



# City of Terrace Climate Action Plan

December 2023

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We would like to express our appreciation to all the individuals and organizations who participated in the development of the City of Terrace Climate Action Plan. Your contributions have been instrumental in shaping and improving the final Plan. Thank you for your valuable time and commitment to this endeavor.

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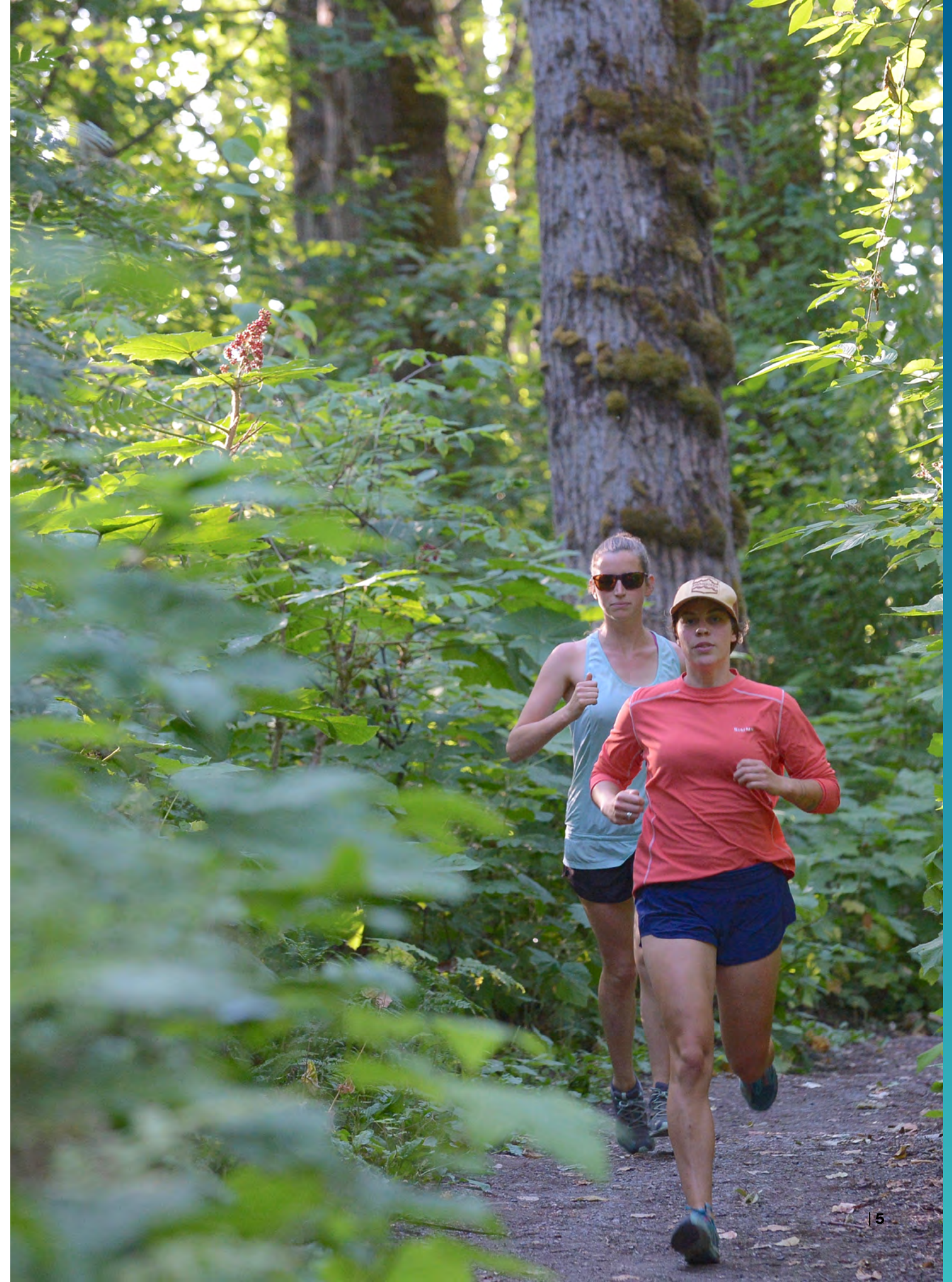
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# Executive Summary

The City of Terrace Climate Action Plan (this Plan) provides a path toward a resilient and low-carbon operations for the City of Terrace (the City). Building from the findings of the *Terrace Climate Projections Report*,<sup>1</sup> this Plan aims to enhance the City of Terrace's ability to adapt to climate-related risks and vulnerabilities. This Plan serves to actively integrate climate change considerations into City processes and decision-making and will support staff and Council to prioritize climate mitigation and adaptation across infrastructure and operational decisions over time. The actions in this Plan create the conditions to foster resilient city operations and infrastructure, incorporate nature-based solutions into City-owned infrastructure, and provide guidance on how to implement proactive measures that will address climate-induced hazards over time.







This Plan's climate hazard risk assessment highlights key climate change impacts to the City, including increased risk of urban flooding, erosion, and landslides on slopes or escarpments due to changing precipitation patterns. It also identifies health risks from summer heatwaves and wildfire smoke, with potential to affect populations experiencing vulnerability and residents' well-being. Over time, the City will face complex demands on resources due to the potential of more frequent emergencies, extended recovery periods, and long-term economic impacts on regional tourism and ecosystems. This plan provides an initial pathway to address these concerns.

Moreover, in line with Terrace's commitment to mitigate climate change, this Plan includes a pathway to reduce greenhouse gas (GHG) emissions in the City. The goal is to achieve

carbon neutrality by 2050, aligning with the provincial CleanBC Roadmap to 2030, Canada's commitment to the Paris Agreement, and the international effort to limit the rise in average global temperatures. Within the City's infrastructure and operations, carbon emissions primarily originate from two sources, the consumption of natural gas in municipal buildings for heating and cooling, and fleet emissions from municipal services. Addressing these sources of emissions is crucial for Terrace's path toward a resilient, low-carbon infrastructure.

This Plan focuses on six key action areas: **Municipal Leadership, Buildings and Infrastructure, Emergency Management and Human Health, Land Use and Planning, Transportation and Mobility, and Waste Management.** Each area contains specific goals and actions to continue the City's efforts into becoming a resilient and low-carbon organization. A summary of the action areas goals is presented below.



AREA OF ACTION	GOALS
 <p><b>Municipal Leadership</b></p>	<ol style="list-style-type: none"> <li>1. Embed climate change considerations into City processes and decision-making.</li> <li>2. Foster increased awareness of climate change and greenhouse gas emissions and incentivize community climate action.</li> </ol>
 <p><b>Buildings and Infrastructure</b></p>	<ol style="list-style-type: none"> <li>3. Enhance building and infrastructure resilience to climate change by integrating climate change considerations into infrastructure planning and maintenance.</li> <li>4. Increase the efficiency and reduce energy consumption of new and existing City buildings.</li> </ol>
 <p><b>Emergency Management and Human Health</b></p>	<ol style="list-style-type: none"> <li>5. Increase awareness and educate residents about climate-related health risks and actions to mitigate impacts on health and wellbeing.</li> <li>6. Enhance capacity to monitor and respond to flood-related impacts on municipal infrastructure and services.</li> <li>7. Increase understanding and awareness of local health related impacts from extreme heat and wildfire smoke and develop key response plans.</li> </ol>
 <p><b>Land use and planning</b></p>	<ol style="list-style-type: none"> <li>8. Consider climate change risks and vulnerability in land use planning and development.</li> <li>9. Reduce exposure to flood risk and support adaptation and resilience in flood risk exposed areas through zoning and regulations.</li> </ol>
 <p><b>Transportation and mobility</b></p>	<ol style="list-style-type: none"> <li>10. Reduce emissions from the City's fleet vehicles.</li> <li>11. Encourage and support sustainable commuting.</li> </ol>
 <p><b>Waste management</b></p>	<ol style="list-style-type: none"> <li>12. Increase diversion of organic waste and recyclable materials from the landfill.</li> <li>13. Work towards zero waste at City facilities and events.</li> </ol>

<sup>1</sup> *Climate Projections for the City of Terrace* (2022).

# CHAPTER 1

# Climate Change in Terrace

## Context for Climate Action

The City of Terrace (the City) recognizes the importance of preparing for the changing climate, and has made a commitment to increase the City’s resilience to climate change. Climate resilience is the capacity of a community or environment to anticipate and manage climate impacts, minimize their damage, and recover and transform as needed after the initial shock.<sup>2</sup> In Canada, weather-related disaster costs have increased from an average of \$8.3 million per event in the 1970s to an average of \$112 million between 2010–2019.<sup>3</sup> By taking a proactive approach to resilience, the City will reduce these costs, and the human and environmental costs of climate change. The Federation of Canadian Municipalities indicates that investments in community adaptation yield a 6:1 return and recommends an annual municipal investment of 0.2% to 0.3% of GDP for resilience.<sup>4</sup>

Terrace’s recent Climate Projections Report (2022) offers insight into the City’s future and highlights what impacts can be expected from climate change between now and the later part of the 21st century. Following this work, the City has developed this Climate Action Plan (this Plan) to better understand what corporate assets, systems, and groups are at risk, and create a strategy to ensure they are protected and can continue to provide services over time. This Plan includes actions that will help the City prepare for climate change and avoid the social and economic costs of inaction.

In addition, the City is responding to global warming challenges by taking steps to reduce greenhouse gas (GHG) emissions, aligning with the Intergovernmental Panel on Climate Change (IPCC) guidelines and the provincial CleanBC Roadmap to 2030. The IPCC urges the achievement of net-zero global GHG emissions by mid-century to keep global warming within 1.5 °C above pre-industrial levels. To achieve this goal, the CleanBC Roadmap to 2030, aims to reduce provincial emissions by 40% by 2030 from 2007 levels and reach net-zero emissions by 2050. In support of this strategy, this Plan includes a comprehensive corporate GHG emissions reduction strategy to guide and enhance the City’s ongoing efforts.

