



City of Richmond

Report to Committee

To: General Purposes Committee **Date:** April 24, 2020
From: Peter Russell, MCIP RPP **File:** 10-6000-01/2020-Vol
 Director, Sustainability and District Energy 01
Re: **2019 Climate Action Revenue Incentive Program and Corporate Carbon Neutral Progress Report**

Staff Recommendation

That the Climate Action Revenue Incentive Program Report and Carbon Neutral Progress Report, as described in the staff report titled, "2019 Climate Action Revenue Incentive Program and Corporate Carbon Neutral Progress Report" dated April 24, 2020, from the Director, Sustainability and District Energy, be posted on the City's website for public information, in accordance with Provincial requirements.

Peter Russell, MCIP RPP
 Director, Sustainability and District Energy
 (604-276-4130)

Att. 3

REPORT CONCURRENCE		
ROUTED TO: Finance Department Parks Services	CONCURRENCE <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	CONCURRENCE OF GENERAL MANAGER Discussed by: g:152CB09CEDB448...
SENIOR STAFF REPORT REVIEW	INITIALS: 	APPROVED BY CAO

April 24, 2020

- 2 -

Staff Report

Origin

The City of Richmond is committed to maintaining carbon neutral corporate operations, first achieved in 2013. The purpose of this report is to update Council on the 2019 corporate greenhouse gas (GHG) emissions and carbon neutrality activities.

This report supports Council's Strategic Plan 2018-2022 Strategy #2 A Sustainable and Environmentally Conscious City:

2.1 Continued leadership in addressing climate change and promoting circular economic principles.

This report supports Council's Strategic Plan 2018-2022 Strategy #6 Strategic and Well-Planned Growth:

6.2 "Green" and circular economic growth and practices are emphasized.

Council signed the BC Climate Action Charter in September 2008, voluntarily committing the City to annual corporate GHG emissions reporting and taking the necessary actions to achieve carbon neutral operations. In 2013, Council adopted the "*Towards Carbon Neutrality: Implementation Strategy*," which put in place an effective framework, defined by four key steps, for meeting carbon neutrality commitments: measure, reduce, compensate (or offset) and report.

Key mechanisms identified in the 2013 strategy to address the need for compensation included assessing and quantifying beyond "business as usual" corporate activities that reduce GHG emissions and the implementation of the Richmond Carbon Market program to purchase offsets from Richmond-based projects, as needed.

The City is reducing GHG emissions through the implementation of the 2013 Green Fleet Action Plan, Energy Management Program (for buildings and infrastructure), and other initiatives. To meet the City's community commitment of 33% reduction from 2007 levels by 2020, Council previously endorsed a 20% GHG emissions reduction target for Fleet by 2020 from 2011 levels and a 65% reduction for corporate buildings by 2020 from 2007 levels.

Analysis

The City of Richmond has achieved carbon neutral operations for the past six reporting years (2013-2018). Based upon this year's review and findings, the City will also be eligible to achieve carbon neutral corporate operations for the 2019 calendar year. Due to ongoing completion of emissions reduction projects, the City is carrying forward a surplus of verified emission credits. As per Provincial reporting protocol, surpluses can be allocated to future reporting years. Based on the continued work to reduce fleet and corporate building related emissions, diversion of community organics from the waste stream, and the accumulation of verified surplus emission credits from previous reporting years, staff are projecting that carbon neutral operations can be maintained into future reporting years.

April 24, 2020

- 3 -

2019 Corporate Carbon Emissions

The reported corporate emissions adhere to the BC Ministry of Environment's reporting methodology, and include GHG reductions resulting from the City's purchase of renewable natural gas. The 2019 total includes GHG emissions associated with traditional municipal services, including those that are contracted out (e.g. community recycling collection). Corporate emissions in 2019 were approximately 14% lower than in 2007. This reduction was achieved despite an increase in population of approximately 20% and corresponding increases in corporate services that are associated with this growth.

Through the replacement of aging facilities with less GHG emission intensive infrastructure and the continued operational improvements at key facilities, it is anticipated that emissions at corporate buildings will continue to be reduced as planned projects are implemented over the coming few years.

Table 1: 2019 Corporate Emission Sources

	Tonnes CO2e	Quantification Method
Emissions from services delivered directly by the City	7,103.6	Derived from metered energy consumption and associated GHG emissions from stationary sources (buildings, lighting, and pumps – except police services energy use) and corporate mobile sources (fleet – except construction related fuel use) used directly by the City
Emissions from contracted services delivering services on the City's behalf	1,897.4	The BC government standard methodology and guidance for estimated contracted emissions. Fuel usage values and Option 3 (Vehicle/Equipment Type and Hours of Usage) were used to determine the contracted emissions value.
TOTAL	9,001.0	

2019 Corporate and Community Carbon Credits (Offset Projects)

In accordance with BC Government Carbon Neutral protocols, the City completed the necessary reporting, quantification and verification of one corporate project outside of the City's traditional services boundary.

- **Diverted Organics Credits:** Emission credits from diverted household organic waste contributed significantly to offsetting the City's corporate emissions footprint in 2019. The estimated total diverted organics for 2019 corresponds to 6,370 tonnes of avoided GHG emissions, which represents 71% of the City's 2019 total corporate emissions.
- **Sun Hor Lum Conservation Area Credits:** The City achieved emissions credits for the 2011 purchase and preservation of the Sun Hor Lum Conservation Area in Northeast Richmond. Preserving this natural habitat and ensuring that the land was not developed for agricultural purposes preserves the carbon stored in the peat soil and provides benefits to Richmond and the region. Analysis and quantification of the carbon storage and sequestration benefits of the Sun Hor Lum Conservation Area resulted in the City claiming 3,244 tonnes of avoided GHG emissions for the period of time the City has

April 24, 2020

- 4 -

owned the site, between 2012 and 2018. The carbon storage and sequestration benefits that were quantified as part of the City's due diligence and conservation management planning are in addition to the ecological benefits that the City and region enjoy from the preservation of this ecosystem. It is believed that this work will help to inform other jurisdictions in the region on the importance of conserving and enhancing bog environments. The City is able to claim additional emissions credits for carbon sequestration from the Sun Hor Lum Conservation site, if the area is preserved and maintained in its natural state for the long term. Additional credits were not quantified in the current reporting year because the City already has a surplus of credits. Staff will assess and report additional credits from this source in future years.

- Richmond Carbon Market:** Council endorsed the Richmond Carbon Market (RCM) program in 2017 as a tool to purchase carbon offsets from Richmond-based emissions reduction projects. The City currently maintains an open bid for interested parties. To date, Council approved the execution of purchase and transfer agreements with Pacific Gateway Hotel and Lafarge Canada. Pacific Gateway Hotel carbon credits were derived from a building energy efficiency project completed in 2015, and credits from Lafarge Canada were derived from asphalt recycling operations at Mitchell Island. Credits were recorded in the 2017 reporting year, and when not fully used, have been carried forward. The Carbon Market has been an effective tool for identifying potential community partners with quantifiable GHG emissions reduction projects.

Table 2: Anticipated Emission Credits (Offsets) for the 2019 Reporting Year

Offsets	Tonnes CO ₂ e	Quantification Method
Household Organic Waste Composting – Municipally Collected	6,370	BC Government Option 1 GHG Reduction Projects reporting method.
Surplus GHG emission credits from 2018 Reporting Year	7,566	As per BC Government reporting protocol.
Total projected credits	13,936	
Estimated surplus carry forward for 2020 (see below discussion)	4,935	

With the above figures, staff anticipate that the City will again be eligible for a “Level 3 Achievement of Carbon Neutrality” through the Climate Action Recognition Program. Formal determination is typically announced at the Union of British Columbia Municipalities’ annual conference. It is estimated that the City will carry forward approximately 4,935 tonnes of GHG (tCO₂e) emission offsets for use in future reporting years. In addition, staff see opportunity to assess the potential for additional emission credits from City-owned bogs in Richmond, including Garden City Lands, that could be utilized in the future to offset Corporate greenhouse gas emissions. Natural bogs that are managed by the City in perpetuity would be eligible.

