City of Kelowna

Climate Resilience & Environmental Stewardship Review

FRAMEWORK & RECOMMENDATIONS REPORT

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Introduction

Never has climate action been more top-of-mind at a global and local level. Whether it is the global race to reduce greenhouse gas (GHG) emissions, major climate change impacts the community is experiencing with increased frequency and magnitude (e.g., wildfires, flooding, extreme heat), or the general impact of growth on our natural areas, climate and environmental issues cannot and should not be ignored.

While municipalities are only part of the solution, many are demonstrating climate leadership. Compared to senior levels of government, municipalities are the best positioned to adapt their land use planning, asset management and service models to become resilient to changing climate conditions. Local governments also have direct or indirect influence over more than half of BC's provincial inventory of GHG emissions.[1] Climate actions such as supporting sustainable transportation, creating complete/compact neighbourhoods, energy efficiency in buildings, transitioning to zero waste, and renewable power generation have a large cumulative effect in the fight against climate change.

The City of Kelowna (the City) recognizes its role in addressing the climate crisis and protecting our natural areas. Currently there are many plans, policies, and programs dedicated towards environmental stewardship, and in many cases, the City has demonstrated leadership. Despite this, there are gaps from where the City wants to go and where it is at. For example, despite steady progress on implementing the 2018 Community Climate Action Plan (CCAP)[2] and nearly a 17 per cent reduction in per capita GHG emissions between 2007 and 2018, the most recent data for community GHG emissions from 2018 show a 3.8 per cent increase compared to the 2007 baseline year. While this can largely be credited to rapid growth, the City is not reducing emissions at the level needed to reach climate mitigation targets. Moreover, as local governments take a more active role in climate adaptation efforts, the City needs to establish foundational policy that will define its approach moving forward.

Climate change is an unprecedented challenge due to its widespread impact and inherent complexity. Adequately addressing it, therefore, does not require incremental change, but transformational change. This means taking a broader more systemic look at the City's approach and considering the implementation of fundamentally different approaches. This report serves as a starting point to the transformational change that is needed.

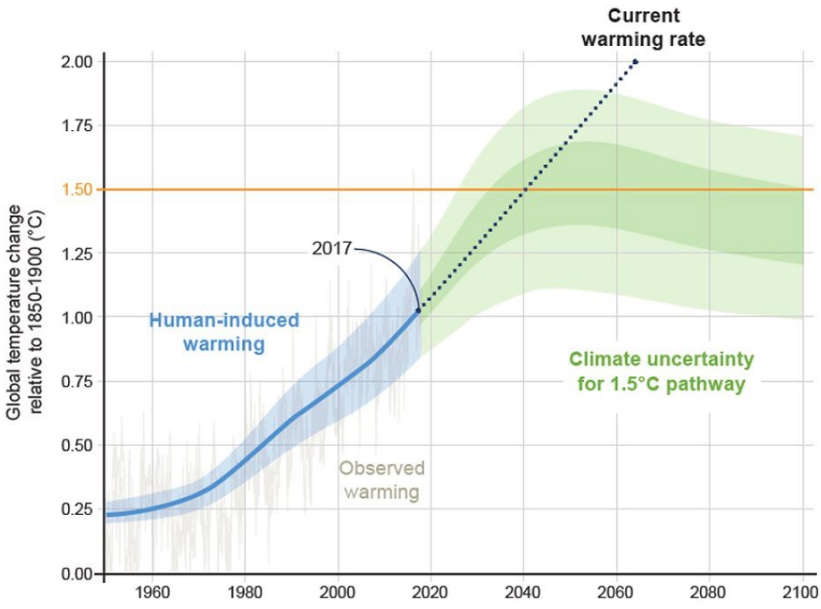
This report is divided into three sections. Part 1 provides context into the motivation, process, and scope of the review. Part 2 summarizes a recommended Climate Resilience & Environmental Stewardship Framework to define priorities and guide action at the City. Part 3 identifies a set of foundational opportunities to advance climate action and environmental stewardship (C&E) in the coming years.

Importance

The need for action on climate change has been stressed for decades at the global level, but recently the scientific community has indicated more aggressive action is needed.

In 2018 the Intergovernmental Panel on Climate Change (IPCC) released a report stressing immediate GHG emissions reductions to limit global warming below 1.5 degrees Celsius (Figure 1). Failure to do so is likely to result in catastrophic climate impacts from the international to local stage.

FIGURE 1. Pathways and uncertainty towards 1.5-degree global warming target[3]



Recognizing their role in this collective action problem, the Government of Canada and the Province of BC have responded, adopting more aggressive emissions reduction targets, with corresponding action plans to put them on the path to net-zero GHG emissions by 2050. The City of Kelowna recently followed suit with City Council directing staff to update the Official Community Plan targets to reduce emissions by 40 per cent below 2007 levels by 2030 and to reach net-zero emissions by 2050.

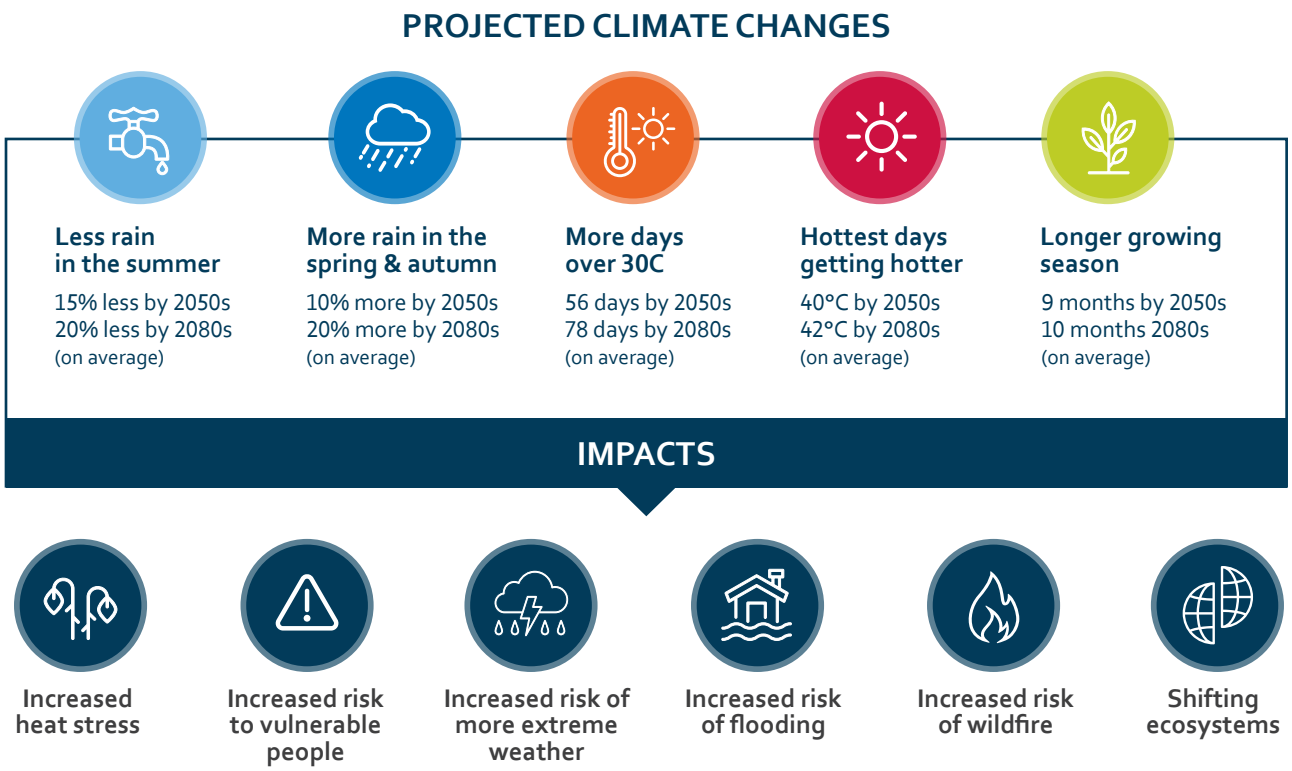
While emissions reduction efforts over the next three decades are important, the climate has already changed from over a century of rapid industrialization, growth, and fossil fuel extraction. Locally, climate changes are expected to increase in both frequency and magnitude even with aggressive action in the short-term to reduce emissions.

The Climate Projections for the Okanagan Region (2020) report models changes in the regional climate to both 2050 and 2080. The overall findings indicate that the Okanagan can expect significant changes to climate in the coming decades including:

- Warmer temperatures year-round;
- Summers that are considerable hotter and drier;
- Warmer winter temperatures;
- Increased precipitation across all seasons except summer; and
- Shifting seasons.

The main climate changes and resulting impacts expected in the Okanagan are summarized in Figure 2.

FIGURE 2. Summary of projected climate changes in the Okanagan and resulting impacts[4]



Recent years provide insight into the catastrophic impacts climate change could have on the region and on the province. Extensive flooding in 2017, followed by back-to-back years of intense wildfires, and most recently an early summer heat dome in 2021. These events are unfortunately not anomalies, but signs of what lies ahead for the community.

While most of the focus been based on climate change, there are other environmentally related considerations that matter locally. For example, as Kelowna continues to grow, protecting and restoring natural areas (e.g., water resources, sensitive ecosystems) from development impacts, and extending the life of the Glenmore Landfill through waste reduction and diversion are also important. The environmental impacts that stem from growth may be compounded by climate change, but they are also important in the absence of a changing climate.

Motivation

Planning for and managing environmental issues is not a new endeavor for local governments in BC, including the City of Kelowna. Over the last few decades, the City has been involved in natural resource management, sustainability planning, and environmental compliance efforts in various ways.

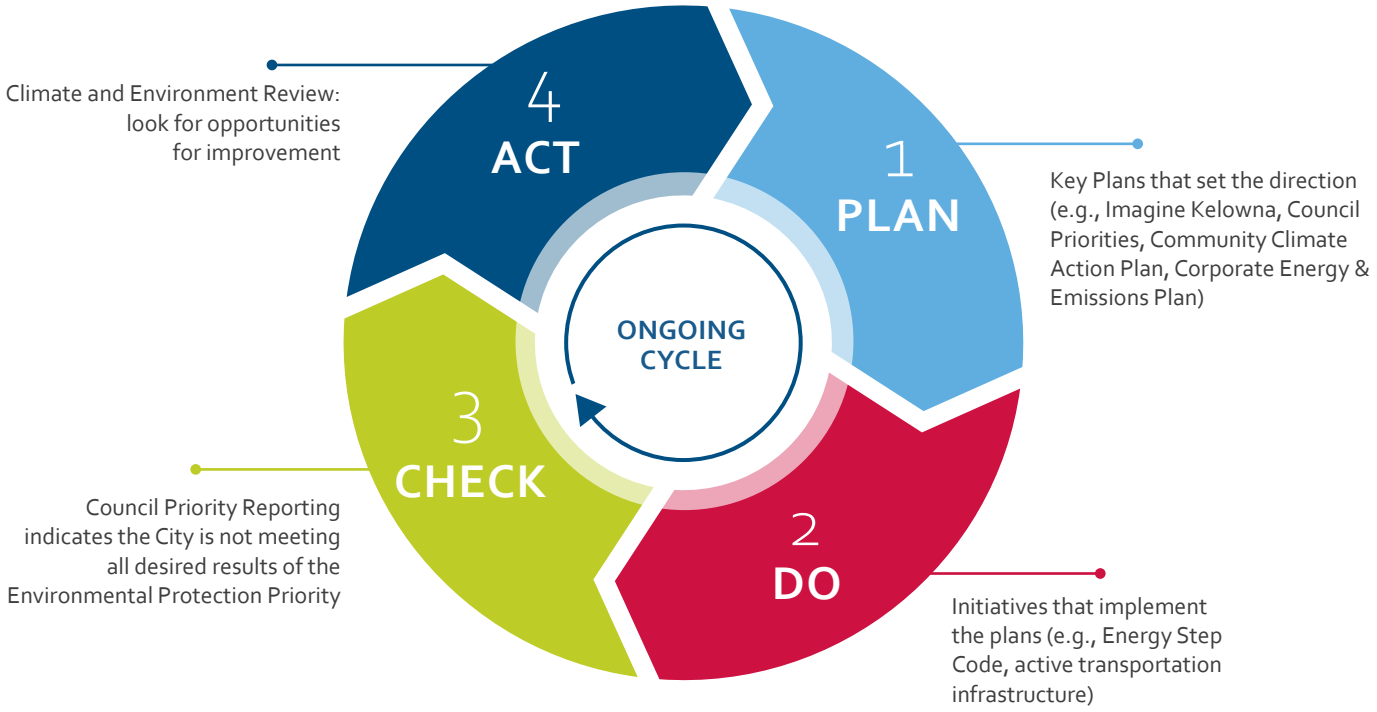
In 2007, Kelowna signed the BC Climate Action Charter, which broadened its environmental efforts towards addressing climate change; in particular, climate mitigation through emissions reduction at the corporate and community level. More recently, as impacts of climate change become more prominent and are expected to worsen, the issue of climate adaption has become an unavoidable consideration at the local scale.

As with any key business area, the City strives to continually improve performance relative to established objectives. Using the recognized Plan-Do-Check-Act (PDCA) cycle, the different elements that have led to this Review are described below and presented in Figure 3:

- **Plan:** Through Imagine Kelowna, Council Priorities 2019-2022, and plans such as the 2018 Community Climate Action Plan and Corporate Energy and Emissions Plan, the imperative for climate action and environmental stewardship was laid out.
- **Do:** The direction has been implemented through a variety of initiatives across the organization and within the community (e.g., Energy Step Code, Mill Creek Flood Protection Project, promoting wildfire resilience through Firesmart initiatives, etc.).
- **Check:** Progress was monitored through annual Council Priority reporting, which demonstrated that the City is not achieving all climate objectives (mainly reducing emissions).
- **Act:** Recognizing some of these gaps, in October 2020, Council supported staff recommendations to implement a series of initiatives to accelerate low-carbon actions in 2021.[5] To further support progress, at the 2021 Budget Deliberations, Council also supported the hiring of the two-year term Champion of the Environment position starting in 2021 to lead a comprehensive review of the City's climate and environment related policies, programs, actions, resource, and systems, and complete this report with a series of recommendations for improvements and coordination.

The motivation for a comprehensive review of the climate and environment portfolio, therefore, stems from recognition that some of the key objectives are not being met or are trending in the wrong direction. There is also recognition that as the local climate continues to change, new approaches and solutions are needed that have never been considered before.

