

## Climate Action Revenue Incentive Program (CARIP) Public Report

# Climate Action Revenue Incentive (CARIP) Public Report for YEAR 2017

City of Richmond

Metro Vancouver



### Report Submitted by

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The City of Richmond has completed the 2017 Climate Action Revenue Incentive Program (CARIP) Public Report as required by the Province of BC. The CARIP report summarizes actions taken in 2017 and proposed for 2018 to reduce corporate and community-wide energy consumption and greenhouse gas emissions (GHG), as well as general sustainability related initiatives, and reports on progress towards achieving carbon neutrality.

April 27, 2018

### General Information

<b>Name of Local Government</b>	City of Richmond
<b>Member of Regional District (RD)</b>	Metro Vancouver
<b>Regional Growth Strategy (RGS) in region</b>	Yes
<b>Population</b>	218,000

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## 1. GENERAL REPORT INFORMATION

This 2017 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 Innovation category, which the City has inputted action items. The categories are further divided into corporate and community 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 2018.

## 2. BROAD PLANNING

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 communities) 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 2017 and planned in 2018.

General Climate Action Questions	
What is (are) your current GHG reduction target(s)?	GHG reduction targets of 33% by 2020, and 80% by 2050, below 2007 levels. Reduce energy use by 10%.
Has your local government used the Community Energy and Emissions Inventory (CEEI) to measure progress?	Yes
Which of the following does your local government use to guide climate action implementation? <ul style="list-style-type: none"> <li>• Community Energy and Emissions Plan</li> <li>• Integrated Community Sustainability Plan</li> <li>• Community-Wide Action Plan</li> </ul>	Yes Yes Yes
Does your local government have a corporate GHG reduction plan?	Yes
Does your local government have a climate reserve fund or something similar?	Yes

## 2.1. Community Actions

<b>Community-Wide Actions Taken in 2017</b>	
	Revised the OCP and Zoning Bylaw to update the City's electric vehicle charging infrastructure requirements which supports charging stations in all new residential buildings.
	Adopted a number of bylaw amendments to regulate the size of houses on properties located within the Agricultural Land Reserve (ALR). The changes established a maximum floor area for all residential buildings in agricultural zones and a "farm home plate" - the area on which all residential improvements must be located.
	Updated Steveston Village Area Plan was approved by Council following public consultation. The update clarifies building height, density, parking, waterfront access, alternative energy, and streetscape options for the village.
	Approved amendments to the Zoning Bylaw to allow secondary suites in standard townhouse zones. The amendments provide additional opportunities to increase the supply and diversity of housing in Richmond.
	Worked with Translink in developing the Southwest Area Transport Plan to define Richmond's long-term transportation network and priorities.
	Met regularly with Richmond's Small Home Builders and Urban Development Institute when preparing new community building related sustainability initiatives.
	Requested that the Metro Vancouver Board reaffirm acceptance of Richmond's Regional Context Statement (RCS). The RCS continues to be consistent with the Regional Growth Strategy in supporting the goals of a compact urban area and a sustainable economy, among others.

<b>Community-Wide Actions Proposed for 2018</b>	
	Continue to implement OCP and CCAP policies as new development applications are processed.
	Continue to follow City by-law requirements and implement "DEU" ready development in the City Centre and West Cambie neighborhood areas
	Continue to meet with Richmond's Small Home Builders and Urban Development Institute when preparing new community building related sustainability initiatives.
	Continue consultation with the City's construction sector stakeholders regarding local implementation of the BC Energy Step Code policy for Part 3 and Part 9 new construction
	Complete development of the Southwest Area Transport Plan, and obtain Council endorsement.

## 2.2. Corporate Actions

<b>Corporate Wide Actions Taken in 2017</b>	
	Continued to implement the corporate High Performance Building Sustainability Policy. This policy sets targets for the construction of energy efficient new corporate buildings and sets in place processes to ensure that energy and resources are used efficiently in existing buildings.
	Continued to implement action items from the City's Green Fleet Action Plan, to reduce GHG emissions associated with the City's vehicle and equipment use.