April 24, 2020

- 5 -

Public Reporting

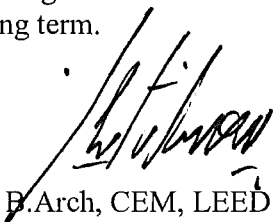
Staff will carry out public reporting on the City’s website (Climate Action Charter related reports Attachments 1-3) and highlight the report through social media and public engagement activities throughout the year.

Financial Impact

None.

Conclusion

The City of Richmond is a leader amongst BC municipalities through its innovative corporate projects and programs to reduce community and corporate GHG emissions. Through the continued and strategic implementation of the *Towards Carbon Neutrality – Implementation Strategy*, the City has focused on completing projects that maximize the reduction of fossil fuel use in City operations. The City is well positioned to maximize corporate and community benefits of transitioning towards a low carbon community and maintain carbon neutral corporate operations in the long term.



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NC:nc

- Att. 1: Carbon Emissions Provincial Reporting Worksheet – 2019 City of Richmond
- Att. 2: Climate Action Revenue Incentive Program – 2019 Public Report
- Att. 3: Contracted Emissions Estimate Report 2019

Attachment 1: Carbon Emissions Provincial Reporting Worksheet – 2019 City of Richmond

Local Government Name:	The City of Richmond
Year:	2019
Contact Information:	
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Stationary Emission Sources:				
Building and Infrastructure Fuel	Unit of Measure	Quantity	Emissions (tCO₂e)	
Electricity	KWH	38,859,991.00	415.21	
Natural Gas	GJ	88,339.00	4365.02	
Mobile Emission Sources: Estimated			4780	
Vehicle Class	Vehicle Fuel	Unit of Measure	Quantity	Emissions (tCO₂e)
Light Duty Vehicle	Gasoline	L	32,772	73.08
Light Duty Vehicle	Diesel	L	421	1.10
Light Duty Truck	Gasoline	L	198,930	450.18
Light Duty Truck	Diesel	L	7,201	18.89
Heavy Duty Truck	Gasoline	L	240,774	516.70
Heavy Duty Truck	Diesel	L	338,968	882.33
Off Road Vehicle	Gasoline	L	18,596	40.30
Off Road Vehicle	Diesel	L	107,333	309.55
Off Road Vehicle	Propane	L	20,215	31.11
Marine	Gasoline	L	32	0.07
Light Duty Truck - Contractor	Gasoline	L	10,402	23.54
Heavy Duty Truck - Contractor	Diesel	L	527,956	1,374.27
Heavy Duty Truck - Contractor	Natural Gas	GJ	32	1.60
Estimated Contractor	Diesel/Gas	L		498.00
Total Emissions (all Sources)				9,000.95
Credits: Estimated				
Organic Waste Diversion		Baseline	Estimated tonnes	Estimated credits
Diverted Household Organic		7,783	20,673	6,370
Diverted Organic Waste (Waste Drop off Service)		4,709	4,450	0
2018 Surplus Carbon Credits				7,566
Total Estimated Credits				13,935.97
Total Estimated Balance				4,935.02



Climate Action Revenue Incentive (CARIP) Public Report for 2019

Local Government:
City of Richmond

Report Submitted by:
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The City of Richmond has completed the 2019 Climate Action Revenue Incentive Program (CARIP) Public Report as required by the Province of BC. The CARIP report summarizes actions taken in 2019 and proposed for 2020 to reduce corporate and community-wide energy consumption and greenhouse gas emissions (GHG), as well as general sustainability related initiatives.

April 24, 2020

General Information

Name of Local Government	City of Richmond
Member of Regional District (RD)	Metro Vancouver
Regional Growth Strategy (RGS) in region	Yes
Population	227,406



Table of Contents

1. GENERAL REPORT INFORMATION.....	3
2. BROAD PLANNING ACTIONS	3
3. BUILDINGS AND LIGHTING ACTIONS.....	5
4. ENERGY GENERATION ACTIONS.....	7
5. GREENSPACE/NATURAL RESOURCE PROTECTION ACTIONS	8
6. SOLID WASTE ACTIONS	12
7. TRANSPORTATION ACTIONS	14
8. WATER AND WASTEWATER ACTIONS.....	17
9. CLIMATE ADAPTION ACTIONS.....	19
10. INNOVATIVE ACTIONS.....	22
11. PROGRAMS, PARTNERSHIPS AND FUNDING OPPORTUNITIES	23
12. CONCLUSION.....	24



1. GENERAL REPORT INFORMATION

This 2018 Climate Action Revenue Incentive Program (CARIP) Public Report documents the actions that the City of Richmond has taken corporately and in the community to support the reduction of greenhouse gas (GHG) emissions and energy use, as well as other sustainability related initiatives. The actions are separated into seven main categories; Broad Planning, Buildings and Lighting, Energy Generation, Greenspace/Natural Resource Protection, Solid Waste, Transportation, Water and Wastewater, and Climate Adaptation. There is also an Innovative Actions category, which the City has inputted items. The categories are further divided into community and corporate related actions, with general climate action questions at the beginning of each category.

This report encompasses a majority of the action items that the City is involved in support of GHG emissions and energy use reduction, but does not cover all sustainability related initiatives that the City conducts or supports. The report represents a “snapshot” of City activities in the past year, and proposed actions for 2020.

2. BROAD PLANNING ACTIONS

Broad Planning refers to high level planning that sets the stage for GHG emissions reductions, including plans such as Official Community Plans, Integrated Community Sustainability Plans, Climate Action Plans or Community Energy Emissions Plans. Land use planning that focuses on Smart Growth principles (compact, complete, connected, and centred) plays an especially important role in energy and GHG reduction. Summarized below are the City of Richmond’s responses to the Provincial inquiries regarding broad planning issues, and summary of initiatives conducted in 2019 and planned in 2020.

General Questions - Broad Planning	
What is (are) your current GHG reduction target(s)?	33% below 2007 levels by 2020; 80% below 2007 levels by 2050. Staff are currently developing new CEEP with revised targets: 50% below 2007 levels by 2030, and net zero GHG emissions by 2050.
Are you familiar with your local government's community energy and emissions inventory (e.g. CEEI or another inventory)?	Yes
What plans, policies or guidelines govern the implementation of climate mitigation in your community?	<ul style="list-style-type: none"> • Community Energy and Emissions Plan • Integrated Community Sustainability Plan • Community-Wide Climate Action Plan • Official Community Plan • Regional Growth Strategy • Other: Ecological Network Management Plan, Riparian Response Strategy, Invasive Species Action Plan
Does your local government have a corporate GHG reduction plan?	Yes



Community-Wide Broad Planning Actions Taken in 2019	
	Report to Council (RTC) on IPCC report, recommending a renewed Community Energy & Emissions Plan (CEEP), with deeper GHG reduction targets in line with limiting global temperature rise to 1.5 degrees Celsius [RTC endorsed by Council]
	Developed community engagement plan and branding (<i>50% x 2030 Advancing Richmond's Climate Leadership</i>). Conducted extensive public and stakeholder outreach and engagement in both spring and fall 2019 campaigns.
	Created eight strategic direction areas with proposed actions for the new CEEP, contingent with achieving 50% emission reduction from 2007 by 2050, and net zero carbon emissions by 2050.
	Development of actions within each CEEP direction area was supported by geospatial modelling and emissions forecasting, with consultant engaged to support this analysis.
Community-Wide Broad Planning Actions Proposed for 2020	
	Report to Council in January 2020 detailing results of community engagement on Community Energy & Emissions Plan completed in 2019, and seeking endorsement of the eight Strategic Directions that create the framework for the new Plan.
	Complete the revised CEEP 2020-2050 in tandem with final round of community engagement to help shape actions and timing within the new Plan.
	Create a Climate Action Strategy that acts as a communications document encompassing the following: (a) major actions and GHG emission targets from the new CEEP, (b) actions tied to energy and emissions leadership on the City's civic buildings and fleet, and (c), City-led infrastructure investments tied to climate adaptation and resiliency.
	Implement of higher BC Energy Step Code requirements in the City's Building Bylaw for detached and duplex homes, with a one-Step relaxation in these requirements available for homes equipped with a City-approved low carbon energy system.
	Implement new, mid-level Step Code requirements for hotels and motels, with a one-Step relaxation in these requirements for buildings equipped with a City-approved low carbon energy system.
	Conduct a curbside EV charging pilot in Richmond to test efficacy of increasing access to Level 2 public charging in proximity to existing MURB development, and where many residents currently don't have the option to charge at home.
	Develop a proposal to REAC-CPS that would provide Metro Vancouver Regional District with an expanded mandate to support local and regional climate action programs.
Corporate Broad Planning Actions Taken in 2019	
	Expand the Energy Optimization Program for City-owned buildings, which includes a range of energy efficiency retrofits for civic buildings and facilities.
	Expansion of public DC Fast Charging and Level 2 Electric Vehicle charging stations at civic locations,



	in partnership with Natural Resources Canada.
Corporate Broad Planning Actions Proposed for 2020	
	Update City of Richmond's High Performance Building policy.

