Richmond

2050 | COMMUNITY ENERGY AND EMISSIONS PLAN

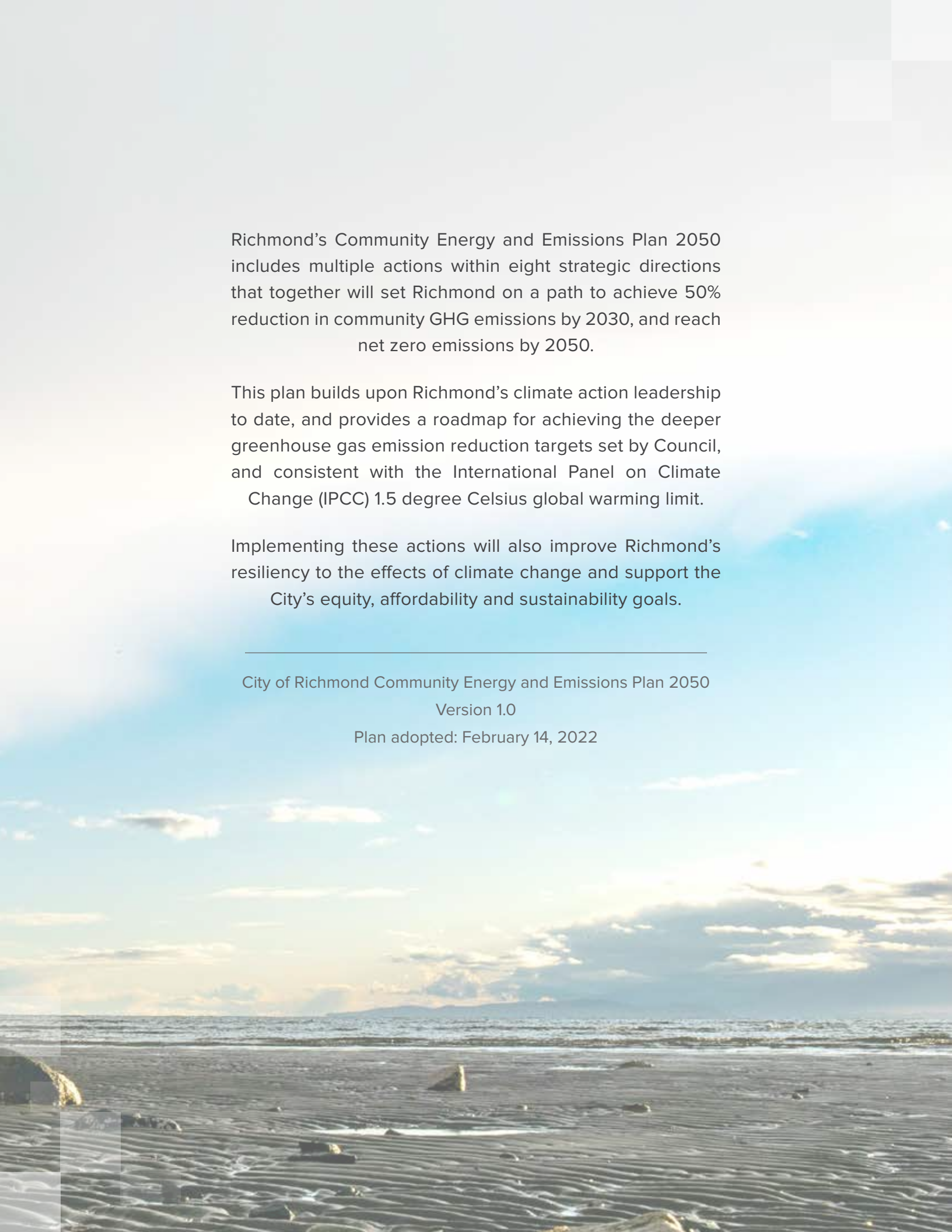
FEBRUARY 2022

Richmond's Community Energy and Emissions Plan 2050 includes multiple actions within eight strategic directions that together will set Richmond on a path to achieve 50% reduction in community GHG emissions by 2030, and reach net zero emissions by 2050.

This plan builds upon Richmond's climate action leadership to date, and provides a roadmap for achieving the deeper greenhouse gas emission reduction targets set by Council, and consistent with the International Panel on Climate Change (IPCC) 1.5 degree Celsius global warming limit.

Implementing these actions will also improve Richmond's resiliency to the effects of climate change and support the City's equity, affordability and sustainability goals.

City of Richmond Community Energy and Emissions Plan 2050
Version 1.0
Plan adopted: February 14, 2022



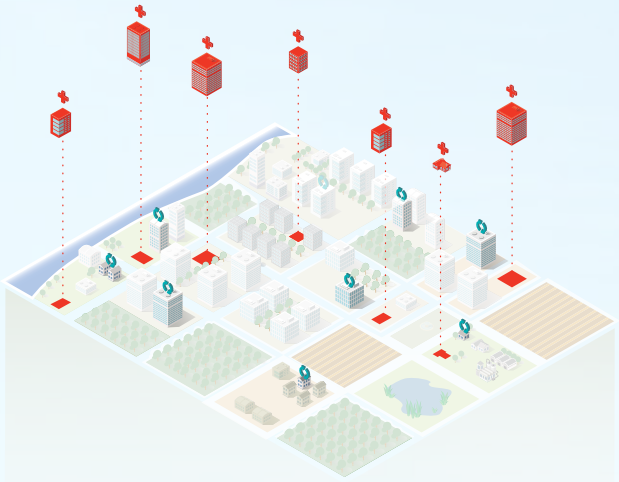
PLAN AT-A-GLANCE - 8 STRATEGIC DIRECTIONS FOR CLIMATE ACTION IN RICHMOND

CARBON NEUTRAL NEW BUILDINGS

All new buildings will be serviced by low carbon energy systems and built to the top performance level of the BC Energy Step Code by 2027.

RETROFIT EXISTING BUILDINGS

Accelerate deep energy retrofits to existing buildings, and shift to low-carbon heating and cooling.



TRANSITION TO ZERO EMISSION VEHICLES

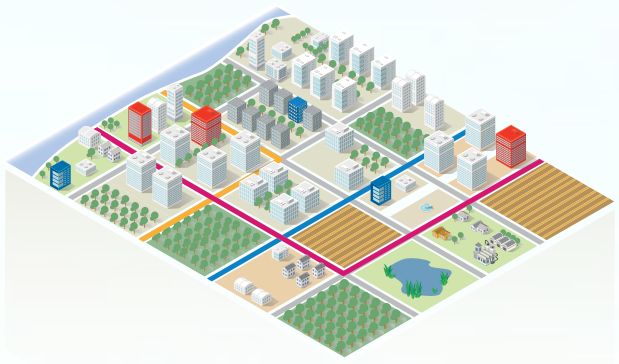
Facilitate electrical mobility for all residents and businesses in Richmond, with expanded options for charging at home, at work, and on-the-go.

SUPPORT FREQUENT TRANSIT

Work with TransLink to increase transit service frequency and foster wider use of transit by implementing and upgrading transit stops that are well integrated with active transportation (walking / rolling / cycling) and with car-sharing networks.

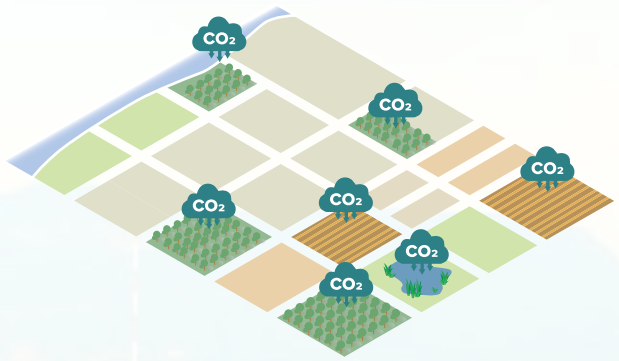
ACTIVE MOBILITY FOR ALL

Prioritize active transportation with investments in walking, rolling and cycling infrastructure that is safe, connected, easy to navigate, and accessible.



COMPLETE COMMUNITIES

Implement OCP and Local Area Plan objectives for compact, complete neighbourhoods throughout Richmond, with a range of services, amenities and housing choices, and sustainable mobility options within a five-minute walk of homes.

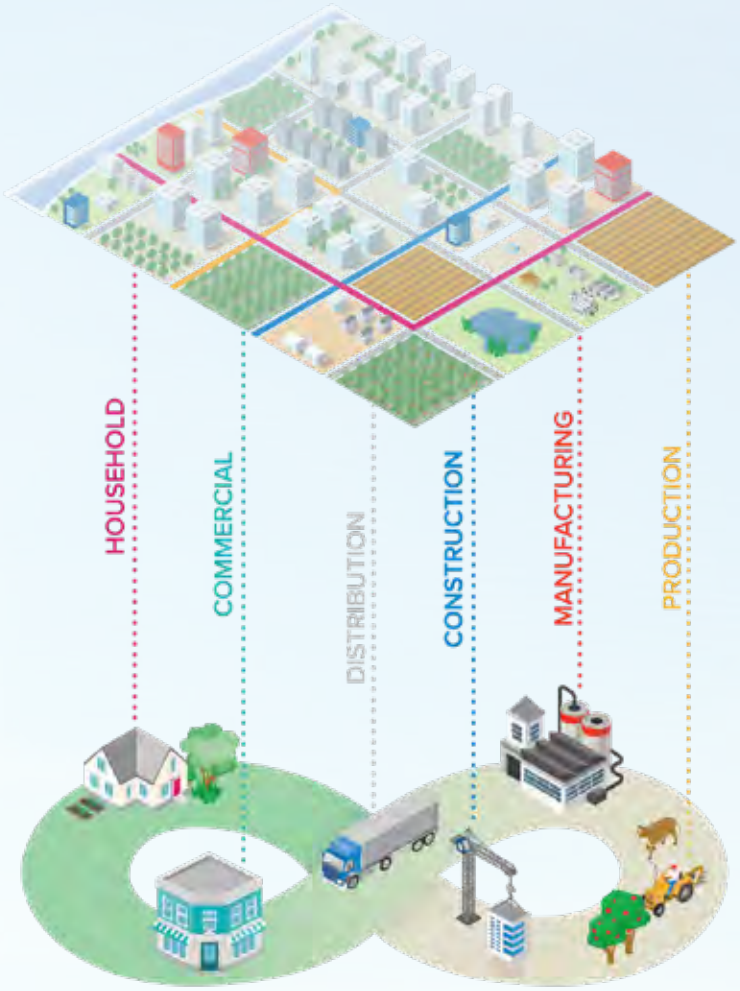


ENHANCE GREEN INFRASTRUCTURE

Maximize the climate benefits of Richmond's green infrastructure by protecting and expanding existing carbon stores in trees, vegetation and soils.

TRANSITION TO A CIRCULAR ECONOMY

Create a Circular Economy in Richmond that maximizes the value of resources by design, responsible consumption, minimized waste and reimagining how resources flow in a sustainable, equitable, low-carbon economy.



ADVANCING EQUITY THROUGH PLAN ACTIONS

The City of Richmond has a long-standing commitment to lead on climate change, and deliver on its vision of a sustainable community that integrates environmental, social and economic dimensions with community well-being.

As the updated Community Energy and Emission Plan was developed, and actions within the Plan's Strategic Directions were defined, it became clear that many of the actions present opportunities to advance climate equity in Richmond, as we design, engage, and resource implementation actions. The plan also recognizes that the burdens, or negative impacts of climate change are not evenly distributed, with some groups more vulnerable and feeling the effects sooner, or to a greater degree than others. This plan responds to that inequity.

Further indications of the equity approach appear throughout this plan, but it is important to consider that the plan sets a framework of intentions and objectives, which is a starting point that sets up on a journey to discover, further improve and respond equitably, as the City accelerates action on climate change in Richmond, to meet our 2030 and 2050 targets.

CONTENTS

Urban cyclist in Richmond, BC

SETTING THE STAGE

Richmond, BC. Photo by Marcos Badra

CLIMATE CHANGE: THE CHALLENGE IN FRONT OF US

Richmond, BC

CLIMATE LEADERSHIP

The City of Richmond is taking bold action in tandem with other leading municipalities in BC, and across Canada, to achieve a common objective of mitigating and eventually eliminating global warming, and doing our part to ensure a sustainable future. The City also recognizes the challenges ahead that must be addressed.

Humanity has now increased the concentration of (CO_2) in the Earth's atmosphere from 270 to over 413 parts per million in 2020 – a 52% increase since the Industrial Revolution. Together with increased emissions of other greenhouse gases such as methane, this has already caused a 1.1° Celsius increase in global mean surface temperature (land and oceans) since the start of the 20th Century, with worldwide impacts on weather systems and ecosystems.

The Pacific Climate Impacts Consortium at the University of Victoria has developed climate projections for Metro Vancouver that scales and localizes the outputs of global climate projection models. These results indicate that as global average temperatures increase, Richmond will experience an increased frequency of climate extremes. For example, the prolonged 'heat dome' in Western Canada and the Pacific Northwest during the summer of 2021, placed extreme stress on people, local agriculture and fisheries, with some of the highest daytime temperatures on record, and resulting in one of the most extensive forest fire seasons ever seen in BC. Heat stress from this weather event was keenly felt by people living in buildings without air conditioning, and with little relief from temperatures that did not drop at night. Shoreline aquatic ecosystems and fisheries also experienced high mortality rates due to elevated water temperatures, and land-based wildlife faced heat stress and a lack of freshwater due to drought. Extreme heat and lack of rainfall placed additional stress on our urban forest, which is vital for cooling the air and providing shade.

Climate modelling also indicates an increased intensity, duration and frequency of storm and extreme precipitation events in the future, which southwest BC experienced in the fall of 2021, with catastrophic rainfall resulting in widespread mudslides and flooding. The same climate models forecast a more rapid snow melt earlier in the year, leading to an increased risk of flooding during the springtime freshet along BC's river systems.

According to the International Panel on Climate Change (IPCC, 2018), concerted and accelerated action is needed to reduce and eliminate additional greenhouse gases by mid-Century, with accelerated climate action and GHG emission reduction achieved by the year 2030. The Paris Accord indicated that humanity can significantly reduce the negative impacts of climate change if we limit overall global temperature rise to no more than 1.5° Celsius by the end of this Century. Otherwise, we are on track to exceed 2.0° Celsius of warming by the year 2100, with resultant negative impacts.

RICHMOND'S CLIMATE LEADERSHIP

Electric vehicle charging station

Geo-exchange heat pump system for Alexanra District Energy System

The good news is that we have a running start, as the City of Richmond has been taking action and demonstrating continued leadership on climate change for over a decade.

EMISSION REDUCTION TARGETS IN RICHMOND OFFICIAL COMMUNITY PLAN 2041

In 2010, City Council adopted targets into Richmond's Official Community Plan aimed at reducing community GHGs by 33% below 2007 levels by 2020, and 80% below 2007 levels by 2050. These targets aligned with the Provincial GHG emission reduction targets adopted in 2007.