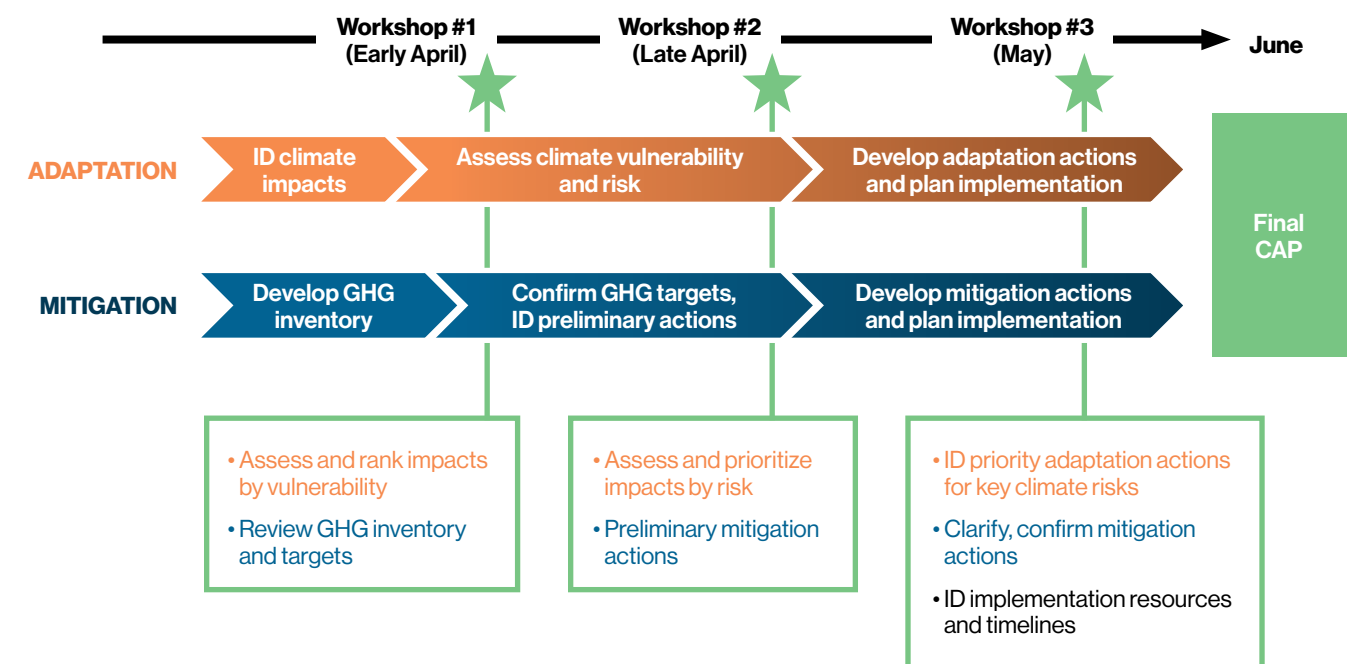


## Climate Action Plan development process

This Plan involved staff from various departments and included a survey of residents to identify areas of concern, vulnerability, and risk. This collaborative approach informed the development of actions aimed at building resilience and reducing GHG emissions from corporate operations. The process of developing this Plan is outlined in the figure below.

“We almost had to move from our house because it was becoming too hot to be in there for our infant and we didn't have air conditioning during the heat dome.”  
—Terrace Resident, Community Survey

FIGURE 1: PLAN DEVELOPMENT PROCESS



<sup>2</sup> United Nations Development Programme. (2023). The Climate Dictionary: An everyday guide to climate change.  
<sup>3</sup> Canadian Climate Institute. (2020). Tip of the Iceberg: Navigating Known and Unknown Costs of Climate Change.  
<sup>4</sup> Federation of Canadian Municipalities. (2020). Investing in Canada’s Future: The Cost of Climate Adaptation at the Local Level.

CHAPTER 2

# Increasing resilience to climate change

## Summary of the risk assessment process

Through a series of workshops, City staff conducted a climate change risk and vulnerability assessment to identify areas where vulnerability to climate is high and the associated risk is significant. The assessment methodology was based on established adaptation planning processes, including the International Council for Local Environmental Initiatives' (ICLEI) 5-milestone process, the International Standards Organization (ISO) risk management standard, and the Provincial framework for climate risk assessment.

The risk assessment began by identifying hazards and associated climate impacts of concern (impact statements), based on the hazards and impacts identified in the Terrace Climate Projections Report (2022) and the outcomes from a community survey conducted in the winter of 2022-2023. Each impact statement was then assessed to determine how vulnerable the community is if the hazard were to occur. The methodology incorporated an examination of the City's adaptive capacity – reflecting the actions the City has already begun to take to enhance its resilience to climate change, including flood risk mitigation strategies and infrastructure upgrades in vulnerable areas. Impacts that the City is most vulnerable to were moved into a risk assessment process which considered the likelihood and consequence of each impact statement. The outcomes of the risk assessment are summarized in Table 1.

**Vulnerability** is the degree of exposure of systems, assets, or groups to climate-related shocks or stresses, their sensitivity to such events, and the City's ability to adapt to each event (adaptive capacity). A system, asset, or group is considered vulnerable if they face exposure to shocks or stresses (e.g., flood plains), exhibits high sensitivity (damage would occur if there was an event), and has limited adaptive capacity (not much that can be done to remove this from harm's way). Moderate and high vulnerability impacts were advanced to the risk assessment stage.

**Risk** is determined by the likelihood of a shock or stress occurring, and the severity of its consequences to systems, assets, or groups. An impact is a high risk when there is a high probability of occurrence, and the event can lead to major or catastrophic consequences. The highest risk impacts pose the greatest threat to the City, and became the focus for action planning.

TABLE 1: SUMMARY OF KEY RISKS AND IMPACTS

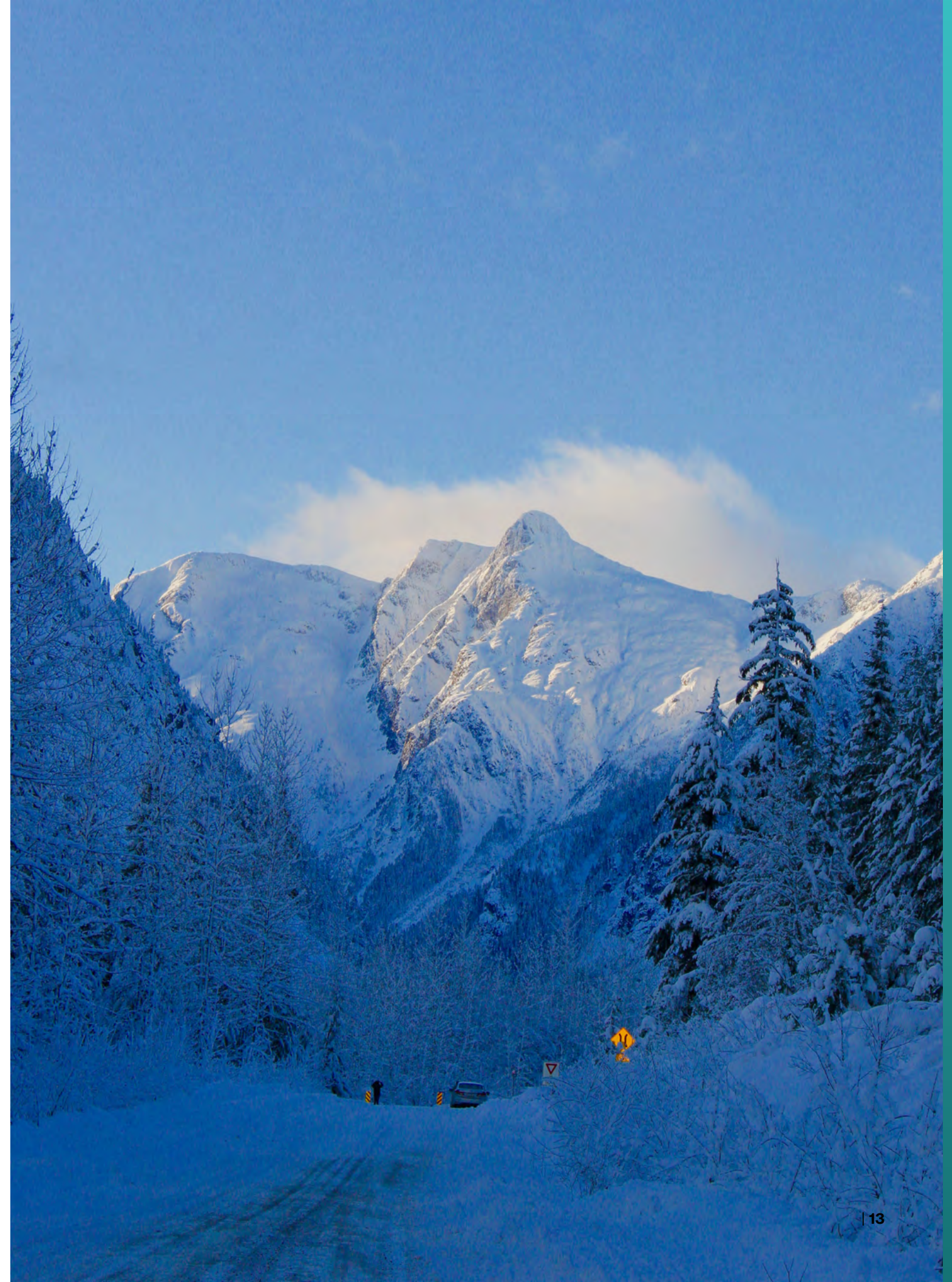
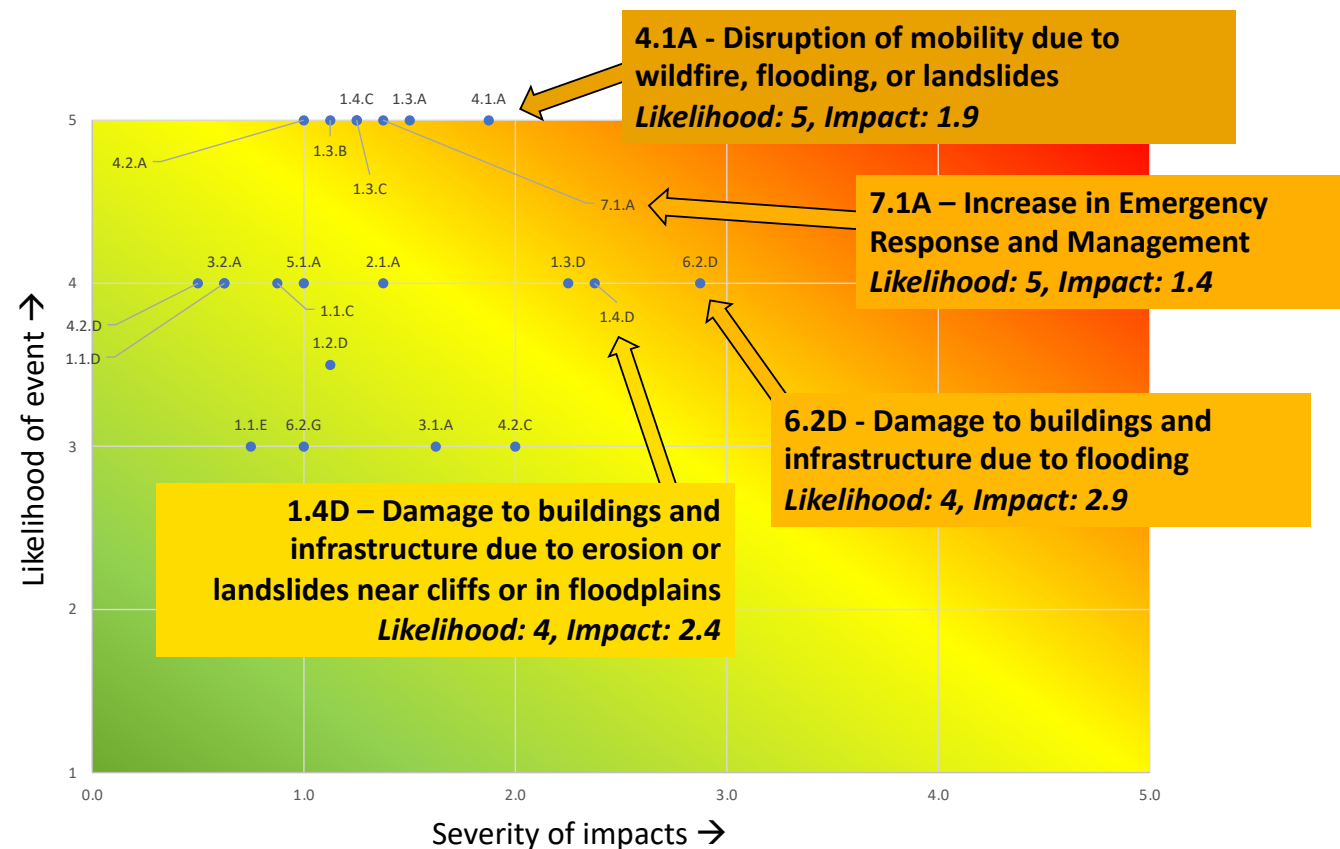
#	Hazard	Impact statement	Likelihood	Consequence	Risk
6.2.D	Flood	Damage to buildings and infrastructure due to flooding	4.0	2.9	12
1.4.D	Precipitation	Damage to buildings and infrastructure due to erosion or landslides near cliffs or in floodplains	4.0	2.4	10
4.1.A	Wildfire, Flooding and Landslides	Disruption of mobility due to wildfire, flooding, or landslides	5.0	1.9	9
1.3.D	Warmer temperatures	Changes to the spring freshet timing and wildfire risk due to low snowpack	4.0	2.3	9
1.3.A	Flood	Stormwater drainage issues due to increased precipitation	5.0	1.5	8
7.1.A	All	Increases in Emergency Response and Management	5.0	1.4	7
1.4.C	Flood	Increased recreation infrastructure maintenance requirements	5.0	1.3	6
1.3.C	Seasonal Temperature Shift	Increased transportation infrastructure maintenance requirements and costs	5.0	1.3	6
4.2.C	Wildfire	Decreased indoor air quality due to wildfire smoke	3.0	2.0	6
1.3.B	Seasonal Temperature Shift	Shifting tourism seasons: shorter winters, longer summers	5.0	1.0	6
2.1.A	Extreme Weather	Damage to private and commercial buildings and property from extreme precipitation and storm-related impacts	4.0	1.4	6
4.2.A	Wildfire	Increase in respiratory illnesses due to wildfire smoke	5.0	1.0	5
3.1.A	Warmer Summer Temperatures	Reduced availability of potable water due to increasing temperatures	3.0	1.6	5