FIGURE 3. Climate & Environment Planning Cycle



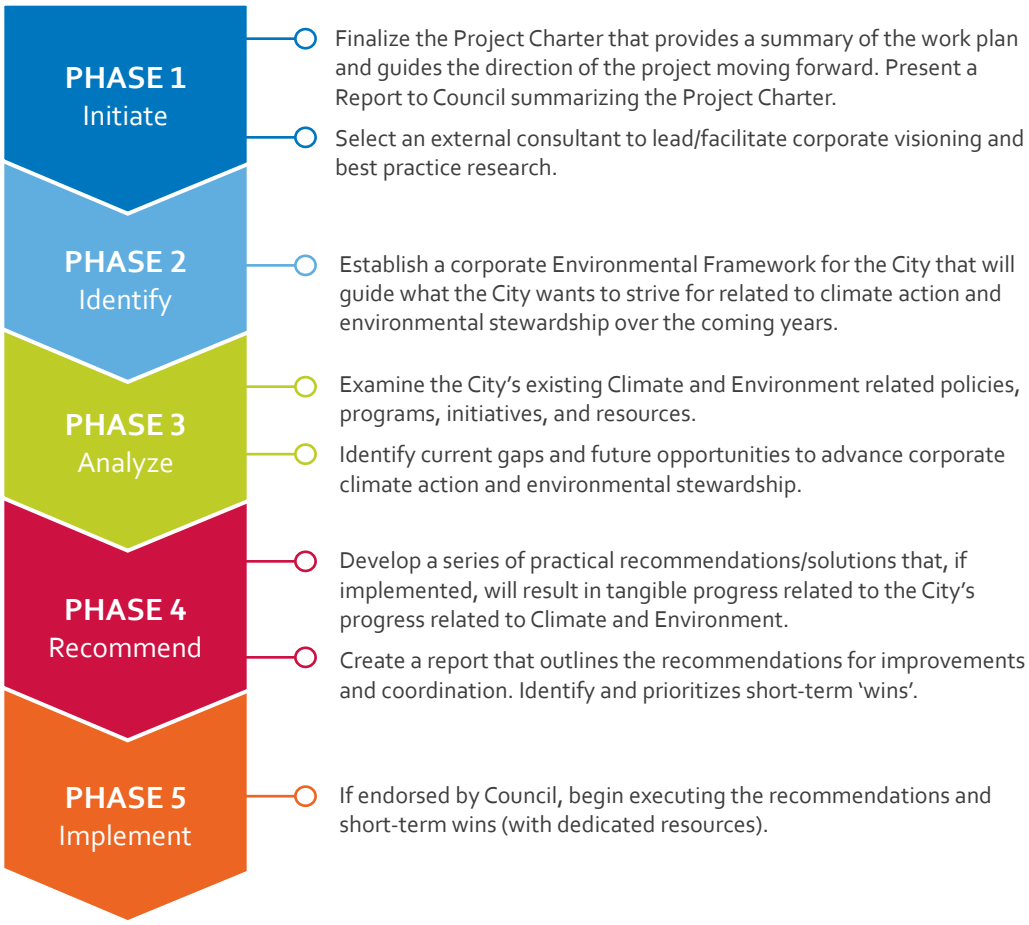
Scope

Over the past year, the Champion of the Environment led a comprehensive review of the City's climate and environment related policies, programs, resources, and systems. The overarching objectives were to:

1. Establish a Framework for the City that will define and guide C&E focal points over the coming years, including priorities/themes and goals.
2. Identify current gaps and future opportunities to advance corporate C&E performance.
3. Develop a series of practical recommendations/solutions that, if implemented, will result in tangible progress related to the City's C&E objectives.

The scope of the review includes the key phases presented in Figure 4. While implementation of recommendations is not a formal part of the review, it will be an integral part of ensuring the long-term success of the City's performance related to C&E.

FIGURE 4. Project Phases



KEY TERMS

For the purposes of this review, **Climate Action** refers to the actions that address **climate change**, which is a long-term change in the average weather patterns that have defined local, regional, and global climates. Climate action can be focused on:

- Reducing greenhouse gas (GHG) emissions (**climate mitigation**);
- Adapting to the impacts of climate change (**climate adaptation**); and
- Bridging mitigation and adaptation efforts (**low-carbon resilience**).

Environment refers to the natural environment, which includes all non-human made surroundings and conditions in which all living and non-living things exist. This includes ecological units that operate as natural systems (e.g., soil, vegetation) and natural resources (e.g., air and water). The natural environment is in contrast with the **built environment** which refers to areas that have been fundamentally transformed and influenced by human activity (e.g., buildings, infrastructure). Therefore, **Environmental stewardship** refers to the responsible use and protection of the natural environment through conservation efforts and sustainable practices.

PART 02

FRAMEWORK

Purpose

Use Cases

Vision

Pathways

Principles

Climate Resilience Framework

The roadmap to effective climate action and environmental stewardship

Principles that apply to our work:

- **Indigenous Knowledge**
- **Social Equity**
- **Triple-bottom Line**
- **Pathway co-benefits**
- **Climate-aligned Finance**

Imagine Kelowna Vision

Kelowna is a thriving mid-sized city that welcomes people from all backgrounds. We want to build a successful community that honours our rich heritage and also **respects the natural wonders that contribute to our identity. As a place with deep agricultural roots, Kelowna understands the need to protect our environment, manage growth and be resilient as our future unfolds.**

Example City Plans that inform the framework:

- Council Priorities 2019-2022
- Imagine Kelowna (The Vision to 2040)
- 2040 Official Community Plan
- 2040 Transportation Master Plan
- 2018 Community Climate Action Plan

Pathways to achieve the vision.

	CORPORATE	COMMUNITY			
PRIORITIES	Demonstrate Corporate Climate Leadership	Reduce GHG emissions	Adapt to a Changing Climate	Protect and Restore Natural Areas	Shift to a Circular Economy
DESIRED RESULTS	Climate resilience is embedded into city decision-making	Growth is centered in connected, walkable, Urban Centres and Core Area	Water consumption is in line with a changing water supply	Okanagan Lake and its tributaries are protected	Agricultural land thrives to support a sustainable local food system
	Procurement prioritizes environmental sustainability	Households depend less on the automobile and shift to sustainable modes	The community is prepared for and resilient to flooding	The community has a healthy and viable urban forest	Buildings have low embodied carbon
	Lead the way in zero-emission fleets	Vehicles are zero-emission	The community is prepared for and resilient to wildfires.	Air pollution and people's exposure to air pollutants is low	Waste is diverted from the Glenmore Landfill
	Lead the way in energy efficient buildings	New and existing buildings are energy efficient and low-carbon	The community is prepared for and resilient to extreme heat	Biodiversity and landscape diversity are preserved and enhanced	The sharing economy along with products-as-service models are growing
	The City is a trusted resource hub for community climate action	Energy is 100% renewable	Health, economic, and environmental risks from invasive species are minimized	Habitat connectivity and natural areas are protected	Resources are recovered from waste

Purpose

The City has developed the Climate Resilience Framework (the Framework) to define and guide climate action planning and environmental stewardship efforts at the City. The Framework is designed to be relevant over planning cycles and can evolve as other priorities become relevant.

The Framework is the City's roadmap to achieving the C&E elements of Imagine Kelowna's vision. It provides a clear structure on the pathways forward ensuring City staff, Council, partners, stakeholders, and residents all have a common starting place for collaboration.

The Framework is organized around **five priority pathways** that collectively help mobilize the Imagine Kelowna vision. **Each pathway consists of five desired results** that are the 'end-states' that must be met to advance each priority. The Framework also outlines **five principles**, informed by best practice research and staff engagement, that form the key values behind the vision.

The Framework and recommendations build upon key policies and plans that have guided C&E efforts at the City, including the 2040 OCP, Imagine Kelowna, Council Priorities 2019-2022, 2040 Transportation Master Plan, and 2018 Community Climate Action Plan. Thus, rather than being completely new, the Framework synthesizes the C&E related priorities and objectives form existing plans into one roadmap.

Use Cases

The Framework supports the embedding of climate low-carbon resilience and environmental stewardship at the City for multiple use cases and user groups (Table 1).[6]

TABLE 1. Use Cases of the Framework

USE CASE	The Framework can be used TO:	The Framework can be used BY:
Policy and Plan Development	Develop new policies, plans and strategies to ensure that C&E is embedded in these efforts.	• Staff • Council
Decision-Making	Inform decision-making by the City for budget development and the prioritization of projects, plans, strategies, and policies.	• Staff (Senior Leadership Team) • Council
Action Plans	Develop actions, which are developed by different departments within the City to address C&E priorities.	• Staff • Neighbouring local governments
Progress Reporting	Evaluate the City's overall progress and the effectiveness of specific policies, plans, initiatives, and departments.	• Staff • Council • Public
Communication	Help communicate the City's C&E priorities to City staff, external stakeholders, and the public.	• Staff • Council • Public • Businesses and Non-Profits • Academia • Other local governments
Applied Research	To inform a research agenda and research priorities among numerous stakeholders (e.g., academia, nonprofits, etc.)	• Academia • Non-Profits

Vision

The Framework is guided by Imagine Kelowna's vision:

> "Kelowna is a thriving mid-sized city that welcomes people from all backgrounds. We want to build a successful community that honours our rich heritage and also **respects the natural wonders that contribute to our identity. As a place with deep agricultural roots, Kelowna understands the need to protect our environment, manage growth and be resilient as our future unfolds."**

This vision describes the qualities the community wants to exemplify. The vision demonstrates a strong community appreciation for the natural environment, a desire to protect it, and to be resilient in an uncertain climate future. The Framework provides more clarity on what the City will prioritize to be bold and put the vision into action.

Pathways

The Framework is organized around five pathways to ensure the vision is achieved. The pathways focus on the following priorities:

Each pathway consists of five desired results that are the 'end-states' that must be met to advance each priority. The desired results are further intended to guide the identification and development of priority C&E initiatives. While each pathway is distinct, they are also interconnected, and together create a climate resilient system.

Demonstrate Corporate Climate Leadership

This pathway is focused on setting an example regarding climate action and environmental stewardship. The City should demonstrate leadership that other community stakeholders can follow while also delivering on some of its own corporate objectives (e.g., corporate GHG emissions reduction). This involves embedding climate resilience into decision making across the organization, practicing environmentally sustainable procurement, reducing GHG emissions in the corporate fleet and city facilities, and being an active and trusted resource for climate action for others in the community.

- **Climate resilience is embedded into City operations and asset management:** The City provides many services and often C&E are not core considerations in providing those services. Therefore, trying to find ways to ensure C&E is contemplated in everything the City does is important. Essentially this means applying a C&E lens to our service offerings.

- **Procurement prioritizes environmental sustainability:** Sustainable procurement embeds relevant environmental sustainability considerations (e.g., reduced GHG emissions, waste reduction) into processes for selecting goods and services, alongside traditional considerations like price, quality, service, and technical specifications. While this desired result is specific to environmental sustainability, sustainable procurement could also include ethical, social, and Indigenous considerations.

- **Lead the way in zero-emission fleets:** While most of the City's energy usage and GHG emissions are from buildings, the energy needed to move staff around still plays a significant role. Decarbonizing the City's fleet may be the 'low-hanging fruit' for corporate GHG emissions reduction because of proven zero-emission vehicle (ZEV) technology. The City is already converting many light duty vehicles to ZEVs, contingent on the availability of electric vehicle (EV) inventory. Going forward, as ZEV technology becomes more mainstream for medium and heavy-duty vehicles, there is opportunity to expand ZEV composition of the fleet. Further, vehicle right-sizing and mode shifting could also help the City decarbonize its fleet.

- **Lead the way in energy efficient and low-carbon buildings and infrastructure:** The energy needed to power the City's facilities is the number one source of corporate GHG emissions. The City requires the use of energy in order to operate and maintain a wide range of assets and infrastructure in order to provide services to a community with a population that is growing very quickly. This includes heating and cooling facilities such as administrative and recreational buildings. An important component to an energy program is policy around the design and construction of new civic facilities as well as addressing renewal and retrofits of existing buildings.

- **The City is a trusted resource for community climate action:** Responding to the climate crisis will require action on the part of all members of the community, whether choosing a different transportation mode, retrofitting one's home, or supporting water conservation or wildfire resilience. The City can support local implementation of policies and plans through education and awareness with the public and key stakeholders.

Reduce Community GHG Emissions

This pathway focuses on reducing community sources of GHG emissions to curb climate change, which can lead to new economic opportunities, and improve the health of people and natural systems. Aligning with IPCC recommendations to curb global warming within the 1.5° Celsius threshold, City Council recently directed staff to update the Official Community Plan community emissions reduction targets to 40 per cent below 2007 levels by 2030 and net-zero by 2050 (See Figure 5 for Kelowna's GHG emission reduction pathway to 2030). Successful low emission development in Kelowna means promoting sustainable transportation through effective land use and alternative transportation modes, supporting the shift to ZEVs, decarbonizing buildings, and shifting to renewable energy sources.

- **Growth is centered in connected, walkable Urban Centres and the Core Area:** Perhaps the simplest way to reduce emissions is to reduce the need to travel at all (i.e., reduce vehicle kilometres travelled). By locating growth closer to jobs and destinations where people can live, work and play in the same area without needing to get in an automobile, the average distance driven per person, and consequently the emissions associated with travel, could be drastically reduced.

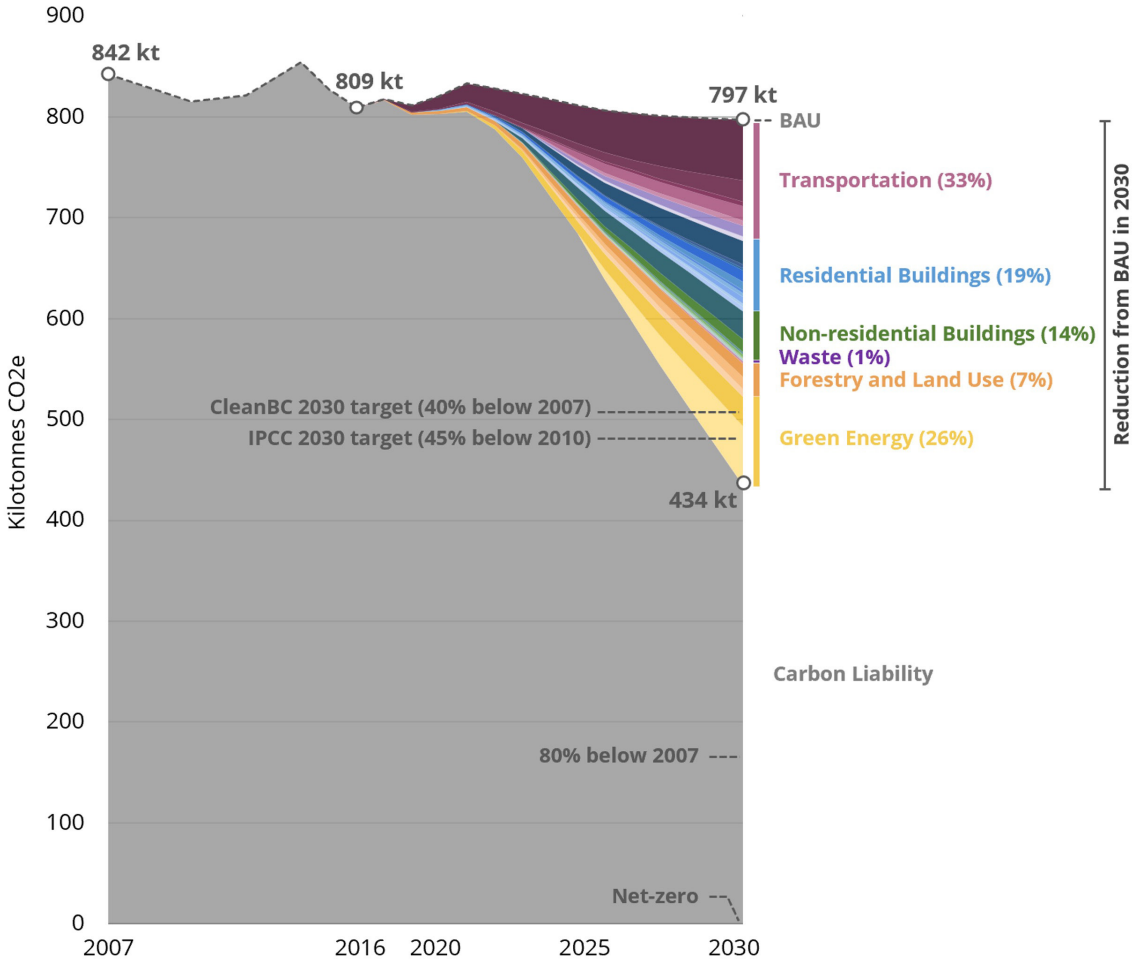
- **Households depend less on the automobile and shift to sustainable transportation modes:** Transportation accounts for over half of the community's GHG emissions, so naturally ensuring less trips are taken from gas guzzling, single occupancy vehicles will go a long way in reducing GHG emissions. This means increasing use of public transit, active transportation (e.g., walking, biking), and increasing the use of shared mobility. Car-centric cities are also centres of pollution and ill-health, so shifting investments to sustainable transportation has other co-benefits that extend beyond emissions reduction.