3. BUILDINGS AND LIGHTING ACTIONS

Low-carbon buildings use the minimum amount of energy needed to provide comfort and safety for their inhabitants and tap into renewable energy sources for heating, cooling and power. These buildings can save money, especially when calculated over the long term. This category also includes reductions realized from energy efficient street lights and lights in parks or other public spaces. Below are the City of Richmond's responses to the Provincial inquiries regarding building and lighting initiatives conducted in 2019 and planned for 2020.

General Questions - Building and Lighting

The Province has committed to taking incremental steps to increase energy-efficiency requirements in the BC Building Code to make buildings net-zero energy ready by 2032. The BC Energy Step Code--a part of the BC Building Code--supports that effort

Is your local government aware of the BC Energy Step Code ?	Yes
Is your local government implementing the BC Energy Step Code ?	Yes

Community-Wide Building and Lighting Actions Taken in 2019

Energy Step Code now in effect in Richmond's Building Bylaw for single-detached and duplex homes (Step 1) and a minimum Step Code level 3 requirement for new townhomes.
Provide free training to local homebuilders on airtightness techniques in new home construction; results obtained in 2019 indicate a significant improvement in the airtightness of new homes.
City of Richmond participation in development of Building Benchmark BC pilot program with five participating municipalities, Metro Vancouver, UBC and Province of BC. Work with OPEN Green Building Society to submit application to Natural Resources Canada for major program funding [two-year funding approved by NRCan in September 2019].

Community-Wide Building and Lighting Actions Proposed for 2020

Implement higher BC Energy Step Code requirements for single-detached and duplex homes, with a one-Step relaxation available for new homes equipped with a City-approved low carbon energy system low-carbon option to maximize GHG reductions.
Implement new, mid-level Step Code requirements for hotels and motels, with a one-Step relaxation in these requirements for buildings equipped with a City-approved low carbon energy system.
Conduct an awareness campaign with owners and property managers of larger residential,



	commercial and industrial buildings to enroll and participate in the regional Building Benchmark BC (January 2020 to April 2021).
	Continue implementing: EnergySave Richmond suite of programs; Metro Vancouver Strata Council Advisor pilot program (encouraging a subsequent phase of this program in the region); water and energy saving programs; promoting Richmond Carbon Market initiative to Richmond businesses as needed.
	Implement public, direct current fast charging (DCFC) stations for electric vehicles in Richmond, at major civic facilities.
	Conduct research to inform Level 2 EV charging infrastructure requirement for new industrial and commercial buildings in Richmond, similar to implementation of EV infrastructure requirements for new residential buildings completed in 2018.

Corporate Building and Lighting Actions Taken in 2019

	Deployment of the Deep Emission Building Retrofit Program to support carbon reductions in City owned buildings, including Richmond Library and Cultural Centre,
	Completed LED Street Light Conversion Project - Phase 3 (421,798 kWh) in savings. The LED upgrade will reduce maintenance and operation costs by 50%, and improve the quality of light by focusing light directly where it is required, in a uniform way. LED lighting also has lower energy consumption and carbon footprint. The street light LED upgrade resulted in 46% savings in electricity.
	Energy efficiency upgrades at Thompson Community Centre, including DDC Upgrade, RTU replacement, and new electric heat pump equipment.
	Gateway Theatre mechanical and lighting upgrade: replacing incandescent lighting with LED fixtures.
	Watermania, heat recovery, cooling tower replacement.
	DDC and energy efficiency upgrades completed at: Community Safety Building (RCMP), South Arm Community Centre, and Thompson Community Centre.
	Boiler replacement at the Richmond Ice Centre: convert atmospheric boiler to condensing boiler.

Corporate Building and Lighting Actions Proposed for 2020

	Secured funding for Phase 4 of the City of Richmond street lighting conversion project, with replacement of approximately 1,000 existing street light fixtures with new and much more energy efficient LED technology.
	Work towards achieving key targets in the City's High Performance Building Policy for new and existing facilities, with focus on energy efficiency, reduced resource use, wellness and wellbeing, circular economy and environmental sustainability.
	Solar PV installation at the Fire Hall No.1.
	Install exhaust heat recovery at the City Hall and South Arm Community Centre
	DDC upgrade the Works Yard, Steveston Tennis Shed and Britannia Heritage Complex



4. ENERGY GENERATION ACTIONS

A transition to renewable or low-emission energy sources for heating, cooling and power supports large, long-term GHG emissions reductions. Renewable energy including waste heat recovery (e.g. from biogas and biomass), geo-exchange, micro hydroelectric, solar thermal and solar photovoltaic, heat pumps, tidal, wave, and wind energy can be implemented at different scales, e.g. in individual homes, or integrated across neighbourhoods through district energy or co-generation systems. Below are the City of Richmond's responses to the Provincial inquiries regarding energy generation, and summary of initiatives conducted in 2019 and planned in 2020.

General Questions - Energy Generation	
Is your local government developing, or constructing a <ul style="list-style-type: none"> • district energy system • renewable energy system • none of the above 	Yes Yes
Is your local government operating a <ul style="list-style-type: none"> • district energy system • renewable energy system • none of the above 	Yes Yes
Is your local government connected to a district energy system that is operated by another energy provider?	No
Are you familiar with the 2018 List of Funding Opportunities for Clean Energy Projects Led by First Nations and Local Governments?	Yes

Community-Wide Energy Generation Actions Taken in 2019	
	Continued to expand and connect new customers in the West Cambie neighbourhood to the Alexandra District Energy Utility (ADEU). In 2019, over 350,000 ft ² of residential floor space were connected to the system. Total space now connected to ADEU = over 1,650,000 ft ² of residential space and over 300,000 ft ² non-residential space.
	Installed new pipes and vault connections under Alexandra Park to allow for the future addition of two new geo-exchange fields. This will ensure the ADEU system will be able to provide the same share of renewable energy to future customers.
	Continued to develop and operate the Oval Village District Energy Utility (OVDEU) in the Oval Village area. Throughout 2019, the OVDEU had 9 connected buildings receiving energy. This totals 2,263,000 ft ² and over 1,900 apartment units.
	Worked with a private utility partner to develop plans and complete due diligence, feasibility analysis, and implementation plan for the design, finance, construction and operation of a City Centre District Energy Utility (CCDEU) which would encompass the entire city centre core.
	Advanced the interim servicing strategy in the City Centre area, requiring developments to provide on-site low carbon energy generation plants designed for interconnection with the future City Centre District Energy Utility (CCDEU). To-date, nine developments have been committed to the



	servicing strategy, totaling approximately 4,610,000 ft2. These developments are currently working through various stages of the development process and are estimated to obtain occupancy between 2021 and 2023.
	Continued to implement DEU infrastructure and developments using dedicated DEU operating funds and capital program, financed through ratepayer funds.
Community-Wide Energy Generation Actions Proposed for 2020	
	Continue to connect buildings and expand the ADEU distribution system as development requires. Three new residential buildings (600,000 ft2) are scheduled for connection in 2020.
	Continue Oval Village District Energy Utility construction and planning in partnership with a private utility partner, with continuous operational improvement and initiated construction for a third interim energy centre. This interim energy centre is scheduled to be in operation in 2020.
	Design and planning for the upcoming connection of five new developments with a total of over 1,800,000 ft ² of building gross floor area to the OVDEU system. These developments are scheduled to connect over the next 3 years, with the first connection in mid-2020.
	Continue securing on-site low carbon energy generation plants designed for interconnection with the future CCDEU system. Development schedules indicate that four applicable developments in the City Centre will go through rezoning in 2020. The four developments are estimated to total approximately 1,870,000 ft ² . Will be seeking approval for expansion of the CCDEU system to encapsulate all of the City Centre Area, potentially allowing for connection upwards of 48 million ft ² of floor space to DE utilities.