COMMUNITY ENERGY AND EMISSIONS PLAN 2014

Richmond's first Community Energy and Emissions Plan (CEEP 2014) included a list of measures that, in combination with policies already adopted by the Province and the federal government, were projected to reduce community GHG emissions to 6% below 2007 emission levels by 2020, and 25% below 2007 levels by 2050, even with continued population and economic growth over this time.

The CEEP 2014 also recognized that the deep GHG emission reduction targets reflected in the OCP would not be achievable solely by City policies and programs alone, but would need the support of utilities, Province of BC and the Federal government in terms of incentive funding, policies, regulations to support decarbonisation and drive market transformation. Accordingly, CEEP 2014 included the following three 'big breakthroughs' that would be central to achieving the 2050 greenhouse gas reduction target.

BIG BREAKTHROUGHS

CARBON ZERO NEW BUILDINGS

COMPLETE CONVERSION OF PASSENGER VEHICLES TO ELECTRIC

MASSIVE RENEWAL OF RICHMOND'S EXISTING BUILDING STOCK

When CEEP 2014 was adopted, these breakthroughs were considered challenging 'stretch goals', given limited regulatory tools and product availability at that time. However, during the past six years, there has been a transformation in the range and effectiveness of low-carbon technologies. In addition, new policies and regulations are now available provincially and locally that support building energy efficiency and the transition to zero emission vehicles.

CEEP Outreach at Hamilton Community Centre.

THE CITY'S TRACK RECORD

Richmond was the first jurisdiction in North America in 2017 to enact a 100% Level 2 electric vehicle charging readiness requirement in Bylaw for all non-visitor parking stalls in new residential buildings, enabling at-home charging. The City successfully secured $440,000 in grant funding from Natural Resources Canada in 2018 to facilitate the largest expansion of public EV charging to date in Richmond. By the end of 2021, 28 new Level 2 charging points will be in place at various civic facilities, along with four new fast chargers.

Richmond was also an early proponent and adopter of the BC Energy Step Code in 2018 – Canada's first performance-based, "stretch code" energy standard. When the Step Code was adopted, Council made a commitment that all new buildings in Richmond would reach the top level of the Step Code starting in 2025. Since 2018, the City has hosted 'Builder Breakfast' learning events for homebuilders several times per year, and has supported the Step Code transition with air tightness training and hands-on courses in advanced building envelopes and mechanical systems.

By the end of 2020, more than 4,500 residential units, representing 4.9-million ft^2 of floor area, was being serviced by the City's Lulu Island Energy Company. The City's low carbon district energy system has become a recognized leader locally, nationally and internationally (18 awards as of 2020). The City also received a $6.2-million grant from CleanBC Communities Fund for design and construction of the Oval District Energy Centre. With planned completion in 2024, 80% of district heating in the Oval District will be served by a renewable sewer heat recovery system.

Richmond was also the first municipality in Canada to engage private industry, suppliers and vendors in a half-day workshop in January 2020 on the City's proposed Circular Economy Procurement Policy, subsequently adopted in 2021. The City has prioritized a successful transition to a Circular Economy, and is participating in national and international collaborations, including the Circular Cities and Regions initiative in 2021, with 14 other Canadian municipalities.

COMMUNITY ENERGY AND EMISSIONS PLAN 2050

CEEP 2050 recognizes the Big Breakthroughs identified in CEEP 2014 as vital to meet our 2030 targets, and the actions in this plan builds upon the leadership and momentum shown by Richmond and other partners in these areas. This new plan provides a roadmap to achieve the 50% emission reduction target by 2030, and near zero carbon by 2050.

This Plan:

1. Establishes revised GHG reduction targets for 2030 and 2050 for the City of Richmond, base reductions from 2007 baseline.
2. Confirms and supports Council's direction to develop a bold new plan that achieves the IPCC Paris Accord global warming limit.
3. Integrates the results and priorities from community and stakeholder engagement.
4. Includes eight Strategic Directions (broad areas of focus) in a plan framework that sets Richmond up for success in achieving deep emission reduction targets.
5. Describes shorter and longer-term actions within each Direction, and their role in meeting the 2030 and 2050 targets.
6. Identifies 'municipal toolkit' levers that can be used to implement plan actions.
7. Indicates plan actions with strong potential to advance equity, justice, fairness and inclusion during implementation.

CEEP 2050 contains an action-oriented roadmap of strategies and integrated actions that will guide current and future work by the City of Richmond in mitigating climate change, sufficient to reach GHG emission reduction targets in line with the IPCC (Paris Accord) 1.5°C global warming limit.

COMMUNITY BENEFITS

In addition to the positive outcomes that can be realized by implementing CEEP 2050 with an equity lens, taking action on climate change yields additional benefits listed below:

Children running through park

CLEANER AIR

Reducing combustion of fossil fuels by transitioning to electric vehicles and sustainable transportation modes such as walking / rolling, cycling and taking transit, will directly reduce health-impacting air pollutants such as carbon monoxide, nitrous oxide, sulphur dioxide and volatile organic compounds. Electric and other clean fuel vehicles also reduce or eliminate fine particulates in the local airshed (i.e., PM 10 and PM 2.5) generated from combustion of diesel, particularly along major arterials and trucking routes. Richmond's streets will be cleaner, quieter and healthier as a result.

Active mobility cyclist

QUALITY OF LIFE AND IMPROVING HEALTH

As electrified light-duty and heavy-duty vehicles become more prevalent, our City becomes much quieter, even as our population grows and the economy expands. Those living next to busy arterials will experience significantly reduced road noise, and better air quality with greatly reduced pollution. Enhancing and expanding Richmond's urban tree canopy will provide cooler, comfortably shaded streets that provide relief on the hottest summer days. A more compact urban form will also make it easier for people to quickly and cost-effectively reach their destinations by foot, by bicycle / e-bike or by frequent transit, and do so without wasting time in traffic congestion.

Window shading

HEALTHY, COMFORTABLE AND CLIMATE-RESILIENT BUILDINGS

The City of Richmond has already signalled its policy intention within the Official Community Plan, requiring that all new buildings achieve the top level of the BC Energy Step Code by 2027. Buildings constructed to the top level of the Step Code, or the certified Passive House standard, are by their nature ultra-low energy and highly resilient. They provide enhanced levels of comfort to building occupants because of their well-insulated draft-free construction, providing a thermally stable indoor environment. Additionally, these buildings feature filtration of supply air within the mechanical ventilation system, ensuring a balanced continuous supply of fresh, clean air to occupants when windows are closed. This feature becomes especially valuable during wood smoke events that have been present in southwest B.C. and the Pacific Northwest during recent summers.

Energy efficient buildings

ECONOMIC INNOVATION AND NEW JOBS

The massive effort involved in comprehensively addressing global warming and transitioning to a low-carbon economy will generate hundreds of billions of dollars of investment annually worldwide, along with significant job creation. Leading jurisdictions like Richmond can expect to see new business and employment growth as a result. Economic benefits will also result from investments in building-scale and neighbourhoods-scale renewable energy systems. Retrofitting existing buildings of all types will help drive a growing regional economy in cost-effective building envelope and mechanical system upgrades that greatly improve energy efficiency and use zero-carbon energy.

The movement away from fossil fuels in transportation is already spurring innovation in electric vehicles, electric scooters, battery storage, as well as hydrogen fuel cell technology. Reducing waste and maximizing the reuse and repurposing of materials will be a normal business approach as we transition to a circular economy. Leading Richmond businesses are already rethinking and retooling their products and procurement processes to be compatible with a zero waste economy.

ADVANCING EQUITY IN OUR PLAN

Richmond public libraries provide inclusive, accessible spaces and community-focused services

This plan identifies many opportunities to advance climate equity in Richmond as we design, resource, and implement actions in the plan. It places considerations of wellness, inclusion and fairness at the center of implementation, recognizing that vulnerability to the effects of climate change is frequently higher for indigenous people and First Nation communities, visible minorities, and low-income households. Women, new Canadians, persons with disabilities, as well as children and seniors, are also more likely to experience the negative impacts of climate change, or are made more vulnerable as a result. Richmond is a diverse community with 27 languages spoken, language can be a barrier, and newcomers may encounter challenges in finding out about supportive energy and climate action programs, if English is not their first language.

CEEP 2050 acknowledges the necessity to address these inequities by ensuring that new policies, programs and incentives are inclusive and broadly available, particularly with respect to improving resiliency to climate change and realizing better health outcomes in new and existing buildings. As initiatives are developed to decarbonize existing buildings and make them more energy efficient, buildings that are the least efficient and exhibit high energy costs for residents will be prioritized for improvements.

The plan also prioritizes frequent, convenient and sustainable transportation choices for all Richmond residents, making sustainable modes the preferred choice, lowering transportation costs and improving community health outcomes. Some households have high transportation costs relative to income, with adults often working more than one job and requiring a vehicle for work. These households may struggle in transitioning from an internal combustion engine vehicle to an electric vehicle, which would cut fuel and maintenance costs dramatically. As new programs roll out to accelerate local transition to zero emission vehicles, we need to ensure that residents and employees will not be left behind, and that they will have a range of EV charging options: at (or near) home, at work, and on the go.

Climate action can also support objectives such as ensuring wider housing choice and affordability, celebrating local diversity and providing opportunities for connection, collaboration and empowerment as new programs are developed. Climate action is also knowledge-based, and is already driving creativity and innovation in many sectors of the economy. This plan includes actions that provide opportunities to build knowledge capacity and competency in skills needed to design and construct highly efficient, zero emission buildings. Similarly, the City will continue to support the transition from a linear to an inclusive circular economy, focusing on developing the skills and training to help facilitate this transition, and ensuring that employability continues.

The climate equity approach in CEEP 2050 is intended to align with and support the following City's strategies and plans:

- Energy Poverty Toolkit for Low-Income Households and Service Providers (in 2022)
- Cultural Harmony Plan 2019-2029
- Official Community Plan 2041
- Social Development Strategy 2013-2022
- Community Wellness Strategy 2018-2023
- Resilient Economy Strategy
- Affordable Housing Strategy 2017–2027
- Volunteer Management Strategy 2018-2021
- 2022 Parks and Open Space Strategy
- Homeless Strategy 2019-2029
- Collaborative Action Plan to Reduce and Prevent Poverty in Richmond 2021-2031

CURRENT AND PROJECTED EMISSIONS IN RICHMOND

Carbon neutral new building

2030 AND 2050 EMISSION REDUCTION TARGETS

Extensive GHG emission modelling and forecasting was conducted to assess the impact of current local policies, Federal and Province of BC regulatory standards, as well as current program and incentive measures at the local, Provincial and National levels. As new proposed actions and measures were identified for CEEP 2050, comparisons could be made of GHG emission reduction progress to 2030 and 2050 for the following emission reduction pathways (three trend lines shown in Figure 1).

1. Business-as-usual trend line, where only climate actions implemented prior to 2017 are included;
2. Actions already adopted trend line, where existing climate action programs and policies adopted by City of Richmond, Province of BC and Federal Government prior to 2020 are fully implemented; and
3. Accelerated action trend line with all new CEEP 2050 actions included in this plan underway. This line represents actions that would achieve the IPCC 1.5° Celsius average global warming limit.

Figure 1 shows that current (2021) policies, programs and regulations by the Federal and Provincial governments, as well as City of Richmond are projected to have a significant GHG emission reduction impact, reaching 26% reduction from baseline year 2007 levels by 2030, and 50% reduction by 2050. However, these projected reductions fall short of the deeper reductions necessary to achieve the IPCC 1.5° Celsius limit. Our modelling showed that the actions included in this plan (when fully implemented) would achieve the 50% emission reduction target by 2030, and reach effective decarbonisation by 2050.

Extensive modeling indicates that with full implementation of actions within the Strategic Directions set out in this plan, Richmond would slightly exceed its targets, reducing emissions by 52% and 83% in 2030 and 2050 respectively. To be cautious in this regard, we have kept our target citywide GHG emissions reduction to 50% by 2030, and 80% by 2050.

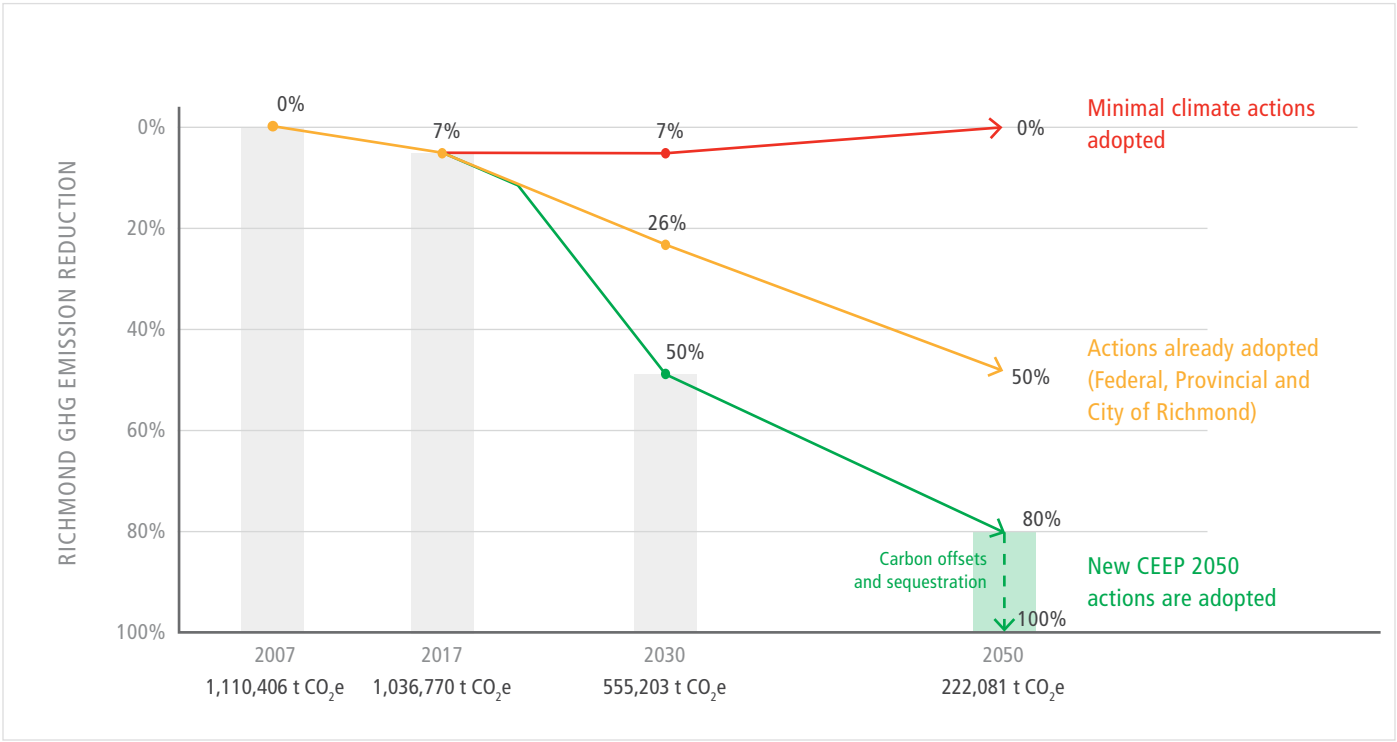


Figure 1 – Current and Projected GHG Emission Reduction Pathways for Richmond

EMISSION REDUCTION TARGETS BY SECTOR

The actions contained in CEEP 2050 further reduce projected GHG emissions in 2030 and 2050. New incentives, clean energy initiatives, and greenhouse gas intensity limits will significantly reduce emissions from new and existing buildings. Significant GHG reductions are projected to result from replacing natural gas heating with electric heat pumps, which combine very high energy efficiency performance with low GHG emissions.