- **Vehicles are zero-emission:** Even with a focus on mode-shifting, Kelowna residents will continue to rely on the automobile in some capacity for the foreseeable future. With that, the challenge then is to reduce GHG emissions from kilometres travelled by automobiles in the community by shifting away from fossil fuels (i.e., internal combustion engine) to those that emit zero or low amounts of GHG emissions. These systems include EVs, hydrogen fuel-cell technology, and renewable fuels (e.g., biofuels). Currently, EVs are the only low-carbon option at the point of market transformation that can make significant impact on GHG emissions reduction over the next decade. EVs also have other benefits relative to traditional gasoline and diesel vehicles that add to their rising value (e.g., lower operating/fuel costs, lower maintenance costs, reduced noise pollution, and improved air quality in urban centres).

- **New and existing buildings are energy efficient and low-carbon:** Buildings account for 40 per cent of community GHG emissions, and most of this is attributed to fossil fuel heating and cooling systems (e.g., natural gas). Energy consumption can be reduced through better efficiency (e.g., efficient technologies, improve the building envelope), or through fuel switching from fossil fuel heating systems to clean energy technologies. Embodied carbon (i.e., the emissions associated with producing building materials) is also an important consideration of the lifecycle emissions of buildings. Embodied carbon is addressed in the "Shift to a Circular Economy" pathway.

- **Energy is 100 per cent renewable:** Achieving 100 per cent clean energy means eliminating emissions from energy use in all sectors of the economy, which could largely be achieved through other components of this pathway. In BC, this predominantly means electrification of transportation and buildings, but other clean energy sources such as renewable natural gas (RNG), and small-scale renewable energy (e.g., solar, geothermal, wind) can help shield residents from rising energy costs while supporting a resilient energy supply system.

FIGURE 5. Kelowna's community emissions reduction pathway to 2030



Adapt to a Changing Climate

Even with aggressive emissions reduction at a local and global level, Kelowna's climate has changed and will continue to over the coming decades. Therefore, the community must be prepared for and be resilient to local climate impacts that are increasing in frequency and magnitude, such as droughts, flooding, wildfires, extreme heat, and invasive species.

- **Water consumption is in line with a changing water supply:** The Okanagan has the highest water consumption per capita in Canada, and water consumption continues to grow as the population increases. There is a high demand for water use from agriculture and landscaping, and the current level of water demand is likely to result in increasing stress on the regional water supply with a changing climate. Flooding and water shortages can decrease water quality and will likely trigger higher water restrictions and water use conflicts, particularly in years where water demand increases to manage wildfire activity. Finding ways to conserve water is vital to ensure water demand does not regularly exceed supply, and to ensure our precious water resources are not depleted.

- **The community is prepared for and resilient to flooding:** Kelowna is no stranger to flooding damages, having experienced them on our rivers and lakes in recent years. With climate change driving up the frequency and intensity of flooding events, the risks and impacts to residents, the local economy, critical infrastructure, and natural areas will only continue to grow. Finding ways to prepare for and become resilient to these anticipated changes helps reduce the vulnerabilities of natural and human systems to new climate realities.

- **The community is prepared for and resilient to wildfires:** The 2017, 2018, and 2021 fire seasons proved to be three of the most historically damaging seasons on record. Similar to flooding, climate change is driving up the frequency and intensity of wildfire events, and the City needs to manage the associated risks by being proactive in preparing for and becoming resilient to the expected change.

- **The community is prepared for and resilient to extreme heat:** Local climate projections indicate summer temperatures are expected to warm considerably over time, with the hottest days getting hotter and more days with hotter temperatures. Therefore, events like 2021's early summer heat dome that caused temperatures to soar up to 10 degrees above normal and causing 32 deaths in the Okanagan are unfortunately expected to become more common. As with other climate impacts, the City needs to manage the associated risks to vulnerable populations by preparing for and becoming resilient to the expected change.

- **Health, economic, and environmental risks from invasive species are minimized:** As climate change occurs, ecosystems and species can be expected to experience stress, resulting in changes to biological diversity. Warmer temperatures and fewer frost days will enhance the potential for invasive species, pests, and pathogens to increase across the Okanagan, compromising the ability of native species to survive and triggering a loss of biodiversity. The risks to public health, the local economy and the environment need to be understood, and intervention efforts in sensitive ecosystems, riparian areas, and wetland should be prioritized.

Protect and Restore Natural Areas

There is no doubt that Kelowna's foundational quality is its natural beauty. People live and visit the area because of Okanagan Lake, the forests, the mountains, and the local biodiversity. These natural assets are invaluable from an environmental, social, and economic perspective, and therefore need to be protected, enhanced, and restored in the face of climate change and development pressures.

- **Okanagan Lake and its tributaries are protected:** Okanagan Lake is the community's greatest natural asset, drawing people to the region for lifestyle and recreation opportunities. The lake, along with its tributaries, are also an important source of water for drinking, irrigation, and fighting wildfires. As well, many of the waterfront areas that people like to visit are also important wildlife and flora habitats. The community wants the City to protect natural streams and the storm water system that feeds into Okanagan Lake to maintain higher water quality, while also balancing recreational and quality of life opportunities with environmental protection, and public ownership of the waterfront.

- **The community has a healthy and viable urban forest:** Kelowna's urban forest includes every tree in the city – on streets, in parks, public spaces, and back yards. Urban forests play important environmental and social roles: they cleanse the air, act as a carbon sink, absorbs rainwater, provide bird habitat, and improve health and well-being. Therefore, there is a strong incentive to not only protect but also restore and expand the urban forest in our city.

- **Air pollution and people's exposure to air pollutants is low:** Although the air quality in the Central Okanagan is generally acceptable, a recent PM2.5 Study in the Central Okanagan showed specific neighbourhoods may reach higher concentrations of particulate matter at times due to local wood burning sources, vehicle emissions, and road dust. Finding ways to manage or restrict the release and concentration of particulate matter and other pollutants can help improve local air quality, ensuring the air we breathe is as clean as possible.

- **Biodiversity and landscape diversity are preserved and enhanced:** Biodiversity is the richness of plant and animal species, their habitats, and the ecological processes that sustain them. This includes Kelowna's aquatic and terrestrial ecosystems. Recognizing the environmental, socio-cultural, and economic value of local biodiversity and its ecosystem services, the City wants to increase the amount and quality of Kelowna's natural areas to support biodiversity and increase access to nature. This means supporting and celebrating biodiversity by greening our operations, and restoring forest, wetland, and shoreline habitats throughout the city.

- **Habitat connectivity and natural areas are protected:** Many aquatic and terrestrial ecosystems are important because of their environmental significance as habitat for fish and wildlife, ecosystem connectivity, their contribution to local and regional biodiversity, their role in reducing climate change impacts, and their sensitivity to disturbance by development. Protecting these areas and the vital ecosystem services they provide, while also identifying new environmentally sensitive areas is important to ensure impacts associated with growth and development are minimized. In practice, this means following through with the OCPs No Net Loss Policy, which strives to balance unavoidable habitat, environment and resource losses with replacement of those items on a project by project basis so that further reductions may be prevented.

Shift to a Circular Economy

While community growth has its benefits (e.g., bringing new amenities, employment, and educational opportunities), rapid change can also bring challenges, including an increase in the creation of products, materials, and consequently waste and pollution. If the City is going to deliver on its climate action, environmental protection, and waste management objectives, transitioning from a "take-make-waste" linear system to a circular economy will be vital (see Figure 6). This can be accomplished by shifting to a sustainable local food system, reducing the embodied carbon of the built environment, reducing waste and diverting it from the landfill, recovering resources from waste, and moving to a sharing economy.

- **Agricultural land thrives to support a sustainable local food system:** More than 40 per cent of Kelowna's land base is within the Agricultural Land Reserve (ALR) and about 55 per cent of the city's land base is zoned for agriculture (including both ALR and non-ALR-land). The City and provincial partners are making strong efforts to protect valuable agricultural land and encourage a successful agricultural industry. The feedback received during Imagine Kelowna made it clear that agriculture is important to the community as a whole and not just people who are directly connected to farming. Cities are also being relied upon to play a role in developing resilient food systems, by integrating urban food security and urban agriculture into climate change adaptation and disaster management strategies.

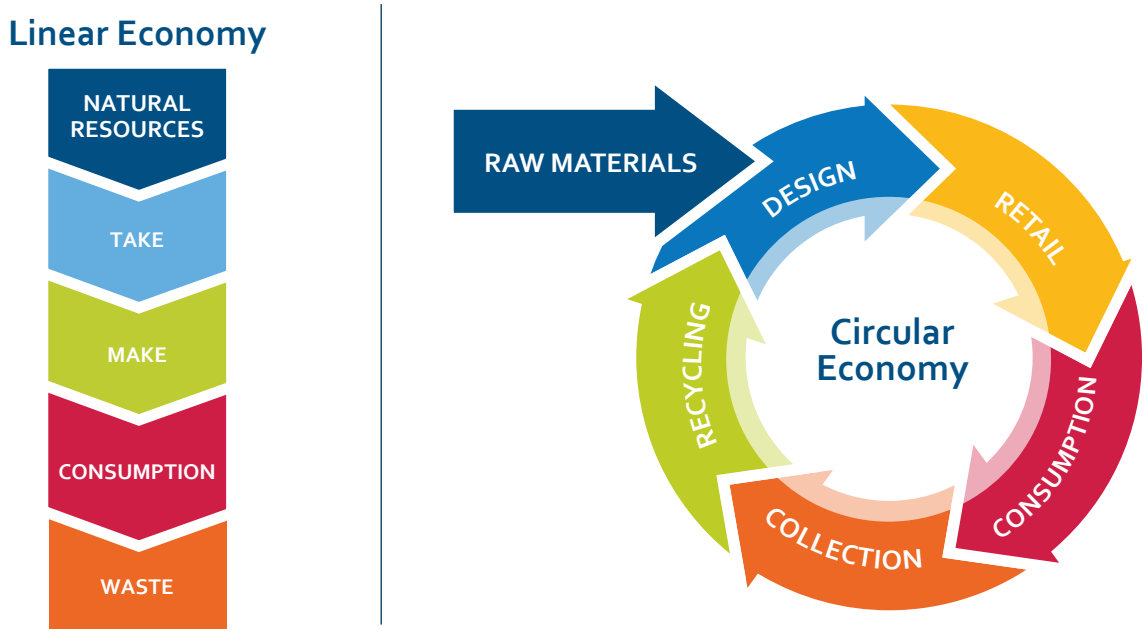
- **Buildings have low embodied carbon:** In the building industry, embodied carbon refers to the emissions arising from the manufacturing, transportation, installation, maintenance, and disposal of building materials. In contrast, operational carbon refers to the emissions due to building energy consumption only. Most of a building's total embodied carbon is released upfront in the product stage at the beginning of a building's life. Unlike with operational carbon, there is no chance to decrease embodied carbon with updates in efficiency after the building is constructed.

- **Waste is reduced or is diverted from the Glenmore Landfill:** Most garbage collected for disposal ends up in the Glenmore Landfill and a small amount is incinerated. While the landfill has a relatively long life expectancy (~70 years remaining), disposing waste at its current rate is not a sustainable solution. Landfilling can also contribute to emissions, land disturbance, and water pollution. Further, the extraction and processing of new resources needed to replace those discarded as waste leads to more pollution. Diverting waste (along with creating less waste to begin with) can help reduce the impact of solid waste on the environment and prolong the life of the Glenmore Landfill.

- **Resources are recovered from waste:** Resource recovery is using wastes as an input material to create valuable products as new outputs. While the aim is to reduce the amount of waste generated or diverting waste from the landfill, some waste will be created; but there is still the opportunities to create value from waste even after it is created. For example, capturing methane gas from decomposing liquid and solid waste and upgrading it to heat homes or using yard waste to make compost are examples of how the City has recovered value from waste.

- **The sharing economy along with products-as-a-service models are growing:** The sharing economy is an opportunity for sustainability. The possibility of using assets without the need of owning the property reduces the need for goods production and reduces waste. Systems of the sharing economy can positively impact the environment by improving resource efficiency and promoting sustainable growth by mitigating excess consumption.

FIGURE 6. Linear economy vs. circular economy[7,8]



Principles

The Framework outlines five principles, informed by best practice research and staff engagement, that form the key values behind the vision:

- Recognize the value of local Indigenous Knowledge
- Consider Social Equity in decision-making and implementation
- Prioritize initiatives with "triple-bottom-line" benefits
- Prioritize initiatives with co-benefits between Pathways
- Balance short-term savings with costs of inaction

The intent is to apply these lenses to all practices and activities related to climate action and environmental stewardship at the City. This does not mean that every initiative will address each principle; but rather, each initiative will consider each principle during conception, and apply them when appropriate.

Recognize the value of local Indigenous Knowledge

Climate change is a multi-dimensional, complex problem that requires a diversity of worldviews and perspectives, including Indigenous Knowledge Systems, to develop novel approaches to address the urgency and complexity of the issue. The syilx Okanagan People have occupied the Okanagan Region for time immemorial, living in harmony with the natural world. Their perspective, therefore, comes from a place of experience and best practice that is invaluable in addressing such a complex problem.

Indigenous engagement on climate action and environmental protection is not a check box. Deep and collaborative engagement is fundamental for the City in addressing climate change. The syilx Okanagan people should not just be consulted in shaping decisions related to climate action and environmental protection, but also in collaboratively identifying solutions.

Consider Social Equity in decision-making and implementation

The modern socioeconomic environment has contributed to ongoing social inequities for certain demographics such as low-income and disadvantaged populations, Indigenous peoples, women, racial minorities, marginalized ethnic groups, and the elderly. These inequities become exacerbated by climate change; therefore, work on climate resilience needs to have an intersectional lens to consider how different groups are affected and may be at greater risk to climate impacts.

As the effects of climate change mount, so does the urgency to ensure equity while pursuing solutions. Inadequate action will mean more lives lost, worsening inequality, and major economic disruptions. The City needs to prioritize action for climate vulnerable populations, and consider social equity at all levels of decision-making and implementation. This will also support addressing the social inequities that are driving this vulnerability.

Prioritize initiatives with "triple-bottom-line" benefits

Environmental, social, and economic wellbeing are often considered mutually exclusive: events that cannot occur simultaneously. While trade-offs are inevitable in certain instances, there are many examples of climate/environmental initiatives that have social and economic co-benefits. The concept of sustainability has evolved, but its central principle that what is good for the planet can also be good for people and profit (and vice versa) is still valid. Exploring opportunities for mutual benefits ensures the City is delivering on climate objectives while also aligning with other social and economic priorities.

Prioritize initiatives with co-benefits across Pathways

Each of the five pathways focuses on a central purpose. For example, the primary value of desired results under the "Reducing GHG Emissions Pathway" is to reduce community emissions. However, the results and corresponding actions may have other benefits that extend to other pathways. Expanding the urban tree canopy can help to protect natural areas but also will reduce emissions through carbon sequestration and support climate resilience by providing shade, making cities more comfortable during extreme heat events. Reducing embodied carbon of building materials will support the shift to a circular economy but will also help reduce corporate and community emissions. The City needs to be deliberate in searching for solutions that have co-benefits across multiple pathways. Doing so will result in efficiencies and will also ensure solutions do not contradict with other pathways.