Corporate Energy Generation Actions Taken in 2019	
	Secured funding to complete major equipment replacement and upgrades at Thompson Community Centre, including the revitalization of the geo-exchange field on-site.
Corporate Energy Generation Actions Proposed for 2020	
	Complete the installation of photovoltaic system at the new Fire Hall No.1 to offset electrical Demand
	Continue to target renewable energy integration, a key component of the City’s High Performance Building Policy, during design and development of new corporate facilities

5. GREENSPACE/NATURAL RESOURCE PROTECTION ACTIONS

Greenspace/Natural Resource Protection refers to the creation of parks and greenways, boulevards, community forests, urban agriculture, riparian areas, gardens, recreation/school sites, and other green spaces, such as remediated brownfield/contaminated sites as well as the protection of wetlands, waterways and other naturally occurring features. Below are the City of Richmond responses to the Provincial inquiry regarding “greenspace” management in the City, and summary of community initiatives conducted in 2019 and planned in 2020.



General Questions – Greenspace	
Does your local government have urban forest policies, plans or programs?	Yes
Does your local government have policies, plans or programs to support local food production?	Yes

Community-Wide Greenspace Actions Taken in 2019	
	522 trees were planted as part of development servicing agreements.
	Partnered with Tree Canada to secure grant funding from local businesses. Volunteer planting events included: <ul style="list-style-type: none"> • Terra Nova Planting (TD Tree Days) <ul style="list-style-type: none"> ○ 118 trees and 841 shrubs ○ 180 volunteers • Railway Greenway North (Earth Day) <ul style="list-style-type: none"> ○ 500 trees and shrubs ○ 50 volunteers • Railway Greenway North (IKEA) <ul style="list-style-type: none"> ○ 500 trees and shrubs ○ 20 volunteers • Paulik Park Planting (FedEx) <ul style="list-style-type: none"> ○ 350 trees and shrubs • Alexandra Greenway Planting (Siemens) <ul style="list-style-type: none"> ○ 12 trees and 319 shrubs ○ 12 volunteers
	Shoreline Cleanups: 42 events were held, with approximately 400 volunteers participating; 37 of these events were registered in partnership with the Great Canadian Shoreline Cleanup
	Planted 518 trees on City streets as a result of urban redevelopment agreements.
	Hosted 21 Sustainability-themed workshops, attended by 331 Richmond residents; topics included organic food gardening, pesticide free pest control, composting, bee keeping, alternatives to traditional farming, and foraging.
	Participated in Provincial Invasive Species Action Month, providing education to the public on invasive species management and alternatives to pesticides.
	Richmond Nectar Trail initiative launched; aims to connect large pollinator habitats to one another with smaller micro habitats in green spaces around the City.
	Updated and streamlined the City's system of managing BC Ministry of Environment and Climate Change Strategy Site Profiles in adherence to the BC Environmental Management Act and BC Contaminated Sites Regulation.
	Implemented a bat habitat conservation strategy that was endorsed by Council, and resulted in the City of Richmond being named the first certified Bat-friendly community in the lower mainland by



BC Community Bat Programs.
Community-Wide Greenspace Actions Proposed for 2020
<p>Volunteer planting events including:</p> <ul style="list-style-type: none"> • TD Tree Days (pending COVID-19 restrictions/impacts): <ul style="list-style-type: none"> ○ 960 trees and shrubs • Paulik Park Enhancements <ul style="list-style-type: none"> ○ 93 trees and 235 shrubs • Bath Slough (pending COVID-19 restrictions/impacts) <ul style="list-style-type: none"> ○ Native trees and shrubs
Host 14 sustainability-focussed workshop session covering topics such as organic food gardening, pesticide free pest control, composting, bee keeping, alternatives to traditional farming, and foraging.
Enrol participants in the Richmond Nectar Trail program.
Partner with the Richmond School District to promote the City Nature Challenge and host iNaturalist workshops.
Partner with the Canadian Wildlife Federation to offer a 3-day Wetlandkeepers Course to City staff and Richmond residents.
Obtain a “Canadian Bee City” designation from Bee City Canada.

Corporate Greenspace Actions Taken in 2019
London/Steveston Park Enhancements: Improvements to 6 acres of London/Steveston Park including the planting of 285 trees.
The Gardens Agricultural Park: Planting included approximately 100 trees and 400 shrubs.
South Arm Park: Planting included approximately 50 trees.
McCallan Greenway: Planting included approximately 500 trees.
Public Tree Management Strategy 2045: In December 2019, Council adopted the City of Richmond Public Tree Management Strategy 2045, a plan for Managing Richmond’s Public Urban Forest. This Strategy demonstrates the City’s continued commitment to maintaining a healthy urban forest and the prudent management of this valuable natural asset. The document outlines the goals and objectives for the sustainable stewardship of all City-owned trees for the next 25 years.
Initiated the Bath Slough Revitalisation Initiative, in efforts to revitalise one of Richmond’s oldest, natural watercourses to a viable and effective ecological corridor.
Maintained the Terra Nova Pollinator Meadow and Bridgeport Pollinator Pasture to support local pollinator populations.
Maintained Alternative Lawn seed mix demonstration plots for the public to see how lawns planted with alternative species to typical turf grass would look, in efforts to decrease the impact of Chafer beetle on private lawns.
Delivered invasive species management for City engineering and park lands; species include knotweed, hogweed, European chafer, Brazilian elodea, parrot’s feather, European fire ants.



	Completed brownfield remediation of a former soil transfer site via risk assessment that resulted in obtaining two Certificates of Compliance for city-owned properties.
	Commenced habitat assessments for offsetting environmental impacts associated with future dike upgrades.
	Hosted six sessions for operation departments to provide training on best management practices for invasive species management, in-stream works, and spill response.
	Integrated contaminated site identification into the development review process.
	Reviewed the multi-family Riparian Management Area application process and implement a strategy to streamline applications and maintain the City's Ecological Network.
	Hosted an environmental stewardship info session for Mitchell Island businesses with participation from Federal, Provincial, and Regional regulators.
	Participated on the Species and Environments at Risk, and Soil and Invasive Species Local Governments Working Group.
	Created an Ecological Network Management Strategy (ENMS) Working Group to develop a management approach for the ecological network. Created a SharePoint site and ENMS map to track initiatives across the City.
	Constructed Woodwards slough.
Corporate Greenspace Actions Proposed for 2020	
	Aberdeen Park – Phase 2 Construction (pending COVID-19 restrictions/impacts): Construction will see the addition of four major park elements: a Chinese exchange garden, public washroom, event pavilion, and children's playground. The exchange garden and playground will expand upon existing planted areas, and include 25 trees and 771 shrubs.
	Alexandra Park Construction (pending COVID-19 restrictions/impacts): Construction of Phase 1 of the 6-acre park will include a stormwater detention wetland, a 2 acre meadow, 85 trees, and 1,100 shrubs.
	Tait Centre Park: Start of construction on a 3 acre park located along the Middle Arm of the Fraser River that will include 56 trees, 1,200 shrubs, and large areas of native grasses. Native shrub and grass planting within the ESA setback along the river will also be included.
	Minoru Lakes Renewal (pending COVID-19 restrictions/impacts): Start of construction on renovation of just over 11 acres of existing park land that currently includes an ornamental water feature (the lakes) that is fed by potable water and is surrounded by seasonal plant beds and large mature trees. The lakes will be renewed to receive rainwater runoff, negate reliance on potable water and be largely self-sustaining. Tree retention is a priority. 75 new trees, 2,500 native aquatic and emergent plants and over 1,500 native shrubs will be planted.
	Richmond Nature Park Hydrogeological and Biophysical Study: A study will commence to improve understanding of the Richmond Nature Park's current hydrogeological regime, how it is being affected by climate change, and the long term viability of bog preservation on site. As well, a comprehensive biophysical inventory will be completed, with special attention to the spread of invasive species.