## Key findings from the risk and vulnerabilities assessment

The risk and vulnerability assessment provided a comprehensive overview of the current and future climate-related hazards the City faces. Key findings from this assessment include:

- **Increased flooding risks:** Urban flooding is a significant risk to the City. Low elevation areas and flood plains are particularly at risk, due to increased precipitation and changes in the timing of the spring freshet. This risk is very relevant for infrastructure situated in these areas, including buildings and transportation systems.
- **High vulnerability to landslides and erosion:** There is a high risk of damage to infrastructure due to erosion or landslides, particularly in areas near cliffs or in floodplains.
- **Health risks due to increased heat and wildfire smoke:** Warmer summer temperatures and increased wildfire activity may drive an increase on the risk of health impacts, both physical (e.g., respiratory illnesses) and mental (e.g., isolation).
- **Strained city resources:** The frequency and intensity of climate-related hazards are expected to increase the demands on emergency response and management services. This is likely to extend recovery periods and escalate infrastructure maintenance and replacement requirements.
- **Potential economic impacts:** Prolonged hazard events and extended recovery periods are likely to have long-term economic impacts on the community.

FIGURE 2: RISK ASSESSMENT MATRIX



## CHAPTER 3

# Reducing emissions

The City of Terrace recognizes that municipalities play an important role in addressing climate change. Cities are on the front lines of climate change and are uniquely positioned to implement effective strategies to reduce GHG emissions and build resilience. The actions taken by municipalities collectively can have significant impacts on the overall emissions trajectory and contribute to global efforts to combat climate change.

For the City, taking action to reduce emissions is not just a moral obligation but also an opportunity to create a sustainable and prosperous future for our community. Embracing new and emerging practices enhances the quality of life for residents, protects the natural environment, and ensures the long-term viability of the local economy while building resilience to climate change.



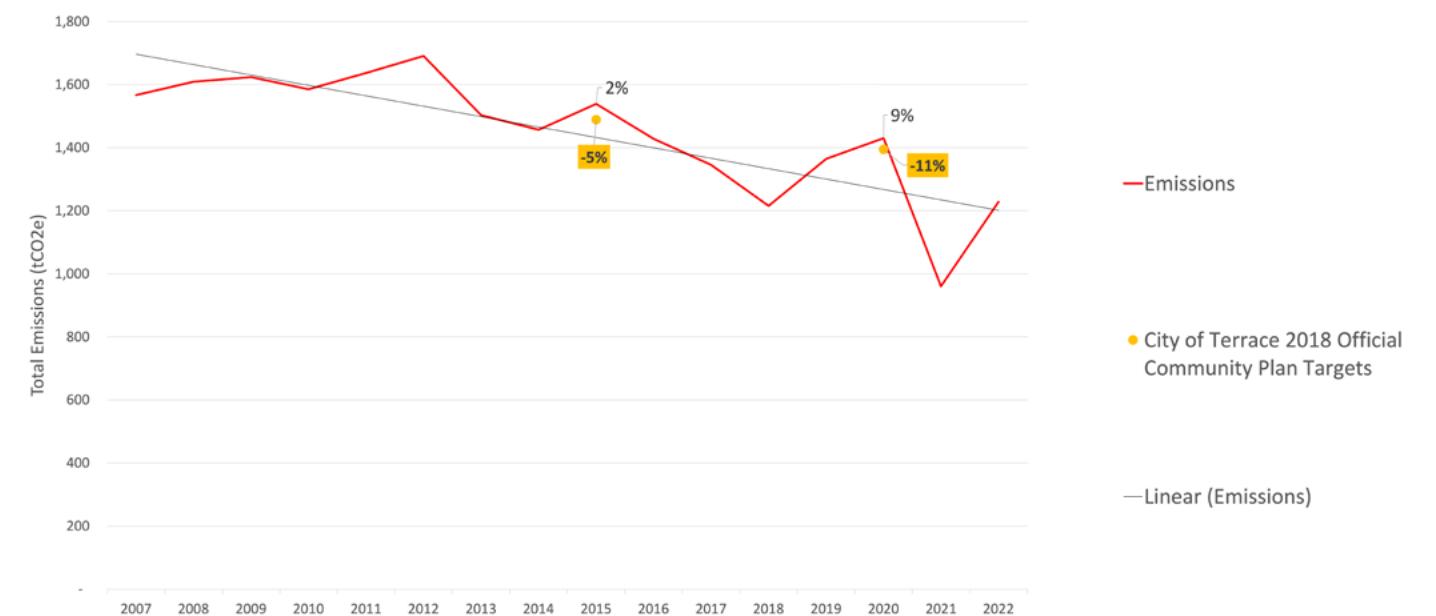
## Corporate emissions reduction target

### THE CITY OF TERRACE WILL WORK TOWARDS ACHIEVING CARBON NEUTRALITY IN CITY OPERATIONS BY 2050

In 2011, the City of Terrace set community-wide GHG reduction targets. These targets aimed for a 5% reduction below 2007 levels by 2015, an 11% reduction below 2007 levels by 2020, and an ambitious goal of an 80% reduction below 2007 levels by 2050, following the Provincial targets at the time. Ongoing initiatives focused on reducing emissions from City operations have made significant progress toward these targets. As a result, the City Council has approved an enhanced target of achieving carbon neutrality in city operations by 2050, in alignment with the CleanBC Roadmap to 2030 strategy and contributing to the broader federal emission reduction objectives.

Figure 3 shows the City's total corporate GHG emissions over the past 15 years. During this period, the City successfully reduced its emissions by over 300 tonnes of CO<sub>2</sub>e, all while expanding its service provisions to support a growing population. To meet the 2050 target, annual GHG emissions from the City's municipal operations relative to 2007 levels will need to be reduced by a further 1,309 tonnes of CO<sub>2</sub>e between 2023 and 2050. The actions in this Plan provide the steps toward achieving these targets.

FIGURE 3: CITY OF TERRACE PAST GHG EMISSIONS REDUCTION SUMMARY (2007 BASELINE)





## Emissions from city operations

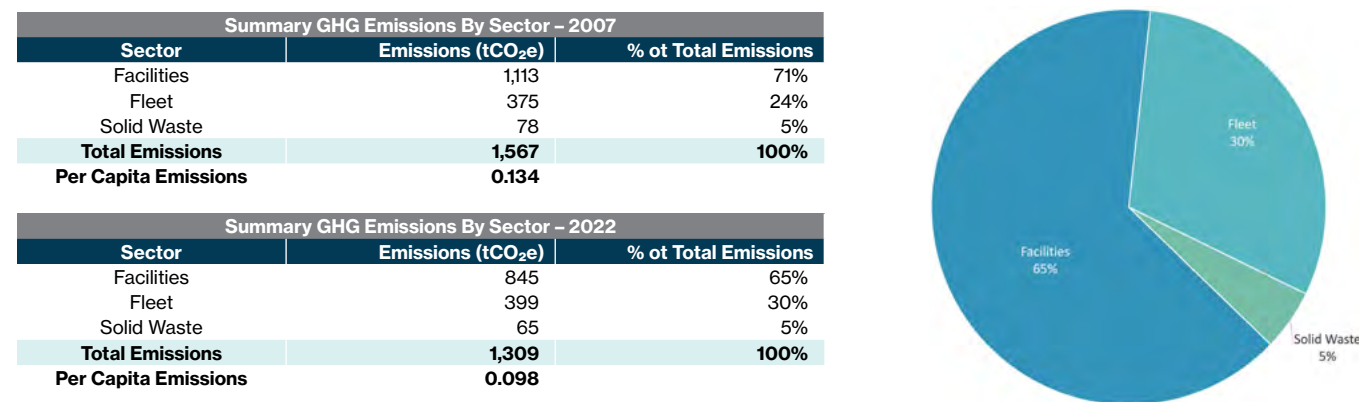
### WHAT IS MEASURED?

This Plan focuses on measuring and addressing emissions from municipal operations and infrastructure, including municipal buildings, facilities and infrastructure, fleet and equipment and corporate waste. It specifically targets the City's own operations and does not include emissions from the broader community, such as homes and personal vehicles.

### WHAT ARE THE KEY SOURCES OF EMISSIONS?

In 2022, total GHG emissions for Terrace's municipal operations were approximately 1,309 tonnes of CO<sub>2</sub>e. Figure 4 shows the City's GHG emissions by sector. Buildings are responsible for 65% of all emissions from municipal operations, while vehicles in the fleet account for an estimated 30%. The remaining emissions result from the breakdown of corporate waste deposited in the landfill.

