Climate Action Revenue Incentive (CARIP) Public Report for 2020

Local Government:
City of Richmond

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The City of Richmond has completed the 2020 Climate Action Revenue Incentive Program (CARIP) Public Report as required by the Province of BC. The CARIP report summarizes actions taken in 2020 and proposed for 2021 to reduce corporate and community-wide energy consumption and greenhouse gas emissions (GHG), as well as general sustainability related initiatives.

April 21, 2021

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

This 2020 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 2021.

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 2020 and planned in 2021.

General Questions - Broad Planning	
What is (are) your current GHG reduction target(s)?	Current OCP community emission reduction targets are 33% below 2007 levels by 2020, and 80% below 2007 levels by 2050. Updated Community Energy and Emissions Plan (2020-2050) in development with actions to meet 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? • 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	**Yes** **No** **No** **Yes** **Yes** **No** **Yes**
Does your local government have a corporate GHG reduction plan?	**Yes**

Community-Wide Broad Planning Actions Taken in 2020	
	Brought forward a Report to Council (RTC) in January 2020 detailing results of 2019 community engagement on Richmond's updated Community Energy & Emissions Plan (CEEP 2020-2050). Council endorsed both RTC and proposed draft actions within eight Strategic Directions that together create the framework for the updated Plan.
	Conducted second phase of geospatial emissions modeling to gauge impact of proposed (CEEP 2020-2050) actions for retrofitting existing buildings, carbon neutral new buildings, zero emission vehicles, active transportation and transit, and compact / complete communities. This provided assurance to staff that deeper emission reduction targets for 2030 and 2050 could be achieved.
	Participated and co-sponsored development of a Building Electrification Road Map (BERM) for BC, in tandem with stakeholders from Province of BC, provincial regulated utilities, and other local governments.
	Engage development community on future BC Energy Step Code performance requirements for new buildings, specifically on fall 2020 Building Regulation Bylaw amendments, and a two-option Step Code approach to incentivize buildings to utilize low-carbon building mechanical systems.
Community-Wide Broad Planning Actions Proposed for 2021	
	Conduct final round of community and stakeholder engagement on proposed actions in updated Community Energy & Emissions Plan (CEEP 2020-2050), and bring forward Plan for Council endorsement in 2021. Update GHG emission reduction targets in Richmond's Official Community Plan to align with deeper emission targets per IPCC Global Warming Limit of 1.5 Celsius.
	Develop a Climate Action Strategy public document that communicates policy, program and infrastructure actions by City of Richmond on energy and emissions leadership on City buildings and fleet, and public infrastructure investments tied to climate adaptation and community resiliency.
	Collaborate with stakeholders to create an implementation plan for the Building Electrification Road Map (BERM) to advance low carbon building electrification in new and existing buildings.
	Create a Sustainability Progress Report capturing environmental leadership taken by City of Richmond from 2015 to 2020, bring forward report for Council endorsement, and have the report publicly available.

	Engage developers of new commercial and industrial buildings on proposed minimum requirements for Level 2 EV charging infrastructure for employee and visitor parking stalls, and bring forward proposed Zoning Bylaw Amendments for Council endorsement.
	Respond to previous City Council referrals and develop proposed policy approach and potential incentives that could be applied to rooftop (or building-integrated) solar photovoltaic systems in new buildings.

Corporate Broad Planning Actions Taken in 2020	
	Began work on a comprehensive review of energy efficiency and GHG emission reduction opportunities in City facilities, and maintain City of Richmond's corporate carbon neutral status.
	Secured Federal grants and City capital funding to expand the Richmond's public electric vehicle (EV) charging network, with 24 new Level 2 charging ports to be added, as well as four new DC Fast Charging sites activated by the end of 2021.
	Developed accessibility design guidelines for parking stalls at the City's new public EV charging locations, including a review of best practice examples from other North American jurisdictions.
	Responded effectively to Provincial public health guidelines, operational energy use and enhanced ventilation requirements in the City's Corporate buildings, due to the COVID-2019 pandemic.
	Participated in Building Benchmark BC in conjunction with ten municipalities and submitted Energy Star Portfolio Manager data for 50 corporate buildings as part of measuring, tracking and disclosing energy usage form the City's facilities (including weather-normalized electricity use intensity and greenhouse gas emissions metrics).
	Engaged industry stakeholders and implemented circular economy training for City staff to respond effectively to City of Richmond procurement requirements. A Circular Economy workshop was held in January 2020 with over 100 attendees to inform the City's procurement policy changes and better understand constraints and opportunities identified by suppliers / vendors / contractors.
	Brought forward recommended changes to the City's procurement policies integrating circular economic criteria, and consulted with City departments to develop proposed policy amendments. NOTE: The procurement policy changes were approved by City Council in March 2021.
Corporate Broad Planning Actions Proposed for 2021	
	Complete a City of Richmond Strategic Energy Management Plan (SEMP) and review with BC Hydro. Begin implementation of SEMP actions following BC Hydro approval.
	Conduct a market review of energy management software, with the objective of improved data and operational performance. Develop a business case for updating or replacing the current energy management software used by the City of Richmond.
	Conduct engineering design, public works, installation and commissioning of the City's new DCFC and Level 2 public EV charging points.
	Bring forward a High Performance Building Policy for Council consideration on new City of Richmond facilities, based upon thorough review of leading energy performance standards, low- or zero-emission operational emissions, and low-embedded carbon content in building materials, and

