

Targeted OCP Review

CLIMATE EMERGENCY WHITE PAPER

FEBRUARY 24, 2020



FOR WORKSHOP DISCUSSION



Prepared by Urban Systems Ltd.

for

the District of North Vancouver



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OFFICIAL COMMUNITY PLAN

CLIMATE EMERGENCY GOAL

Develop an energy-efficient community that reduces its greenhouse gas (GHG) emissions and dependency on non-renewable fuels while adapting to climate change.

Source: Our Official Community Plan for a Sustainable Future, 2011



1. INTRODUCTION

As part of the District of North Vancouver’s Targeted Official Community Plan (OCP) Review, White Papers have been developed for:



The purpose of each White Paper is to provide important background information on each topic area. Each White Paper also includes a list of possible actions the District could take to address key issues. District Council will use the White Papers to inform the development of an Action Plan.

THE CLIMATE EMERGENCY – RISKS THAT CANNOT BE IGNORED

The District is currently experiencing challenges related to extreme weather and expects climate change to exacerbate these challenges in the future. In recent years, the District has experienced: heat waves; extreme drought conditions that have impacted reservoir levels to the point that water use had to be restricted; large regional wildfires that have impacted air quality; and intense rainfall events that have caused flooding and debris flow.

The financial costs of climate change are rising, undeniably affecting District residents, businesses, and institutions. Inaction today will place an even greater burden on future generations. Action on the climate emergency must be far reaching and multifaceted, involving collective and individual efforts.



2. KEY TERMS

Climate

The average weather in a given region over a long period of time (i.e. 30 years or more).

Climate change

Statistically significant variations in the climate, which can be caused by human activity (e.g. greenhouse gas emissions and changes in land use).

Climate adaptation

The process of adjustment to actual or expected climate and its effects.

Climate mitigation

Efforts to reduce or prevent greenhouse gas emissions.

Corporate emissions

The greenhouse gas emissions of a corporate entity, such as the District of North Vancouver, which includes its buildings and vehicle fleet.

Greenhouse gas (GHG)

Gases that trap heat in the atmosphere, including carbon dioxide (CO₂).

3. CONNECTIONS TO OTHER TOPIC AREAS

HOUSING

We can build and heat our homes in ways that reduce fossil fuel dependence, thereby reducing GHG emissions.

Many District homes are subject to natural hazards exacerbated by extreme weather.

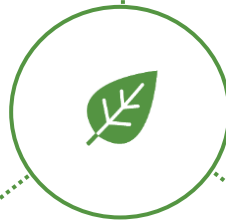
Reliable public transit can reach more people when residential growth is concentrated in compact, connected centres. Residents living in those centres will be able to reduce their dependence on passenger vehicles, thereby reducing GHG emissions.

ECONOMY & EMPLOYMENT LANDS

Businesses can make operating decisions to reduce fossil fuel dependence.

Climate change will impact local businesses, particularly those located in areas subject to sea level rise.

Attracting clean tech businesses to the District is a strategic opportunity.



Transportation accounts for 52% of GHG emissions in the District, 96% of which is from passenger vehicles (Integral Group LLC, 2019).

Increased use of sustainable transportation choices will reduce GHG emissions.

TRANSPORTATION



4. CURRENT CONDITIONS AND PROGRESS SINCE 2011

Key Statistic

What is Important to Know?

Between 2007 and 2016, community emissions decreased by approximately 10%.

(The Community Energy and Emissions Plan (CEEP, 2019) targets 45% emissions reduction by 2030, up from the OCP target of 33% by 2030).

- This trend is in the right direction, but if the “business as usual” scenario continues, emissions are expected to increase by 19% by 2050 (Integral Group LLC, 2019).

Between 2012 and 2018, District corporate emissions decreased approximately 10% (District of North Vancouver, 2019).

(OCP Implementation Review targets reduction of corporate GHG emissions)

- This trend is in the right direction, which demonstrates that the District is demonstrating corporate climate leadership that can be used as an example to the broader community.

Transportation accounts for 52% of the District’s total GHG emissions (Integral Group LLC, 2019).

- It is typical for transportation to account for the majority of a community’s total GHG emissions. Most of these emissions are from personal vehicles and are, in part, a result of commuting across low-density single-family areas.

