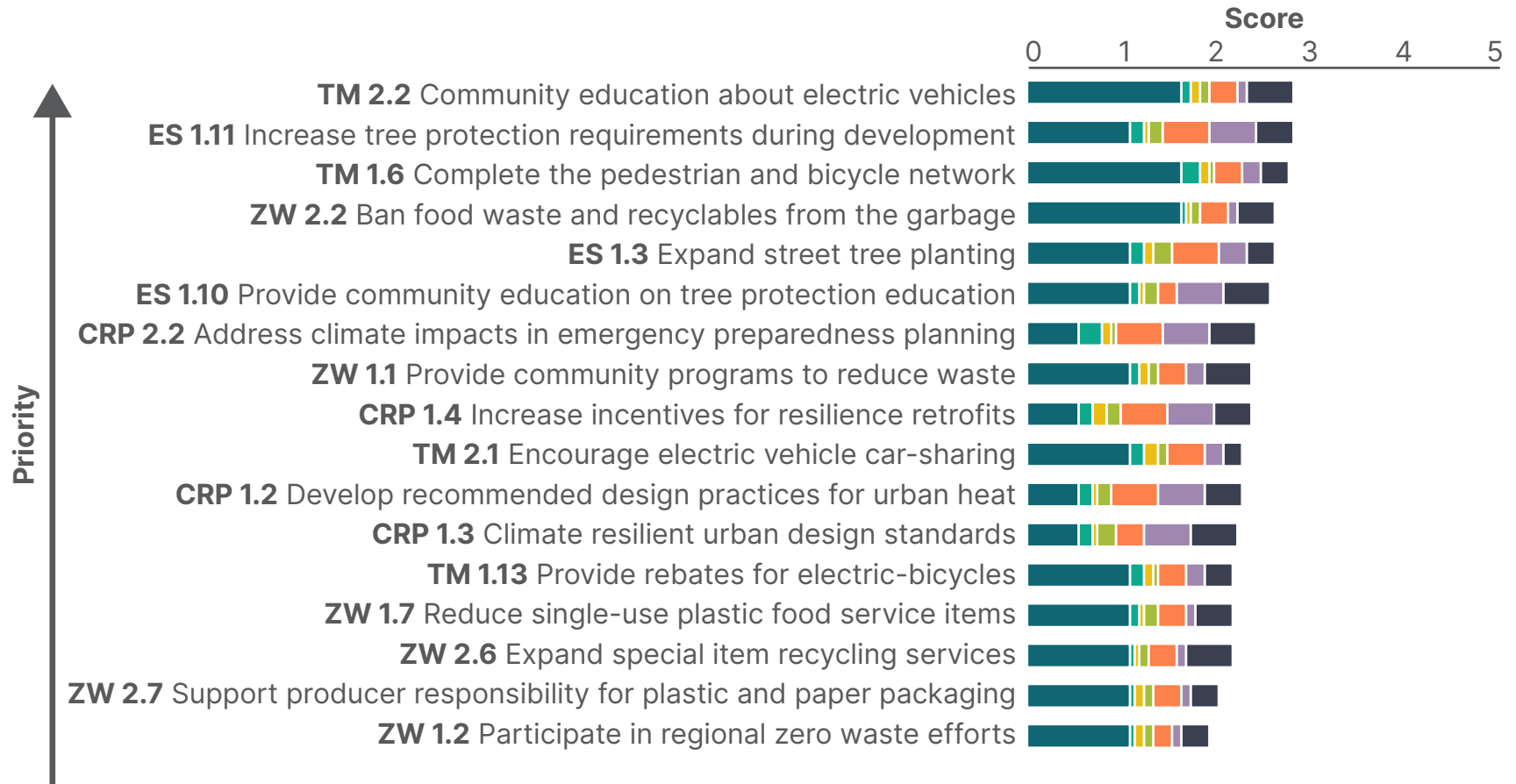
	Criteria	Weight	Definition
	GHG Emissions Impact	55%	Reduces GHG emissions
	Co-benefits	15%	Provides co-benefits related to improving health/ quality of life, providing cost savings to community, and/or supporting ecosystem health
	Equity	10%	Benefits or supports communities that face historic inequities
	Resilience Impact	10%	Increases community resilience to climate impacts
	Feasibility	10%	Is possible to implement based on level of community support and political, technical, and regulatory feasibility/barriers

We developed the weightings used in this analysis with input from Community Climate Advisors and the broader community. See below for the MCA results and see “[Appendix C: Multi-Criteria Analysis](#)” for more details on this analysis.

Multi-Criteria Analysis Results



Multi-Criteria Analysis Results (cont.)



Community Support and Engagement: What You Can Do

Community involvement in implementing the CAP actions is crucial for the success of the plan and its goals. The City will continue to collaborate with local residents and businesses to implement plan actions equitably, inclusively, and effectively. Almost all plan actions would benefit from community support, but the following will especially rely on broad community engagement:

Transportation and Mobility:

- Reduce driving by taking transit, walking, biking, telecommuting, or using shared-mobility services (TM 1.5, 1.9, 1.10, 1.13, 2.1).
- Replace gasoline- or diesel-powered vehicles with **electric options** (TM 2.2, 2.4).
- Use an e-bike for short trips (TM 1.5, 1.9, 1.10, 1.13).

Buildings and Energy:

- **Utilize federal** or **utility incentives** to increase your home's energy efficiency. If renting, talk to your landlord or property manager about available incentives (BE 1.3).
- When replacing your furnace or water heater, choose an efficient, electric heat pump (B 1.3, 1.5, 1.6).
- Replace gas appliances with electric options (BE 1.5).
- Find out your **home's solar potential** and talk to your utility about installing solar panels. If renting, consider participating in **Seattle City Light's Green Up program** to support community solar projects (BE 3.1).



Zero Waste:

- Take steps to **reduce the amount of food you waste** (ZW 1.1).
- Avoid single-use plastic items and switch to reusable options when possible (ZW 1.1).
- Extend the life of furniture, clothing, and appliances by repairing them (ZW 1.1).
- Compost all food scraps, food-soiled paper, and yard debris and recycle all accepted plastic, paper, glass, and metal containers. Find out what you can **recycle and compost here**. If renting, contact your property manager about setting up compost service (ZW 2.3, 2.4, 2.5).



Ecosystems and Sequestration:

- Protect existing trees and natural areas on your property. If you have room, consider planting more trees (ES 1.10, 1.11, 1.12, 1.13).
- Remove invasive species, lawn, and hardscaped areas on your property and add native plants. Amend landscape beds with compost or natural mulch wherever possible.
- Volunteer with the **Green Shoreline Partnership** to restore urban forest habitat in our parks (ES 1.1, 1.2).

Community Resilience and Preparedness:

- Ensure your household is prepared for extreme heat, wildfire smoke, and flooding events. Get involved with the **CERT program** to volunteer during emergencies (CRP 2.1, 2.3, 2.4, 3.2).
- Considering participating in the Soak It Up Rebate program to install a rain garden on your property to reduce drainage issues and protect clean water (CRP 1.4, 1.5).
- Talk to your friends, family, and community about climate change and the actions we can take to reduce emissions and prepare for climate impacts (CRP 3.2, 3.4).



Equity Considerations

The CAP aims to address the interrelated crises of climate change and racial and social inequities that have impacted frontline communities most. An equity-centered approach to the development and implementation of the plan is essential to realizing the City's goals of climate action and anti-racism. Examples of equity considerations in implementation of the plan include:

- **Impacts:** Does the action generate disproportionate burdens (including costs), directly or indirectly, to communities of color, low-income populations, or other frontline communities? If so, how can these impacts be mitigated?
- **Benefits:** Can the benefits produced by an action intentionally reduce historical or current disparities? Are the benefits of an action dispersed equitably?
- **Accessibility:** Are the action's benefits broadly accessible to households and businesses throughout the community, especially communities of color, low-income populations, frontline communities, and minority-owned, women-owned, and emerging small businesses?
- **Alignment and partnership:** Does the action align with and support existing priorities of communities of color, low-income populations, or other frontline communities? Are there opportunities to collaborate with community-based organizations or leverage partnerships and resources?
- **Accountability:** Does the action have appropriate accountability mechanisms to ensure that communities of color, low-income populations, or other frontline communities will benefit equitably and not experience disproportionate burdens or impacts?



Implementation Matrix

The tables below highlight key implementation considerations, including action timelines, lead City departments and divisions, known costs and funding sources, key partners, priority scores, and other considerations. The tables include priority scores for the 35 actions that were evaluated in MCA, scoring from one to five. A priority score of five would represent a highly feasible, impactful, equitable action that has multiple co-benefits, while a one would represent an action that is unfeasible, not impactful, inequitable, and does not have co-benefits. This section also includes preliminary key performance indicators (KPIs) for select strategies. The implementation matrix is a living document and should be updated as needed, at minimum biennially alongside the City budget.

The framing used to define the timeline of each action is loosely defined as Short term = <5 years, Medium term = 5–15 years, and Long term = >15 years.

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations



Transportation and Mobility

STRATEGY #1: REDUCE COMMUNITY-WIDE DRIVING.

Key Performance Indicators:

- **KPI 1:** Walkscore™ (TM 1.1 – 1.3)
- **KPI 2:** Percent of households living within 10-minute walk of high-capacity transit (TM 1.1 – 1.3)
- **KPI 3:** Percentage of trips made by bicycle, walking, transit, or other shared-use option (TM 1.1 – 1.13)

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
TM 1.1	Increase density and walkability	Long term	Planning and Community Development		Local and regional transit agencies	4.15	Align with TMP and Comprehensive Plan updates

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
TM 1.2	Increase street and pathway connectivity	Short/ Medium term	Public Works		Local and regional transit agencies, private developers	3.15	Align with TMP and Comprehensive Plan updates
TM 1.3	Support transit-oriented development	Long term	Planning and Community Development		Local and regional transit agencies, private developers	3.8	Align with TMP and Comprehensive Plan updates
TM 1.4	Reduce demand for parking	Medium term	Planning and Community Development, Public Works		Regional agencies, PSRC, private developers	3.5	Align with TMP and Comprehensive Plan updates
TM 1.5	Reduce car trips from multifamily residents	Short term	Planning and Community Development, Public Works		Private developers	3.35	Align with TMP and Comprehensive Plan updates
TM 1.6	Complete the pedestrian and bicycle network	Long term	Public Works			2.8	Align with TMP update
TM 1.7	Reduce commute trips by business employees	Short term	Public Works		King County, local businesses and employers	3.55	
TM 1.8	Create mobility hubs	Medium term	Public Works		Bikeshare and e-scooter companies, Metro Transit, Community Transit, Sound Transit	2.9	Align with TMP update

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
TM 1.9	Provide shared-use electric bicycle or scooter programs	Short term	City Manager's Office, Environmental Services		Regional jurisdictions, private providers, and community groups	3.1	
TM 1.10	Expand transit service and access	Medium term	Public Works		Local and regional transit agencies, WSDOT, PSRC	3.5	Align with TMP update
TM 1.11	Increase bicycle parking infrastructure	Short/medium term	Public Works, Environmental Services, Administrative Services		Local businesses		
TM 1.12	Provide bicycling education programs	Short term	Environmental Services, Recreation, Cultural, and Community Services		Local non-profits and advocacy groups, schools, and businesses, RCCS summer camps.		
TM 1.13	Provide rebates for electric bicycles	Short term	Environmental Services		Local businesses	2.2	
TM 1.14	Regional road usage fees	Medium/Long term	Public Works		Regional transportation agencies, WA State		Align with regional or state-level initiatives

STRATEGY #2: ACCELERATE ELECTRIC VEHICLE ADOPTION.

Key Performance Indicators:

- **KPI 1:** Percent of registered vehicles that are electric (TM 2.1 – 2.4)
- **KPI 2:** Number of public charging stations (TM 2.5 – 2.7)
- **KPI 3:** Percentage of the City’s light-, medium-, and heavy-duty vehicle fleet that are EV/PHEV/alternative fuel (TM 2.8 – 2.11)
- **KPI 4:** Total fuel consumption for transportation and off-road equipment in the City fleet (TM 2.8 – 2.11)

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
TM 2.1	Encourage electric vehicle car-sharing	Short term	Public Works, City Manager’s Office		Private car share providers, surrounding jurisdictions and businesses	2.3	Align with TMP update
TM 2.2	Community education about electric vehicles	Short term	Environmental Services		K4C partner jurisdictions, local dealerships	2.85	
TM 2.3	Support electrification of partner vehicle fleets	Medium term	Environmental Services	Infrastructure Investment and Jobs Act, Inflation Reduction Act	Shoreline School District, Recology, North City Water District, Seattle City Light	3.35	
TM 2.4	Provide rebates for electric vehicle purchases	Long term	Environmental Services	Inflation Reduction Act	Seattle City Light, WA State, regional jurisdictions, and local businesses		Align with federal incentives from Inflation Reduction Act

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
TM 2.5	Increase EV charging infrastructure installed in new buildings	Short term	Planning and Community Development			3.3	
TM 2.6	Install public charging stations in strategic locations	Short/medium term	Environmental Services, Public Works, Administrative Services	Infrastructure Investment and Jobs Act, Inflation Reduction Act	Seattle City Light, WSDOT, local businesses	3.3	
TM 2.7	Encourage charger installation at commercial and multifamily buildings	Short term	Environmental Services	King County C-PACER	Building owners, affordable housing providers		
TM 2.8	Electrify the City fleet	Ongoing	Administrative Services	Inflation Reduction Act	Seattle City Light		
TM 2.9	Electrify the City's heavy-duty vehicles and equipment	Medium/Long term	Administrative Services, Public Works	Inflation Reduction Act	Seattle City Light		
TM 2.10	Increase charging infrastructure at City facilities	Short/Medium term	Administrative Services	Seattle City Light Fleet Electrification Program	Seattle City Light		
TM 2.11	Electrify the City's off-road equipment	Medium term	Administrative Services, Public Works				



Buildings and Energy

STRATEGY #1: ELECTRIFY SPACE AND WATER HEATING FOR NEW AND EXISTING BUILDINGS.

Key Performance Indicators:

- **KPI 1:** Number of households using heating oil and natural gas (BE 1.3 – 1.5)
- **KPI 2:** Commercial/industrial natural gas consumption (BE 1.6 – 1.8)
- **KPI 3:** Natural gas consumption at City facilities (BE 1.9)

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
BE 1.1	Encourage new homes to be all-electric	Short term	Planning and Community Development		State Building Code Council, City of Seattle, Regional Code Collaboration	3.8	Align with Washington State Residential Energy Code update
BE 1.2	Advocate for local control of energy code	Medium term	City Manager's Office, Planning and Community Development		K4C partners, Regional Code Collaboration	3.25	
BE 1.3	Provide a home electrification program	Short term	Environmental Services	Inflation Reduction Act, Community Development Block Grants, Energy Efficiency and Conservation Block Grants	K4C partners, Seattle City Light, affordable housing providers	4.15	Align with federal incentives and grants
BE 1.4	Explore heating oil tax	Short term	Environmental Services		K4C partners		

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
BE 1.5	Provide incentives for electric appliances	Short term	Environmental Services	Inflation Reduction Act, Community Development Block Grants, Energy Efficiency and Conservation Block Grants	Seattle City Light, building owners, affordable housing providers		Align with federal and utility incentives and action BE 1.3.
BE 1.6	Support electrification of commercial and multifamily buildings	Short/ Medium term	Environmental Services	Inflation Reduction Act, Community Development Block Grants, Energy Efficiency and Conservation Block Grants, King County C-PACER, private financing	K4C partners, Seattle City Light, local building owners, affordable housing providers	3.95	Align with federal incentives and State Clean Buildings Act
BE 1.7	Require large buildings to reduce emissions	Short term	Environmental Services, Planning and Community Development	King County C-PACER, Clean Buildings Incentive	K4C partners	3.2	Align with State Clean Buildings Act

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
BE 1.8	Support job training	Medium term	Environmental Services	Inflation Reduction Act	K4C partners, local businesses and HVAC contractors, Shoreline Community College		
BE 1.9	Electrify City facilities	Medium term	Administrative Services	Energy Efficiency and Conservation Block Grants	Seattle City Light		

STRATEGY #2: INCREASE ENERGY EFFICIENCY OF NEW AND EXISTING BUILDINGS.

Key Performance Indicators:

- **KPI 1:** Estimated energy savings from local code amendments above state energy code requirements.
- **KPI 2:** Number of buildings participating in efficiency programs.

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
BE 2.1	Improve energy efficiency of new large buildings	Ongoing	Planning and Community Development		K4C partners, Regional Code Collaboration		

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
BE 2.2	Support energy efficiency projects at large buildings	Short/ Medium term	Environmental Services	Inflation Reduction Act, Community Development Block Grants, Energy Efficiency and Conservation Block Grants, King County C-PACER	K4C partners, City of Seattle, WA State, King County		Link with BE 1.6

STRATEGY #3: INCREASE RENEWABLE ENERGY GENERATION AND ACCESS.

Key Performance Indicators:

- **KPI 1:** Community-wide solar energy generation.
- **KPI 2:** Number of community solar installations benefitting low-income residents.

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
BE 3.1	Incentivize solar or renewable energy installations	Short/ Medium term	Planning and Community Development	WSU Community Solar Expansion Project	Developers, affordable housing providers, Seattle City Light		
BE 3.2	Increase requirements for new buildings to include solar panels	Short/ Medium term	Planning and Community Development				

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
BE 3.3	Support renewable energy at affordable housing projects	Short/ Medium term	Environmental Services	WSU Community Solar Expansion Project, C-PACER	Affordable housing providers, Seattle City Light		Link with BE 1.6
BE 3.4	Support biogas pilot projects	Short/ Medium term	Environmental Services		King County Solid Waste Division		

STRATEGY #4: SUPPORT AFFORDABLE GREEN BUILDINGS THAT CONSERVE WATER AND PROTECT HABITAT.

Key Performance Indicators:

- **KPI 1:** Number of green certified residential units and commercial square footage.

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
BE 4.1	Increase requirements for sustainable building practices	Ongoing	Planning and Community Development		Regional Code Collaboration, K4C Partners, developers, green building certification programs		
BE 4.2	Green building policy for City buildings	Short term	Environmental Services, Administrative Services		Green building certification programs		

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
BE 4.3	Expand incentives for sustainable building practices	Ongoing	Planning and Community Development		K4C Partners, developers, green building certification programs		



Zero Waste

STRATEGY #1: REDUCE PER CAPITA WASTE GENERATION, ESPECIALLY WASTED FOOD.

Key Performance Indicators:

- **KPI 1:** Tons of solid waste sent to landfill (ZW 1.1 – 1.8)
- **KPI 2:** Number of waste reduction projects supported (ZW 1.1 – 1.8)
- **KPI 3:** Tons of solid waste prevented or food rescued through prevention activities (ZW 1.1 - 1.7)

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
ZW 1.1	Provide community programs to reduce waste	Ongoing	Environmental Services	State and County solid waste grants	King County Solid Waste Division, WA State, Recology King County, businesses, community groups and non-profits	2.4	Align with County Re+ efforts

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
ZW 1.2	Participate in regional zero waste efforts	Short/ Medium term	Environmental Services	State and County solid waste grants	King County, WA State, Recology, Cedar Grove Compost, businesses, community groups and non-profits	1.95	Align with County Re+ efforts
ZW 1.3	Support food rescue networks	Short/ Medium term	Environmental Services	State and County solid waste grants	Food rescue organizations, local food banks, Shoreline School District, businesses		
ZW 1.4	Develop a deconstruction ordinance	Short/ Medium term	Environmental Services	State and County solid waste grants	King County, building and construction industry		
ZW 1.5	Waste reduction in City operations	Ongoing	Administrative Services, Environmental Services	State and County solid waste grants			
ZW 1.6	City sustainable purchasing	Short term	Administrative Services, Environmental Services	State and County solid waste grants			
ZW 1.7	Reduce single-use plastic food service items	Short term	Environmental Services	State and County solid waste grants	Zero Waste Washington, K4C partners, local businesses	2.2	

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
ZW 1.8	Explore every-other-week garbage collection	Short/medium term	Environmental Services	State and County solid waste grants	King County, K4C partners		Align with county RE+ efforts

STRATEGY #2: INCREASE DIVERSION RATES AND ACCESS TO RECYCLING AND COMPOSTING SERVICES.

