Taking Action on Climate Change

Capital Regional District - Regional Climate Action Strategy

Final Report
April 2017

Making a difference...together

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This document represents current information as of the time of publication.
For current information, please view the document online at **www.crd.bc.ca/climate**

1 | GUIDING VISION

The Capital Region is low carbon, energy-efficient and values its natural resources; the community minimizes emissions, is well informed and prepared for the potential impacts of climate change and works collaboratively to increase resilience for the uncertainties ahead.

The Guiding Vision for the Regional Climate Action Strategy (RCAS) recognizes the need for reduced greenhouse gas emissions (GHGe), the importance of our region's natural environment and the necessity of taking strategic action on climate change to strengthen the resilience of our region as we face uncertainty.

The impacts of climate change are already being felt globally and locally, and these impacts will continue to intensify and affect our communities and the natural environment for decades to come. It is urgent that we do our part to stabilize the climate by achieving the regional target to reduce GHGe by 61% by 2038, from 2007 levels.

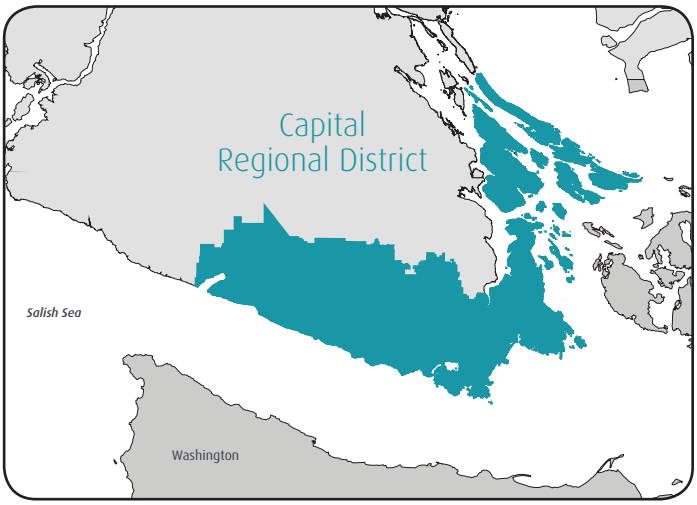
The more action the global community takes now to reduce emissions, the less intense these changes become over the mid- and long-term.

2 | INTRODUCTION

Regional Climate Action Strategy

The primary purpose of the Regional Climate Action Strategy (RCAS) is to guide Capital Regional District (CRD) services to support community-focused climate mitigation and adaptation action over the next five years. The RCAS takes an integrated approach by aligning climate action with existing and planned federal, provincial and regional initiatives. The actions outlined in this strategy may also serve as a resource for local government and community leaders.

The RCAS builds on the work that is already being done by residents, businesses, local governments and First Nations, the direction provided in the Regional Growth Strategy and by federal and provincial governments. The success of this RCAS relies on a commitment to climate action by both the CRD and our federal, provincial and regional partners.



CRD Services

As the regional government for 13 municipalities and 3 electoral areas on southern Vancouver Island and the nearby Gulf Islands, the CRD provides:

- **region-wide services** for all residents (e.g. regional parks, solid waste management).
- **sub-regional services** for two or more jurisdictions (e.g. recreation facilities).
- **local decision-making and services for rural electoral areas** (e.g. fire protection, building code inspections, land use planning outside the Islands Trust area).

In total, the CRD has more than 200 service and infrastructure agreements with municipalities and electoral areas, and varying degrees of control or influence over activities associated with GHGe and their consequences. The RCAS focuses primarily on regional initiatives that can be done to support, or in collaboration with, our partners. The RCAS also touches on a number of CRD community services; however, comprehensive mitigation and adaptation strategies are required for select CRD services and infrastructure plans. For example, a Climate Change Adaptation Strategy for the Greater Victoria Water Supply Area is being developed by the CRD Watershed Protection division. (See Appendix C for a sample list of CRD strategies and plans).

Correlation with the Regional Growth Strategy

The RCAS was developed as one of three documents to support the Regional Growth Strategy (RGS) and was expanded to include the Southern Gulf Islands. The remaining documents, the Regional Food and Agriculture Strategy and the draft Community Health and Well-being Plan will also include content to support climate action in the region. (See Appendix C)

The RGS is a framework, developed by municipalities and the regional district in partnership, for identifying social, economic and environmental objectives. It provides direction for municipal and electoral area planning decisions, except the Islands Trust area. The core objectives of the RGS, which serves as an overarching tool to guide decisions on regional issues, have been designed to support climate change mitigation and adaptation goals. Achieving the RGS objectives will be critically important to successfully reduce community GHGe and prepare for climate change.

Corporate Climate Action Strategy

The RCAS acknowledges that the CRD has a leadership role in the region. In 2008, the CRD Board committed to reducing operational GHGe 33% by 2020, from 2007 levels.

In 2015, the CRD Board then identified two strategic priorities around corporate climate action:

- Provide a climate lens for Board decision-making.
- Accelerate corporate mitigation and adaptation activities.

In response to these strategic priorities, staff developed a Corporate Climate Action Strategy (CCAS). The CCAS guides the CRD's operational approach and decision-making through a policy framework and corresponding climate action activities and actions to meet these Board directives.

Taking Action on Climate Change

VISION

The Capital Region is low carbon, energy-efficient and values its natural resources; the community minimizes emissions, is well informed and prepared for the potential impacts of climate change and works collaboratively to increase resilience for the uncertainties ahead.

ROLES

CLIMATE ACTION GOALS

Mitigation

1. Developed urban areas are compact and complete.
2. Multi-modal transportation systems are low carbon.
3. Buildings are high performing and low carbon.
4. Natural assets are valued for reducing our contributions to climate change.
5. Waste generation is minimized and remaining waste is transformed into a resource.

Adaptation

6. Regional vulnerabilities to the impacts of climate change are understood.
7. Communities are prepared for and resilient to the impacts of climate change.
8. Natural assets are resilient to the impacts of climate change.

3 | CONTEXT

What Does "Climate Change" Mean?

Climate change means that long-term weather patterns are changing, and **since the 1950s, the climate has changed at an unprecedented rate.** The atmosphere and oceans have warmed, the amounts of snow and ice have diminished, sea level has risen and the concentrations of GHG have increased (IPCC, 2013).

These rapid changes are largely attributed to the concentrations of GHG in our atmosphere (including carbon dioxide, methane and nitrous oxide) reaching unprecedented levels due to human activity. For example, in 2011, atmospheric concentration of carbon dioxide exceeded pre-industrial levels by 40%, methane by 150%, and nitrous oxide by 20% - all of which exceed the highest concentrations recorded over the past 800,000 years (IPCC, 2013).

When the atmosphere has higher concentrations of these gases, it traps more of the sun's heat rays and results in changes to long-term weather patterns. Approximately 68% of the elevated emissions are the result of burning fossil fuels like gasoline, natural gas, oil, coal and propane to produce energy, and the production of cement. The remaining 32% of GHGe are the result of deforestation and other land use changes (IPCC, 2013).

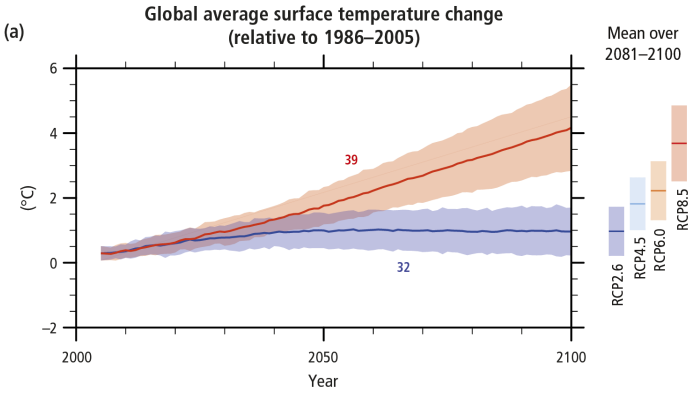


Figure SPM.6(a) from IPCC's Climate Change 2014 Synthesis Report shows modeled global average surface temperature change relative to 1986-2005/ The mean of the projections (lines) and a measure of uncertainty (shading) are shown for RCP8.5 (red) and RCP2.6 (blue). The number of climate models used to calculate the mean is indicated.

The Imperative for Climate Action

A changing climate brings much uncertainty. At a global scale, a changing climate has already resulted in a warmer atmosphere, warmer and more acidic oceans, reduced amounts of snow and ice, and higher sea levels. By the end of this century, even if we are able to take significant action to reduce emissions, it is likely that global temperatures will continue to rise. This will result in continued ocean acidification, reduced glaciers and increased sea levels, and impacts on precipitation–generally becoming wetter in wet regions and drier in dry regions (IPCC, 2013).

Locally, according to the Pacific Climate Impacts Consortium (PCIC) Plan2Adapt Tool, climate model projections for the capital region indicate:

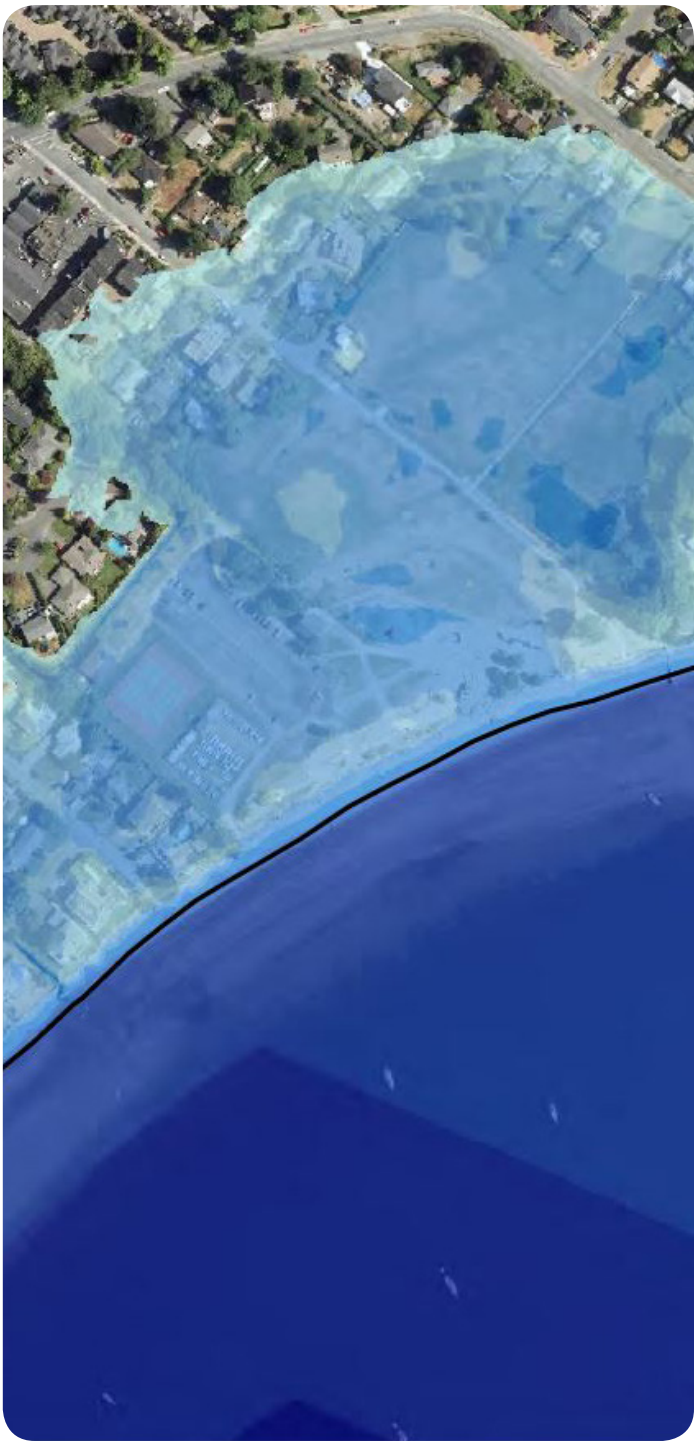
- **Year-round temperatures will rise.**
- **Dry spells in the summer will extend.**
- **Storm activity will become more frequent and intense, with higher winds and more precipitation falling during storm events.**
- **Sea levels will rise and will be subject to larger storm surge and wave effects, further increasing the risks of sea level rise.**

The Pacific Climate Impacts Consortium (PCIC) has also produced regionally downscaled climate modelling for the capital region. The results of this work predict an increase in mean temperature, an increase in annual precipitation, a decrease in snowfall and an increase in frost-free days.