**FIGURE 4: COMPARISON OF GHG EMISSIONS BY SECTOR IN THE BASELINE YEAR (2007) AND MOST RECENT YEAR (2022). PIE CHART SHOWING TOTAL GHG EMISSIONS IN 2022.**



**FIGURE 5. CITY OF TERRACE GHG EMISSIONS BREAKDOWN BY FUEL TYPE, 2022.**

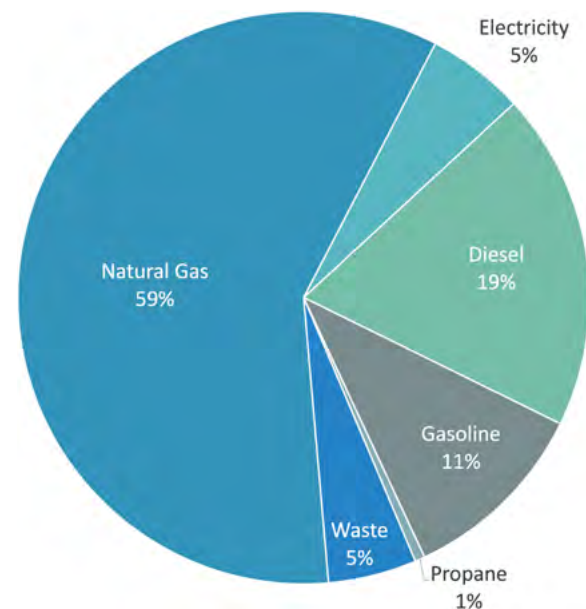


Figure 5 presents a detailed breakdown of total greenhouse gas emissions in the City, segmented by fuel type. The majority of the City's emissions come from the consumption of natural gas (about 60%) primarily utilized for building cooling and heating systems.

Emissions derived from vehicle fuels represent 30% of the total, with diesel fuel (predominantly consumed by heavy-duty vehicles) contributing most significantly within this category.

Notably, despite its widespread use, electricity contributes to only 5% of the City's GHG emissions. Given that electricity in British Columbia is predominantly generated from hydroelectric plants with very low GHG emissions, a significant opportunity exists to further utilize this low-carbon energy source.

Corporate waste accounts for the remaining 5% of emissions. This category includes elements such as the disposal of non-recyclable materials and the release of GHGs from road works and civil projects.

**Buildings and Infrastructure:** Within the City's municipal operations, the primary source of emissions from buildings and infrastructure is natural gas consumption used for space and water heating. The following buildings have been identified as the top five emitters owned by the City, due to their high natural gas consumption:

- Aquatic Centre,
- Civic Centre,
- RCMP Building,
- City Hall, and
- Public Works Building.

Together, these facilities account for 92% of the total buildings and infrastructure emissions in 2022 (Figure 6). The City benefits from access to low-emission electricity provided through B.C.'s hydro-powered grid, therefore, the contribution of electricity to the overall emissions from buildings is minimal.

**Fleet and Equipment:** In the City's fleet sector, heavy-duty vehicles contribute almost half of the GHG emissions in this category (Figure 7). These vehicles typically operate on diesel fuel and have a gross vehicle weight rating exceeding 4,500 kilograms (9,920 pounds).

Heavy-duty vehicles encompass a range of vehicles such as:

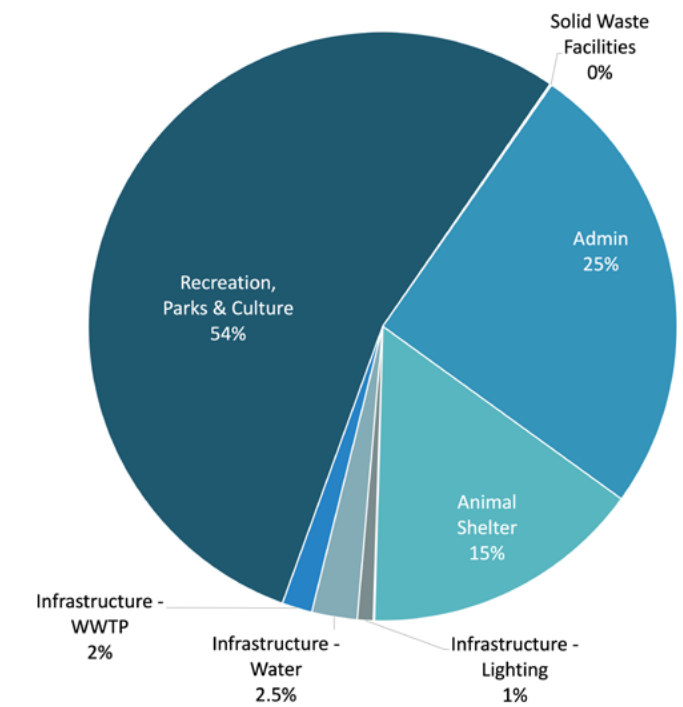
- Fire trucks,
- Garbage trucks and street sweepers,
- Graders, plows, and dump trucks.

Light-duty vehicles powered by gasoline account for 35% of the GHG emissions in the fleet sector and include:

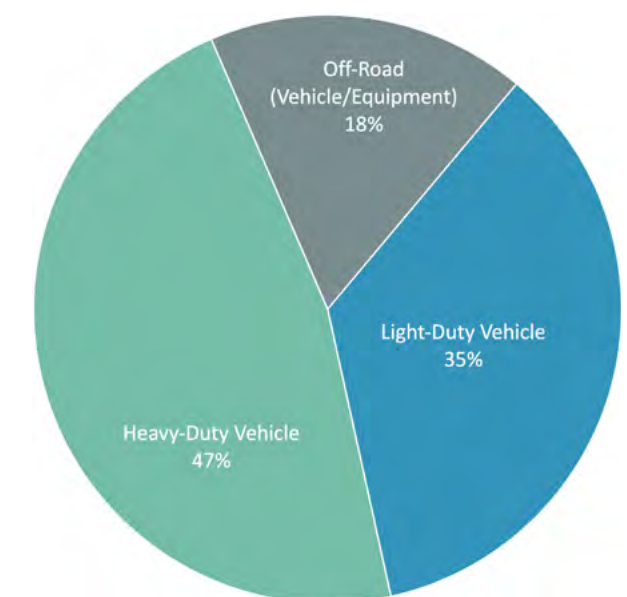
- City cars,
- Vans,
- Pick-up trucks.

The remaining emissions originate from off-road equipment, which includes propane-powered vehicles, including the Zamboni and other specialized vehicles.

**FIGURE 6. FACILITIES GHG EMISSIONS BY FACILITY PURPOSE, 2022.**



**FIGURE 7. FLEET GHG EMISSIONS BY TYPE, 2022.**



**Corporate Waste:** Solid waste generated by corporate activities accounts for approximately 5% of the City’s total GHG emissions. While specific data on the exact emissions from corporate solid waste is currently unavailable, a proxy analysis suggests that 5% serves as a reasonable approximation. However, it is important to conduct further studies to obtain more accurate and comprehensive data pertaining to corporate waste.

## Emission reduction scenarios

This Plan encompasses three key GHG emission reduction scenarios, each with distinct targets and strategies:

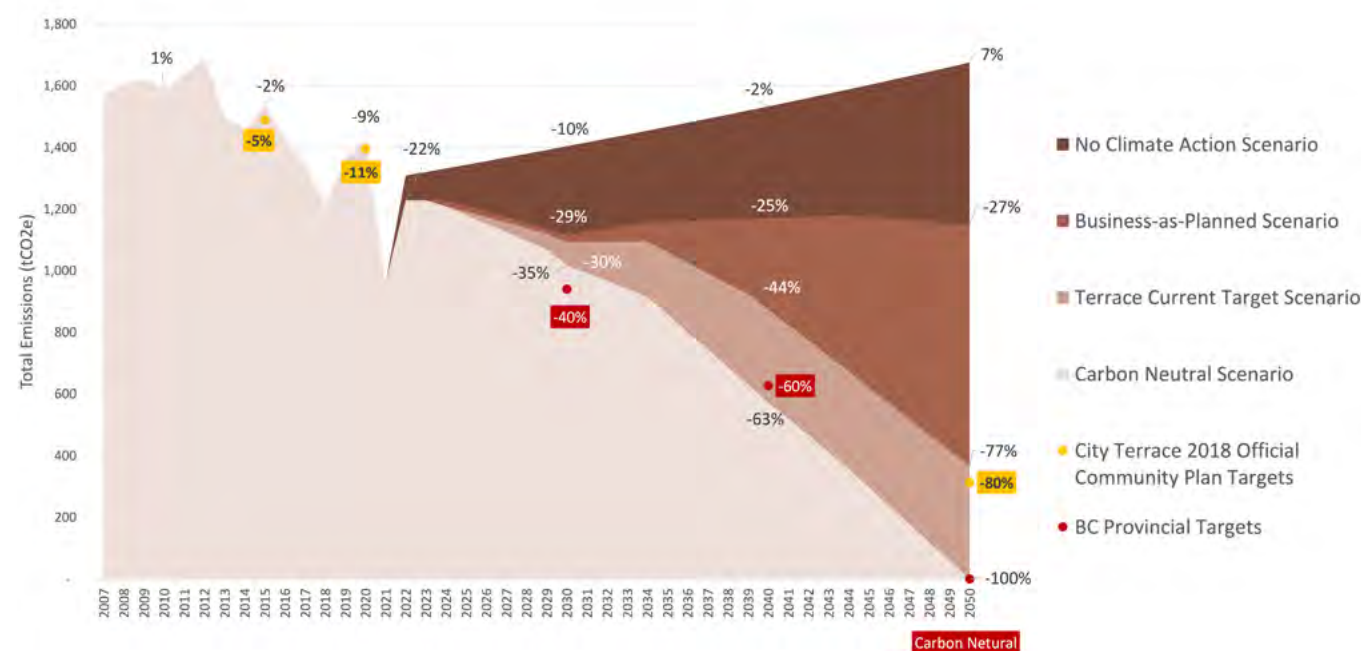
**Business-as-planned scenario:** This scenario represents the trajectory based on existing provincial and federal policies without additional targeted actions by the City. It serves as a reference point to understand the outcome of the emissions if no additional measures are taken beyond current policies.

**Terrace community target scenario:** This scenario involves the City cutting GHG emissions by 80% from 2007 levels by 2050, aligning with both B.C.’s legislative goal and the City’s own community targets set in 2011. This scenario is endorsed in the City’s 2018 Official Community Plan (OCP) update.

**Carbon neutral scenario (aligning with CleanBC Roadmap to 2030):** This scenario involves striving for carbon neutrality within municipal operations, reflecting the City’s recent adoption of net-zero corporate GHG emissions, as well as aligning with the CleanBC initiative. It requires comprehensive efforts to eliminate or offset emissions from all municipal activities.