<b>Corporate Wide Actions Proposed for 2018</b>	
	When the City reviews the City Centre Area Plan (CCAP) building height requirements, in association with YVR's Airport Zoning Regulations (AZR), consideration will be given to maximizing energy efficiency through increased density.
	Work with Sustainability staff to incorporate an energy efficiency step code for new corporate buildings.
	Continue to implement the corporate High Performance Building Sustainability Policy.
	Continue to implement action items from the City's Green Fleet Action Plan

### 3. BUILDINGS AND LIGHTING

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 2017 and planned for 2018.

<b>Building and Lighting</b>	
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 Cost?	Yes
Is your local government planning on implementing the BC Energy Step Code?	Under consideration

### 3.1. Community Actions

<b>Community-Wide Actions Taken in 2017</b>	
	Continued to implement building and district energy policies. Secure commitments from new development in the City Centre to achieve higher energy efficiency standards.
	Conducted numerous consultation and information sessions with the City's construction sector stakeholders regarding local implementation of the BC Energy Step Code policy for Part 3 and Part 9 new construction
	Developed building energy benchmarking, reporting and disclosure model in partnership with Energy Utilities for future implementation.
	Continued with the following EnergySave Richmond suite of programs. <ul style="list-style-type: none"> <li>• Richmond Carbon Market program, which supports community based GHG emissions reduction projects through facilitation and funding</li> <li>• Climate Smart program that provides coaching to Richmond-based businesses on cost-effective opportunities to reduce GHG emissions, energy use, and waste generation</li> </ul>
	Supported implementation of the Cool It! Climate education in 20 Richmond Grades 4-7 classrooms.

<b>Community-Wide Actions Proposed for 2018</b>	
	Implement electric vehicle direct current fast charging stations in the City and EV residential parking standard requirements for new buildings, to further encourage the use of electrical vehicles.
	Continue consultation with the City's construction sector stakeholders regarding local implementation of the BC Energy Step Code policy for Part 3 and Part 9 new construction
	Continue development of municipal regulatory and enforcement policies and guidelines regarding BC Energy Step Code implementation
	Propose a benchmarking, reporting and disclosure bylaw for buildings.
	Continue to implement EnergySave Richmond suite of programs. <ul style="list-style-type: none"> <li>• Climate Smart program for businesses.</li> <li>• Water and energy saving programs.</li> <li>• Richmond Carbon Market program to Richmond businesses as needed.</li> </ul>
	Continue to support climate change education in up to 20 Richmond classrooms.

### 3.2. Corporate Actions

<b>Corporate Wide Actions Taken in 2017</b>	
	Completed mechanical and building control upgrades at Watermania
	Completed Phase 2 of the City of Richmond street lighting conversion project, with the replacement of over 1,500 less energy efficient street light fixtures with new more efficient LED technology, for an estimated energy savings of over 460,000 kWh annually
	Completed the upgrade of the building automation systems at Fire Hall No.6 and the Library Cultural Centre to improve overall occupant comfort and equipment scheduling and monitoring
	Continued providing corporate staff Energy Statement information to engage and inform City staff on corporate energy use and costs in their areas of responsibility on a quarterly basis.

<b>Corporate Wide Actions Proposed for 2018</b>	
	Complete mechanical upgrades at Richmond Ice Centre and Library Cultural Centre
	Complete the upgrade of the building automation systems at Fire Hall No.4 and No.5 and at the Community Safety Building to improve overall occupant comfort and equipment scheduling and monitoring
	Secure funding for Phase 3 of the City of Richmond street lighting conversion project, with the replacement of approximately 1,000 less energy efficient street light fixtures with new more efficient LED technology
	Continue to 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, and environmental sustainability.

## 4. ENERGY GENERATION

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, 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 2017 and planned in 2018.

<b>General Climate Action Questions</b>	
Is your local government developing, or constructing: <ul style="list-style-type: none"> <li>• A district energy system</li> <li>• A renewable energy system</li> </ul>	<b>Yes Yes</b>
Is your local government operating: <ul style="list-style-type: none"> <li>• A district energy system</li> <li>• A renewable energy system</li> </ul>	<b>Yes Yes</b>
Is your local government connected to a district energy system that is operated by another energy provider?	<b>No</b>
Are you aware of the Integrated Resource Recovery guidance page on the <a href="#">BC Climate Action Toolkit</a> ?	<b>Yes</b>
Are you familiar with the 2017 " <a href="#">List of Funding Opportunities for Clean Energy Projects Led by First Nations and Local Governments?</a> "	<b>Yes</b>