A particular focus is bridging climate mitigation and adaptation efforts through low-carbon resilience. The City needs to prioritize integrated policies, pursue systemic actions, and invest in projects that concurrently: (1) reduce climate risks and vulnerabilities; (2) reduce emissions; and (3) advance other corporate and community priorities such as community safety, health, equity, and economic development.[8]

FIGURE 7. Low-carbon resilience approach

Balance short-term savings with costs of inaction

Climate change is having and will continue to have a financial impact on the City. As climate events become more extreme and occur more frequently, it disrupts and damages infrastructure, driving up repair costs and shortening asset lifetimes. The City needs to balance paying predictable costs today for reducing GHG emissions and building climate resilience, compared to delaying action and paying higher and unpredictable costs later to try and cope with the impact of climate change on less resilient infrastructure.

Although staff needs to demonstrate sound financial management in the short-term by seeking C&E initiatives that can save money for the City and taxpayers, it also needs to recognize that for many climate related projects, the cost of inaction will only grow over time. Therefore, the cost of inaction needs to be taken into consideration when evaluating the financial merits of C&E related initiatives.

PART 03

RECOMMENDATIONS

Recommendations and Quick Starts

Moving Forward

Recommendations and Quick Starts

Demonstrate Corporate Climate Leadership

RECOMMENDATIONS	QUICK STARTS
Apply a Climate Lens for Decision Making across the organization	• Develop a climate lens decision making tool • Develop an internal carbon price and to guide climate friendly purchasing
Reduce fleet emissions through rapid electrification of the light duty fleet	• Apply an electric first purchasing policy for new light duty vehicles
Develop 'green' standards for City facilities	• Develop a sustainable building policy for new City facilities
Expand educational resources to help residents participate in the City's climate action and environmental stewardship efforts	• Develop a Resident's Guide to Climate Action

Reduce GHG Emissions

RECOMMENDATIONS	QUICK STARTS
Prioritize efforts to decarbonize Kelowna's biggest source of emissions: Transportation	• Continue to invest in transit service and active transportation infrastructure per the Transportation Master Plan • Fund and implement Transportation Demand Management Initiatives • Support the shift to EVs through a vast charging network
Adopt a low-carbon approach to Energy Step Code	• Establish an Energy Step Code Adoption Schedule with low-carbon priority
Bring together energy and resilience into one Home Retrofit Program	• Continue to design a home retrofit program through the FCM Community Efficiency Financing Program • Pilot a home energy coordinator support service • Direct incentives to proven low-carbon technologies (e.g., electric heat pumps)

Adapt to a Changing Climate

RECOMMENDATIONS	QUICK STARTS
Combine Climate Mitigation and Adaptation into one Climate Resilient Kelowna Strategy	• Complete a Community Climate Vulnerability and Risk Assessment
Develop a strategy to expand blue and green infrastructure	• Explore options to incorporate climate resilience in roof space for new construction
Implement the proposed actions of the Community Wildfire Resilience Plan	• Expand FireSmart Programs

Protect and Restore Natural Areas

RECOMMENDATIONS	QUICK STARTS
Identify and manage natural assets, species-at-risk, and critical habitat	• Develop a strategy to monitor changes to sensitive ecosystems • Invest in relevant datasets to give a better picture of key environmental indicators • Develop a Natural Asset Management Strategy
Develop a Natural Environment Strategy with City responses to regional strategies	• Inventory and develop City responses to regional and provincial natural environment strategies, such as the Okanagan Region Biodiversity Strategy, Okanagan Lake Responsibility Plan, and Central Okanagan Non-Structural Flood Mitigation Resource Guide

Shift to a Circular Economy

RECOMMENDATIONS	QUICK STARTS
Focus waste diversion efforts on construction and demolition debris	• Complete a Construction & Demolition Debris Reuse & Recycling Feasibility Study • Explore policy for low-carbon concrete
In collaboration with regional partners, develop a Circular Economy Strategy	• Participate in the Canadian Circular Cities and Regions Initiative Peer-to-Peer Network

Corporate Climate Leadership

Apply a Climate Lens for Decision Making across the organization

Gap: Integrating climate change data and considerations needs to happen in day-to-day municipal operation, not just through major community or service delivery plans. The City has various policies and plans with a deliberate climate action focus (e.g., Community Climate Action Plan, Energy Step Code Implementation Strategy for Part 3 Buildings, Community Wildfire Protection Plan), many of which provide a clear indication of how climate mitigation or adaptation objectives are being addressed. However, the City does not have tools to ensure that climate impacts, opportunities, risks and potential benefits and savings are systematically considered in all decisions, especially those where climate is not the major motivator.

Recommendation: Climate resilience relies on effective policy planning and decision-making. From Planning and Development Services, to Engineering and Purchasing, to administrative and front-line staff, every City employee can play a role in addressing climate change. The City makes important decisions every day, for instance when it decides to construct a new building, purchase new fleet vehicles, and improve services. There are key opportunities for the City to look at these decisions with a "Climate Lens". A Climate Lens is a framework to incorporate climate change into decision-making processes and demonstrate municipal leadership.

Climate decision-making provides a comprehensive approach for decision-makers to make decisions with respect to the underlying mitigation or adaptation impacts. The IPCC defines a "good" climate decision as one that integrates climate information, impacts, potential risks, and vulnerability into an existing or proposed decision-making context. It is an iterative process centered around emissions reductions and other climate-related impacts to develop cost-effective initiatives or projects.

Quick Start: Develop a climate lens decision making tool

This Quick Start aims to create a climate lens program to give staff across the organization the resources and tools to undertake purposeful emissions analysis and climate risk assessments for relevant initiatives, enabling climate-informed decision-making. The Climate Lens will facilitate the mainstreaming of climate considerations into operations and capital project planning and major decisions.

The Climate Lens program will aim to achieve the following objectives and outcomes:

- Integrate climate considerations into strategic decision-making;
- Build staff climate competency and leadership;
- Increase climate accountability;
- Increase transparency through reporting; and
- Monitor climate performance.

The Climate Lens program will initially focus on new operating programs and capital projects to ensure future investments are aligned with the City's emissions reduction goals and climate risk adaptation needs.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST
Policy/Tool	High Importance Medium Urgency	2-3 years	Ongoing	$50-100K

Quick Start: Develop an internal carbon price to guide climate-friendly purchasing

To complement a climate decision making tool, it is recommended that the City adopt an internal carbon price to ensure carbon pollution is considered in the financial analysis for corporate purchases. Although the social, environmental, and economic benefits of reducing emissions are well-established, they are often under-represented in decision-making processes. Setting a corporate carbon price is one approach that local governments can use to better account for those life-cycle benefits. Integrating a carbon price into decision making processes provides a consistent shift towards lower carbon outcomes such as renewable energy and energy efficiency.

An internal corporate carbon pricing policy would essentially be a "shadow price" used in financial analyses to compare actual and/or notional costs for different options. A corporate carbon price is not the same as a carbon tax, which is a carbon price set by a government and applied across a jurisdiction. In those cases, the carbon tax is paid by residents, businesses, and other organizations based on the carbon pollution they emit, thereby providing an incentive for them to reduce their carbon pollution. In this case, the carbon price is used only to inform decision-making, but there is no real fee paid.

While the price would need to be determined, other local governments, such as Metro Vancouver and City of Vancouver, have applied a net carbon price of $150 per tonne of CO_2e, escalating annually using a 1.06 multiplier after 2022.[9] Other examples of local governments that have an internal carbon price include New Westminster, District of Saanich, and Dawson Creek.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST
Policy/Tool	High Importance Medium Urgency	3-6 months	10 years	$10-25K

Reduce fleet emissions through rapid electrification of the light duty fleet

Gap: The City's fleet is comprised of around 270 vehicles made up of a variety of classes, makes, and models. As per the Green Fleet Strategy, over the next 10 years the City anticipates a two per cent annual growth in fleet size, and if procurement continues with business-as-usual practices, a 20 per cent growth in fleet emissions by 2031 is expected. There are zero-emission vehicle (ZEV) replacement options available for many of the vehicle classes within the City's fleet, and as electric vehicle (EV) technology continues to improve, it is likely those options will expand, especially for medium- and heavy-duty vehicles. The City has pledged to convert 10 per cent of the light duty vehicle fleet to EVs by 2023 through the West Coast Electric Fleets initiative, and, in 2021, recommended a fleet-specific GHG reduction target that matched the Provincial Transportation target of 27-32 per cent below 2007 emissions by 2030. However, this was prior to the release of CleanBC Roadmap to 2030 in the Fall of 2021, and the EV landscape continues to change rapidly. Additional EV purchases in the coming decade are needed to achieve deeper emissions reductions.

Recommendation: To lead the way in zero-emission transportation, it is recommended the City electrify all on-road fleet vehicles based on known technological availability over the next 10 years. The Green Fleet Strategy indicates this would result in a 49 per cent reduction in on-road emissions compared to 2021. Further emissions reductions could be achieved with fleet rightsizing, optimal fleet utilization, reductions in EV capital costs, off-road fleet vehicle electrification, increases in the carbon tax, and additional EV replacement options for medium- and heavy-duty vehicles. While this level of EV adoption would increase the City's capital spend, it would reduce operating expenses. As a result, the total life cycle costs of the fleet could be reduced.

Quick Start: Apply an electric first purchasing policy for new light duty vehicles and install the infrastructure to support the shift

Supply issues aside, EV technology is available now for most light-duty vehicles. Of the vehicle classes within the City's fleet, there are ZEV replacement options available currently or within the next three years for the following vehicle classes:

- Cars
- SUVs
- Light-duty trucks
- Select Heavy Duty Trucks
- Vans

With price parity between EVs and internal combustion engine vehicles expected by 2025, lower operating costs, and the environmental benefits of EVs, the shift to EVs is making more and more sense. It is important for the City to capitalize on replacement cycles for light duty vehicles because purchasing decisions lock customers into a particular vehicle for 3-5 years, depending on the lifecycle. Therefore, it is recommended the City develop an electric first purchasing policy that will change the mindset from needing to justify an EV purchase to needing to justify why not to purchase an EV. An internal carbon price could be applied to support the business case.

A critical component for elec¬tric vehicle fleets is the charging infrastructure required to maintain or improve the operating flexibility offered by gas-powered fleets. To support the EV transition outlined in the City's Green Fleet Strategy, a Battery Electric Vehicle (BEV) Infrastructure Assessment was completed that outlined the charging requirements needed to support the transition to BEVs. The study identified any required utility upgrades for charging infrastructure at 10 City facilities. It is recommended that charging infrastructure be funded and installed as per the study's recommendations. Grant funding should be pursued where appropriate.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST
Policy & Procurement	High Importance High Urgency	3-6 months	10 years (potentially ongoing)	$50,375,974*
Infrastructure	High Importance High Urgency	Costing study complete	10 years	$1,830,000

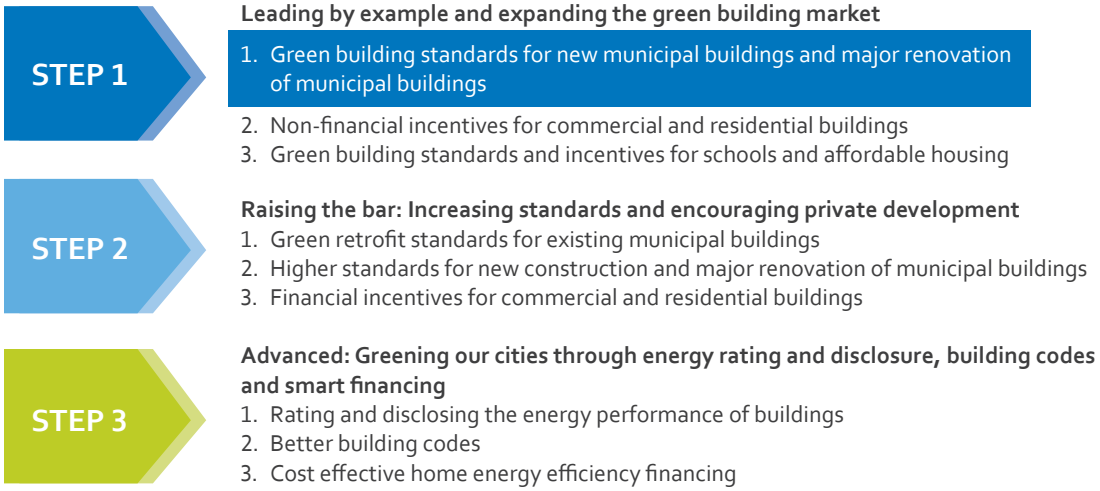
** Only a $516,398 premium comparing ICE-to-EV and ICE-to-ICE purchases over the next 10 years.*

Develop 'green' standards for City facilities

Gap: Through the *BC Climate Action Charter* the City committed to carbon neutral corporate operations. Further, through the 2018 Corporate Energy and Emissions Plan, the City set a target to reduce corporate emissions by 12 per cent below 2007 levels by 2022. Available data suggests that the City's corporate emissions remained stagnant between 2007 and 2018.[1] Buildings account for 43 per cent of corporate emissions, and currently the City does not have standards in place to ensure that construction of new buildings and renewals to components of existing buildings are built to a defined energy efficiency or low-carbon standard. As such, while some new and existing buildings have incorporated green features, many have not.

Recommendation: Municipal buildings can serve as a model for developing community-wide energy efficiency and environmental sustainability practices for all new construction and development. As outlined by the U.S. Green Building Council, the first step in establishing a greener built environment is to establish green development standards focused on new municipal buildings and major renovation of municipal buildings (Figure 8).

FIGURE 8. Recommended municipal steps for implementing green building policies



Focusing on municipal buildings can demonstrate municipal leadership as these buildings are highly visible and provide an opportunity to educate community members about the benefits of green buildings. Moreover, these sites can be used to increase local expertise of building maintenance and operations and reduce operational costs, while helping to achieve the City's corporate emissions reduction targets.

Quick Start: Develop a sustainable building policy for new City buildings

A Corporate Green Building Policy should be developed that outlines the City's obligation to a certain level of performance or standard for all new buildings. The policy would primarily address building energy and emissions performance and would demonstrate the City's commitment to climate action. Further, a policy would demonstrate leadership and would provide guidance to encourage the application of green building practices in private sector development, which could result in additional energy and emissions reduction at the community level.

The policy should be reviewed every three to four years to reflect changes in building practices and technology. In addition, the policy should align with a recognized third party certification program (e.g., Leadership in Energy and Environmental Design (LEED), Zero Carbon, Energy Step Code, Passive House) to ensure consistency and validate the approach. The policy should be cost-effective, provide high enough standards to achieve desired emissions reduction results, provide flexibility, and consider additional funds to cover the capital costs for these improvements.

While the policy should initially focus on new buildings, going forward requirements for undertaking retrofits of existing civic buildings should also be incorporated.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST
Policy	High Importance High Urgency	3-6 months	Ongoing	$10-25K

Expand educational resources to help residents participate in the City's climate action and environmental stewardship efforts

Gap: Effective climate action and environmental stewardship at the community scale requires everyone to work together, including residents, businesses, community organizations, institutions, neighbouring local governments, and senior levels of government. While the City has shown leadership in areas through progressive policy, it has not been as active in educating the public and stakeholders on the importance of addressing the climate crisis and demonstrating what others can do to support the City's climate action and environmental protection efforts.