Since 2007, transportation emissions have become a proportionately higher contributor to overall District emissions (Integral Group LLC, 2019).

- This may be attributable to greater improvements being made in the buildings sector versus the transportation sector.
- Daily auto driver trips per capita in the District increased from 2.02 in 2011 to 2.22 in 2017 (TransLink, 2019).

Of the District’s transportation related emissions, approximately 96% comes from passenger vehicles and 4% from commercial vehicles (Integral Group LLC, 2019).

- It is typical for passenger vehicles to outweigh commercial vehicles in terms of overall GHG emissions.
- This points to the importance of focusing on residents and their passenger vehicles.



Key Statistic

What is Important to Know?

Energy use in buildings account for 40% of the District's total GHG emissions (Integral Group LLC, 2019).

- It is common for energy use in buildings to be a major contributor to a community's total GHG emissions. Additional embodied carbon emissions related to building materials further increase opportunities to reduce emissions (this isn't part of the 40% statistic).
- Energy consumption and emissions from single-family homes outweighs that from multi-family dwellings. Single-family homes are responsible for 43% of the District's energy consumption (Integral Group LLC, 2019).
- Carbon based heating systems in buildings, embedded carbon in construction materials, and emissions from construction create a significant opportunity to reduce emissions from this sector through new programs such as retrofitting, fuel switching and/or waste management.

Of the District's 16,000 hectares, more than 2,000 hectares is District managed parkland (District of North Vancouver, 2009)

- Existing parkland provides sinks for carbon to be sequestered.
- Parkland helps to maintain and enhance biodiversity within the District.

5. COMMON MISCONCEPTIONS

MISCONCEPTION: Climate change is a problem for the future.

FACT: The impacts of climate change are already being experienced around the globe and in the District. In order to mitigate and adapt to climate change, immediate action is required.

MISCONCEPTION: As individuals, we cannot make an impact on slowing or reversing climate change.

FACT: Individuals have a large role to play in slowing or reversing climate change. Individual behaviours and daily decisions can significantly influence one's carbon footprint.

MISCONCEPTION: I need an electric vehicle and solar panels in order to make a difference.

FACT: While technological solutions like electric vehicles can help reduce one's carbon footprint, other actions, such as walking, cycling or taking transit, are just as effective. Furthermore, solar photovoltaic (PV) panels do not reduce one's carbon footprint as it simply displaces hydroelectricity in BC. Solar hot water panels, on the other hand, can reduce one's carbon footprint as it usually displaces fossil fuels.

MISCONCEPTION: I already recycle so I don't need to do more for the environment.

FACT: While recycling is important, other actions can have a more significant impact on improving the environment and reducing one's carbon footprint. Actions related to "waste" do not reduce one's carbon footprint as much as actions related to transportation and energy use (e.g. heating) in buildings. Additionally, the other R's (i.e. reducing, reusing) should take precedence over recycling.

MISCONCEPTION: My gas furnace is good for the planet.

FACT: There are greenhouse emissions associated with using one's gas furnace. Other heating solutions, like high-efficiency electric heat pumps, are better for the planet as they have very limited greenhouse gas emissions.



6. KEY ISSUES

Key Issue	Why is it Critical to Address this Issue?
District residents depend on fossil fuels to heat their homes and businesses.	<ul style="list-style-type: none">• Generally speaking, we are still dependent on fossil fuels for the heating of our buildings.• Heating buildings accounts for approximately 40% of the District's total GHG emissions.• Funding is currently available at the federal and provincial levels to help address fossil fuel dependence and fuel switching. Municipal top-up funding would help to further incentivize fuel switching.• Without changes in this area, the District will not meet its GHG targets.
District residents predominantly use passenger vehicles fueled by fossil fuels to get around.	<ul style="list-style-type: none">• Transportation accounts for 52% of the District's total GHG emissions (Integral Group LLC, 2019).• Of the District's transportation related emissions, approximately 96% comes from passenger vehicles and 4% from commercial vehicles (Integral Group LLC, 2019).• In 2017, 80% of trips were made by passenger vehicles (TransLink, 2019).• Passenger vehicle dependence is, in part, due to land use and density in the District as well as a lack of transit and active transportation options.• Funding is currently available at the federal and provincial levels to help address fossil fuel dependence and fuel switching. Funding is also currently available to build public transportation infrastructure and to advance active transportation options.• Without changes in this area, the District will not meet its GHG targets.
Extreme weather	<ul style="list-style-type: none">• The District is currently experiencing challenges related to extreme weather and anticipates these impacts to amplify in the future with climate change.