#### 4.1. Community Actions

<b>Community-Wide Actions Taken in 2017</b>	
	Continued to expand and connect the Alexandra District Energy Utility (ADEU) to new customers in the West Cambie neighbourhood. The latest expansion included the construction of a new energy centre to service the ADEU's first commercial customers – total space now connected to ADEU = over 1,200,000 ft <sup>2</sup> of residential space and over 335,000 ft <sup>2</sup> non-residential space
	Continued to implement connections of new customers with the Oval Village District Energy Utility (OVDEU) in the Oval Village area. Three new developments with a total of 573 units and 693,000 ft <sup>2</sup> of building gross floor area were connected to the OVDEU system in 2017.
	Completed a city-wide assessment of the available energy resource in the City's municipal wastewater system, which could be extracted in conjunction with new development to reduce conventional energy use.
	Participated in Metro Vancouver Integrated Resource and Recovery Plan developed for Lulu Island Sewerage Area. Identified opportunities to implement sewer heat recovery from the Lulu Island Treatment Plant and displace conventional energy use
	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.
	Continued to implement DEU infrastructure and developments using dedicated DEU operating funds and capital program, financed through ratepayer funds.

<b>Community-Wide Actions Proposed for 2018</b>	
	Continue to connect buildings and expand the ADEU distribution system as development requires. Three new residential buildings (432,000 ft <sup>2</sup> ) are scheduled for connection in 2018-2019.
	Expand the geexchange field at ADEU to provide additional renewable heating and cooling capacity for the West Cambie neighbourhood.
	Continue Oval Village District Energy Utility construction and planning in partnership with a private utility partner, with the installation of additional distribution piping and the design for a third interim energy centre.
	Complete the design and planning for the connection of four new developments with a total of over 1,000,000 ft <sup>2</sup> of building gross floor area to the OVDEU system.

## 4.2. Corporate Actions

<b>Corporate Wide Actions Taken in 2017</b>	
	Completed a feasibility study on the potential energy savings at the Library and Cultural Centre from major equipment replacement project, and a connection to a nearby renewable energy system, like an underground geo-exchange system.
	Initiated installation of a solar photovoltaic array at Fire Hall No.1 to offset electrical demand.

<b>Corporate Wide Actions Proposed for 2018</b>	
	Continue to target renewable energy integration, a key component of the City's High Performance Building Policy, during design development of new corporate facilities.
	Further assess the potential to provide renewable energy to the Library and Cultural Centre with an installation of a geo-exchange system in the location of the current Minoru Aquatic Centre, which is planned to be removed.

## 5. GREENSPACE/NATURAL RESOURCE PROTECTION

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. Greenspaces support climate change mitigation (reducing emissions by absorbing and sequestering GHG) and adaptation (providing shade, cooling, deflecting strong wind, and improving air quality). Below are the City of Richmond responses to the Provincial inquiry regarding "greenspace" management in the City, and summary of community initiatives conducted in 2017 and planned in 2018.

<b>General Climate Action Questions</b>	
Does your local government have urban forest policies, plans or programs?	<b>Yes</b>
Does your local government have policies, plans or programs to support local food production?	<b>Yes</b>

## 5.1. Community Actions

<b>Community-Wide Actions Taken in 2017</b>	
	Planted 779 trees on City streets and parks, as per the City Tree Management Plan.
	Collected LIDAR data capturing the City's urban forest in order to allow for ongoing monitoring of tree canopy coverage and health.
	Enhanced approximately 2.1 ha (21,000 m <sup>2</sup> ) of disturbed riparian habitat with native plantings through residential, commercial and industrial developments approvals.
	Delivered 30 free workshops that have attracted over 500 residents and included topics such as Natural Lawn Care and Organic Gardening, to Bee Identification and Fruit Tree Management

<b>Community-Wide Actions Proposed for 2018</b>	
	Complete a GIS inventory of all trees on public property, to be included as part of the Urban Forest Management Strategy.
	Begin implementation of Urban Forest Management Strategy recommendations.
	Begin planning for restoration of the Bath Slough area which will include the removal of various invasive species and replacing this area with native trees and shrubs and ongoing success monitoring.
	Implement a Riparian Response Strategy update to formalize and streamline the RMA application process to improve customer service and allow for success monitoring.
	Continue the successful partnership with Emily Carr University to establish a new 2,500 m <sup>2</sup> pollinator meadow at Terra Nova Rural Park.