	enhanced wellness / occupant health.
	Continue to integrate detailed circular economy criteria into department procurement documents, and pursue opportunities to pilot test new or innovative approaches with a segment of suppliers.

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 2020 and planned for 2021.

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 2020	
	Conducted seven Builder Breakfast webinar events in 2020, six of which were done virtually during the COVID-19 pandemic. City staff successfully pivoted to online engagement of Part 9 homebuilders, designers and contractors, with over 600 total participants attending from February to December 2020.
	Through our Builder Breakfast engagement, City staff polled builders on their preferences regarding proposed 2020 Step Code requirements for Part 9 residential buildings. This included a new two-option approach, where builders could qualify for a one-Step relaxation in requirements by installing a low carbon energy system.
	Engaged large building developers and energy modellers on proposed 2020 Energy Step Code requirements for hotels and motels. Two webinar workshops were held in June and July, in collaboration with UDI Pacific Region. The development community endorsed a two-option approach, where a hotel / motel could qualify for a one-Step relaxation in requirements by installing, or connecting to, a low carbon energy system.
	Received City Council endorsement of amendments to Richmond's Building Regulation Bylaw on new Energy Step Code performance requirements for Part 9 residential buildings and Part 3 hotels and motels, effective December 15, 2020.
	Responded to Council Referral and conducted research, policy development and industry

	engagement in 2020 on proposed new incentives for single-detached and duplex homes that achieve the top performance levels of the BC Energy Step Code, including additional density bonus for achieving the certified Passive House standard.
	Received City Council endorsement of amendments to Richmond's Building Regulation Bylaw and Zoning Bylaw, providing density incentives and building permit fee relaxations for single-detached and duplexes homes achieving the top Step Code performance levels, or the certified Passive House standard. Effective date for these Bylaw amendments: February 2021.
	Continued participation by City staff on the BC Energy Step Code Council, and serve as co-chairs on both Part 9 and Part 3 technical subcommittees.
	Conducted detailed analysis comparing Step Code thermal energy performance outcomes for Part 9 residential buildings (absolute TEDI, climate-adjusted TEDI, and % better thermal envelope). Using a Richmond dataset of modelled Step Code houses, the % better thermal envelope metric showed inferior thermal performance results in comparison to the absolute and climate adjusted metrics. City Council directed that a letter be sent to the Province of BC and Energy Step Code Council informing them of the results of the City's analysis.
	Received City Council approval in January 2020 for Richmond's participation in the Building Benchmark BC (BBBC) initiative, supported by ten municipalities and UBC. This voluntary program targets owners and managers of large commercial, industrial and multi-unit residential buildings to voluntarily benchmark and report their annual energy use and GHG emissions. Participating municipalities also submitted and disclosed benchmarking results for their corporate facilities.
Community-Wide Building and Lighting Actions Proposed for 2021	
	Engage Part 9 residential homebuilders on proposed Step Code requirements, and low-carbon energy system relaxations, to be adopted into Richmond's Building Regulation Bylaw effective January 1, 2021. Include updated performance definition for a low carbon energy system.
	Continue participation on the Energy Step Code Council and technical subcommittees, and engage with staff from Province of BC on development of greenhouse gas intensity (GHGI) performance metrics that could be incorporated into the BC Building Code / Step Code as early as 2022.
	Develop a comprehensive training and capacity-building approach for a cohort of local Part 9 homebuilders, designers and trades, to help drive projects that reach the top levels of energy performance and emission reduction. A suite of subsidized courses and hands-on training will be considered, including collaboration with BCIT, Small Planet Supply, Passive House Canada and Zero Emission Building Exchange.
	Continue the successful virtual Builder Breakfast series in Richmond, as well as 'tri-City' Builder Breakfast events (piloted in 2020) with City of New Westminster and City of Surrey.
	Extend the successful Building Benchmark BC initiative to 2022, with the objective of increasing the number of buildings participating in this program (using grant funding from FCM, and contributions from partner municipalities).