Key Issue

Why is it Critical to Address this Issue?

	<ul style="list-style-type: none">• Some impacts of climate change and extreme weather in the District could include:<ul style="list-style-type: none">○ Increased flooding, debris flow, slope instability, property damage, decreased reservoir levels, and impacts to recreation opportunities related to changes in precipitation patterns.○ Increased risk of wildfire, ecosystem risk, increased invasive organisms, longer drier summers, and public health impacts due to air quality, temperature increases, and temperature extremes.
Rising sea levels ¹	<ul style="list-style-type: none">• Since much of the District borders the ocean, rising sea levels will impact its land base. This may include industrial lands as well as residential lands. Adaptation measures will likely be costly; however, the cost of inaction will likely be even higher.• Rising sea levels will have an impact on all topic areas.• Planning and preparing for rising sea levels cannot be avoided.• There is federal funding available to help communities prepare for rising sea levels and other related climate adaptation activities.
The misconception that individual actions don't have a significant impact.	<ul style="list-style-type: none">• Many individuals and businesses want to take action but are overwhelmed and unsure about what are the most effective actions, as well as what resources are available.• The collective impact of relatively small changes by individuals can be transformational in terms of reducing overall GHGs in the community.• Key actions involve integrating more climate friendly behaviours into daily life (commuting, shopping, heating, travel, eating, etc.).

¹ Information about the District's developing Sea Level Rise Strategy can be found here: <https://www.dnv.org/sea-level-rise-strategy>

7. KEY TRENDS AND EMERGING ISSUES

Key Trend/ Emerging Issue	Why is This Trend/Emerging Issue Important?
<p>Without proactive and aggressive climate action, population and employment growth are predicted to increase overall District emissions by 19% by 2050 (Integral Group LLC, 2019).</p>	<ul style="list-style-type: none"> • This creates a significant ‘emissions gap’ of nearly 500,000 tonnes of carbon dioxide equivalent (CO₂e) between the District’s projected emissions and the targeted goal of achieving carbon neutrality in 2050 (Integral Group LLC, 2019). • The OCP (Town and Village Centres model), transportation actions, and retrofits/fuel switching will all have a significant positive influence on the District’s emissions trend.
<p>Escalating extreme weather events and associated impacts in the District.</p>	<ul style="list-style-type: none"> • Since 2014, the District has seen heat waves, extreme drought conditions impacting reservoir levels, large regional wildfires that impact air quality, intense rainfall events that cause flooding and debris flow. • Landslides, and other extreme weather events, have a high potential for injury and loss of life (e.g. Berkley landslide).
<p>Increasing awareness and public pressure on institutions to take action on the climate emergency.</p>	<ul style="list-style-type: none"> • Public awareness has been building locally and globally. Action is being demanded of all levels of government. • This trend creates an opportunity for the District (insofar as there is growing public support to act), but it comes with closer scrutiny; the District will be held accountable.
<p>Increasing consideration of climate equity and social co-benefits.</p>	<ul style="list-style-type: none"> • It is important to ensure that climate actions support a full range of people in the community, and are available to people from diverse backgrounds, ages, incomes, and abilities. • This approach ensures identified actions do not disproportionately impact vulnerable populations while also addressing other important community needs, including physical, social and mental well-being.



Key Trend/ Emerging Issue

Why is This Trend/Emerging Issue Important?

Funding is increasingly tied to Climate Lens Assessments.

- In order for the District to access much of the available federal and provincial funding, projects must be assessed through a climate lens, including mitigation and adaptation/resilience.