## 5.2. Corporate Actions

<b>Corporate-Wide Actions Taken in 2017</b>	
	Completed an initial Northeast Bog Conservation Area carbon storage and sequestration study, to quantify the tangible GHG emissions reduction of conserving habitat in Richmond.
	Began construction of Aberdeen Park in July 2017. When completed, it will include trees, native planting, and a water feature that also serves as a stormwater detention facility.
	Began the development of an Urban Forest Management Strategy to improve management practices, encourage tree planting, and ultimately expand upon Richmond's urban forest canopy.
	Opened Tait West Park to the public. The approximately 1.5-acre park on the North Arm of the Fraser River includes rain gardens, trees, native and drought-tolerant plants. In addition to the park development, planting occurred along the adjacent dike and riverfront.

<b>Corporate-Wide Actions Taken in 2017</b>	
	Completed London's Landing Waterfront Park, a public space along the South Arm of the Fraser River. Its ecological features include terraced foreshore planting, a bioswale, and a lookout that invites park users to experience the waterfront. As an environmentally sensitive area (ESA), monitoring will be ongoing over the next three years.
	Constructed the final portion of the Railway Greenway, along McCallan Road between River Road and Westminster Highway. This important corridor encourages active transportation, offering a safe travel route for cyclists and pedestrians, and incorporates new trees and shared use crossings.
	Created a stormwater detention pond and installed a clay seepage barrier to protect the existing bog ecosystem at the Garden City Lands. Fill was placed on top of existing peat in areas designated for agriculture to prevent release of CO <sub>2</sub> . It is estimated that 500 trees and 20,000 shrubs were planted in 2017.
	Realized the first phase of Lansdowne Linear Park. It serves as an active transportation corridor that encourages multimodal travel, and features native planting and rain gardens.

<b>Corporate Wide Actions Proposed for 2018</b>	
	Continue planting trees and shrubs, capping peat areas with fill, and digging additional water bodies to serve as detention ponds at Garden City Lands.
	Complete a new pollinator pasture in Terra Nova's cultural precinct, and add native shrubs and trees (through a tree planting grant secured by Parks Programs) along the east edge of Terra Nova Rural Park.
	Update the Riparian Response Strategy to formalize and streamline the RMA application process to improve customer service and allow for success monitoring.

## 6. SOLID WASTE

Reducing, reusing, recycling, recovering and managing the disposal of 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 2017 and planned in 2018.

<b>General Climate Action Questions</b>	
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

## 6.1. Community Actions

<b>Community-Wide Actions Taken in 2017</b>	
	Served over 160,000 residents at the City recycling depot. providing drop off recycling for materials such as small & large appliances, batteries, cell phones, lights, Styrofoam, plastic bags and more.
	Promoted the new Richmond Collection Schedule app and Recycling Wizard to provide residents with collection day reminders and drop off locations for recyclable items. Since its launch in 2016, there have been 38,358 addresses searched, 7,482 active reminders in place and 65,571 materials searched in the Recycling Wizard.
	Launched “Let’s Recycle Correctly” campaign to engage with residents directly to increase awareness of the expanded range of materials accepted, and created instructional recycling videos to assist in improving the quality of recycling to reduce contamination levels.
	Provided recycling containers at 69 Special Events to improve waste diversion.
	Green Ambassadors participated in 23 events, volunteering 3,130 hours to help promote recycling and green initiatives.
	Completed approximately 90 community engagement activities, including Recycling Depot tours, information sessions, workshops and outreach displays at community events.

<b>Community-Wide Actions Proposed for 2018</b>	
	Install new public spaces recycling containers that are a newer design at various parks throughout the City.
	Provide updated and user friendly Commercial and Multi-Family Development Guidelines to assist developers & planners in design of recycling and waste spaces to support increased diversion.
	Prepare Richmond specific Disaster Debris Management Plan.
	Add features to the Richmond Collection Schedule app to include a Recycling Challenge Game and the ability to order recycling supplies.
	Continue public engagement through workshops, Recycling Depot tours, theatrical shows, community outreach, and education sessions at multi-family buildings to promote waste reduction and recycling.
	Continue to operate a Recycling Depot for drop off of recyclable items not commonly accepted through curbside collection programs.
	Help to maintain a litter-free City by servicing and inspecting litter and recycling containers approximately 5,400 times per week.