Corporate Building and Lighting Actions Taken in 2020	
	Secured Council-approved additional capital funding for a low-carbon mechanical system upgrade to City of Richmond's Library & Cultural Centre that will result in 65% reduction in GHG emissions from the previous natural gas heating system.
	Secured funding for Phase 4of the City's street lighting conversion project, with replacement of approximately 1280 street lighting fixtures with new, more energy efficient LED lights.
	Completed installation and commissioning of rooftop solar photovoltaic array at Fire Hall No. 1.
	Installed exhaust heat recovery at City Hall and South Arm Community Centre.
	Completed mechanical upgrading including the installation of heat pump rooftop and upgrading Direct Digital Control at the Thompson Community Centre.
Corporate Building and Lighting Actions Proposed for 2021	
	Secure funding for the lighting upgrade at the City hall and Community Safety Building. The project is sponsored by BC Hydro to reduce the overall utility cost and provide more efficient lighting system
	Complete LED Street Light Conversion Project - Phase 4 (395,545 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.
	Participate at the BC Hydro Continuous Optimization Program to find the operational opportunities and reduce the operational cost
	Complete DDC upgrades at the Civic 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 2020 and planned in 2021.

General Questions - Energy Generation	
Is your local government developing, or constructing a • district energy system • renewable energy system • none of the above	 **Yes** **Yes**
Is your local government operating a • district energy system	 **Yes**

• renewable energy system • none of the above	**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 2020	
	Continued to expand and connect new customers in the West Cambie neighbourhood to the Alexandra District Energy Utility (ADEU). In 2020, over 400,000 ft^2 of residential floor space were connected to the system. Total space now connected to ADEU = over 2,050,000 ft^2 of residential space and over 300,000 ft^2 non-residential space.
	Continued to develop and operate the Oval Village District Energy Utility (OVDEU) in the Oval Village area. Throughout 2020, the OVDEU had 10 connected buildings receiving energy. This totals 2,651,000 ft^2 and over 2,270 apartment units.
	Continued work 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.
	Progressed 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, eleven developments have been committed to the servicing strategy, totalling approximately 5,000,000 ft^2. These developments are currently working through various stages of the development process and are estimated to obtain occupancy between 2021 and 2025.
	Continued to implement DEU infrastructure and developments using dedicated DEU operating funds and capital program, financed through customer rates.
Community-Wide Energy Generation Actions Proposed for 2021	
	Continue to connect buildings and expand the ADEU distribution system as development requires. Two new residential buildings (200,000 ft^2) are scheduled for connection in 2021.
	Continue Oval Village District Energy Utility construction and planning in partnership with a private utility partner, with continuous operational improvement and construction to accommodate long term growth. Detailed planning and design will also begin on the permanent energy centre which will use renewable sewer heat recovery technology to provide 80% of customer energy requirements.
	Design and planning for the upcoming connection of five new developments with a total of over 1,000,000 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-2021.
	Continue securing on-site low carbon energy generation plants designed for interconnection with the future CCDEU system. Development schedules indicate that three applicable developments in the City Centre will go through rezoning in 2021. The three developments are estimated to total

	approximately 1,560,000 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 2020	
	Completed mechanical upgrading including the installation of heat pump rooftop and upgrading Direct Digital Control at the Thompson Community Centre.
Corporate Energy Generation Actions Proposed for 2021	
	Complete the deep mechanical upgrade at Library Cultural Centre that will result in reducing the GHG emission by over 60% from the previous hearing system by installing heat pump and upgrading the DDC system.

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 2020 and planned in 2021.

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 2020	
	424 trees were planted as part of development servicing agreements.
	243 trees were planted by Parks Operations in 2020. This includes trees planted on frontages and boulevards, and in parks.
	Community Gardens (urban agriculture): • Cook School Park Community Gardens: 40 plots constructed for the local community in a medium to high density City Centre neighbourhood • Riverport Community Gardens: 17 plots constructed adjacent to a medium density waterfront development
	Typical volunteer planting events were put on hold in 2020 due to the COVID-19 pandemic.
	Responded to 210 inquires from residents regarding invasive species.
	Participated in Provincial Invasive Species Action Month, providing education to the public on invasive species management and alternatives to pesticides.
	Continued Richmond Nectar Trail initiative which aims to connect large pollinator habitats to one