	Invasive species inventory on City dikes, RMA network, and roadways for purple loosestrife, wild chervil, and parrot's feather.
	Investigate natural capital accounting using the Municipal Natural Assets Initiative (https://mnai.ca/) to assess the financial value of natural assets in Richmond.
	Continue work on Phase 2 updates of the Riparian Response Strategy to better address multifamily, commercial and industrial development impacts adjacent to riparian areas.
	Complete the initial development of Environmental Design Guidelines aimed at achieving partnerships in the agricultural and development communities with the goal of achieving more wildlife friendly development throughout both urban and rural areas of the City.
	Increase ecosystem functionality with the initiation of programs to protect species such as birds, bats, and pollinators.
	Assess the effectiveness of recent single family home RMA changes and provide update to council on multifamily RMA management strategy.
	Develop environmental best management practices plans for operation crews. Work with external regulators to improve environmental compliance on Mitchell Island.

6. SOLID WASTE ACTIONS

Reducing, reusing, recycling, recovering and managing the disposal of the residual solid waste minimizes environmental impacts and supports sustainable environmental management, greenhouse gas reductions, and improved air and water quality. Below are the City of Richmond responses to the Provincial inquiries regarding solid waste management in the City, and summary of initiatives conducted in 2019 and planned in 2020.

General Questions – Solid Waste	
Does your local government have construction and demolition waste reduction policies, plans or programs?	Yes
Does your local government have organics reduction/diversion policies, plans or programs?	Yes

Community-Wide Solid Waste Actions Taken in 2019	
	Extended days of operation at the Recycling Depot from five to six days per week and expanded accepted items to include upholstered furniture, electronics, propane tanks, butane cylinders, tires, smoke and CO alarms.
	Increased Large Item Pick Up program from four to six items per year and added tires as an accepted item.
	Introduced Single-Use and Other Items Bylaw 10000 and completed communication and engagement campaign with Richmond businesses and residents.
	Designed, implemented and completed a flexible plastic packaging pilot recycling program in partnership with the Richmond School District.
	Launched the Let's Recycle Correctly! Campaign and implemented audits of Blue Box, Garbage Cart



	and Green Cart with a focus on education and awareness.
	Introduced the Richmond Repair Fair at City events to provide free repairs on small household items.
	Installed additional in-ground containers to address capacity and reduce service frequency as well as installed 27 new public space recycling containers.
	Hosted community engagement activities including 12 Recycling Depot tours, 32 recycling workshops, 11 outreach displays and 20 information sessions at multi-family buildings with approximately 3,950 attendees.
	Green Ambassadors supported 20 special events and attended 11 symposiums for training and engagement with 4,167 volunteer hours. The Green Ambassador program was also highlighted by creating a new dedicated web page to promote awareness and recruitment.
	Provided over 280 recycling stations at 82 special events to improve waste diversion.
	Joined the national Love Food Hate Waste campaign to help reduce food waste.
Community-Wide Solid Waste Actions Proposed for 2020	
	Enhance service at the Richmond Recycling Depot by expanding operation to seven days per week; complete upgrades and expand accepted items to include fire extinguishers, motor oil, antifreeze and car batteries.
	Develop and implement a communication plan to achieve 80% waste diversion and increased awareness about how to support a circular economy.
	Host expanded Richmond Repair Fair events throughout the year and assess program.
	Work with businesses to implement the Single-Use Plastic and Other Items Bylaw 10000.
	Consider a pilot program for the collection of grease to assess the effect of grease build-up on the sanitary sewer system.
	Complete a detailed review and scope assessment related to enhanced recycling options for the commercial sector.
	Research and stay current on policies and actions around the world related to marine plastics and increase awareness of how to reduce plastic litter in Richmond.
	Prepare an annual progress report to the community to identify progress towards established waste diversion targets, "Report 2019: Continuous Improvement for Sustainable Waste Management". https://www.richmond.ca/recycling
Corporate Solid Waste Actions Taken in 2019	
	Hosted four, lunch-and-learn sessions for staff to increase awareness of recycling correctly, single-use items, food waste and the environmental benefit of recycling.
	Installed recycling stations at new City facilities to ensure consistency among facilities for both staff and the public.
	Participated in a review of purchasing policies to enhance circular economy principles.
	Provided on-request support for miscellaneous City facility clean-ups by arranging collection for recycling or proper disposal of materials.
Corporate Solid Waste Actions Proposed for 2020	
	Review waste management systems at arenas to identify barriers and opportunities to increase waste diversion.
	Continue visual audits at major City facilities and provide feedback relating to their recycling and waste management.



Develop RFP for collection of cardboard and garbage from City facilities ensuring circular economy principles are incorporated.

7. TRANSPORTATION ACTIONS

Transportation actions that increase transportation system efficiency emphasize the movement of people and goods, and give priority to more efficient modes, e.g. walking, cycling and public transit, can contribute to reductions in GHG emissions and more livable communities. Below are the City of Richmond responses to the Provincial inquiries regarding transportation system management in the City, and summary of initiatives conducted in 2019 and planned in 2020.

General Questions – Transportation	
Does your local government have policies, plans or programs to support: <ul style="list-style-type: none"> • Walking • Cycling • Transit Use • Electric Vehicle Use • Other (please specify) 	Yes Yes Yes Yes Yes
Does your local government have a Transportation Demand Management (TDM) strategy (e.g. to reduce single-vehicle occupancy trips, increase travel options, provide incentives to encourage individuals to modify travel behaviour)?	Yes
Does your local government integrate its transportation and land use planning?	Yes

Community-Wide Transportation Actions Taken in 2019	
	Completion of pilot program for public bike-share system.
	Expanded active mobility network with completion of 6 new multi-use pathways: <ul style="list-style-type: none"> • River Dr (Van Horne Way-No. 4 Road); • No. 6 Road (Bridgeport Road-Cambie); • No. 2 Road (Steveston Hwy-Dyke Road); • Alderbridge Way (No. 4 Road-Fisher Gate); • Midtown Bikeway (Phase 1): Maple Lane School and McCutcheon P • Saunders-Woodwards Bikeway (Phase 1): Saunders Road-No. 3 Road.
	Expanded active mobility network with completion of northern extension of Parkside Bikeway (Granville Ave-Westminster Hwy) .
	To encourage active transportation and promote cycling as a mode of transport: <ul style="list-style-type: none"> • Provided free cycling education training courses to over 300 Grade 5-7 students at 4 elementary schools, and to new immigrants; • Provided free bike maintenance courses for seniors and the general public.
	Production and distribution of free updated cycling and recreational trails map in partnership with Tourism Richmond to promote active transportation.
	Created a Pedestrian Facility Inventory along major roads and bus routes using GIS to determine and prioritize gaps in the network.