The Georgia Basin Impacts Study (conducted by PCIC in 2012 and updated in 2016) refines these projections and indicates a trend towards reduced precipitation during summer months and towards additional precipitation in winter months. The CRD is currently working with PCIC on a *Climate Projections of the Capital Region* study to update this climate modelling and to identify impacts relevant to our region. Additionally, the CRD worked with local governments to undertake a study to understand the region's coastal vulnerabilities to sea level rise in 2015.

While there is still uncertainty, this knowledge helps position our communities to be prepared for and resilient to the impacts of climate change. These changes will not always happen consistently (seasonal and annual variations will occur); however, they will bring added stress to the region's natural and built environments, and to our social and economic systems. The uncertainty ahead demands that we pay attention to climate change by taking action to reduce our contribution to climate change (called **"mitigation"**), while also taking action to prepare our communities to be resilient in the face of a changing climate (called **"adaptation"**).

There is a clear role for local governments to take action on mitigation and adaptation. The Federation of Canadian Municipalities report estimates that 44% of Canada's GHG emissions are within direct or indirect control of local (municipal and regional) governments (EnviroEconomics, 2009). As climate change impacts increase in frequency and severity, many of the costs of the impacts on infrastructure, social and economic systems and natural systems will be borne by communities.



Mitigation

Although the capital region makes a small contribution relative to the global scale of GHGe, it is the collective contribution that has resulted in climate change, and it requires our collective action to mitigate. This means it is the responsibility of all regions to find alternatives to burning fossil fuels for energy, to use energy more efficiently and to conserve our forests and natural spaces.

Adaptation

Adapting our communities for climate change requires us to understand the potential range of local impacts, and to prepare our infrastructure (e.g. water supply, sewer and stormwater systems), social and economic systems (e.g. heat waves, disruptions to work, competitiveness), and natural systems (e.g. biodiversity change, habitat loss, invasive species and shifting ecosystems) to handle the increasing stressors that are expected with climate change. The focus will be to ensure minimal disruption and costs, while maximizing potential benefits.

The RCAS encompasses both the mitigation and adaptation actions the CRD will take to address climate change. It is imperative that our partners and community members also take action on climate change to ensure we reduce our emissions and are prepared for the changes ahead.

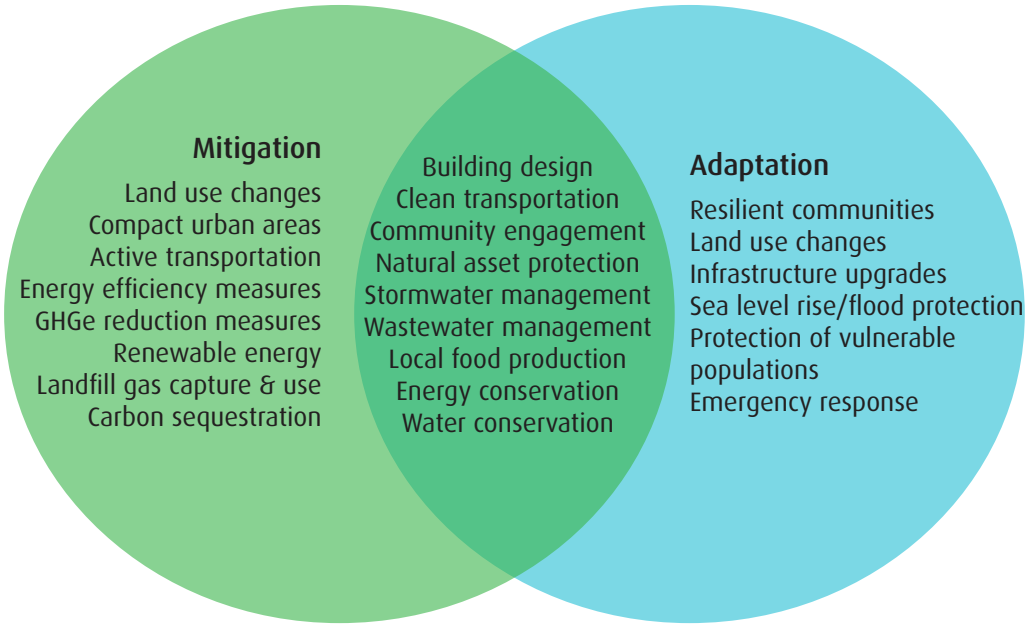
Co-Benefits of Climate Action

Implementing climate change mitigation and adaptation actions can yield many community sustainability co-benefits that will improve the quality of life in the region. Taking an integrated approach by aligning climate action with other regional initiatives will ensure opportunities are leveraged to maximize community benefits.

Some of these enhancements and improvements include mitigation (M), adaptation (A), or both (M/A):

- biodiversity, recreation opportunities and ecosystem services through expansion and protection of green spaces (M/A)
- quality, performance and durability of buildings (M/A)
- community infrastructure that is safer today and in the future (M/A)
- opportunities for community economic development and diversification (M/A)
- public health and cleaner air (M/A)
- more resilient energy system (M/A)
- food security (A)
- protection of the region's vulnerable populations (A)
- safeguard the region's economy (M/A)
- more robust emergency management system (A)
- protected drinking water supplies (A)
- increased transportation choices and affordability (M)
- reduced cost to operate local government services in more compact settlements (M)

Mitigation and Adaptation Synergies



What Action is the CRD Already Taking?

Climate Action

Climate action is well established across CRD services. The CRD developed its first Community Energy Plan (CEP) in 2007 and in 2009, through the Climate Action and Adaptation Service Establishment Bylaw No. 3510, the CRD became the first regional district to have a Climate Action Program (CAP) to support and implement regional climate action efforts.

How CRD Activities Support the Vision and Goals

The CRD has over 220 services, a great number of which have plans and strategies that address both corporate- and community-related climate change goals. Action on climate change requires leadership from all departments and operational units. Recognizing this, the RCAS builds upon the important work already being done across the organization. The RCAS, along with the CAP initiatives, the CRD Board's climate change decision-making lens and the Regional Growth Strategy, ensures climate action is embedded into the organizational culture of the CRD and is supported by a range of CRD plans, operations, service areas and departments.

Working on climate action is not new to the CRD. Numerous divisions and service areas are already undertaking plans and actions that directly or indirectly support the RCAS vision and goals both on the mitigation and adaptation fronts. Appendix C contains a table that demonstrates how several of current CRD plans and processes support the RCAS goal areas.

Corporate Climate Action

The CRD is committed to fostering a liveable and resilient region through action on sustainability. This begins with leadership in its own operations, including a commitment to reduce corporate GHGe by 33% below baseline levels before 2020. Under the BC Climate Action Charter, the CRD is also committed to measuring, reducing, offsetting or balancing, and reporting on annual emissions from corporate operations. The CRD became carbon neutral in corporate operations in 2012 and will maintain this carbon neutral status while working towards meeting the GHGe reductions targets.

During the 2015 Board strategic planning process, the CRD Board identified "accelerating corporate mitigation and adaptation activities" as a priority for the organization. In response, the CRD is implementing multiple initiatives, such as applying a climate change lens to all new capital projects, developing policies and implementing the CCAS. In 2017, the organization will begin work on a Corporate Climate Adaptation Plan. This will complement the work already underway to develop a Climate Change Adaptation Strategy for the Greater Victoria Water Supply Area.

Information about the CRD's corporate climate action initiatives can be found within the CCAS, the Climate Action annual reports and the Climate Action Revenue Incentive Program public reports.

The CRD's Climate Action Program

Under the CRD Environmental Protection division, the CAP directly supports the region through 6 important roles:

- Assist local governments in developing and implementing emissions reductions and climate adaptation **policies, plans and programs** under their community and corporate portfolios.
- Provide **scientific information, data and indicators** related to local and regional GHGe and projected climate impacts for the capital region.
- Increase **public awareness** of climate change issues and catalyzing action through partnerships with public and private sectors, non-governmental and community organizations, and First Nations.
- **Leverage external funding** and working with services across the organization and local governments to lead and support a number of regional climate change mitigation and adaptation activities.
- **Liaise with senior levels of government** on climate change-related programs, policies and legislation that impact the capital region.
- **Support the CRD** in fulfilling its own corporate climate objectives, including the climate-related CRD Board strategic priorities.

The CAP also reports annually on its activities to the CRD Environmental Services Committee and Board, and coordinates the CRD Climate Action Inter-Municipal Working Group and the Climate Action Inter-Municipal Task Force made up of local government staff and elected officials. Members participate in these groups to share information, collaborate, review current program deliverables and provide input on the direction of future CAP work. In addition to facilitating these groups, the CAP provides customized support to local governments including, but not limited to, providing consultation coordination, assisting with the development of community plans, programs, information reports and education initiatives, and hosting or sponsoring capacity-building workshops.

Although there is already supportive climate action across the CRD, further efforts are needed to realize the vision and goals outlined in this strategy.

Climate Action Program Initiatives in the Community

the resilient region exchange

Established in January 2011, the **Resilient Region Exchange Breakfast** series connects individuals from government, business, the public sector, non-profits and academia. The goal is to provide a space to forge partnerships, incubate ideas and develop projects that contribute to a resilient capital region.

TRANSPORTATION TUNE-UP

The **Transportation Tune-Up** campaign was a community based social marketing initiative that trained citizens on fuel-efficient driving and sustainable transportation options through direct contact and online media.

CLIMATE ACTION TO-GO

The **Climate Action To-Go Kit program** is a creative way to engage housholds and grade K-12 students. The kits include hands-on tools and resources for energy conservation and climate action made available through, and partnership with, local libraries and School Districts. The CRD designed the program for replication. In 2012, the Sunshine Coast Regional District adopted the program.

The CRD Student Climate Challenge

The **Ready, Set, Solve: Student Climate Challenge** invites teams of post-secondary students to solve real climate and sustainability challenges submitted by local governments, non-profits and institutions. The program is hosted with support from BC Hydro, Camosun College, Royal Roads University and University of Victoria.

The provincial **Oil to Heat Pump Incentive Program** encourages homeowners to replace oil tanks with electric heat pumps, an effective way to reduce home heating GHGe. The CRD offers top-up incentives ($150) towards home energy assessments for participating residents. Delivered by City Green Solutions.

The **Growing Solutions** campaign focused on connecting food choices to climate change. The goals included increasing food security and inspiring citizens to grow, buy and support local food. In partnership with Lifecycles Project Society, the initiative helped establish 5 school vegetable gardens, expand 4 existing school gardens and launch a household behaviour-change campaign reaching over 7,000 citizens.