	another with smaller micro habitats in green spaces around the City. 27 sites registered with the program across the City.
	Facilitated the 2020 Bat Matters Conference with BC Community Bat Programs.
	Participated in and promoted the City Nature Challenge in partnership with the Richmond School Board.
	Encouraged two private entities to conduct a study to understand how Sandhill cranes are utilizing their properties and suggest outcomes to improve their survivability.
	Initiated the Climate Community Leaders Program.
	Participated in web conference for the Real Estate Board of Greater Vancouver and delivered information real estate agents on the City's Riparian Management Areas.
	Supported the delivery of British Columbia Sustainable Energy Association's Cool It! Climate Leadership Program to students in Richmond.
Community-Wide Greenspace Actions Proposed for 2021	
	Community Gardens (urban agriculture): • Cook School Park Community Gardens Phase 2: 20 plots proposed • Branscombe House Community Gardens: 40-50 plots proposed • Garden City Lands Community Gardens: 200 plots proposed with option for additional 100
	At this point no volunteer planting events are scheduled for 2021 due to the COVID-19 pandemic.
	Continue to enrol participants in the Richmond Nectar Trail program.
	Host 5 virtual sustainability-focussed workshop session covering topics such as organic food gardening, pesticide free pest control, composting, bee keeping, alternatives to traditional farming, and foraging.
	Obtain a "Canadian Bee City" designation from Bee City Canada and designation as "Bird Friendly City".

Corporate Greenspace Actions Taken in 2020	
	Alexandra Greenway: The implementation of a section of the Alexandra Greenway between Alderbridge Way and Alexandra Road took place in 2020. Intending to serve as both an active transportation and ecological corridor, it includes an asphalt, shared-use pathway, stormwater detention areas, and 109 total trees.
	Garden City Community Park: 39 trees were planted on a former residential parcel that was added to the park in 2020.
	Paulik Park Enhancements: 93 trees were planted.
	Woodwards Slough: 2020 saw the completion of planting at Woodwards Slough, a site identified for habitat compensation for a former highway-widening project. It included the provision of approximately 9,000 m2 of riparian habitat and 3,300 m2 of watercourse compensation. It will continue to be monitored by a qualified environmental professional, as per Fisheries and Oceans Canada (DFO) requirements.
	Completed erosion and sediment control and riparian enhancement planting of Woodwords Slough.

	Installed a “Bat Condo” capable of supporting up to 3000 bats within Terra Nova Rural Park.
	Hosted 2 sessions for operation departments to provide training on best management practices for spill response, attended by 25 staff.
	Participated on the Species and Environments at Risk, and Soil and Invasive Species Local Governments Working Group.
	Partnered with the Canadian Wildlife Federation to offer a 2-day Wetlandkeepers Course to City staff.
	Completed invasive species inventory on City dikes, RMA network, and roadways for purple loosestrife, wild chervil, and parrot’s feather.
	Completed the 3rd water draw down at Mariners Village for the management of Brazilian elodea in a City owned water body.
	Continued to facilitate 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.
	Assisted in developing RFP for Nature Park hydrogeological and biophysical study.
	Provided outreach regarding management of trees and the protection of Birds during nesting season.
	Provided access to City owned lands for Environment and Climate Change Canada’s “Gulls of the Salish Sea” study.
	Initiated a study to the feasibility of banning rodenticide on City owned lands.
	Assisting in the drafting of an erosion and sediment control bylaw.
	Continued Mitchell Island storm water monitoring program & received 75k in funding from the Federation of Canadian Municipalities to look at green infrastructure stormwater improvements. The program was also a finalist for a UBCM award.
	Presented with the Federation of Canadian Municipalities on a Middle Arm Brownfield remediation study.
	Retained a consultant to prepare a scope to assess soil experiments regarding invasive species persistence.
	Secured a Provincial Water Use License to allow activation of an actuator valve within Bath Slough Pump station and recharge Bath Slough with fresh water from the Fraser River.
	Presented to Contaminated Sites Approved Professionals Society on the Opportunities to support Local Government in the Contaminated Sites World.
	Presented to the Metro Vancouver Storm water Interagency Liaison Group (SILG) on the City’s award winning Mitchell Island Stewardship Initiative.

	Completed a Contaminated Sites Liability Assessment for City owned lands.
Corporate Greenspace Actions Proposed for 2021	
	Aberdeen Park – Phase 2 Construction: This project was originally planned for 2020, but was delayed due to the COVID-19 pandemic. Construction will occur in 2021, and 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: This project was originally planned for 2020, but was delayed due to the COVID-19 pandemic. Construction of the 6-acre Phase 1 park will occur in 2021 and include a stormwater detention wetland, a 2 acre meadow, 85 trees, and 1,100 shrubs.
	Paulik Park Enhancements: 27 trees and 565 shrubs/groundcover plants to be added
	Railway Greenway: 180 trees will be planted.
	Richmond Nature Park Hydrogeological and Biophysical Study: This project was originally planned for 2020, but was delayed due to the COVID-19 pandemic. In 2021, 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.
	Tait Centre Park: This project was originally planned for 2020, but was delayed due to the COVID-19 pandemic. In 2021, construction will start 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.
	Terra Nova Rural Park: 180 trees will be planted.
	Implement a ban on rodenticide use on City owned lands.
	Complete a 4th water draw down at Mariners Village for the management of Brazilian elodea.
	Implement an update to the city's Site Identification system that identifies potentially contaminated properties during the redevelopment permitting process.
	Partner with the Canadian Wildlife Federation to offer a field component of the Wetlandkeepers Course to City staff.
	Continue work on Phase 2 updates of the Riparian Response Strategy to better address multifamily, commercial and industrial development impacts adjacent to riparian areas.