Recommendation: The City can demonstrate climate leadership by better supporting residents and businesses to reduce emissions, adapt to a changing climate, protecting natural areas, and minimizing/diverting waste. While some people understand the urgency around climate action and the various co-benefits (e.g., acting on climate change helps improve health and well-being, protect the natural environment, save money, support clean energy jobs, and ensure quality of life for future generations), many people do not. Further, many Kelowna residents do not understand what they can do at a personal or household level that could create positive change.

Mobilizing citizen engagement is essential to reach the City's C&E objectives. The City can and should support this through:

- More frequent updates on C&E initiatives using City channels (e.g., available incentives, new policies and programs, pertinent resources)
- Facilitating educational opportunities for the public or targeted stakeholders (e.g., speaking engagements)
- Developing resources that demonstrate how residents and businesses can support City initiatives at home or work

While general education and awareness is important, tailored information that links to specific City initiatives ensures that action at the household/business level aligns with and positively impacts City progress.

Quick Start: Develop a Resident's Guide to Climate Action

The Climate Resilient Kelowna Strategy is expected to be complete in 2023 and will outline how to reach bold emissions reduction targets and adapt to major climate impacts in the community. While the City will establish bold policy, the community plays a considerable role in achieving Kelowna's climate targets. To complement the Climate Resilient Kelowna Strategy, the City should develop an accompanying guidebook for residents to (1) help them learn about climate change and its importance; (2) demonstrate what they can do to in their own lives to reduce emissions and adapt to a changing climate; and (3) provide information on programs and incentives available to help.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST
Policy	High Importance Medium Urgency	6 months	5 years	$10-25K

Reduce GHG Emissions

Prioritize efforts to decarbonize Kelowna's biggest source of emissions: Transportation

Gap: Transportation accounts for over half of the emissions locally and recent community emissions modelling indicates if the City is to reach the recommended 2030 emissions reduction target of 40 per cent below 2007 levels, 33 per cent of the reduction needs to come from the transportation sector. The most recent community emissions data indicates emissions increased 3.8 per cent between 2007 and 2018 (Table 2), with transportation emissions remaining fairly flat; therefore, more needs to be done to decarbonize the transportation sector in Kelowna.

TABLE 2. Community emissions change from 2007 to 2018

	Absolute GHG emissions (tonnes CO_2e)	
	Total Emissions	% absolute change since 2007
2007	841,789	—
2016	808,874	↓ 3.9%
2018	874,156	↑ 3.8%

Recommendation: Investment in decarbonizing the transportation sector makes sense not only because it is the largest source of community emissions, but also because there are viable technologies already available. Whether it is mode shifting to public transit, bicycles, or e-bikes, or fuel switching from gasoline to electric, the barrier to decarbonizing the transportation sector is not based on readiness, but rather willingness to change. The City can help support the shift to low-carbon transportation options through infrastructure investments (e.g., active transportation corridors, EV charging infrastructure), incentives (e.g., low-income E-Bike incentives, EV charging rebates), education and awareness, supporting and advocating for policies at higher levels of government, and regulation (e.g., EV-readiness bylaws for new residential construction).

There are various social and economic co-benefits to investing in transportation that extend beyond emissions reduction. A shift to zero-emission vehicles supports clean air and public health, and a shift to active transportation can improve personal health and fitness while reducing the need to expand costly infrastructure for automobiles. Therefore, while emissions reduction investments in other sectors often only generate environmental benefits, the business case for transportation decarbonization is easy to make because the many co-benefits address multiple City priorities.

This recommendation does not mean transportation is the emission reduction 'silver bullet' and all other decarbonization efforts should be abandoned. Rather, it means transportation initiatives that have a strong emissions reduction potential need to move forward, efforts need to be amplified through new initiatives, and key transportation projects should be prioritized when funding is limited.

Quick Start: Continue to invest in transit service and active transportation infrastructure per the Transportation Master Plan

As indicated in the 2040 Transportation Master Plan (TMP), "The TMP aims to double the trips made by transit and quadruple the number of trips made by bicycle by 2040. Transit service will be increased over time in coordination with BC Transit. However, the key to making biking an attractive option is building a network of comfortable routes protected from traffic. This is an important strategy for accommodating growth in our Urban Centres and Core Area." Shifting as many car trips as possible to active transportation (e.g., biking and walking) is imperative to help reduce vehicle kilometres travelled (VKT) and GHG emissions. Therefore, it is critical that the City follow through with the build out of the active transportation corridors (ATCs) proposed in the TMP as quickly as possible.

This is not an additional recommendation to the TMP, but rather reinforces the importance of the ATCs from an emissions reduction lens. Therefore, the build out of this infrastructure should occur at an accelerated pace, or at least in-line with the proposed schedule in the TMP. Co-benefits include: increasing physical activity and improving health, improving air quality, reducing road congestion and saving money on gas and parking. In addition, several active transportation corridor projects were placed in Scenario 3 of the TMP, which included projects that were recommended, but not ultimately included in the TMP project list due to cost constraints. To maximize climate benefits, these projects should also be advanced.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST
Infrastructure	High Importance High Urgency	In progress	18 years as per TMP (in progress)	$84 million (capital) $8.04 million (operating)

Quick Start: Fund and implement Transportation Demand Management Initiatives

The 2040 TMP proposes many actions to increase the supply of transportation routes and options but contains relatively little funding for moderating or shaping the demand for new transportation options. Research shows these transportation demand management (TDM) initiatives can be highly cost effective. TDM actions can work in tandem with the City's infrastructure investments to improve the utilization of the City's low-carbon transportation options. A modest investment in programs, roughly one per cent of the $1.3B value of the TMP, could offer a high return in terms of reducing emissions and congestion.

Several TDM programs are currently recommended in the TMP, though funding has not yet been secured. Examples include:

- **Income qualified transit passes:** The City would offer discounted monthly transit passes for income qualified residents.
- **The employee commute trip reduction program:** A program to encourage more workers to commute by walking, biking, transit, or to work remotely. Tactics could include education, incentives, and grants.
- **Income qualified E-bike purchase incentives:** The City could provide rebates on e-bike purchases for low-income and senior residents.
- **School busing partnership with SD23:** The City could work with School District 23 and the Province to find ways to increase the number of students taking school buses to school, for example by lowering the distance threshold for busing students. This would be a cost-effective way to help reduce emissions as well as peak hour traffic congestion.

- **Transit Travel Training Program:** Formalize general transit training to encourage and empower people to use conventional transit.
- **Safe-Routes-to-School Expansion:** Helps provide schools with travel planning and infrastructure improvements to make it safer for students to bike or walk to school.

In relation to CleanBC, the province's target is to go from a sustainable mode share of 24 per cent to 30 per cent province-wide by 2030 (i.e., an increase in sustainable mode share of 6 per cent). With the proposed initiatives in the TMP, Kelowna's target would go from 15 per cent to 21 per cent.

Additionally, the TMP noted several TDM initiatives that could further improve climate outcomes with additional funding. All together, with a total investment of $1.5 million annually to fully fund all Travel Demand Management recommendations, it is estimated the TMP's VKT could be further reduced from a 10 percent increase by 2040 to only a 5 percent increase by 2040.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST
Incentive and Educational Programs	High Importance High Urgency	In progress	3-5 years	$1.5 million annually

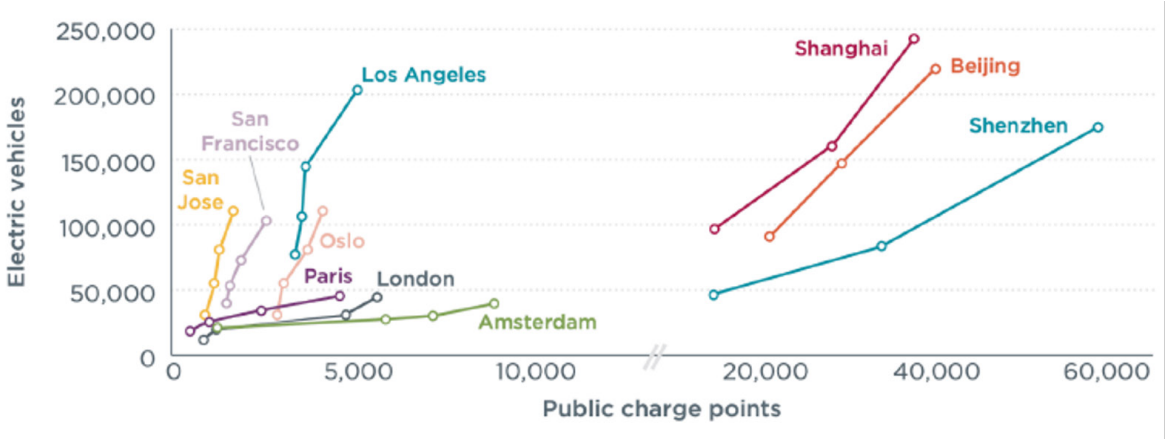
Quick Start: Support the shift to EVs through a vast charging network

Price parity between electric vehicles and internal combustion engine vehicles is expected by 2025,[10] and provincial and federal mandates require an escalating annual percentage of new light-duty zero emissions vehicles' sales and leases, reaching 100 per cent by 2035. The City's Community EV & E-Bike Strategy was endorsed by Council in Fall 2021. The Strategy has an overarching vision that Kelowna is a city where charging an EV and riding an E-Bike is easy, convenient, and affordable. To realize this vision, the Strategy has the following objectives:

- Increase access to EV charging on private property.
- Expand the public EV charging network.
- Increase awareness and knowledge level of EVs, EV charging options, and E-Bikes among residents.
- Support and accelerate fleet and shared mobility (e.g., carshare, bikeshare, ridesharing, ride-hailing) electrification.
- Expand E-Bike infrastructure and improve E-Bike affordability

In order to encourage residents to adopt EVs, municipalities must build EV charging infrastructure at scale. As Kelowna is a city where many households have private parking spaces, the initial focus should be on policy to advance home charging. However, public EV infrastructure can help prompt a shift to EVs by making prospective EV owners more confident that they will have access to the required infrastructure. An analysis of data in major cities by C40 Cities found that EV ownership is correlated with public charging points (Figure 9), although this will vary depending on access to residential charging.

FIGURE 9. Ratio of electric vehicles to public charging points for leading city markets, 2015-2018.[11]



Since the Strategy was adopted, staff have implemented several initiatives outlined in the Strategy (e.g., complete a public EV charging infrastructure gap analysis, expand the off-street public Level 2 charging network, offer residential EV charging incentives for multi-unit residential buildings), but there are still many foundational initiatives that need to move forward in the short-term or current initiatives need to be enhanced. Several key initiatives to implement in the short-term include:

1. **Implement EV Ready requirements for new residential developments:** all residential archetypes including each parking stall for MURBs need to have the infrastructure installed to support Level 2 charging.
2. **Expand the public charging network to support "garage orphans":** Continue to use city assets (e.g., parking lots, parkades, recreation centres) to strategically expand the public charging network to support EV owners without access to charging at-home or at-work.
3. **Support for retrofitting existing buildings with EV charging**: Recognizing that access to at-home charging is particularly challenging for MURB residents, continue to offer (1) financial incentives for the planning or installation of EV chargers in existing MURBs, and (2) educational support to incorporate EV charging options into their buildings.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST
1. Policy	High Importance High Urgency	Complete	Ongoing	–
2. Infrastructure		Ongoing	10 years	$135K annually
3. Incentives		5 years	5 years	$75K annually

Adopt a low-carbon approach to Energy Step Code

Gap: In 2019, the City became an early adopter of Energy Step Code, which is a provincial policy that aims to create healthier, more efficient and more comfortable buildings by requiring increasing levels of energy efficiency. The Step Code is designed to help both local government and industry incrementally move toward a future in which all new construction across the province is "net-zero energy ready" by 2032. Through the CleanBC Strategy, the Province has set the direction for future iterations of the BC Building Code to require Step Code compliance through a step-by-step path so that, compared to current base BC Building Code, new homes will be:

- 20 per cent more energy efficient by 2022
- 40 per cent more energy efficient by 2027
- 80 per cent more energy efficient by 2032[12]

Through the CleanBC Roadmap to 2030, the Province indicated it will be adding a new carbon pollution standard to the BC Building Code, supporting a transition to zero-carbon new buildings by 2030.

Currently, the City's Step Code Strategy for Part 9 and Part 3 Buildings only addresses the lower steps and there is no indication of future adoption dates of higher steps. Furthermore, the City has not adopted a low-carbon approach, meaning many new buildings may not be reducing emissions at the expected level even if energy efficiency is improving.

Recommendation: One of the main lessons learned from engagement for the first phase of Step Code implementation is that Industry wants predictable building requirements. While higher levels of energy efficiency may be challenging for some, it is much more likely that builders can reach those higher performance levels if they can start planning for it early. At a policy level, this means providing as much advanced notice of eventual requirements as possible.

The advantage of Step Code is that the requirements have already been outlined, so it is possible for local governments to establish a predictable Step Code schedule with minimal risk that the policy landscape will change. Further, once the Province releases the new carbon pollution standard to the BC Building Code and provides adoption options for local governments, there should be a clear path forward towards net-zero carbon new buildings.

It is recommended that the City be an early adopter of the higher steps of Step Code and outline an advanced approach to low-carbon requirements for new buildings, which will provide Industry with clarity on Kelowna's requirements moving forward.

Quick Start: Establish an Energy Step Code Adoption Schedule with low-carbon priority

Once the Province releases the new carbon pollution standard to the BC Building Code, the City should determine its own pathway to zero-carbon buildings in advance of the Province's schedule. This means not only outlining the next adoption phase but also mapping out all remaining phases with specific adoption dates for each step and low-carbon requirements. This can be accomplished through a Council Policy or Energy Step Code Adoption Schedule.

Similar to the first Step Code adoption phase in 2018 and 2019, an engagement process should be initiated to facilitate collaboration between the City and the building and development industry to determine how to best use the Step Code to meet climate action targets while providing industry predictability and consistency.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST
Policy	High Importance High Urgency	1 year	Ongoing	Staff time only

Quick Start: Implement a Step Code Compliance Assurance Program

The development of a Step Code adoption schedule does not mean the work is over. In fact, the bulk of the work begins as new phases are implemented. As Step Code is still a relatively new policy, the City needs to support staff, industry, and the community through the transition, especially as more stringent energy efficiency and low-carbon performance levels are adopted. The City must also ensure the appropriate compliance mechanisms are in place, to provide assurance that buildings are being built to the proposed 'steps'. The benefits of Step Code are only realized if buildings are confirmed to be constructed to the performance level indicated.

This Quick Start has two components:

1. Hire a Green Building Specialist Term Position: Currently, industry and staff support for Step Code falls on the Community Energy Specialist in the Policy & Planning Department. Although the Community Energy Specialist is responsible for Step Code policy development, the day-to-day operations of Step Code implementation add to an already fully subscribed workload. Understanding that Step Code compliance assurance is the responsibility of the municipality and staff must ensure that appropriate compliance checks are in place the void should be filled by a term staff position. The position will largely focus on reviewing Part 9 residential building permit applications to ensure the accuracy of Step Code submissions from a procedural and technical perspective. The position will also liaise with staff, industry, and the community for capacity building.