## 6.2. Corporate Actions

Corporate Wide Actions Taken in 2017	
	Supported Community Services department with their Annual Purge Event to properly recycle paper, small appliances, batteries, electronics and hazardous materials.
	Continued to install recycling stations at various City Facilities.
	Completed a waste composition study at City Facilities to compare data with 2014 results and provide a report card to those facilities to identify areas for improvement.

Corporate Wide Actions Proposed for 2018	
	Update signage on existing City Facility recycling containers to ensure they represent the materials accepted in the recycling program and provide consistency at all facilities.
	Expand the We Recycle campaign on the intranet to provide staff with additional recycling information and tips.

## 7. TRANSPORTATION

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, ridesharing, and public transit, can contribute to reductions in greenhouse gas 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 2017 and planned in 2018.

General Climate Action Questions	
Does your local government have policies, plans or programs to support: <ul style="list-style-type: none"> <li>• Walking</li> <li>• Cycling</li> <li>• Transit Use</li> <li>• Electric Vehicle Use</li> <li>• Other: car-sharing, carpooling</li> </ul>	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 behavior)?	Yes
Does your local government integrate its transportation and land use planning?	Yes

## 7.1. Community Actions

<b>Community-Wide Actions Taken in 2017</b>	
	Completed upgrade of special crosswalk on an arterial road (No. 2 Road) to a pedestrian signal with a new crossing on additional leg of the intersection to support the implementation of the Crosstown local street bikeway that utilizes local streets and off-street connecting pathways.
	Installed the City's first on-street bike corral in Steveston to provide needed bike parking in an area where off-street boulevard space is constrained.
	Installed four new pedestrian signals to support pedestrian movements across arterial roadways.
	Upgraded or installed five arterial road crosswalks to include overhead downward lighting, pedestrian-actuated flashing beacons and verbal wayfinding message.
	Constructed numerous sidewalk and walkways in Richmond to support walking and greater access to transit services.
	Upgraded 20 bus stops to allow greater accessibility, and replaced or installed multiple new transit shelters to support transit use.
	Staged 17 <sup>th</sup> annual "Island City, by Bike" tour for the community to encourage cycling as a mode of transportation.
	Upgraded 20 existing signalized intersections to include accessible pedestrian signal (APS) features including pole locator tone, yellow pushbutton with 3 raised dots (indicates APS device), verbal wayfinding message, audible walk indication tone when Walk light on, and Braille and raised letter street name.
	Supported education and encouragement programs for cycling and walking through the delivery of cycling education courses to elementary school students and new immigrants.
	Completed numerous bike lane improvements throughout the City to support cycling transportation in the City.
	Advanced \$3.5M of voluntary developer contributions to TransLink to initiate design work for new Canada Line Capstan Station.

<b>Community-Wide Actions Proposed for 2018</b>	
	Initiate construction of Phase 1 of River Parkway (Gilbert Road-Cambie Road) that includes protected bike lanes.
	Initiate construction of road, pedestrian and cycling improvements on No. 2 Road (Steveston Hwy-Dyke Road) that includes an off-street multi-use pathway and upgraded bus stops to provide accessibility.
	Initiate improvements to Cambie Road (River Road-No. 3 Road) including a multi-use pathway on the south side with crossing enhancements.
	Construct pedestrian pathways and ramps within the Riverside Industrial Park to provide pedestrian access to all bus stops in the area.
	Construct pedestrian pathway on north side of River Road (No. 6 Road-Burdette Road) including crosswalk.
	Construct pedestrian pathway on north side of River Road (Brighthouse Way-Oval Way).

<b>Community-Wide Actions Proposed for 2018</b>	
	Construct multi-use off-street pathways on River Drive (No. 4 Road-Van Horne Way) and Sexsmith Road (Beckwith Road-Charles St).
	Extend north end of Parkside Bikeway from Garden City Park through Anderson School to Alberta Road and Westminster Hwy.
	Continue the upgrade of bus stops to become fully accessible by converting up to 18 additional locations, and install 10 new transit shelters at bus stops.
	Continue expansion of the special crosswalk program and the upgrading of traffic signals to include accessible pedestrian signal features.
	Continue to facilitate expansion of car-share services in Richmond.
	Explore potential for pilot public bike share program in Richmond.
	Continue support for education and encouragement programs for cycling and walking.
	Continue funding partnerships with external agencies (e.g., ICBC, MoTI, TransLink) to implement pedestrian, cycling, transit amenity, and traffic safety improvements.
	Continue to participate in stakeholder consultation process to develop recommendations for a mobility pricing system for Metro Vancouver.