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 2020 and planned in 2021.

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 2020	
	Completed renovation of Recycling Depot to improve operation, provide more convenient drop-off areas and expand accepted items to include fire extinguishers, lead acid batteries for vehicles, motor oil and antifreeze. In 2020 the Recycling Depot also saw an increase of 1,300 tonnes of material over 2019.
	COVID-19 safety measures were put in place to ensure the City could deliver uninterrupted service for the public, including litter collection, solid waste and recycling collection, large item pickup and Recycling Depot Services. This included an educational campaign on proper disposal of personal protective items to protect collection staff, the public and the environment.
	Received provincial approval on March 11, 2020 of the Single-Use Plastic and Other Items Bylaw No. 10000 with adoption of the bylaw postponed until 2021 due to COVID.
	Transitioned to a virtual platform for 7 of 10 Green Ambassador symposiums and Green Ambassadors supported 4 special events with an estimated 1,135 volunteer hours.
	Created an option to allow residents who use the Richmond Recycling app to opt out of mailed collection calendars to reduce printing and postage.
	Hosted community engagement activities including 7 workshops, 1 Depot tour and 2 virtual youth engagement sessions “Zero Heroes: Home Edition” with a total 325 participants. Also supported the Richmond Youth Foundation 2020 Case Competition on single-use items.
	Collaborated with FoodMesh to build a regional Food Recovery Network pilot program, bringing together local food businesses with charities and farmers to safely and easily divert food to those who could put it to good use.
	Implemented a new tagging system for residential collection to reduce contamination and provide residents with immediate feedback. The new tags include a detailed description on the issue and how to easily rectify or find more information on how to recycle correctly.
	Transitioned the “Let’s Recycle Correctly” campaign from newspaper ads to digital ads in both Chinese and English.
Community-Wide Solid Waste Actions Proposed for 2021	
	Enhance service at the Richmond Recycling Depot by expanding operations to seven days per week.
	Work to develop COVID-19 compatible Repair Fair events to promote repair and reuse in the community.
	Develop and undertake business engagement to advise business of the provincial approval for the Single-Use Plastic and Other Items Bylaw No. 10000 and next steps for implementation.
	Undertake a detailed review and scoping exercise to establish enhanced recycling for the commercial sector.

	Prepare an annual progress report to the community to identify progress towards established waste diversion goals, "Report 2020: Safe and Seamless Service Delivery.
	Continue to raise awareness about the issue of single-use plastic and the new ban, and leverage federal and provincial actions to strengthen the City's implementation of single-use policy to reduce unnecessary waste.
	Undertake a pilot program to test the feasibility of the "Seabin" – a floating debris interception device – designed to capture floating debris in any water body.

Corporate Solid Waste Actions Taken in 2020	
	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 2021	
	Look at the opportunity to pave a portion of the Recycling Depot with a recycled plastic aggregate.
	Develop RFPs for collection of recycling and garbage from the City Operations Yard, ensuring circular economy principles are incorporated.
	Investigate option to recover propane from canisters dropped-off for recycling at the Richmond Recycling Depot for reuse.

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 2020 and planned in 2021.

General Questions – Transportation	
Does your local government have policies, plans or programs to support: • 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 2020	
	Applied for and awarded Emotive Community Outreach Initiative Grant to promote electric vehicle awareness among youth.
	Received the first Solar Arc solar powered charging station in Canada. It can be also be utilized to provide emergency solar power for emergency operations. Beta testing has been completed. The Solar Arc will be installed at a public site in 2021.
	Completion of pilot program for public bike-share system in March 2020. Worked with local community organization to donate surplus bicycles for distribution to low income families across Richmond.
	Expanded active mobility network with completion of new multi-use pathways: • Alderbridge Way (Fisher Gate-Shell Road) • Sexsmith Road (Beckwith Road-Charles St) with designation between cyclists and pedestrians • Odlin Road Neighbourhood Bikeway (western terminus of Odlin Rd-Brown Rd) • Cambie Road (River Road-No. 3 Road)
	Expanded the active mobility network with the upgrade of the existing facilities: • Saunders-Woodwards Neighbourhood Bikeway (Phase 2): modification of mid-block closure on Woodwards Rd to accommodate through movement of cyclists and pedestrians
	Expanded active mobility network with completion of protected on-street bike lanes as part of new River Parkway (Gilbert Road-Cambie Road).
	To encourage active transportation and promote cycling as a mode of transport: • Provided free cycling education training courses to Grade 5-7 students at 4 elementary schools in Fall 2020
	Completion of new pedestrian walkway on Viking Way (Cambie Road-Bridgeport Road).
	Installation of 2 special crosswalks (pedestrian-actuated overhead amber lights) to expand active mobility network and improve road safety.
	Completed upgrade of 9 pedestrian signals with installation of countdown timer.
	Enhanced signage and pavement markings along Imperial Landing Park pathways to better clarify which are multi-use and which are pedestrian-only.
	Amended Traffic Bylaw No. 5870 to permit cyclists to ride in crosswalks with elephant's feet markings.
	Upgraded pavement markings and signage at a number of intersections to improve the safety of cyclists: • Westbound Bike Lane on Westminster Hwy: (1) delineators and green paint approaching Garden City Road; (2) bike stencils and bike lane lines across intersection at No. 4 Road; (3) bike stencils, green paint, bike lane lines, signage on either side of intersection at No. 5 Road • Southbound Bike Lane on Shell Road: bike stencils approaching Steveston Hwy