2. Continue the Step Code Compliance Assurance Program: In 2022, a pilot Step Code Compliance Assurance Program was developed and implemented which involved third party review of 10 Part 9 Step Code submissions. This was to ensure Step Code compliance and that proper procedures were being followed. The pilot program helped staff identify common issues with the energy efficiency components of building permit applications and allowed for capacity building with Energy Advisors and the building industry. It is recommended the Compliance Assurance Program be continued for at minimum two years based on the success of the pilot program. If the Green Building Specialist has the technical expertise to conduct the compliance assurance program, then this component may not be needed.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST
1. Staff Position	High Importance High Urgency	6 months	2 years	~$100K
2. Program		In progress	Ongoing	$10-25K

Bring together energy and resilience into one Home Retrofit Program

Gap: In the 2018 Community Climate Action Plan, it was assumed that to meet a modest emissions reduction target of four per cent below 2007 levels by 2023, one per cent of the existing residential building stock would need to be retrofitted annually, achieving at least a 30 per cent improvement in energy efficiency. That equates to retrofitting around 550-600 homes annually. While data is not readily available to confirm this, energy efficiency often ranks near the bottom of people's motivation for completing renovations; therefore, with minimal municipal retrofit programs during this period, it is very unlikely that that target was reached. As Council recently directed staff to update the OCP with more ambitious emissions reduction targets, the number of homes needing energy retrofits will increase.

From a program design perspective, the focus of home retrofit programs to this point has been on energy efficiency because it can lead to emissions reduction and energy savings. However, measures that can increase a buildings resilience to climate impacts are often ignored. As local climate impacts (e.g., floods, wildfires, extreme heat) increase in frequency and magnitude, home resilience measures are becoming equally as important.

Recommendation: Recognizing that municipal levers are relatively limited for decarbonizing and building resilience in existing buildings, action should be prioritized around addressing some of the major barriers to home retrofits. Through engagement, it is clear that the main barriers are (1) the high capital cost of upgrades combined with the lack of financing options to overcome the high cost, and (2) lack of adequate information and support to make informed decisions.[13] It is important to find ways to reduce "sticker shock" as energy-saving and resilience retrofits need to be affordable for homeowners. While

rebates are available from the Provincial and Federal Government and FortisBC, community members feel it is overwhelming to try to understand current rebates, stay up to date on new offers, and access maximum cost savings.

To address these barriers, the City should develop a Home Retrofit Program that brings together energy and resilience measures. The City is a trusted source of information in the community, and a structured program that provides support to households along the retrofit journey could help address the gaps identified above. The program should include financing options, energy and resilience support service (i.e., energy 'concierge') to help homeowners navigate the complicated retrofit journey, and incentives targeted towards proven low-carbon (e.g., electric heat pumps) and resilient technologies.

The program should replace the need for a full Community Energy Retrofit Strategy because the City's resources will have more value for a more targeted approach that can be mobilized quickly as opposed to a more general strategy where action is less defined. With municipal levers being relatively limited for existing buildings and the policy landscape in constant flux at other levels of government, a program approach allows the City to pivot if necessary or incorporate policy changes (e.g., Provincial Alterations Code expected in 2024) into the program.

Quick Start: Continue to design a home retrofit program through the FCM Community Efficiency Financing Program

In 2021, the City completed a retrofit financing feasibility study through the Federation of Canadian Municipalities' (FCM) Community Efficiency Financing Program (CEF). The study's main conclusion is that third party financing is the only viable retrofit financing option in the short-term. The recommendation is for the City to begin to design a retrofit program by building relationships with local financial institutions to develop retrofit financing products and submit an application to FCM for credit enhancement. If the City were ultimately successful in their application to FCM, the parameters of the retrofit loan products could be renegotiated to achieve more favourable terms for new applicants.

Whilst the City of Kelowna could proceed with this approach alone, it may be beneficial to collaborate with other Municipalities in the region. Benefits of a regional approach may include: stronger interest from local/regional financial institutions to participate in the program, stronger application to FCM for credit enhancement, greater interest and awareness of residents, and economies of scale in program marketing and delivery.

There are two steps to implementing a full program through FCM CEF:

1. **Complete a Program Design Study:** Lays the groundwork for a home energy upgrade financing program by documenting the details of what the program would entail.
    - Grants of up to $175,000 to cover up to 80 per cent of eligible costs (remaining 20 per cent needs to be dedicated from the City).
2. **Implement a Capital Program:** If the City partners with third-party lenders, participating lenders can access this funding to offset their risk by providing partial coverage for losses that may arise. The program would also unlock preferential financing products for homeowners that would otherwise not be made available in the absence of the credit enhancement (e.g., below-market interest rates, extended repayment terms, or expanded underwriting criteria).
    - Credit enhancement of $2 million pledged by GMF to support third-party financing
    - Applicant must demonstrate a minimum leverage ratio of 5:1 (credit enhancement to third party capital)
    - Grant of up to $5 million to cover up to 80 per cent of costs (not to exceed the total start-up and operating costs)

While FCM CEF is currently geared only towards energy measures, combining energy and resilience measures may be considered an innovative approach that should be explored.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST*
1. Study	High Importance High Urgency	1 year	4 years	Up to $210,000
2. Program		1 year		Up to $5 million

** Primarily grant funded.*

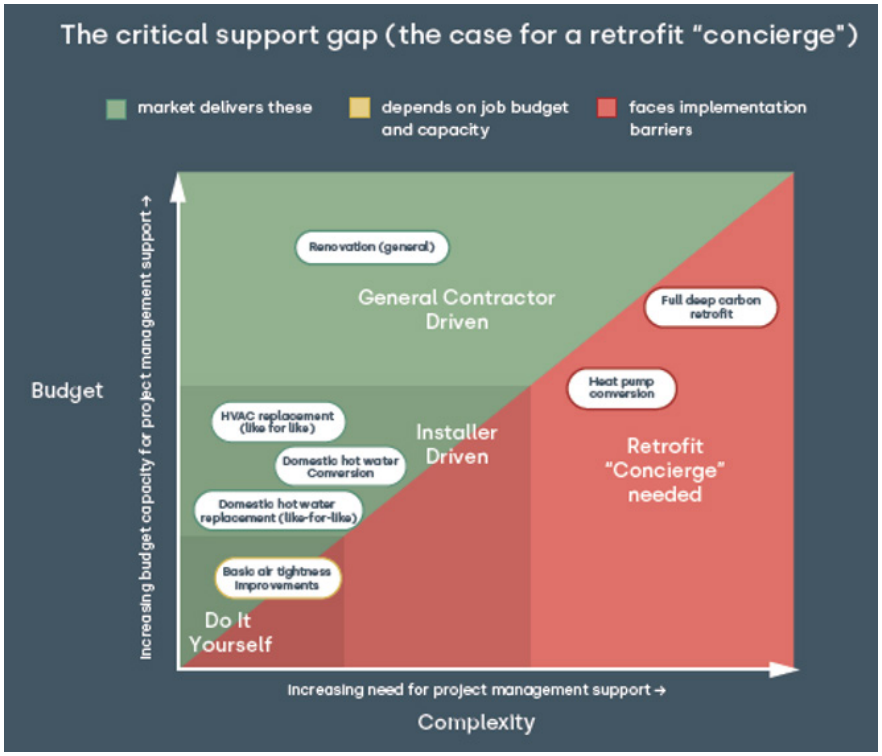
Quick Start: Pilot a home energy coordinator support service

The retrofit journey is a complicated one. Despite government and utility incentives, many households are not identifying and implementing home energy retrofit measures, even when there are clear benefits. This could be for a variety of reasons, including:

- Complexity of home systems and retrofit approaches (technical aspects, costs, energy savings, GHG benefits)
- Confusion on current rebate eligibility and "stackability".
- Challenging contractor interactions and advice on products and services
- Budget/financing uncertainties

A recent market research report by OPEN Technologies and Vancity indicates the homeowner retrofit journey is currently fragmented and overwhelming, particularly for relatively small but highly complex jobs that do not financially justify a general contractor in a coordinating role (Figure 10).[14]

FIGURE 10. The case for a retrofit concierge/coordinator



To directly address these barriers, the City could develop a one-to-one coordinator service between homeowners and home energy auditors, contractors, utility/government rebate programs, and financing providers. Essentially the coordinator would support homeowners through all steps in the upgrade process, including: identifying candidate homes for retrofits, engaging with homeowners to identify opportunities for upgrades and rebates, connecting homeowners with Energy Advisors, reviewing Energy Advisor recommendation, and supporting measure implementation.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST*
Pilot Program	High Importance High Urgency	Complete	2 years	$70K annually

** Seek grant funding. Expected $70,000 annually from the City if no grant funding available.*

Quick Start: Direct incentives to proven low-carbon technologies

For many residents the reason for not investing in home energy improvements is straightforward: it costs too much. While other levels of government and FortisBC offer a variety of incentives, there is still room for the City to provide financial support towards the measures that will have the greatest impact on emissions reduction, especially if the added incentive can impact a purchase decision. With heating and cooling from emissions insensitive energy sources (e.g., natural gas, propane) accounting for most of a home's energy and emissions, it makes sense to direct financial support towards fuel switching technologies that will result in direct emissions reduction. Currently, the most viable technology in market is electric air-source heat pumps.

Through the BetterhomesBC Program the Province offers $3,000 for a Tier 2 Central ducted heat pump if fuel switching from a fossil-fuel system. Recognizing that the Provincial incentive may not be enough to entice someone to fuel switch to an electric heat pump, between September 2021 and August 2022 the City is offering a $2,000 municipal top-up that is administered through the Province. So far, the City's dedicated funding amount has almost been exhausted, indicating high uptake of the incentive. One key benefit of the program is that it is administered through the Province, so the top-up simply gets added to the Provincial incentive. This eases the administrative burden on the City, which is important with limited staff resources.

Based on the success of the first year of the top-up, it is recommended the City contribute to the municipal top-up program for at least three more years, and increase the annual investment so more local homeowners can benefit. An investment of $100,000 annually over the next three years is recommended, which has the potential to benefit 150 Kelowna homes.

Going forward, the City should continue to monitor low-carbon technologies, and diversify the top up if other technologies are a viable solution in directly reducing emissions.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST*
Incentive	High Importance High Urgency	1 month	3-5 years	$100K annually

Adapt to a Changing Climate

Combine Climate Mitigation and Adaptation into one Climate Resilient Kelowna Strategy

Gap: The 2018 Community Climate Action Plan demonstrated the City's commitment to climate action through a set of initiatives to help the community reduce emissions by 4 per cent below 2007 levels by 2023. While a step in the right direction, this plan is focused solely on GHG emissions reduction (i.e., climate mitigation). Although the City has pioneered or been involved in various climate adaptation work such as flood planning and wildfire resilience, climate adaptation planning has not occurred at the community level, considering all potential climate impacts to the community. Further, climate mitigation and adaptation have not been considered together more systematically through a lens of low-carbon resilience.

Recommendation: As discussed in Section 2, one of the principles of the Framework is to look for co-benefits between pathways. In particular, there are many harmonious opportunities for low-carbon resilience that reduce both emissions and climate risk (e.g., green infrastructure and distributed energy systems that diversify energy sources and reduce the risk of system failure during a stress or shock situation). It is and will continue to be fundamental to consider mitigation and adaptation efforts and investments in an integrated way to identify interdependencies and synergies that maximize efficiencies and cost-effectiveness and minimize risk.

Currently the City is in the process of laying the groundwork for a revised Climate Resilient Kelowna Strategy, with the intention of developing strategies for both emissions reduction and climate adaptation at the community level. It is recommended that the City continue the development of this dual plan and look for opportunities to integrate these two concepts through low-carbon resilience (where possible), rather than have them as completely separate sections of the same plan.

▶ Quick Start: Complete a Community Climate Vulnerability and Risk Assessment

Evaluating the threat posed by climate change begins with an assessment of the changes to which a community is exposed, the sensitivity of the local community to these changes, their potential impacts, and the local capacity to adapt. These are the steps of a Climate Vulnerability and Risk Assessment (CVRA), which is the technical basis for climate adaptation planning and strategy development.

The results of the CVRA will also inform the development of the 2040 Infrastructure Plan highlighting what infrastructure and services could be at risk or be needed to address climate change events (e.g., wildfires, floods, storms, drought).

The City recently began the CVRA with a consultant and is aiming to have the study complete by the end of 2022.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST*
Study	High Importance High Urgency	6-8 months (in progress)	8 years (2023-2030)	$60K

** Already funded through 2022 budget*

Develop a strategy to expand blue and green infrastructure

Green and blue infrastructure include all natural or human-made elements that provide or perform some form of ecological or hydrological function or process. Blue infrastructure refers to water elements, like rivers, canals, ponds, wetlands, and floodplains; green infrastructure refers to natural assets (e.g., trees, lawns, hedgerows, parks, fields, and forests), enhanced assets (e.g., rain gardens, bioswales, stormwater ponds), and engineered assets (e.g., permeable pavement, green roofs). Both are seen as cost-effective, environmentally sustainable solutions to address a changing climate.

Gap: Kelowna's existing green and blue infrastructure is helping to combat the impacts of climate change. This is particularly true for the city's parks and tree canopy. There are currently many City plans, strategies, and initiatives that are collectively contributing to protecting or increasing green and blue infrastructure in the city (e.g., Official Community Plan, Subdivision and Development Services Bylaw, etc.). However, despite current efforts, the community is still experiencing climatic impacts, which are only projected to grow or worsen in urban areas.

The Climate Projections Report for the Okanagan Region found that, by the 2050's, the city can expect a higher number of hot days per year (days with >30° C) and the hottest days to get hotter. At the same time, rainfall is also projected to increase in the Spring and Fall but decrease in the Summer. What makes these changes particularly difficult is that Kelowna is expected to grow substantially over the next few decades. Increased development of urban areas can create micro-climates that affect climatic variables, including temperature. For example, the urban heat island effect creates higher surface and air temperatures from the higher density of buildings and heat absorbing materials and replacement of pervious vegetated surfaces with impervious built surfaces which reduce evaporative cooling. The increase in impervious surfaces and decrease in vegetation can also contribute to flooding risk in urban areas, as less stormwater can infiltrate into the ground, increasing runoff. Projected temperature and precipitation changes are expected to further intensify these effects.

Recommendation: To become increasingly resilient to changing climate, considerable expansion of green and blue infrastructure is needed (particularly heat and flooding in urban areas). This means protecting and enhancing existing green and blue infrastructure, incorporate them into the existing built form, and ensuring they are considered at the onset of new projects.

Many of the City's current plans and initiatives noted above are already contributing to this approach, but often in uncoordinated ways. The planning and implementation of green and blue infrastructure requires a city-wide systematic and holistic view to ensure that opportunities for efficiencies and benefits across departments can be identified. Achieving this will require significant cross-coordination between City departments. Therefore, it is recommended that the City develop a coordinated and comprehensive city-wide strategy to significantly expand blue and green infrastructure in a more structured way.

▶ Quick Start: Explore options to incorporate climate resilience in roof space for new construction

As Kelowna continues to grow and more land is occupied by medium to large buildings, there is an increasing amount of roof space that is adding minimal to no value to the building or the community. Most conventional rooftops actually compound climate-related issues such as the urban heat island effect and stormwater management.

Some communities like the City of Toronto have adopted bylaws that require green roofs (i.e., a vegetative layer grown on a rooftop) for new developments, along with other initiatives to support green roofs. Essentially green infrastructure on rooftops, green roofs provide shade, remove heat from the air, and reduce temperatures of the roof surface and surrounding air. Green roofs have other

co-benefits such as reducing building energy use, controlling stormwater, and adding aesthetic value and habitat for plants and animals.