Key Performance Indicators:

- **KPI 1:** Number of residential and business customers using compost and recycling services (ZW 2.1 – 2.8)

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
ZW 2.1	Require compost and recycling service at business and multifamily properties	Short term	Environmental Services	State and County solid waste grants	King County, K4C partners, WA state, businesses, Recology, Cedar Grove Composting		Align with WA State requirements
ZW 2.2	Ban food waste and recyclables from the garbage	Short/medium term	Environmental Services	State and County solid waste grants	King County, K4C partners, WA state, businesses, apartment property managers, Recology, Cedar Grove Composting	2.65	Align with WA State requirements and targets
ZW 2.3	Community food waste drop off	Short term	Environmental Services	State and County solid waste grants	King County, K4C partners, WA state, Recology, Cedar Grove Composting		

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
ZW 2.4	Provide equitable recycling and composting education	Short term	Environmental Services	State and County solid waste grants	King County, K4C partners, WA state, businesses, apartment property managers, Recology		
ZW 2.5	Support anaerobic digestion pilot projects	Medium term	Environmental Services	State and County solid waste grants	King County, local businesses		
ZW 2.6	Expand special item recycling services	Short/ medium term	Environmental Services	State and County solid waste grants	Recology, businesses, property managers, Ridwell	2.2	
ZW 2.7	Support producer responsibility for plastic and paper packaging	Short/ medium term	Environmental Services		King County, K4C partners, WA State	2.05	Align with Re+ plan and state-level efforts
ZW 2.8	Increase recycling and composting at City facilities	Short term	Environmental Services				



Ecosystems and Sequestration

STRATEGY #1: MAINTAIN AND INCREASE TREE CANOPY AND URBAN FOREST HEALTH.

Key Performance Indicators:

- **KPI 1:** Acreage under ecological restoration (ES 1.1 – 1.8)
- **KPI 2:** Number of park and street trees planted (ES 1.1 – 1.8)
- **KPI 3:** Percentage of urban tree canopy cover (ES 1.9 – 1.13)
- **KPI 4:** Tree equity scores (ES 1.1 – 1.13)

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
ES 1.1	Create nature patches	Medium term	Parks, Fleet, and Facilities, Public Works Grounds Maintenance	Carbon credit programs	Green Shoreline Partnership, City Forest Credits		Align with PROS plan update
ES 1.2	Expand forest restoration efforts	Medium term	Parks, Fleet, and Facilities	USDA Urban and Community Forestry grants, King Conservation District Member Jurisdiction funds, carbon credit programs	Green Shoreline Partnership, City Forest Credits		Align with Urban Forest Strategic Plan and PROS plan updates

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
ES 1.3	Expand street tree planting	Short/ Medium term	Parks, Fleet, and Facilities	USDA Urban and Community Forestry grants, King Conservation District Member Jurisdiction funds, carbon credit programs	City Forest Credits	2.65	Align with Urban Forest Strategic Plan update
ES 1.4	Increase urban forestry funding	Short/ Medium term	Parks, Fleet, and Facilities	USDA Urban and Community Forestry grants			
ES 1.5	Climate resilient parks design	Ongoing	Parks, Fleet, and Facilities	FEMA and stormwater management grants, City Forest Credits			Align with PROS plan update and Parks Bond implementation
ES 1.6	Acquire parks and open spaces	Ongoing	Administrative Services	King County Land Conservation Initiative, King County Parks Levy Grants, City Parks Alliance			
ES 1.7	Update street tree list and planting practices	Short term	Parks, Fleet, and Facilities, Public Works Engineering				

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
ES 1.8	Utilize forest carbon credits	Medium/ Long term	Administrative Services		City Forest Credits, King County		
ES 1.9	Develop a community tree planting program	Short term	Environmental Services, Surface Water Utility		Green Shoreline Partnership, schools, community and faith-based groups, businesses.	2.95	
ES 1.10	Provide community education on tree protection	Short/ Medium term	Environmental Services, Surface Water Utility		Community groups, schools, arborist companies	2.6	
ES 1.11	Increase tree protection requirements during development	Short term	Planning and Community Development		K4C partners	2.85	
ES 1.12	Fund habitat projects on private property	Short/ Medium term	Surface Water Utility, Environmental Services	FEMA and stormwater management grants, City Forest Credits			
ES 1.13	Enhance tree-related code enforcement	Short term	Planning and Community Development				

STRATEGY #2: INCREASE SOIL SEQUESTRATION IN NATURAL AND LANDSCAPED AREAS.

Key Performance Indicators:

- **KPI 1:** Tons of compost and mulch applied in City maintenance activities and projects (ES 2.1 – 2.2)
- **KPI 2:** Number of properties using or receiving education on compost as a soil amendment (ES 2.1 – 2.2)

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
ES 2.1	Increase requirements for compost usage in new construction	Short term	Planning and Community Development, Public Works				
ES 2.2	Provide community compost education and resources	Short term	Environmental Services, Surface Water Utility		Schools, community gardening organizations, landscape supply businesses		



Community Resilience and Preparedness

STRATEGY #1: ENSURE THAT NEW BUILDINGS, LAND USE DECISIONS, AND PUBLIC INFRASTRUCTURE IMPROVEMENTS INCREASE RESILIENCE TO CURRENT AND FUTURE CLIMATE IMPACTS.

Key Performance Indicators:

- **KPI 1:** Number of codes and standards updated to increase resilience (CRP 1.1 – 1.5)
- **KPI 2:** Number of City projects incorporating resilience features (CRP 1.1 – 1.5)
- **KPI 3:** Area of city impacted by urban heat island effect (CRP 1.1 - 1.4)
- **KPI 4:** Square footage of green stormwater infrastructure installed in City projects (CRP 1.1 - 1.3)

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
CRP 1.1	Expand Climate Impacts Tool usage	Short term	Environmental Services, Surface Water Utility				Align with upcoming master plan and comprehensive plan updates
CRP 1.2	Develop recommended design practices for urban heat	Short term	Environmental Services, Public Works			2.3	
CRP 1.3	Climate resilient urban design standards	Short term	Public Works, Planning and Community Development			2.25	
CRP 1.4	Increase incentives for resilience retrofits	Short/ Medium term	Surface Water Utility, Environmental Services	FEMA and stormwater management grants, City Forest Credits	Schools and other large institutional landowners	2.4	Link with ES 1.12
CRP 1.5	Community “nature-scaping” education	Short/ Medium term	Surface Water Utility, Environmental Services		Schools, community gardening organizations		Link with CRP 1.4 and ES 1.12

STRATEGY #2: STRENGTHEN COMMUNITY AND MUNICIPAL EMERGENCY PREPAREDNESS IN CONSIDERATION OF PREDICTED CLIMATE IMPACTS SUCH AS EXTREME HEAT, FLOODING, WILDFIRE SMOKE, AND DROUGHT.

Key Performance Indicators:

- **KPI 1:** Number of households receiving preparedness resources/education (CRP 2.1)
- **KPI 2:** Public cooling center utilization (number of users, number opened) (CRP 2.3)
- **KPI 3:** Number of shelter beds available (CRP 2.6)

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
CRP 2.1	Provide preparedness resources for heat, wildfire smoke, and flooding events	Short term	Community Services, Surface Water Utility	FEMA Emergency Preparedness grants	Community Emergency Response Team (CERT) volunteers, King County		
CRP 2.2	Address climate impacts in emergency preparedness planning	Short term	Emergency Management	FEMA Emergency Preparedness grants	King County	2.45	
CRP 2.3	Provide community cooling centers	Short term	Community Services		King County Library System, Oaks Shelter		
CRP 2.4	Create neighborhood resilience hubs	Short/ Medium term	Emergency Management	FEMA Emergency Preparedness grants	CERT volunteers, King County		

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
CRP 2.5	Increase access to garden space	Medium term	Recreation, Cultural and Community Services, Administrative Services		Community organizations		
CRP 2.6	Increase shelter and housing services	Ongoing, long term	Community Services		Affordable housing providers, North Urban Human Services Alliance		

STRATEGY #3: INCREASE COMMUNITY AWARENESS OF CLIMATE CHANGE IMPACTS AND MITIGATION AND SUPPORT COMMUNITY-BASED EFFORTS THAT INCREASE RESILIENCE.

Key Performance Indicators:

- **KPI 1:** Mini-grant funding used for climate resilience or mitigation projects (CRP 3.1)
- **KPI 2:** Participants in City-led climate action programs. (CRP 3.1 – 3.4)

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
CRP 3.1	Provide mini-grants for community climate projects	Short term	Environmental Services		Community organizations		

ID	Action	Timeline	Lead City department(s)/ division(s)	Known costs and funding source(s)	Key partners	Priority score	Implementation considerations
CRP 3.2	Provide community education on climate action	Ongoing	Environmental Services		K4C partners		
CRP 3.3	Create a CAP implementation advisory board	Short term	Environmental Services		Community organizations, businesses		
CRP 3.4	Create a community ambassador program	Short term	Community Services		Workforce development programs, Shoreline School District, Shoreline Community College		

APPENDIX A. GREENHOUSE GAS EMISSIONS INVENTORY

REVISED SEPTEMBER 2021

The City of Shoreline periodically assesses the levels at which we – as both City government and our greater community – emit greenhouse gases (GHG), the primary cause of recent climate change. The King County Growth Management Planning Council – a formal body of elected officials from across King County – voted in 2014 to adopt a shared target to reduce countywide sources of greenhouse gas (GHG) emissions, compared to a 2007 baseline, by 25% by 2020, 50% by 2030, and 80% by 2050.

The City has also adopted those targets but uses 2009 as a baseline year because that was the year the City Hall – a certified LEED Gold building and primary building for housing City employees and services – was completed. The City also has a goal of zero net emissions by 2030 for local government operations. This goal refers to the need to both reduce future GHG emissions and take steps to remove GHGs from the atmosphere in a process referred to as carbon removal. Carbon removal can happen through natural processes – such as by restoring forests and wetlands – and with technological strategies.

The City measures progress in meeting those goals with GHG emissions inventories. These inventories identify the major sources of GHGs and levels of pollution. Major sources include transportation, energy used by homes and buildings, and solid waste. The City has completed four GHG emissions inventories for 2009, 2012, 2016, and 2019.

Emissions are calculated based on the types and quantities of activities that release GHGs, and associated emissions factors. An emissions factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant.⁴ Burning different fuels releases different types and quantities of pollutants, such as carbon dioxide. Typically, GHG emissions are reported in units of carbon dioxide equivalent (CO₂e). Gases – such as methane and nitrous oxide – are converted to CO₂e based on their global warming potential. In this report, GHGs are reported in metric tons of carbon dioxide equivalent (mtCO₂e).

This report summarizes the results of a 2019 GHG Emissions Inventory for both the Shoreline community and local government operations. The City used the ClearPath online software platform to complete and document inventory calculations and data sources in accordance with the following protocols, developed by ICLEI – Local Governments for Sustainability:

- U.S. Community Protocol (USCP) for Accounting and Reporting of Greenhouse Gas Emissions
- Local Government Operations Protocol (LGOP)

⁴ US EPA, “Basic Information of Air Emissions Factors and Quantification,” accessed on 6/16/21

Community-wide Inventory

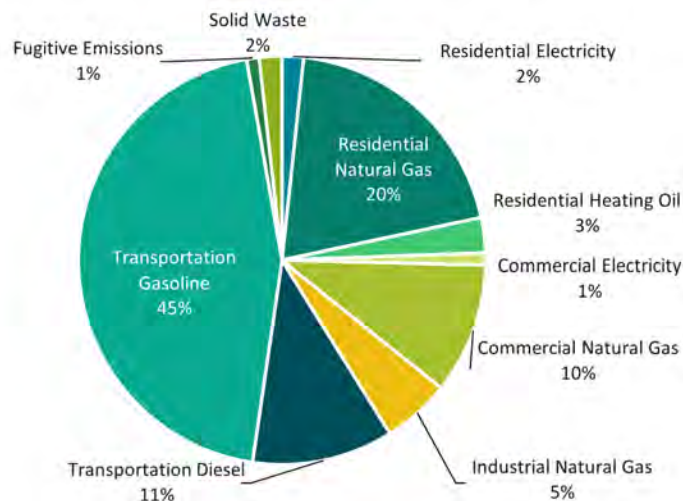
The City of Shoreline has completed four “geographic-plus” inventories for community-wide activities. The geographic-plus inventory quantifies the estimated release of GHG emissions from activities within the City of Shoreline’s geographic boundary, including from transportation and building energy use. The “plus” portion expands this scope to include emissions produced by electricity generation outside of the community but consumed by in-city activities, emissions associated with waste generated in the city but processed outside of city boundaries, and fugitive emissions (i.e., unintentional leaks) from natural gas distribution.

Not included are the GHG emissions associated with the goods and services consumed within the community. A “consumption-based” inventory typically measures those emissions, including embodied emissions associated with production, transportation, use and disposal of goods, food, and services consumed in the city. The consumption of goods and services can result in a significant amount of GHG emissions. While a consumption-based inventory is not available for the City of Shoreline, King County’s 2015 consumption-based GHG emissions totaled 2.7 times the emissions calculated in their 2015 geographic-plus inventory.⁵

Key Results from the 2019 Community-wide Inventory

- The City of Shoreline’s geographic-plus GHG emissions (Figure 1) totaled 249,180 metric tons of carbon dioxide equivalent (mtCO₂e) in 2019.
- The largest sources of GHG emissions were transportation (56%), and the built environment (42%), primarily from natural gas usage in the residential and commercial sectors.
- 2019 GHG emissions decreased by an estimated 5% compared to 2009. This trend is not on track to meet the City’s near-term goal to reduce GHG emissions by 25% by 2020 compared to 2009.
- Per-person GHG emissions declined to 4.4 mtCO₂e per person in 2019, an estimated 10% decrease compared to 2009 (Figure 2), despite an increase in population.

Figure 1. Sources of geographic-plus based GHG emissions for Shoreline in 2019 (249,180 mtCO₂e)



⁵ “King County Greenhouse Gas Emissions Inventory, A 2015 Update: Executive Summary,” accessed on 6/16/21

Figure 2. Per capita emissions for Shoreline in 2009 compared to 2019. The line represents Shoreline's population

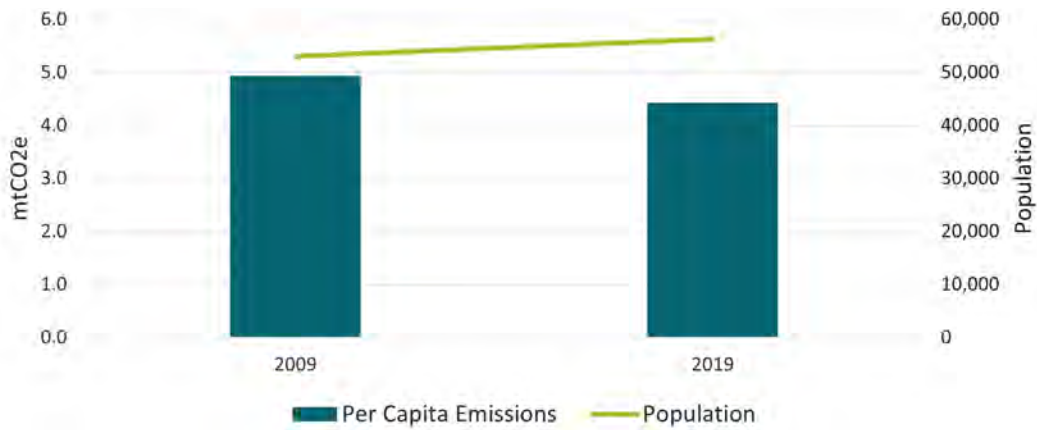
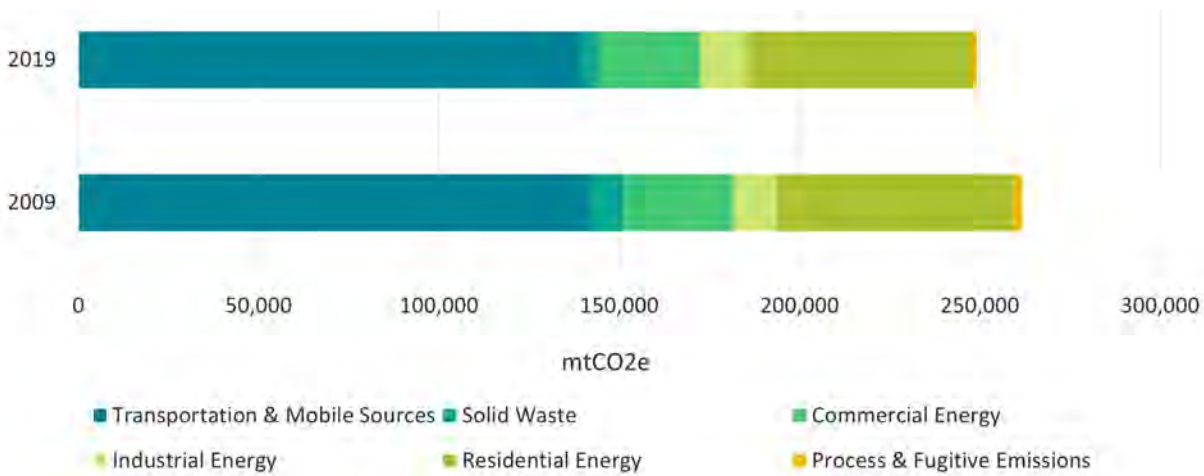


Figure 3. Yearly comparison of emissions for Shoreline from 2009-2019.



Community-wide Inventory	2009 mtCO ₂ e	2019 mtCO ₂ e	% Change 2019 v. 2009
Population	53,007	56,267	+6%
Total Emissions	261,785	249,180	-5%
Emissions Per Capita	4.9	4.4	-10%
Transportation	141,740	139,781	-1%
Residential Energy	65,004	60,886	-6%
Commercial Energy	30,381	28,158	-7%
Industrial Energy	12,278	13,402	+9%

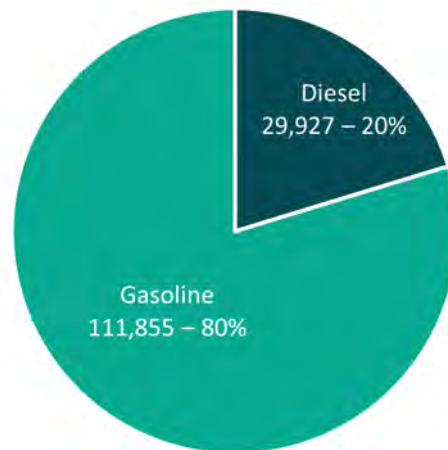
Community-wide Inventory	2009 mtCO ₂ e	2019 mtCO ₂ e	% Change 2019 v. 2009
Fugitive Emissions	2,925	2,462	-16%
Solid Waste	9,457	4,491	-53%

Transportation

Transportation was the largest source of community-wide GHG emissions in 2019, accounting for 56% of total emissions. The majority of those emissions were attributed to gasoline use by passenger vehicles. Total transportation emissions have decreased 1% since 2009.

Transportation data in 2019 was obtained from [Google Environmental Insights Explorer \(EIE\)](#) database for the City of Shoreline and analyzed using the [Global Protocol for Community-Scale Greenhouse Gas Emission Inventories](#) methodology. This data includes vehicle miles traveled (VMT) for both passenger vehicles and public transit buses.

Figure 4. 2019 transportation-related GHG emissions (139,781 mtCO₂e).



2019 Transportation Emissions Factor Set

Gasoline	Passenger Vehicle	Light Truck	Heavy Truck	Transit Bus	Paratransit Bus	Motorcycle
MPG	24.377	17.868	5.372	17.868	17.868	24.377
g CH ₄ /mile	0.0183	0.0193	0.0785	0.0193	0.0193	0.0183
g N ₂ O/mile	0.0083	0.0148	0.0633	0.0148	0.0148	0.0083

Diesel	Passenger Vehicle	Light Truck	Heavy Truck	Transit Bus	Paratransit Bus	Motorcycle
MPG	24.377	17.868	6.392	17.868	17.868	24.377
g CH ₄ /mile	0.0005	0.001	0.0051	0.001	0.001	0.0005
g N ₂ O/mile	0.001	0.0015	0.0048	0.0015	0.0015	0.001

MPG: Miles Per Gallon. CH₄: Methane. N₂O: Nitrous Oxide.