For transportation, the City will advocate for strengthening of Federal vehicle fuel efficiency and Provincial zero emission vehicle sales requirements, while working locally to rapidly expand EV charging opportunities for local residents, workers and visitors, accelerating the shift toward zero emission vehicles.

Under this and other City plans, Richmond will accelerate OCP 2041 targets to 2030 for expansion of sidewalks, crosswalks, and safe and accessible bike paths. The City will also partner with TransLink on improved, zero emission transit service, providing more people with a convenient, low-emission travel option.

Over the coming decade, Richmond's updated Official Community Plan will provide direction on how Richmond's neighbourhoods can become more energy efficient and lower carbon. The City will also continue advancing towards the goal of a zero waste city, further reducing GHG emissions.

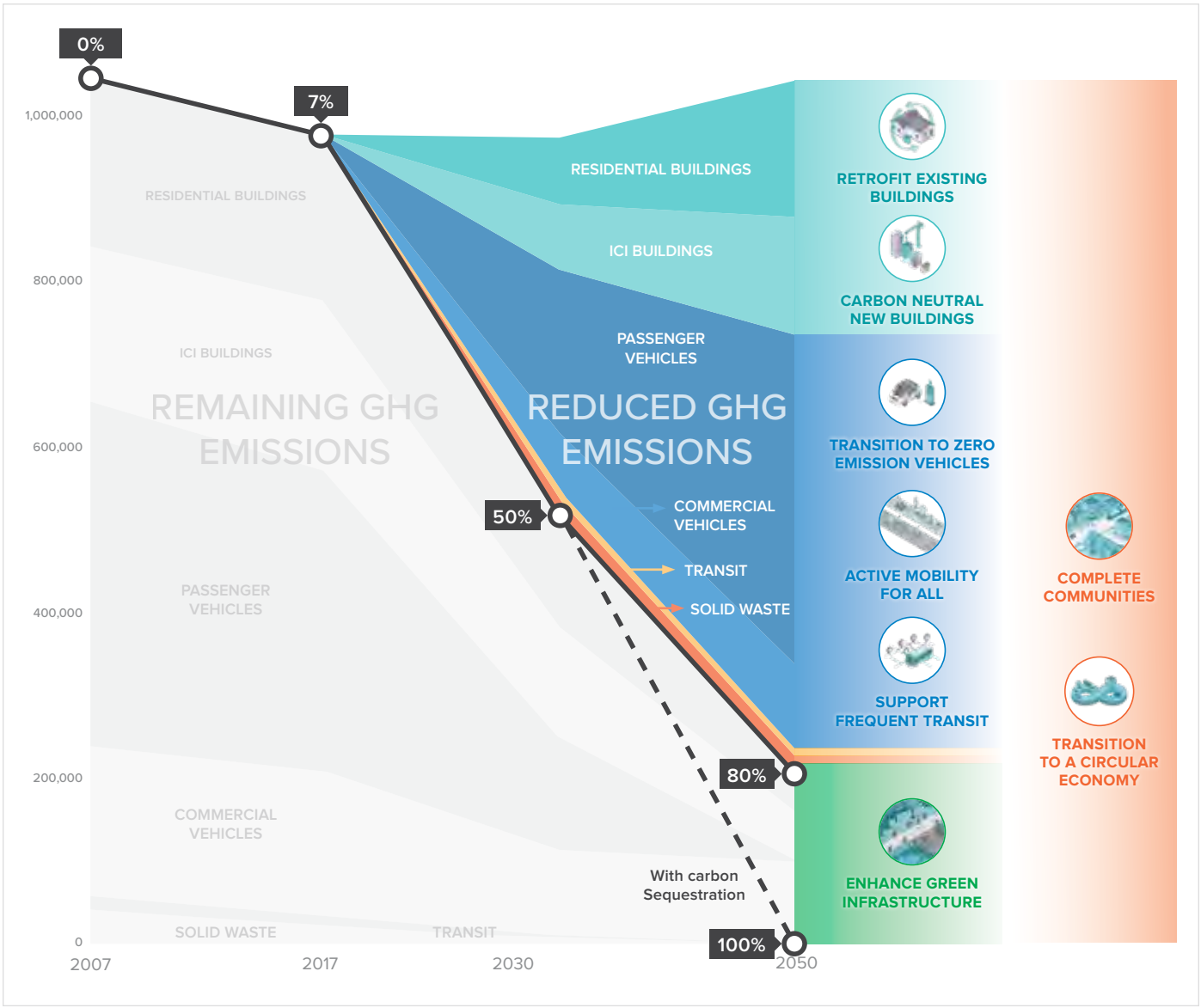


Figure 2 - Sectoral Impact of CEEP 2050 Emission Reduction Strategies from 2007 Baseline

OUR PLAN GOES BEYOND A TYPICAL MUNICIPAL-BASED EMISSIONS REDUCTION PLAN

TYPICAL SCOPE

MUNICIPAL OR TERRITORIAL GHG EMISSION INVENTORIES

ADDRESS CITYWIDE GHG EMISSIONS FROM NEW AND EXISTING BUILDINGS, TRANSPORTATION AND WASTE

Richmond's CEEP 2050 plan includes actions and measures that mitigate greenhouse gas emissions from new and existing buildings, light and heavy-duty transportation, as well as liquid and solid waste. They comprise the emission inventories that local governments in BC (including City of Richmond) report on.

Municipal inventories (see Figure 1) are also used to measure and assess progress in meeting 2030 and 2050 emission reduction targets. These inventories are largely energy-based, reflecting fossil fuels used in moving people and goods within the community, energy to heat buildings and pools, or cook food. Additionally, methane emissions from anaerobic decomposition of waste materials is included in Richmond's municipal GHG emission inventory.

Action on territorial / municipal energy and emissions are largely captured in climate mitigation actions within the first six CEEP 2050 directions.


Retrofit Existing Buildings


Carbon Neutral New Buildings


Transition to Zero Emission Vehicles


Complete Communities


Active Mobility for All


Support Frequent Transit

EXPANDED SCOPE

GHG EMISSIONS FROM MATERIAL FLOW, PRODUCT CREATION AND CONSUMPTION

ADDRESS EMISSIONS FROM THE GOODS AND SERVICES THAT RICHMOND RESIDENTS AND BUSINESSES CONSUME

Our new plan goes beyond territorial emission inventories to consider 'consumption-based' and 'material-based' emissions. This would include GHG emissions from the materials, goods and services that are used or consumed in Richmond by local residents, businesses and organizations, regardless of where these goods are manufactured or produced. This could include food production, consumer and industrial goods, as well as the embedded carbon content in construction materials.

Research conducted by the Ellen MacArthur Foundation estimates that approximately 45% of total global emissions are due to production of consumer and industrial goods, food production as well as the embedded carbon used to create construction materials.

While CEEP 2050 does not quantify consumption and material-based GHG emissions in Richmond, it does have specific policy and program actions identified to mitigate this type of emissions by transitioning from a linear to a circular economy.

A number of recommended actions are also included within this CEEP direction focusing reporting on and reducing the embedded carbon content of construction materials used in buildings and infrastructure.


Transition to a Circular Economy


Carbon Neutral New Buildings

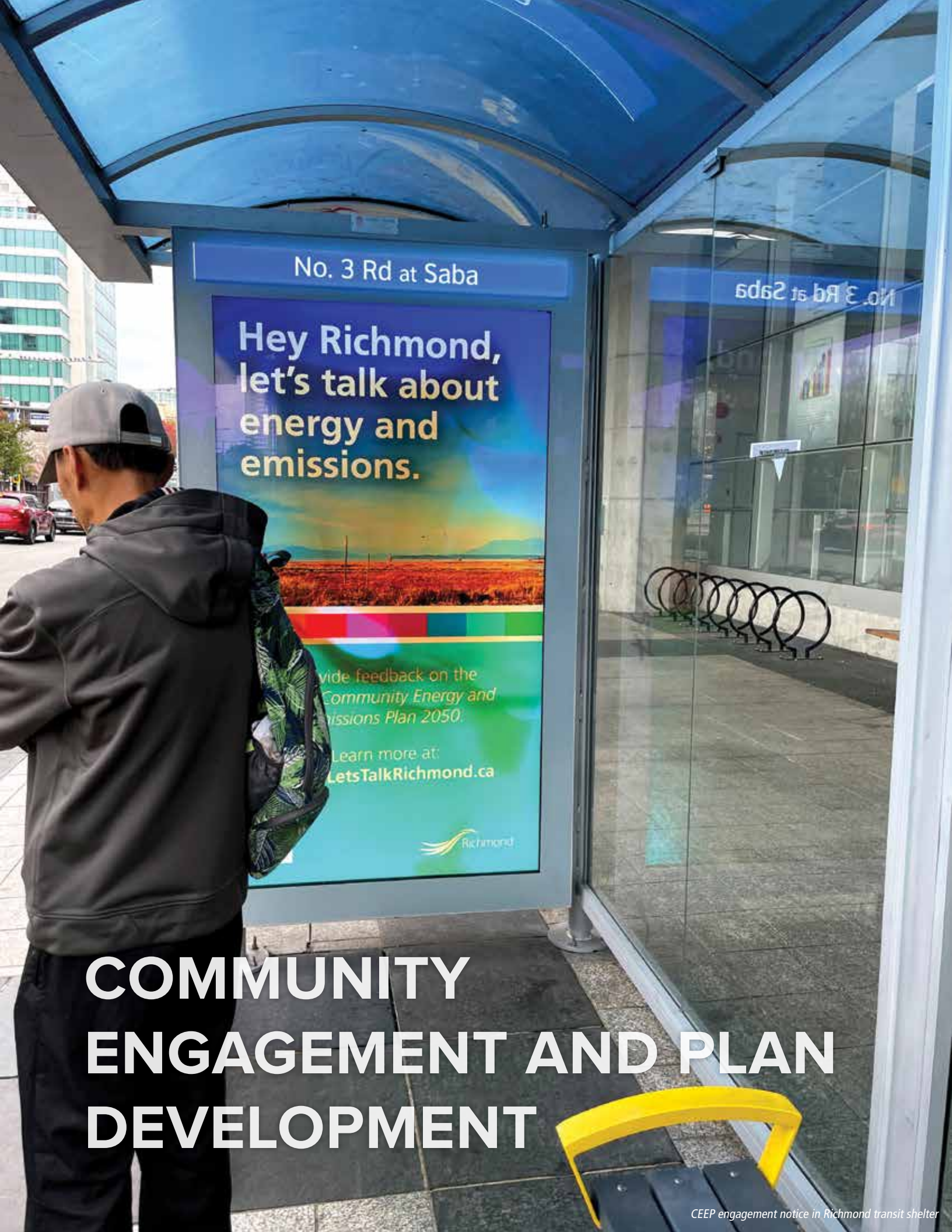
CARBON SEQUESTRATION MEASURES

SEQUESTER EMISSIONS TO FURTHER REDUCE AND OFFSET

As progress is made in significantly reducing emissions from new and existing buildings, transportation and liquid and solid waste, residual emissions from these sectors may prove much harder to fully decarbonize. These emissions could be offset through natural carbon sequestration, or by technological means, such as direct air capture and carbon storage.

CEEP 2050 also seeks to protect large amounts of carbon already stored in our urban forest, and in peat soils and buried shoreline eelgrass beds:


Enhance Green Infrastructure



COMMUNITY ENGAGEMENT AND PLAN DEVELOPMENT

CEEP engagement notice in Richmond transit shelter

COMMUNITY ENGAGEMENT PROCESS

Throughout the Plan development process, the City used a variety of ways to reach out and engage the community, in order to gather input on priority areas of concern, and gain feedback on proposed actions. A summary of surveys, promotion / outreach activities, and community events is summarized in this section. Additionally, each strategic direction includes a summary of what the City heard from our engagement relevant to that direction.

IDEAS PHASE
MAY - AUG 2019

- Identify priority themes and areas of focus for climate action
- Community survey, Ideas Fair at City Hall, community and stakeholder workshops

DIRECTIONS PHASE
SEP - NOV 2019

- Identify 8 Directions to support accelerated climate action, and 6 municipal levers to support implementation of proposed actions
- Community surveys, Directions Fair at City Hall, community and stakeholder workshops

PLAN FINALIZATION
AUG - SEP 2021

- Let's Talk Richmond online engagement (six weeks) on draft plan, and 100+ proposed implementation actions

SURVEY

of people who completed surveys

386	167	222
PHASE 1	PHASE 2	PHASE 3

Age of respondents

2% - Under 18 years old
5% - 18 to 24 years old
12% - 25 to 34 years old
36% - 35 to 54 years old
21% - 55 to 64 years old
23% - Over 65 years old




PROMOTION

To promote our events we...

Used posters and other promotional items available in City facilities, including community centres, libraries, and community service centres

Posted 9 animated social media posts on Facebook, Twitter and Instagram

Published print and digital ads in *Richmond News/Glacier Media, Richmond Sentinel, Ming Pao and Sing Tao, and Pattison Transit Shelter Ads*

Emailed and conducted in-person outreach to stakeholders and community members

Created a Climate Action eNewsletter with 10 issues published and over 300 readers subscribed to date

Gave away bookmarks, bubble tea sets, and reusable straws to invite participants



EVENTS

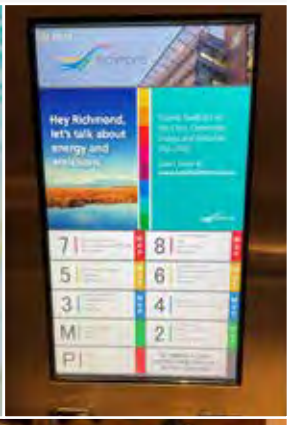
1,000 + people
were engaged in person

At our events...

We facilitated **67** EV test drives

We had the help of **100+** volunteers

14 items were fixed at the Fix-it Station, diverting waste from landfills



We hosted:

3 Major public consultation events
2 Community workshops
12 Presentations to stakeholder groups
9 Days of outdoor summer events (Sustain-a-Buck voting on Plan directions and proposed actions)
4 Youth-oriented Now-Wow-How workshop (highschool), youth focus groups (SFU), input by Sustainabiliteens

STRATEGIC DIRECTIONS AND ACTION PLAN FOR 2030 AND 2050

STRATEGIC DIRECTIONS FOR CLIMATE ACTION

The roadmap to achieve Richmond's deeper GHG emission reduction targets for Richmond by 2030 and 2050 rests on implementing eight strategic directions. Each direction includes multiple actions that support achievement of these targets, and identifies where the City, as well as local residents, businesses, senior levels of government, non-profit organizations, external partners, and the design and development community, can play a lead or supporting role.