Created an inventory of and prioritized locations for the removal of channelized right-turn islands at intersections to improve pedestrian and cyclist safety and mobility.
Hosted free 19th annual "Island City, by Bike" tour event with over 100 participants to promote cycling as a mode of transport.
Provided input into TransLink's development of Transport 2050 (new 30-year regional transportation strategy) which will shape the future regional transportation network.
Completed feasibility studies to identify measures to improve bus speed and reliability at 3 "hot spot" locations in partnership with TransLink.
Installation of special crosswalks (pedestrian-actuated overhead or side-mounted flashing amber lights) at 5 intersections to expand active mobility network and improve road safety.
Installation of new crosswalk and improved walkway to Dixon Elementary School to enhance safety.
Expanded active mobility network with construction of off-street bike path on eastbound Granville Ave to provide access to Minoru Centre for Active Living.
Upgrade of crosswalk on Saunders Road at Garden City Road for cyclists with addition of green paint and elephant's feet.
Replacement of painted bike stencils with thermoplastic bike stencils on Granville Ave, Railway Ave, Minoru Blvd, and Garden City Road.
Upgrade of 16 bus stops to become accessible; 585 of 721 of active stops (81%) are now accessible, which is above the regional average.
Addition of 16 transit shelters to enhance transit experience for passengers; total of 97 transit shelters.
Installation of pedestrian countdown timers at 8 intersections; total of 16 intersections.
Successfully awarded electric charging stations and software service provider to enable the expansion of future Public EV charging in the City.
Installed two additional public charging stations.
Applied for and awarded a Natural Resources Canada (NRCAN) grant funding to install 4 public DC fast chargers and 14 Level 2 charging stations utilizing matching grant funding.
Participated in the 2019 Canada Day Celebration promoting the City's Green Fleet and EV outreach Programs.
The City hosted a Community Directions Fair in October 2019, where staff, volunteers and green ambassadors provided support and information on electric vehicles and 67 residents were able to test drive electric vehicles.
Community-Wide Transportation Actions Proposed for 2020
Update of Cycling Network Plan including associated policies, standards, guidelines.
Implementation of pilot program for shared e-scooter system and renewal of bike-share system.
Expansion and enhancement of active mobility network: <ul style="list-style-type: none"> • Alderbridge Way (Shell Road-Fisher Gate): multi-use pathway; • Garden City Road (Lansdowne Road-Westminster Hwy): protected bike and pedestrian paths; • Odlin Road Bike Route (Odlin Road-Brown Road): multi-use pathway; • Midtown Bike Route (Schaefer Gate-Cullen Cr): multi-use pathway; • Westminster Hwy (No. 6 Road-No. 7 Road): reconstruction of multi-use pathway with protection; • Railway Ave (Steveston Hwy-Williams Road): restriping of bike and vehicle lane lines to



	<p>create wider bike lane;</p> <ul style="list-style-type: none"> • Cambie Road-No. 5 Road: multi-use pathways on Cambie Road at intersection and on No. 5 Road (Cambie Road-Thorpe Road).
	Upgrade of 15 bus stops to become accessible.
	Addition of 10 transit shelters to enhance transit experience for passengers.
	Installation of special crosswalks (pedestrian-actuated overhead or side-mounted flashing amber lights) at 4 intersections to expand active mobility network and improve road safety.
	Garden City Road-Lansdowne Road: removal of channelized right-turn island (northwest corner) and upgrade of on-street bike lane to off-street bike path.
	<p>Implementation of new pedestrian pathways:</p> <ul style="list-style-type: none"> • St. Edwards Drive (350m west of Cambie Road-Bird Road): north side; • Westminster Highway (Muir Road-150m east): north side; • Viking Way (Cambie Road-Bridgeport Road): east side.
	Completion of multi-year program to provide accessible pedestrian signal features at all City-owned traffic signals and special crosswalks.
	Provide free cycling education training courses to 50% of all Grade 6-7 students in elementary schools (with remaining 50% of schools planned for delivery in 2021).
	Complete the installations of 4 public DC Fast chargers and 14 public Level 2 charging stations utilizing NRCAN grant funding.
	Install the first Solar Arc solar powered level 2 EV Charging station in Canada. It can also be utilized to provide emergency solar power for emergency operations.
	Continue to facilitate additional car-sharing service hubs in other areas of Richmond.
	Expand electric capacity at city facilities to enable the future expansion of electric vehicle charging stations.
	Increase workshops and outreach displays for staff and the public to provide information on electric vehicles and charging infrastructure. Develop volunteers and train the trainer sessions to be able to offer more outreach support.

Corporate Transportation Actions Taken in 2019

	Installed 4 EV charging stations for City Vehicles.
	To reduce idling, the City retrofitted six Public Works vans with photovoltaic solar panels to charge inverters, and power running lights, arrow boards, lighting and space heaters.
	Outfitted all 11 litter trucks with propane conversions as part of the propane pilot to reduce Fleet overall emissions.
	Increased membership of car-sharing services by 26 users.
	Replaced 26 units incorporating the City's Green Fleet Action Plan targets, including the replacement of 3 gas-powered passenger vehicles with electric and/or plug-in hybrid vehicles and other replacements made were more fuel efficient than the units they replaced.
	Purchased a new hydro-vac truck with technology that will contribute to higher functionality and lower fuel consumption and emissions.
	Prepared Auntie Idle newsletters for staff to promote new technologies, programs and tips on anti-idling techniques and the operation of City of Richmond's vehicle procedures, policies and expectations.



	Implemented a successful GPS pilot on 71 City vehicles to assist with operational efficiencies, reduction of idling, route planning, resource allocation, and improved worker safety.
	By utilizing a SharePoint application to combine data from various City programs, management reporting tools have been developed to assist with idling information to allow for further training to promote idle reduction in departments and promote innovative ideas to reduce idling and make operational efficiencies.
Corporate Transportation - Actions Proposed for 2020	
	Expand electric vehicle charging stations for Fleet vehicles at City facilities and develop electric capacity for future expansion at City Hall Annex and the Works Yard.
	Replace 47 units incorporating the City's Green Fleet Action Plan targets including the replacement of 14 gas-powered passenger vehicles with electric and/or plug-in hybrid vehicles.
	Implement an electric generator pilot project to utilize silent and clean energy technologies.
	Explore the expansion of electrification of Fleet beyond passenger vehicles to include pick up trucks.
	Develop training mentorship programs to promote maximized use of all units that have auxiliary solar units installed to achieve full benefit of idle reduction technologies.
	Implement a permanent solution for GPS.
	Prepare semi-annual Auntie Idle newsletters for staff to promote new technologies, programs and tips on anti-idling techniques and the operation of City of Richmond's vehicle procedures, policies and expectations.

8. WATER AND WASTEWATER ACTIONS

Managing and reducing water consumption and wastewater is an important aspect of developing a sustainable built environment that supports healthy communities, protects ecological integrity, and reduces GHG emissions. Below are the City of Richmond responses to the Provincial inquiry regarding water and wastewater management in the City, and summary of initiatives conducted in 2019 and planned in 2020.

General Questions - Water Conservation

Does your local government have water conservation policies, plans or programs?	Yes
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Community-Wide Water and Wastewater Actions Taken in 2019

	Issued 581 toilet rebates to homeowners that replaced old toilets with a low-flush toilet to reduce residential water use. The total incentive paid to homeowners through this program in 2019 was \$58,100.
	Partnered with BC Hydro in spring and fall 2019 to provide a clothes washer rebate program to reduce home water use and electricity. To date, 1201 rebates have been issued to homeowners who replace their less efficient (water and electricity) washer for a new efficient model at a total cost of \$80,650 to the City. It is estimated that this program achieved annual savings in water and energy of 4,530,000 litres per year and 116,000 kilowatt hours per year, respectively.
	Sold 75 rain barrels through the City's Rain Barrel Program to Richmond residents, to help promote the use of rain water for gardening purposes and reduce the use of potable water in gardens.