The **Green 365** initiative promoted the use of green behaviours in and around the home. Also included in this campaign were **My Green Plan,** an online tool that helps residents select and prioritize sustainability actions they want to undertake and **My Green School Plan**, a challenge promoting sustainable behaviour changes identified and implemented by students in their school.

Two rounds of the **Tap by Tap: Multi-Unit Residential Program** provided high-efficiency faucet aerators and showerheads to apartment building and property managers resulting in annual regional savings of 96,000,000 L of water, 17,100 GJ of energy and 830 tonnes of C02e.

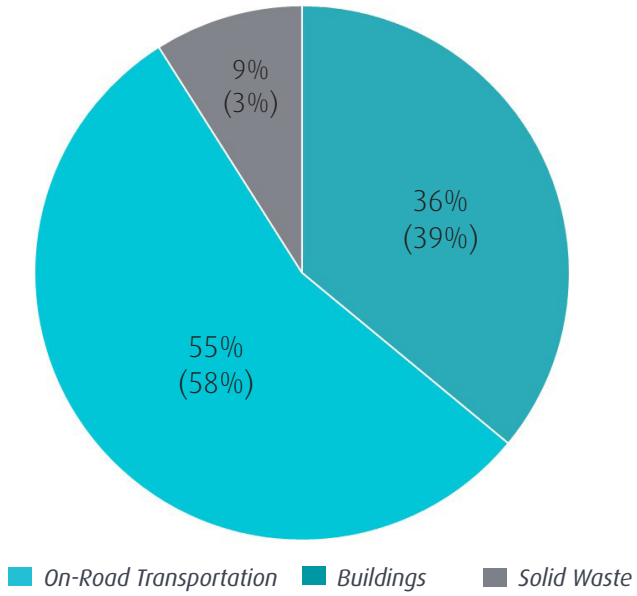
The CAP provides outreach support for the **People Power** program which focuses on motivating, supporting and encouraging residents to safely walk, roll and cycle more often. It runs in tandem with community-led infrastructure investments and data collection programs across the region. Led by CRD Regional & Strategic Planning, the program is made possible with support from the Victoria Foundation, the Traffic Safety Commission and the Real Estate Foundation.

4 | CURRENT REALITIES

Greenhouse Gas Emissions

Most of our daily activities result in the release of GHGe. On a global scale, the majority of GHGe result from burning fossil fuels to produce energy for buildings, transportation and industrial processes; some result from agricultural activity and the remaining result from land-use changes and deforestation, waste and international transport.

Figure 1: Capital Region 2010 CEEI by source (2007 in brackets)



Tracking Emissions in BC

In order to track the progress of communities reaching their GHG reduction targets, the Province has led the development of the Community Energy and Emissions Inventory (CEEI) reporting. CEEI represent energy consumption and GHGe from community activities in on-road transportation, buildings and solid waste. This inventory was the first of its kind in North America and, though narrow in scope, it helps local governments meet their BC Climate Action Charter commitment to measure and report on community GHGe profiles.

Regional Greenhouse Gas Emissions

Using the community-scale activities in the 2010 CEEI report as the basis for the scope of this strategy, the capital region collectively generates approximately 1.5 megatonnes of CO_2 equivalent GHGe every year from vehicles, buildings and solid waste (BC MOE, 2014). This total includes the combined contribution from all residents, businesses and organizations in the jurisdiction of the CRD (see Figure 1).

To achieve the regional target to reduce emissions by 61%, from 2007 levels, would **require a decrease of 1 million tonnes of CO_2e.** This is an ambitious target which will require significant effort to achieve.

Although not included in the inventory, land clearing for local development further contributes to emissions from community-scale activities. The strategy does include the value that natural areas, such as rural and urban forests and riparian areas, have in sequestering and storing carbon (Appendix B).

Activities occurring within the region that are not directly influenced by local governments (e.g. air travel, deforestation in other jurisdictions, industrial processes, agriculture) are outside of the scope of the RCAS and should be addressed by senior government and/or industry plans.

Transportation
895,000 tonnes of CO_2e (55% of our GHGe)

Driving personal vehicles is the largest source of GHGe from community activities in the capital region (44%). Single occupant vehicles overwhelmingly represent the primary mode of transportation. Approximately 71% of residents use vehicles to get to work, while 11% take transit, 10% walk, and 6% cycle (Statistics Canada Census, 2011). Commercial vehicles that are registered in the region are responsible for approximately 13% of emissions.

Buildings
541,000 tonnes of CO_2e (36% of our GHGe)

Residential and commercial buildings in the region account for the second and third largest sources of community GHGe (20% and 15%, respectively). Most of the emissions from these buildings result from using natural gas and oil to provide heating and hot water. Factors that affect energy use include building age, size and type of use. In the capital region, 75% of homes were built before 1980 (generally much less energy efficient than newer buildings) and almost 70% of homes are detached or attached single-family (which typically use significantly more energy per capita than multi-family buildings).

Solid Waste
127,000 tonnes of CO_2e (9% of our GHGe)

Decomposing garbage (organic waste) produces landfill gas, which is mainly made up of carbon dioxide and methane (a very potent GHG). To reduce emissions, the CRD started collecting landfill gas at Hartland in 1991, using a network of wells and pipes, then in 2003, the CRD built a landfill gas-to-electricity plant to produce electricity from the captured landfill gas. In 2015, a 66% landfill gas capture rate produced enough energy to power 1,100 homes. The CRD is striving to achieve the 75% landfill gas collection efficiency target.

Regional Climate Impacts

The Pacific Climate Impacts Consortium (PCIC) has put forward a list of potential impacts that may affect the capital region by the 2050s. Although this list is quite comprehensive, our knowledge base on local climate impacts is still limited. As such, this is a 'work in progress' intended to provide a starting point for more detailed local assessment of climate change impacts. Some future possible impacts for the capital region according to the Plan2Adapt tool, created by the PCIC, include:

- high intensity precipitation
- increase in hot and dry conditions
- increase in temperature
- longer dry season
- possible change in productivity
- possible flooding
- reduced water supply
- sea level rise and storm surge
- shift in hydrological region classification
- waterlogged soil
  (PCIC, 2012)

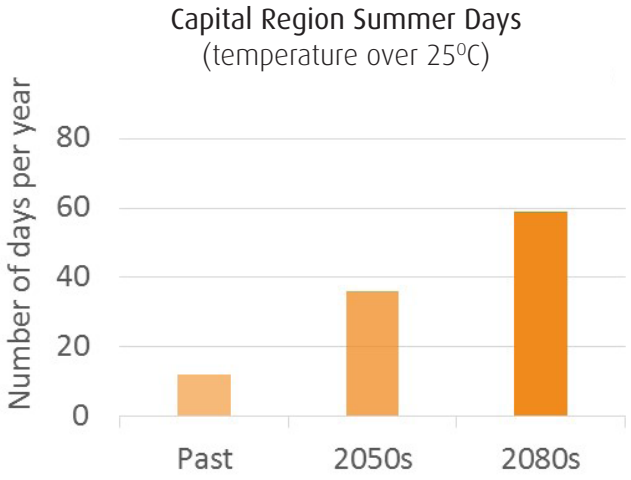
Additional potential impacts to our coastal communities are found in Natural Resources Canada's (NRCan) report on Canada's Marine Coasts in a Changing Climate. Key findings include:

- Winter precipitation is expected to increase, more falling as rain and less as snow.
- Summer water availability will be affected by changing precipitation patterns with less rainfall expected in the summer months. This, combined with reduced snowpack, will decrease the amount of water available to some regions in the late summer and autumn. During this period, river levels are expected to decrease and water temperature will likely increase as a result.
- Sea level rise will not affect all areas of British Columbia's coast equally due to the differences in vertical land movement. Some of the greatest relative sea level rise on Canada's west coast are projected to occur on Southern Vancouver Island.
- Storm surge flooding presents a greater risk to coastal communities than sea level rise alone (NRCan, 2013).

As these changes occur, some of the outcomes that need to be considered by local governments include:

- stress to water conveyance, transportation and building infrastructure that is not designed to meet projected changes
- increased risk of forest fires
- stress to our potable water supply in summer months
- heat stress on fish and habitats impacting recreation, tourism and biodiversity
- ecosystem regime shifts, biodiversity change, habitat loss and possible change in agricultural productivity, including an increased ability to grow some crops
- pollination and harvesting may be delayed or otherwise affected
- increased salinity of wetlands, affecting ecosystems and agriculture
- inundation of coastal and low lying areas
- increased awareness and engagement of citizens in planning for these changes

While these possible outcomes of climate change are individually significant, it is important to acknowledge that several of these may occur in combination, **compounding the impacts felt by communities.**

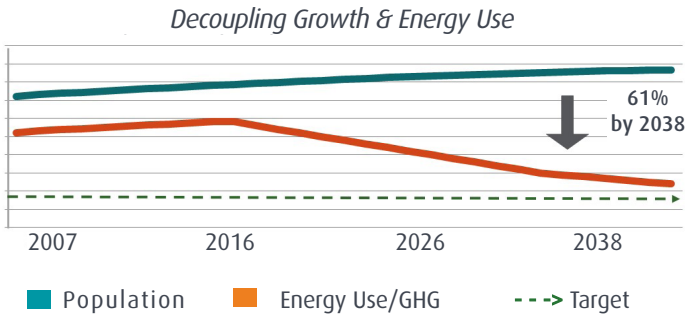


Source: Climate Projections for the Capital Region (2017)

5 | ISSUES & OPPORTUNITIES

Growth, Infrastructure Investment and Preservation

The current mix of urban, suburban and rural communities in the region contributes to high emissions from transportation. As the capital region prepares to welcome close to 95,000 more people by 2038 (CRD, 2016), particularly in the core and west shore, we have an opportunity to contain growth in urban settlements while maintaining the character of the rural areas of the region. Population growth has historically been closely tied to the amount of energy we use, and the amount of GHGe we generate. It is vital to decouple our use of energy, water and resulting GHGe from population growth to ensure we meet our targets, reduce our impacts and achieve a more sustainable region. New growth also creates an opportunity for innovation to reduce the risks of climate change and maximize potential opportunities.



Targeting growth and investment into complete communities in urban areas will set us on this path and also serve to:

- help keep rural areas rural.
- leave natural areas to sequester carbon, increase adaptive capacity, regulate stormwater runoff and provide ecosystem services.
- create a wider variety of housing options and improved affordability.
- create enough demand for improved transit service.
- provide more healthy and affordable options for personal transportation.

A Vision for Transportation

As the region's most significant source of GHGe, any path forward will need to focus strongly on mitigating the environmental impacts of transportation including moving towards lower carbon emission options such as walking, cycling, transit and electric vehicles.

The Regional Transportation Plan (RTP) outlines a vison, through 2038, emphasizing a shift from single occupancy vehicle use to active transportation such as walking, cycling and transit. The region has set targets, and invested in infrastructure and education programs, in an effort to make transit and active transportation a viable option for residents. The region also continues to invest in making transit quicker, more comfortable, convenient and reliable for riders.

Given that a significant number of trips within the region are less than 5km, there is a real opportunity to divert trips to active transportation options. The mainstreaming of electric bicycles will also increase the practicality of cycling for residents who have been discouraged for reasons such as distance and topography. Electric bicycles provide both a positive GHGe outcome and the potential to divert a significant number of trips from regional roads to dedicated bicycle infrastructure.