CEEP 2050 includes new actions that support the 'major moves to 2030'. They are included within the following strategic directions: Retrofit Existing Buildings, Transition to Zero Emission Vehicles, and Carbon Neutral New Buildings. They build upon progress made in these areas since 2014. Equally necessary to achieving Richmond's accelerated emission reduction targets are actions contained within Complete Communities, Active Mobility for All, Support Frequent Transit, Enhance Green Infrastructure, and Transition to a Circular Economy.

Progress in all eight directions is necessary to achieve our accelerated GHG emission reduction targets. Some actions within these directions are already underway, while others will start in the short term (next 1-3 years). The cumulative impact of other actions will be most evident over the medium to longer term, as new infrastructure is installed, older buildings are retrofitted and renewed, green infrastructure expands and Richmond heads toward a carbon neutral community.

The areas within these strategic directions are rapidly transforming, with new policy and program development underway. Accordingly, some CEEP 2050 actions may evolve over time to reflect the rapid pace of development and innovation that is occurring.

8 STRATEGIC DIRECTIONS FOR ACTION

The emissions targets and actions within each Direction will put Richmond on a path to achieve carbon reduction targets in line with the International Panel on Climate Change (IPCC) 1.5° Celsius global warming limit.

Each strategic direction includes:

- Carbon reduction targets for 2030 and 2050
- Why action is important
- Major actions and sub-actions (100+ in total)

RETROFIT EXISTING BUILDINGS

Accelerate deep energy retrofits to existing residential, institutional, commercial and industrial buildings, and shift to low-carbon heating and cooling using in-building systems or district energy.

TRANSITION TO ZERO EMISSION VEHICLES

Facilitate electrical mobility for all residents and businesses in Richmond, with expanded options for charging at home, at work, and on-the-go for personal electric vehicles, electric car-share, e-bicycles and e-scooters.

CARBON NEUTRAL NEW BUILDINGS

All new buildings will be serviced by low carbon energy systems and built to the top performance level of the BC Energy Step Code by 2027.

COMPLETE COMMUNITIES

Implement OCP and Local Area Plan objectives for compact, complete neighbourhoods throughout Richmond, with a range of services, amenities and housing choices, and sustainable mobility options within a five-minute walk of homes.

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ENHANCE GREEN INFRASTRUCTURE

Maximize the climate benefits of Richmond's green infrastructure by protecting and expanding existing carbon stores in trees, vegetation and soils.

TRANSITION TO A CIRCULAR ECONOMY

Create a Circular Economy in Richmond that maximizes the value of resources by design, responsible consumption, minimized waste and reimagining how resources flow in a sustainable, equitable, low-carbon economy.

LOCAL GOVERNMENT IMPLEMENTATION TOOLKIT

6 TOOLS FOR IMPLEMENTATION

The City of Richmond has six methods or tools to help secure or encourage reductions in greenhouse gas emissions. They can be used individually or together when developing or implementing new programs or policies from the plan.

Different elements of the local government 'toolkit' can be used depending on:

- Specific toolkit lever(s) to advance action
- Relative jurisdiction or level of control by the City
- Resources or investment required

POLICY AND REGULATION

City Council can develop and implement bylaws that set out legal regulations to govern specific activities carried out within the City of Richmond. Provincial legislation sets the areas in which Council has jurisdiction to implement bylaws. The City has the right to enforce adopted bylaws when a bylaw is violated. City Council may also adopt policies setting out standard procedures and priorities that staff and Council can use when evaluating and implementing plans and projects.

COLLABORATION AND PARTNERSHIPS

Local governments may need to partner with provincial or federal governments, or with other agencies to have a sufficient mandate to implement prioritized climate actions. It may be more cost-effective for external agencies or non-governmental associations to implement specific climate actions on behalf of the City, or work with several governments to implement climate actions together.

INFRASTRUCTURE

Local governments design, build and maintain a wide range of physical infrastructure that benefit the residents and economy of the City, including roads, sewers, street lights, electric vehicle (EV) charging facilities and community centres. Local governments also administer important public services for the community including fire protection, police and a range of social services.

ADVOCACY

In some areas, local governments have little or no legal mandate to implement policies or programs to reduce GHG emissions. In these cases, City Council can make formal requests to the provincial and/or federal governments and their agencies on behalf of Richmond residents for policy changes and/or new regulations to be implemented. The City regularly calls on senior levels of government to take greater action on sustainability and climate change issues.

INCENTIVES

City Council can provide incentives to encourage climate action by adjusting the allocation of City resources. Council can adjust the criteria by which the City charges municipal taxes or fees, and/or prioritizes service delivery. Incentives can only provide encouragement, they cannot prevent (or require that) an action be taken. However, well-designed incentives can influence decision makers to choose low-carbon options more often than they would otherwise.

OUTREACH AND CAPACITY BUILDING

Local residents and businesses have sole responsibility for many decisions that affect the amount of GHGs being emitted within Richmond. Local governments can allocate resources to increase awareness of the climate impacts of building design and operations, energy use and transportation choices, and provide information and resources to assist local residents make low-carbon choices.

RETROFIT EXISTING BUILDINGS

STRATEGIC DIRECTION 1 - SUMMARY

RETROFIT EXISTING BUILDINGS

CARBON REDUCTION TARGETS

2030 TARGET

Achieve 70% reduction in GHG emissions from buildings representing 33% of Richmond's total building emissions in 2017.

2050 TARGET

Reduce GHG emissions from buildings built before 2018 by a further 28%, and reduce GHG emissions from buildings built between 2018 and 2030 by 21%.

STRATEGIC DIRECTION

Accelerate deep energy retrofits to existing residential, institutional, commercial and industrial buildings, and shift to low-carbon heating and cooling using in-building systems or district energy.

MAJOR MOVE FOR 2030

CURRENT EMISSIONS IMPACT

Richmond's 33,617 existing buildings emitted 398,000 tonnes of greenhouse gas emissions in 2017 (40% of total community emissions).

WHY ACTION IS IMPORTANT

Retrofitting and decarbonizing a significant proportion of existing buildings in Richmond over the next 10 years is essential to achieve our 2030 GHG emission reduction targets, and build momentum for continued action to 2050. While this represents a challenge in terms of scale of effort, it also offers a clear opportunity to bring benefits to local residents and businesses, with improved energy efficiency and comfort, reduced energy costs, and a boost to the economy.

Space heating is the largest energy use in Richmond's buildings. Greater use of low carbon grid electricity for building heating and cooling would significantly reduce overall emissions. Energy efficient heat pumps will play a big role in the transition to zero emission mechanical systems, and will require the City and partners to develop a comprehensive program to incentivize and accelerate building energy retrofits. As the City's district energy systems mature, there may be opportunities for larger buildings to be retrofitted to connect to the City's low-carbon district heating system.

Through building energy retrofits and low-carbon mechanical system upgrades, this action plan will target the highest GHG-emitting buildings that are expected to remain in use over the next 30 years.

84.9% of survey respondents stated that this Strategic Direction was important to them.

CLIMATE ACTION SUMMARY

As we develop, prioritize and rollout new programs and incentives for existing buildings, ensure that the benefits of lower energy costs and opportunities for healthier, more comfortable and resilient buildings are readily available to all residents, including renters, leaseholders or property owners. *(See page 49 for detailed roadmap of this direction)*

CREATE A RICHMOND BUILDING RETROFIT PLAN

- ☐ Create a comprehensive, multi-year plan to accelerate the retrofit of existing buildings
- ☐ Integrate building, energy and spatial data to identify priority building types and optimal strategies to incent or require low-carbon energy improvements

SET ENHANCED ENERGY AND EMISSION STANDARDS FOR EXISTING BUILDINGS

- ☐ Support timely development and adoption of energy efficiency requirements for retrofitting buildings
- ☐ Implement greenhouse gas (GHG) performance requirements for existing buildings
- ☐ Create a framework that guides the use of renewable natural gas (RNG) for heating in existing buildings

PARTICIPATE IN REGIONAL BUILDING RETROFIT INITIATIVES

- ☐ Deliver a program for strata and rental apartment buildings incenting low-carbon systems and energy improvements focused on occupant health, comfort and affordability
- ☐ Achieve efficiencies of scale in marketing and administering building retrofit programs

CREATE INCENTIVES AND REMOVE BARRIERS TO LOW CARBON ENERGY RETROFITS

- ☐ Explore policy, program and regulatory options to encourage installation of local carbon mechanical systems during building retrofits
- ☐ Develop a heat pump incentive program targeting residential buildings which currently lack mechanical cooling systems
- ☐ Partner with other interested municipalities, Metro Vancouver and the Province to implement a low-interest financing program for building energy retrofits
- ☐ Advocate for energy utility rates that encourage low-GHG building energy retrofits
- ☐ Develop a decarbonisation strategy for affordable housing in partnership with stakeholders

BUILD INDUSTRY SUPPORT AND COMPETENCY FOR LOW CARBON MECHANICAL SYSTEMS

- ☐ Work with equipment suppliers and contractors and utility stakeholders to increase local availability of mechanical systems with a high coefficient of performance
- ☐ Improve building electrification awareness, coordination, and advocacy among key stakeholders

ADVANCE BUILDING ENERGY AND EMISSIONS PERFORMANCE REPORITNG AND DISCLOSURE

- ☐ Advance energy and emissions performance reporting and disclosure requirement for existing buildings

EXTEND DISTRICT ENERGY SERVICE WHERE FEASIBLE

- ☐ Identify where larger existing buildings could be connected to City's district energy system

TRANSITION TO ZERO EMISSION VEHICLES

STRATEGIC DIRECTION 2 - SUMMARY

TRANSITION TO ZERO EMISSION VEHICLES

CARBON REDUCTION TARGETS

2030 TARGET

Reduce GHG emissions from light-duty vehicles 50% below 2017 levels.

Reduce GHG emissions from heavy-duty vehicles 33% below 2017 levels.

2050 TARGET

Reduce GHG emissions from light duty vehicles to 5% of 2017 levels.

Reduce GHG emissions from heavy duty vehicles to 13% of 2017 levels.

STRATEGIC DIRECTION

Facilitate electrical mobility for all residents and businesses in Richmond, with expanded options for charging at home, at work, and on-the-go for personal electric vehicles, electric car-share, e-bicycles and e-scooters.

MAJOR MOVE FOR 2030

CURRENT EMISSIONS IMPACT

Greenhouse gases (GHGs) emitted by cars, light and heavy-duty trucks accounted for 57% of Richmond's total emissions in 2017.

WHY ACTION IS IMPORTANT

Reducing vehicle use through active modes (walking, rolling, cycling) and public transit is an important strategy for meeting our climate goals, while providing reduced transportation costs for residents and businesses, and positively contributing to health and quality of life. For these reasons, it continues to be a focus of the City's transportation strategy.

Transitioning to zero emission vehicles complements this approach, and will help to dramatically reduce transportation emissions to near zero by 2050. Since most of BC's electricity comes from clean energy sources, electric vehicles (EVs) are a highly effective strategy at reducing community emissions, emitting approximately 97% less GHGs than equivalent internal combustion vehicles.

84.6% of survey respondents stated that this Strategic Direction was important to them.

CLIMATE ACTION SUMMARY

Ensure that access to electric vehicle (EV) charging is readily available at home, at work and on-the go throughout Richmond. Incentive programs should prioritize support for retrofitting existing multi-unit rental and strata buildings to enable Level 2 EV charging at home. *(See page 53 for detailed roadmap of this direction)*

EXPAND PUBLIC ELECTRIC VEHICLE CHARGING OPPORTUNITIES

- ☐ Build out a network of public electric vehicle (EV) charging stations at civic facilities in Richmond to accelerate rate of local EV adoption
- ☐ Create mobility hubs with EV charging stations near transit stations, within neighbourhood service centres and at community centres
- ☐ Support curbside EV charging stations in areas where residents are less likely to be able to charge at home, and encourage car share providers to electrify and expand their fleets

EXPAND ELECTRIC VEHICLE CHARGING OPPORTUNITIES ON PRIVATE PROPERTY

- ☐ Extend current residential EV charging requirements to include visitor and car-share parking stalls
- ☐ Establish light-duty EV charging requirements for parking stalls in new commercial and industrial development
- ☐ Support an EV Charging Retrofit Advisor program for existing multi-unit residential buildings
- ☐ Collaborate with other local governments to advocate for passage of provincial 'right-to-charge' legislation
- ☐ Support homeowners wanting to implement Level 2 EV charing at home

ENCOURAGE ZERO EMISSION VEHICLE ADOPTION

- ☐ Advocate for low GHG emission requirements for ride-hailing services
- ☐ Increase public awareness of, and support for, car-sharing and electric mobility
- ☐ Support implementation of Provincial zero emission vehicle sales requirements and advocate for further improvements
- ☐ Work with partners to accelerate transition of heavy duty vehicles to zero emission fuels and/or battery electric power.

ENCOURAGE LOWER EMISSIONS FROM INTERNAL COMBUSTION ENGINE VEHICLES

- ☐ Support continued implementation and further improvement to Federal vehicle fuel efficiency regulations

CARBON NEUTRAL NEW BUILDINGS

STRATEGIC DIRECTION 3 - SUMMARY

CARBON NEUTRAL NEW BUILDINGS

CARBON REDUCTION TARGETS

2030 TARGET

Achieve 70% low-carbon energy supply for heating and cooling in district-energy-connected buildings in Richmond.

New buildings permitted as of 2027 (not connected to district energy) will consume 50% less energy and emit two-thirds less GHGs than new buildings permitted in 2018.

2050 TARGET

Incrementally reduce the embedded carbon content of materials used in the construction of new buildings in Richmond, by developing a cross-sector, regional framework that sets maximum embedded carbon intensity limits.

Reduce the GHG intensity of district-energy-connected buildings to 85% below the 2017 emission-intensity of natural gas heated buildings.

STRATEGIC DIRECTION

All new buildings will be serviced by low carbon energy systems and built to the top performance level of the BC Energy Step Code by 2027.

MAJOR MOVE FOR 2030

CURRENT EMISSIONS IMPACT

On any given year, newly constructed buildings have a comparatively small impact on total community greenhouse gas emissions relative to emissions from the entire stock of existing buildings in Richmond. But over a period of time, new buildings can represent a growing source of emissions, which means that improving their energy efficiency and carbon performance is one of the 'major moves' in achieving our 2030 GHG emission reduction target.

WHY ACTION IS IMPORTANT

As a growing City, Richmond is expecting to add more than 28,000 new housing units during the next 20 years. New buildings can be a large source of greenhouse gas (GHG) emissions, primarily from space heating and hot water supply. Therefore, the overall energy efficiency of a building is critical, as is the transition toward mechanical (HVAC) systems powered by low-carbon energy.

Provincial and National building codes are moving toward 'near zero' energy performance standards for new buildings (like Net Zero Energy Ready and the Passive House standard). Nationally, this target is set for 2030, with 2032 being the target for the BC Building Code. What this means is that by the start of the 2030s, all new buildings will be so efficient (thermal envelope and mechanical systems) that they could be net zero on an annual basis, with the addition of future on-site renewable energy, or connection to neighbourhood-scale clean energy systems. As a leading municipality, the City of Richmond intends to effectively achieve this target by 2027 via the BC Energy Step Code, with requirements implemented in our Building Regulation Bylaw in 2025, subject to future approval by City Council.