The chart below illustrates the three scenarios:

**FIGURE 8. CITY OF TERRACE GHG EMISSIONS REDUCTION SCENARIOS SUMMARY.**



### CARBON NEUTRAL SCENARIO

Following the City’s successful reduction in municipal emissions in previous years, this Plan also includes the objective of striving for complete municipal carbon neutrality. This sets the stage for transformative actions and substantial GHG emissions reduction efforts.

As previously noted, a large portion of the City’s GHG emissions are produced by fossil fuels, with natural gas being the most significant contributor. In contrast, electricity from hydroelectric plants, the predominant electricity source in British Columbia, have a very low carbon footprint (Figure 4). This difference offers an excellent opportunity for the City to reduce GHG emissions by shifting towards greater use of electricity in place of fossil fuels.

Achieving carbon neutrality requires substantial investments and funding. Therefore, it is crucial to consider the lifecycle and payback period of investments to ensure cost-effectiveness and maximize the benefits of GHG emission reduction actions.

# Climate Action Vision and Goals







## VISION

**As a progressive and resourceful corporate entity, the City of Terrace is dedicated to integrating advanced, efficient, and adaptable climate strategies in our operations to ensure a sustainable, safe, and resilient foundation for the well-being of our community and future generations.**

## Goals

This Plan emphasizes six focus areas for preparing for and responding to climate change, in addition to reducing GHG emissions. These focus areas align climate goals, strategies, and actions with the City's existing departments. These focus areas include the following:



	AREA OF ACTION	GOALS
	<b>Municipal Leadership</b>	<ol style="list-style-type: none"> <li>1. Embed climate change considerations into City processes and decision-making.</li> <li>2. Foster increased awareness of climate change and greenhouse gas emissions and incentivize community climate action.</li> </ol>
	<b>Buildings and Infrastructure</b>	<ol style="list-style-type: none"> <li>3. Enhance building and infrastructure resilience to climate change by integrating climate change considerations into infrastructure planning and maintenance.</li> <li>4. Increase the efficiency and reduce energy consumption of new and existing City buildings.</li> </ol>
	<b>Emergency Management and Human Health</b>	<ol style="list-style-type: none"> <li>5. Increase awareness and educate residents about climate-related health risks and actions to mitigate impacts on health and wellbeing.</li> <li>6. Enhance capacity to monitor and respond to flood-related impacts on municipal infrastructure and services.</li> <li>7. Increase understanding and awareness of local health related impacts from extreme heat and wildfire smoke and develop key response plans.</li> </ol>
	<b>Land use and planning</b>	<ol style="list-style-type: none"> <li>8. Consider climate change risks and vulnerability in land use planning and development.</li> <li>9. Reduce exposure to flood risk and support adaptation and resilience in flood risk exposed areas through zoning and regulations.</li> </ol>
	<b>Transportation and mobility</b>	<ol style="list-style-type: none"> <li>10. Reduce emissions from the City's fleet vehicles.</li> <li>11. Encourage and support sustainable commuting.</li> </ol>
	<b>Waste management</b>	<ol style="list-style-type: none"> <li>12. Increase diversion of organic waste and recyclable materials from the landfill.</li> <li>13. Work towards zero waste at City facilities and events.</li> </ol>

## Types of Action

This Plan identifies four different types of actions to build resilience to climate change and reducing corporate GHG emissions:

- **City operations:** Create and implement new approaches or adapt existing practices to increase operational resilience to climate change and reduce the GHG emissions generated by city operations. These include audits and upgrades of physical assets.
- **Policy and programs:** Establish, update, or enforce policies and bylaws and develop and/or implement initiatives and projects.
- **Partnerships and engagement:** Collaborate with internal and external stakeholders to advance climate action within the City and the broader community.
- **Education:** Increase awareness by providing information and opportunities that empower residents to take individual and collective action on climate change.

## Action Planning and Resourcing

This Plan provides a high-level estimate of the financial and staff resources associated with each action, as well as an approximate timeframe for each to inform action prioritization.

Timeframe	Investment	Staff Resources
<b>Short</b> 1-2 years	<b>Existing resources</b>	* <10% of one FTE <sup>^</sup>
<b>Medium</b> 3-4 years	<b>\$</b> \$0-\$100K	** 10-25% of one FTE
<b>Long</b> 5+ years	<b>\$\$</b> \$100K-500K	*** 25-75% of one FTE
<b>Ongoing</b>	<b>\$\$\$</b> \$500K+	**** 75-100% of one+ employees dedicated










<sup>^</sup>An FTE means one full time employee's role










## Co-Benefits










This Plan highlights the co-benefits associated with climate action. By adopting a low-carbon resilience strategy, the goal is not only to increase resilience to climate change and reduce GHG emissions, but also to provide additional benefits for the community, local economy and the environment.

The co-benefits identified in this Plan are based on Simon Fraser University's Integrated Climate Action for BC Communities Initiative,<sup>5</sup> which provides a comprehensive and evidence-based framework to assess and understand the broader advantages that climate action can bring beyond emissions reduction and climate resilience. The following list identifies specific areas where the proposed climate actions can create additional benefits.

<sup>5</sup> LCR: Advancing the Co-Benefits of Climate Action (2021).

Economic Co-Benefits					
	Supports green job creation		Diversifies local economy		Reduces costs/increases savings
	Fosters innovation and green, clean industries		Supports clean energy transition		Promotes a circular economy
	Reduces risks to property values		Reduces waste, optimizes resources		Avoids community damages and costs over time

Environmental Co-Benefits					
	Enhances biodiversity		Supports habitat creation		Improves water retention and absorption
	Enhances pollutant capture		Improves air quality		Reduces extreme temperatures
	Improves water quality		Increases carbon sequestration/storage		Promotes regional connectivity

Social Co-Benefits					
	Enhances human health and well-being		Supports local food security		Limits tax increases
	Improves climate awareness and access to data and information		Improves community livability and vitality		Enhances local autonomy
	Advances equity and social inclusion		Reduces congestion		Improves public safety, disaster preparedness and response

## CHAPTER 5

# Action Plan

This section articulates specific actions by focus area to advance adaptation and climate resilience across the City and to advance opportunities for corporate greenhouse gas emissions reductions. The selection of these strategies was based on research and analysis of best practices in comparable municipalities, multiple rounds of staff input, and informed by a public engagement survey to understand the City's residents' greatest climate change concerns.

## Priority Actions

Priority actions include those identified with “short” timeframes and are intended to be implemented within 1-2 years of this Plan's adoption. Actions identified with a “medium” timeframe are intended to be implemented within 3-4 years, while those listed with a “long” timeframe are intended to be pursued five or more years from the date of adoption. Priority actions for Terrace are summarized below:

### CLIMATE ADAPTATION

- **Public works yard flood plan:** Develop a corporate contingency plan for a flooding event impacting the City's Public Works Yard.
- **Wildfire smoke needs assessment:** Conduct research and analysis to assess community needs during wildfire smoke events and inform response planning.
- **Extreme heat response plan:** Develop an extreme heat response plan in collaboration with provincial, district and community partners.
- **Support extreme heat and wildfire smoke public awareness efforts:** In collaboration with relevant authorities and community organizations, create or support existing public education campaign(s) to increase awareness of health-related impacts and mitigation strategies for wildfire smoke and extreme heat.
- **ESA education campaign:** Develop and implement an education campaign to increase landowner awareness about environmentally sensitive areas (ESAs).
- **Review levels of service:** Review the levels of service to account for climate change impacts on the road network.
- **Road maintenance budgets:** Review maintenance budgets to account for climate change impacts on the road network.

### CLIMATE MITIGATION

- **Staff commuting policy:** Develop a policy that supports emissions reductions from staff commuting.
- **Facilities audits:** Conduct audits of all municipal facilities to assess energy usage and emissions, and identify opportunities for resilience decarbonization measures.
- **BC Energy Step Code:** Add support for builders seeking to meet the upper steps of the BC Energy Step Code ahead of the timeline of 2032, and ensure that all new municipal facilities designed after 2025 are net-zero energy-ready.
- **Green fleet policy:** Develop a policy to guide the transition to Zero Emission Vehicles, including the enhancement of systems for collecting emissions data and lifecycle information to support decision-making.
- **Green fleet plan:** Develop a green fleet plan to establish a clear roadmap for transitioning our fleet to electric vehicles.
- **Dumpster security:** Enhance security measures for dumpsters at City Hall and the Sportsplex to enhance proper waste diversion.
- **Zero-waste events:** Establish a policy mandating all events hosted at city facilities to adopt and implement zero-waste practices. Establish a system to capture and track this information.

Beyond the above key priority actions, this Plan identifies other 20+ important medium- and long-term actions that will support the advancement of the City of Terrace's climate resilience building and emissions reduction goals.





## 5.1 Municipal Leadership

### OVERVIEW

Building a community that is resilient to climate change and able to achieve net-zero emissions requires collaboration and leadership. City leadership requires not only a commitment to advancing local climate adaptation and mitigation initiatives, but a recognition that climate change needs to be considered in every city department, policy, plan, and project. This focus area highlights the actions that enable the City to effectively allocate resources, collaborate, and build capacity to effectively respond to the City's climate change challenge.

### GOALS

1. Embed climate change considerations into city processes and decision-making.
2. Foster increased awareness of climate change and greenhouse gas emissions and incentivize community climate action.

### ACTIONS

#	Actions	Resources	Staff Time	Timeframe	Adaptation/Mitigation
<b>City Operations</b>					
1.1	<b>Lifecycle GHGs:</b> Develop a tool and require consideration of GHG emissions and lifecycle costs when making decisions for municipal projects.	\$	*	Medium	Mitigation
1.2	<b>Green Team:</b> Establish a Green Team Committee to research and identify funding opportunities for decarbonization initiatives and promote staff communication and engagement on climate-related initiatives and behaviour change.	\$	*	Medium	Mitigation
<b>Policy, Programs and Planning</b>					
1.3	<b>Staff Commuting Policy:</b> Develop a policy that supports emissions reductions from staff commuting.	Existing resources	**	Short	Mitigation
1.4	<b>Sustainable Procurement:</b> Develop and adopt a sustainable procurement policy that prioritizes the procurement of environmentally friendly products, building materials, and services.	\$	**	Medium	Adaptation Mitigation

#	Actions	Resources	Staff Time	Timeframe	Adaptation/Mitigation
1.5	<b>Sustainable Business Recognition:</b> Work with community stakeholders to help establish a program to recognize and celebrate businesses that demonstrate a commitment to sustainability and actively contribute to the achievement of the municipality's climate goals.	\$	*	Medium	Adaptation Mitigation

### CO-BENEFITS

Economic Co-Benefits		Environmental Co-Benefits		Social Co-Benefits	
	Supports green job creation		Enhances pollutant capture		Enhances human health and well-being
	Diversifies local economy		Improves air quality		Reduces congestion
	Reduces costs/ increases savings				
	Fosters innovation and green, clean industries				
	Supports clean energy transition				
	Promotes a circular economy				





## 5.2 Buildings and Infrastructure

### OVERVIEW

The City of Terrace owns and operates multiple buildings across the municipality and maintains a diverse range of infrastructure assets that provide important municipal services to citizens. The resilience of municipal buildings and infrastructure to climate change has significant implications for the City's ability to maintain and confidently invest in the assets required to provide municipal services. Much of the City's infrastructure was built for a historical climate that no longer reflects the realities of the environments that they were built in. More frequent and intense rainfall, increasing temperatures, changing seasonal weather patterns, and other climate change effects are challenging the capacity and durability of infrastructure assets. Many local governments are rethinking how they fund, design and maintain traditional infrastructure assets, and exploring new ways to develop and manage new and existing natural assets that bolster resilience to climate change and provide valuable ecosystem services.

