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).

	GHG emissions reduction impact
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).
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

#	Supports public health/ quality of life (QOL)	Creates cost savings for the community/supports affordability	Supports ecosystem health/ the natural environment
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
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**