84.9% of survey respondents stated that this Strategic Direction was important to them.

CLIMATE ACTION SUMMARY

As new development occurs, advance equity and affordability in the community by ensuring the benefits of lower energy costs and healthier, more comfortable and resilient buildings are readily available to all residents, whether you are a renter or property owner. New buildings that are low carbon and highly energy efficient ensures occupants reap the benefits of improved energy security and quality of construction. *(See page 56 for detailed roadmap of this direction)*

ACCELERATE TRANSITION TO THE TOP LEVEL OF BUILDING PERFORMANCE

- ☐ Support the construction of flagship high-performance, low-carbon buildings in Richmond
- ☐ Support training on designing, constructing and commissioning of high performance buildings
- ☐ Accelerate use of low-embedded carbon content materials in new construction

SUPPORT CONTINUOUS IMPROVEMENT TO THE BC ENERGY STEP CODE

- ☐ Support ongoing improvements to Energy Step Code regulation and performance standards
- ☐ Advocate for adoption of emission intensity (GHGI) targets that local governments can reference in tandem with the Energy Step Code
- ☐ Ensure good practices in mechanical equipment design, installation and commissioning

ADVANCE IMPLEMENTATION OF LOW CARBON ENERGY SYSTEMS IN NEW CONSTRUCTION

- ☐ Raise awareness of the benefits of building electrification
- ☐ Maximize low carbon energy in new construction
- ☐ Assess the feasibility of using Renewable Natural Gas (RNG) for residual or peak heating needs in new buildings
- ☐ Encourage local availability of low-carbon domestic hot water and space heating systems with a high coefficient of performance

IMPLEMENT BUILDING ENERGY AND EMISSIONS PERFORMANCE REPORTING AND DISCLOSURE

- ☐ Build capacity and momentum for a mandatory energy and emissions reporting requirement for new buildings

EXPAND LOW CARBON DISTRICT ENERGY SYSTEMS

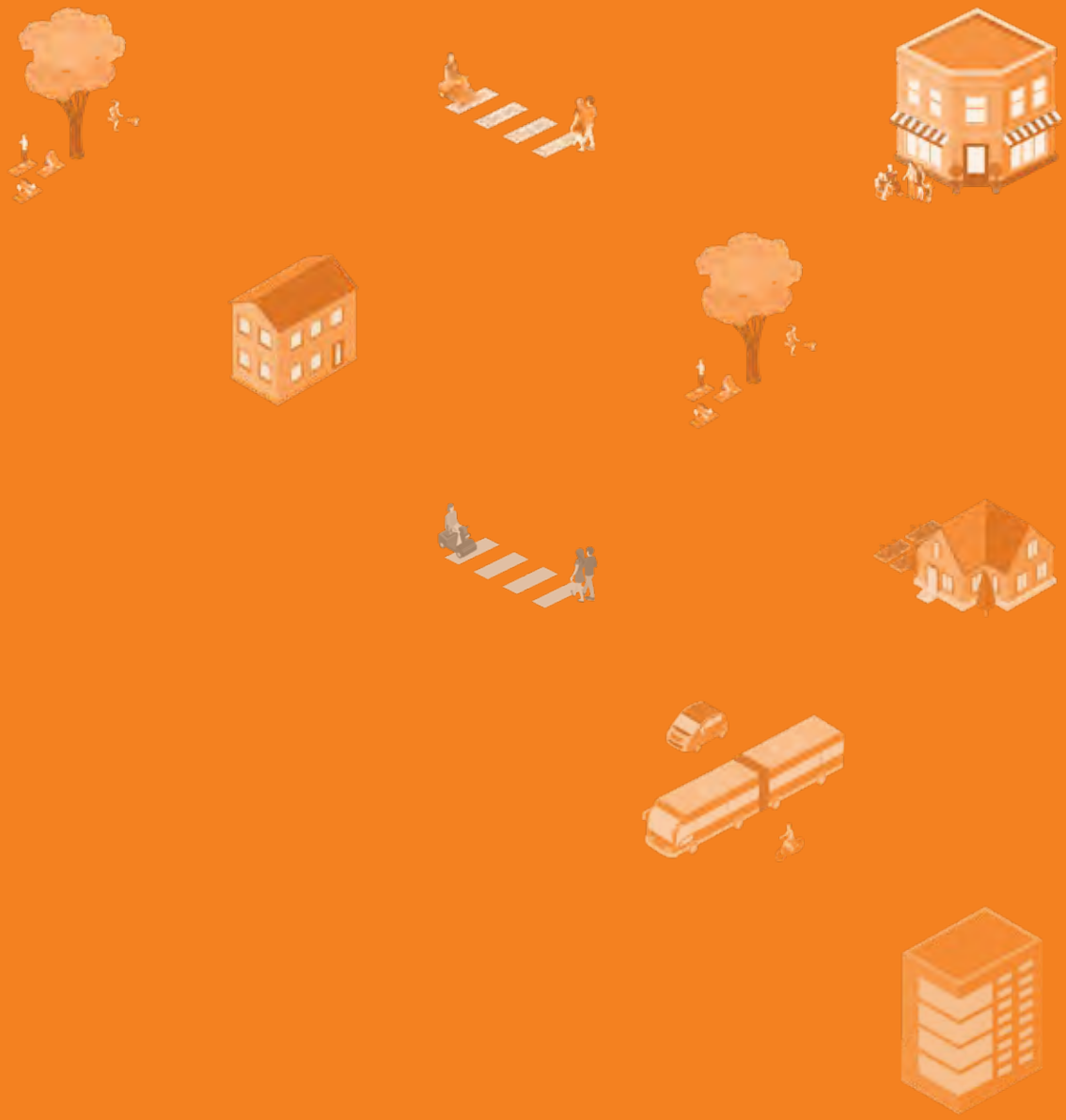
- ☐ Continue expansion of City's low carbon district energy systems and explore new opportunities outside existing district energy service areas

ENCOURAGE ON-SITE RENEWABLE ENERGY

- ☐ Encourage cost-effective on-site renewable energy generation in new construction

ACCELERATE ADOPTION OF LOW GLOBAL WARMING POTENTIAL TECHNOLOGIES

- ☐ Support local certification of promising new building technologies not yet certified in Canada
- ☐ Encourage Provincial and Federal governments to enact more stringent regulation related to high global warming potential (GWP) coolants and technologies



COMPLETE COMMUNITIES

STRATEGIC DIRECTION 4 - SUMMARY

COMPLETE COMMUNITIES

CARBON REDUCTION TARGETS

2030 TARGET

Achieve Richmond's OCP travel mode-split targets for both active mobility and transit by 2030.

2050 TARGET

Ensure 90% of Richmond residences are within 400 metres (5 minute walk / roll) of transit, and no more than 1,600 metres from a neighbourhood mobility hub.

STRATEGIC DIRECTION

Implement OCP and Local Area Plan objectives for compact, complete neighbourhoods throughout Richmond, with a range of services, amenities and housing choices, and sustainable mobility options within a five-minute walk of homes.

CURRENT EMISSIONS IMPACT

Urban form has significant influence on the amount of energy used by transportation as well as heating and cooling of buildings. Policies in Richmond's Official Community Plan (OCP) and City Centre Area Plan encourage compact development and have facilitated the extension of high-frequency rapid transit to Richmond, helping the City reduce overall greenhouse gas (GHG) emissions since 2007, even with continued population growth and economic expansion.

WHY ACTION IS IMPORTANT

Richmond's Official Community Plan is a key policy tool for implementing sustainable land use and transportation objectives expressed in this Plan, making our city less car reliant, more people-focused, and healthier. Carbon reduction objectives for complete communities are also supported by successful implementation of recommended actions within three Strategic Directions: Carbon Neutral New Buildings, Active Mobility for All, and Support Frequent Transit.

Compact development policies within our OCP and area plans are critical to achieving the types of land uses that support low- or zero-emission travel modes and energy efficient buildings. Having a wider range of services and amenities closer to home is strongly influenced by land use policies set in these plans, facilitating easy access by transit or active travel modes.

Neighborhood mobility hubs offer an integrated range of pedestrian-friendly transportation options such as public transit, cycling, e-scooter and car-share facilities, as well as taxi and ride hailing services and public electric vehicle charging. These hubs may also offer secure bicycle storage and repair services. By design, mobility hubs are well integrated with surrounding land uses, making everyday "first-to-last kilometre" journeys easy and sustainable.

85.7% of survey respondents stated that this Strategic Direction was important to them.

CLIMATE ACTION SUMMARY

Policies that promote compact development create a range of benefits: residents become healthier as walking and rolling becomes easier within and between neighbourhoods, and the air is cleaner along quieter and safer roads. Complete communities support social equity, diversity, and inclusion when policies are used to encourage a broad range of housing solutions and choices within neighbourhoods.

Accessible, low-cost and sustainable travel options such as walking/rolling and cycling, using e-bikes/e-scooters, and public transit support equity and fairness objectives by providing quick and easy access to local services and amenities. *(See page 60 for detailed roadmap of this direction)*

APPLY A CLIMATE LENS AS RICHMOND'S OCP AND LOCAL AREA PLANS ARE IMPLEMENTED

- ☐ Assess the impacts on energy use and greenhouse gas (GHG) emissions as new local area plans are introduced, and when there are amendments or updates to the Official Community Plan (OCP)
- ☐ Work to achieve a net reduction of community GHG emissions as new development occurs and transportation infrastructure is replaced or extended

ENHANCE CHOICES FOR HOUSING AND SERVICES WITHIN NEIGHBOURHOODS

- ☐ Encourage the development of compact and complete communities with a wide range of housing options throughout Richmond, as per OCP direction
- ☐ Determine the land use and transportation policy implications of an increased number of residents working from home

ACTIVE MOBILITY FOR ALL

STRATEGIC DIRECTION 5 - SUMMARY

ACTIVE MOBILITY FOR ALL

CARBON REDUCTION TARGETS

2030 TARGET

Increase walk / roll trips to reach 18% of all trips taken.

Increase bicycle ridership and micro-electric mobility to reach 10% of all trips taken.

2050 TARGET

Increase walk / roll trips to reach 25% of all trips taken.

Increase bicycle ridership and micro-electric mobility to reach 15% of all trips taken.

STRATEGIC DIRECTION

Prioritize active transportation with investments in walking, rolling and cycling infrastructure that is safe, connected, easy to navigate, and accessible.

CURRENT EMISSIONS IMPACT

No greenhouse gas (GHG) emissions are emitted from active mobility, so it can have a major role in reducing transportation emissions, by providing an easy and convenient alternative to driving to a destination.

WHY ACTION IS IMPORTANT

Active mobility is zero or near zero emission by definition, as no fossil fuels are required to walk, cycle or roll, and electric scooters and e-bikes use BC's low-GHG electric grid to recharge batteries. Active modes are also simple, cheap and highly effective for shorter-distance trips. They can make up the majority of trips in compact, complete communities, where most destinations are close by. While these journeys are short, the avoided GHG emissions on a daily basis add up over time, which has a direct, positive impact on the environment and mitigates climate change, not to mention the health benefits that can be gained.

To make active mobility attractive, the City can provide safe and convenient infrastructure such as wider sidewalks and curb cuts, pedestrian activated crossing signals, comprehensive network of separated bike lanes, bike-share stations and plenty of racks to safely park your bicycle at destination points.

87.5% of survey respondents stated that this Strategic Direction was important to them.

CLIMATE ACTION SUMMARY

Ensuring that nearby destinations in our community are easy and convenient to walk, roll or cycle to makes active modes of travel readily available for all ages and abilities. This plan supports active mobility because it is inclusive and participatory, supports a healthier community, and is affordable to the user. *(See page 61 for detailed roadmap of this direction)*

ACCELERATE CITYWIDE USE OF ACTIVE TRANSPORTATION

- ☐ Prioritize walking, rolling and cycling as a preferred way to travel in Richmond
- ☐ Allocate annual capital funding for active transportation infrastructure sufficient to achieve Official Community Plan (OCP 2041) mode share targets by 2030

REDUCE BARRIERS TO ACTIVE TRANSPORTATION WITHIN NEIGHBOURHOODS

- ☐ Expand existing walking and rolling connectivity within and between neighbourhoods
- ☐ Identify opportunities for creating walking and rolling connections between non-connecting streets

ENGAGE RICHMOND RESIDENTS ON ACTIVE TRANSPORTATION

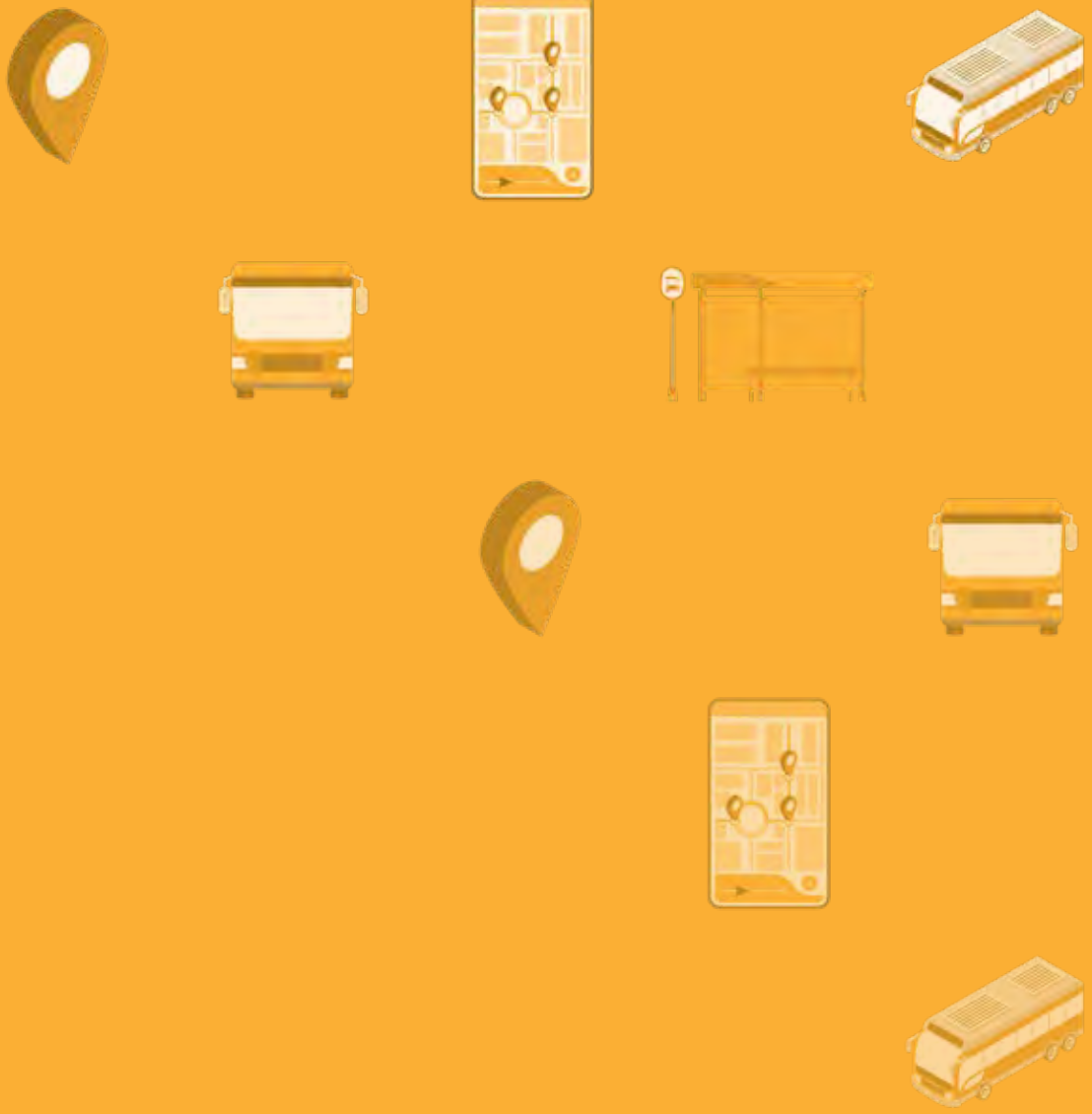
- ☐ Expand active transportation programs and services (e.g. shared e-bike and e-scooter services) in Richmond

MAKE ACTIVE TRANSPORTATION THE CONVENIENT CHOICE FOR SHORTER TRIPS

- ☐ Ensure there are supportive land uses along transit routes so that active transportation is a convenient choice for shorter trips
- ☐ Maintain and expand investments in walking, rolling and cycling infrastructure within City Centre and within 400 metres of Neighbourhood Service Centres
- ☐ Maintain and expand investments in walking, rolling and cycling infrastructure within a 400 metre pedestrian catchment zone along Frequent Transit Network (FTN) routes

SET PARKING STANDARDS TO SUPPORT SUSTAINABLE TRAVEL OPTIONS

- ☐ Establish further reductions for parking space requirements in new development, where appropriate
- ☐ Explore options to enable the conversion of parking spaces within existing buildings to support active transportation



SUPPORT FREQUENT TRANSIT

STRATEGIC DIRECTION 6 - SUMMARY

SUPPORT FREQUENT TRANSIT

CARBON REDUCTION TARGETS

2030 TARGET

Increase transit mode share to reach 22% by 2030.