## 7.2. Corporate Actions

<b>Corporate Actions Taken in 2017</b>	
	Continued existing initiatives that encourage the use of alternative modes of transportation for commuting to and from work and corporate travel such as sponsorship and promotion of Bike to Work week, use of corporate bike fleet, pilot use of pedal-electric bike, and promotion of transit fare passes for work travel.
	Continued use of City Intranet site to promote Bike to Work Week and other sustainable transportation initiatives.
	Replaced three gas-powered passenger vehicles with hybrid/electric vehicles.
	Expanded car sharing program to include 24/7 availability for both staff and the public.
	Initiated a capital project to expand public electric vehicle charging stations, including level III charging stations that are owned and operated by the City.
	Conducted feasibility study at four major City sites to determine electrical capacity for all parking stalls to be potentially electrified to support EV expansion.
	Installed electrical vehicle infrastructure to allow for the addition of six dual port level two charging stations at the City of Richmond Annex.
	Installed 1 level two charging station at the RCMP headquarters and upgraded two level one charging stations to level two charging stations at City Hall underground parking stalls.

<b>Corporate Actions Proposed for 2018</b>	
	Update the existing cycling network plan and develop conceptual designs for different types of cycling facilities for the City Centre.
	Continue to promote car-sharing services for corporate use.

<b>Corporate Actions Proposed for 2018</b>	
	Increase electrical vehicle infrastructure and charging stations at City facilities to support electric vehicle charging requirements for future vehicle replacements.
	Replace approximately six gas-powered vehicles with hybrid/electric vehicles in 2018.
	Use data analytics to encourage reduction of idling and emissions.
	Complete design to the electrification of parking stall at City Facilities for fleet employees and public charging.
	Undertake Alternative Fuel Pilot (Propane) initiative with corporate vehicles to evaluate emission reduction benefits.

## 8. WATER AND WASTEWATER

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 greenhouse gas 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 2017 and planned in 2018.

<b>General Climate Action Questions</b>	
Does your local government have water conservation policies, plans or programs?	Yes

### 8.1. Community Actions

<b>Community-Wide Actions Taken in 2017</b>	
	Supported the implementation of Metro Vancouver water sprinkling restrictions throughout Richmond.
	Installed 826 water meters at single-family residences (100% of single-family homes in the City of Richmond are now metered).
	Issued 662 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 2017 was \$66,200.
	Partnered with BC Hydro in May/June & October/November 2017 to provide a clothes washer rebate program to reduce home water use and electricity. To date, 765 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 \$54,700 to the City. It is estimated that this program achieved annual savings in water and energy of 3,114,000 liters per year and 73,750 kilowatt hours per year, respectively.

<b>Community-Wide Actions Taken in 2017</b>	
	Installed usage meters under the Volunteer Multi-Family Water Meter Program in 146 complexes (comprising 9,119 multi-family dwelling units) including 61 apartment complexes (6,577 units) and 85 townhouse complexes (2,542 units). It is mandatory for new multi-family residences to have a water meter. A total of 40% of multi-family units in Richmond are water metered.
	Assessed and helped to reduce water waste at single-family homes by providing notification on properties with consumption greater than 250 m3 quarterly.
	Installed mobile drinking fountains for use at 56 community events to provide the public with portable tap water.
	Sold 153 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.
	Coordinated a booth at the annual Capital Works Open House and the Public Works Open House educating residents about water meter installations and water conservation measures.
	Hosted Project WET, an interactive elementary school program that teaches classes about water consumption, conservation, quality and supply. In 2017, over 360 students and teachers attended.
	Hosted a series of Works on Wheels bus tours for the public to learn about water and wastewater infrastructure maintained by the City.