8. RELEVANT BEST PRACTICES

Best Practice	Why is This a Best Practice?
<p>Take immediate and simultaneous action on climate mitigation and adaptation.</p>	<ul style="list-style-type: none">• There is scientific consensus that immediate action is required to avoid significant and irreversible climate change.• Communities also need to prepare for (and adapt to) the impacts of climate change.• Numerous actions address both mitigation and adaptation (e.g. planting trees).
<p>Prioritize actions that reduce demand for energy and fossil fuels.</p>	<ul style="list-style-type: none">• Follow the energy management hierarchy by prioritizing demand side management (i.e. reducing demand for energy) before supply side management (i.e. supplying lower carbon forms of energy). This is recommended as demand side management is more cost-effective than supply side management.• This would relate to the District’s housing and building stock (e.g. reducing energy waste by weather-stripping a building) in addition to transportation (e.g. driving less versus buying a new electric vehicle).
<p>Complete technical and risk-based analysis to understand which areas are most vulnerable to climate related events, (e.g. sea level rise, slope instability) and take action.</p>	<ul style="list-style-type: none">• This relates to the good work that the District has already initiated: climate adaptation strategy, sea level rise analysis, and development permit areas.• The District is already following many best practices in this area.

9. KEY INDICATORS

Indicator	Why is This Important to Measure?
Greenhouse Gas Emissions (tonnes of carbon dioxide equivalent, tCO ₂ e)	<ul style="list-style-type: none">• This indicator gives insight into how a community is meeting climate mitigation (GHG reduction) targets (e.g. the District reduced emissions by XX tCO₂e).
Energy Consumption (kWh or GJ)	<ul style="list-style-type: none">• This indicator gives insight into how much energy is being used in the community and whether a community is meeting energy reduction targets (e.g. the District consumed XX kWh of electricity and XX GJ of fossil fuels).
Vehicle-Kilometers Travelled (VKT)	<ul style="list-style-type: none">• This indicator gives insight into how a community is reducing its vehicle dependency (and, consequently, reducing its reliance on fossil fuels).• The utility of this indicator in this context will have to be assessed further.



10. ACTIONS TO-DATE

The District has already taken meaningful action on Climate Emergency issues. The list below is not comprehensive but does highlight key actions the District has taken more recently.

General

- 2015 District Corporate Strategic Energy Management Plan (SEMP) – updated annually including 2019 version which was endorsed by Executive
- 2017 Climate Change Adaptation Strategy (CCAS)
- 2019 Climate and Ecological Emergency Declaration
- 2019 Community Energy and Emissions Plan (CEEP), “IMPACT2050”, established new targets for GHG emissions reduction
- Climate Action Revenue Incentive Program (CARIP) monitoring and reporting mechanism. Note that the 2018 CARIP report includes a detailed list of actions taken across the organization that contribute to both emissions reductions and climate adaptation
- 2012 Energy and Water Conservation and Greenhouse Gas Emission Reduction Development Permit Areas (DPA)
- Green Building Policy – Private Sector Developments
- Initiated the North Shore Sea Level Rise Risk Assessment and Adaptive Management Strategy (not yet complete)
- 2018 BC Energy Step Code adopted
- Initiated North Shore Resilience Strategy (not yet completed, led by North Shore Emergency Management)
- Initiated Integrated Stormwater Management Plan, ISMP (not yet completed)
- Initiated Climate and Innovation Reserve Fund (not yet completed)
- Initiated Carbon Budget (not yet completed)

Transportation & Land Use

- Completed Plans for Lynn Creek, Lions Gate, Lynn Valley, Maplewood and Edgemont for complete, compact and an energy efficient network of centres in the community
- Continued work on the North Shore Spirit Trail, a multi-use pathway from Horseshoe Bay to Deep Cove
- Completed segments of numerous bike lanes, including: Lynn Valley Road, Highland Boulevard, and E. 29th Street bike lanes
- Laid the groundwork for a Rapidbus extension across the North Shore (Park Royal to Phibbs Exchange), representing an additional 14km of bus service
- Continued detailed design work with TransLink and the Province on the Phibbs Exchange project to support additional transit ridership
- Completed a range of walking and biking safety infrastructure improvements to encourage active transportation



- Introduction of U-Pass at Capilano University, in conjunction with TransLink and the District

Buildings

- Energy retrofit of the Karen Magnussen Community Recreation Centre, and other District facilities, representing the majority of Corporate emissions - ongoing
- Adopted the BC Energy Step Code on December 11, 2017 (effective July 1, 2018), with requirements to build to Step 3 for Part 9 residential buildings (three storeys or less)
- Continued support for BC Hydro's Appliance Rebate program, including financial support to residents