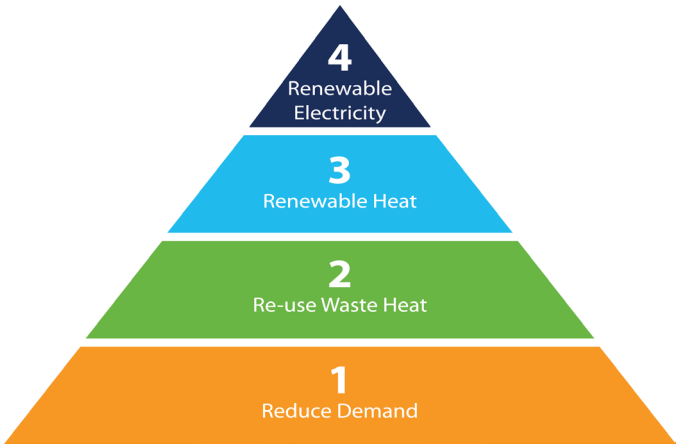
In our region, electric vehicles offer a means of mitigating GHGe but do not address the issues of congestion and the impact that increased congestion will have on residents' quality of life. The introduction of electric autonomous cars may also have the potential to mitigate some aspects of congestion, while reducing GHGe on a per kilometer basis; however, it may also result in an increase of overall trips and kilometers traveled. While out of scope of the Province's CEEI, the movement of freight across the region is vital and any opportunity to address the GHGe of freight movement should be examined and advocated for.

The region continues to focus on creating complete communities, where people can readily walk and cycle to reach many of their daily requirements and where fast and frequent transit connections to key regional services and centres are available. As a region, we will also need to consider the impacts of potential closures to the parts of the regional multi-modal network that are at risk as a result of climate change.

Looking forward, it is evident that new technology, infrastructure improvements, education and climate change strategies provide opportunities to make a meaningful change in transportation GHGe and infrastructure resilience.

Building to Improve Efficiency & Resilience

Our beautiful historic communities come with the challenges of ageing, inefficient buildings that are in need of water and energy efficiency improvements. Projections indicate that 75% of the buildings that will exist in 2038, have already been built (Urban Futures, 2014). Some of these buildings still rely on older oil heating systems that are less efficient and have greater emissions than most other heating options. Oil and natural gas are relatively



A hierarchy for addressing cost-effective energy use (BC Hydro)

inexpensive (currently), reducing the short-term incentive to conserve energy and making the business case to switch to lower emission technologies less attractive. Furthermore, there are often cases where the people controlling the heat and power are not the ones paying the energy bills, creating a disconnect between taking action and receiving the cost-saving benefits.

However, the desire to renovate or replace ageing buildings, expected rising energy costs, and increased awareness about and availability of energy-efficient technologies all present opportunities to transition to a more efficient building stock. Focusing on "efficiency first" reduces a building's demand for energy, thus reducing the size of systems needed for heat and power, and making new high-efficiency or on-site renewable energy systems more cost effective. Improving the energy efficiency of natural gas and other fossil fuel consumption directly reduces GHGe. Further reductions can be found by switching from fossil fuels to electricity. Electricity in BC is generated from clean energy resources with zero or low emissions. However, electricity is currently a more expensive form of energy and using more electricity results in the need for new transmission and power generation infrastructure, ultimately resulting in higher electricity prices. Furthermore our growing population, our increasing reliance on electronic devices, our continued shift to a knowledge-based economy and our transition to electric vehicles will only exacerbate this problem and result in an increased demand for electricity.

At the same time, the climate is changing and adaptive planning needs to be a part of any long-term decisions we make about new and existing building stock. Combining adaption measures with energy efficiency is a cost-effective approach to energy and emissions management, improves the resiliency of our communities and creates jobs in the construction and retrofit industry.

Why Focus on Building Adaptive and Resilient Communities?

A region that is prepared to successfully adapt to the changes ahead is able to manage and possibly even benefit from changes to the climate with minimal costs or disruptions to communities.

Improving our region's adaptive capacity involves undertaking actions to amend policies, adjust operational practices and improve infrastructure to ensure they can accommodate multiple known and unknown stressors. It also involves preparing the community to make action-oriented decisions in times of uncertainty, improving the community's ability to work towards and create a more desirable future.

Enhancing human capacity, conserving our naturally resilient systems and investing in resilient infrastructure will have multiple benefits beyond climate change adaptation, including enhanced biodiversity, improved social equity and economic prosperity.

Complexity, Innovation and Engagement

Climate action is one of the most complex, emerging challenges of our time. Creating the social context for the depth of collaboration needed to turn the tide of climate change is a significant task facing the region. So is balancing the short-term responsibilities and objectives of citizens and governments with the long-term priorities of climate action.

The capital region is home to an engaged citizenry, an active social sector, education and research institutions, and many national and international climate action resources and thought leaders that contribute skill and passion to this undertaking. Together, we have the resources to take action towards a better future for generations to come.

6 | GOALS & ACTION PLAN

The task ahead is great, tackling our contributions to climate change and preparing for the potential impacts will require effort from many others-both individuals and organizations-beyond the CRD. Collaboration and partnerships are key to ensuring effective action is taken to achieve our vision and associated goals, and the CRD is prepared to take action in its areas of responsibility.

This section dives into each goal area, providing key considerations, a description of the CRD's role in achieving each goal and acknowledgement of key partner roles. The action plan will then guide CRD program service and work plans and can be used as a tool to identify external partnership and funding opportunities.

Goal 1: Developed urban areas are compact and complete

Land use planning is the area where local governments can have the most significant impact in mitigating climate change. Almost half of the community GHGe in the capital region result from people using personal vehicles to get around. By planning urban areas to be both compact and complete where homes are near businesses and other community amenities, **trips are shorter and people rely less on their vehicles.**

In addition to tackling personal vehicle emissions, planning compact and complete communities can result in a more diverse array of homes, including more multi-family and apartment homes. These **different building types have lower energy needs per capita and a smaller contribution to climate change.**

An additional benefit of planning compact and complete communities in existing developed areas is the **protection of agricultural land, rural areas, parks and green spaces.** This results in the preservation of important carbon sinks that sequester carbon, while providing numerous other benefits to the region including ecosystem services that support the region's resilience to climate change.

Through thoughtful planning, these new compact developments can minimize their overall impact by incorporating low impact techniques such as green streets, rain gardens, rainwater harvesting, permeable surfaces and green infrastructure.

Roles

CRD

The CRD is responsible for land use planning in the Juan de Fuca Electoral Area, while local municipalities and the Islands Trust are responsible for land use planning within their respective municipalities and local trust areas. The CRD also plays an important role in leading the development, monitoring and progress reporting of the RGS, a key document guiding the direction of development in the region. The RGS, which encompasses all municipalities and electoral areas except for the Island Trust Area, also sets forth policies, actions and targets to reduce GHGe.

Partners

First Nations Governments

- Responsible for land use planning and policy decisions on Reserve and (pending) Treaty Settlement Lands

Municipalities

- Support regional growth planning
- Make local land use planning decisions

Islands Trust

- Make land use planning and policy decisions

CRD Action	CRD Division
Identify opportunities to support local governments and interested First Nations governments with transit-oriented development.	• Regional & Strategic Planning
Develop tools and undertake research to support local governments and interested First Nations governments, in creating compact and complete urban areas. ***[Action addresses adaptation and mitigation]***	• Environmental Protection • Regional & Strategic Planning
Manage compliance with Regional Growth Strategy (RGS): ▶ Review Regional Context Statements for alignment with the RGS. ▶ Continue to adopt Official Community Plans (OCP) for the Juan de Fuca Electoral Area that are consistent with the RGS. ***[CRD acting as a local authority]*** ▶ Monitor and report on RGS commitments.	• Environmental Protection • Juan de Fuca Electoral Area Planning • Regional & Strategic Planning
Continue to develop GHG-related targets, policies and actions for the Juan de Fuca Electoral Area OCP. ***[CRD acting as a local authority]***	• Juan de Fuca Electoral Area Planning

Goal 2: Multi-modal transportation systems are low carbon

In addition to making land use conducive to shorter trips, it is vital to **provide appropriate infrastructure so that residents and visitors can easily choose alternatives to single occupant vehicles and to support low- or zero-emission vehicles.** Local governments can have significant influence in this realm by investing in well-connected pedestrian, cycling, transit, electric vehicle and electric bike charging infrastructure and land use planning which supports compact design.

Roles

CRD

The CRD currently plays a limited role in transportation planning and infrastructure in the region. The CRD builds and maintains regional trail infrastructure; collects vehicle traffic and bicycle data; collects and disseminates information on trends and best practices; manages select docks; and undertakes transportation modelling activities. The CRD also coordinates the development and implementation of regional-scale plans to guide and enhance inter-community connectivity.

In electoral areas, the CRD provides project management for transportation plans and projects and is a local partner for transit initiatives. The CRD plays an advisory role to the Ministry of Transportation & Infrastructure in the Juan De Fuca, Salt Spring Island and Southern Gulf Islands electoral areas.

Partners

Federal and Provincial Governments

- Define vehicle and fuel emission standards
- Provide funding for large infrastructure projects
- are responsible for road infrastructure in electoral areas, highways and through First Nations

Municipalities

- provide local roads, sidewalks, cycling infrastructure and trails
- create land use and development plans
- develop bylaws to support low-carbon travel

Islands Trust

- Makes land use planning and policy decisions for Salt Spring Island and the Southern Gulf Islands electoral areas

BC Transit

- Manages Victoria Regional Transit system operation
- Advises Victoria Regional Transit Commission
- Funds provincial portion of the system
- Partner with Salt Spring Island Transit

Victoria Regional Transit Commission

- Determines transit route configurations, service levels and fares
- Reviews and recommends annual operating budgets and capital spending

CRD Action	CRD Division
Establish a CRD Transportation Service to fulfill the multi-modal vision of the Regional Transportation Plan. ▶ Consolidate CRD transportation functions. ▶ Apply for external funding. ▶ Requisition for future infrastructure projects.	• Regional & Strategic Planning
Implement the Regional Transportation Plan and the Pedestrian and Cycling Master Plan. ***[Action addresses adaptation and mitigation]***	• Regional Parks • Regional & Strategic Planning
Implement priority projects identified in the Regional Trails Management Plan to support active transportation.	• Regional Parks
Identify opportunities to work with BC Transit as they develop policies and plans for rapid transit, frequent transit and increased accessibility.	• Regional & Strategic Planning
Facilitate delivery of the Salt Spring Island (SSI) Community Transit Service and implement multi-modal transportation projects including recommendations from the Pedestrian and Cycling Master Plan: SSI Edition.	• Regional & Strategic Planning • Salt Spring Island Administration
Support electric vehicle (EV) and electric bicycle (e-bike) adoption and infrastructure deployment (including battery plug-in and fuel cell EV infrastructure) in coordination with the Province, local governments and private sector. ***[Action addresses adaptation and mitigation]***	• Environmental Protection • Regional & Strategic Planning • Risk, Insurance & Facility Management
Develop, deliver and support education programs and initiatives that achieve reductions in transportation related GHGe.	• Environmental Protection
Demonstrate leadership by implementing the CCAS corporate fleet actions and policy. ***[Action addresses adaptation and mitigation]***	• Risk, Insurance & Facility Management

Goal 3: Buildings are high performing and low carbon

Capital region residents spend a significant portion of their time living, working and playing indoors. The energy used in these buildings accounts for over a third of the region's community GHGe and thus offer another important opportunity to reduce the capital region's contributions to climate change. At the same time opportunities to adapt new and existing buildings to a changing climate can be explored.