Data Sources: Google Environmental Insights Explorer (EIE); 2019 US National Defaults (updated 2020)

The Built Environment

In the context of this inventory, the built environment refers to emissions from:

- grid electricity consumption,
- natural gas consumption and fugitive emissions associated with natural gas distribution, and
- other stationary fuel consumption (e.g., propane, kerosene, fuel oil).

Together, the built environment produced GHG emissions in the amount of 104,910 mtCO₂e in 2019, or 42% of community-wide emissions. As shown in Figure 5, natural gas consumption was responsible for 87% of emissions from the built environment. The Residential sector was the largest consumer of energy—for both electricity and natural gas— followed by the Commercial sector and the Industrial sector.

Figure 5. 2019 emissions from the built environment (104,910 mtCO₂e)

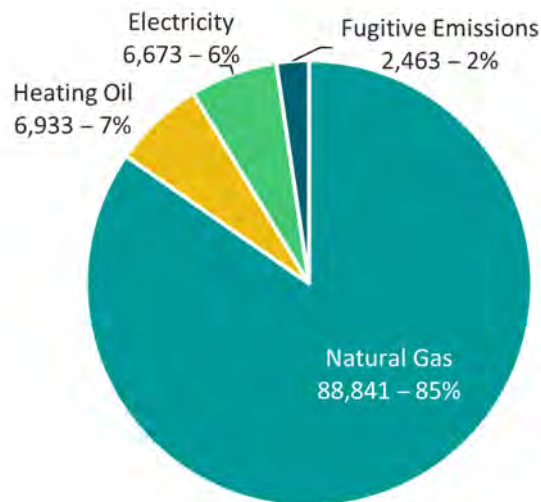


Figure 6. Sources of residential (left) and commercial (right) GHG emissions in 2019 (mtCO₂e).

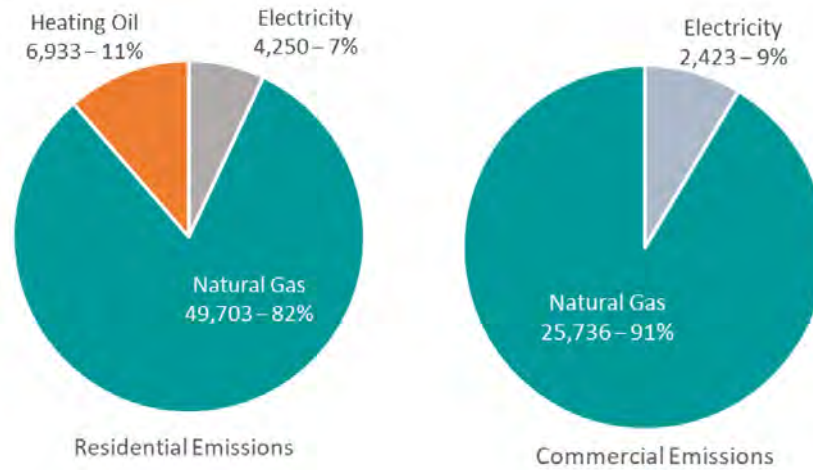
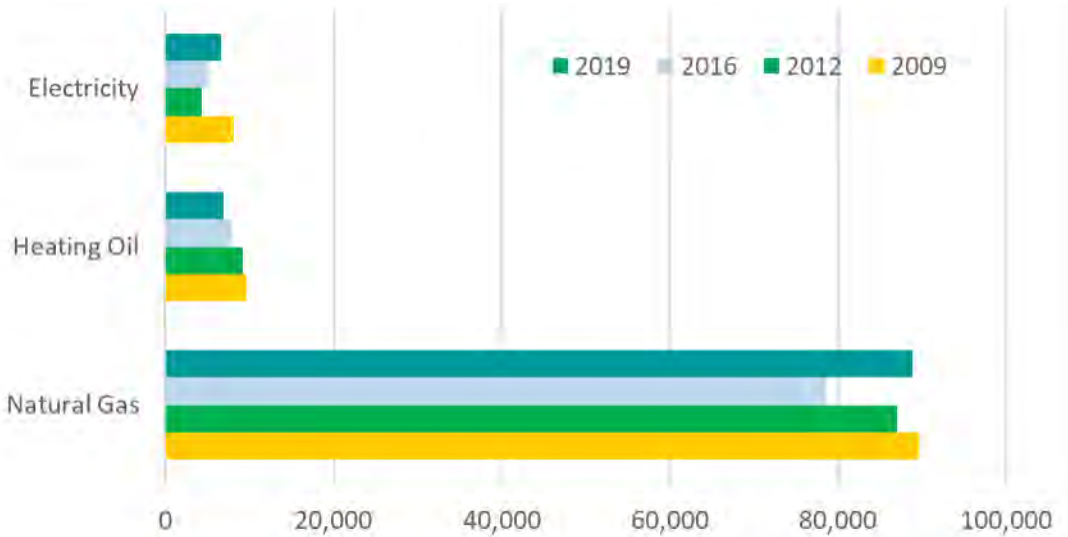


Figure 7. Emissions by fuel type from the built environment from 2009 to 2019 (mtCO₂e).



Electricity

Shoreline’s electricity is delivered through Seattle City Light (SCL). SCL reports customer classes as residential and commercial (including large, medium and small general service). SCL generates electricity primarily through hydroelectricity. Total electricity use – across all sectors – decreased 16% in 2019 compared to 2009.

2019 Grid Electricity Emissions Factor Set

CO₂ lbs/MWH	41.57	Data Sources	Seattle City Light The Climate Registry CRIS Report
CH₄ lbs/MWH	30		
N₂O lbs/GWh	5		

CO₂: carbon dioxide. MWH: Megawatt hour. GWh: Gigawatt hour.

Natural Gas

Natural gas in Shoreline is delivered by Puget Sound Energy (PSE). PSE reports customer classes as residential, commercial, and industrial. Fugitive emissions were calculated related to leakage in the local natural gas distribution system based on the total quantity of natural gas consumed (14,194,696 therms) and assumed leakage rate (default value = 0.3%). Total natural gas use – across all sectors – decreased 1% in 2019 compared to 2009.

2019 Natural Gas Consumption

	Residential	Commercial	Industrial
GHG Emissions	49,703 mtCO ₂ e	25,736 mtCO ₂ e	13,402 mtCO ₂ e
Activity/Usage	9,345,098 therms	4,838,754 therms	2,525,221 therms
Emissions factors	ClearPath: 53.02 kg CO ₂ , 0.005 kg CH ₄ , 0.0001 kg N ₂ O per MMBtu		
Data Source	Puget Sound Energy		

MMBtu: one million BTU

Fugitive Emissions

GHG Emissions	2,463 mtCO ₂ e
Activity/Usage	Residential and commercial therms
Emissions factors	ClearPath: 6.6316 ×10 ⁻⁷ MT CO ₂ /MMBtu, 6.1939 ×10 ⁻⁵ MT CH ₄ /MMBtu
Data Source	Puget Sound Energy

Residential Heating Oil

Residential heating oil data was estimated based on the number of households using fuel oil, kerosene, etc. as reported in the 2019 5-year American Community Survey (ACS) Data Profiles for Selected Housing Characteristics, House Heating Fuel, and the conversion factor used in the 2016 Emissions Inventory. Residential heating oil use decreased 29% in 2019 compared to 2009.

2019 Residential Heating Oil

GHG Emissions	6,933 mtCO ₂ e
Activity/Usage	674,722 gallons
Emissions factors	ClearPath: 73.96 kg CO ₂ , 0.010870 kg CH ₄ , 7.2464 ×10 ⁻⁴ kg N ₂ O per MMBtu
Data Source	2019 ACS 5-Year Estimates Data Profiles for Selected Housing Characteristics, House Heating Fuel

Solid Waste

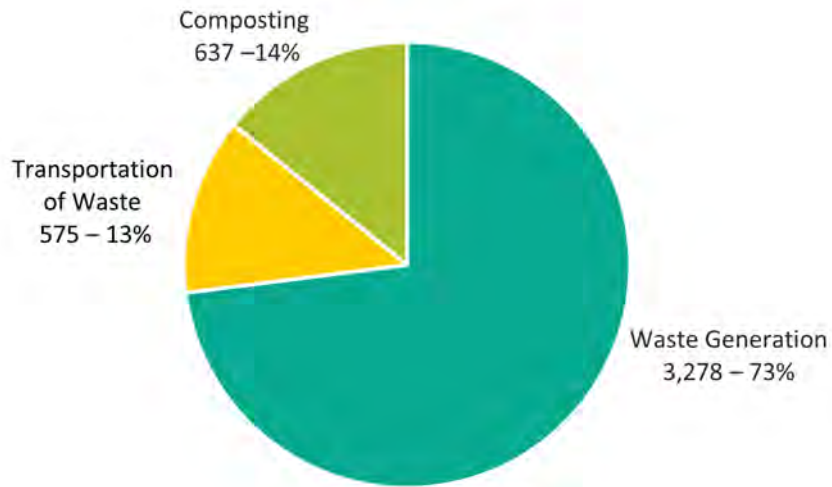
Solid waste activities produced GHG emissions in the amount of 4,490 mtCO₂e in 2019, or 2% of community-wide emissions. As shown in Figure 8, emissions from waste generation made up 73% of Shoreline’s total solid waste-related emissions, followed by emissions from composting (14%) and transporting waste to facilities outside of city boundaries (13%). Emissions from solid waste disposal have declined 38% since 2009 despite increasing population. The amount of solid waste sent to the landfill decreased by 14% in 2019 compared to 2009, while the amount of waste composted increased by 54%.

Solid waste generated in the City of Shoreline is transported to the Cedar Hills Landfill. Food and yard waste from Shoreline is sent to Cedar Grove Maple Valley, Cedar Grove Everett, Lenz Composting, the Shoreline Transfer Station and Pacific Top Soil. Emissions from the transportation of all waste generated in Shoreline in 2019 was estimated based on tonnage and distance to receiving landfills and other waste facilities.

2019 Waste Generation

GHG Emissions	4,490 mtCO ₂ e
Activity/Usage	18,576 tons solid waste generated 9,146 tons composted 9,033 tons recycled
Emissions Factors	2019 King County Waste Characterization Study (Table 43)
Data Source	Recology King County

Figure 8. 2019 solid waste emissions (4,490 mtCO₂e)



2019 Waste Characterization Emissions Factor Set: Detailed Composition, Overall Disposed Waste, 2019*

Newspaper	0.3%
Office Paper	0.5%
Corrugated Cardboard	3.9%
Magazines/Third Class Mail	5.9%
Food Scraps	15.5%
Grass	1.3%
Leaves	1.3%
Branches	0.6%
Dimensional Lumber	9.6%
Data Source	2019 King County Waste Characterization Study (Table 43)

*Refers to the estimated percentage of each material in the total amount of disposed waste in King County in 2019.

Updated Inventory Methodologies

The 2019 community-wide inventory was conducted in adherence with the U.S. Community Protocol, to the extent possible. New categories of data gathered for the 2019 Emissions Inventory included:

- Data entries for waste collected in Shoreline for composting outside of city boundaries.
- Data entries for transporting solid waste and compost from Shoreline to processing facilities located outside of city boundaries.
- Data on fugitive emissions from natural gas distribution.
- Data on vehicle miles traveled by vehicles passing through city boundaries (referred to as out-of-boundary, Scope 3 emissions) was collected from Google EIE. Out-of-boundary transportation represents a significant source of emissions, increasing transportation-related emissions from 139,782 mtCO₂e to 276,384 mtCO₂e (a 98% increase). This data was not included in the official 2019 Emissions Inventory as comparable data could not be obtained for previous inventory years to allow for a direct comparison.
- Data on electricity used to treat potable water for consumption within city boundaries. Data was obtained from Seattle Public Utilities and North City Water District, which both provide potable water in Shoreline but do not have treatment plants located within city boundaries. Water treatment data was collected but not included in the formal 2019 Emissions Inventory as comparable data for previous inventory years was not available.
- Data on electricity used to treat wastewater generated within city boundaries. Both King County and the City of Edmonds operate wastewater treatment plants that service Shoreline. Data was obtained from King County regarding the operation of their West Point Wastewater Treatment Plant, which is located outside of city boundaries. No data was provided by the City of Edmonds. Wastewater data was collected but not included in the formal 2019 Emissions Inventory as comparable data for previous inventory years was not available. Emissions calculated for water and wastewater treatment outside city boundaries totaled 578 mtCO₂e in 2019.

Each inventory update may require some level of change from past practices to make improvements on calculations that were data-limited in the past or to work within data limitations of the current inventory. A summary of changes applied to the 2009, 2012, and 2016 inventories to provide a more robust analysis and allow for direct comparison with 2019 Emissions Inventory data is provided in the table below.

Summary of Changes Applied to the 2009, 2012, and 2015 Greenhouse Gas Inventories

Inventory Year	Summary of Changes to Analysis Conducted in 2021
2009	<ul style="list-style-type: none"> • Added data on composted waste and corrected an error in the waste characterization factor set. • Added data on fugitive emissions from natural gas distribution. • Updated calculations based on IPCC 5th Assessment 100 Year Values for Global warming Potential (previously used IPCC 2nd Assessment). • Edited VMT calculations to exclude pass-thru vehicle travel.*

Inventory Year	Summary of Changes to Analysis Conducted in 2021
2012	<ul style="list-style-type: none"> • Added landfill and compost data, and 2012 King County waste characterization factor set. • Added data on fugitive emissions from natural gas distribution.
2016	<ul style="list-style-type: none"> • Added data on composted waste and corrected an error in the waste characterization factor set. • Added data on fugitive emissions from natural gas distribution. • Updated calculations based on IPCC 5th Assessment 100 Year Values for Global warming Potential (previously used IPCC 2nd Assessment). • Updated SCL emissions factors from 2015 data to 2016 data.

**Note that this calculation was not edited for 2012 and 2016 VMT data. Thus, inventories for those two years do not provide a direct comparison of transportation-related emissions – or overall community emissions – and would need to have pass-thru travel data removed from the VMT totals in order for that to occur.*

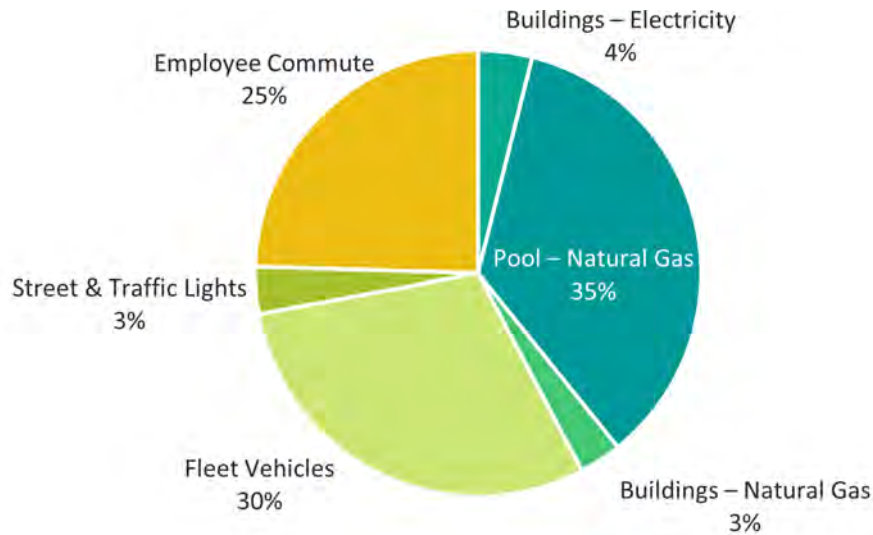
Local Government Operations Inventory

The City’s 2019 Emissions Inventory for local government operations measures emissions from City-owned and operated buildings and vehicles, street and traffic lights in city boundaries, and City employee commuting methods. By tracking emissions over time, the City can measure the GHG reduction benefits from policies and programs put in place to reduce emissions within our operations. Although the GHG emissions from the City of Shoreline’s operations as a government entity are small when compared with community-wide emissions (approximately 0.4% of the community-wide total), the City is committed to reducing its own footprint to model best practices for climate action.

Key Results from the 2019 Local Government Operations Inventory

- The City of Shoreline’s GHG emissions from local government operations (Figure 9) totaled 1,271 metric tons of carbon dioxide equivalent (mtCO₂e) in 2019.
- Emissions from natural gas use associated with the community pool accounted for 35% of total municipal emissions, followed by emissions from the City’s vehicle fleet (30%) and emissions from employee commuting (25%).
- Total emissions from local government operations (not including employee commute emissions, which were not available for 2009), increased 15% compared to 2009. This increase is primarily due to a 32% increase in the number of fleet vehicles in 2019 vs. 2009, including more trucks and fewer passenger cars.
- While the City does not have a means to accurately measure net emissions (i.e., to estimate the amount of carbon removed from the atmosphere by City facilities and natural spaces), it does not appear that we are on track to meet our goal of zero net emissions by 2030.

Figure 9. 2019 GHG emissions for City of Shoreline local government operations (1,271 mtCO₂e).



Local Government Operations Inventory	2009 mtCO ₂ e	2019 mtCO ₂ e	% Change 2019 v. 2009
Total Emissions (no employee commute data)	835	959	+15%
Total Emissions (with employee commute data)	835*	1,271	+52%
Buildings & Facilities	584	537	-8%
Streetlights & Traffic Signals	53	42	-21%
Vehicle Fleet	198	380	+92%
Employee Commute	NA	312	NA

*No employee commute data available for 2009.

Excluded from Government Operations Inventory

The following components were not included in this inventory:

- **Electric Power Production:** The City of Shoreline does not own or operate any power generation facilities.
- **Transit Fleet:** Public transit in Shoreline is managed independently by King County Metro Transit and Sound Transit. Estimates of public transit-related emissions are included in the Community-wide inventory using data from Google EIE.
- **Water and Wastewater Treatment:** The City of Shoreline does not own or operate any water/wastewater treatment facilities. Electricity use associated with wastewater distribution via the Ronald Wastewater District is included in the Community-wide inventory as the City did not own or control that distribution system in 2019.

- Solid Waste: The City does not track waste generation for municipal facilities. Emissions associated with waste generation, transport of solid waste, and composting resulting from City facilities and operations are included in the Community-wide inventory.

Buildings & Facilities

Electricity

The City owns and operates a number of buildings and facilities that use electricity, including office buildings, community centers, park facilities, public restrooms, trails/lighted pathways, and pump stations used by the Public Works department. Seattle City Light provides electricity for all City facilities.

Electricity use for City buildings and facilities increased 44% in 2019 compared to 2009. City Hall was responsible for 54% of electricity use in 2019, followed by the Shoreline Pool (15%), Hamlin Park Maintenance Facility (6%), Shoreline Park (6%) and all other City buildings, parks, and facilities.

GHG Emissions	49.8 mtCO ₂ e
Activity/Usage	2,507,881 kWh
Emissions Factors	SCL Emissions Factor 2019
Data Sources	Seattle City Light Individual bills for Ronald Wastewater accounts

Natural Gas

A total of five City facilities used natural gas in 2019: the Shoreline Pool, the Richmond Highlands Recreation Center, Kruckeberg Gardens, the old Police Station at 185th, and the Ronald Wastewater office. Natural gas use in City buildings and facilities decreased 11% in 2019 compared to 2009. The pool was responsible for most (92%) of natural gas use at City facilities in 2019 and 35% of total emissions from municipal operations. The pool was permanently decommissioned in early 2021 which should yield significant emissions benefits moving forward.

GHG Emissions	487.9 mtCO ₂ e
Activity/Usage	91,733 therms
Emissions Factors	ClearPath
Data Sources	Puget Sound Energy

Streetlights & Traffic Signals

Seattle City Light provides electricity to City facilities, including streetlights and traffic signals. Electricity use for streetlights and traffic signals decreased 18% in 2019 compared to 2009.

GHG Emissions	43 mtCO ₂ e
Activity/Usage	2,126,024 kWh
Emissions Factors	2019 SCL Emissions Factors
Data Sources	Seattle City Light

Vehicle Fleet & Machinery

The City had 71 on-road fleet vehicles in 2019, including passenger vehicles, light/medium/heavy trucks, and light vans, which used gasoline, diesel, and electricity for fuel. Gasoline and diesel fuel is also used to power some off-road machinery, such as lawnmowers.