Waste

- Participated in Metro Vancouver's North Shore Wastewater Treatment Plant project, which will lead to an approximate GHG reduction of 300 tonnes CO₂ for the District - opening 2021
- Supplied standardized carts for waste collection and provided incentives for waste reduction, including decreased utility fees for those using smaller garbage containers - ongoing

Urban Forestry

- Restoration planting plans for both the Streamside, and Protection of Natural Environment Development Permit Areas
- Required new street trees as part of Development Permits and subdivision applications
- Updates to the Community Wildfire Protection Plan (CWPP) - 2019
- Treatment of a total of 54 ha of the 70 ha of high-risk interface areas identified in the Community Wildfire Protection Plan (CWPP)

11. POTENTIAL ACTIONS

The following list includes potential actions that have been grouped into categories that Council could choose to advance in the short-term. Appendix A includes a more complete list of action items. Also please note that transportation actions are more fully addressed in the Transportation White Paper.

Potential Action	Description
Establish a Building Retrofit Program	<ul style="list-style-type: none"> • Focus on existing buildings and heating. CEEP shows that approximately 40% of emissions are associated with the heating of existing buildings • Provide information, resources, incentives, and financing support to encourage building owners/occupants to improve the energy efficiency of existing buildings with a particular focus on heating <ul style="list-style-type: none"> ○ Example 1: To switch from gas-based heating systems to high efficiency electric systems (e.g. heat pumps) ○ Example 2: To improve the energy performance of building envelopes (insulation, weather-stripping doors/windows, etc.)
Strengthen Municipal Assets	<ul style="list-style-type: none"> • In the context of a changing climate and more extreme weather events, develop a comprehensive strategy to improve and increase the resiliency of: <ul style="list-style-type: none"> ○ built assets (buildings, roads, water/sewer systems, lighting) ○ natural assets (forests, coastline, wetlands, waterways, soil) ○ green infrastructure (bio swales, rain gardens, urban parks)
Zero Carbon Mobility	<ul style="list-style-type: none"> • Strive for a zero-carbon transportation system • Implement measures to: <ul style="list-style-type: none"> ○ Reduce/eliminate personal vehicle trips (e.g. parking permits or pricing); ○ Increase transit and active transportation (e.g. cycling, walking, rolling); and/or ○ support electric mobility options (e.g. electric scooters, bikes, and vehicles).



Potential Action

Description

Carbon Conscious Governance

- Ensure that corporate decisions consider carbon and ecological impacts and advance climate goals
 - Example 1: Carbon budgeting, carbon-based decision-making at the corporate level
 - Example 2: Working with other levels of government - advocating for low carbon vehicle fuel standards, and/or mobility pricing.

Explore 'Indirect' GHG Emissions

- Explore examples of best practices that support residents and businesses to reduce their 'indirect' GHG emissions from:
 - The consumption of goods and services (e.g. low carbon options for food choice and shopping).
 - Embodied emissions (e.g. building materials - concrete versus wood)
- Explore negative emissions technologies (e.g. carbon capture and storage).

Compact, Complete Communities

- Advance low carbon, compact, and 'complete' town and village centres with a range of services within walking/cycling distance (e.g. amenities, transit, housing, employment, and recreation opportunities).
- Ensure the ability to live, work and play within a short distance

Integrate Climate Equity

- This action could apply to all other actions
 - Ensure climate actions support a full range of people in the community, and are available to people from diverse backgrounds, ages, incomes, and abilities.
 - Apply a climate equity lens on decision-making frameworks
-



Potential Action

Description

Climate Action Outreach

- This action could apply to all other actions
- Provide information, resources, and/or financial support for community members to take action in their homes or businesses
 - Example 1: Installing electric vehicle charging infrastructure, building retrofits/upgrades and other energy conservation measures
 - Example 2: Managing stormwater, enhancing the health of private trees

NOTE: District energy (DE) systems are often identified as a solution to provide low-carbon energy to a group or cluster of buildings. District energy has been examined by the District and has been found not to be viable or feasible. This could change if the District were to alter land use and densities to improve the business case for district energy.