Additionally, the energy required to operate these facilities makes up a significant portion of the City's total corporate emissions and represents an important opportunity for climate action. Combined, city facilities generate approximately 65% of total municipal emissions. Advancements in construction materials and techniques are providing opportunities to increase building efficiency and significantly reduce carbon emissions. Taking proactive steps towards climate action, the City has already undertaken retrofitting projects for certain municipal buildings, such as the aquatic center, incorporating energy-efficient measures. Building on this momentum, the City is currently focused on further retrofitting initiatives for key facilities, including the RCMP building and the sewer treatment plant, aiming to implement more energy-efficient measures that align with its carbon-neutral objective.

### GOALS

3. Enhance building and infrastructure resilience to climate change by integrating climate change considerations into infrastructure planning and maintenance.
4. Increase the efficiency and reduce the energy consumption of new and existing city buildings.

### ACTIONS

#	Actions	Resources	Staff Time	Timeframe	Adaptation/Mitigation
<b>City Operations</b>					
2.1	<b>Ice Plant Upgrade:</b> Consider heat recovery options as part of the Ice Plant upgrade.	\$\$	**	Medium	Mitigation
2.2	<b>Water &amp; Wastewater Treatment Plant:</b> Commission a resilience review and explore opportunities to upgrade the water and wastewater treatment plant with resilience measures, and heat and carbon recovery technology.	\$	*	Medium	Mitigation

#	Actions	Resources	Staff Time	Timeframe	Adaptation/Mitigation
2.3	<b>Facilities Audits:</b> Conduct audits of all municipal facilities to assess energy usage and emissions, and identify opportunities for resilience decarbonization measures.	\$	**	Short	Mitigation
2.4	<b>Asset Management Planning:</b> Incorporate resilience, energy and GHG reduction recommendations from building assessments into asset and financial management planning.	\$	\$\$	Medium	Adaptation Mitigation
2.5	<b>Building Resilience and Decarbonization:</b> Undertake resilience and decarbonization efforts based on the recommendations derived from the facility audits, considering the lifespan and upgrade timeframes of assets.	\$\$\$	***	Long	Adaptation Mitigation
<b>Policy, Programs and Planning</b>					
2.6	<b>BC Energy Step Code:</b> Add support for builders seeking to meet the upper steps of the BC Energy Step Code ahead of the timeline of 2032, and ensure that all new municipal facilities designed after 2025 are net-zero energy-ready.	\$	***	Short	Mitigation
2.7	<b>Building Retrofit Bylaw:</b> Adopt a new bylaw to encourage energy efficiency metrics in existing buildings, in line with future iterations of the BC Building Code.	\$	**	Medium	Mitigation
2.8	<b>Grading and Stormwater Regulations:</b> Investigate options for updating regulations regarding private property grading and stormwater management.	Existing resources	**	Medium	Adaptation



### 5.3 Emergency Management and Human Health

**OVERVIEW**

The City of Terrace is experiencing the impacts of more frequent and severe extreme weather events. The 2021 heat dome event, described by Environment Canada as “prolonged, dangerous, and historic”, set temperature records in the City and made it harder for residents to engage in recreation and exercise outside, or live comfortably in homes without air conditioning. Localized, elevated flood risk, led the City to activate its emergency operations center in both 2022 and 2023. While landslides, flooding, and wildfires occasionally lead to road closures in the region, the reliance on a single highway for transporting goods to and from the City means that any service disruption to this provincial infrastructure has amplified consequences.

These types of repeated extreme events increase pressure on the City’s emergency management systems, and can negatively impact the wellbeing and mental health of community members. Residents from equity deserving groups are often disproportionately affected by climate change, with fewer resources to prepare and adapt. While residents remain resilient, there is a need for proactive and targeted measures to mitigate and adapt to these extreme events.

**GOALS**

- 5. Increase awareness and educate residents about climate-related health risks and actions to mitigate impacts on health and wellbeing.
- 6. Enhance capacity to monitor and respond to flood-related impacts on municipal infrastructure and services.
- 7. Increase understanding and awareness of local health-related impacts from extreme heat and wildfire smoke and develop key response plans.

**ACTIONS**

#	Actions	Resources	Staff Time	Timeframe	Adaptation/Mitigation
<b>City Operations</b>					
3.1	<b>Public Works Yard Flood Plan:</b> Develop a corporate contingency plan for a flooding event at the City's Public Works Yard.	Existing resources	**	Short	Adaptation
<b>Policy, Programs and Planning</b>					
3.2	<b>Wildfire Smoke Needs Assessment:</b> Conduct research and analysis to assess community needs during wildfire smoke events and inform response planning.	\$	*	Short	Adaptation

**CO-BENEFITS**













Economic Co-Benefits		Environmental Co-Benefits		Social Co-Benefits	
	Supports green job creation		Enhances pollutant capture		Enhances human health and well-being
	Reduces costs/ increases savings		Improves air quality		Improves climate awareness and access to data and information
	Fosters innovation and green, clean industries				
	Supports clean energy transition				
	Reduces risks to property				
	Reduces waste, optimizes resources				
	Avoids community damages and costs over time				





#	Actions	Resources	Staff Time	Timeframe	Adaptation/Mitigation
3.3	<b>Implement Skeena River Flood Mitigation Recommendations:</b> Review and implement priority flood mitigation recommendations relevant to the City identified in the RDKS Skeena River Channel Management Program Report (McElhanney, 2021).	\$\$\$	****	Medium	Adaptation
3.4	<b>Implement Kitsumkalum River Flood Mitigation Recommendations:</b> Prioritize and implement flood mitigation recommendations identified in the Kitsumkalum River Flood Mitigation Plan.	\$\$\$	****	Medium	Adaptation
3.5	<b>Water Level Monitoring Plan:</b> Develop a water level monitoring plan to consistently monitor and record water level observations at key municipal sites.	\$	**	Medium	Adaptation
3.6	<b>Extreme Heat Response Plan:</b> Develop an extreme heat response plan in collaboration with provincial, district and community partners.	\$	**	Short	Adaptation
<b>Partnerships and Engagement</b>					
3.7	<b>Support Extreme Heat and Wildfire Smoke Public Awareness Efforts:</b> In collaboration with relevant authorities and community organizations, create or support existing public education campaign(s) to increase awareness of health-related impacts and mitigation strategies for wildfire smoke and extreme heat.	\$	**	Short	Adaptation
<b>Education</b>					
3.8	<b>Develop Education Campaign for Recreating in Adverse Climate Conditions:</b> Engage with community recreation partners to develop a 'safer recreation' education campaign to support healthy recreation in adverse climate conditions (heat, smoke).	\$	**	Medium	Adaptation
3.9	<b>Precipitation and Storm Education Campaign:</b> Develop and implement an education campaign to increase landowner awareness of extreme precipitation and storm damage risk.	\$	***	Medium	Adaptation

### CO-BENEFITS

Economic Co-Benefits		Environmental Co-Benefits		Social Co-Benefits	
	Reduces costs/ increases savings		Promotes regional connectivity		Enhances human health and well-being
	Fosters innovation and green, clean industries				Improves climate awareness and access to data and information
	Reduces risks to property				Improves community livability and vitality
	Reduces waste, optimizes resources				Enhances local autonomy
	Avoids community damages and costs over time				Advances equity and social inclusion
					Improves public safety, disaster preparedness and response





## 5.4 Land use and planning

### OVERVIEW

The ability of local governments to shape land-use decisions within their community is one of the most influential tools available to them in their efforts to mitigate the health, economic, and environmental impacts of climate change. This involves designating areas for green infrastructure (e.g., parks, urban forests, and permeable surfaces) to mitigate flooding and heat island effects, and prioritizing the preservation of natural areas and sensitive ecosystems through land use policies to safeguard biodiversity. Cities can also regulate or limit development in areas exposed to specific climate risks, including flooding, to ensure that future development is resilient to climate change as impacts become more frequent and severe.

### GOALS

8. Consider climate change risks and vulnerability in land use planning and development.
9. Reduce exposure to flood risk and support adaptation and resilience in flood-risk-exposed areas through zoning and regulations.

### ACTIONS

#	Actions	Resources	Staff Time	Timeframe	Adaptation/Mitigation
<b>Policy, Programs and Planning</b>					
4.1	<b>Floodplain Management Bylaw:</b> Develop a stand-alone floodplain management bylaw, separate from the Zoning Bylaw.	Existing resources	**	Medium	Adaptation
4.2	<b>Update Slope Hazard Guidelines:</b> Update OCP's Slope Hazard Development Permit Area Guidelines and Policies (includes identification and mapping of areas exposed to erosion and geohazard events).	\$\$	**	Medium	Adaptation
<b>Education</b>					
4.3	<b>ESA Education Campaign:</b> Develop and implement an education campaign to increase community awareness about environmentally sensitive areas (ESAs).	\$	***	Short	Adaptation

### CO-BENEFITS

Economic Co-Benefits		Environmental Co-Benefits		Social Co-Benefits	
	Reduces costs/ increases savings		Enhances biodiversity		Enhances human health and well-being
	Reduces risks to property		Supports habitat preservation or creation		Improves climate awareness and access to data and information
	Avoids community damages and costs over time		Increases carbon sequestration/ storage		Improves community livability and vitality
					Improves public safety, disaster preparedness and response





## 5.5 Transportation and Mobility

### OVERVIEW

The City of Terrace operates a diverse fleet, comprising heavy-duty vehicles, light-duty vehicles, and off-road equipment to provide a range of services to its residents. While the majority of greenhouse gas emissions from the City's fleet are attributed to its heavy-duty vehicles (47%), light-duty vehicles (35%) and off-road vehicles and equipment (18%) also contribute to emissions. Recognizing the importance of addressing these emissions, the City is currently undertaking the development of a comprehensive fleet decarbonization roadmap aimed at not only reducing the carbon footprint of the fleet, but also ensuring the infrastructure's resilience to climate change. This plan outlines additional actions the City can take to further increase resilience and reduce emissions from fleet operations.

### GOALS

- 10. Reduce emissions from the City's fleet vehicles.
- 11. Increase infrastructure resilience to climate change.