Fuel consumption (in gallons of gasoline/diesel) and mileage totals were used to calculate emissions from the City's vehicle fleet. Fuel consumption was used to calculate emissions from off-road machinery. The number of vehicles in the City fleet increased by 32% in 2019 vs. 2009, with fewer passenger cars and more light and medium trucks. Estimated miles traveled by City vehicles in 2019 decreased by 8% compared to 2009, while gallons of fuel consumed increased by 69% (primarily diesel fuel use).

On-Road Vehicles

GHG Emissions	351 mtCO ₂ e
Activity/Usage	22,031 gallons – gasoline 15,075 gallons – diesel 436 kWh – electricity (estimated)
Emissions Factors	2019 US National Default 2019 Seattle City Light
Data Sources	City staff in the Administrative Services Department: miles from CityWorks and fuel use from King County Fleet and the Shoreline School District (which both provide fueling sites for City vehicles).

Off-Road Machinery

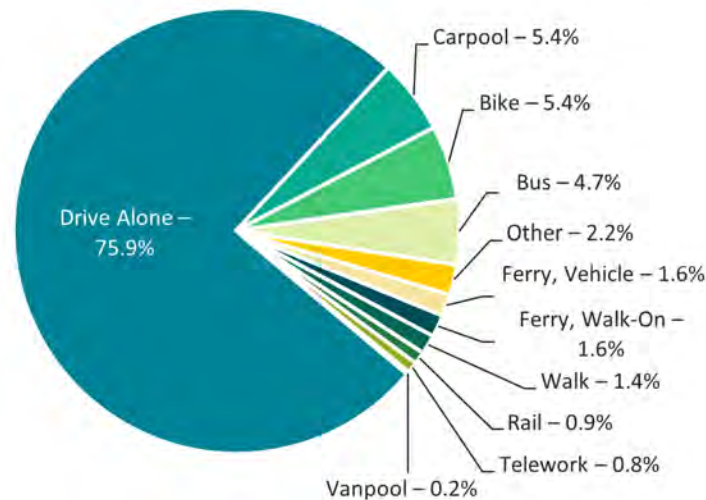
GHG Emissions	28 mtCO ₂ e
Activity/Usage	504 gallons – gasoline 2,777 gallons – diesel
Emissions Factors	2019 US National Default
Data Sources	City staff in the Administrative Services Department

Employee Commute

Estimated emissions associated with City of Shoreline employee commutes were obtained from the 2019 Commute Trip Reduction (CTR) Employer Survey Report from the Washington State Department of Transportation. In 2019, 76% of City employees completed the survey and reported a 75.9% drive alone rate (Figure 10). Employee commute data was not included in the 2009 baseline inventory.

GHG Emissions	312 mtCO ₂ e
Activity/Usage	439,584 vehicle miles traveled
Emissions Factors	2019 US National Default
Data Sources	2019 CTR Employer Survey Report – Washington State Department of Transportation

Figure 10. Mode split for all City employees in 2019.



Next Steps

The City plans to conduct a Contribution Analysis in the Summer of 2021 to help understand the factors driving the noted changes in emissions between the 2009 and 2019 Emissions Inventory years, such as weather or population growth. The information from this report and the Contribution Analysis will help inform community discussions about priority strategies to reduce GHG emissions as we update our 2013 Climate Action Plan. To learn more about what the City is doing to fight climate change and reduce emissions, please visit www.shorelinewa.gov/sustainability.

This report was developed in June 2021 by Autumn Salamack, Environmental Services Coordinator with the City of Shoreline. For more information on City efforts to reduce GHG emissions and take climate action, visit www.shorelinewa.gov/sustainability.

APPENDIX B: COMMUNITY ENGAGEMENT

Phase 1 Engagement Summary | July 2021 – April 2022

Overview

This document summarizes the engagement efforts of Phase 1 of the Shoreline Climate Action Plan update and identifies key themes related to level of commitment to climate action, priorities for the Plan, and concerns about specific near-term impacts of climate change. The feedback from this phase of engagement will be used to shape the focus areas of the plan and to establish criteria for the Multi-Criteria Analysis of CAP actions, which will occur in summer 2022.

The City completed its first Climate Action Plan in 2013 to help reduce greenhouse gas emissions associated with transportation, building energy use, and solid waste generation in Shoreline. Since that time, the City has completed many of the recommended actions from the 2013 Climate Action Plan. However, according to recent science-based targets and the results of a 2019 community-wide greenhouse gas emissions inventory, we need to continue to significantly reduce emissions to avoid the worst impacts of climate change. The CAP will outline key actions the City can take to reduce community-wide emissions and prepare our community for the impacts of climate change.

From July 2021 through February 2022, we conducted a first phase of engagement to assess the community's interest in climate action, identify key concerns related to near-term climate impacts, and gather feedback on key priorities and co-benefits that should be reflected in the Plan. This phase of engagement included one **virtual "Community Climate Conversation" event**, an **online survey**, and five **meetings of the City's "Community Climate Advisors,"** a panel of community members with lived experience as frontline communities* who were compensated for their time attending meetings and providing feedback.

The following outreach strategies were used to promote these engagement opportunities:

- **Posters:** City staff hung posters in parks and community centers in June 2021 to advertise the application opportunity for the community climate advisor positions.
- **Social Media Posts and Press Releases:** City staff released information about the Climate Advisor opportunity, the CAP survey, and the Community Climate Conversation event on the City's Facebook and Twitter feeds and on the City's website. Press releases for these opportunities were also sent to the Shoreline Area News blog.
- **Partner Emails:** City staff emailed representatives of neighborhood associations and community groups with an interest in this topic to provide information about the Plan and engagement opportunities. Staff also sent emails to the City's "News for Neighborhoods" and "Sustainable Shoreline" email lists, which together include approximately 3,100 emails.
- **Currents Newsletter:** City staff included articles about the Climate Action Plan update and engagement opportunities in the November, Winter, and February issues of "Currents," the City's print newsletter. Currents is mailed to all business and residential addresses in the City.
- **Project Factsheet:** Cascadia staff created a project factsheet to provide a summary of the purpose, timeline and key elements for the project, and links to the project webpage.

- **Student Assembly:** City staff presented at a special student assembly at Shorecrest High School on April 21, 2022, as part of the school’s Earth Week celebrations. Approximately 50 students attended.
- **Webpage:** The project webpage (www.shorelinewa.gov/climate) hosts information about the purpose and timeline for the Plan update, contact information for the project manager, links to the factsheet, and updates about each engagement opportunity. It also contains links to other relevant documents and materials.

**Frontline Communities are those people who are most likely to be impacted by the effects of climate change. These are community members that face historic and current inequities, often experience the earliest and most acute impacts of climate change and have limited resources and/or capacity to adapt to those impacts. Their voices are often the least heard even though they may be the most valuable ones to add because they are the most vulnerable to climate impacts.*

Summary of Findings

Key Themes

- In general, the majority of participants in Phase 1 engagement self-reported that they were **well-informed or familiar** with climate change issues and were **very concerned** about climate change.
- Participants showed **strong support** for Shoreline to take aggressive climate action, especially based on the results of the 2019 Emissions Inventory, suggesting that **the City should be a leader in** climate action.
- In general, the biggest **barrier for action implementation** for the community is the **financial impact**.

Community Priorities

- The community selected **environmental justice/equity** and **increasing climate resilience** as the top two criteria to use when evaluating actions to include in the CAP. These criteria will be incorporated into the multi-criteria analysis which will be used to prioritize CAP actions:
- **Environmental Justice and Equity:** Promotes environmental justice and equitable practices. This criterion was identified by the community as non-negotiable.
- **Climate Resilience:** Strengthens community resilience to near term climate impacts such as extreme heat, wildfire smoke, or flooding.
- The community also showed significant interest in several important **co-benefits** that will result from the actions selected in Shoreline’s CAP. The co-benefits that were most highly prioritized during Phase 1 engagement, in order of priority, included:
- **Other Environmental Benefits:** Strengthens ecosystem health and provides other environmental benefits such as increased tree canopy.
- **Public Health:** Improves air quality, provides health benefits, and improves quality of life.
- **Cost Savings/Affordability:** Provides cost savings to the community or supports increased affordability of housing.

Recommendations for Incorporation into the Shoreline CAP

- **Engagement** for the Shoreline CAP development should be **authentic and accessible, meeting people where they are**. This engagement should prioritize those who have historically been excluded from engagement or are the most vulnerable to climate impacts.
- CAP actions should work to mitigate or adapt to the climate impacts that Shoreline's community is most concerned about. These impacts include **more frequent wildfire smoke** and **extreme heat**, aligning with the community's highest expressed concern for the consequences of these impacts such as **dangers to public health and safety to current and future generations** and **destruction of natural ecosystems and habitats**.

Community Climate Conversation #1 (November 30, 2021)

Creating Shoreline's Future Together: Updating Shoreline's Climate Action Plan

On November 30, 2021, the project team hosted an initial Community Climate Conversation: "Creating Shoreline's Future Together: Updating Shoreline's Climate Action Plan" online via Zoom. The objective of this event was to introduce the Shoreline CAP update, review the results of the 2019 GHG Emissions Inventory and the City's updated science-based emissions reduction targets, and to gather input on community priorities for how to achieve Shoreline's climate action goals. A total of 60 people registered and 30 people attended in addition to City and consultant staff. Two polls were conducted during the event to gauge level of support for climate action and gather feedback on priorities for criteria/co-benefits. Participants were also able to provide open-ended feedback via the chat and during a Q/A period.

Workshop Findings

Key Themes

- In general, participants felt that it was **very important** that Shoreline take climate action.
- Participants noted that some of the **challenges of living in Shoreline** include loss of tree cover, lack of public transportation around town, lack of affordable and mixed housing, unsatisfactory noises and smells, cost of taxes and utilities, and plastic and food waste.

Community Priorities

- Through a multiple-choice polling exercise conducted during this workshop, the community selected the factors that were their highest priorities and should be used as criteria to evaluate actions, or that could be considered co-benefits to the CAP's actions.
- From this polling exercise, the community identified the following **criteria** as their highest priorities:
 - Climate Resilience
 - Ecosystem Health
 - Justice and Equity
- Overall, the community expressed a **strong preference for co-benefits** resulting from the actions in Shoreline's CAP. Some of the highest priorities heard during open-ended discussion during this workshop included improving air quality, increasing green space, and improving walk- and bike-ability of the community.

- **In the future**, participants' priorities are development of accessible transportation around town, community gardens and parks, community wind and solar projects, bike lanes, sidewalks, and resources for mental health and emergency preparedness.

Recommendations for Incorporation into the Shoreline CAP

- During this workshop, participants identified **climate resilience** as the most important factor for the City to consider when evaluating actions to include in the CAP, followed by **ecosystem health and justice and equity**.
- When asked about **local, near-term impacts of climate change** to Shoreline's community, workshop participants were concerned about many impacts, which could be mitigated through CAP actions. The top two impacts identified during this discussion were **public health impacts** (including impacts on seniors and vulnerable populations, and the wellbeing of future generations) and the **impacts on natural ecosystems & habitats**. Additional impacts that the community expressed concern for were economic impacts to the community as a whole and home/property values, as well as resilience of public infrastructure.
- It is recommended to heavily consider **the cost to the community** when developing CAP actions, in response to a large amount of concern from the community about the cost to Shoreline's residents to implement proposed actions.

Community Climate Advisor Meetings (July – October 2021)

In July 2021, the City recruited a group of Community Climate Advisors (CCA), a diverse group of community members who live and/or work in Shoreline and represent diverse backgrounds, experiences, and perspectives. During Phase 1 of engagement, the CCA group convened five times between July and October 2021 to provide early input for City staff on community engagement, messaging, key audiences, and priorities for the Plan update.

Meeting 1 – Project Introduction, Framing and Outreach (July 21, 2021)

In this first meeting, staff introduced Advisors to the CAP update project and began discussion of priority audiences and key messaging themes for engagement.

Advisor Recommendations

- Identify trusted messengers, organizations already working with target audiences.
- Go to where target audiences are already gathering (churches, cafes, shops, parks, social media, etc.).
- Peer to peer interactions are influential.
- Schools are a great resource for target audiences. Work through family advocates for most marginalized groups, send info home with students to reach families, connect with Climate Action Clubs, etc.
- Changing culture and increasing motivation to act is a significant challenge.
- Recommend focusing on financial and/or health benefits of actions.

Meeting 2 – Emissions Inventory Review (August 18, 2021)

During the second meeting, Advisors reviewed the 2019 Greenhouse Gas Emissions Inventory results and discussed key themes for communicating the inventory results to the community.

Advisor Recommendations

- The 2019 GHG Emissions Inventory results highlight the need for more drastic action by both City and individuals.
- Cost/affordability is a primary factor for community members to adopt actions.
- Frame actions in terms of cost savings and public health benefits.
- Concerted community education is needed for the drastic changes that will be necessary to reduce emissions.
- There is a prominent perception of natural gas as a “clean” source of energy and a need for more information about our electricity supply and why it is a better option in terms of emissions.
- The impacts of climate change are centered in areas with overlapping socioeconomic inequities (i.e., Aurora corridor and urban heat).
- Tailor communication efforts to different audiences based on the desired action. For example, unhoused persons, older adults, and non-English speaking communities along the Aurora corridor are important audiences for communication about resilience actions and resources.
- Need more information about how urban development is helping mitigate and/or exacerbating climate change and climate impacts.

Meeting 3 – Priority Audiences for Community Engagement (August 25, 2021)

During the third meeting, Advisors discussed priority audiences for community engagement in the development of the CAP and potential engagement strategies.

Advisor Recommendations

- Engagement must be authentic, accessible, and transparent. Accessibility options and language translation/interpretations are minimum efforts. Need to create space for authentic listening to community concerns and provide consistent reports of how feedback is being used.
- Priority audiences to engage include those who are most vulnerable to climate impacts and those who have not been typically engaged on these issues in the past. These include community members who are disabled, have limited English proficiency, are unhoused, youth, or have lower incomes.
- Priority engagement strategies for these audiences include:
 - Cultural events
 - Peer-to-peer networking and storytelling
 - Businesses and locations serving as community hubs
 - Community leaders and trusted messengers, i.e., teachers or faith leaders
 - Door-to-door canvassing in specific areas
 - Students and youth (can help reach families)

Meeting 4 – Engagement Strategies Discussion (September 14 and 15, 2021).

During the fourth meeting (two sessions), Advisors identified priority audiences for engagement and key engagement strategies.

Advisor Recommendations

- Focus on youth, BIPOC, and those most vulnerable to climate impacts. Maximize intersectionality of outreach efforts (i.e., BIPOC youth).
- Prioritize engagement opportunities to meet target audiences when and where they are already gathering instead of asking them to come to specific City/project events.
- Short videos can boost participation. Pair with ambassadors promoting the survey.
- Provide community service opportunities for high school students.
- Key languages for outreach include Spanish, Amharic, and Mandarin.
- Prioritize outreach materials with more graphics and less text.
- Currents and QR code signage are easy and effective tools.
- Keep consistent messaging across outreach. Include an engaging call to action.
- Incentives/prizes are helpful to get survey responses. Keep surveys short.

Meeting 5 – Criteria and Co-Benefits Discussion and Ranking (October 27, 2021)

At the October 27, 2021 meeting, Advisors reviewed and ranked options for criteria to inform the Multi-Criteria Analysis (MCA) framework that will be used to prioritize strategies for inclusion in the CAP. Advisors discussed the list of proposed criteria, suggested alternatives, voted for their top two criteria and then suggested which criteria could be lumped together as important co-benefits.

Advisor Recommendations

- The following criteria to be included in the MCA alongside “Emissions Reduction Potential” and “Feasibility”:
- **“Climate Justice and Equity”** was the highest-ranking criteria (31% selected) and was considered a non-negotiable in terms of community values.
- **“Cost Savings”** and **“Economic Recovery,”** were recommended to be combined and when combined, was the second highest ranking criteria (31% selected).
- Add a new criterion/co-benefit, “Awareness/Education,” for actions that increased awareness among community members of ways they could participate in climate action.
- “Awareness/Education” and “Other Environmental Benefits” each received 12.5% of votes in the ranking exercise.
- “Quality of life” and “Resilience” each received 6.5% of votes in the ranking exercise.
- “Awareness/Education, Other Environmental Benefits, and Quality of Life, Public Health, and Resilience” are important factors but can be grouped as co-benefits for the MCA.

Climate Action Survey (November 2021 – May 2022)

Overview

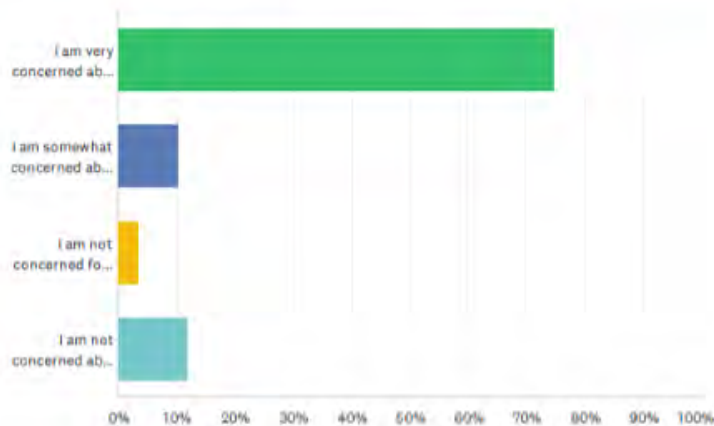
177 community members participated in an online survey between November 16, 2021 and May 7, 2022 to provide feedback on level of interest and support for climate action in Shoreline, concerns related to climate change, and priorities related to climate action. The survey was promoted on the City website and social media feeds, via City email lists, on Shoreline Area News, in the November Winter Currents, and at community events including a special assembly at Shorecrest High School.

Key Findings

- 99% of respondents report being either well informed about or **familiar with climate change** issues.
- 75% of respondents reported being “**very concerned**” about climate change, 10% of respondents reported being “somewhat concerned” about climate change, and 12% reported being “not concerned” about climate change.
- Of the near-term impacts of climate change for Shoreline, 77% of respondents reported being “extremely concerned” with **more frequent wildfire smoke** and lower air quality. 68% of respondents reported being “extremely concerned” with **increased temperatures/extreme heat**, and 67% with **loss of habitat and species**.
- Of the aspects of the Shoreline community vulnerable to climate change, 72% of respondents reported being “extremely concerned” with the **well-being of future generations**. 67% of respondents reported being “extremely concerned” with **trees, parks, wetlands and other ecosystems in Shoreline**.
- On average, respondents agreed with statements that “**the City should be a leader** in addressing climate change” and “**the City should do more** to address climate change.”
- In addition to cost and emissions reduction potential, respondents ranked the following criteria as “most important” for prioritizing strategies:
 - Provides **other environmental benefits** (60%)
 - Protects **public health and quality of life** (52%)
 - Strengthens **community resilience** to climate impacts (50%)

Q2 Generally, how concerned are you about climate change?

Answered: 177 Skipped: 0



ANSWER CHOICES	RESPONSES	
I am very concerned about climate change	74.58%	132
I am somewhat concerned about climate change	10.17%	18
I am not concerned for myself, but for the next generation	3.39%	6
I am not concerned about climate change	11.86%	21
TOTAL		177

Themes from Open-Ended Responses

Based on open-ended responses to questions 3, 4, 8, and 9, respondents reported concern for the following:

- **Tree Preservation (57):** concern with loss of established tree canopy
- **Housing and Affordability (41):** concern for impacts of actions on cost of living; concern for cost of housing and homelessness.
- **Green Building and Energy (26):** Supportive of green building strategies including solar (11), electrification (5), onsite stormwater management (5) and embodied carbon (4).
- **Reducing Driving (19):** supportive of strategies that create alternatives to driving alone including safe bike/ped infrastructure (11), improving public transportation (6), and improving community walkability (2).
- **Habitat (18):** concern for degradation and loss of terrestrial and aquatic habitat
- **Strong Policy (17):** support for stronger policy action to effect necessary change
- **City Influence (14):** concern with limit of City's sphere of influence given the scale of climate change
- **Climate Justice and Equity (12):** concern for disproportionate impacts of climate change on marginalized communities or how actions will impact specific vulnerable groups.
- **Public Support (12):** interest in actions that would garner widespread adoption or further increase public awareness of climate action opportunities.
- **Climate Science (10):** skeptical of climate change or showed misunderstanding climate science
- **Politicization (9):** discomfort with climate action as overly politicized
- **Electric Vehicles (8):** support for electric vehicles; concerns with affordability
- **Corporate Action (8):** interest in involving businesses in solutions or increasing corporate responsibility
- **Transparency (7):** highlighted need for transparent reporting on progress of efforts

Q8 Are there any other criteria you think the city should consider when evaluating actions to include in the CAP?

take cut trees lot homeless buildings solar energy cool considering moving live families
 Will changing climate Greener make park climate change projects
 people homes city reduce trees removed need see
 Shoreline cars actions expensive cost Protecting plan community
 increase now stop save helping us keep safe time actions will create solutions
 environment

Respondent Demographics

- 62% homeowners, 25% students, 10% renters, 1% business owner/employee
- Primarily female (52%) with less male (30%) and gender variant (4%) identifying respondents.
- Respondents primarily identified as White (70%) with less identifying as Asian American (10%), other (6%), Hispanic (5%), Black/African (4%), and Hawaiian/Pacific Islander (2%).
- Respondents were primarily aged 65 or older (28%) or under 18 (25%). 31% were between 25 and 55 in age.