In consideration of some of the benefits of green roofs along with the growing amount of wasted rooftop space in the community, it would be prudent for the City to evaluate policy options to create more value for rooftops. However, without knowing the suitability of green roofs in Kelowna's climate, the study should consider other beneficial rooftop uses such as cool roofs (i.e., reflective and emissive materials that remain cooler than traditional materials during peak temperatures) and renewable energy (e.g., solar panels). The study should outline what municipal levers are available and provide recommendations on an optimal policy option the City could adopt.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST
Study	High Importance High Urgency	6-8 months	Ongoing	$25-50K

Implement the Community Wildfire Resilience Plan

Gap: Kelowna continues to face an ever-increasing threat of wildfire, as the 2017, 2018, and 2021 fire seasons proved to be three of the most historically damaging seasons on record. Unfortunately, climate projections indicate local wildfire events are only going to increase in both frequency and magnitude. Through the City's 2016 and 2011 Community Wildfire Protection Plans (CWPPs), recommendations for wildfire risk reduction initiatives were made, but the community continues to be exposed to a number of wildfire risks based on the natural environment and has continued development into the wildland urban interface. Several neighbourhoods still face hazardous conditions, and at the household levels, the dissemination and uptake of FireSmart programs throughout the City is relatively low, which has frequently resulted in landscaping decisions that directly expose residents to fire hazards.[15]

Recommendation: Increasing potential for wildfires in the community means more proactive measures are needed to minimize wildfire risks. The 2021 Community Wildfire Resilience Plan (CWRP), currently in draft form, is an opportunity to decrease community wildfire risk through a stronger focus on the FireSmart disciplines: education, legislation & planning, development considerations, interagency cooperation, cross-training, emergency planning, and vegetation management. It is recommended the City implement the proposed action plan, leveraging Community Resiliency Investment (CRI) grants whenever possible.

Quick Start: Expand FireSmart Programs

Per the new CWRP, supporting public education around FireSmart principles, wildfire risk & mitigation, and associated initiatives that relate to climate (e.g., cultural/prescribed burning as a primary option for managing grass fuel risk) are important and should be carried out immediately to support wildfire resilience. Further, a 2022 pilot of the Community FireSmart Chipping Program has been successful and should be continued in future years. The annual program offers service assistance for residents to remove and dispose of hazardous vegetation from the home ignition zones around their properties.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST
Program	High Importance High Urgency	3-6 months	Ongoing	$45K annually

Protect and Restore Natural Areas

Develop a Natural Environment Strategy with City responses to key regional or provincial plans and strategies

Gap: As a relatively large municipality, the City leads many of its own strategies and plans that relate to stewardship of the natural environment (e.g., Urban Forestry Strategy, Area-Based Water Management Plan). However, as environmental and climate impacts do not follow political boundaries, many plans and strategies that affect aspects of the City's natural environment are completed at a regional, watershed, or provincial level. This is a viable approach because it ensures collaboration amongst the many different stakeholders that could be impacted by a particular issue and allows resources to be shared for efficiency.

Although City staff are typically involved in the development of major regional or provincial plans and strategies where the City is a stakeholder, it is less clear how the City implements such initiatives. Because the City is not the 'owner' of the regional plan or strategy, there is less accountability towards following through with implementation. Consequently, many of the recommended policies from regional plans and strategies for aspects of the natural environment and climate adaptation (e.g., biodiversity, foreshore management) have not been implemented at the city-level. The grey area between City-led and regional or provincial strategies results in a less-defined approach for municipal management of the natural environment.

Recommendation: The City needs a comprehensive strategy to identify and manage aspects of the natural environment. An effective and efficient approach would be leveraging regional planning initiatives for implementation at the municipal scale and formalizing City responses where appropriate. This approach would save the City resources because it would avoid spend time and money on plan development (or in some cases re-development). It would also allow the City to customize implementation efforts by selecting only the elements of the plan or strategy it sees as important or applicable to Kelowna's context. Where no regional or provincial strategy exists for a key aspect of Kelowna's natural environment, City-specific strategies could then be considered.

To ensure the City stays accountable to regional responses, each response should be presented and endorsed by City Council in the same way as a City-led strategy.

▶ Quick Start: Inventory and develop City responses to regional and provincial natural environment strategies, such as the Okanagan Region Biodiversity Strategy, Okanagan Lake Responsibility Plan, and Central Okanagan Non-Structural Flood Mitigation Resource Guide

While the City has a pulse on relevant regional and provincial initiatives, the first step in determining how to leverage strategies at other levels of government is to identify, document, and track all that may apply. Relevant strategies should be mapped according to the desired results of the "Protect and Restore Natural Areas" pathway of the Framework and OCP policies.

Not every regional plan or strategy that may impact the City's natural areas is worthy of a formal response, but there are some initiatives that are already complete that provide policy direction for what local governments can do from an implementation perspective: the Okanagan Region Biodiversity Strategy , kłúsx̌nítkʷ (Okanagan Lake) Responsibility Planning Initiative (in progress), and Central Okanagan Non-Structural Flood Mitigation Guide.

Biodiversity is an important component of the 'Protect and Restore Natural Areas' pathway of the Framework, along with the Natural Environment Chapter of the 2040 OCP. Some municipalities

(e.g., City of Surrey) have created their own Biodiversity Conservation Strategy, but the City does not currently have strong direction or strategy related to biodiversity. The Okanagan Region Biodiversity Strategy was led by the Okanagan Collaborative Conservation Program and is an environmental policy framework that sets priorities for identifying, preserving, and restoring important natural areas. One section of the strategy provides strategic direction and opportunities for action for local governments. For example, land use planning and development, financing biodiversity conservation, creating incentives for private landowners, science and information, and partnerships and collaboration. As this strategy is now several years old, if there is opportunity for a new strategy in the short-term, the City should be involved in strategy development, and create a subsequent response to the updated strategy.

kɬúsx̌nítkʷ (Okanagan Lake) Responsibility Planning Initiative is designed to bring syilx and non-syilx partners together to address the cumulative impacts threatening the long-term viability of Okanagan Lake and its ecosystems to provide clean drinking water, habitat for fish and wildlife, erosion and flood control, and contribute to climate change mitigation. The planning process is syilx led and the project aims to change land use planning by creating new decision-making processes, policies, and practices for stronger environmental protection that provide meaningful and lasting change. While the City is involved in the planning process, a formal response will ensure recommended actions are addressed.

Although flood mitigation aligns more closely to the 'Adapt to a Changing Climate' pathway of the Framework, protecting our water resources is an important consideration for protecting natural areas as well. The Central Okanagan Non-Structural Flood Mitigation Guide is a toolbox of flood mitigation actions that are not large, engineered structures (e.g., dikes and dams). For example, land stewardship, land use management, building management, education and awareness, emergency response, insurance and disaster financial assistance.[19] A City response to this plan could support the actions from the Climate Resilient Kelowna Strategy, and ensure adequate local action for non-structural flood mitigation.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST
Study	High Importance Medium Urgency	6-8 months (per strategy)	Ongoing	Staff time only

Identify and manage natural assets, species-at-risk, and critical habitat

The term municipal natural asset refers to the stock of natural resources or ecosystems that a jurisdiction could rely upon or manage for the sustainable provision of one or more services. The stocks of ecosystem resources are natural capital in the sense that these resources are assets that yield goods and services ("flows"), which over time are essential to the sustained health and survival of the local population and economy. In the local government context, it is important to understand, measure, manage, and account for natural assets in the same way it is for engineered assets. Doing so can enable local governments to provide core services such as stormwater management, water filtration, and protection from flooding and erosion, as well as additional services such as those related to recreation, health, and culture. Outcomes of what is becoming known as municipal natural asset management can include cost-effective and reliable delivery of services, support for climate change adaptation and mitigation, and enhanced biodiversity.

Gap: In 2020, the City participated in the Municipal Natural Asset Initiative (MNAI) with a cohort of other local governments across Canada to develop an inventory of natural assets in the community. A second project with MNAI is currently underway in coordination with regional partners and is focused on incorporating ecosystems and species at risk as well as critical habitat into the natural asset inventories. While these are positive steps forward, additional work is needed to prioritize and implement management options that will result in tangible progress on natural asset, species at-risk, and critical habitat protection.

It is also recognized that while the City utilizes spatial data for key environmental indicators, including natural assets, many of the inventories are based on provincial or regional data which may be coarse or outdated; thus, the datasets may not capture more detailed environmental attributes or recent changes such as developments that are necessary to inform appropriate management actions.

Recommendation: As with most strategic areas, tangible progress or value is not realized until management actions are implemented. Through MNAI, the City completed the assessment phase of the asset management process which includes an inventory and conditions assessment of natural assets in the community (Figure 11). To capitalize on the benefits of this assessment work, the City should continue the natural asset management process through the planning and implementation phases. This equates to developing long-term goals and service delivery requirements from natural assets, completing natural asset operations and maintenance plans for priority assets, completing a financial plan for natural assets, and ongoing adaptive management.

Understanding that the data used to generate an initial inventory of natural assets and environmentally sensitive areas was based on relatively coarse or outdated data, the City should explore other options to gather higher resolution spatial data (see Quick Start below). Doing so could result in more informed management actions that reflect the true state of natural areas.

FIGURE 11. Natural Asset Management Process

Quick Start: Develop a strategy to monitor changes to sensitive ecosystems

OCP policies 14.5.7 and 14.5.8 require land use and development projects to have "no net loss" of natural terrestrial and aquatic ecosystem's function and productivity. No net loss is a principle that strives to balance unavoidable habitat, environment, and resource losses with replacement of those items so that damages resulting from human activities are balanced by equivalent or greater gains in habitat and biodiversity. Population growth, development pressures and climate change threaten the community's terrestrial and aquatic ecosystems and species. Development sprawl, habitat loss, and conditions such as fires and floods challenge biodiversity and ecosystem health on multiple fronts. In the face of an uncertain and limited resources at higher levels of government, Kelowna must take a leadership role in protecting the resources within its boundaries.

While no net loss policy has been applied for over a decade, understanding its success is challenging. Monitoring changes to environmentally sensitive terrestrial and aquatic ecosystems is difficult, and to this point, an approach has not been developed to determine if this principle is effectively being executed. Kelowna and area have the privilege of having some of the rarest ecosystems in the country and to ensure these are around for centuries, it is recommended a strategy be developed to that identifies a path forward for ensuring changes to sensitive ecosystems can be adequately monitored.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST
Strategy	High Importance High Urgency	3-6 months	Ongoing	$25-50K

Quick Start: Invest in relevant datasets to give a better spatial perspective of key environmental indicators

The City relies on certain datasets to benchmark conditions of environmental indicators. For example, developing an inventory or baseline of urban tree canopy, sensitive ecosystems, natural assets, and Okanagan Lake foreshore relies on third party data acquired in various ways (e.g., aerial imagery, water surveys, field sampling). Such data is valuable, but understanding that it only provides a snapshot in time of environmental conditions and methods have improved over time, the City should invest in important data such as:

- **Light Detection and Ranging (LiDAR):** LiDAR is a remote sensing technique that is based on measuring the time it takes a laser pulse to strike an object and return to the source. Typically, a laser scanner is flown in an airplane, the exact location of which is tracked by a GPS satellite. LiDAR has many uses and has value for spatially identifying natural and man-made features within a community at a very granular level including urban tree canopy, natural assets, impervious versus pervious areas, and Okanagan Lake foreshore, as well as aid the City in flood and wildfire mitigation efforts.
- **Foreshore Inventory Mapping (FIM):** The FIM methodology is used to quantify the level of disturbance (from a natural condition) that has occurred along lake shorelines. It allows staff to assess the rate of change occurring along shorelines. FIM serves to benchmark current foreshore conditions for regulatory agencies and for investigations into possible illegal foreshore activities or development. The most recent FIM for Kelowna was completed in 2016 and showed there was only 41.4 per cent of natural shoreline remaining, down from 42.81 per cent in 2009.
- **Sensitive Ecosystem Inventory (SEI):** The City has an inventory and maps of environmentally sensitive areas including creeks, wetlands, grasslands, old growth forests, and sensitive ecosystems. Twenty-seven creeks and 278 wetlands have been identified within the city. The SEI helps the City, the development community and residents better understand and manage environmentally sensitive ecosystems. The most recent SEI for Kelowna was completed in 2007.

Investing in up-to-date data and inventories will allow the City to have an accurate picture of the community's natural areas, and could help inform an updated Natural Environment Development Permit Area.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST
Data and Mapping	High Importance Medium Urgency	3-6 months	Ongoing	$120-150K every 3 years

Quick Start: Develop a Natural Asset Management Strategy

As illustrated in Figure 11, managing natural assets is an ongoing process. The City, through a partnership with the Municipal Natural Asset Initiative, was able to complete a high level natural asset inventory in 2021 as an initial set. More needs to be done to continue to understand the value of our natural assets and how to integrate the management of these with other assets. This includes developing long-term goals and service delivery requirements from natural assets, completing natural asset operations and maintenance plans for priority assets, completing a financial plan for natural assets, and ongoing adaptive management. Outputs could help comprise a stand-alone Natural Asset Management Plan or inform natural asset components of broader asset management plans.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST
Strategy	High Importance Medium Urgency	1-2 years	Ongoing	$100-200K

Shift to a Circular Economy

Focus waste reduction diversion efforts on construction and demolition debris

Gap: Over the past few years, Kelowna has been Canada's fastest growing Census Metropolitan Area, with a population growth rate of 14 per cent between 2016 and 2021. Coinciding with population growth, the community has also seen a sharp increase in development, with a record number of annual residential building permits issued in 2021. While this "building boom" has its benefits (e.g., bringing new amenities, employment, and educational opportunities), it also brings challenges, including an increase in the creation of construction and demolition debris (CDD) that makes it to the Glenmore Landfill.

Construction and demolition debris make up the largest component of waste at the Glenmore Landfill, which, therefore, presents one of the greatest challenges and opportunities when considering waste diversion and extending the life of the landfill.

Recommendation: While zero waste is a worthy aspirational target, the reality is there is a long way to go, and waste reduction and diversion efforts should prioritize the areas that could have the biggest impact and/or where there are proven solutions. The combination of development growth and knowing that CDD waste is the largest component of waste at the Glenmore Landfill, make it a suitable area to focus on through a waste management lens. Furthermore, example policies and local government interventions from BC and around the world indicate there are real world examples to follow that could be applied locally; meaning policy to manage CDD waste is not a pipe dream but an area with opportunities for practical application in the short-term. It is therefore recommended that the City focus waste reduction and diversion efforts on CDD waste by evaluating municipal policy options. This does not mean that research into other waste streams (e.g., organics) should cease, but resources should be prioritized for CDD in the short-term.

Quick Start: Complete a Construction & Demolition Debris Reuse & Recycling Feasibility Study

A significant amount of CDD material can be redirected to other value-added uses and processes, creating new jobs and revenue for the region, extending the life of the landfill, as well as reducing CO_2 emissions in producing new materials. However, the City does not have a full understanding of the waste reduction/diversion options for CDD material and what could be the optimal policy solution to limit CDD waste at the landfill.