<b>Community-Wide Actions Proposed for 2018</b>	
	Continue the volunteer Multi-Family water meter program.
	Continue the toilet rebate program (\$100,000 in funding for 2018)
	Continue offering the water saving kits to homeowners with a newly installed water meter.
	Continue to participate in the clothes washer rebate joint program in May/June and October/November with BC Hydro in 2018 (pending Council approval).
	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.
	Continue to organize and host the Public Works Open House for the public to learn about all of Richmond's operations and sustainable programs.
	Continue to host Project WET, an interactive elementary school program that teaches classes about water consumption, conservation, quality and supply.
	Continue to provide community events with the portable drinking fountains to encourage tap water consumption.
	Fund and organize the presentation of "H2Whoa!", a theatrical production that focuses on positive actions and educating students about the use of water, the need to protect it and its importance to everyday living.
	Deploy a universal Fixed Based Network for water meter reading in order for leaks to be identified earlier and to decrease manual reading of water meters.

## 8.2. Corporate Actions

<b>Corporate Actions Taken in 2017</b>	
	Participated in the Metro Vancouver Municipal Water Conservation Coordinator Committee. The meetings revolve around networking with other municipalities and discussing initiatives, progresses, updates in policies and results.
	Replaced all domestic hot and water copper mains at City Hall with Aquatherm pipe to address pin hole leaks, and reduce waste.
	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.
	Introduced a full-time grease inspector to improve education and enforcement of liquid waste source control initiatives.
	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.

<b>Corporate Actions Proposed for 2018</b>	
	Continue to take part in the Metro Vancouver Municipal Water Conservation Coordinator Committee.
	Update the City's Water Use Restriction Bylaw to reflect changes in Metro Vancouver's Drinking Water Conservation Plan.

## 9. CLIMATE ADAPTION

For local governments, adaptation to a changing climate can take the form of changes in policy, management, technology and behaviour that minimize negative impacts or exploit opportunities. It can involve both "hard" and "soft" solutions, including: changes in infrastructure engineering, planning, zoning, bylaws and public education. Below are the City of Richmond responses to the Provincial inquiries regarding climate change adaption, and summary of initiatives conducted in 2017 and planned in 2018.

<b>Please identify the THREE climate impacts that are most relevant to your Local Government.</b>	
<ul style="list-style-type: none"> <li>• Sea level rise and storms causing coastal flooding and/or erosion</li> <li>• Changing temperatures influencing species migration and ecosystem shifts</li> <li>• Warmer winter temperatures reducing snowpack</li> </ul>	

**In 2017 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. storm water system upgrades)	Yes
Beach Nourishment projects	No
Economic diversification initiatives	Yes
Strategic and financial planning	Yes
Cross-department working groups	Yes
OCP policy changes	Yes
Changes to zoning and other bylaws and regulations	Yes
Incentives for property owner (e.g. reducing storm water run-off)	Yes
Public education and awareness	Yes
Research	Yes
Mapping	Yes
Partnerships	Yes

<b>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?</b>	
<b>Resources</b>	
<a href="#">Indicators of Climate Change for British Columbia, 2016</a>	Haven't used
<a href="#">Plan2Adapt</a>	Haven't used
<a href="#">Climate Projections for Metro Vancouver</a>	Haven't used
<a href="#">Province of BC's BC Adapts Video Series</a>	Haven't used
<a href="#">Preparing for Climate Change: An Implementation Guide for Local Governments</a>	Have reviewed – somewhat useful
<a href="#">The Public Infrastructure and Engineering Vulnerability Committee's (PIEVC) protocol Sea Level Rise Primer</a>	Haven't used
<a href="#">BC Regional Adaptation Collaborative Webinars</a>	Haven't used
<a href="#">www.ReTooling.ca</a>	Haven't used
<a href="#">Water Balance Model</a>	Haven't used
<a href="#">The Water Conservation Calculator</a>	Haven't used
<b>Funding</b>	
<a href="#">National Disaster Mitigation Program (NDMP)</a>	Have used - useful
<a href="#">Community Emergency Preparedness Fund (CEPF)</a>	Haven't used
<a href="#">Municipalities for Climate Innovation Program (MCIP)</a>	Have applied – waiting on decision
<a href="#">Climate Adaptation Partner Grants (FCM)</a>	Have used – useful
<a href="#">Infrastructure Planning Grants (MAH)</a>	Haven't used
<a href="#">Federal Gas Tax Fund</a>	Have used – useful