	Reduced water pressure during from October to May to reduce the volume of leakage and extend the life of our water infrastructure. The City continues its timer-based pressure management program during off-peak hours in the summer months, further reducing leakage volume and extending the life of water infrastructure.
	The City continues its Volunteer Multi-Family Water Meter Program providing outreach and meter installation incentives to non-metered multi-family residences to encourage water conservation. To date, 146 water meter installations at multi-family complexes have been completed. It is mandatory for all new multi-family complexes to have a water meter.
	Commenced an environmental stewardship program for the Mitchell Island community. Highlights included the hosting of a new Environmental Stewardship Information Session on the island attended by 90+ regulators and local workers, undertaking a storm water monitoring program for the island that identified pollution from businesses, and collaborating with provincial and federal regulators on joint site inspections, including a water-based inspection of Mitchell Island foreshore.
Community-Wide Water and Wastewater Actions Proposed for 2020	
	Continue the volunteer Multi-Family water meter program.
	Continue the toilet rebate program in 2020.
	Continue offering the water saving kits to homeowners with a newly installed water meter.
	Continue to participate in the joint clothes washer rebate program with BC Hydro in 2020.
	Continue the City's Rain Barrel Program and promote the use of rain water for gardening and irrigation purposes.
	Distribute, if necessary, educational brochures on water restrictions, describing the stages and what they entail.
	Maintain updated water conservation information on the City's website for public use.
	Continuation of the Mitchell Island Environmental Stewardship program, and additionally conducting a feasibility study of possible green infrastructure improvements.

Corporate Water and Wastewater Actions Taken in 2019 + Additional Actions	
	Participated in the Metro Vancouver Regional Engineers Advisory Committees. The meetings revolve around networking with other municipalities and discussing initiatives, progresses, updates in policies and results.
	Implemented a timer-based pressure management program to decrease system pressures during off-peak hours in the summer months to reduce water loss to system leakage.
	Initiated grease management pilot projects to combat fats, oils, and grease buildup in the sanitary system.
	Participated in Metro Vancouver's local government working group in the Regional Assessment of Residential Water Metering project to assess the costs and benefits of water metering and share Richmond's experience and expertise with regards to successes in water metering.
Corporate Water and Wastewater Actions Proposed for 2019	
	Continue to take part in the Metro Vancouver Regional Engineers Advisory Committees.
	Coordinate with the Metro Vancouver Residential Indoor and Outdoor Uses of Water Monitoring Study.



9. CLIMATE ADAPTION ACTIONS

This section of the CARIP survey is designed to collect information related to the types of climate impacts local governments are experiencing and how they are being addressed. Below are the City of Richmond responses to the Provincial inquiries regarding climate change adaption, and summary of initiatives conducted in 2019 and planned in 2020.

Please identify the THREE climate impacts that are most relevant to your Local Government.	
<ul style="list-style-type: none"> • Warmer winter temperatures reducing snowpack • Extreme weather events contributing to urban and overland flooding • Sea level rise and storms causing coastal flooding and/or erosion 	
In 2019 has your local government addressed the impacts of a changing climate using any of the following?	
Risk and Vulnerability Assessments	Yes
Risk Reduction Strategies	Yes
Emergency Response Planning	Yes
Asset Management	Yes
Natural/Eco Asset Management Strategies	Yes
Infrastructure Upgrades (e.g. stormwater system upgrades)	Yes
Beach Nourishment Projects	No
Economic Diversification Initiatives	Yes
Strategic and Financial Planning	Yes
Cross-Department Working Groups	Yes
Official Community Plan Policy Changes	Yes
Changes to Zoning and other Bylaws and Regulations	Yes
Incentives for Property Owners (e.g. reducing storm water run-off)	Yes
Public Education and Awareness	Yes
Research	Yes
Mapping	Yes
Partnerships	Yes



Climate Change Adaptation Actions Taken in 2019

Please elaborate on key actions and/or partnerships your local government has engaged in to prepare for, and adapt to a changing climate. Add links to key documents and information where appropriate.

	Completed Dike Master Plan Phases 3 and 5 which provide area-specific guidance for dike upgrades.
	Completed the Flood Protection Management Strategy 2019, a long-term flood protection guidance document that updates the previous Strategy with current climate change science and an Implementation Program.
	Completed the Steveston Island Sea Gates and Geotechnical Investigation to inform dike corridor upgrades along Steveston Island.
	Completed the Drainage Pump Station Condition Assessment.
	Continued to investigate soil densification technologies for flood protection infrastructure.
	Worked with regional authorities (First Nations representatives, Provincial Government, and Municipalities) on flood protection and seismic guidelines planning for the Lower Mainland.
	Design or construction in progress on 5 drainage pump stations.
	Initiated construction on 650m of dike from Gilbert to No. 3 Rd.
	Updated intensity-duration-frequency data included in the City's engineering design specifications to reflect increased rainfall intensities experienced in the City.
	Monitored and analyzed data from rain gauges, electronic river level sensors and electronic drainage infrastructure level sensors to assess climate change impacts on the City's drainage network. Real-time river level data is included on the City's webpage and can be found by accessing: https://www.richmond.ca/scadamaps/riverlevelmap.jpg .
	Installed electronic river level sensors and electronic drainage infrastructure level sensors at strategic locations.
	Transportation participating in cross-departmental working group on the City's phased Dyke Master Plan.
	Transportation participating in cross-departmental working group on the City's Community Emissions and Energy Plan (CEEP) Renewal.
	Transportation participating in cross-departmental working group implementing the City's Wellness Strategy.
	Completed the design, tendering and award of the south dike upgrade from Gilbert Rd to No.3 Rd.
	Completed the detailed design and permitting for the south dike raising project from No.3 Rd to 400m west of No.4 Rd excluding the frontage of 13911 Garden City Road.
	Completed the detailed design of the south dike raising project at No.9 Rd.
	Completed designs for 3 drainage pump stations.
	Started construction on 1 drainage pump station.
	Completed the dike raising of the south dike from Gilbert Rd to No.3 Rd.
Climate Change Adaptation Actions Proposed for 2020	
	Complete Dike Master Plan Phase 4.
	Establish a plan for habitat compensation related to flood protection work .
	Continue collaboration with regional authorities on flood protection and seismic guidelines planning for the Lower Mainland.
	Complete construction on 650m of dike from Gilbert to No. 3 Rd.



	Initiate construction on 600m of dike from No. 3 Rd to Crown Packaging.
	Continue negotiations with private owners to complete 1500m of flood protection upgrades.
	Continue design and construction on 6 drainage pump stations.
	Continue to monitor and analyze data from existing rain gauges, electronic river level and electronic drainage infrastructure level sensors, while looking to install new rain gauges and sensors at strategic locations.
	Establish a plan to update the City's drainage model with updated rainfall data and drainage infrastructure.
	Continued participation of Transportation in cross-departmental working group on the City's phased Dyke Master Plan.
	Continued participation of Transportation in cross-departmental working group on the City's Community Emissions and Energy Plan (CEEP) Renewal.
	Investigate the Climate Community Leaders Program, a community engagement model that will build capacity in the community to reduce GHG emissions. Social Capital Strategies Inc. will work through the Canadian Urban Sustainability Practitioners Network in partnership with the City of Richmond to design and implement an approach tailored to the local context. Funding has been secured through various agencies, including BC Hydro to support the Climate Community Leaders Program.
	Procure a design consultant for the 2022 dike raising project.
	Complete construction of the south dike raising project from No.3 Rd to 400m west of No.4 Rd, excluding the frontage of 13911 Garden City Road.
	Complete the permitting of the south dike raising project at No.9 Rd.
	Start construction on 2 drainage pump stations.
	Complete construction on one drainage pump station.

The following are key resources that may be helpful to your local government in identifying climate impacts, as well as, strategies, actions and funding to deal with them. For those resources that you have used, please indicate whether they were useful in advancing your work in climate change adaptation?

Indicators of Climate Change for British Columbia	Useful
Plan2Adapt	Haven't Used
Climate Projections for Metro Vancouver	Useful
Climate Projections for the Capital Region	Haven't Used
Climate Projections for the Cowichan Valley Regional District	Haven't Used
Province of BC's BC Adapts Video Series	Haven't Used
Preparing for Climate Change: Implementation Guide for Local Governments	Useful
Public Infrastructure and Engineering Vulnerability Committee's (PIEVC)	Haven't Used
Sea Level Rise Adaptation Primer	Useful
BC Regional Adaptation Collaborative Webinars	Haven't Used
Retooling for Climate Change	Haven't Used
Water Balance Model	Haven't Used
Water Conservation Calculator	Haven't Used
Funding:	
National Disaster Mitigation Program (NDMP)	Useful



Community Emergency Preparedness Fund (CEPF)	Useful
Municipalities for Climate Innovation Program (MCIP)	Useful
Climate Adaptation Partner Grants (FCM)	Useful
Infrastructure Planning Grants (MAH)	Haven't Used
Federal Gas Tax Fund	Useful

10. INNOVATIVE ACTIONS

This section provides the opportunity to showcase an innovative *Corporate and/or Community-Wide* GHG reduction and/or climate change adaptation activity that your local government has undertaken. Below is summary of two of the innovated initiatives that the City implemented in 2018.