Phase 2 Engagement Summary | March 2022 – June 2022

Overview

This document summarizes the engagement efforts of Phase 2 of the Shoreline Climate Action Plan update and identifies key themes related to community responses to draft strategies and actions. The feedback from this phase of engagement will be used to refine actions to be evaluated in the Multi-Criteria Analysis to determine the final list of actions for inclusion in the CAP update, which will occur in summer 2022.

The City completed its first Climate Action Plan in 2013 to help reduce greenhouse gas emissions associated with transportation, building energy use, and solid waste generation in Shoreline. Since that time, the City has completed many of the recommended actions from the [2013 Climate Action Plan](#). However, according to recent science-based targets and the results of a 2019 community-wide greenhouse gas emissions inventory, we need to continue to significantly reduce emissions to avoid the worst impacts of climate change. The CAP will outline key actions the City can take to reduce community-wide emissions and prepare our community for the impacts of climate change.

From March through June 2022, we conducted the second phase of engagement to assess the community's support and concern for draft strategies and actions across all focus areas that will be included in the Climate Action Plan update. These engagement opportunities also served as a space for the community to identify additional strategies or actions, as well as identify equity considerations for draft actions. This phase of engagement included three **virtual "Community Climate Conversation" events**, an **online survey** and **in-person poster surveying**, and three optional **meetings of the City's "Community Climate Advisors,"** a panel of community members with lived experience as frontline communities* who were compensated for their time attending meetings and providing feedback.

The following outreach strategies were used to promote these engagement opportunities:

- **Posters and Yard Signs:** City staff placed yard signs in parks and along frequently travelled intersections and hung posters at local businesses and organizations, libraries, and City Hall to advertise the public survey.
- **Social Media Posts and Press Releases:** City staff promoted CAP survey and Community Conversations on the Shoreline Area News blog, on the City's Facebook and Twitter feeds, and on the City's website.
- **Postcard Mailer:** The City printed and mailed postcards advertising the Community Climate Conversation events to all Shoreline residential addresses in February 2022.
- **Partner Emails:** City staff emailed representatives of neighborhood associations and community groups to advertise the community conversations and public survey. Staff also sent emails to the City's "News for Neighborhoods" and "Sustainable Shoreline" email lists, which together include approximately 3,100 emails.
- **Currents Newsletter:** City staff included articles about the Climate Action Plan update and engagement opportunities in the March and April issues of "Currents," the City's print newsletter. Currents is mailed to all business and residential addresses in the City.
- **Webpage:** The project webpage (www.shorelinewa.gov/climate) hosts information about the purpose and timeline for the Plan update, contact information for the project manager, links to the factsheet, and updates about each engagement opportunity. It also contains links to other relevant documents and materials.

**Frontline Communities are those people who are most likely to be impacted by the effects of climate change. These are community members that face historic and current inequities, often experience the earliest and most acute impacts of climate change and have limited resources and/or capacity to adapt to those impacts. Their voices are often the least heard even though they may be the most valuable ones to add because they are the most vulnerable to climate impacts.*

Summary of Findings

Key Themes

- In general, Shoreline's residents who participated in engagement opportunities were **very supportive** of the City's proposed CAP actions.
- In general, participants supported both **resilience actions** and actions **to reduce greenhouse gas emissions**.

Community Priorities

- Based on Phase 2 engagement, the community's **highest priorities** across engagement types were:
 - Improving infrastructure to increase Shoreline's walkability and bikeability.
 - Retrofitting existing construction to improve energy efficiency and electrifying where possible, and promoting electrification in new construction.
 - Requiring or subsidizing composting and recycling for multi-family buildings and businesses.
 - Increasing access to services for recycling difficult items.
 - Preserving existing trees and planting new ones.

Community Concerns

- The concern most expressed during engagement was around the **cost of actions to individuals**, which poses an equity issue. The community expressed that where possible, the actions in the CAP should provide incentives, tax breaks, etc. to assist the community with implementing financially-straining actions.
 - Commonly mentioned actions under this concern included completing energy efficient retrofits or purchasing an electric vehicle.

Community Climate Conversations #2-4 (March 2022)

In March 2022, the project team hosted three Community Climate Conversations online via Zoom, each focused on specific focus areas of the Climate Action Plan. The objective of these events was to introduce proposed strategies and actions in each focus area and to gauge community support or concerns related to the proposed strategies, identify equity considerations, and suggest additional actions the City could consider.

Workshop	Focus Area(s)	Date	Registered	Attended
Walk, Ride, Roll, and Plug — Decarbonizing Shoreline’s Transportation	Transportation	March 2, 2022 6:00–8:00 pm	90	51
Keeping Warm, Staying Cool — Achieving Carbon-Neutral Buildings and Energy	Buildings & Energy Consumption & Waste	March 16, 2022 6:00–8:00 pm	80	34
Fostering Community Resilience — Capturing Carbon in Trees and Ecosystems	Ecosystems & Sequestration Community Resilience & Preparedness	March 30, 2022 6:00–8:00 pm	94	36

Workshop Findings

Key Themes

- Participants **generally strongly supported all strategies and actions discussed** but brought to light many considerations and concerns about each action for the City to consider.
- Participants suggested that **the City should be the model** that the community can follow for CAP actions.
- Participants expressed the need for **education** around many actions, in particular:
 - Increasing participation in **recycling and composting**,
 - The **benefit of trees**, where education should be provided to homeowners who do yard management, arborists and developers, youth, etc.
 - **Home energy electrification**, so that residents can understand actual costs to transition, monetary changes to monthly bills, and the environmental impact of switching.
 - Participants noted that **until individual actions are more convenient** for the individual, there will not be widespread behavior change.

Community Priorities

Transportation

- The strongest support was shown for actions that promote safe infrastructure for non-motorized transportation, especially sidewalks, or that increase community **walkability and bikeability**.
- Participants also showed strong support for **electric vehicle adoption**.

Buildings & Energy priorities include:

- There was strong support **for moving away from fossil fuels** and for localized renewable energy production, such as **community solar**.
- Participants felt that an increased focus should be placed on **retrofitting existing construction**, rather than only on **new construction**.

Consumption & Waste priorities include:

- One of the top priorities for participants was **expanding recycling and compost services** to be more accessible to **multi-family residences**.
- Participants strongly support actions working to **reduce waste of all types**, and suggested many different promotions including **reusable takeout containers, food waste reduction apps, and reuse options promotions**.
- Participants supported **expanding access** to recycling services that accept **hard-to-recycle items** such as incandescent light bulbs and plastic bags.

Ecosystems & Sequestration

- Participants **strongly supported** all actions that focused on both **preserving and planting trees**. Existing and older trees should be preserved while **also** ensuring that new planting is happening, which should be made up primarily of native tree species.
- Participants strongly supported replacing underused grass areas in Parks with forested habitats. Participants were particularly concerned about the negative environmental and health impacts of synthetic turf fields with crumb rubber infill at many School District facilities.
- Participants emphasized the need to **protect existing trees** during sidewalk construction.

Community Resilience & Preparedness

- Participants **strongly supported** resilience actions such as creating cooling centers, resilience hubs, shelter services, and more affordable housing.
- Participants expressed **the most support** for the actions in this focus area that support those who need it most.

Community Concerns

- The majority of participant's concern was for the cost of individual actions, noting that it is necessary to **provide financial assistance** to those who cannot afford to electrify, install solar, etc. through rebates, incentives, and grants.
- Participants showed concern **for lack of safe bike and walking infrastructure** in Shoreline.
- There was concern for actions that may **increase the cost of rent inadvertently**, such as implementing sustainable urban design practices.

Community Climate Advisor Meetings (May 2022)

In May 2022, staff held three drop-in sessions for Community Climate Advisors to provide more in-depth feedback on the draft CAP strategies. Four advisors attended these sessions and provided feedback on key strategies in the Transportation, Building Energy, and Resilience & Preparedness focus areas. Feedback from these three sessions is compiled in the chart below. Feedback from Advisors included the following themes and key actions:

Key Themes

Support for Building Electrification and Resources

- Strong support for building electrification actions and incentives to help building owners electrify.
- Key concern with understanding true cost of electrification. Other barriers include contractor availability, lack of knowledge about heat pump systems.

- Strong interest in providing resources to help lower income residents and “middle” or “middle-low” income building owners, who often miss out on low-income programs but for whom traditional incentives are not enough.
- Support for strong policy action to disincentivize fossil fuel heating systems.
- Interest in focusing programs and resources in areas with greatest socio-economic needs and greatest climate vulnerability
- Interest in combining electrification with efficiency and solar.

Transportation

- Overall interest and support for increasing walkability, safe bike and pedestrian infrastructure, improving CTR programs and transit service.
- Concern that this shift is a longer-term process that will require significant infrastructure changes and investment to scale.
- Strong interest in improving safety and comfort for pedestrians/cyclists and in improving safety, cleanliness, and convenience of local transit.
- Some interest and support for e-bikes/e-scooters and shared-use options but concern about safety and need for safe infrastructure first.
- Support for electric vehicles but concerns about affordability and access, especially for lower-income. Strong support for options that increased awareness and public charging options.

Resilience and Preparedness

- Strong support for this section overall. Interest in mobilizing the community to support implementation and ensuring resources are provided for those most vulnerable to climate impacts.
- Strong support for resources related to **urban heat** and **wildfire smoke**.

Climate Action Survey 2 (May 31 – June 21, 2022)

Online Survey

375 community members participated in an online survey between May 31 and June 21, 2022 to provide feedback on actions the City can take to address climate change. Specifically, participants provided their input on strategies related to clean transportation, clean buildings and energy, healthy trees and ecosystems, community resilience and preparedness, and zero waste and circular economy. The goals of the survey are to 1) identify which strategies have particularly strong or low support, 2) identify any additional strategies we should consider, and 3) identify key themes related to each set of strategies or particular strategies that will allow the City effectively and equitably implement actions. The survey was promoted on the City website, via City email lists, by posters and yard signs displayed at public parks, local businesses, organizations, libraries and City Hall, on Shoreline Area News, and at community events including a special student forum with youth from Shorecrest and Shorewood High Schools.

Poster Outreach

City staff created interactive, physical posters to mirror the online survey and present the strategies for each of the five focus areas: clean transportation, clean buildings and energy, healthy trees and ecosystems, community resilience and preparedness, and zero waste and circular economy. On each of the five posters, individuals placed up to three stickers next to the strategies they most supported and wrote on sticky notes to share additional ideas. Posters

were displayed for at least two weeks during the survey period at each of the following locations: Spartan Recreation Center, Ronald Commons, Lake Forest Park-Shoreline Senior Center, and Shoreline Library. Due to space limitations at a few locations, only 2-3 posters were displayed at one time, with City staff switching out posters halfway through the two-week period. Amharic and Tigrinya translations were included in the posters at displayed at Ronald Commons. City staff also used the posters at a special student forum with youth from Shorecrest and Shorewood High School where they facilitated interaction with the posters and provided additional context for strategies.



Above: Posters displayed at Spartan Recreation Center.

Key Findings

Below are the top three strategies for each category that survey and poster respondents most supported.

Transportation & Mobility

1. More safe sidewalks and walking paths (40%)
2. School buses, utility trucks, and city vehicles are all electric (34%)
3. More businesses within walking distance (26%)

Buildings & Energy

1. New homes and buildings are built more energy efficient (33%)
2. Financial help for homes, businesses, and apartments to install solar panels (32%)
3. New large buildings are built with solar panels (29%)

Ecosystems & Sequestration

1. More trees and forest restoration projects in parks (38%)

2. New buildings incorporate more trees (36%)
3. More staff and resources to maintain and plant city trees (35%)

Community Resilience & Preparedness

1. Education and incentives to help build rain gardens, remove pavement, or plant trees at homes, businesses, schools, and other properties (58%)
2. More shelter services and affordable housing (38%)
3. New buildings, roads and infrastructure are built to withstand climate change (35%)

Zero Waste

1. Better access to services for recycling difficult items like plastic bags and Styrofoam™ (48%)
2. All apartments provide compost service for their residents (43%)
3. Packaging companies pay to support recycling of their products (42%)

Based on open-ended responses to questions 2, 4, 6, 8, and 10, online survey respondents reported concern for the following:

Themes from Open-Ended Responses

Transportation & Mobility

- Supportive of **increasing walkability** within Shoreline; interested in more centrally located businesses and shopping centers and having safe sidewalks and walking paths, but not at the expense of losing established tree canopy.
- Supportive of making Shoreline **more bike-friendly**; interested in creating safer, protected bike lanes and paths (i.e., barricaded) and developing infrastructure that makes biking to places more convenient – physically and culturally, but not at the expense of losing established tree canopy; also concern whether existing bike lanes are used enough to warrant add more.
- Generally supportive of **electric vehicles (EV)** and other electric modes of transportation; concern around affordability, lack of public charging stations, rebates being distributed to those who can already afford to buy an EV; concern around where batteries for EVs come from and their environmental impact.
- Interest in making clean **public transportation** more accessible; expanding routes to accommodate the growing population, especially with more multifamily properties being built.

Buildings & Energy

- Support for requiring **new buildings and homes** to be built more energy efficient; providing **incentives** to make current buildings and homes more energy efficient, and enacting stronger **policy** action to effect necessary change.
- Concern around **affordability** for individuals to improve energy efficiency; emphasized rebates and financial incentives would be essential for most.
- Interest in a mix of clean energy systems – solar, geothermal, electric – and starting with actions that would be most efficient and effective overall.

Ecosystems & Sequestration

- **Tree preservation** was the highest concern; support for the City to maintain established tree canopy as well as adding additional trees along streets and in other green spaces.
- Support for enacting a more robust **policy for new developments to maintain tree canopy** and add more trees in their designs.
- Desire to begin with actions that are most **efficient and effective**.

Community Resilience & Preparedness

- Support for requiring new infrastructure to be **built to withstand climate change**.
- Interest in requiring multifamily properties to include/retrofit to add air conditioning, adding cooling centers, and taking measures to **protect the most vulnerable** from extreme heat, flooding, and other effects of climate change.
- Support for the **City to take the lead in climate change resilience** through more education, enacting stronger policy for developers, and implementing those strategies that are most **efficient and effective**.

Zero Waste

- Support for **requiring composting and recycling**, especially for multifamily properties and businesses.
- Interest in involving businesses in solutions or increasing **corporate responsibility**, especially when it comes to recycling and preventing plastic waste and packaging; concern about placing the responsibility on the individual as being less effective.
- Interest in making **recycling specialty items more accessible** (e.g., creating more drop-off locations in high traffic areas like school parking lots).
- Interest in enacting **policy** that bans plastic and Styrofoam™.

Respondent Demographics

- 73% homeowners, 10% renters, 7% business owner/employee, 3% students
- Primarily female (67%) with less male (24%) and no gender non-conforming (0%) identifying respondents.
- Respondents primarily identified as White (77%) with less identifying as Asian American (8%), Hispanic (6%), other (3%), American Indian/Alaska Native (2%), Black/African (1%), and Hawaiian/Pacific Islander (1%).
- Respondents were largely aged 65 or older (37%). Ages 25-64 made up a large proportion (59%). Younger ages made up a small proportion of respondents, 18-24 (2%) and under 18 (2%).

APPENDIX C: MULTI-CRITERIA ANALYSIS

Cascadia led a qualitative multi-criteria analysis (MCA) of 35 actions from Shoreline's CAP action list. The MCA assigns qualitative numerical scores to each evaluated action and criterion to arrive at an overall priority score for each action. This memo provides an overview of the MCA approach and findings. It includes:

- An overview of the **evaluation steps** for the multi-criteria analysis.
- Detailed descriptions of the **evaluation criteria**, including sub-criteria definitions and criteria weights.
- Results of the MCA.

MCA Evaluation Steps

The MCA evaluation steps are as follows:

1. To arrive at a priority score, **each criterion** is clearly **defined** and assigned a **weight**. The City of Shoreline decided on weightings based on relative priorities as indicated by existing City values and commitments and by feedback from City staff, community members, and other stakeholders.
2. Cascadia developed **qualitative score matrices** to allow for a consistent, objective ranking process. Cascadia then assigned scores for each action based on the criteria definitions and professional judgement drawing from peer city case studies, knowledge of City context, community feedback, and consultant experience. Each criterion is evaluated on a 1 (low) to 5 (high) scale.

Evaluation Criteria






Summary

The following criteria were used to evaluate the 35 selected actions supporting Shoreline's updated Climate Action Plan. Each criterion is evaluated on a 1 (low) to 5 (high) scale.

GHG Emissions Impact was heavily prioritized in this analysis (55%) to reflect the City's priority for greenhouse gas emissions reductions as the main benefit from the actions in the Shoreline CAP.

Resilience Impact, **Feasibility**, and **Equity** were weighted equally (10%) to reflect the City and community's additional priorities.

Co-benefits were prioritized at 15% total (5% each) to reflect how well actions achieve co-benefits that the community prioritizes, while recognizing that achieving these benefits is not the primary purpose of these actions but was still a priority to the community.

Criterion		Weight	Definition/Subcriteria
GHG Emissions Impact		55%	Reduces greenhouse gas (GHG) emissions
Resilience Impact		10%	Increases community resilience to climate impacts
Feasibility		10%	Includes community support, political, technical, and regulatory feasibility/barriers
Equity		10%	Benefits or supports communities that face current or historic inequities
Co-benefits		15%	Provides co-benefits related to improving health/quality of life, providing cost savings to community, and/or supporting ecosystem health



GHG Emissions Impact

This criterion evaluates impact according to the lever of the action (voluntary/indirect programs, regulatory action, etc.), how directly the action addresses emissions, whether the action is focused on the City’s highest-emissions sources, the timeline and ability to scale the impact, and the ease of measuring and tracking the impact.

GHG emissions reduction impact	
1	No emissions reductions – action is not intended to/does not reduce GHG emissions or increase sequestration.
2	Low – voluntary/indirect strategies (e.g., education/outreach, planning, assessments) that indirectly reduce emissions; regulatory/direct strategies that address a very small emissions source; limited scope/ability to scale (i.e., low or very low impact/reductions/sequestration).
3	Moderate – voluntary/indirect programs that directly reduce emissions with financial incentives; voluntary/indirect programs without financial incentives but with relatively high reduction potential (addresses large source of emissions); regulatory/infrastructure projects with low/medium or indirect emissions reduction potential (i.e., moderate impact/reductions/sequestration).
4	High – regulatory/infrastructure projects that directly reduce emissions; strong voluntary/indirect programs with financial incentives and/or addressing a top emission source; limited scope/reach or with broad scope/reach that will be realized after 2030 (i.e., high impact/reductions/sequestration).
5	Very high – regulatory/infrastructure projects that directly reduce emissions and that will be realized by 2030; broad reach/scope (i.e., very high impact/reductions/sequestration).



Climate Resilience Impact

This criterion evaluates impact according to whether the action is focused on the City's greatest climate risks and vulnerabilities, how broadly the action would affect the community, and scalability and timeline. Shoreline's top climate vulnerabilities were identified in the [2020 Climate Impacts & Resiliency Study](#).