A key strategy to reducing the region's GHGe is to **retrofit the region's existing building stock.** Prioritizing energy efficiency measures such as air sealing, insulating and replacing inefficient heating and cooling systems (e.g. oil furnaces) with high-efficiency heating and cooling systems (e.g. heat pumps) can significantly help to reduce building-related GHGe. Water saving actions, such as replacing showerheads and faucet aerators, also reduce energy consumption and GHGe. While newly constructed buildings are often more energy and water efficient, as we seek to reduce our collective GHGe it is also important to consider the **embodied carbon in our existing building stock** and the emissions associated with new builds.

With **emerging technologies and evolving building practices and regulated standards in BC,** there has been a shift toward more energy-efficient new buildings over the last decade. The Provincial Building Code and BC Energy Efficiency Act set building standards, and these have recently been updated with improvements to energy and water efficiency requirements. While improved, the standards are not as high as builders have shown are possible. For example, building to the "Passive House" standard can result in 90% or more savings in energy needs. Building policies and practices need to be further developed to achieve this goal.

Roles

CRD

The CRD plays a limited role in influencing the amount and sources of energy used in buildings. The CRD enforces the BC Building Code in electoral areas and upon request, in First Nations communities.

The CRD can educate, encourage and incent energy and water efficiency, and the use of alternative energy systems and can play a coordinating role by administering initiatives at a regional scale.

Partners

Federal and Provincial Governments

- Set building code and equipment standards
- Provide funding for incentive programs to support transition to higher efficiencyof alternative energy systems

First Nations Governments

- Responsible for all development on Reserve
- Adhere to National Building Code standards

Municipalities

- Issue building permits and enforce the BC Building Code
- Set development permit area requirements
- Deliver education and incentive programs

Islands Trust

- Set development permit area requirements

Utilities

- Provide reliable energy
- Deliver demand-side management programs, including incentives

Industry and Non-profits

- Increase capacity for energy efficiency retrofits
- Provide education outreach on building technologies and alternative energy systems

CRD Action	CRD Division
Support the transition from oil heating to high efficiency, low emissions heating systems.	• Environmental Protection
Educate and provide regional coordination for national and provincial initiatives. Examples include: ▶ opt-in regulations (e.g. the Energy Step Code, a tiered energy performance standard beyond Building Code) ▶ energy literacy initiatives such as energy benchmarking and, voluntary and mandatory energy labeling programs for buildings	• Building Inspection • Environmental Protection
Develop, deliver and support educational programs and initiatives that achieve reductions in building-related GHGe and, water and energy use. *[Action addresses adaptation and mitigation]*	• Environmental Partnerships • Environmental Protection
Provide research, data and analysis to local governments and interested First Nation governments on high performing, resilient and low carbon buildings. *[Action addresses adaptation and mitigation]*	• Environmental Partnerships • Environmental Protection
Support and develop programs that increase the use of renewable energy, green innovation and smart technology in buildings. *[Action addresses adaptation and mitigation]*	• Environmental Protection
Build capacity among building officials and industry in the region by: ▶ sharing and promoting resources at monthly South Vancouver Island Building Officials meetings. ▶ supporting ongoing education of building officials and industry. *[Action addresses adaptation and mitigation]*	• Building Inspection • Environmental Protection
Demonstrate leadership by implementing the CCAS policy and actions related to existing and new corporate buildings. *[Action addresses adaptation and mitigation]*	• Risk, Insurance & Facility Management

Goal 4: Natural assets are valued for reducing our contributions to climate change

Green spaces, blue spaces and parks **provide important climate mitigation benefits due to concentrations of carbon-storing vegetation. In some cases, these areas also enhance opportunities for non-motorized transportation.** A significant regional example of this is the Galloping Goose Trail, which serves as an active transportation, recreational and commuting corridor.

In addition to these important climate change mitigation benefits, green and blue spaces provide important ecosystem services that support the region's resilience to climate change. For instance, the forests in the Greater Victoria Water Supply Area contribute to the high quality of water in the supply reservoirs. Green spaces in urban and suburban areas provide natural cooling capacities because they absorb and utilize energy from the sun through evapotranspiration. In contrast, the built environment largely absorbs heat from the sun, which results in an urban heat island effect. As temperatures in the region rise due to climate change, these **natural assets can also serve to reduce the need for energy intensive air conditioning.** Partners, including municipalities and electoral areas, play an important role in protecting these natural assets (Appendix B).

Roles

CRD

The CRD is responsible for acquiring natural assets and can support efforts to sequester and store carbon. Several services within the CRD play an important role in managing the CRD's natural areas and supporting efforts on natural areas in the region that are managed by others, including:

- working with partners to purchase parkland through the Land Acquisition Fund;
- managing over 20,000 hectares of forested land in three watersheds that supply potable water to residents;
- and working collaboratively with partners to maintain healthy watersheds, harbours and nearshore aquatic ecosystems that play a valuable role in blue/green carbon sequestration.

In the Juan de Fuca Electoral Area, the CRD is responsible for land use planning and can implement various tools, such as development permit areas, that protect the natural environment.

Partners

Provincial and Federal Governments

- Protect parks and shores (e.g. Gulf Islands National Park Reserve, Goldstream Provincial Park, Race Rocks Marine Protected Area)

Municipalities

- Collaborate with the CRD in defining a direction for regional parks
- Manage municipal parks and trails
- Create urban forest strategies
- Make land use planning decisions and manage environment development permit areas
- Implement integrated watershed management

Islands Trust

- Local trust committees make land use planning decisions and manage environment development permit areas
- Local trust committees collaborate with CRD for new parks when subdividing or rezoning
- The Islands Trust Fund secures land in Nature Reserves and through Conservation Covenants and collaborates with the CRD Parks on projects as appropriate

CRD Action	CRD Division
Working with partners, update the regional inventory of land cover. ***[Action addresses adaptation and mitigation]***	• Environmental Protection • Regional Parks
Collaborate with local governments and interested First Nations governments to develop and implement a strategy to improve, increase area of, and protect rural, suburban and urban tree canopy and root space. ***[Action addresses adaptation and mitigation]***	• Aboriginal Initiatives • Environmental Protection • Regional Parks
Consider carbon sequestration and storage in all CRD land, marine management, asset management and acquisition decisions to reduce community GHGe in collaboration with stakeholders and First Nations governments.	• All CRD Services
Develop a silviculture working group for the Juan de Fuca Electoral Area in collaboration with landowners. ***[CRD acting as a local authority]***	• Juan de Fuca Electoral Area Planning

Goal 5: Waste generation is minimized and remaining waste is transformed into a resource

Eight percent of the region's GHGe are generated from the management of solid waste in the region, primarily from decomposing organic waste. These emissions can be reduced by **decreasing the amount of waste we send to landfills,** and by finding ways to manage landfill waste to reduce emissions (e.g. **consuming and preserving local food, composting, minimizing transportation of wastes and capturing and utilizing landfill gases as an energy source**).

Roles

CRD

The CRD is responsible for solid waste management in the region and provides three major services: **diversion** (recycling and waste diversion programs), **recovery** (landfill gas capture and electricity generation), and **landfilling** (disposal services and environmental protection).

As part of the waste diversion strategy, the CRD implements landfill restrictions when viable and sustainable recycling alternatives exsist (e.g. 2015 Kitchen Scraps).

The CRD's efforts on solid waste are guided by the Solid Waste Management Plan. The CRD is currently developing the third revision to the Solid Waste Management Plan (the Integrated Solid Waste and Resource Management Plan).

Partners

Provincial and Federal Governments

- Set targets to guide local government waste diversion performance

Municipalities

- Collect solid waste and organics, where applicable

Industry

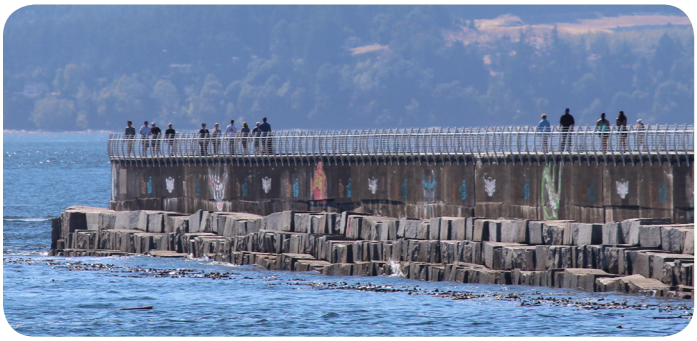
- Provide waste and recyclable services for residents without municipal services and businesses Stewardship Agencies
- Provide funding for products covered under the BC Recycling Regulation (e.g. printed paper and packaging, paint, electronics, etc.)

Non-Profits

- Operate recycling facilities on the Southern Gulf Islands
- Greater Victoria Compost Education Centre provides composting education to capital region residents

CRD Action	CRD Division
Minimize community GHGe by completing the CRD Integrated Solid Waste and Resource Management Plan.	• Environmental Resource Management
Work with local governments to plan waste reduction strategies based on waste composition study results.	• Environmental Resource Management
Develop and deliver programs to promote the 3Rs (reduce, reuse, recycle) and zero waste approaches to reduce the amount of community solid waste (e.g. food preservation).	• Environmental Partnerships • Environmental Protection • Environmental Resource Management • Regional & Strategic Planning
Promote organic material diversion (kitchen scraps, yard and garden waste) and facilitate the responsible recovery of resources locally.	• Environmental Partnerships • Environmental Resource Management
Identify and evaluate additional opportunities to optimize landfill gas recovery and energy production from organic waste.	• Environmental Engineering • Environmental Protection • Environmental Resource Management

Goal 6: Regional vulnerabilities to the impacts of climate change are understood



Deciding how best to adapt to climate change requires an understanding of how the climate is changing and how these changes will impact the region's social, economic, physical and natural systems. Determining vulnerability requires **understanding how sensitive the region is to projected changes** and how able we are to adapt to these changes with minimal disruption and costs, and maximum potential benefits. While there is a high level of uncertainty associated with the future, grounding our work with the best possible information on local impacts of climate change will enable the region to focus efforts on how to best prepare for the changes ahead.

Roles

CRD

The CRD has an important knowledge-management role to play in developing a robust understanding of regional climate change issues and opportunities. Many community partners and thought-leaders are spearheading studies, measuring data and reporting on changes as they occur. The CRD can play a central role in collecting, mapping and sharing this information with other partners as the region works together towards climate adaptation.

Partners

Federal Government

- Conduct marine monitoring and mapping

Provincial Government

- Provide resources and toolkits for conducting vulnerability assessments
- Fund BC-based climate projection modelling
- Publish provincial and regional climate change indicator data

First Nations

- Maintain and share traditional knowledge
- Continue data collection, mapping, monitoring, observations and reporting

Municipalities

- Local data collection, studies and mapping

Universities and Community Partners

- Conduct climate modeling and data collection
- Disseminate knowledge

CRD Action	CRD Division
Continue and expand data collection and mapping efforts to identify vulnerabilities to the impacts of climate change and acquire resources to help prepare for a changing climate (e.g. Light Detection and Ranging data). *[CRD acting as a local authority]*	• Environmental Protection • Health and Capital Planning • Juan de Fuca Electoral Area Planning • Protective Services • Regional Parks • Regional & Strategic Planning • Watershed Protection
Conduct region-wide climate risk and vulnerability assessments for natural and social impacts (e.g. ecosystem shifts, invasive species, drought, disease) every five years, or sooner as new information (e.g. climate projects) becomes available in partnership with local governments and interested First Nations governments. *[CRD acting as a local authority]*	• Environmental Protection • Health and Capital Planning • Juan de Fuca Electoral Area Planning • Protective Services • Regional Parks • Regional & Strategic Planning • Watershed Protection
Convene appropriate partners to identify and fill gaps in marine monitoring programs, to determine whether changes in the marine environment are related to climate impacts and advocate for the coordination of marine science data collection and research in region by the federal government.	• Environmental Protection
As the latest climate data becomes available, share with stakeholders and First Nations governments, and facilitate the updating of regional climate projections.	• Environmental Protection
Compile research on ecosystem shifts for stakeholders, and interested First Nations, to include in natural area and watershed management planning (e.g. watershed report cards).	• Environmental Protection • Regional Parks • Watershed Protection
Collaborate with local governments, and interested First Nations governments, to include regional climate change projections in infrastructure planning standards (e.g. revise design storms, Intensity Duration Frequency curves).	• Environmental Engineering • Environmental Protection
Include regional climate change projections in hazard, risk and vulnerability assessments for the three Electoral Areas' Emergency Operations Work Plans and share regional climate change projections with local authorities' emergency programs.	• Protective Services
Demonstrate leadership by developing a corporate climate change adaptation plan.	• Risk, Insurance & Facility Management

Goal 7: Communities are prepared for and resilient to the impacts of climate change

Preparing communities for the impacts of climate change will require **improving hard infrastructure, educating people, strengthening social networks, enhancing local food systems, promoting responsible food consumption and developing emergency response systems** to deal with changes in temperature, precipitation and rising sea levels.