	• Great Canadian Way-Sea Island Way: green paint and elephants feet to crosswalks on northwest and southwest legs plus appropriate signage • Additional wayfinding signage at various locations
	Upgrade of 13 bus stops to become accessible; when completed, 605 of 723 of active stops (83.7%) will be accessible, which is above the regional average.
	Initiated feasibility studies to identify measures to improve bus speed and reliability in partnership with TransLink: • No. 3 Road (Cook Road-Steveston Highway) • Garden City Road (Sea Island Way-Cook Road) • Granville Ave (No. 3 Road-No. 4 Road) • other hot spot locations/corridors
	Initiated update of City's cycling network plan that will include updated designs for cycling infrastructure that reflect current trends and best practices, and prioritized implementation strategy.
	Supported regional Bike to Shop and Go by Bike events in Summer and Fall 2020 to encourage cycling for transportation.
	Completion of multi-year program to upgrade all City-owned traffic signals and special crosswalks to include APS (accessible pedestrian signal) features.
	Automation of pedestrian pushbuttons at 25 traffic signals in City Centre and along Railway Greenway (May 2020-Ongoing).
Community-Wide Transportation Actions Proposed for 2021	
	Install Level II and III Public EV charging stations utilizing the NRCAN Grant funding that was approved. (4 DCFC level 3 and 14 dual port level 2 Public chargers)
	Deploy EV outreach program educational toolkit, slide decks and lesson plans to K-12 in the Richmond School District that was created with youth involvement to help frame a unique and engaging approach using grant received from Emotive.
	Deploy the Solar Arc for solar powered EV charging for public charging.
	Expand active mobility network with completion of new facilities: • Charles St (Sexsmith Road-entrance to Bridgeport Canada Line Station and Transit Exchange): multi-use pathway • Crosstown Neighbourhood Bikeway (Phase 3): curb bulges at Lucas Road-No.3 Road to facilitate the through movement of cyclists • Midtown Neighbourhood Bikeway (Phase 2): upgrade of pathway in Marrington Neighbourhood Park to accommodate pedestrians and cyclists
	Expand the active mobility network with the upgrade of the existing facilities: • Garden City Road (Lansdowne Road-Westminster Hwy): upgrade existing paved shoulder on west side to provide separate pedestrian walkway and southbound bike lane with physical separation between the facility and the roadway

	• Westminster Hwy (No. 6 Road-No. 7 Road): reconstruct multi-use pathway to address sections in poor condition and add physical separation between the path and the roadway • Railway Greenway: upgrade of 3 intersections to ultimate design (curb, gutter, expanded landing area, relocation of signal pole) • Granville Ave (Garden City Road-Railway Ave): addition of delineator posts to provide physical protection between bike lane and adjacent travel
	Launch pilot program of shared e-scooter system and permit private e-scooter operation as part of Province of BC electric kick scooter pilot project.
	Complete update of City's cycling network plan that will include input from the public and updated designs for cycling infrastructure that reflect current trends and best practices, and prioritized implementation strategy.
	Support regional Bike to Shop and Go by Bike events in Summer and Fall 2021 to encourage cycling for transportation.
	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 2022).
	Upgrade of 20 bus stops to become accessible.
	Installation of 10-15 transit shelters and benches at bus stops.
	Implementation of new pedestrian pathways: • St. Edwards Drive (350m west of Cambie Road-Bird Road): north side • Westminster Highway (Muir Road-150m east): north side • River Road (No. 6 Road-Burdette Road): north side
	Complete feasibility studies to identify measures to improve bus speed and reliability in partnership with TransLink.
	Installation of 6 bike counters to track usage of cycling facilities.
	Develop city-wide process/plan to address traffic safety related issues within school zones and adjacent roadways.
	Installation of special crosswalks (pedestrian actuated overhead or side-mounted flashing amber lights) to expand active mobility network and improve road safety at 4 locations.