Climate resilience impact	
1	Addresses a very minor need – very low climate risk for City/community or may be a voluntary action that indirectly enhances resilience. May have limited ability to scale.
2	Addresses a minor need – low climate vulnerability for City/community (transportation, emergency services) or a higher climate risk but with indirect action; may be a voluntary action with ability to scale.
3	Addresses a moderate need – average/moderate climate vulnerability for City/community (parks and open space, storm drains); may address high climate risk/vulnerability but through a voluntary or indirect programs, possibly with incentives.
4	Addresses a higher-than-average need – high climate risk for City/community (air quality, heat-related illnesses, flooding; indirect risks to overburdened communities). May have a long timeframe or limited reach.
5	Addresses a very major need – very high climate risk(s) for City/community (air quality, heat-related illnesses, flooding; direct risks to overburdened communities); risks may be addressed through regulatory action. Will be realized by 2030 and will have broad reach across the community.



Feasibility

The feasibility criteria assess the degree of City control over an action's strategy success and the likely regulatory, political, and technological constraints to implementation, as well as anticipated cost to the City, and community support. Community support focuses on support from community partners and stakeholders such as the business, environmental, social justice, and other community perspectives. Political constraints include the level of City Council support and direction, City staff support and capacity, the regulatory role and level of support of King County, alignment or reinforcement of other City, County, and regional policies, plans, programs, and initiatives (including opportunities for shared implementation), whether funding or other needed resources from state and federal entities is easily acquired, and whether the outcome of a legislative process may affect the feasibility of a strategy.

Feasibility	
1	Very high barriers – action currently UNVIABLE given current regulations, politics, community support, and/or technologies and anticipated opportunity windows. If encountered, challenges are VERY DIFFICULT or IMPOSSIBLE to overcome and/or unable to adapt to new technologies. Not identified in any existing Shoreline and/or regional plan (e.g., K4C).

Feasibility	
2	High barriers – action LIKELY to encounter challenges given current regulations, politics, community support, and/or technologies and anticipated opportunity windows. If encountered, challenges are DIFFICULT to overcome and/or difficult to adapt to new technologies. Identified in existing Shoreline and/or regional plan but has been identified as having high barriers.
3	Moderate barriers – action MAY encounter challenges given current regulations, politics, community support, and/or technologies and anticipated opportunity windows. If encountered, challenges are MODERATELY DIFFICULT to overcome and/or moderately difficult to adapt to new technologies. Identified in an existing Shoreline and/or regional plan, but no action yet.
4	Low barriers – action UNLIKELY to encounter challenges given current regulations, politics, community support, and/or technologies and anticipated opportunity windows. If encountered, some or most challenges are RELATIVELY EASY to overcome and/or are relatively easy to adapt to new technologies. Related to an existing Shoreline and/or regional plan (e.g., K4C, e.g., “expand on something from a plan”).
5	Very low barriers – MINIMAL to NO challenges anticipated given current regulations, politics, community support, and/or technologies and anticipated opportunity windows. If encountered, most challenges are EASILY overcome and/or easily adaptive to new technologies. Identified in existing Shoreline and/or regional plan (e.g., K4C).



Equity

The equity criterion focuses on how costs and benefits are distributed among community members and communities that face current or historic inequities.



Equity	
1	Very low – ALL benefits and costs are perpetuating current/historic inequities.
2	Low – SOME benefits and costs are perpetuating current/historic inequities.
3	Moderate/neutral – action DOES NOT distribute benefits and costs in the community in a way that perpetuates historic inequities.
4	High – MANY or MOST benefits are accruing to the sectors of the community that face current or historic inequities; other sectors of the community accrue benefits as well.
5	Very high – MOST or ALL benefits are accruing to the sectors of the community that face current or historic inequities; other sectors of the community accrue benefits as well.



Co-Benefits

Many actions will have benefits beyond greenhouse gas emissions reduction or building climate resilience. Based on City input and community priorities summarized from extensive community feedback during the CAP update process, the selected co-benefits for consideration in the MCA are public health, cost savings, and ecosystem health.



- **Protecting public health and improving quality of life (QOL):** Shoreline community members identified public health and quality of life as priority co-benefits that should be considered when evaluating actions.
- **Providing cost savings to the community or increasing affordability:** The Community Climate Advisors (CCA) and other community members also identified cost savings and affordability as important criteria. 
- **Protecting or improving ecosystem health:** Shoreline community members ranked ecosystem health as a top criterion in the online survey and the first community climate conversation workshop. Healthy natural systems include the processes and functions that sustain healthy species, habitats, and ecosystems. Specific priorities of this co-benefit include protecting biodiversity, protecting and increasing trees in Shoreline, and promoting urban forest health, and stream and wetland health. 

#	Supports public health/ quality of life (QOL)	Creates cost savings for the community/supports affordability	Supports ecosystem health/ the natural environment
1	Very low – NO to MINIMAL support for public health and QOL and may negatively affect public health/QOL.	Very low – NO to MINIMAL cost savings for the community, or may create increased costs for the community.	Very low – NO to MINIMAL support for healthy natural systems and may negatively affect natural systems.
2	Low – Minorly benefits the public health and QOL of SOME, but the benefits are likely short-term (i.e., <1 month).	Low – Creates minor cost savings for SOME of the population but the benefits are likely short-term (i.e., <1 month) but no significant cost savings for a SIGNIFICANT portion of the population	Low – INDIRECTLY supports healthy natural systems of any size or priority; benefits expected to last <5 years and/or be limited in reach/ scale
3	Moderate – Minorly improves public health/QOL for SIGNIFICANT portion of the population but the benefits are likely short-term (i.e., <1 month) or creates moderate public health/QOL improvements for SOME of the community for some time (i.e., 1 month to a few years)	Moderate – Creates minor cost savings for a SIGNIFICANT portion of the population but the benefits are likely short-term (i.e., <1 month) or creates moderate cost savings for SOME of the community for some time (i.e., 1 month to a few years)	Moderate – DIRECTLY supports SOME healthy natural systems, which may or may not be deemed critical or high-priority in a plan or directive; benefits expected to be short-term (i.e., 5-10 years) and/or limited in reach/scale
4	High – Creates moderate public health/QOL benefits for a SIGNIFICANT portion of the population for some time (i.e., 1 month to a few years) or persistently creates significant benefits for SOME of the population (i.e., >5 years).	High – Creates moderate cost savings for a SIGNIFICANT portion of the population for some time (i.e., 1 month to a few years) or persistently creates significant cost savings for SOME of the population (i.e., >5 years).	High – SIGNIFICANTLY and DIRECTLY supports SOME healthy natural systems, a few of which are deemed CRITICAL or HIGH-PRIORITY in a plan or directive; benefits expected to be short-term (i.e., 5-10 years) but broad in reach/scale

#	Supports public health/ quality of life (QOL)	Creates cost savings for the community/supports affordability	Supports ecosystem health/ the natural environment
5	Very high – Persistently creates long term benefits for a SIGNIFICANT portion of the population (i.e., >5 years).	Very high – Persistently creates long term cost savings for a SIGNIFICANT portion of the population (i.e., >5 years).	Very high – SIGNIFICANTLY and DIRECTLY supports MANY healthy natural systems or SIGNIFICANTLY and DIRECTLY supports CRITICAL or HIGH-PRIORITY healthy natural systems of any size; benefits expected to persist (i.e., >10 years) and be broad in reach/ scale

Results

The following table presents the results of the multi-criteria analysis in order of priority score (beginning with the highest priority scores). In general, actions in the transportation and mobility and buildings and energy focus areas received higher priority scores than actions in the other three focus areas.

Focus Area Key:

	Buildings and Energy
	Transportation and Mobility
	Ecosystems and Sequestration
	Community Resilience and Preparedness
	Zero Waste

Action ID	Action Description	GHG Impact	Health/Quality of Life	Cost-Savings	Ecosystem Health	Equity	Resilience	Feasibility	Priority Score
TM 1.1	Study and implement land use policies to increase density, increase the variety of land uses within neighborhoods, increase walkability, and encourage business development so that basic and desirable amenities are accessible by walking from all neighborhoods.	5	4	2	2	4	2	4	4.15

Action ID	Action Description	GHG Impact	Health/Quality of Life	Cost-Savings	Ecosystem Health	Equity	Resilience	Feasibility	Priority Score
BE 1.3	In collaboration with utilities and local jurisdictions, develop a residential home energy program to provide education, technical assistance, and financial assistance to replace gas and oil heating systems with electric heat pumps, improve home efficiency, and install renewable energy systems. Options include a rebate program, bulk-purchase retrofit campaign, or other financing mechanism. Prioritize low-income households for assistance and incentives.	4	4	4	1	5	5	5	4.15
BE 1.6	Promote existing financing mechanisms and incentives such as C-PACER to convert gas and oil heating systems at commercial and multifamily buildings to electric space and water heating at low or no-cost. Partner with utilities and local jurisdictions to provide technical assistance to building owners or develop new incentives as needed with a focus on low and middle-income residential buildings. Pair electrification with efficiency retrofits and renewable energy installations.	4	3	3	1	4	5	5	3.95

Action ID	Action Description	GHG Impact	Health/ Quality of Life	Cost-Savings	Ecosystem Health	Equity	Resilience	Feasibility	Priority Score
TM 1.3	Partner with transit agencies and private developers to encourage redevelopment of Park and Ride locations for transit-oriented development projects that incorporate affordable housing.	4	3	4	1	5	3	4	3.8
BE 1.1	Provide education, technical assistance, and incentives to encourage and incentivize construction of all-electric new single-family homes. Possible incentives include reduced permit fees, additional development benefits, property tax exemptions, and/ or rebates. Explore options to disincentivize gas and oil heating for new residential construction, such as adding permit fees or taxes on gas or oil heating equipment.	4	2	3	3	3	5	4	3.8
TM 1.7	Enhance and expand the City's Commute Trip Reduction (CTR) Program to encourage CTR across the city for major employers and within the City for internal employees. Possible strategies could include ridesharing programs, carpool matching, telecommuting, and employer-sponsored vanpools.	4	3	2	2	3	2	5	3.55

Action ID	Action Description	GHG Impact	Health/Quality of Life	Cost-Savings	Ecosystem Health	Equity	Resilience	Feasibility	Priority Score
TM 1.4	Continue to study and implement policies that reduce demand for parking in mixed-use and commercial centers and encourage transportation modes other than driving. Focus especially on limiting off-street, surface parking to reduce urban heat.	5	2	1	2	2	1	2	3.5
TM 1.10	Partner with Metro Transit, Sound Transit, Community Transit and/or WSDOT to increase transit service and access to encourage greater ridership. Improve cross-city transit connections, especially to the new light rail stations, explore flexible micro-transit service, and expand subsidized or discounted transit programs and increase education to encourage greater use of them.	4	2	2	2	4	2	4	3.5
TM 2.3	Secure or develop grant funding to support fleet electrification by schools, businesses, and utility partners (i.e. Shoreline School District, North City Water, Recology).	4	3	2	2	4	1	3	3.35

Action ID	Action Description	GHG Impact	Health/Quality of Life	Cost-Savings	Ecosystem Health	Equity	Resilience	Feasibility	Priority Score
TM 1.5	Continue to incentivize travel demand management (TDM) strategies to reduce car trips through the Deep Green Incentive Program. Explore and implement options to increase TDM incentives for new development through this and other programs.	4	3	2	2	3	1	4	3.35
TM 2.5	Strengthen our existing EV-ready ordinance to increase the percentage of required EV-ready stalls and to require installation of a minimum number of charging stations for all new multifamily residential and commercial construction and during major renovation of parking lots/structures.	4	2	2	2	3	1	4	3.3
TM 2.6	Expand the public EV charging network by assessing gaps in infrastructure, identifying opportunities to increase grid capacity for increased charging, and supporting installation of charging stations for public use on business, institutional, city and utility property in key areas. Install charging stations for public use at all City facilities open to the public such as parks and recreation centers.	4	2	2	2	4	1	3	3.3

Action ID	Action Description	GHG Impact	Health/Quality of Life	Cost-Savings	Ecosystem Health	Equity	Resilience	Feasibility	Priority Score
BE 1.2	Advocate for legislative changes to allow local updates to the Residential Provisions of the Washington State Energy Code so the City can require residential building electrification and increase energy efficiency for new residential construction.	4	2	2	1	3	2	3	3.25
BE 1.7	Study and implement carbon-based building performance standards to reduce fossil-fuel use in commercial and multi-family buildings larger than 20,000 square feet that complement benchmarking and performance requirements under the State Clean Buildings Act.	4	2	3	1	3	2	2	3.2

Action ID	Action Description	GHG Impact	Health/ Quality of Life	Cost-Savings	Ecosystem Health	Equity	Resilience	Feasibility	Priority Score
TM 1.2	Where it supports the City's connectivity objectives, increase street connectivity. Identify funding and acquire mid-block right-of-way and street connections to increase multimodal connectivity and encourage transit-oriented development, especially in the King County Candidate Countywide Centers (148th St. Station Area, 185th St. Station Area, Shoreline Place, and Town Center).	4	3	1	1	3	2	2	3.15
TM 1.9	Partner with King County and other cities to pilot bikeshare or e-bike/e-scooter-share programs. Partner with community groups to pilot an e-bike library where bikes are available to low-income community members without requiring smartphone technology and a credit card to access.	3	3	2	2	5	2	4	3.1

Action ID	Action Description	GHG Impact	Health/Quality of Life	Cost-Savings	Ecosystem Health	Equity	Resilience	Feasibility	Priority Score
ES 1.9	Develop a program to provide trees for schools, churches, institutions, businesses, or residential properties in Shoreline along with training in tree planting and care focusing on identified urban heat islands and environmental health disparity areas. Partner with local organizations and community volunteers to plant and maintain trees.	2	3	2	4	5	5	4	2.95
TM 1.8	Create shared-use mobility hubs to enhance cross-community travel by transit, rideshare, EV, bikeshare, e-bikeshare, e-scootershare, and any means other than driving a traditional gas/diesel vehicle alone.	3	3	2	2	3	2	4	2.9
TM 2.2	Provide community education and outreach about the benefits of EVs and promote existing rebates and credits for EV purchases.	3	2	2	2	3	1	5	2.85

Action ID	Action Description	GHG Impact	Health/Quality of Life	Cost-Savings	Ecosystem Health	Equity	Resilience	Feasibility	Priority Score
ES 1.11	Identify opportunities to increase tree retention and canopy cover on private property, especially in areas with documented urban heat impacts or environmental health disparities and implement recommendations.	2	3	1	3	5	5	4	2.85
TM 1.6	Create a connected network of safe, comfortable, welcoming, and low-stress bicycle facilities, sidewalks, and trails for pedestrian and bicycle travel that connects to schools, commercial destinations, transit stops, and essential services.	3	4	2	1	3	2	3	2.8
ZW 2.2	Study and implement source separation requirements for basic recyclable materials, compostable paper, and food waste for residential and commercial generators in Shoreline. Require composting for businesses and multifamily properties in accordance with HB 1799.	3	1	1	2	3	1	4	2.65

Action ID	Action Description	GHG Impact	Health/Quality of Life	Cost-Savings	Ecosystem Health	Equity	Resilience	Feasibility	Priority Score
ES 1.3	Complete an inventory of street tree assets to assess replanting needs and identify key sites available to plant additional street trees. Identify planting opportunities in areas with documented urban heat island effects or environmental health disparities and conduct focused street tree planting efforts in these areas.	2	3	2	4	5	3	3	2.65
ES 1.10	Provide education and resources for private property owners and arborist companies to encourage tree retention, care, and planting of additional trees on private property. Consider promoting habitat certification programs, conservation easements or other conservation programs to encourage protection of existing natural areas on private and institutional property.	2	2	1	3	2	5	5	2.6

Action ID	Action Description	GHG Impact	Health/ Quality of Life	Cost-Savings	Ecosystem Health	Equity	Resilience	Feasibility	Priority Score
CRP 2.1	Increase equitable access to emergency preparedness resources for vulnerable populations and areas, especially those related to flooding, extreme heat, and wildfire smoke. Develop and distribute tools and resources for the community to stay safe during urban heat or wildfire smoke events. For example, consider providing filter-fan kits for vulnerable populations.	1	5	2	1	5	5	5	2.45
ZW 1.1	Utilize grant funding to provide waste reduction programs and education for the community with a focus on food waste prevention. Options include enhancing local food rescue and donation network, expanding King County's "Repair Café" program, supporting tool libraries, or other community-based activities to reduce waste.	2	2	2	2	3	2	5	2.4

Action ID	Action Description	GHG Impact	Health/Quality of Life	Cost-Savings	Ecosystem Health	Equity	Resilience	Feasibility	Priority Score
CRP 1.4	Increase incentives and promotion of green stormwater and urban forest retrofits on developed properties, with emphasis on areas prone to urban heat and flooding or identified environmental health disparities. Segue with urban forest related efforts above.	1	3	3	3	5	5	4	2.4
TM 2.1	Partner with regional jurisdictions and businesses to provide an electric vehicle (EV) car share program in the community.	2	3	3	2	4	2	2	2.3
CRP 1.2	Study and implement requirements or incentives for private development within areas with identified urban heat impacts, surface water vulnerabilities, or environmental health disparities to incorporate measures to mitigate and increase resilience to climate impacts.	1	3	1	3	5	5	4	2.3

Action ID	Action Description	GHG Impact	Health/Quality of Life	Cost-Savings	Ecosystem Health	Equity	Resilience	Feasibility	Priority Score
CRP 1.3	Review and update urban design standards to increase citywide resilience to climate change. For example, modify design standards to encourage greater tree retention and incorporation of more trees, green stormwater infrastructure and other nature-based practices.	1	3	1	4	3	5	5	2.25
TM 1.13	Incentivize e-bike ownership through a bulk purchase or rebate program.	2	3	2	1	3	2	3	2.2
ZW 1.7	Support programs and policies to reduce the use of single-use food service-ware, especially plastic.	2	2	1	3	3	1	4	2.2
ZW 2.6	Utilize grant funding to expand special item recycling services for key materials such as polystyrene foam and plastic film. Increase equitable access to these services by providing education and technical assistance for key audiences.	2	1	1	2	3	1	5	2.2

Action ID	Action Description	GHG Impact	Health/ Quality of Life	Cost-Savings	Ecosystem Health	Equity	Resilience	Feasibility	Priority Score
ZW 2.7	Support State and Federal legislation for extended producer responsibility systems to increase recycling of consumer packaging and other key materials.	2	1	2	2	3	1	3	2.05
ZW 1.2	In support of King County's RE+ plan, explore and implement solid waste service models that incentivize waste reduction and diversion, such as every-other-week garbage service or pay-as-you-throw models.	2	1	2	2	2	1	3	1.95

APPENDIX D: SEQUESTRATION ANALYSIS

Cascadia Consulting Group (“Cascadia”) used the USDA Forest Service’s i-Tree Canopy software to conduct a high-level land carbon sequestration analysis to estimate potential greenhouse gas (GHG) emissions reduction benefits from Shoreline’s urban forests. The software facilitates a supervised random sampling (100 samples) using Google Maps aerial photography. The analysis includes quantification of the carbon sequestration potential of Shoreline’s existing tree canopy.

Results

The i-Tree Canopy analysis indicates 44% of Shoreline’s land mass is covered with trees as of 2021.⁶ These trees sequester an estimated 13,890 metric tons of CO₂ equivalent (MT CO₂e) from the atmosphere every year⁷ and store an estimated 413,840 MT CO₂e.⁸

Tree Benefit Estimates: Carbon

Description	Carbon (kT)	±SE	CO ₂ Equiv. (kT)	±SE	Value (USD)	±SE
Sequestered annually in trees	3.79	±0.43	13.89	±1.57	\$646,250	±72,907
Carbon stored in trees	112.87	±12.73	413.84	±46.69	\$19,249,244	±2,171,60

Tree Benefit Estimates: Air Pollution

Abbreviation	Description	Amount (T)	± SE	Value (USD)	± SE
CO	Carbon Monoxide removed annually	1.36	±0.15	\$420	±47
NO ₂	Nitrogen Dioxide removed annually	12.75	±1.44	\$1,530	±173
O ₃	Ozone removed annually	12.75	±1.44	\$1,530	±173
SO ₂	Sulfur Dioxide removed annually	3.87	±0.44	\$63	±7

6 Value depicted as mean estimate, with 95% confidence interval of 39.04-48.96%.

7 Assumes a sequestration rate of 28,498 lbs. CO₂/acre/year. Source: i-Tree Canopy v.71.

8 Value depicted as mean estimate assuming a storage amount of 21,940 MT of Carbon, or 80,446 MT of CO₂, per mi² and rounded.