2050 TARGET

Increase transit mode share to reach 27% by 2050.

STRATEGIC DIRECTION

Work with TransLink to increase transit service frequency and foster wider use of transit by implementing and upgrading transit stops that are well integrated with active transportation (walking/rolling, cycling) and with car-sharing networks.

CURRENT EMISSIONS IMPACT

Greenhouse gas (GHG) emissions from all TransLink operations across Metro Vancouver increased 5% between 2014 and 2018, but with increased ridership, GHGs emissions per boarded passenger declined 14% over the same period.

WHY ACTION IS IMPORTANT

For medium to longer distance trips, public transit is an essential strategy to reduce GHG emissions from transportation. Public transit is much more energy-efficient (on a per-person basis) than the use of private automobiles. Traveling on a diesel bus, rather than driving a conventional internal combustion vehicle, reduces carbon emissions per kilometre by 50%, while taking rapid transit (Canada Line or SkyTrain) or a battery electric-powered bus can reduce travel emissions by up to 99%.

Metro Vancouver has lower GHG emissions than most other public transit systems in North America due to comparatively high ridership levels, and because more than half of TransLink's fleet uses lower-GHG fuels and grid electricity, including compressed natural gas, hybrid diesel-electric buses and electric trolley buses.

In 2018, the TransLink board committed to have its fleet and operations run on 100% renewable energy by 2050. TransLink is now testing battery electric buses for use in Metro Vancouver, as well as hydrogen fuel cells.

91.1% of survey respondents stated that this Strategic Direction was important to them.

CLIMATE ACTION SUMMARY

Public transit's role as an essential service is well recognized, but it also plays a key role in providing an affordable, inclusive and low-emission mode of travel. Making transit a convenient choice for longer trips (over 4 km) means it has to be frequent (at least 15 minute from morning to evening), and provide a safe and comfortable experience. The City is working closely with TransLink to achieve these objectives, so that residents of all ages and abilities can conveniently reach their destinations without having to use a vehicle. *(See page 64 for detailed roadmap of this direction)*

ENSURE TRANSIT-SUPPORTIVE LAND USE

- ☐ Ensure supportive land use along high frequency transit routes so that transit is a convenient choice for most longer trips over four kilometres
- ☐ Increase the range of housing types, supply and tenure close to frequent transit

INCREASE TRANSIT PROVISION AND SERVICE IMPROVEMENTS

- ☐ Facilitate expansion of high-frequency local and regional transit service with TransLink
- ☐ Work with TransLink to introduce rapid bus service on frequent transit routes and other transit service improvements identified in the Southwest Area Transport Plan

ENCOURAGE HIGHER TRANSIT RIDERSHIP

- ☐ Reduce barriers to transit by investing in supportive, accessible, people-friendly infrastructure

SUPPORT TRANSITION TO 100% ZERO EMISSION TRANSIT

- ☐ Expand battery electric bus service and implement e-bus charging facilities within Richmond

ENGAGE RESIDENTS ON TRANSIT SERVICE AND MOBILITY HUB IMPROVEMENTS

- ☐ Engage residents on transit service and mobility hub improvements and benefits

ENHANCE GREEN INFRASTRUCTURE

STRATEGIC DIRECTION 7 - SUMMARY

ENHANCE GREEN INFRASTRUCTURE

CARBON REDUCTION TARGETS

2030 TARGET

By 2030, measures have been identified and initiated to sequester 20% of Richmond's current annual GHG emissions (approximately 200,000 tonnes of carbon dioxide equivalent CO_2 per year by 2050).

2050 TARGET

By 2050, Richmond can verifiably show that 200,000 tonnes of CO_2 have been sequestered or directly removed from the atmosphere annually, as a city-wide carbon 'buffer' equal to 20% of Richmond's annual emissions in base year 2007.

STRATEGIC DIRECTION

Maximize the climate benefits of Richmond's green infrastructure by protecting and expanding existing carbon stores in trees, vegetation and soils.

CURRENT EMISSIONS IMPACT

It is estimated that below-ground soils in Richmond collectively store the equivalent of 7.7-million tonnes of carbon dioxide (CO_2). Protecting the carbon stored in our soils (peatland and saltwater marsh habitat in particular) will prevent large amounts of sequestered carbon from being released into the atmosphere, and contributing to global warming. Protecting and enhancing the trees and vegetation within our parks and farmland, as well as the 'urban forest' along our streets and within our neighbourhoods, will contribute a modest offset to annual greenhouse gas (GHG) emissions.

WHY ACTION IS IMPORTANT

Green infrastructure refers to natural and built biological environments that provide functions similar to traditional civic infrastructure. Green infrastructure can enhance Richmond's resiliency and adaptability to climate change by managing and filtering stormwater, reducing 'urban heat island' effects, improving local air quality, and supporting biodiversity.

Richmond's green infrastructure also includes its soils, agricultural areas with peatland soils, and the saltwater marshlands of Sturgeon Banks, which already contain large amounts of sequestered carbon. Carbon-smart land management has potential to sequester additional CO_2, thereby helping reduce the City's net emissions. Keeping Richmond's natural 'carbon bank' intact is an important way to limit unwanted release of GHG emissions.

The target for 2050 implies that once significant emissions have been reduced from new and existing buildings, encouraging sustainable travel options, decarbonizing mobility and reducing waste, some remaining emissions will still need to be offset to achieve the City's net zero emissions goal. Residual emissions in Richmond could be annually offset using a combination of natural carbon sequestration as well as the use of technological means, such as direct air capture systems and carbon storage as these technologies mature and become cost-effective.

89.4% of survey respondents stated that this Strategic Direction was important to them.

CLIMATE ACTION SUMMARY

Protecting and enhancing our urban tree canopy, and ecosystems within Richmond's parks and shoreline provides wider access and enjoyment of natural systems for local residents. While taking measures to protect the existing stock of sequestered carbon in Richmond, the City is also committed to ensuring that our natural areas are accessible for all ages and abilities. *(See page 66 for detailed roadmap of this direction)*

EXPAND RICHMOND'S URBAN TREE CANOPY

- ☐ Achieve a robust, long-term urban forest on public and private land

PROTECT EXISTING STOCKS OF SEQUESTERED CARBON

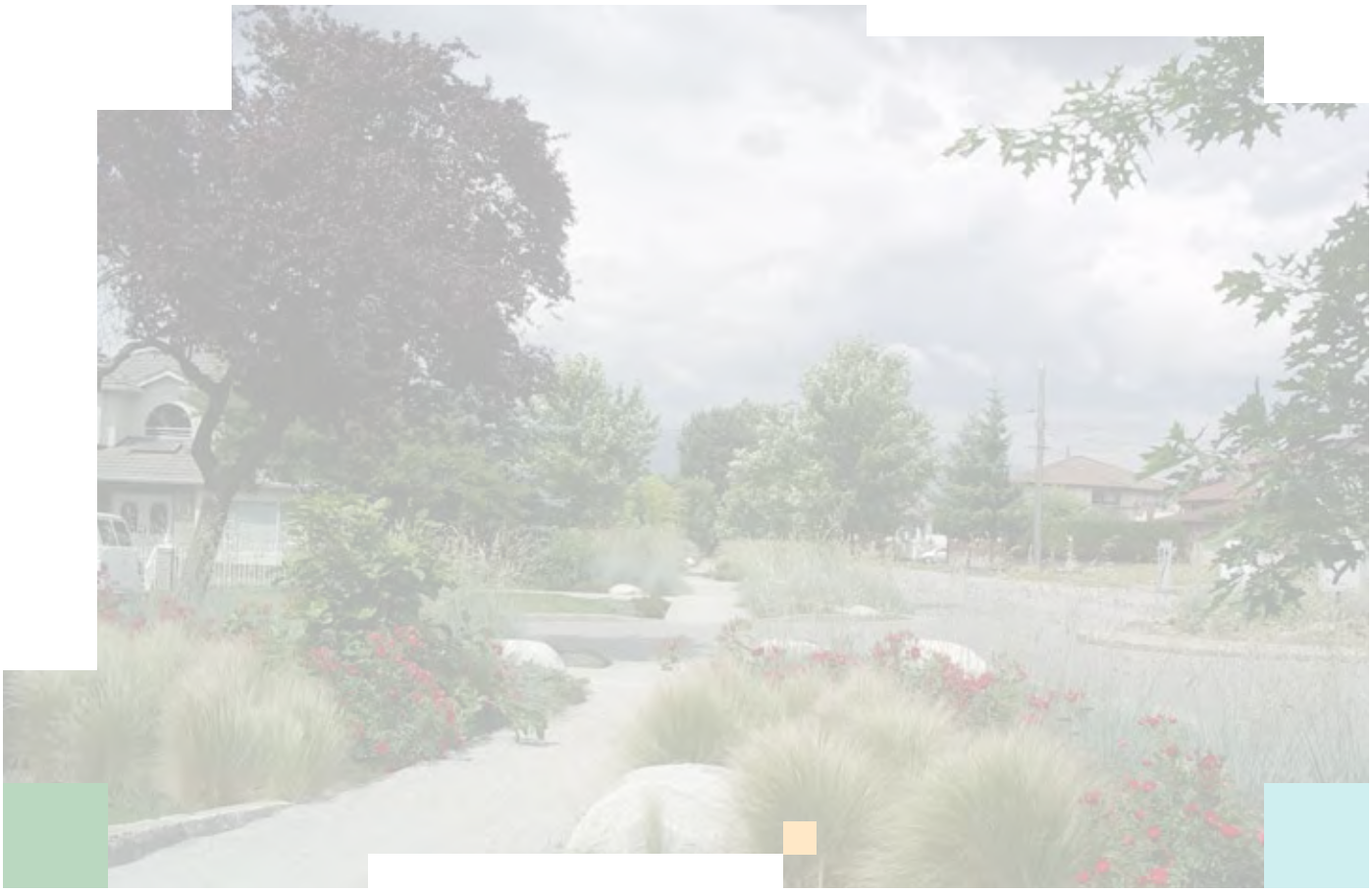
- ☐ Implement citywide strategy and actions to preserve Richmond's natural carbon stores

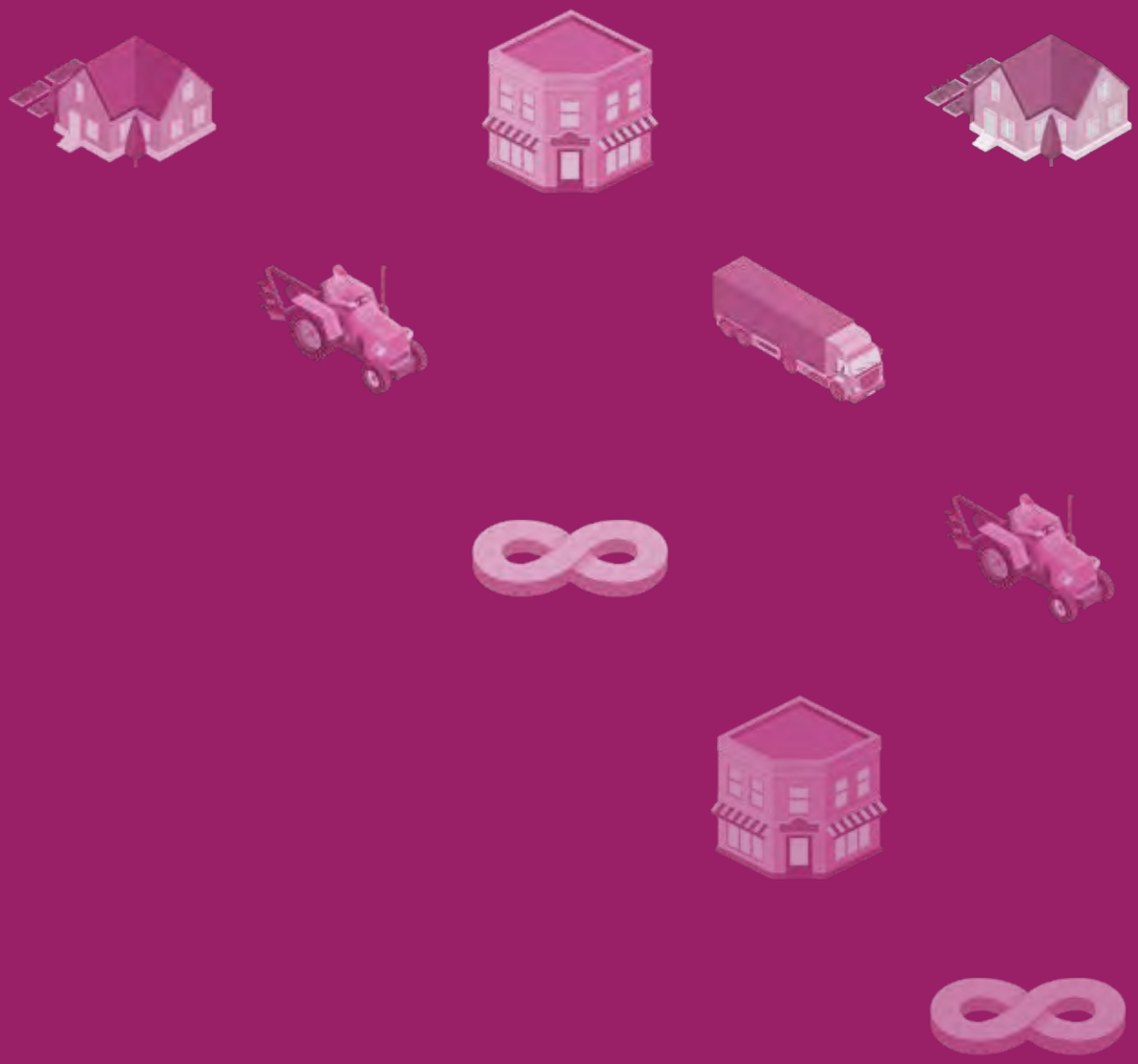
PROMOTE SUSTAINABLE REUSE OF SOIL AND WASTE BIOMASS

- ☐ Consider opportunities to use agricultural waste as biomass fuel, partnering with the Agricultural Land Reserve (ALR) and Kwantlen Polytechnic University
- ☐ Assess potential to preserve Richmond soils for use as future agriculture, in partnership with developers and landowners

PLAN NOW TO SCALE UP CARBON SEQUESTRATION AND OFFSETS IN RICHMOND

- ☐ Develop a strategy to achieve up to 200,000 tonnes of carbon dioxide (CO_2) equivalent carbon sequestration annually by 2050





TRANSITION TO A CIRCULAR ECONOMY

STRATEGIC DIRECTION 8 - SUMMARY

TRANSITION TO A CIRCULAR ECONOMY

CARBON REDUCTION TARGETS

2030 TARGET

By 2030, the City of Richmond's Circular Economy Strategy is fully deployed, with innovation being demonstrated by the City and local businesses in material use, waste and emission reduction from manufacturing, transporting and retailing of products and services.