Corporate Transportation Actions Taken in 2020	
	Acquired the City's first hydrogen fuel cell passenger vehicle (Toyota Mirai).
	Acquired the City 1st 100% electric 5,000lb. forklift for the Recycle Depot.
	Received a matching CleanBC Heavy-Duty Vehicle Efficiency Program Incentives grant and installed three hydrogen fuel enhancements to reduce emissions and regens.
	Fleet acquired a Tier 4 Front End loader for the Recycling Depot. It will also be used to assist with snow response and Public Works operations.
	Increased car sharing services by 9 users.
	Replaced 29 units incorporating the City's Green Fleet Action Plan targets, including replacement of

	gas powered vehicles with hybrid, fully electric, one hydrogen unit and technologies that will assist in reducing carbon emissions.
	Implemented an electric generator pilot to utilize silent and clean energy technologies.
	City facilities received electrical and transformer upgrades to support building efficiency upgrades and electrical vehicle charging.
	Modified operation of City employee carpool program (approximately 60 participants) to enable continuation with appropriate protocols during COVID-19 pandemic
Corporate Transportation - Actions Proposed for 2021	
	Report out on the City's Green Fleet Action Plan targets and compile strategies to compose a new Green Fleet Action Plan.
	Expand propane pilot to include additional vehicles.
	Renew the City's E3 Fleet Certification.
	Replace 52 units incorporating the City's Green Fleet Action Plan targets, including the replacement of 29 gas-powered passenger vehicles with electric and/hybrid or plug-in hybrid vehicles.
	Create purchasing RFQ to request for the supply and delivery of fully electric and plug in hybrid pick up trucks to replace the City's aging light duty pick up trucks.
	Installing Level 2 (10 dual port Fleet EV chargers) at the City Works Yard, which includes an electrical service upgrade for ensuring adequate power supply.
	Transition from a pilot GPS program to a permanent, more robust system to assist with route planning, scheduling, winter operations reporting and to find efficiencies in fuel usage and work flows.
	Expanding fleet training utilizing in-house skill sets to customize driver and operator training to include methods to reduce fuel consumption, idling, and increase driver safety.
	Introduce a customized remote equipment ordering system to allow staff to order equipment from any location using any device instead of having to return to work offices to complete equipment orders.
	Continued operation of City employee carpool program (approximately 60 participants).

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 2020 and planned in 2021.

General Questions - Water Conservation	
Does your local government have water conservation policies, plans or programs?	**Yes**

Community-Wide Water and Wastewater Actions Taken in 2020	
	Issued 877 toilet rebates to homeowners that replaced old toilets with a low-flush toilets to reduce residential water use. The total incentive paid to homeowners through this program in 2020 was $87,700.
	Partnered with BC Hydro in the fall of 2020 to provide a clothes washer rebate program to reduce home water use and electricity. To date 1,369 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 $96,750 to the City. It is estimated that this program achieved annual savings in water and energy of 5,167,000 litres per year and 132,000 kilowatt hours per year, respectively.
	Sold 154 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, about 50% of all multi-family complexes have been metered. It is mandatory for all new multi-family complexes to have a water meter.
Community-Wide Water and Wastewater Actions Proposed for 2021	
	Continue the volunteer Multi-Family water meter program.
	Continue the toilet rebate program ($100,000 in funding for 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 if it is offered in 2021.
	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.

Corporate Water and Wastewater Actions Taken in 2020	
	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.

	Continued implementation of the grease management program through inspections and partnership with Metro Vancouver to combat fats, oils, and grease buildup in the sanitary system.
	Participated in Metro Vancouver's Technical Subcommittees to address specific wastewater issues for the region.
Corporate Water and Wastewater Actions Proposed for 2021	
	Continue to take part in the Metro Vancouver Regional Engineers Advisory Committees and Technical Subcommittees.
	Contribute to Metro Vancouver's Drinking Water guidelines, Liquid Waste Management Plans, and other water conservation and liquid waste management programs.

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 2020 and planned in 2021.