Abbreviation	Description	Amount (T)	± SE	Value (USD)	± SE
PM2.5	Particulate Matter less than 2.5 microns removed annually	4.57	±0.52	\$112,510	±12,693
PM10	Particulate Matter greater than 2.5 microns and less than 10 microns removed annually	67	±2.90	\$35,561	±4,012
Total		133.12	±15.02	\$182,677	±20,609

Tree Benefit Estimates: Hydrological

Abbreviation	Description	Amount (Mgal)	± SE	Value (USD)	± SE
AVRO	Avoided Runoff	54.19	±6.11	\$484,239	±54,630
E	Evaporation	392.58	±44.29	N/A	N/A
I	Interception	395.86	±44.66	N/A	N/A
T	Transpiration	806.74	±91.01	N/A	N/A
PE	Potential Evaporation	1,258.83	±142.01	N/A	N/A
PET	Potential Evapotranspiration	1,092.90	±123.30	N/A	N/A

Considerations

This carbon sequestration analysis represents a high-level estimate of annual land carbon sequestration in Shoreline. Data limitations and other considerations include:

- **Omission of non-tree vegetation:** This approach assumes that non-tree vegetation does not sequester carbon, which is not the case. This analysis does not include carbon benefits from non-tree vegetation such as agriculture, pasture, and shrubs.
- **Tree generalization:** This approach does not explicitly differentiate between tree types, but assumes that all trees sequester an average, representative amount of carbon every year.
- **Statistical sampling:** This approach extrapolates a statistical sampling of an area, rather than analyze the area in its entirety, which inevitably results in some level of statistical uncertainty and imprecision.

Methodology

i-Tree Canopy (version 7.1) estimates tree cover and tree benefits for a given area with a random sampling process to easily classify ground cover types. For this study, Cascadia used ground cover types “Tree” and “Non-Tree.” We selected the City of Shoreline’s boundaries from the pre-existing geographic boundaries in the program. The program randomly sampled 100 data points across the two ground cover types to estimate sequestration benefits. The following figures serve to visualize the study’s methodology.

- **Figure 1:** Selected city boundaries for the Shoreline study using pre-defined U.S. Census Places outlines.
- **Figure 2:** Estimated tree canopy cover on Shoreline in 2021, using random sampling from the i-Tree Canopy software with 100 data points classified as Tree or Non-Tree cover.
- **Figure 3:** Selected project location and sequestration benefits for the Shoreline study. The Shoreline study used the King County pre-set feature with both rural and urban land chosen. The air pollution benefits are shown in terms of removal rate of each pollutant.
- **Figure 4:** Example of tree cover area in the random sampling classification exercise.
- **Figure 5:** Example of non-tree area in the random sampling classification exercise.

Figure 1. Selected city boundaries for the Shoreline study using pre-defined U.S. Census Places outlines.

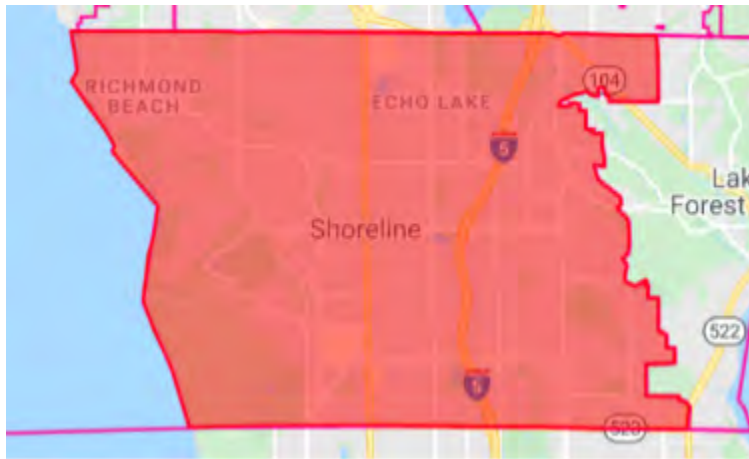


Figure 2. Estimated tree canopy cover in Shoreline in 2021, using random sampling from the i-Tree Canopy software with 100 data points classified as Tree or Non-Tree cover



Figure 3. Selected project location and sequestration benefits for the Shoreline study. The Shoreline study used the King County pre-set feature with both rural and urban land chosen. The air pollution benefits are shown in terms of removal rate of each pollutant.

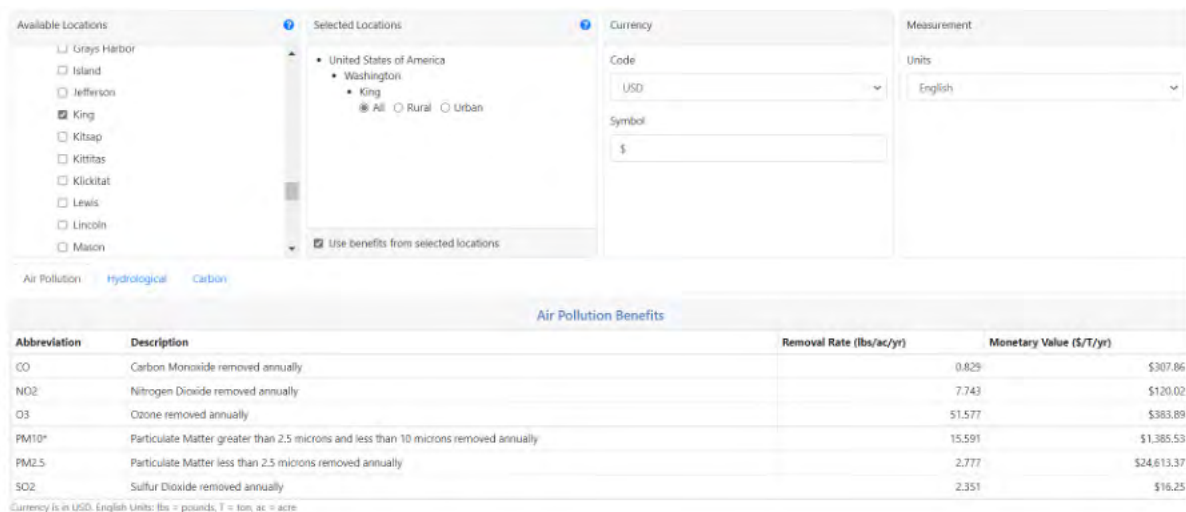


Figure 4. Example of tree cover area in the random sampling classification exercise.



Figure 5. Example of non-tree area in the random sampling classification exercise.



Appendix: Sampled Coordinates

ID	Class	Latitude	Longitude
1	Non-Tree	47.75227	-122.35110
2	Non-Tree	47.75443	-122.32719
3	Non-Tree	47.76202	-122.34578
4	Non-Tree	47.76230	-122.37907
5	Tree	47.76939	-122.34754
6	Tree	47.75256	-122.37072
7	Non-Tree	47.75494	-122.35635
8	Non-Tree	47.75775	-122.34500
9	Non-Tree	47.75399	-122.31516
10	Non-Tree	47.73477	-122.30868
11	Non-Tree	47.77037	-122.34168
12	Non-Tree	47.74797	-122.36024
13	Tree	47.75686	-122.36541
14	Tree	47.76939	-122.33628
15	Non-Tree	47.75403	-122.30937
16	Non-Tree	47.77629	-122.34618
17	Non-Tree	47.74677	-122.37586
18	Tree	47.73932	-122.36659
19	Non-Tree	47.74403	-122.30368
20	Tree	47.75890	-122.36872
21	Tree	47.75886	-122.35052
22	Non-Tree	47.76919	-122.34571
23	Non-Tree	47.73637	-122.29924
24	Tree	47.74524	-122.31104

ID	Class	Latitude	Longitude
25	Tree	47.76984	-122.31888
26	Tree	47.74830	-122.31458
27	Tree	47.76621	-122.38582
28	Non-Tree	47.74105	-122.29642
29	Non-Tree	47.75027	-122.36719
30	Tree	47.76774	-122.35119
31	Non-Tree	47.76735	-122.32040
32	Non-Tree	47.76307	-122.34601
33	Tree	47.76838	-122.34161
34	Non-Tree	47.77377	-122.33689
35	Tree	47.77538	-122.37145
36	Non-Tree	47.76309	-122.31485
37	Tree	47.76535	-122.32359
38	Tree	47.75583	-122.36305
39	Non-Tree	47.76835	-122.31865
40	Non-Tree	47.75427	-122.32656
41	Non-Tree	47.73510	-122.29974
42	Tree	47.76821	-122.32923
43	Tree	47.76691	-122.38668
44	Tree	47.74570	-122.31391
45	Non-Tree	47.76411	-122.33661
46	Non-Tree	47.75433	-122.37608
47	Non-Tree	47.73858	-122.36341
48	Tree	47.77042	-122.29971
49	Tree	47.73922	-122.32178

ID	Class	Latitude	Longitude
50	Non-Tree	47.75946	-122.31160
51	Tree	47.76812	-122.32809
52	Non-Tree	47.74879	-122.30346
53	Tree	47.73963	-122.31777
54	Non-Tree	47.74421	-122.32513
55	Non-Tree	47.75509	-122.31918
56	Tree	47.74099	-122.35558
57	Non-Tree	47.76183	-122.33812
58	Tree	47.73673	-122.29528
59	Tree	47.76844	-122.35633
60	Tree	47.73631	-122.35552
61	Tree	47.74690	-122.29771
62	Tree	47.74663	-122.32337
63	Non-Tree	47.74999	-122.31822
64	Tree	47.74543	-122.35559
65	Non-Tree	47.77240	-122.39368
66	Tree	47.76966	-122.31415
67	Non-Tree	47.77181	-122.34855
68	Non-Tree	47.74847	-122.33404
69	Tree	47.75096	-122.37087
70	Tree	47.74439	-122.29867
71	Tree	47.77443	-122.36146
72	Tree	47.77371	-122.32364
73	Non-Tree	47.76509	-122.33062
74	Tree	47.73739	-122.33188
75	Non-Tree	47.75615	-122.37473

ID	Class	Latitude	Longitude
76	Tree	47.73656	-122.30615
77	Non-Tree	47.76401	-122.32806
78	Non-Tree	47.73490	-122.33761
79	Non-Tree	47.73462	-122.31469
80	Non-Tree	47.74428	-122.34125
81	Non-Tree	47.77384	-122.33905
82	Non-Tree	47.73923	-122.34387
83	Tree	47.76123	-122.36061
84	Tree	47.74340	-122.37836
85	Tree	47.75484	-122.35869
86	Tree	47.74572	-122.31141
87	Non-Tree	47.74814	-122.33546
88	Non-Tree	47.75756	-122.35650
89	Tree	47.74638	-122.29862
90	Tree	47.74076	-122.35855
91	Non-Tree	47.73948	-122.31915
92	Non-Tree	47.75225	-122.31188
93	Tree	47.76907	-122.35208
94	Non-Tree	47.77778	-122.35142
95	Non-Tree	47.73602	-122.29411
96	Non-Tree	47.77588	-122.38189
97	Non-Tree	47.74387	-122.31526
98	Non-Tree	47.77176	-122.38827
99	Non-Tree	47.75181	-122.36816
100	Non-Tree	47.77053	-122.32272

APPENDIX E: WEDGE ANALYSIS

Forecast Results

Cascadia completed a customized “wedge analysis” model that forecasts anticipated future GHG emissions and depicts emissions reduction scenarios for the Shoreline community. This wedge estimated business-as-usual (BAU) and adjusted business-as-usual (ABAU) scenarios. To provide context for selecting GHG emissions reduction targets, Cascadia forecasted two future GHG emissions scenarios, described in detail below and presented in **Figure 1**. Key takeaways include:

- Without federal, state, or local climate action, Shoreline’s total GHG emissions are expected to **increase** by 45% from 2019 to 2050.
- When considering the anticipated impacts of state and federal policies, Shoreline’s total GHG emissions are expected to **decrease** overall by 42% from 2019 to 2050.

Figure 1. Shoreline BAU and ABAU Emissions Forecast through 2050 (in thousands of MT CO₂e).

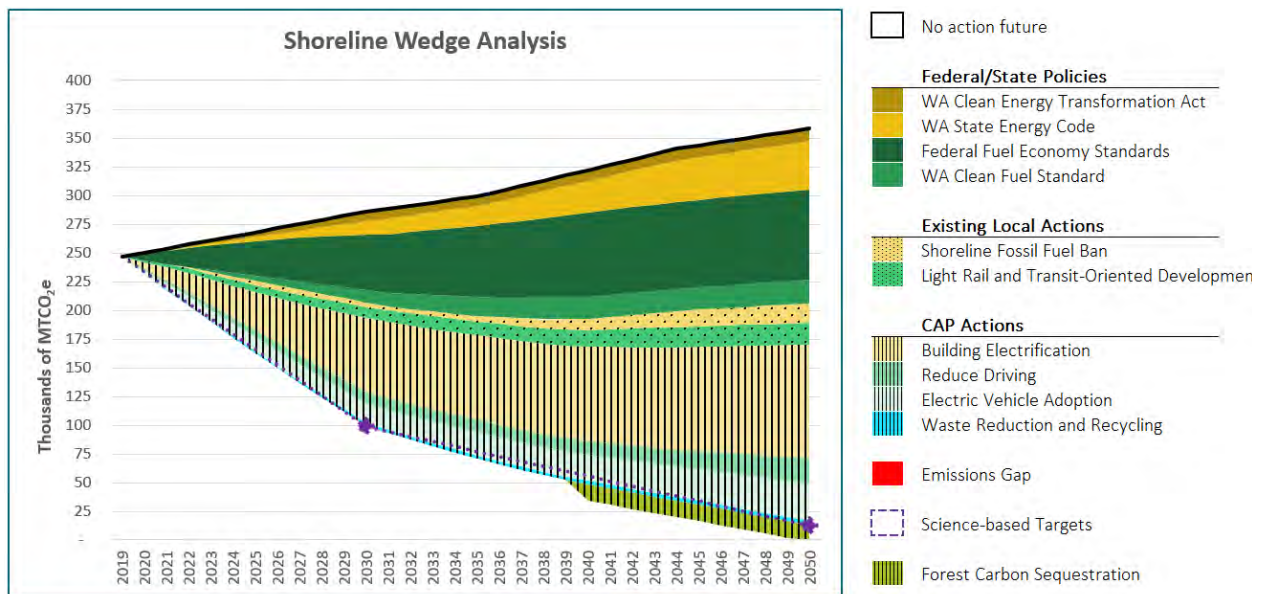


Table 1. Summary of emissions forecast estimates (in MT CO₂e).

Description	2019	2030	2040	2050
Business-as-usual (BAU) emissions – emissions forecast based on Shoreline’s 2019 GHG emissions profile, assuming no climate action (programs, policies, standards) at the local, state, or federal level.	246,579	285,658	322,052	358,350
Impact of Clean Energy Transformation Act (CETA) – see Table 3 .	-	-7,925	-9,413	-10,910

Description	2019	2030	2040	2050
Impact of Washington State Energy Code – see Table 3 .	-	-12,166	-27,660	-42,115
Impact of Corporate Average Fuel Economy (CAFE) standards – see Table 3 .	-	-48,051	-73,392	-78,994
Impact of Washington Clean Fuel Standard – see Table 3 .	-	-10,644	-18,817	-20,253
Adjusted business-as-usual (ABAU) emissions – adjusted BAU forecast to account for the impacts of adopted federal and state policies (still assuming no climate action at the local level).	246,579	206,873	192,770	206,078
Difference between BAU and ABAU emissions	-	78,785	129,282	152,272
Existing action emissions – expanded scenario that accounts for the impacts of existing climate action at the local level, in addition to adopted federal and state policies.	-	193,170	168,279	170,407
CAP action emissions – expanded scenario that accounts for the impacts of proposed future climate actions to be included in the 2022 Shoreline CAP update, in addition to adopted federal and state policies and existing action emission reduction.	-	99,347	48,443	12,966

Forecast Growth Rates

The forecast uses the projected changes in demographics in Table 2 to approximate growth in activity associated GHG emissions over time:

- The number of residential housing units in Shoreline (Housing Units)
- The number of people who live in Shoreline (Population)
- The number of people who work in Shoreline (Employment)
- The number of people who live and/or work in Shoreline (Service Population)

Table 2. Projected changes in Shoreline’s demographics*

	2019	2030	2040	2050
Housing Units	23,953	26,717	33,006	39,378
Population	56,370	60,650	65,020	69,320
Employment	16,932	22,250	24,850	27,410
Service Population	73,302	82,900	89,870	96,730

*Data Sources: Puget Sound Regional Council Growth Projections

The “adjusted business-as-usual” (ABAU) forecast adjusts the BAU forecast to account for the impacts of adopted federal and state policies (still assuming no climate action at the local level). The emissions reductions associated with these policies count toward Shoreline’s overall emissions reductions and progress towards targets. **Table 3** summarizes four key policies reflected in the ABAU forecast.

Table 3. Key federal and state policies reflected in ABAU forecast.

Policy	Level	Key Assumptions in Forecast/Model
<p>Clean Energy Transformation Act (CETA)</p> <p>Requires all electric utilities to eliminate coal-fired electricity from their state portfolios by 2025 and GHG neutral by 2030.</p>	State	<ul style="list-style-type: none"> Adjust the Puget Sound Energy (PSE) emissions factor used to calculate MT CO₂e per kWh consumed to reflect the following adjustments in PSE’s energy mix: (1) coal decreases linearly to zero from 2019 to 2025; (2) other fossil fuels decrease linearly to zero from 2019 to 2030. Assumes electricity will be greenhouse gas neutral (electricity emissions factor equals zero) in 2030 and beyond with a straight line emissions factor reduction from 2019 to 2030.
<p>State Energy Codes</p> <p>Requires adoption of state energy codes (new buildings) from 2013 through 2031 that incrementally move towards achieving a 70% reduction in annual net energy consumption (compared to a 2006 baseline).</p>	State	<ul style="list-style-type: none"> Reduce projected BAU electricity and natural gas consumption associated with new buildings linearly up to 70% by 2031. Assume no energy consumption reductions in existing buildings.
<p>Clean Fuel Standard</p> <p>Washington state’s Clean Fuel Standard (HB 1091) requires a 20% reduction in the carbon intensity of transportation fuels by 2038, compared to a 2017 baseline, beginning January 1, 2023.</p>	State	<ul style="list-style-type: none"> Reduce gasoline and diesel emissions factor linearly by 20% from 2023 to 2038.
<p>Corporate Average Fuel Economy (CAFE) standards</p> <p>National Highway Traffic Safety Administration standards regulate light- and heavy-duty vehicle fuel economy standards (how many miles the vehicle can drive per gallon of fuel).</p>	Federal	<ul style="list-style-type: none"> Assume emissions factor (MT CO₂e per VMT) for total vehicles on the road will decrease incrementally over time in accordance with U.S. Environmental Protection Agency’s (EPA) OMEGA 1.4.1 Model to determine the impact of CAFE standards for the 2017-2025 model years.

Assumptions

Action	Key Assumptions in Forecast/Model
Shoreline Building Code	Shoreline's updated building code bans fossil fuel in new commercial/large multifamily space and water heating, plus increased efficiency measures. The ban goes into effect July 2022.
Light Rail and Transit Oriented Development	This model used the transportation demand model developed for Shoreline's Transportation Master Plan update to model VMT and Mode Share estimates. This model was generated from PSRC's regional transportation forecast model that accounts for the light rail coming online, overall transit and transportation system improvements, and the impact of transportation-oriented development forecasted for Shoreline. Assume zero emissions from light rail (carbon free energy).
Building Electrification	Assumes an 60% reduction in natural gas use and 100% reduction in heating oil use by 2030, and a 98% reduction of natural gas use by 2050.
Reduce Driving	This scenario assumes a 20% decrease in per capita VMT by 2030 and 50% by 2050 from a 2019 baseline (an additional 14% below the ABAU in 2030 and an additional 23% reduction beyond ABAU in 2050).
Electric Vehicle Adoption	Assumes that 30% of Passenger/Light Duty VMT and 1% of Heavy Duty is from Electric Vehicles by 2030, and 95% light duty/passenger VMT and 20% of heavy duty VMT is electric by 2050.
Waste Reduction/ Recycling	Assumes a BAU reduction of solid waste 70% by 2030 (30% of that diverted to compost) and solid waste reduction of 80% below BAU by 2030.
Forest Carbon Sequestration	Assumes a BAU increase of carbon sequestration by 5% by 2050 (from the City's 2019 i-Tree canopy analysis).