Roles

CRD

The CRD's ability to protect citizens from climate impacts results mainly from its ability to educate the community, support municipal planning initiatives, manage regional water and sewer infrastructure and, through its role as the Chair on the Local Government Emergency Program Advisory Commission, share information and coordinate regional emergency preparedness. Additionally, the CRD can play a critical role in preparing citizens by providing information on climate change and working with partners to provide programs that help citizens anticipate and take action to prepare for changes ahead. The CRD can also influence the well-being of citizens in the jurisdiction where it acts as a local authority by ensuring infrastructure is prepared for incremental changes and extreme events over its useful lifetime.

Partners

Federal and Provincial Governments

- Provide funding for infrastructure upgrades
- Set regulatory framework for the building code, sewer and water
- Prepare Provincial and Federal roads

First Nations Governments

- Manage zoning, land use, buildings, infrastructure and emergency preparedness on Reserve land

Municipalities

- Manage land use, development, infrastructure and emergency preparedness

Islands Trust

- Manage land use planning and make policy decisions

Regional Emergency Partnership

- Prepare for emergencies or disasters that are multi-jurisdictional or impact the entire region

CRD Action	CRD Division
Collaborate and coordinate with stakeholders and interested First Nations governments to include climate change projections and risks in strategies, plans and policies.	• All Services
Work with stakeholders and interested First Nations governments, on an integrated watershed management approach to adapt to changes in flows, groundwater storage and other stressors due to climate change. ***[CRD acting as a local authority]***	• Environmental Engineering • Environmental Protection • Juan de Fuca Electoral Area Planning • Watershed Protection
Work with stakeholders and interested First Nations governments to address the capacity of wastewater transmission and treatment systems to manage and minimize elevated flows as a result of increased inflow and infiltration due to climate change-induced storms.	• Environmental Engineering • Environmental Partnerships • Environmental Protection
Incorporate climate-related disaster planning and communications into public outreach activities.	• Environmental Protection • Protective Services • Regional Parks
Work with the Province and the Regional Emergency Partnership to reduce the risk of interface forest fires.	• Protective Services
Integrate available information on climate change risks and vulnerabilities into Juan de Fuca Electoral Area OCP development and educate residents on how to avoid or reduce damage and personal injury from storms and flooding (e.g. preparing buildings). ***[CRD acting as a local authority]***	• Building Inspection Services • Juan de Fuca Electoral Area Planning
Develop, deliver and support educational programs and initiatives that promote local food systems. ***[Action addresses adaptation and mitigation]***	• Environmental Protection • Regional & Strategic Planning
Demonstrate leadership by integrating climate change and sustainability considerations into corporate asset management.	• Financial Services

Goal 8: Natural assets are resilient to the impacts of climate change

Natural areas, including green spaces, parks and blue spaces, are well suited to **buffer many impacts of climate change** in the region by providing ecosystem services (e.g. absorbing water from extreme rain events, providing shade and cooling on warm days). Protecting biodiversity, preserving and adding to our natural areas and valuing the important role they play in moderating climate change is critical to the CRD's strategy. Partners, including municipalities and electoral areas, contribute to the protection and restoration of these natural assets (Appendix B).

Roles

CRD

The CRD is responsible for managing natural assets, which are important to the preservation of biodiversity throughout the region. Several departments/services within the CRD play an important role in managing the CRD's lands and supporting efforts on lands within the region that are managed by others, including the Regional Parks Department, the Integrated Water Services Department and the Integrated Watershed Management Program. These CRD services work collaboratively with regional partners (municipalities, First Nations, the provincial and federal governments, environmental and professional organizations and community members) to manage, protect, monitor and educate to preserve natural assets and improve the resilience of the region.

Partners

Federal and Provincial Governments

- Set floodplain guidelines
- Manage parks and water bodies in their jurisdiction
- Manage forested areas
- Provide information resources

First Nations Governments

- Manage development decisions in their jurisdiction

Municipalities

- Manage parks and development decisions in their jurisdiction

CRD Action	CRD Division
Develop a regional biodiversity strategy with stakeholders and interested First Nations that includes a species inventory, planting guidelines and planning for natural areas. The Strategy should reflect regional climate change projections and adaptation priorities (e.g. sea level rise, flood inundation) and advocate to senior levels of government to protect biodiversity. ***[Action addresses adaptation and mitigation]***	• Aboriginal Initiatives • Environmental Partnerships • Environmental Protection • Regional Parks • Watershed Protection
Foster the region's natural areas resiliency to climate-induced change (e.g. sea level rise, flood inundation) in collaboration with stakeholders and interested First Nations. ***[CRD acting as a local authority]***	• Aboriginal Initiatives • Environmental Protection • Juan de Fuca Electoral Area Planning • Regional Parks
Include the value of natural areas in regional climate adaptation in all CRD land and marine management, asset management and acquisition decisions, and work collaboratively with stakeholders and interested First Nations. ***[Action addresses adaptation and mitigation]***	• All CRD Services
Advocate for increased groundwater protection.	• Environmental Protection
Continue to use environmental development permit areas, covenants and other mechanisms to improve the resiliency of shoreline and marine habitats in the Juan de Fuca Electoral Area. ***[CRD acting as a local authority]***	• Environmental Protection • Juan de Fuca Electoral Area Planning

7 | IMPLEMENTATION AND REPORTING

As demonstrated throughout this strategy, climate action is currently, and will continue to be, integrated into work plans across the CRD departments, divisions and services. Over the next five years, as resources allow, the actions contained within this strategy will be implemented by the CAP and a range of other service areas. The CAP will coordinate, manage, monitor and report on the strategy's progress. Collaboration and involvement of staff across the capital region will be integral to the strategy's success.

Implementation Responsibilities

As the CRD moves forward with the identified actions, knowledge and understanding of the potential impacts of climate change will continue to develop. New opportunities for accessing external funding to support the identified goals and actions may arise. To ensure the strategy remains relevant in this dynamic environment, the CAP will:

- continue to identify opportunities for external funding that support the strategy goals;
- participate in regional and provincial forums to share best practices with other regions and local governments;
- remain current with climate science and potential risks and impacts for the capital region;
- continue to identify opportunities for increasing public awareness on climate change risks and opportunities;
- provide data, information and policy support to local governments climate action efforts;
- provide updated information about climate change projections and risks to senior management and the CRD Board to inform decision-making;
- monitor data to track progress;
- evaluate progress annually and adjust actions as needed; and
- continue to provide annual reports to the CRD Board regarding the Climate Action Program.

Performance Indicators

To understand whether the strategy is helping to achieve our goals, the CAP will work with relevant CRD divisions to report the following performance indicators:

Performance Indicators by Strategy Goals	
Regional Climate Action Vision	• number and impact of projects and partnerships that demonstrate support for reductions in GHGe and increased resiliency • reduction in community GHGe
Goal 1: Developed urban areas are compact and complete	• percentage of new dwelling units within the Growth Policy Area • number of people with access to destinations that fulfill daily needs
Goal 2: Multi-modal transportation systems are low carbon	• establishment of a CRD Transportation Service • reductions in GHGe from personal vehicle transportation • increase in transit services and related infrastructure • increase in active transportation infrastructure kilometres • percentage of all trips made by walking, biking or transit • percentage of the Regional trail network completed
Goal 3: Buildings are water and energy efficient	• reductions in residential and commercial building GHGe and energy use • volume of water used in the Greater Victoria Water Supply Area
Goal 4: Natural assets are valued for our contributions to climate change	• completion of the regional inventory of land cover • number of hectares of protected areas, forest land and tree cover
Goal 5: Waste generation is minimized and remaining waste is transformed into a resource	• completion of the CRD Integrated Solid Waste and Resource Management Plan • percentage of methane gas captured at Hartland landfill • per capita waste disposal rate
Goal 6: Regional vulnerabilities to the impacts of climate change are understood	• number of stakeholders and residents engaged through educational programming and outreach. • completion of the *Climate Projections for the Capital Region* report and integration of the results into CRD plans, strategies and processes • completion of an updated list of Species at Risk and critical habitats in regional parks • updated habitat survey for core area harbours • number of streams with water quality and flow monitoring stations
Goal 7: Communities are prepared for and resilient to the impacts of climate change	• incorporation of climate adaptation into emergency preparedness • completion of Green Infrastructure Common Design Guidelines • number of partnerships focused on local food education • number of high priority stormwater discharges • number of shoreline closure days and locations • length of staged water restrictions
Goal 8: Natural assets are resilient to the impacts of climate change	• completion of a regional biodiversity strategy • percentage change in the amount of tree canopy cover • watershed evaluations that incorporate environmental and hydrological monitoring • number of volunteer hours leveraged in restoration or stewardship activities

Reporting

The CAP will continue to report the Community Energy and Emissions Inventory provided by the Province, as new data becomes available. Further to this, the CAP will monitor and report on the following annually:

- progress toward completion of actions in this strategy
- barriers identified during implementation of each action
- status of support or participation from partners and other organizations
- number of citizens reached through public awareness efforts
- performance indicators

After five years of implementation, the CAP will undertake a thorough review and update to determine what actions are needed to continue advancing the region's action on climate mitigation and adaptation.

APPENDICES

Appendix A: LOCAL PROJECT EXAMPLES

Central Saanich

Urban Forest and Tree Appreciation

The District of Central Saanich celebrates Urban Forest and Tree Appreciation Day in recognition of the community's large urban forest and the individual trees which contribute to the exceptional beauty of the District. The forest and trees provide numerous benefits including, but not limited to, natural management, micro-climate control, shading, traffic calming, improved air quality and soil conservation.

Colwood

Solar Colwood

Over a period of almost four years, with support from multiple partners, more than 500 residents accomplished more than 1,000 energy saving or renewable energy actions. Solar Colwood provided 39 private solar hot water system incentives – making it a leader in Canada. Partnering with the CRD Climate Action Program in 2014, the initiative was expanded to provide 41 additional incentives for private solar hot water systems throughout the region. Solar Colwood also provided incentives for the installation of 120 ductless heat pumps, and for 9 public and 12 private electric vehicle charging stations. Altogether, Solar Colwood is estimated to have reduced GHGe by 651 tonnes of CO_2e/year.

Esquimalt

Green Events

To encourage event planners to improve the environmental performance of their events, the Township of Esquimalt's Green Event Planning Guide provides advice on how to conserve energy and natural resources, minimize waste, promote alternative transportation and prioritize healthy, fairly-traded and sustainable food.