2050 TARGET

By 2050, the City of Richmond is a fully circular city.

STRATEGIC DIRECTION

Create a Circular Economy in Richmond that maximizes the value of resources by design, responsible consumption, minimized waste and re-imagining how resources flow in a sustainable, equitable, low-carbon economy.

CURRENT EMISSIONS IMPACT

Greenhouse gas (GHG) emissions from the management of liquid and solid waste in Richmond constituted 2.2% of municipal emissions in 2017. But these statistics only incorporate direct emissions such as methane emissions from anaerobic decomposition of waste. From a Circular Economy perspective, the production, transportation, and retailing of products used by consumers and businesses are responsible for a significantly larger amount of carbon emissions from sectors of the economy that extend beyond municipal waste management.

WHY ACTION IS IMPORTANT

Globally, 45% of carbon emissions originate from the production of vehicles, consumer goods and food, as well as construction materials used in buildings. Traditional product development uses a linear 'take-make-waste' approach.

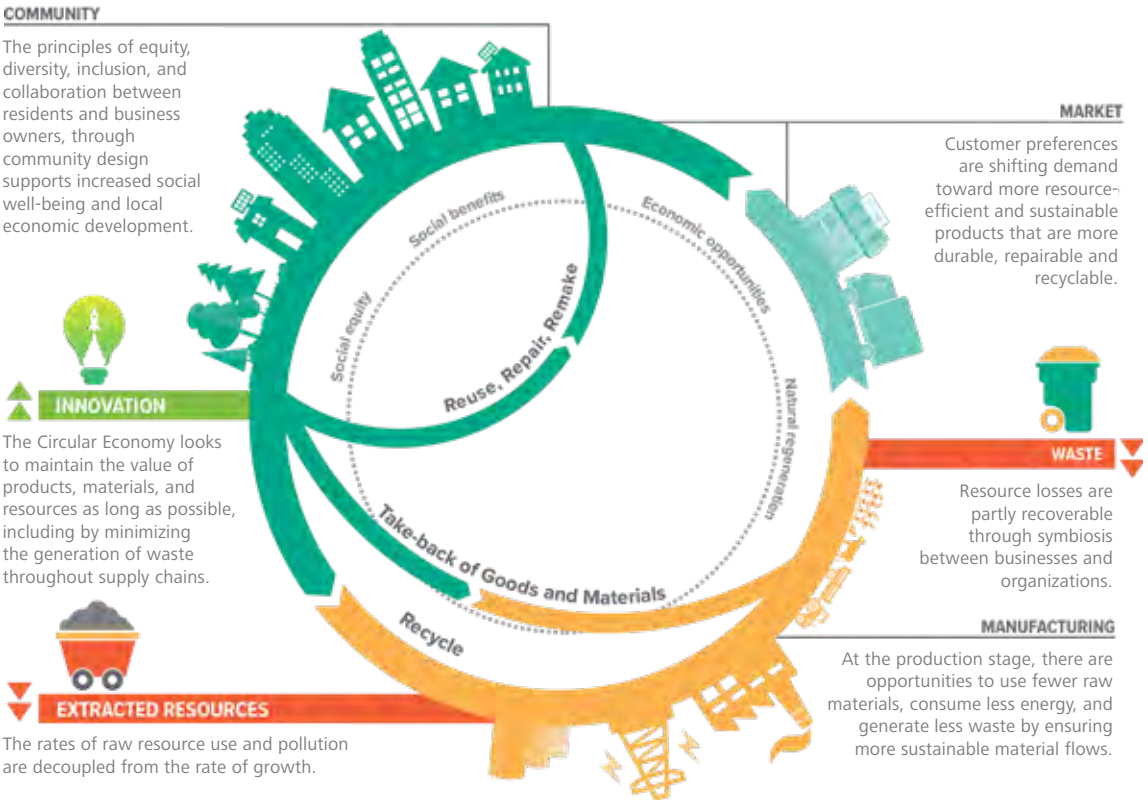
LINEAR ECONOMY MODEL: TAKE - MAKE - USE - DISPOSE

By contrast, the Circular Economy maximizes value, and reduces or eliminates waste by transforming how products and services are designed, manufactured and used. Innovation is used to extend the lifespan of products and materials, reduce or eliminate emissions, and conserve natural resources. A comprehensive response to climate change considers the vast potential of a Circular Economy to reduce greenhouse gas emissions.

78.6% of survey respondents stated that this Strategic Direction was important to them.

The City of Richmond's vision for circular economy is to maximize the value of resources, by design, through responsible consumption, minimizing waste and re-imagining how resources flow in a sustainable, equitable, low-carbon economy.

The Circular Economy (CE) emerges as a counterpoint to the linear model. CE combines economic growth with a development cycle that preserves and enhances natural capital, optimizes resource production and minimizes risk through the management of limited resources. The loops inside the circle show how organizations and enterprises can reduce production costs and losses, generate new sources of revenue and reduce their dependence on natural raw materials.



CLIMATE ACTION SUMMARY

Transitioning to a fully Circular Economy represents a massive transformation in the production and use of materials and energy, with significant opportunities for longer-lived goods, elimination of waste and pollution, and an open doorway to re-think processes and innovate. The City is committed to a successful and fair transition for local enterprises and organizations, and is supporting this through direct engagement, idea-sharing and knowledge-building. *(See page 68 for detailed roadmap of this direction)*

ADVANCE IMPLEMENTATION OF CIRCULAR ECONOMY INITIATIVES BY CITY OF RICHMOND

- ☐ Integrate Circular Economy principles into the City's corporate plans, processes and standards to lead by example

SUPPORT IMPLEMENTATION BY RESIDENTS

- ☐ Inspire residents to participate in the Circular Economy and accelerate demand for products derived from circular processes

SUPPORT IMPLEMENTATION BY BUSINESSES

- ☐ Accelerate adoption of Circular Economy approaches by the private sector in the design, manufacture and retooling of products and services

TRANSITION TO LOW EMBODIED CARBON CONSTRUCTION MATERIALS

- ☐ Accelerate the use of construction materials with low embodied carbon content

ADDITIONAL ENABLING ACTIONS

ADDITIONAL ENABLING ACTIONS

CEEP 2050 also identifies four enabling actions that would support progress on implementation actions in more than one Strategic Direction. A rationale for each enabling action is summarized below, and Attachment 1 includes additional detail associated with each enabling action.

1. ENSURE REGULAR PROVISION OF MUNICIPAL GREENHOUSE GAS EMISSION INVENTORIES

To assess year-by-year progress on reducing greenhouse gas emissions and associated targets, local governments will need consistent and reliable community-wide inventories. These inventories will need to be available to all local government jurisdictions in BC. In 2008, the Provincial government created the Community Energy and Emissions Inventory (CEEI) to provide municipal energy and emissions data to every local government in BC. While CEEI inventories were completed in 2007, 2010 and 2012, inadequate resourcing has prevented the Province from completing inventories in subsequent years.

PROPOSED CLIMATE ACTION

ENSURE REGULAR PROVISION OF MUNICIPAL GREENHOUSE GAS EMISSION INVENTORIES

- ☐ Increase Provincial resources to provide annual or bi-annual reporting of municipal greenhouse gas inventories for all local government jurisdictions in British Columbia.

2. SUPPORT REGION-WIDE DELIVERY OF CLIMATE ACTION PROGRAMS

Many local governments within the Greater Vancouver Regional District (including City of Richmond) have adopted accelerated GHG emission reduction targets in line with the International Panel on Climate Change target of limiting global average warming to no more than 1.5 degrees Celsius. All of these local governments face similar challenges and opportunities presented by accelerated climate action, particularly for programs and incentives. Therefore, it makes sense to work together and pool resources. There may be considerable opportunities to increase the cost-effectiveness of local government programs for building retrofits, low-carbon new buildings and EV charging by enabling municipalities in Metro Vancouver to jointly deliver these initiatives across the region over a number of years. Currently, Metro Vancouver cannot administer a program longer than a 12-18 month period. Richmond can address this barrier by proposing the adoption of a service establishment bylaw by the Metro Vancouver Board to enable climate action programs by the region.

PROPOSED CLIMATE ACTION

ENABLE REGION-WIDE DELIVERY OF CLIMATE ACTION PROGRAMS

- ☐ Extend the mandate of Metro Vancouver Regional District to enable cost-effective, regional delivery of climate action programs, in cooperation with member municipalities.

3. REDUCE EMISSIONS FROM PORTABLE GENERATORS AND GAS-POWERED EQUIPMENT

Fuel switching to low-carbon electric power is an effective approach in BC for significantly reducing greenhouse gas emissions, as well as health-impacting common air contaminants like carbon monoxide, nitrous oxide, sulphur dioxide, volatile organic compounds and fine particulates that result when burning fossil fuels.

The performance of batteries and small motors has now increased to the point that the dominant type of landscaping equipment sales are toward quieter and lighter plug-in equipment, or may have the additional feature of being able run solely by battery power. Policies or programs to accelerate a transition to electrified lawn equipment would also reduce carbon emissions and other pollutants, thereby improving air quality. For larger electric generators used in locations not accessible to the electric grid, portable gas or diesel generators were typically the only option. This is changing fast, with mobile units supplying higher-capacity batter power now readily available.

Metro Vancouver Regional District has a legislated mandate to protect air quality by regulating sources of contaminants, and has adopted GHG reduction targets at the regional level. Staff will work with Metro Vancouver to explore demonstration opportunities and policy measures to reduce greenhouse gas and air emissions from portable generators and gas-powered small equipment.

PROPOSED CLIMATE ACTION

REDUCE EMISSIONS FROM PORTABLE GENERATORS AND GAS-POWERED EQUIPMENT

- ☐ Assess program, regulatory and technical options to encourage transition from fossil fuel-powered generators and handheld equipment to zero emission electric power.

4. SUPPORT PROVINCIAL COMMITMENT TO 100% CLEAN ELECTRICITY DELIVERY STANDARD

Most of the GHG emission reduction opportunities identified in this plan rely on shifting from fossil fuels to low-GHG emission electricity. In 2021, the CleanBC Roadmap to 2030 is committed BC to a 100% clean electricity delivery standard for BC Hydro, which may come into effect in 2030.

The average GHG intensity of the electricity consumed in British Columbia is very low compared to most jurisdictions around the world. However, depending upon the year, it may be three to four times higher than the official GHG intensity value set by the Province for planning and reporting purposes. This can complicate assessment of actual GHG reductions achieved through electrification. This enabling action advocates for a consistent downward track for remaining emission intensity of grid electricity in BC, and BC Hydro should begin work as soon as possible on a clean electricity delivery standard.

PROPOSED CLIMATE ACTION

ENSURE PROVINCIAL COMMITMENT TO 100% CLEAN ELECTRICITY DELIVERY STANDARD

- ☐ Advocate for a clean electricity delivery standard to guarantee grid electricity with a reliable zero-GHG emission intensity no later than 2030.

IMPLEMENTATION ROADMAP

IMPLEMENTATION ROADMAP

The eight strategic directions set out in the Community Energy and Emissions Plan 2050 include multiple actions that together enable Richmond to fully achieve accelerated GHG emission reduction targets for 2030 and 2050. This includes 77 primary actions and 199 related implementation steps within this plan.

These will build upon progress resulting from leadership actions and measures implemented under the previous plan (CEEP 2014), as well as more recent policy targets, and regulatory standards initiated by the Province of BC and Federal Government up to 2020, such as the BC Energy Step Code, Zero Emission Vehicles sales targets (Provincial), and minimum vehicle fuel efficiency (Federal).

ACTIONS

One or more primary actions grouped within an overall action objective. Primary actions are numbered according to the order of appearance within the Strategic Direction

TOOLKIT

Indication of the municipal toolkit levers most relevant to advance action

IMPLEMENTATION

Implementation steps (sub-actions) that support the primary action

RESOURCES

Indication of the relative level of resources (time, dollars, effort) required to advance action

MAJOR MOVE FOR 2030

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
EXPAND RICHMOND'S URBAN TREE CANOPY			
Achieve a robust, long-term urban forest on public and private land [7.1.1]		Implement the Public Tree Management Strategy (adopted by Council, November 2019)	• • •
EQUITY OPPORTUNITY		Develop a city-wide urban forest management strategy for private land, as part of Richmond's Environmental Management Strategy	• •
PROTECT EXISTING STOCKS OF SEQUESTERED CARBON			
Implement citywide strategy and actions to preserve Richmond's natural carbon stores [7.2.1]		Identify policy and regulatory options to protect carbon already stored within Richmond soils, peatlands and urban tree canopy, and investigate additional sequestration opportunities.	•
		Maintain and enhance water table levels on City-owned central wetlands to preserve carbon stored in peat soils, partnering with the Federal Government and Province of BC.	• • •

EQUITY OPPORTUNITY

As emission reduction programs, policies and other actions are developed, the plan seeks to achieve an equitable transition on the journey to net zero emissions in Richmond. CEEP 2050 identifies actions that could be particularly strong levers to advance equity, fairness and inclusion during implementation.

MAJOR MOVE FOR 2030

Following formal adoption of CEEP 2050, all eight strategic directions will be implemented in tandem. However, making progress on actions within Carbon Neutral New Buildings, Retrofit Existing Buildings, and Transition to Zero Emission Vehicles is particularly critical over the next ten years to meet our 2030 emissions reduction target of 50% from 2007 levels.