DISTRICT RESIDENTS CAN HELP ADDRESS THE CLIMATE EMERGENCY BY...

- Choosing low-carbon transportation options such as public transit, walking, or cycling a few days per week.
- Organizing carpools with others if they choose to drive (including travel for work and children's activities)
- Converting gas furnaces to lower carbon alternative such as an electric heat pump
- Shopping for locally-made goods instead of goods shipped from overseas
- Switching from gasoline or diesel-powered vehicles to electric vehicles
- Commuting by electric bikes or scooters
- Choosing to live in more compact forms of housing
- Taking shorter showers
- Choosing staycations over carbon intensive flights
- Choosing reusable products over disposable ones (reusable water bottles, food containers, bags, utensils, straws, razors, etc.)
- Shifting to a more plant-based diet
- Planting trees on their property
- Insulating their homes and weather-stripping doors and windows

12. REFERENCES

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APPENDIX A

Potential Actions – Additional Items

A.1 POTENTIAL ACTIONS - MITIGATION

Category	Action
Regulations (bylaws and policies)	<ul style="list-style-type: none"> • Ensure new developments are designed to contribute to ‘complete communities’ that allow residents to live, work, and play in the same place. • Improve building energy efficiency in new residential construction projects by accelerating to higher steps in the BC Energy Step Code (note: opportunities in new construction are not as great as opportunities in existing buildings) • Improve building energy efficiency in new institutional, commercial and industrial construction projects, as introduced in the BC Energy Step Code • Reduce the amount of organics and recyclables sent to landfill from construction, land clearing and demolition companies by requiring a site waste diversion plan and audit system.
Plans and Strategies	<ul style="list-style-type: none"> • Establish an Urban Forestry Management Strategy that protects and enhances the District’s urban forest for years to come. This could be linked to a Natural Asset Management Strategy or Green Infrastructure Strategy. • Reduce the number and length of single occupancy car trips in the District using Transportation Demand Management (TDM) strategies (e.g. parking policies/fees, bicycle facilities, transit subsidies, advocacy)
Incentives	<ul style="list-style-type: none"> • Implement a Building Retrofit program to improve the energy efficiency and comfort of the existing building stock in the District (including both publicly and privately owned residential and non-residential buildings). • Reduce or eliminate our dependence on fossil fuels by switching away from fossil fuel-based sources of energy (e.g. fossil gas), towards the use of electricity in all buildings. Use heat pumps to electrify existing fossil gas furnaces and hot water heaters to reduce overall energy use and limit increased utility costs. Incentives may be required to advance this action item.

Category

Action

	<ul style="list-style-type: none"> • Transform select Town Centres into energy leaders by targeting net-zero ready levels of energy performance in all new buildings. This may involve negotiations with developers and/or providing specific incentives (e.g. energy efficiency density bonusing) • Internal Transportation Demand Management – bus passes for staff, bike share, car share, guaranteed ride home, telecommuting, etc.
<p>Advocacy and Monitoring</p>	<ul style="list-style-type: none"> • Lobby federal and provincial government for improvements in fuel efficiency standards for gasoline powered vehicles and zero-emission vehicle (ZEV) standards. • Encourage efforts to electrify Port operations. • Advocate for an increase in methane capture from landfills to reduce emissions from waste. • Support regional efforts for mobility pricing (bridge crossing), provincial/national low carbon fuel standards • Support regional efforts to manage congestion using mobility pricing (e.g. parking fees, transit fares, level of service, road usage charges, etc.). • Continue to encourage Metro Vancouver’s wood waste bans to reduce landfill methane.
<p>Capital (Building things)</p>	<ul style="list-style-type: none"> • Support electric vehicle adoption by increasing the availability of electric vehicle charging infrastructure and electric bike charging infrastructure. • Improve the transit network’s efficiency and accessibility to enhance residents’ transit experience. • Improve residents’ access to non-automotive transportation systems (e.g. allocate more curb space to transit stops and bicycle facilities). • Improve walking and cycling safety through the addition of new infrastructure (e.g. separated bike lanes, and traffic calming infrastructure, such as intersection diverters).