### ACTIONS

#	Actions	Resources	Staff Time	Timeframe	Adaptation/Mitigation
<b>City Operations</b>					
5.1	<b>Review Levels of Service:</b> Review the levels of service to account for climate change impacts on the road network.	Existing resources	*	Short	Adaptation
5.2	<b>Road Maintenance Budgets:</b> Review maintenance budgets to account for climate change impacts on the road network.	Existing Resources	**	Short	Adaptation
<b>Policy, Programs and Planning</b>					
5.3	<b>Green Fleet Policy:</b> Develop a policy to guide the transition to Zero Emission Vehicles, including the enhancement of systems for collecting emissions data and lifecycle information to support decision-making.	\$	**	Short	Mitigation
5.4	<b>Green Fleet Plan:</b> Develop a green fleet plan to establish a clear roadmap for transitioning our fleet to electric vehicles.	Existing Resources	**	Short	Adaptation Mitigation
5.5	<b>E-bikes:</b> examine the viability of incorporating e-bikes as an alternative to some staff vehicle trips, and develop a pilot scheme.	\$	**	Medium	Mitigation

#	Actions	Resources	Staff Time	Timeframe	Adaptation/Mitigation
<b>Partnerships and Engagement</b>					
5.6	<b>Promotion of Active Transportation:</b> Evaluate staff commuting emissions and promote sustainable habits by developing programs to incentivize transit use, carpooling, and active transportation.	\$	**	Medium	Mitigation

### CO-BENEFITS

Economic Co-Benefits		Environmental Co-Benefits		Social Co-Benefits	
	Reduces costs/ increases savings		Enhances pollutant capture		Enhances human health and well-being
	Supports clean energy transition		Improves air quality		Improves community livability and vitality
					Advances equity and social inclusion
					Reduces congestion





## 5.6 Waste management

### OVERVIEW

Diverting organic waste from landfills is an effective way to reduce emissions of methane, a greenhouse gas that is approximately 80 times more potent than CO<sub>2</sub> emissions.<sup>6</sup> By assessing its corporate waste management systems and identifying and implementing opportunities to increase waste diversion through composting, recycling construction materials, and paper products, emissions can be reduced while generating valuable resources. The City of Terrace aims to improve waste management by reducing excessive or unnecessary consumption, improving waste diversion from City facilities, municipal events, and improving systems for sorting and managing waste streams.

### GOALS

- 12. Increase diversion of organic waste and recyclable materials from the landfill.
- 13. Work towards zero waste at city facilities and events.

### ACTIONS

#	Actions	Resources	Staff Time	Timeframe	Adaptation/Mitigation
<b>City Operations</b>					
6.1	<b>Dumpster Security:</b> Enhance security measures for dumpsters at City Hall and the Sportsplex to enhance proper waste diversion.	\$	*	Short	Mitigation
6.2	<b>Waste Sorting:</b> Improve waste sorting at Public Works.	Existing Resources	**	Medium	Mitigation
6.3	<b>Waste Audit:</b> Perform a comprehensive waste audit on both municipal and contracted facilities to assess current waste management practices, identify areas for improvement, and develop strategies for enhancing waste reduction, recycling, and diversion efforts.	\$	**	Medium	Mitigation

<sup>6</sup> Methane has more than 80 times the warming power of carbon dioxide over the first 20 years after it reaches the atmosphere. Even though CO<sub>2</sub> has a longer-lasting effect, methane sets the pace for warming in the near term. Source: Environmental Defense Fund. (n.d). *Methane: A crucial opportunity in the climate fight.* <https://www.edf.org/climate/methane-crucial-opportunity-climate-fight>.

#	Actions	Resources	Staff Time	Timeframe	Adaptation/Mitigation
6.4	<b>Recycling and Organics:</b> Implement a recycling and organics pick-up program at privately operated City-owned facilities (e.g.: RCMP, Kwinitsa, Visitor Info, and George Little House) and establish a system to record and monitor the collection of recyclables and organic waste.	\$	***	Medium	Mitigation
<b>Policy, Programs and Planning</b>					
6.5	<b>Zero-Waste Events:</b> Establish a policy mandating all events hosted at city facilities to adopt and implement zero-waste practices. Establish a system to capture and track this information.	\$	**	Short	Mitigation
6.6	<b>Reduce Paper Consumption:</b> Develop and implement an initiative to reduce excess paper usage in corporate municipal operations (e.g., digitizing all files, standard double-sided printing) and track it through waste audits or through the Green Team Committee efforts.	\$	**	Medium	Mitigation
6.7	<b>Street Waste:</b> Develop and implement a waste management strategy for waste in public spaces, including collaborating with RecycleBC to create effective recycling and composting initiatives.	\$\$	***	Long	Mitigation

### CO-BENEFITS

Economic Co-Benefits		Environmental Co-Benefits		Social Co-Benefits	
	Supports green job creation		Enhances pollutant capture		Enhances human health and well-being
	Promotes a circular economy		Improves air quality		Improves community livability and vitality
	Reduces waste/ optimizes resources				
	Reduces costs/ increases savings				

## CHAPTER 6

# Implementation

This Climate Action Plan articulates 13 goals and 38 specific actions across 6 diverse areas of climate action. Together, they provide a pathway for the City of Terrace to take a focused and effective approach towards reducing climate change risk for the community and reducing the City's corporate greenhouse gas emissions. This Plan will be implemented in tandem with district, provincial, and federal climate action efforts, and will inevitably adapt as the scope of the City's climate change challenge evolves and as new solutions come into focus.

## Key elements of implementation

Successfully achieving the goals outlined in this Plan will require a balance of the following elements:

- **Further assessment and resource planning:** This Plan serves as a roadmap for the City, providing clear goals and a GHG reduction target that can provide a framework for individual and coordinated action across all departments. While some actions are ready for short-term implementation, others will require further assessment, planning and resourcing.
- **Partnerships and collaboration:** The City will actively monitor and engage with prospective partners to identify potential opportunities from existing and developing policies, funding programs, technologies, and resources.
- **Focusing on equity:** Recognizing that climate change is disproportionately felt by equity-deserving groups, policies, programs and projects developed to address these impacts should seek to bring light to and prioritize addressing inequities.
- **Resourcing:** Successful implementation of this Plan will require strategic resourcing, leveraging external funding and allocating capital and operational budget dollars to implement specific actions.

## Governance

The City of Terrace has legislated authority that allows it to influence behaviour and drive change in particular areas within its control. These include infrastructure and community planning, bylaws and regulations, creating incentives, and building partnerships.

The Development Services department will oversee the implementation of this Plan, in collaboration with relevant staff from other departments to advance the actions identified in this plan. The Planning Department will guide overall implementation, consider equity implications, integrate a climate lens into decision-making, provide progress reports, and address emerging tasks. Lead and supporting departments will be responsible for reporting on and ensuring the successful implementation of actions assigned to them on an annual basis.

**As a dynamic document, this Plan will continually adapt and evolve with the emerging needs and priorities of the community and Council. The adoption of this plan signals the Terrace City Council's support for actively integrating climate change considerations into the City's evolving processes. This plan serves as a roadmap and reference for Council to guide decision-making related to climate action.**

## Resource requirements

The Action Plan Implementation Table (Appendix A) provides an initial high-level estimate of the resource requirements to implement each action, and more detailed estimates for actions prioritized for implementation will be developed through the annual budgeting process. While some actions require relatively minimal resources, others may require more significant investments of capital and operational resources. Securing external funding from provincial and federal partners will be critical to the implementation of this Plan, with a range of co-benefits that advance complimentary municipal priorities. Securing these funds will require dedicated staff capacity to identify and apply for these opportunities.

## Further Action Prioritization

The prioritization of actions is expected to evolve over time in response to the emerging needs of the community and the shifting landscape of climate change, adaptive responses, and solutions that facilitate greenhouse gas reduction. These priorities will be assessed and updated based on the following criteria:

- Alignment and integration of departmental work and priorities with this Plan.
- Availability of external resources and funding opportunities.
- Level of impact to enhance resilience to climate change.
- Level of impact in reducing greenhouse gas emissions from city operations.
- Ability to improve outcomes for equity-deserving groups.

Those with lower incomes, existing health conditions, or facing social discrimination, may be disproportionately vulnerable to climate change. Households with limited financial resources are less able to take individual action to protect themselves and their property from extreme weather events and may struggle to recover in the aftermath of such events. As a result, the implementation of this Plan must center on equity, fairness, and affordability.

## Monitoring and Evaluation

This Climate Action Plan describes a diverse range of actions that put the City of Terrace on a path towards enhanced resilience to climate change and a low-carbon future. Achieving the goals identified across each of the six areas of action will require coordinated interdepartmental engagement, community leadership, and ongoing performance monitoring and reporting.

The following measures are recommended to support the implementation and ongoing evolution of the Climate Action Plan:

- Provide annual progress reporting on achievement to date and ongoing opportunities for community engagement. This includes hosting and attending forums and existing meeting processes to share and celebrate the City's climate action efforts, inspire public interest, and encourage community and individual action.
- Share this Plan with all city departments and integrate actions into departmental and individual employee work plans.
- Coordinate an annual implementation review and annual progress reporting through each city department through the Development Services.
- Present an annual report on this Plan's progress to Council to support implementation accountability.



# APPENDIX A Action Plan Implementation Table

Actions	Lead Department	Supporting Department	Resources	Staff Time	Timeframe	Adaptation/Mitigation
<b>1. Municipal Leadership</b>						
<b>City Operations</b>						
<b>1.1 Lifecycle GHGs:</b> Develop a tool and require consideration of GHG emissions and lifecycle costs when making decisions for municipal projects.	Admin	Finance	\$	*	Medium	Mitigation
<b>1.2 Green Team:</b> Establish a Green Team Committee to research and identify funding opportunities for decarbonization initiatives and promote staff communication and engagement on climate-related initiatives and behaviour change.	Development Services	Public Works	\$	***	Medium	Mitigation
<b>Programs, Policy and Planning</b>						
<b>1.3 Staff commuting policy:</b> Develop a policy that supports emissions reductions from staff commuting.	Admin		Existing resources	**	Short	Mitigation
<b>1.4 Sustainable Procurement:</b> Develop and adopt a sustainable procurement policy that prioritizes the procurement of environmentally friendly products, building materials, and services.	Finance	Public Works, Admin	\$	**	Medium	Adaptation Mitigation
<b>1.5 Sustainable Business Recognition:</b> Work with community stakeholders to help establish a program to recognize and celebrate businesses that demonstrate a commitment to sustainability and actively contribute to the achievement of the municipality's climate goals.	Admin	Economic Development Officer	\$	*	Medium	Adaptation Mitigation
<b>2. Buildings and Infrastructure</b>						
<b>City Operations</b>						
<b>2.1 Ice Plant Upgrade:</b> Consider heat recovery options as part of the Ice Plant upgrade.	Parks, Recreation and Culture		\$\$	**	Medium	Mitigation
<b>2.2 Water &amp; Wastewater Treatment Plant:</b> Commission a resilience review and explore opportunities to upgrade the water and wastewater treatment plant with resilience measures, and heat and carbon recovery technology.	Public Works		\$	*	Medium	Mitigation