## 9.1. Community Actions

<b>Community-Wide Actions Taken in 2017</b>	
	Engaged key stakeholders and hosted two public open houses to gather feedback for Dike Master Plan Phase 2.
	Began Phase 3 and 4 of the Dike Master Plan which looks at the long term plan to improve the dike.
	Established the Integrated Rainwater Resource Management Strategy which provides a strategic approach to address Richmond's unique stormwater management issues and needs. The strategy aims to protect and enhance the City's stormwater conveyance infrastructure and ecological assets under more frequent rainfall events and considers rainwater as a resource to be utilized, promoting water conservation.
	Treated 260 knotweed infestations throughout the city, equal to approximately 2.5 ha.

<b>Community-Wide Actions Proposed for 2018</b>	
	Consider maximizing energy efficiency through increased density when the City reviews the City Centre Area Plan (CCAP) building height requirements, in association with YVR's Airport Zoning Regulations (AZR).
	Upgrade 3 drainage pump stations.
	Raise approximately 1.8 km of dike
	Prepare the Flood Protection Management Strategy Update
	Complete Phases 3 and 4 of the Dike Master Plan.
	Initiate Phase 5 of the Dike Master Plan
	Continue detailed design of dike raising projects, and commence construction of South Dike raising from Gilbert Rd to No 3 Rd.

## 10.INNOVATION

This section is intended to give the opportunity to describe any innovative Corporate and/or Community-Wide GHG reduction or climate change adaptation activity that have been undertaken over the past year(s) that your local government is particularly proud of and would like to share with other local governments. Below is summary of two of the innovated initiatives that the City implemented in 2017.

<b>Community-Wide Innovative Action</b>	
	"Introduction to Electric Vehicles (EV)" free workshops were being offered in partnership with the Richmond Library to residents to reduce any fears around owning one of these specialty cars and answer any questions residents might have. The course is taught by a Richmond resident that owns an electric vehicle.
	Produced a "Sustainability in Action" series of videos informing the public on a variety of energy saving and sustainability related initiatives

<b>Corporate Innovative Action</b>	
	All new staff orientation sessions also include a session on Green Fleet Driving techniques and our Green Fleet Policy.
	All new drivers are assessed by our Fleet training officer and are required to study and sign off on the requirements defined in our Driver's program, which includes everything outlined in the course materials before they can operate a City owned vehicle.
	Monthly analytic reports are produced to identify idling levels of vehicles and these figures are used to educate and also to find innovative methods of reducing idling on high idling units, for instance solar panels, LED Lighting and auxiliary power.

## 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.

<b>Programs and Funding</b>	
	The Provincial organization TransLink: 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.
	The Provincial organization TransLink: provides capital funding on a 50-50 cost-share basis for the construction of pedestrian and cycling-related infrastructure including wayfinding, 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.
	The City received federal and provincial funding from the National Disaster Mitigation Program for the Flood Mitigation Strategy Update, which consists of three projects: Dike Master Plan Phase 3, Flood Management Strategy Update and Pump Station Condition Assessment
	The City received federal and provincial funding from the National Disaster Mitigation Program for the Steveston Island Flood Risk Investigation Project.
	The City received funding from UBCM for Dike Master Plan Phase 5
	In 2016, The City received \$16.6 million provincial funding through the EMBC program to upgrade drainage pump stations and dikes to prepare for climate change
	Utilized Clean Energy Vehicles for BC funding when the City purchased new electric vehicles. Funding was also received for new electric vehicle purchases through the Provincial SCRAP-IT BC program for scraping old gasoline vehicles that are being replaced with efficient electric or plug in electric vehicles.
	Staff are in the process of applying for Federal Funding through NRCAN to expand Electric vehicle infrastructure/Charging stations for public use.
	Worked with the Richmond Butterflyway Rangers who are responsible for planting pollinator patches in 21 locations throughout Richmond, including City Hall.
	Partnered with Emily Carr University to establish a new 2,500 m <sup>2</sup> pollinator meadow at Terra Nova Rural Park.
	City received funding from the Federation of Canadian Municipalities, for two feasibility study related to corporate renewable energy generation (solar PV installation) and to community energy generation (micro-sewer heat recovery opportunities)

## 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, liveable and well-managed community in Canada”.