Category

Action

	<ul style="list-style-type: none">• Install multi-stream waste containers (e.g. organics, recyclables, and garbage) at all streetscape waste locations.• Plant large tree species to provide shading for buildings, which helps keep buildings cool during summers and warm during winters, improving occupant comfort and reducing energy use.• Plant large tree species to provide shading along active transportation routes, which will help keep pedestrians and cyclists cooler during summer months.• Provide high capacity EV charging on municipal lands, replacing fleet vehicles with low or zero-emissions vehicles, etc.• Continue aggressive retrofit program of District assets/buildings, develop construction standards for Corporate construction (small & large buildings)
Services and Programs	<ul style="list-style-type: none">• Expand organics and recycling collection programs (e.g. to multi-unit residential buildings, commercial buildings). Explore opportunities to divert organics locally on the North Shore, shift to a bi-weekly garbage collection schedule, or explore other options to reduce residential waste at its source.• Implement a Building Retrofit program to improve the energy efficiency and comfort of the existing building stock in the District (including both publicly and privately owned residential and non-residential buildings).
Education Programs	<ul style="list-style-type: none">• Internal and external education program around fuel-switching in buildings• Update Mayor/Council with CEEP implementation, build understanding of potential trade-offs (parking fees, more construction/density equates to lower emissions), ongoing research (e.g. embodied emissions), integrating carbon into municipal decision-making, carbon budget



A.2 POTENTIAL ACTIONS - ADAPTATION

Potential actions reflect those in the 2017 Climate Change Adaptation Strategy.

Category	Action
Regulations (bylaws and policies)	<ul style="list-style-type: none">• Create and implement a Coastal Hazard Development Permit Area to protect people, property, and foreshore ecosystems from coastal impacts• Review and strengthen building and development policies to require the consideration of climate change over the life cycle of a structure• Within a Biodiversity Conservation Strategy, generate area-specific guidelines to acquire sensitive areas, restore existing lands with native species, and increase connectivity between biodiversity hubs
Plans and Strategies	<ul style="list-style-type: none">• Strengthen the capacity to respond to and recover from extreme weather events and provide continuity of essential municipal services by:<ul style="list-style-type: none">○ Completing a Continuity of Operations plans to ensure delivery of priority services○ Developing and implementing additional technological tools to assist in situational awareness and emergency response communication○ Providing targeted training for clerks to ensure emergency service requests and concerns are responded to in a timely manner• Plan for the distribution of alternative potable water supply during an emergency• Increase the resiliency of municipal assets to extreme weather events, changes in precipitation and temperature, and sea level rise by:<ul style="list-style-type: none">○ Completing the Integrated Stormwater Management Plan and implement recommendations to maintain watershed health and reduce the impacts of extreme runoff○ Updating the Community Wildfire Protection Plan and implement recommendations to reduce

Category	Action
	<p>wildfire risk and strengthen the capacity to respond</p> <ul style="list-style-type: none"> ○ Identifying eco-assets, conduct risk assessment under climate change conditions, and include these in the Asset Management Plan ○ Implement recommendations in the Debris Geohazard Risk and Risk Control Assessment for debris flood/flow creeks by integrating them into the Asset Management Plan <ul style="list-style-type: none"> ● Implement the Invasive Plant Management Strategy to manage harmful invasive plants on public and private land ● Identify critical functions that are vulnerable to power outages and further develop priority response and power restoration protocols
Advocacy and Monitoring	<ul style="list-style-type: none"> ● Assign specific indicators for each adaptation action to help monitor progress ● Integrate Required Actions into existing plans and decision-making processes to increase the likelihood of completion
Convening	<ul style="list-style-type: none"> ● Seek opportunities for interagency coordination to minimize adverse health impacts to staff, responders, and the public during heat waves and air quality advisories
Capital (Building things)	<ul style="list-style-type: none"> ● Invest in backup power equipment for critical functions and develop a fueling strategy
Services and Programs	<ul style="list-style-type: none"> ● Develop and implement programs for rainwater and grey water collection and recycling ● Proactively manage all District-owned forested areas to increase forest resilience, health, and structure and reduce other natural hazards ● Create more opportunities for heat refuge areas
Education and Incentive Programs	<ul style="list-style-type: none"> ● Develop and implement an education and incentive program to encourage more resilient choices for the design, maintenance, and renewal of private development