Highlands

Integrated Community Sustainability Plan

The District of Highlands worked with residents to create the Highlands Integrated Community Sustainability Plan, a framework to identify what kind of community the Highlands residents want in the year 2030 and what needs to happen now in order to get there. It forms the community's highest level policy and guides the District towards its desired and sustainable future.

Juan de Fuca Electoral Area

Sensitive Ecosystem Management

In the Juan de Fuca Electoral Area, 2 communities have detailed sensitive ecosystem inventory (SEI) projects, 3 communities have adopted provincial SEI, 6 communities have Riparian Development Permit Areas and 5 communities have Sensitive Ecosystem and Steep Slope Development Permit Areas.

Langford

Bicycle lanes on major roads

Awarded the BikeBC grant to support active transportation infrastructure, the City of Langford is working to expand its cycling network by adding bike lanes to the City's major corridors.

Metchosin

Natural Asset Protection

To protect significant natural assets, the District of Metchosin is working on an innovative and historic land swap deal with the City of Langford and Beecher Bay First Nation that, if approved, will result in the preservation of 250 acres of Crown Land and approximately 150 acres of private rural land as greenspace.

North Saanich

Sea Level Rise Risk Assessment & Resilience Planning

The District of North Saanich conducted a wave effects study in 2016 and is now undergoing a public consultation process to relate the implications to local marine policy and shoreline development. Complementing this work, a local resilience planning case study is being completed, as part of a PhD dissertation, using scenario development, visualization and participatory planning methods to develop and explore community-appropriate flood protection strategies such as using green infrastructure, structural and regulatory measures.

Oak Bay

Bowker Creek Urban Watershed Renewal

The Bowker Creek Urban Watershed Renewal Initiative (BCI) is a unique multi-jurisdictional effort to improve the health of a highly urbanized watershed. The BCI was established

because of concerns about flooding, pollution and the degraded condition of Bowker Creek. Together, *the Bowker Creek Blueprint: A 100-year action plan* was developed to provide member municipalities, the CRD, the community and other land stewards with information and guidance to manage and restore the watershed and creek corridor over the short and long-term. In 2015 the District of Oak Bay helped support one of the ten short-term Blueprint actions, restoring Bowker Creek through the Oak Bay High School lands and transforming this section of the creek into a healthier riparian environment and a community-accessible greenspace.

Saanich

Climate Change Adaptation Plan

To identify priority climate change impacts and the short and long-term actions required to respond to climate change, the District of Saanich developed a Climate Change Adaptation Plan in 2011.

Salt Spring Island

Official Community Plan

The Salt Spring Island Official Community Plan (OCP) was updated to include climate change and energy efficiency objectives and policies in 2008. With GHGe targets set at an ambitious 15% reduction by 2015, 40% reduction by 2020 and 85% reduction by 2050 (from 2007 levels).

Sidney

Official Community Plan

The Township of Sidney's Official Community Plan promotes smart growth and compact, mixed-use development resulting in a walkable community that provides a mix of amenities for all residents.

Sooke

Protecting Natural Assets

The District of Sooke's Liquid Waste Management Plan takes an integrated approach to protecting the community's 17 watersheds, the Sooke Harbour and Sooke Basin from the environmental pressures of urban development. It works on 3 principles: protect existing water quality, prevent future damage, and remediate areas that may already be damaged.

Southern Gulf Islands

Protecting Eelgrass Habitat

To help protect and conserve critical nearshore areas, the Islands Trust and the Islands Trust Fund, in partnership with SeaChange Marine Conservation Society, the Mayne Island Conservancy Society and the Seagrass Conservation Working Group, inventoried and mapped native eelgrass along shorelines within the Islands Trust Area including Galiano, Mayne, Salt Spring, North and South Pender, Sidney, Piers and Saturna islands. Eelgrass habitats capture and store large amounts of carbon at more efficient rates (up to ninety times the uptake) provided by equivalent terrestrial forest areas. The maps and report were designed to assist planners and elected officials to make science-based decisions when planning for nearshore areas and are regularly used to evaluate proposed shoreline modifications.

Victoria

#Biketoria

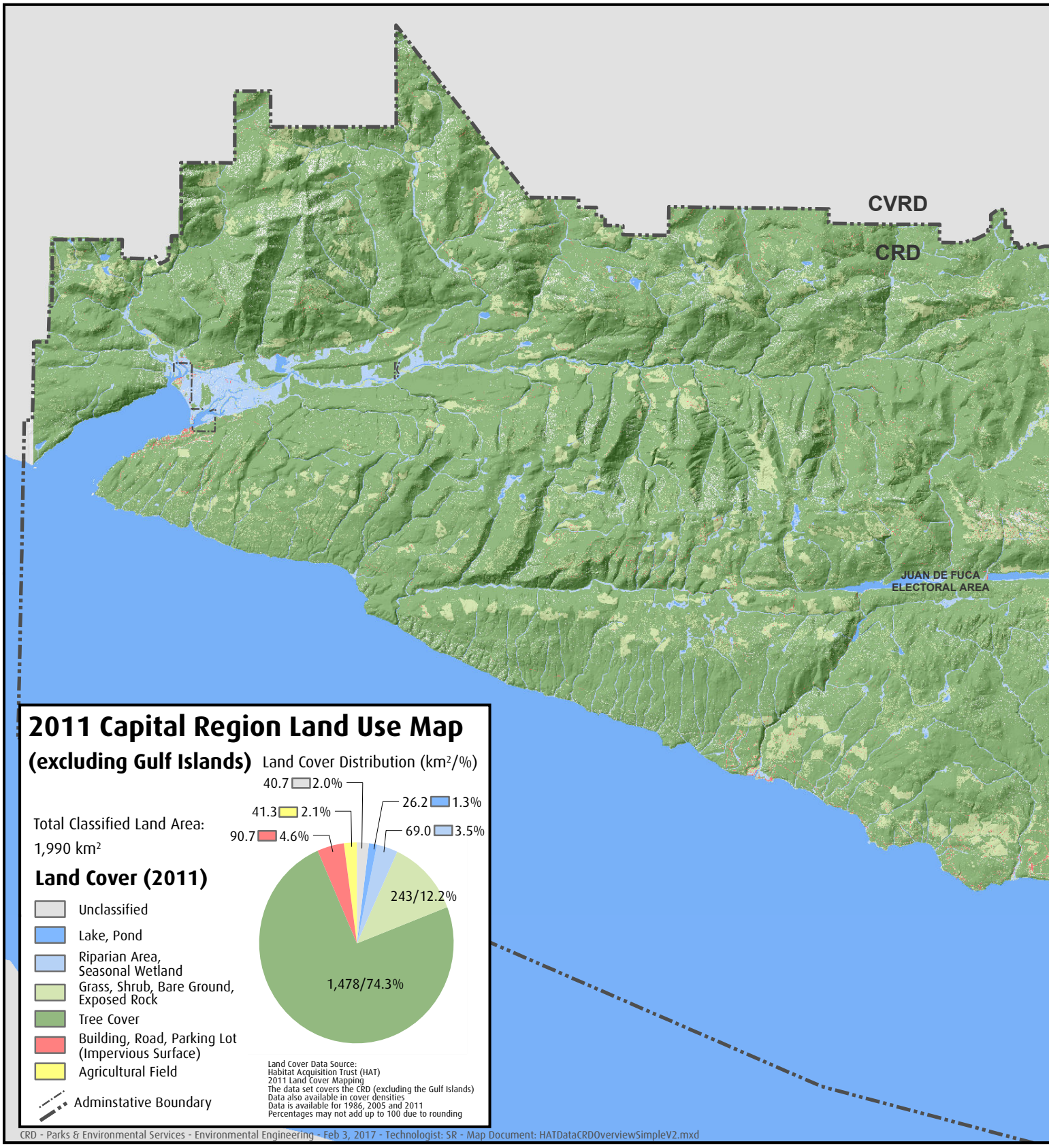
In early 2016, the City of Victoria approved the #Biketoria Network Plan and committed to establishing 5.4 km of protected bikeways in the downtown core by 2018 to support riders of all ages and abilities. Once fully completed, the cycling network will provide over 24 kilometers of enhanced bicycle infrastructure connecting neighbourhoods, employment centres, schools and community destinations.

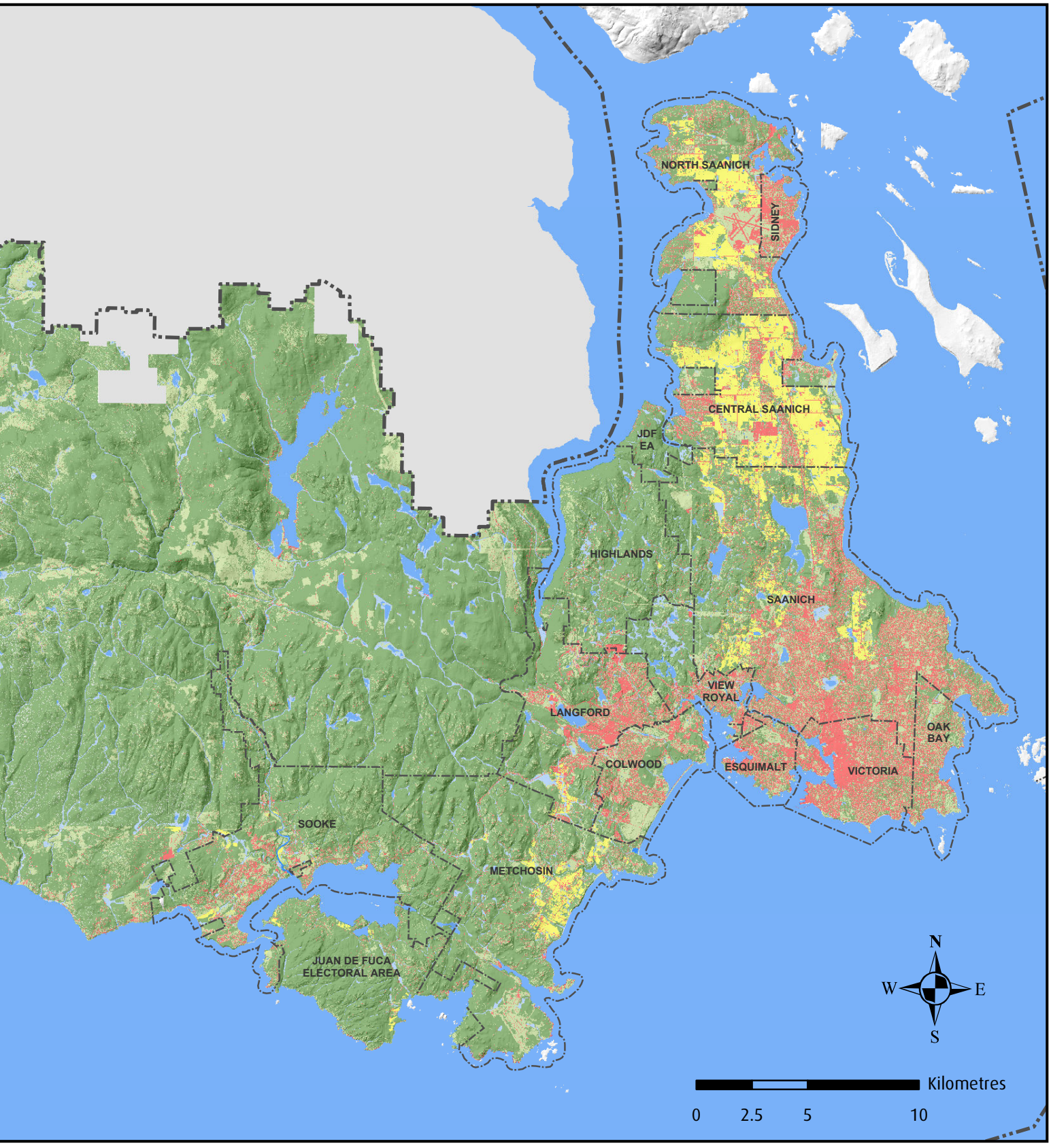
View Royal

Island Highway Improvement Project

The Island Highway Improvement Project transformed a major transportation corridor in the Town of View Royal. The project delivered road improvements, stormwater management improvements and community art. The road improvements included wider sidewalks, bike lanes, bus pull-outs, turning lanes, underground wiring and traffic signalization. Trail connections to the E&N Rail Trail were put in to improve access to the region's alternative transportation network and encourage reduced automobile use. Innovative technology including bioswales and rain gardens in the road median treat stormwater to improve the habitat of Portage Inlet and Esquimalt Harbour. A 60 meter long stone mural along Island Highway creates a dramatic visual representation of a cascading median rain garden.