Shoreline CAP: Detailed Cost Analysis

Workbook last updated:

8/26/2022

Workbook Overview

This workbook conducts a cost analysis of a shortlist of proposed actions for the Shoreline CAP update.

Tab Name	Description
Summary	This tab summarizes outcomes from the detailed cost analysis.
Key Assumptions	This tab summarizes key assumptions and inputs for the cost analysis.
Modeled Costs	This tab estimates costs of implementing 10 actions from the transportation and mobility, buildings and energy, and community resilience and preparedness focus areas.
Bibliography	This tab contains information about sources referenced in this workbook.

Color Coding

User inputs
Calculation

0.01 Reference cell (do not change)

Contact Information

Questions about this workbook can be directed to:

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Summary

This tab summarizes outcomes from the detailed cost analysis.

Sector	ID	Action Name	Description	Negative (green) is net cost savings.	
				NPV Costs to City	NPV Costs to Community
Transportation and Mobility	TM 2.6	Install public charging stations in strategic locations	Expand the public EV charging network by assessing gaps in infrastructure, identifying opportunities to increase grid capacity for increased charging, and supporting installation of charging stations for public use on business, institutional, city and utility property in key areas. Install charging stations for public use at all City facilities open to the public such as parks and recreation centers.	\$718,664	(\$18,428)
Transportation and Mobility	TM 1.7	Reduce commute trips by business employees	Enhance and expand the City's Commute Trip Reduction (CTR) Program to encourage CTR across the city for major employers and within the City for internal employees. Possible strategies could include ridesharing programs, carpool matching, telecommuting, and employer-sponsored vanpools.	\$7,838,140	(\$203,074)
Transportation and Mobility	TM 1.4	Reduce demand for parking	Continue to study and implement policies that reduce demand for parking in mixed-use and commercial centers and encourage transportation modes other than driving. Options include regional road usage fees, employee workplace parking or parking cash outs as part of CTR programs, residential parking, and public parking in mixed use and commercial centers. Explore both regional and local solutions.	\$200,720	\$447,074
Transportation and Mobility	TM 1.1	Increase density and walkability	Study and implement land use policies to increase density, increase the variety of land uses within neighborhoods, increase walkability, and encourage business development so that basic and desirable amenities are accessible by walking from all neighborhoods.	\$115,426	(\$1,777,519)
Transportation and Mobility	TM 1.8	Create mobility hubs	Create shared-use mobility hubs to enhance cross-community travel by transit, rideshare, EV, bikeshare, e-bikeshare, e-scootershare, and any means other than driving a traditional gas/diesel vehicle alone.	\$6,095,586	(\$355,504)
Transportation and Mobility	TM 1.2	Increase street and pathway connectivity	Where it supports the City's connectivity objectives, increase street connectivity. Identify funding and acquire mid-block right-of-way and street connections to increase multimodal connectivity and encourage Transit Oriented Development, especially in the King County Candidate Countywide Centers (148th St. Station Area, 185th St. Station Area, Shoreline Place, and Town Center).	\$1,127,712	(\$888,760)
Buildings & Energy	BE 1.3	Provide a home electrification program	In collaboration with utilities and local jurisdictions, develop a residential home energy program to provide education, technical assistance, and financial assistance to replace gas and oil heating systems with electric heat pumps, improve home efficiency, and install renewable energy systems. Options include a rebate program, bulk-purchase retrofit campaign, or other financing mechanism. Prioritize low-income households for assistance and incentives.	\$1,499,701	\$98,182,777
Buildings & Energy	BE 1.6	Support electrification of commercial and multifamily buildings	Promote existing financing mechanisms and incentives such as C-PACER to convert gas and oil heating systems at commercial and multifamily buildings to electric space and water heating at low or no-cost. Partner with utilities and local jurisdictions to provide technical assistance to building owners or develop new incentives as needed with a focus on low and middle-income residential buildings. Pair electrification with efficiency retrofits and renewable energy installations.	\$437,791	(\$599,054)
Buildings & Energy	BE 1.7	Require large buildings to reduce emissions	Study and implement carbon-based building performance standards to reduce fossil-fuel use in commercial and multi-family buildings larger than 20,000 square feet that complement the benchmarking and performance requirements under the State Clean Buildings Act. Provide technical assistance to building operators on compliance with these and Clean Buildings Act standards and on accessing available state and utility incentives	\$138,499	(\$49,390)
Community Resilience & Preparedness	CRP 1.3	Climate resilient urban design standards	Review and update urban design standards to increase citywide resilience to climate change. For example, modify design standards to encourage greater tree retention and incorporation of more trees, green stormwater infrastructure and other nature-based practices.	\$10,308	\$0
Total				\$18,182,549	\$94,738,123
Average per year				\$2,120,927	\$11,094,654
Average FTE requirement				0.24	

Key Assumptions

This tab summarizes key assumptions and inputs for the cost analysis.

Overarching Assumptions

Item	#	Units	Source
Discount rate		3%	2050 Inflation Prediction Future Inflation Calcula
Average rate of inflation		2%	

City Cost Assumptions

Item	#	Units	Source
Staff labor cost		74,704 \$/year	
Cost amount to trigger financing		\$1,000,000	
Staff hours per year		2,080 hours	

Community Cost Assumptions

Cost amount to trigger financing		\$282,473,173	https://www.census.gov/quickfacts/fact/table/sh
Average household size		2.53	

Item	Units	Source
	10-yr average	
Population change	0.7%	%
Residents	59,898	# residents
Households	26,214	# households

Jobs	21,161	# jobs	
Businesses	2,033	# businesses	Chamber of Commerce Shoreline, WA - Chamber
Electricity cost - SCL	0.121	\$/kWh	Seattle City Light Residential Rates
Electricity cost - SCL	\$35.43	\$/MMBtu	Calculation
<i>Change in cost</i>		%	EIA_Electricity_NG_Projections_2020-2050
Natural gas cost - PSE	\$0.50	\$/therm	EIA_Electricity_NG_Projections_2020-2050
<i>Change in cost</i>		%	EIA_Electricity_NG_Projections_2020-2050
Natural gas cost	\$4.97	\$/MMBTU	Calculation
Gasoline cost	\$4.57	\$/gallon	https://gasprices.aaa.com/?state=WA
Diesel cost	\$4.18	\$/gallon	https://gasprices.aaa.com/?state=WA
Average passenger vehicle mpg	24.2	mpg	https://afdc.energy.gov/data/10310
Average passenger EV mpg	100	mpge	https://www.energysage.com/electric-vehicles/b/
Average passenger EV miles/kWh	2.97	miles/kWh	https://www.inchcalculator.com/convert/mile-pe
Average light/heavy vehicle mpg	17.50	mpg	https://afdc.energy.gov/data/10310
MMBtu to kwh	293	kwh	
MMBtu to therm	10	therm	
Average electricity use	71	MMBTU/household	
Average natural gas use	80	MMBTU/household	
Total energy use	151	MMBTU/household	
Passenger VMT	2,373	VMT per capita	Calculated based on Shoreline's forecasted VMT/s
Light/heavy VMT	1,531	VMT per capita	Calculated based on Shoreline's forecasted VMT/s
Commercial sector consumption	\$832	Mmbtu/business	Calculated using 2019 commercial consumption fr
Average energy cost	\$2,593	\$/household	
Average energy cost	\$17	\$/MMBtu	
# of EVs in King County	50,513	EVs	Electric Vehicles By County Data.WA State of W
Shoreline:King County pop'n	0.03	residents	US Census
# of EVs in Shoreline	1,359	EVs	

of passenger vehicles in Shoreline

52,429

 vehicles

<https://www.census.gov/quickfacts/fact/table/re>

Total natural gas usage	4,838,754	therms
60% reduction	1,935,502	
Difference from 2019 to 2030	2,903,252	
Number of commercial customers using	563	customers
Therms/comm customer	8,595	therms
Commercial customers who need to switch	338	
Number of commercial customers in Shoreline	48	
% of commercial accounts that would need to switch	8.57%	

2019 GHG inventory

2019 GHG inventory

Modeled Costs

This tab estimates costs of implementing 10 actions from the transportation and mobility, buildings and energy, and community resilience and preparedness focus areas.

ID	Description	*negative values are cost savings										Expand column groupings above if already budgeted										Expand column groupings above if already budgeted									
		Action Information			Outputs			City Inputs				City References			Community Inputs			Community References													
		NPV Costs to City	NPV Costs to Community	FTE	Years of Implementation	Start year	End Year	One Time Costs	Annual Costs	One Time Savings	Annual Savings	City Cost Source(s)	City Cost Assumptions/Comments	Years of Implementation	Start year	End Year	One Time Costs	Annual Costs	One Time Savings	Annual Savings	Community Cost Source(s)	Community Cost Assumptions/Comments									
TM 2.6	Expand the public EV charging network by assessing gaps in infrastructure, identifying opportunities to increase grid capacity for increased charging, and supporting installation of charging stations for public use on business, institutional, city and utility property in key areas. Install charging stations for public use at all city facilities open to the public such as parks and recreation centers.	\$718,664	(\$18,428)	0.04	7	1	7	\$610,775	\$17,479		- La Mesa CAP Implementation, measure 75, pg. 32 (estimated hours for barriers study + staff time to support education) - CARB Technical Analysis (pg. 18 - cost of level 2 charger installation) - Alternative fuels data center	- 100 hours of staff time for assessing gaps in Infrastructure and identifying opportunities (one-time cost) (source: La Mesa) - 200 hours of staff time to support, coordinate, and oversee installation (one-time cost) - 75 hours per year of staff time per year to support education and coordination (annual cost) (source: La Mesa) - Installation of 5 level 2 chargers at 6 locations (2 rec centers and 4 parks/night of way spots) - \$20,000 one-time cost of installation per charger (CARB) - City pays for kWh for 50% of EVs charging 5% of the time at city stations annually (see community cost assumptions for more details) - \$400/station annual cost of charging station maintenance (Alternative fuels data center)	8	3	10						\$2,785	- 2022 Kelley Blue Book Article: "How much does it cost to charge an electric car?" - Charge Hub	- City chargers offer free charging (based on current chargers at City Hall - source: Charge Hub), so assumed that community would receive cost savings from 50% of EVs charging 5% of the time at City stations (article cited says 90% of charging is done at home) - kWh use determined by dividing per capita VMT by 3.5 kWh (article cited says 3-4 kWh/mile) - Community would begin to benefit from additional charging stations beginning in year 3								
TM 1.7	Enhance and expand the City's Commute Trip Reduction (CTR) Program to encourage CTR across the city for major employers and within the City for internal employees. Possible strategies could include ridesharing programs, carpool matching, telecommuting, and employer-sponsored vanpools.	\$7,838,140	(\$203,074)	0.05	10	1	10		\$915,134		- Passport zone cost estimator - Bike Lockers - Downtown Seattle Access Parking Cash Out Experience	- Current program temp staff time (\$16,000/year) will be doubled to implement expanded program (City) - Minimal FTE time (2 hours/week) to oversee/coordinate temp and program implementation - City will subsidize transit pass plans for 20% of employees in Shoreline - Transit pass subsidized cost of \$185.04/employee (Passport zone cost estimator) - Annual mini-grants of \$10,000 each for 10 businesses (for \$75/month/employee cashout incentives (~1/2 of what the FlexPark program found effective), assuming the other half would be covered by the employer, equals about 10 additional parking spots/year, or to cover installation of 5 outdoor bike lockers) (Bike lockers, downtown Seattle cash out experience)	9	2	10						\$26,864	- Pleasanton impact analysis (Action P9: bicycle rack incentive program)	- Cash out program / bike parking grants will result in cost savings from 0.1% VMT reduction (adapted from Pleasanton impact analysis) - Community would start to benefit from CTR program in year 2								
TM 1.4	Continue to study and implement policies that reduce demand for parking in mixed-use and commercial centers and encourage transportation modes other than driving. Options include regional road usage fees, employee workplace parking or parking cash-outs as part of CTR programs, residential parking, and public parking in mixed use and commercial centers. Explore both regional and local solutions.	\$200,720	\$447,074	0.63	10	1	10	\$37,352	\$25,000	\$52,411	- Light Rail Station Subareas Parking Study 2020 Update - Shoreline RPZ guidelines	- 0.5 FTE of staff time for studying and implementing (one-time cost) - Average of 0.5 and 0.75 FTE annual staff time (City) - \$25,000 budgeted annually to continue to obtain baseline parking utilization information, identify current and anticipated future on-street parking capacity challenges, and discuss tools to manage parking now and into the future within the light rail subareas (Light rail parking study) - Annual revenue to the City of \$17.50 per new pass purchased (same as current cost, RPZ guidelines) and assumed 5% of Shoreline's population purchases residential parking zone (RPZ) permits - Costs and cost savings associated with installing meters will take place in 10+ years (and are therefore not in this analysis)	10	1	10					\$52,411	- Residential Parking Zone Permit Application	- Annual cost to community of \$17.50/pass for new parking passes (same as current cost, Shoreline RPZ guidelines) and assumed 5% of Shoreline's population purchases RPZ permits - Costs of metered parking will take place in 10+ years (and are therefore not in this analysis)									
TM 1.1	Study and implement land use policies to increase density, increase the variety of land uses within neighborhoods, increase walkability, and encourage business development so that basic and desirable amenities are accessible by walking from all neighborhoods.	\$115,426	(\$1,777,519)	0.12	10	1	10	\$40,000			- Dublin CAP, Appendix C (pg. 21) - Consultant estimate	- 250 hours per year of staff time for ongoing implementation - \$40,000 for initial consultant and/or staff time to study and develop new policies (Dublin)	8	3	10					\$268,640	- Pleasanton impact analysis (Action E6: Housing Element)	- Cost savings equivalent to average passenger VMT reduction of 1% per year (adapted from Pleasanton impact analysis) - Cost savings to community would begin in year 3									
TM 1.8	Create shared-use mobility hubs to enhance cross-community travel by transit, rideshare, EV, bikeshare, e-bikeshare, e-scootshare, and any means other than driving a traditional gas/diesel vehicle alone.	\$6,095,586	(\$355,504)	0.15	10	1	10	\$6,000,000			- 2021 Bay Area (MTC) study (cited by City)	- One-time costs of \$2 million per regional mobility hub; assumes City will pilot 3 regional hubs (City) - 6 hours per week of staff time to oversee maintenance and coordination of hubs	8	3	10					\$53,728	- Pleasanton impact analysis (Actions P10: Increase transit ridership and B3: Bicycle & Pedestrian Master Plan and Trails Master Plan)	- Cost savings equivalent to average of 0.2% VMT reduction annually (adapted from Pleasanton impact analysis) - Cost savings to community would begin in year 3									
TM 1.2	Where it supports the City's connectivity objectives, increase street connectivity. Identify funding and acquire mid-block right-of-way and street connections to increase multimodal connectivity and encourage Transit Oriented Development, especially in the King County Candidate Countywide Centers (148th St. Station Area, 185th St. Station Area, Shoreline Place, and Town Center).	\$1,127,712	(\$888,760)	0.50	10	1	10	\$7,470	\$94,000		- SDOT Planning Level Project Estimates	- \$38,500 to stripe a new crosswalk and build a curb ramp on each side to meet standards. - Acquiring of 2 lights-of-way per year - Annual restriping of 2 rights-of-way, at \$8,500 each - Initial staff time of 0.1 FTE to acquire funding and set up program - Annual staff time of 0.05 to monitor and acquire new rights-of-way - \$12,000 initial program set-up cost to the City (total cost will be shared with other partner utilities/jurisdictions) (Dublin CAP)	8	3	10					\$134,320	- Pleasanton impact analysis (Action P10: Increase Transit Ridership)	- Cost savings equivalent to average passenger VMT reduction of 0.5% per year (adapted from Pleasanton impact analysis) - Cost savings to community would begin in year 3									
BE 1.3	In collaboration with utilities and local jurisdictions, develop a residential home energy program to provide education, technical assistance, and financial assistance to replace gas and oil heating systems with electric heat pumps, improve home efficiency, and install renewable energy systems. Options include a rebate program, bulk-purchase retrofit campaign, or other financing mechanism. Prioritize low-income households for assistance and incentives.	\$1,499,701	\$98,182,777	0.38	10	1	10	\$7,000	\$147,000		- Dublin CAP (Appendix C, pg. 8)	- 15 hours per week of staff time for implementation and promotion of program (City) - Annual cost of \$17,000 for program administrator (City) - average incentive of \$6,500 per household that receives financing (City) - The City assumes 1/3 of incentive cost - 1,200 households participate annually, however only 5% (60/year) receive financing	10	1	10					\$11,617,470	- Santa Barbara CAP Table D-1 (p. D-4)	- Cost to utilities of 0.1 FTE of staff time to provide technical assistance (assumed same FTE cost as City) - Cost to install high-level home upgrades of \$10,000 (averaging \$5,000 - \$15,000) minus incentive of \$6,500 for 60 households - Annual energy savings of 15-30% (Santa Barbara CAP) - 1,200 households participate annually, 5% receive funding - the remaining 1,140 pay the full cost of upgrades									
BE 1.6	Promote existing financing mechanisms and incentives such as C-PACER to convert gas and oil heating systems at commercial and multifamily buildings to electric space and water heating at low or no-cost. Partner with utilities and local jurisdictions to provide technical assistance to building owners or develop new incentives as needed with a focus on low and middle-income residential buildings. Pair electrification with efficiency retrofits and renewable energy installations.	\$437,791	(\$599,054)	0.25	10	1	10	\$7,000	\$31,850		- Dublin CAP (Appendix C, pg. 8)	- One-time cost of \$7,000 to develop program (Dublin CAP) - 8% of PSE's commercial customers in Shoreline upgrade annually using C-PACER (Calculation to reach goals) - City provides incentives of \$2,000 per household/business - City covers 1/3 of each incentive - 10 hours per week of ongoing staff time to promote and implement (City estimate)	10	1	10					\$144,771	- Santa Barbara CAP (Table D-1, p. D-4)	- Cost estimate is the value of the high-level costs for energy efficient upgrades in the Santa Barbara CAP (\$5,000 per building) (assumed averaged incentive is \$2,000 per household/business) - 8.5% of multi-family residences / buildings retrofit HVAC/hot water heater annually to reach 60% natural gas reductions by 2030.									
BE 1.7	Study and implement carbon-based building performance standards to reduce fossil-fuel use in commercial and multi-family buildings larger than 20,000 square feet that complement the benchmarking and performance requirements under the State Building Act. Provide technical assistance to building operators on compliance with these and Clean Buildings Act standards and on accessing available state and utility incentives.	\$138,499	(\$49,390)	0.21	10	1	10	\$5,387			- La Mesa CAP, Measure E 1-b (pg.11)	- Annual staff time of 175 hours to implement and enforce standards - One-time staff time of 150 hours to study and develop standards - 5 hours per week of staff time for ongoing technical assistance	10	1	10					\$75,000	- Santa Barbara County Energy CAP (Table D-1, p. D-4) - Dublin CAP (Appendix C, pg. 9) - Nonresidential Building Cost Effectiveness Study Result: Lifecycle Utility Cost Savings, Med Office, Mixed Fuel - EE = \$161,534 over for 30 years = \$5,386 per year	- Annual energy savings of 15-30% (Santa Barbara CAP) - Cost estimate is the net value of the high-level costs for energy efficient upgrades in the Santa Barbara CAP (\$5,000 per building). - 15 large buildings participate annually to reach ~100 by 2030 - Annual utility cost savings of \$5,386/building (Dublin CAP)									
CRP 1.3	Review and update urban design standards to increase citywide resilience to climate change. For example, modify design standards to encourage greater tree retention and incorporation of more trees, green stormwater infrastructure and other nature-based practices.	\$10,308	\$0	0.07	2	1	2				- Estimate from City Staff	- 150 total hours of staff time annually (for two years) to work on code updates	1									No direct or significant financial cost change to community.									