Actions	Lead Department	Supporting Department	Resources	Staff Time	Timeframe	Adaptation/Mitigation
<b>2.3 Facilities Audits:</b> Conduct audits of all municipal facilities to assess energy usage and emissions, and identify opportunities for resilience decarbonization measures.	Admin		\$	**	Short	Mitigation
<b>2.4 Asset Management Planning:</b> Incorporate resilience, energy and GHG reduction recommendations from building assessments into asset and financial management planning.	Finance		\$	**	Medium	Adaptation Mitigation
<b>2.5 Building Resilience and Decarbonization:</b> Undertake resilience and decarbonization efforts based on the recommendations derived from the facility audits, considering the lifespan and upgrade timeframes of assets.	Public Works		\$\$\$	***	Long	Adaptation
<b>Programs, Policy and Planning</b>						
<b>2.6 BC Energy Step Code:</b> Add support for builders seeking to meet the upper steps of the BC Energy Step Code ahead of the timeline of 2032, and ensure that all new municipal facilities designed after 2025 are net-zero energy-ready.	Development Services		\$	***	Short	Mitigation
<b>2.7 Building Retrofit Bylaw:</b> Adopt a new bylaw to encourage energy efficiency metrics in existing buildings, in line with future iterations of the BC Building Code.	Development Services		\$	**	Medium	Mitigation
<b>2.8 Grading and Stormwater Regulations:</b> Investigate options for updating regulations regarding private property grading and stormwater management.	Public Works	Admin (Communications)	Existing Resources	**	Medium	Adaptation
<b>3. Emergency Management and Human Health</b>						
<b>City Operations</b>						
<b>3.1 Public Works Yard Flood Plan:</b> Develop a corporate contingency plan for a flooding event at the City's Public Works Yard.	Public Works		Existing Resources	*	Short	Adaptation
<b>Programs, Policy and Planning</b>						
<b>3.2 Wildfire Smoke Needs Assessment:</b> Conduct research and analysis to assess community needs during wildfire smoke events and inform response planning.	Development Services		\$	*	Short	Adaptation
<b>3.3 Implement Skeena River Flood Mitigation Recommendations:</b> Review and implement priority flood mitigation recommendations relevant to the City identified in the RDKS Skeena River Channel Management Program Report (McElhanney, 2021).	Development Services		\$\$\$	****	Medium	Adaptation

Actions	Lead Department	Supporting Department	Resources	Staff Time	Timeframe	Adaptation/Mitigation
<b>3.4 Implement Kitsumkalum River Flood Mitigation Recommendations:</b> Prioritize and implement flood mitigation recommendations identified in the Kitsumkalum River Flood Mitigation Plan.	Development Services		\$\$\$	****	Medium	Adaptation
<b>3.5 Water Level Monitoring Plan:</b> Develop a water level monitoring plan to consistently monitor and record water level observations at key municipal sites.	Public Works		\$	*	Medium	Adaptation
<b>3.6 Extreme Heat Response Plan:</b> Develop an extreme heat response plan in collaboration with provincial, district and community partners.	Parks, Recreation and Culture	Admin (Communications)	\$	**	Medium	Adaptation
<b>Partnerships and Engagement</b>						
<b>3.7 Support Extreme Heat and Wildfire Smoke Public Awareness Efforts:</b> In collaboration with relevant authorities and community organizations, create or support existing public education campaign(s) to increase awareness of health-related impacts and mitigation strategies for wildfire smoke and extreme heat.	Parks, Recreation and Culture	Admin (Communications)	\$	**	Short	Adaptation
<b>Education</b>						
<b>3.8 Develop Education Campaign for Recreating in Adverse Climate Conditions:</b> Engage with community recreation partners to develop a 'safer recreating' education campaign to support healthy recreation in adverse climate conditions (heat, smoke).	Parks, Recreation and Culture	Admin (Communications)	\$	**	Medium	Adaptation
<b>3.9 Precipitation and Storm Education Campaign:</b> Develop and implement an education campaign to increase landowner awareness of extreme precipitation and storm damage risk.	Public Works	Admin (Communications)	\$	***	Medium	Adaptation
<b>4. Land Use and Planning</b>						
<b>Programs, Policy and Planning</b>						
<b>4.1 Floodplain Management Bylaw:</b> Develop a stand-alone floodplain management bylaw, separate from the Zoning Bylaw.	Development Services		Existing resources	**	Medium	Adaptation
<b>4.2 Update Slope Hazard Guidelines:</b> Update OCP's Slope Hazard Development Permit Area Guidelines and Policies (includes identification and mapping of areas exposed to erosion and geohazard events).	Development Services		\$\$	**	Medium	Adaptation

Actions	Lead Department	Supporting Department	Resources	Staff Time	Timeframe	Adaptation/Mitigation
<b>Education</b>						
<b>4.3 ESA Education Campaign:</b> Develop and implement an education campaign to increase community awareness about environmentally sensitive areas (ESAs).	Development Services	Admin (Communications)	\$	***	Short	Adaptation
<b>5. Transportation and Mobility</b>						
<b>City Operations</b>						
<b>5.1 Review Levels of Service:</b> Review the levels of service to account for climate change impacts on the road network.	Public Works		Existing resources	*	Short	Adaptation
<b>5.2 Road Maintenance Budgets:</b> Review maintenance budgets to account for climate change impacts on the road network.	Public Works		Existing resources	**	Short	Adaptation
<b>Programs, Policy and Planning</b>						
<b>5.3 Green Fleet Policy:</b> Develop a policy to guide the transition to Zero Emission Vehicles, including the enhancement of systems for collecting emissions data and lifecycle information to support decision-making.	IVC Committee	Finance, Public Works and Development Services	\$	**	Short	Mitigation
<b>5.4 Green Fleet Plan:</b> Develop a green fleet plan to establish a clear roadmap for transitioning our fleet to electric vehicles.	IVC Committee	Finance, Public Works and Development Services	Existing resources	**	Short	Adaptation Mitigation
<b>5.5 E-bikes:</b> Examine the viability of incorporating e-bikes as an alternative to some staff vehicle trips and develop a pilot scheme.	IVC Committee	Finance, Public Works and Development Services	\$	**	Medium	Mitigation
<b>Education</b>						
<b>5.6 Promotion of Active Transportation:</b> Evaluate staff commuting emissions and promote sustainable habits by developing programs to incentivize transit use, carpooling, and active transportation.	Admin		\$	**	Medium	Mitigation
<b>6. Waste Management</b>						
<b>City Operations</b>						
<b>6.1 Dumpster Security:</b> Enhance security measures for dumpsters at City Hall and the Sportsplex to enhance proper waste diversion.	Public Works	Parks, Recreation & Culture for Sportsplex, Admin for City Hall	\$	*	Short	Mitigation

Actions	Lead Department	Supporting Department	Resources	Staff Time	Timeframe	Adaptation/Mitigation
<b>6.2 Waste Sorting:</b> Improve waste sorting at Public Works.	Public Works		Existing resources	**	Medium	Mitigation
<b>6.3 Waste Audit:</b> Perform a comprehensive waste audit on both municipal and contracted facilities to assess current waste management practices, identify areas for improvement, and develop strategies for enhancing waste reduction, recycling, and diversion efforts.	Admin		\$	**	Medium	Mitigation
<b>6.4 Recycling and Organics:</b> Implement a recycling and organics pick-up program at privately operated City-owned facilities (e.g.: RCMP, Kwinitsa, Visitor Info, and George Little House) and establish a system to record and monitor the collection of recyclables and organic waste.	Public Works		\$	***	Medium	Mitigation
<b>Programs, Policy and Planning</b>						
<b>6.5 Zero-Waste Events:</b> Establish a policy mandating all events hosted at city facilities to adopt and implement zero-waste practices. Establish a system to capture and track this information.	Admin	Parks, Recreation and Culture, and Public Works	\$	**	Medium	Mitigation
<b>6.6 Reduce Paper Consumption:</b> Develop and implement an initiative to reduce excess paper usage in corporate municipal operations (e.g., digitizing all files, standard double-sided printing) and track it through waste audits or through the Green Team Committee efforts.	Admin	Public Works	\$	**	Medium	Mitigation
<b>6.7 Street Waste:</b> Develop and implement a waste management strategy for waste in public spaces, including collaborating with RecycleBC to create effective recycling and composting initiatives.	Public Works	Admin, Parks, Recreation and Culture, and Development Services	\$\$	***	Long	Mitigation



APPENDIX B

# Risk Assessment Summary

Municipal Priority	#	Hazard	Impact statement	Vulnerability	Likelihood	Consequence	Risk
1	6.2.D	Flood	Damage to buildings and infrastructure due to flooding	12	4.0	2.9	12
1	1.4.D	Precipitation	Damage to buildings and infrastructure due to erosion or landslides near cliffs or in floodplains	20	4.0	2.4	10
1	4.1.A	Wildfire, Flooding and Landslides	Disruption of mobility due to wildfire, flooding, or landslides	12	5.0	1.9	9
1	1.3.D	Warmer temperatures	Changes to the spring freshet timing and wildfire risk due to low snowpack	12	4.0	2.3	9
2	1.3.A	Flood	Stormwater drainage issues due to increased precipitation	4	5.0	1.5	8
2	7.1.A	All	Increases in Emergency Response and Management	9	5.0	1.4	7
2	1.4.C	Flood	Increased recreation infrastructure maintenance requirements	9	5.0	1.3	6
2	1.3.C	Seasonal Temperature Shift	Increased transportation infrastructure maintenance requirements and costs	9	5.0	1.3	6
3	4.2.C	Wildfire	Decreased indoor air quality due to wildfire smoke	8	3.0	2.0	6
3	1.3.B	Seasonal Temperature Shift	Shifting tourism seasons: shorter winters, longer summers	9	5.0	1.1	6
2	2.1.A	Extreme Weather	Damage to private and commercial buildings and property from extreme precipitation and storm-related impacts	12	4.0	1.4	6
2	4.2.A	Wildfire	Increase in respiratory illnesses due to wildfire smoke	12	5.0	1.0	5
2	3.1.A	Warmer Summer Temperatures	Reduced availability of potable water due to increasing temperatures	16	3.0	1.6	5
3	5.1.A	Warmer Summer Temperatures	Stress to local aquatic species from increased water temperature	16	4.0	1.0	4

Municipal Priority	#	Hazard	Impact statement	Vulnerability	Likelihood	Consequence	Risk
2	1.2.D	Extreme Heat	Increased morbidity and mortality as indoor spaces overheat	9	3.5	1.1	4
3	1.1.C	Seasonal Temperature Shift	Increases in invasive species due to shifting climate norms	9	4.0	0.9	4
3	6.2.G	Flooding, Extreme Weather	Fish spawning habitat affected by stream turbidity and erosion from extreme weather	9	3.0	1.0	3
3	3.2.A	Seasonal Temperature Shift	Decline in local terrestrial species due to shifting climate norms	9	4.0	0.6	3
3	1.1.D	Warmer Summer Temperatures	Increased vector-borne disease transmission and spread	9	4.0	0.6	3
3	1.1.E	Warmer Summer Temperatures	Decreased soil and plant quality due to heat stress, pests	9	3.0	0.8	2
2	4.2.D	Wildfire	Decreased opportunities for outdoor exercise and recreation due to wildfire smoke	9	4.0	0.5	2