Appendix B: Capital Region Land Use Map

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Appendix C: SAMPLE LIST OF PLANS

CRD Plans with Climate Actions	Regional Climate Action Strategy Goal							
	1	2	3	4	5	6	7	8
Capital Region Community Energy Plan (2007)	✓	✓	✓					✓
Climate Change: Corporate Action Plan (2008)		✓	✓	✓	✓			
Climate change decision-making lens (2015)	✓	✓	✓	✓	✓			
Community Health and Well-Being Plan (2017 Draft)	✓	✓	✓	✓	✓	✓		
Core Area Inflow and Infiltration Management Plan: 2016 Update (In development)						✓	✓	
Corporate Climate Action Strategy		✓	✓	✓	✓	✓		✓
Corporate Plan (2015-2018)		✓		✓	✓	✓	✓	✓
Integrated Solid Waste and Resource Management Plan (Draft)				✓	✓	✓		
Liquid Waste Management Plans				✓	✓	✓		
Proposed Integrated Watershed Management Program Plan (2010)		✓	✓	✓		✓	✓	✓
Regional Food and Agriculture Strategy (2016 Draft)	✓	✓		✓	✓	✓	✓	✓
Regional Green/Blue Spaces Strategy (1997)				✓				✓
Regional Growth Strategy (2016 Draft)	✓	✓	✓	✓	✓			✓
Regional Housing Affordability Strategy (2007)	✓		✓					
Regional Parks Land Acquisition Strategy (2015-2017)			✓					✓
Regional Parks Strategic Plan (2012-2021)		✓		✓		✓		✓
Regional Pedestrian & Cycling Master plan (2011) and SSI Edition (2013)		✓						
Regional Trails Management Plan (2015)				✓				
Regional Transportation Plan (2014)	✓	✓						
Strategic Plan for the Greater Victoria Water Supply System (2012)						✓	✓	✓

Appendix D: GLOSSARY

Adaptation: The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects. [1]

Adaptive Capacity The ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities or to respond to consequences. [2]

Biodiversity The variability among living organisms from terrestrial, marine and other ecosystems. Biodiversity includes variability at the genetic, species and ecosystem levels. [3]

Capacity Building The practice of enhancing the strengths and attributes of, and resources available to, an individual, community, society or organization to respond to change. [4]

Capital Regional District (CRD): The regional government for 13 municipalities and three electoral areas on southern Vancouver Island and the nearby Gulf Islands. The CRD is governed by a 24-member Board of Directors and supported by more than 75 committees and commissions, the CRD was incorporated in 1966 to provide regional decision-making on issues that transcend municipal boundaries.

As a local government and shared-services provider, the CRD develops partnerships to facilitate and deliver projects and services that benefit municipalities, electoral areas, First Nations and the region as a whole. The CRD has more than 200 service, infrastructure and financing agreements with municipalities and electoral areas to deliver services in the following categories:

- regional, where all municipalities and electoral areas are served;
- sub-regional, where two or more jurisdictions are served; and
- local, in the electoral areas where the CRD is the local government.

In addition, the CRD owns and operates the Capital Region Housing Corporation, a non-profit provider of more than 1,200 affordable rental units in the region, and administers the Capital Regional Hospital District.

The CRD works collaboratively with First Nations and other levels of governments and has a direct relationship with individuals, businesses, organizations and institutions that access regional utilities and services, and with communities that collaborate for regional services on behalf of their residents.

Climate: The "average" weather over a long period of time. Aspects of climate include temperature, precipitation, wind speed and direction, sunshine, fog and frequency of extreme events. [5]

Climate Change: The process by which the average weather becomes different over time. Climate has changed due to natural forces over the course of history (e.g., volcanoes, ocean currents) but human activity (e.g., industry, transportation) is now considered the cause of rapid and severe climate change. These changes include sea level rise, more intense and more frequent extreme weather events (e.g., storms, hurricanes, storm surge) and in Atlantic Canada, warmer, wetter summers and winters. [6]

Co-benefits: The positive effects that a policy or measure aimed at one objective might have on other objectives, irrespective of the net effect on overall social welfare. Co-benefits are often subject to uncertainty and depend on local circumstances and implementation practices, among other factors. [7]

Drought: A period of abnormally dry weather, long enough to cause a serious hydrological imbalance. Drought is a relative term; therefore any discussion in terms of precipitation deficit must refer to the particular precipitation-related activity that is under discussion. For example, shortage of precipitation during the growing season impinges on crop production or ecosystem function in general (due to soil moisture drought, also termed agricultural drought), and during the runoff and percolation season primarily affects water supplies (hydrological drought). Storage changes in soil moisture and groundwater are also affected by increases in actual evapotranspiration in addition to reductions in precipitation. [8]

Ecosystem: A functional unit consisting of living organisms, their non-living environment, and the interactions within and between them. The components included in a given ecosystem and its spatial boundaries depend on the purpose for which the ecosystem is defined: in some cases they are relatively sharp, while in others they are diffuse. Ecosystem boundaries can change over time. Ecosystems are nested within other ecosystems, and their scale can range from very small to

the entire biosphere. In the current era, most ecosystems either contain people as key organisms or are influenced by the effects of human activities in their environment. [9]

Ecosystem services: Ecological processes or functions having monetary or non-monetary value to individuals or society at large. These are frequently classified as (1) supporting services such as productivity or biodiversity maintenance, (2) provisioning services such as food, fiber or fish, (3) regulating services such as climate regulation or carbon sequestration, and (4) cultural services such as tourism or spiritual and aesthetic appreciation. [10]

Energy Efficiency: The ratio of useful energy output of a system, conversion process, or activity to its energy input. In economics, the term may describe the ratio of economic output to energy input. [11]

Embodied Carbon: The GHGe associated with the non-operation phase of the building. This includes emissions cause by extraction, manufacture, transportation, assembly, maintenance, replacement, deconstruction, disposal and end of life aspects of the materials and systems that make up a building. [12]

Extreme Weather Event: An event that is rare at a particular place and time of year. Definitions of rare vary, but an extreme weather event would normally be as rare as or rarer than the 10th or 90th percentile of a probability-density function estimated from observations. By definition, the characteristics of what is called extreme weather may vary from place to place in an absolute sense. When a pattern of extreme weather persists for some time, such as a season, it may be classed as an extreme climate event, especially if it yields an average or total that is itself extreme (e.g., drought or heavy rainfall over a season). [13]

First Nations: A term that came into common usage in the 1970s to replace the word "Indian," which some people found offensive. Although the term First Nations is widely used, no legal definition of it exists. Among its uses, the term "First Nations peoples" refers to the Indian people in Canada, both Status and non-Status. Some Indian people have also adopted the term "First Nations" to replace the word "band" in the name of their community. [14]

The traditional territories of 22 First Nations span portions of the region and 11 of those Nations hold reserve lands throughout the capital region.

Fossil fuels: Carbon-based fuels from fossil hydrocarbon deposits, including coal, peat, oil and natural gas. [15]

Greenhouse Gas (GHG): Greenhouse gases are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of terrestrial radiation emitted by the Earth's surface, the atmosphere itself and by clouds. This property causes the greenhouse effect. Water vapour (H_2O), carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4) and ozone (O_3) are the primary greenhouse gases in the Earth's atmosphere. Moreover, there are a number of entirely human-made greenhouse gases in the atmosphere, such as the halocarbons and other chlorine- and bromine- containing substances, dealt with under the Montreal Protocol. Beside CO_2, N_2O and CH_4, the Kyoto Protocol deals with the greenhouse gases sulphur hexafluoride (SF6), hydrofluorocarbons (HFC) and perfluorocarbons (PFC). [16]

Groundwater: Water below the level of the water table in the ground; water occupying the subsurface-saturated zone. [17]

Infrastructure: The physical capital and associated services considered basic and necessary to the functioning of the built environment. These include such things as: sanitary sewers, treatment plants, and water pipelines and distribution/collection systems; roads, signals, sidewalks and other components of the transportation system including transit vehicles, ferries and airports; solid waste management facilities including transfer stations and landfills; and, energy supply and distribution systems including hydroelectric and natural gas transmission and distribution systems. More generally, infrastructure can refer to other tangible public and private assets necessary to support the development of a modern urban settlement, such as hospitals, schools and recreation facilities. In some cases, preserved green space and natural areas including forest, wetlands and stream corridors have been described as "green infrastructure" essential to the vitality of healthy human communities.

Interface Fire: A fire that involves human development and wild land simultaneously. [18]

Invasive Species: Any species not native to a particular ecosystem whose introduction causes, or is likely to cause, economic or environmental harm or harm to human health. [19]

Mitigation (of climate change): A human intervention to reduce the sources or enhance the sinks of greenhouse gases. [20]

Mitigation (of disaster risk and disaster): The lessening of the potential adverse impacts of physical hazards (including those that are human-induced) through actions that reduce hazard, exposure and vulnerability. [21]

Natural Asset: Assets of the natural environment such as aquifers, creeks and foreshores that provide equivalent civil (engineered) municipal goods and services. [22]

Natural Capital: A region's stock of natural assets and ecosystems that provide flows of goods and services. [23]

Official Community Plan (OCP) Under Section 471 of the Local Government Act, a general statement of the broad objectives and policies of the local government respecting the form and character of existing and proposed land use and servicing requirements in the area covered by the plan.

Resilience: The capacity of social, economic and environmental systems to cope with a hazardous event, trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity, and structure, while also maintaining the capacity for adaptation, learning and transformation. [24]

Sequestration: The uptake (i.e., the addition of a substance of concern to a reservoir) of carbon containing substances, in particular carbon dioxide (CO_2), in terrestrial or marine reservoirs. Biological sequestration includes direct removal of CO_2 from the atmosphere through land-use change (LUC), afforestation, reforestation, revegetation, carbon storage in landfills and practices that enhance soil carbon in agriculture (cropland management, grazing land management). [25]

Silviculture: The art and science of controlling the establishment, growth, composition, health and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis. [26]

Storm Surge: The temporary increase, at a particular locality, in the height of the sea due to extreme meteorological conditions (low atmospheric pressure and/or strong winds). The storm surge is defined as being the excess above the level expected from the tidal variation alone at that time and place. [27]

Urban Heat Island: The relative warmth of a city compared with surrounding rural areas, associated with changes in runoff, effects on heat retention and changes in surface reflectivity. [28]

Vulnerability: The degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change. It is a function of the character, magnitude and rate of climate change and variation to which a system is exposed, its sensitivity and its adaptive capacity. [29]

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