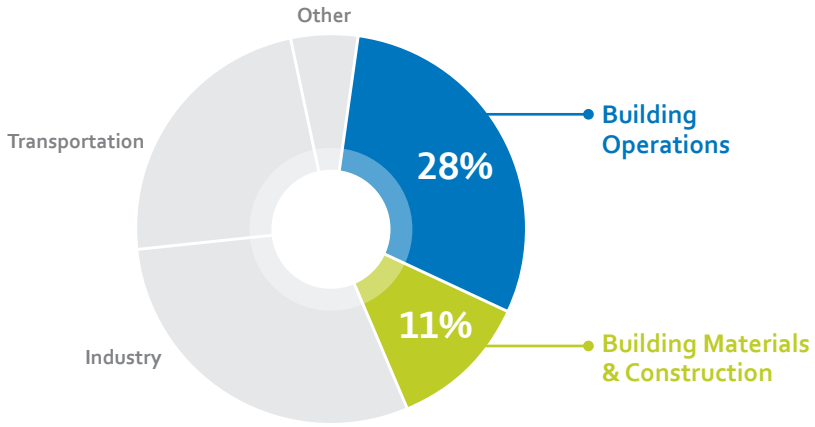
Utility Services is planning on performing deconstruction rather than demolition on three to four City owned houses in 2022. It is recommended that this study be carried out and supported by analysis of the diversion percentages from deconstruction, as well as a broader CDD market capacity assessment. The study should be carried out in partnership with the RDCO.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST
Study	High Importance Medium Urgency	6-8 months	Ongoing	$35K (funded)

Quick Start: Explore policy for low-carbon concrete

Municipalities typically focus on reducing buildings operational emissions, rather than embodied emissions arising from the material to construct a new building. While cities do have more direct control over operational emissions, embodied emissions account for 11 per cent of annual global emissions (see Figure 12). Moreover concrete, steel, and aluminum are responsible for 23 per cent of global emissions, most of which arise from the use of these materials in buildings.

FIGURE 12. Share of annual global CO_2 emissions[20]



A growing number of municipalities are developing approaches to tackle this challenge. For example, in 2019, the County of Marin in California's Bay Area passed the Bay Area low-carbon concrete codes (the first of their kind in North America) as an amendment to the County's building code. To comply with the code, buildings must be built with concrete that includes a limited amount of cement or concrete with a limited amount of embodied emissions, as per the Low Carbon Concrete Code.

In November 2021, the City of Langford became the first jurisdiction in Canada to adopt a low-carbon concrete bylaw. The bylaw applies to city-owned or solicited projects and private construction projects greater than 50 cubic meters. Starting June 1, 2022, concrete used for these projects must be produced using post-industrial carbon dioxide mineralization technologies or another technique that leads to lower embodied CO_2.

Considering the growing importance of embodied emissions, especially with the increasing number of large buildings in Kelowna that have concrete construction in many cases, and the precedence in municipal policy, the City should explore a policy for low-carbon concrete.

TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST
Study	High Importance Medium Urgency	6-8 months	Ongoing	$10-25K

In collaboration with regional partners, develop a Circular Economy Strategy

Gap: As Kelowna continues to grow, eliminating waste and pollution, circulating products and materials, and regenerative nature are increasingly important considerations. Looking for solutions that can minimize environmental impacts from growth are vital in ensuring the long-term sustainability of our region. If the City is going to deliver on some of its climate action, environmental protection, and waste management objectives, transitioning from a "take-make-waste" system to a circular economy will be vital.

While waste management is not new for local governments, the transition to a circular economy is. At this point, there are few examples (particularly in North America) of local governments that have transitioned from circular theory to practice. The City is at a similar stage; recognizing the need and benefits of transitioning to a circular economy but not understanding how to translate the theory into actionable policy.

Recommendation: In contrast to the traditional linear economy with short-sighted design, high consumption, and the storage or attempted destruction of the resulting waste, a circular economy is based on closing the loop with a holistic and regenerative perspective on design, production, consumption and disposal. Cities are well-positioned for a circular economy system due to their proximity of citizens, producers, retailers, and service providers. Local benefits of a circular economy could include more jobs and entrepreneurial activity in areas such as remanufacturing, repair, logistics and services.

The City is in the early stages of its circular economy journey, but understanding some of the benefits, it would be prudent to start to think more strategically about practical application. Over the coming years, developing a Circular Economy Strategy that outlines how the City will help support a shift to a local circular economy through its municipal levers will have co-benefits for climate, waste management, and economic objectives. With many of the components of a circular economy having regional implications (e.g., waste management), it is recommended the development of a Circular Economy Strategy be carried out with regional partners such as the Regional District of Central Okanagan and other member municipalities if there is interest.

Quick Start: Participate in the Canadian Circular Cities and Regions Initiative Peer-to-Peer Network

To support local governments in their quest to shift to a circular economy, FCM, the National Zero Waste Council, Recycling Council of Alberta, and Recyc-Quebec established the Circular Cities & Regions Initiative. The Peer-to-Peer (P2P) Network is one of the main initiatives and provides "In-depth access to circular economy experts and the opportunity to discuss approaches, opportunities and challenges with peers from across the country. Two foundational workshops and key resources on circular economy provided by the Ellen MacArthur Foundation."[21]

As the City is in the early stages of its circular economy journey, the P2P Network would help the City understand the opportunities for incorporating circular principles, learn from other local governments across Canada who are on a similar journey, and understand the municipal policy levers for change. If successful on an application, the learnings from the P2P Network could be applied to the development of a Circular Economy Strategy in the coming years.

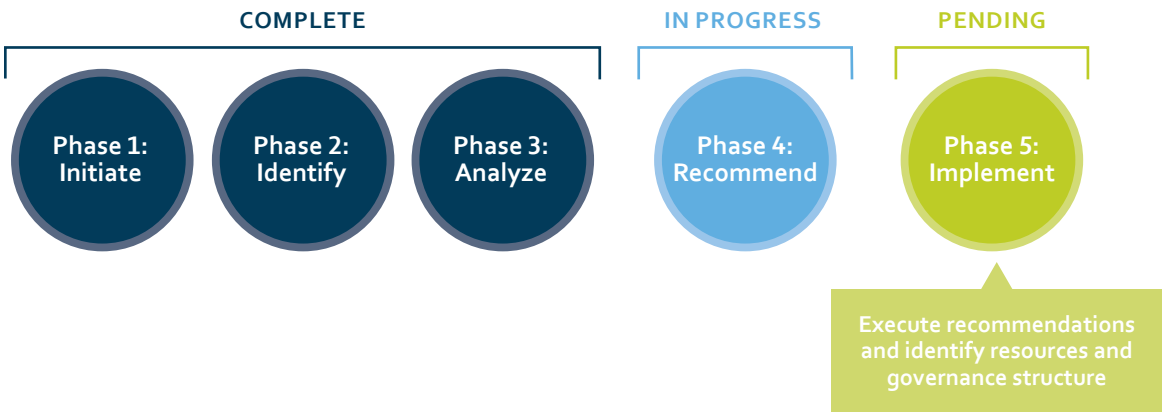
TYPE OF INITIATIVE	PRIORITY	DEVELOPMENT TIMEFRAME	IMPLEMENTATION TIMEFRAME	COST
Network/ Project	Medium Importance High Urgency	1 month (complete)	1 year	Staff time only

Moving Forward

While progressive policy and programs are important to advance climate and environmental priorities, to succeed in its tasks, the City needs the structures, systems, and resources in place to make decisions, oversee the delivery of services, and report on performance.

Therefore, the City needs a strong governance system that provides the appropriate level of staffing resources, the appropriate staffing structure, and the appropriate budget. The City also needs to determine how best to engage with external stakeholders on C&E initiatives. Recommendations for effective governance are not provided in this report; however, in Phase 5 (Implement) of the Review, the Champion of the Environment will work with the City Manager and the Senior Leadership Team to identify governance components in advancing and operationalizing the Framework and recommendations.

FIGURE 13. Remaining phases of Climate & Environment Review



As the Framework shows, effective climate action and environmental stewardship has many different pieces. The recommended initiatives in Section 3 represent foundational opportunities and short term wins to advance the Framework, but this by no means captures everything. It is recognized the City has in place many existing C&E initiatives and new initiatives will be needed as additional problems arise and technologies change. Therefore, the City will need to be proactive and adaptable moving forward to adequately address contemporary climate and environmental challenges.

APPENDICES

Appendix A

Activities of the Climate and Environment Review

Staff completed the following activities related to the Review:

- **Phase 1 – Project Initiation:**
  - *May – June/21:* Completed the Project Plan.
  - *July/21:* Engaged Neilson Strategies Inc. to lead/facilitate corporate visioning and Governance Best Practice Review.
- **Phase 2 – Identify Corporate Priorities:**
  - *July – November/21:* Researched elements of the draft Climate Resilience Framework, including a review of current City priorities/objectives related to climate action and environmental stewardship (C&E), and best practices from other communities.
  - *October 19/21:* Hosted a workshop with 35 City Staff to brainstorm a C&E corporate vision, set of priorities, and list of objectives that informed the Climate Resilience Framework.
  - *November/21:* Created the draft Climate Resilience Framework that was informed by the October 19 workshop and internal/external research.
- **Phase 3 – Analyze Current State to Determine Gaps:**
  - *July/21 – April/22:* Conducted 25 structured interviews with City Department Managers and/or Subject Matter Experts to begin analyzing the City's existing C&E related policies, programs, initiatives, systems, and resources.
  - *July/21 – April/22:* Reviewed current C&E related City policy, plans, strategies, systems, and initiatives.
  - *January/22 – June/22:* Engaged a consultant to complete a Governance Best Practice Review from other municipalities across Canada to assess governance components (e.g., staffing, funding, organizational structure, external engagement) related to C&E.
  - *January/22 – May/22:* Engaged a consultant to conduct a Policy Best Practice Review drawing on local approaches and actions being undertaken by other communities.
- **Phase 4 – Recommend Action**
  - *April/22 – July/22:* Synthesis and analysis of the initial findings to better understand and frame the character of change underway in the City, the gaps in action, and the opportunities to advance C&E efforts. This informed a revised Climate Resilience Framework and development of potential actions within the City's context.
  - *Summer/22:* Present Framework and Recommendations Report to Council.
- **Phase 5 – Implement the Recommendations**
  - To Be Determined

Appendix B

Implementation Plan

PATHWAY: Demonstrate Corporate Climate Leadership

Recommendations	Quick Starts	Priority (Importance and Urgency)	Development Timeframe	Implementation Timeframe	Estimated Operating Cost	Estimated Capital Cost	Additional Staff Needed?
Apply a Climate Lens for Decision Making across the organization	Develop a climate lens decision making tool	High Importance Medium Urgency	2-3 years	Ongoing	$50K-100K	–	Yes
	Develop an internal carbon price to guide climate friendly purchasing	High Importance Medium Urgency	3-6 months	10 years	$10K-25K	–	Yes
Reduce fleet emissions through rapid electrification of the light duty fleet	Apply an electric first purchasing policy for new light duty vehicles	High Importance High Urgency	3-6 months	10 years (potentially ongoing)	$17.2 million (vehicle lifecycle)	$34.8 million*	No
Develop 'green' standards for City facilities	Develop a sustainable building policy for new City buildings	High Importance High Urgency	3-6 months	Ongoing	$10K-25K	–	No
Expand educational resources to help residents participate in the City's climate action efforts	Develop a Resident's Guide to Climate Action	High Importance High Urgency	6 months	5 years	$10K-25K		Yes

PATHWAY: Reduce GHG Emissions

Recommendations	Quick Starts	Priority (Importance and Urgency)	Development Timeframe	Implementation Timeframe	Estimated Operating Cost	Estimated Capital Cost	Additional Staff Needed?
Prioritize efforts to decarbonize Kelowna's biggest source of emissions: Transportation	Continue to invest in transit service and active transportation infrastructure per the Transportation Master Plan	High Importance High Urgency	In progress	20 years as per TMP (in progress)	$8.04 million	$84 million	No
	Fund and implement Transportation Demand Management Initiatives	High Importance High Urgency	In progress	3-5 years	$1.5 million annually ($4.5 million-7.5 million total)	–	Yes
	Support the shift to EVs through a vast charging network	High Importance High Urgency	In progress	3-5 years	$75K annually ($225K-375K total)	$135K annually ($600K- 1 million total)	Yes

** Only a $516,398 premium comparing ICE-to-EV and ICE-to-ICE purchases over the next 10 years.*

Recommendations	Quick Starts	Priority (Importance and Urgency)	Development Timeframe	Implementation Timeframe	Estimated Operating Cost	Estimated Capital Cost	Additional Staff Needed?
Adopt a low-carbon approach to Energy Step Code	Establish an Energy Step Code Adoption Schedule with low-carbon priority	High Importance Medium Urgency	1 year	Ongoing	(Staff time only)	–	No
	Implement a Step Code Compliance Assurance Program	High Importance High Urgency	In progress	Ongoing	Consultant: $10 K-25K Staff Position: $100K	–	Yes
Bring together energy and resilience into one Home Retrofit Program	Continue to design a home retrofit program through the FCM Community Efficiency Financing Program	High Importance High Urgency	2 years (combined Program Design and Capital Program)	4 years	Program Design: up to $210,000 Capital Program: up to $5 million	–	Yes (only for Capital Program)
	Pilot a home energy coordinator support service	High Importance High Urgency	Complete	2 years	$70,000 annually ($140K total)	–	Yes
	Direct incentives to proven low-carbon technologies	High Importance High Urgency	1 month	3-5 years	$100K annually ($300K-$500K total)	–	No

PATHWAY: Adapt to a Changing Climate

Recommendations	Quick Starts	Priority (Importance and Urgency)	Development Timeframe	Implementation Timeframe	Estimated Operating Cost	Estimated Capital Cost	Additional Staff Needed?
Combine Climate Mitigation and Adaptation into one Climate Resilient Kelowna Strategy	Complete a Community Climate Vulnerability and Risk Assessment	High Importance High Urgency	6-8 months (in progress)	8 years (2023-2030)	$60K (funded)	–	No
Develop a strategy to expand blue and green infrastructure	Explore options to incorporate climate resilience in roof space for new construction	High Importance Medium Urgency	6-8 months	Ongoing	$25K-50K	–	No
Implement the Community Wildfire Resilience Plan	Expand FireSmart Program	High Importance High Urgency	3-6 months	Ongoing	$45K annually	–	No

PATHWAY: Protect and Restore Natural Areas

Recommendations	Quick Starts	Priority (Importance and Urgency)	Development Timeframe	Implementation Timeframe	Estimated Operating Cost	Estimated Capital Cost	Additional Staff Needed?
Identify and manage natural assets, species-at-risk, and critical habitat	Develop a strategy to monitor changes to sensitive ecosystems	High Importance High Urgency	3-6 months	Ongoing	$25K-50K	–	No
	Invest in relevant datasets to give a better picture of key environmental indicators	High Importance High Urgency	3-6 months	Ongoing	$120K every 3 years	–	No
	Develop a Natural Asset Management Strategy	High Importance High Urgency	1-2 years	Ongoing	100K-200K	–	No
Develop a Natural Environment Strategy with City responses to regional strategies	Inventory and develop City responses to regional and provincial natural environment strategies, such as the Okanagan Region Biodiversity Strategy, Okanagan Lake Responsibility Plan, and Central Okanagan Non-Structural Flood Mitigation Resource Guide	High Importance Medium Urgency	6-8 months (per strategy)	Ongoing	(Staff time only)	–	Yes

PATHWAY: Shift to a Circular Economy

Recommendations	Quick Starts	Priority (Importance and Urgency)	Development Timeframe	Implementation Timeframe	Estimated Operating Cost	Estimated Capital Cost	Additional Staff Needed?
Focus waste management efforts on construction and demolition debris	Complete a Construction & Demolition Debris Reuse & Recycling Feasibility Study	High Importance Medium Urgency	6-8 months	Ongoing	$35K (funded)	–	No
	Explore policy for low-carbon concrete	High Importance Medium Urgency	6-8 months	Ongoing	$10K-25K	–	No
In collaboration with regional partners, develop a Circular Economy Strategy	Participate in the Canadian Circular Cities and Regions Initiative Peer-to-Peer Network	Medium Importance High Urgency	1 month (complete)	1 year	(Staff time only)	–	No

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