Community-Wide Innovation Action	
	Implementing a fixed-base water meter reading network that provides a tool for helping property owners reduce leakage and adjust water consumption habits.
	Investigating microbial-induced soil densification for increased seismic resilience
	Flood Protection Management Strategy 2019 recommends using a risk-based approach to flood protection and seismic planning.
	The Richmond Green Ambassadors program is coordinated by the City of Richmond in partnership with the Richmond School District. This provides networking and volunteering opportunities for secondary school green teams and other like-minded youth who are interested in environmental sustainability through community engagement. Green Ambassadors participate in monthly symposiums, giving them the opportunity to hone leadership and presentation skills and to learn about environmental sustainability, then apply what they have learned through green initiatives at their schools and volunteering at City events or activities. Each year, the Green Ambassadors also plan and host the annual REaDY Summit (Richmond Earth Day Youth Summit) to teach elementary school students about recycling and other sustainability initiatives such as water conservation, green transportation and wetlands protection.
	City of Richmond is developing a comprehensive policy framework to introduce Circular Economic principles into the City's procurement requirements in 2019. A half-day external stakeholder engagement workshop is being scheduled for Q1 2020, to develop the approach. [Note: Richmond is the first City in Canada to conduct industry engagement on Circular procurement principles.]
	The City of Richmond has partnered with FoodMesh to develop a Richmond Food Recovery Network. It is the first initiative of its kind in Metro Vancouver, with the City of Richmond launching a Food Recovery Network to help address food waste and food insecurity. The online exchange platform creates a network where Richmond-based food businesses and farmers can either donate or sell their surplus food to charities, farmers or other businesses.

Corporate Innovation Action	
	Environmental Programs developed four lunch and learn workshops for internal staff highlighting, Food Waste Reduction, How to Recycle Correctly, Understanding the Recycling Process, and Single-Use Plastics and the Effect on the Marine Environment. The workshops were popular among staff and each workshop was hosted at full capacity. Staff were engaged, asked lots of questions and



indicated they would share the information with friends and family, helping to promote behaviour change in support of climate action.

11. PROGRAMS, PARTNERSHIPS AND FUNDING OPPORTUNITIES

Local governments often rely on programs, partnerships and funding opportunities to achieve their climate action goals. Please share the names of programs and organizations that have supported your local government’s climate actions by listing each entry in the box below separated by a forward slash (e.g. program1/program2).

Mitigation

Mitigation Programs, Partnerships and Funding	
	Disaster Mitigation and Adaptation Fund – Infrastructure Canada: The City of Richmond received \$13.78 million in grant funding to complete structural flood mitigation work.
	Union of BC Municipalities – Community Emergency Preparedness Fund – The City of Richmond received \$750,000 in grant funding to complete structural flood mitigation work.
	TransLink (Regional Transportation Authority) – provides funding support towards cycling education and promotion initiatives including Bike to Work/School Week, cycling education courses for elementary students, cycling education courses for adults, and community bike ride.
	TransLink (Regional Transportation Authority) –provides capital funding on a 50-50 cost-share basis for the construction of pedestrian and cycling-related infrastructure including way finding, and for the upgrade of existing bus stops to become fully accessible.
	BikeBC (Ministry of Transportation & Infrastructure) – provides capital funding on a 50-50 cost-share basis for the construction of cycling-related infrastructure.
	ICBC – provides funding support towards the construction of pedestrian-related infrastructure including pathways and crosswalks.
	Transport Canada – contributed capital funding on a 50-50 cost-share basis for the construction of active transportation infrastructure as part of a larger road improvement project.
	BC Hydro – Community Energy Manager co-funding / Corporate Energy Manager co-funding / Building Energy Specialist co-funding / Airtightness Training for Homebuilders grant / Mid-Construction Blower Door Testing grant
	Facilitated approach to investigating policy options for encouraging low carbon energy systems (LCES) in new Part 9 residential buildings, using a one- or two-Step relaxation in BC Energy Step Code performance requirements to help drive LCES installation. BC Hydro provided co-funding for research and local government facilitation in developing three proposed approaches available for local governments.

Adaptation

Adaptation Programs, Partnerships and Funding	
	No response



12. CONCLUSION

This report highlights a wide range of initiatives that the City is undertaking to continue to advance sustainability corporately and in the community, with focus on reducing greenhouse gas emissions, and energy and resource use. This report does not encompass all of the sustainability related initiatives and actions that the City is involved in, but simply provides a “snapshot” of some of the key areas and work that the City has completed and is planning on completing. These efforts help to position the City as a leader in our region and beyond. The City has set aggressive sustainability targets on a range of fronts, including for greenhouse gas emissions reduction and waste diversion. The City will continue to pursue best practices and innovation to achieve its sustainability related goals, which are recognized as critical to Richmond’s Vision of “being the most appealing, livable and well-managed community in Canada”.

Attachment 3: Contracted Emissions Estimate Report 2019

CARIP/Carbon Neutral Progress Report Reporting Year 2019**Supporting Documentation
Contracted Emissions Template**

LOCAL GOVERNMENT
City of Richmond 6911 No. 3 Road Richmond, BC V6Y 2C1
PROJECT DESIGNATE
Poroshat Assadian, Corporate Energy Manager Sustainability & District Energy Direct 604-244-1239 Passadian@richmond.ca
RATIONALE
<p>An estimation methodology for hired equipment contractor emissions is being utilized for 2019, as actual emissions for some contracts over \$25,000 have not provided fuel usage values.</p> <p>The City has identified four main contract areas that deliver traditional municipal services:</p> <ol style="list-style-type: none"> 1. Cascades Recovery Inc. and Supersave Disposal provide recycling depot container collection and recycling services; 2. Sierra Waste Services provide residential solid waste and recycling services; 3. Maple Leaf Disposal provides waste and recycling collection services at City facilities; 4. Smithrite (GFL) provides waste collection services at the Public Works Yard; 5. Waste Connections provide waste and recycling collection services for special events; and 6. Individual Hired Equipment. <p>Contractor emissions associated with the delivery of traditional municipal services by Sierra Waste Services, Supersave Disposal, Maple Leaf, Waste Connections, and Smithrite have been included in our mobile fleet emissions reporting spreadsheet, as fuel usage and vehicle type information was provided for 2019. Contractor emissions associated with the delivery of services by Cascades Recovery and Hired Equipment were estimated by from total kilometers and hours driven, respectively.</p> <p>The hired equipment contracted emissions, with the exception of equipment used outside of the defined traditional service boundaries or for construction rather than maintenance activities, is listed in the table below by traditional service area.</p> <p>Option 3 is the estimation methodology used:</p> <ol style="list-style-type: none"> 1. Hired equipment records sorted to exclude out of scope contracts; 2. City equipment operating records assessed to determine average consumption factors in liters per charge hour or kilometers driven for each equipment family; 3. Consumption factors used to estimated fuel consumption for contractor or hired equipment; 4. BC GHG emissions factors applied to calculate GHG emissions.

Attachment 3: Contracted Emissions Estimate Report 2019

CONTRACTED EMISSIONS	
Option 3: Vehicle/Equipment Type and Kilometers or Hours of Usage	
Traditional Service Area	Estimated Annual GHGs (tonnes)
Drinking, Storm and Wastewater	410.6
Solid Waste Collection, Transportation and Diversion	5.9
Roads and Traffic Operations	82.6
Parks, Recreation, Arts, and Cultural Services	15.5
Corporate Operations	4.1
Total	518.7