Please identify the THREE climate impacts that are most relevant to your Local Government.	
• 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 2020 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 2020 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.	
	City participating in TransLink's update of its 30-year strategic plan (Transport 2050).
	City participating in Metro Vancouver's update of its Regional Growth Strategy (Metro 2050).
	Transportation participating in cross-departmental working group on the City's Community Emissions and Energy Plan (CEEP) Renewal.
	Transportation partnering with TransLink in planning for RapidBus service between Richmond City Centre and the SkyTrain Expo Line.
	Completed construction of 650 m of south dike upgrade between Gilbert Road and No. 3 Rd.
	460 m of dikes were re-armoured with 3,672 tonnes of rip-rap as part of the City's Dike Maintenance Program in 2020.
	Completed re-construction of the Horseshoe Slough and Shell Road North Drainage Pump Stations.
	Secured an additional $900,000 in senior government grants for dike improvements and master planning updates.
	Drafted Dike Master Plan Phase 4.
	Created a new informational video on Richmond's flood protection program to be presented on the City website and included with on-going public engagement.
	Developed a plan to update the City's drainage model with current information, and train applicable staff on use of the model.
	Participated in six public presentations promoting flood protection and providing information on the City's various flood protection initiatives.
	Revised dike layers on staff RIM to display dike maintenance regions, in addition to crest elevations, survey, inspection data and Dike Master Plan phases.
	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.
	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
	Participated in Metro Vancouver's Stormwater Interagency Liaison Group meetings. The meetings allow municipalities to share knowledge, experience and expertise and provides guidance on sustainable stormwater management practices.

Climate Change Adaptation Actions Proposed for 2021	
	City continue to participate in TransLink's update of its 30-year strategic plan (Transport 2050).
	City continue to participate in Metro Vancouver's update of its Regional Growth Strategy (Metro 2050).
	Transportation continue to participate in cross-departmental working group on the City's Community Emissions and Energy Plan (CEEP) Renewal.
	Transportation continue to partner with TransLink in planning for RapidBus service between Richmond City Centre and the SkyTrain Expo Line.
	Bring forward Dike Master Plan Phase 4 to Council for Public Engagement endorsement.
	Establish a plan for habitat compensation related to flood protection work.
	Continue collaboration with regional authorities on flood protection and seismic guideline planning for the Lower Mainland.
	Start construction on the south dike upgrade between No. 3 Road and 400 m west of No. 4 Road
	Start construction on the south dike upgrade between 200 m west of No. 9 Road and the Ewen Road Drainage Pump Station.
	Engage the public on the City's accelerated flood protection program to support a 50-year implementation period.
	Begin design of the south dike upgrade between No. 4 Road and No. 5 Road.
	Begin design of the south dike upgrade between Graybar Road and Queens Road.
	Begin preliminary design of the south dike upgrade between No. 2 Road and Gilbert Road.
	Start construction on Steveston Hwy and No. 3 Road and Steveston Hwy and Gilbert Road Drainage Pump Stations.
	Complete the grant funded Seismic Flood Hazard Assessment which will standardize the acceptable level of seismic flood hazard across the City.
	Complete the grant funded drainage model update with updated rainfall data and drainage infrastructure.
	Establish a consolidated dike operation & maintenance manual.
	Develop a process to standardize SCADA reporting and data collection at drainage pump stations.
	Continue to investigate soil densification technologies for flood protection infrastructure.
	Continue collaboration with regional authorities on flood protection and seismic guidelines planning for the Lower Mainland.
	Perform drainage pump station design optimization for four drainage pump stations that are senior government grant funded.
	Continue negotiations with private owners to complete 1500m of flood protection upgrades.
	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.
	Facilitated a dike inspection course.

	Continue to participate in Metro Vancouver's Stormwater Interagency Liaison Group meetings.
	Complete re-construction of the No. 7 Road South 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	
	A K-12 educational program and toolkit was created with grant funding from Emotive BC with youth involvement to help frame a unique and engaging approach to promote the adoption of electric vehicles. The lesson plans encourage students to use their critical thinking skills and other core competencies to think about their actions to protect the environment. The program is highly adapted to many age and regional demographics and could be shared with other regional districts and potentially expanded provincially and beyond.
	The Richmond Green Ambassador 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.
	Environmental Programs has worked together with KPU professors to shape course projects through the Wilson School of Design that focus on the issues surrounding single-use items. City staff have been asked to guest lecture on January 29th and March 2nd on the proposed *Single-Use Plastic and Other Items Bylaw No. 10000* and highlight the importance for design students to understand repair and proper waste management issues before designing new alternative products or programs. Students will then apply the information learned as part of a single-use design project to help create and build real world designs that minimize waste and build circular solutions. City staff return for the mid-term and final project presentations to provide real-world/industry feedback.
	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.

Corporate Innovation 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	
	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
	Disaster Mitigation and Adaptation Fund – Infrastructure Canada: The City of Richmond was approved $13.78-million in grant funding in 2019 to complete structural flood mitigation work. This grant covers multiple years of mitigation work, as approved by Richmond City Council.
	Union of BC Municipalities – Community Emergency Preparedness Fund – The City of Richmond was approved $750,000 in grant funding to complete structural flood mitigation work.
	Union of BC Municipalities – Community Emergency Preparedness Fund – The City of Richmond was approved $150,000 in grant funding to complete flood mitigation planning work.

Adaptation

Adaptation Programs, Partnerships and Funding	

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".