IMPLEMENTATION APPROACH

The following four key attributes inform our approach to plan implementation.

OPPORTUNISTIC AND STRATEGIC

Achievement of deep emission reductions by 2030, and full decarbonisation by 2050, will require a scale-up of activity. Staff will take advantage of new opportunities, partnerships and collaborations that may arise over the years, with respect to new Federal and Provincial funding programs, expanded regulatory mandates, and emergence of 'break-through' technologies and approaches.

A ROADMAP, NOT A WORK PLAN

CEEP 2050 it is not a detailed, phased work plan. Rather it is a roadmap, with a sufficient level of guidance and definition so that action can begin immediately, while allowing flexibility to further refine or modify plan actions as opportunities arise, as well as develop detailed work plans as needed.

RESOURCES TO MATCH AMBITION

We will need to assemble resources sufficient to match the scale of effort required by the plan. This includes identifying sources of external or partner funding, creating dedicated operating budgets for initiatives that span several years, including additional level funding requirements. Increased competency and knowledge capacity for sectors related to building electrification and decarbonisation should receive high priority.

EQUITABLE TRANSITION TO ZERO CARBON

Our plan acknowledges the opportunity to address inequities by ensuring that new policies, programs and incentives are inclusive and broadly available. It also recognizes that the negative impacts of climate change are not equitably felt, and that vulnerability to these effects is often higher for indigenous people and First Nations, visible minorities, low-income households, women, seniors, new Canadians and persons with disabilities.

CENTERING EQUITY IN PLAN IMPLEMENTATION

A significant proportion of climate mitigation actions (37 actions out of 77) within the CEEP 2050 Implementation Roadmap are identified as particularly good opportunities to advance equity, fairness, wellness and inclusion in Richmond during implementation of that action. These are flagged within the Roadmap tables that follow.

To support implementation, a short checklist has also been developed to assist City staff and partner organizations in creating well thought-out and impactful programs, policies, infrastructure development, new regulation and engagement approaches that achieve Richmond's accelerated GHG emission reduction targets. The following table contains points to consider when designing and implementing climate action, with the objective of centering equity as actions are resourced and rolled out.

CONSIDERATIONS FOR IMPLEMENTATION ACTIONS	SUPPORTIVE CITY POLICIES AND INITIATIVES
1. Adopt an integrated, co-creative approach when designing the implementation action 2. Identify who is being targeted or served by the action, as well as supportive partners and allies 3. Understand the direct and indirect impacts of the proposed action 4. Identify groups that are the most vulnerable to the negative impacts of climate change 5. Consider the contextual factors experienced by groups / populations targeted by the action 6. Determine a meaningful, culturally appropriate engagement approach that considers Richmond's diverse population and languages when building awareness about new programs 7. Engage and encourage participation by under-represented groups 8. Build capacity by outlining how the action can support and empower vulnerable populations 9. Design the implementation action so that the benefits are broadly available, and that the action is intended to target those who are at risk of the negative impacts of climate change, or are underrepresented in climate action programs 10. Integrate spatial analysis and data analytics to help target climate action in Richmond, by identifying areas of highest need / vulnerability 11. Define steps to nurture effective, long-term relationships 12. Ensure that the implementation action supports a sustained relationship of mutual respect, trust and reconciliation with local First Nations and indigenous people ***NOTE:*** *Further guidance on the above can be accessed through the Canadian Urban Sustainability Practitioners (CUSP) Network, as well as Urban Sustainability Directors Network (USDN). See: A Guidebook on Equitable Clean Energy Program Design for Local Governments and Partners (USDN, 2018)*	When implementing strategies and actions from CEEP 2050, consideration should be given to the priority the City has placed on advancing social inclusion, and responding to the evolving needs of Richmond's diverse population. Creating a cross-departmental team with a commitment integrating equity into plan actions can also assist in this regard. The following City strategies and plans should also be reviewed to help inform plan implementation: • Energy Poverty Toolkit for Low-Income Households and Service Providers (forthcoming in 2022) • Cultural Harmony Plan 2019-2029 • Official Community Plan 2041 • Social Development Strategy 2013-2022 • Community Wellness Strategy 2018-2023 • Resilient Economy Strategy • Affordable Housing Strategy 2017-2027 • Volunteer Management Strategy 2018-2021 • Parks and Open Space Strategy 2022 • Homeless Strategy 2019-2029 • Collaborative Action Plan to Reduce and Prevent Poverty in Richmond 2021-2031

RETROFIT EXISTING BUILDINGS

IMPLEMENTATION ROADMAP

MAJOR MOVE FOR 2030

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
CREATE A RICHMOND BUILDING RETROFIT PLAN			
Create a comprehensive, multi-year plan to accelerate the retrofit of existing buildings [1.1.1] *EQUITY OPPORTUNITY*		Set an overall 2030 GHG reduction target for each major building archetype in Richmond	•
		Identify building types prioritized for retrofit initiatives and develop effective means of incenting or requiring low-carbon energy retrofits for these buildings	••
		Seek approval for a new staff role to develop and activate Richmond's building retrofit program	•••
		Create a five-year implementation plan for a building retrofit program, including annual capital and operating funding requirements. [Integrated with regional programs in 1.3]	•••
Integrate building, energy and spatial data to identify priority building types and optimal strategies to incent or require low-carbon energy improvements [1.1.2] *EQUITY OPPORTUNITY*		Build upon data analysis and geospatial emissions forecasting completed in developing CEEP 2050, and seek opportunities to utilize new spatial visualization and data analysis tools to support implementation of the building retrofit plan	••
		Integrate data on social equity, housing need and energy poverty with other geospatial building attributes to identify areas of highest need and inform City policies and programs	••
SET ENHANCED ENERGY AND EMISSION STANDARDS FOR EXISTING BUILDINGS			
Support timely development and adoption of energy efficiency requirements for existing buildings [1.2.1]		Participate in the Province-led process to develop the BC Building Alteration Code by 2024	••
		Advocate for mechanical system retrofit design requirements in the proposed BC Building Alteration Code	•
		Once available, adopt the BC Building Alteration Code into local bylaws and enforce compliance	•••
Implement greenhouse gas (GHG) performance requirements for existing buildings [1.2.2]		Advocate for Provincial opt-in GHG performance requirements for existing buildings	•
		Adopt future BC Building Code emissions performance requirements into Richmond Building Regulation Bylaw when available	•
Create a framework that guides the use of renewable natural gas (RNG) for heating in existing buildings [1.2.3]		Work with FortisBC and other partners to identify regulatory mechanism to ensure use of RNG over the full lifespan of natural gas devices	•

Policy and Regulation

Infrastructure

Incentives

Collaboration and Partnerships

Advocacy

Outreach and Education

RESOURCES

• Low

•• Medium

••• High

IMPLEMENTATION ROADMAP

MAJOR MOVE FOR 2030

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
PARTICIPATE IN REGIONAL BUILDING RETROFIT INITIATIVES			
Design and deliver a program for strata and rental apartment buildings incenting low-carbon heating systems and energy improvements focused on occupant health, comfort and affordability [1.3.1] *EQUITY OPPORTUNITY*		Partner with utilities and interested municipalities in Metro Vancouver to develop a program for long-term delivery	•••
		Work in partnership to identify incentives and secure funding for the program	••
		Work in partnership to promote and engage landlords, property managers and strata councils in this program	•
Achieve efficiencies of scale in marketing and administering building retrofit programs [1.3.2]		Partner with other local governments to advance a regional climate action through a Service Establishment Bylaw for Metro Vancouver	••
		Work with Metro Vancouver and member municipalities to jointly implement regional building retrofit programs where appropriate	•
CREATE INCENTIVES AND REMOVE BARRIERS TO LOW CARBON ENERGY RETROFITS			
Explore policy, program and regulatory options to encourage installation of local carbon mechanical systems during building retrofits [1.4.1]		Support Development Applications and Building Approvals staff on regulatory review of building mechanical systems	•
		Collaborate with local governments and BC Hydro to identify and implement best practice standards for permitting heat pumps, so as to ensure that permitting processes for heat pumps are not a barrier to increased implementation of heat pump systems	•
Develop a heat pump incentive program targeting residential buildings which currently lack mechanical cooling systems [1.4.2] *EQUITY OPPORTUNITY*		Create an inventory for Richmond of residential buildings that do not have mechanical cooling	•••

Policy and Regulation
Infrastructure
Incentives
Collaboration and Partnerships
Advocacy
Outreach and Education

RESOURCES
• Low
•• Medium
••• High

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
Partner with other interested municipalities, Metro Vancouver and the Province to implement a low-interest financing program for building energy retrofits [1.4.3]	Policy and Regulation, Collaboration and Partnerships, Advocacy	Partner with other interested municipalities and/or Metro Vancouver to encourage the Province to implement PACE enabling legislation	••
	Policy and Regulation, Collaboration and Partnerships	Partner with other interested municipalities and/or Metro Vancouver to design a regional-scale building retrofit financing program that achieves efficiencies of scale	••
	Policy and Regulation, Collaboration and Partnerships	Partner with other interested municipalities and/or Metro Vancouver to provide cost-efficient program delivery of a building retrofit financing program	••
	Incentives, Collaboration and Partnerships	Partner with other interested municipalities and/or Metro Vancouver to jointly launch and promote the building retrofit financing program	•••
	Incentives, Collaboration and Partnerships	Partner with other interested municipalities and/or Metro Vancouver to secure needed funding for a building retrofit financing program	••
Advocate for energy utility rates that encourage low-GHG building energy retrofits [1.4.4]	Policy and Regulation, Collaboration and Partnerships	Support efforts by the Province and BC Hydro to implement revised electrical rates that encourage low-GHG building retrofits	••
		Advocate that BC Hydro revise electricity connection and upgrade fees to encourage low-GHG building energy retrofits	•
Develop a decarbonisation strategy for affordable housing in partnership with stakeholders [1.4.5] *EQUITY OPPORTUNITY*	Advocacy	Advocate for regular increases to the Provincial Carbon Tax, with the burden of increased fuel costs minimized for low-income households	•
	Policy and Regulation, Collaboration and Partnerships, Advocacy	Work with the Province, utilities and other stakeholders to ensure that all British Columbians can participate in and benefit from building electrification	••
	Policy and Regulation, Infrastructure, Incentives	Implement financing mechanisms to assist building electrification for low-income and affordable housing sectors	•••
BUILD INDUSTRY SUPPORT AND COMPETENCY WITH LOW CARBON MECHANICAL SYSTEMS			
Work with equipment suppliers and contractors and utility stakeholders to increase local availability of mechanical systems with a high coefficient of performance [1.5.1]	Collaboration and Partnerships, Advocacy, Outreach and Education	Work with HVAC and heat pump equipment manufacturers, suppliers and contractors to increase the availability of high-performance heat pumps in BC	••
	Collaboration and Partnerships, Advocacy	Participate in a stakeholder coalition to advocate for building electrification and track implementation	•
	Outreach and Education	Support a messaging campaign to HVAC industry to gear up for heat pump sales and installation	••
Improve building electrification awareness, coordination, and advocacy among key stakeholders [1.5.2]	Collaboration and Partnerships, Outreach and Education	Partner with municipalities, Province of BC, and Thermal Comfort Association of BC to increase industry knowledge and capacity on heat pumps	••
	Outreach and Education	Promote implementation of heat pump systems by distributing information to building owners and managers	•

Policy and Regulation
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Outreach and Education

RESOURCES
• Low
•• Medium
••• High

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
ADVANCE BUILDING ENERGY AND EMISSIONS PERFORMANCE REPORTING AND DISCLOSURE			
Advance energy and emissions performance reporting and disclosure requirements for existing buildings [1.6.1]		Advocate for a Provincial requirement that owners of commercial, institutional, and multi-unit residential buildings annually measure, report, and/or disclose energy usage and greenhouse gas emissions for their properties	•
		Require homebuilders to disclose at sale the energy-efficiency performance of homes to prospective buyers using an 'energy score'	•
		Richmond to annually report energy use and greenhouse gas emissions for civic buildings	•
EXTEND DISTRICT ENERGY SERVICE WHERE FEASIBLE			
Identify where larger existing buildings could be connected to City's district energy system [1.7.1]		Conduct a feasibility study to identify potential buildings and develop a business case	• •
		Provide new district energy service or local shared low-carbon heating and cooling infrastructure to identified buildings	• • •
		Encourage larger existing buildings that have a hydronic space heating system to connect to district energy when the current mechanical system is near replacement	• •

Policy and Regulation

Infrastructure

Incentives

Collaboration and Partnerships

Advocacy

Outreach and Education

RESOURCES

• Low

• • Medium

• • • High

TRANSITION TO ZERO EMISSION VEHICLES

IMPLEMENTATION ROADMAP

MAJOR MOVE FOR 2030

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
EXPAND PUBLIC ELECTRIC VEHICLE CHARGING OPPORTUNITIES			
Build out a network of public electric vehicle (EV) charging stations at civic facilities in Richmond to accelerate rate of local EV adoption [2.1.1]	Policy and Regulation	Secure funding for priority 'on the go' EV charging locations	••
	Infrastructure	Implement and maintain public EV charging stations	•••
EQUITY OPPORTUNITY	Policy and Regulation	Identify optimal locations for the City's public EV charging network as EV ownership and access to private EV charging expands	•
Create mobility hubs with EV charging stations near transit stations, within neighbourhood service centres and at community centres [2.1.2]	Policy and Regulation	Develop guidelines for the provision of mobility hubs as part of a Transportation Demand Management (TDM) strategy within new developments	••
	Infrastructure	Implement additional mobility hubs in Richmond as funding and development opportunities arise.	••
EQUITY OPPORTUNITY			
Support curbside EV charging stations in areas where residents are less likely to be able to charge at home, and encourage car share providers to electrify and expand their fleets [2.1.3]	Policy and Regulation	Assess projected demand for 'at home' EV charging in Richmond neighbourhoods to identify areas that could benefit from public EV charging	•
	Infrastructure + Collaboration and Partnerships	Implement curbside public EV charging stations as a demonstration project within City Centre in partnership car share providers	••
EQUITY OPPORTUNITY	Infrastructure + Collaboration and Partnerships	In partnership with car share providers, identify other locations in Richmond where curbside charging would benefit EV owners unable to charge at home	••
EXPAND ELECTRIC VEHICLE CHARGING OPPORTUNITIES ON PRIVATE PROPERTY			
Extend current residential EV charging requirements to include visitor and car-share parking stalls [2.2.1]	Outreach and Education	Create a 'how to' guide for retrofitting existing visitor and car-share parking stalls with Level 2 EV charging capability	••
Establish light-duty EV charging requirements for parking stalls in new commercial and industrial development [2.2.2]	Policy and Regulation	Develop Zoning Bylaw requirements for Level 2 EV charging infrastructure for visitor and workforce parking stalls	••
EQUITY OPPORTUNITY			

Policy and Regulation
Infrastructure
Incentives
Collaboration and Partnerships
Advocacy
Outreach and Education

RESOURCES
• Low
•• Medium
••• High

IMPLEMENTATION ROADMAP

MAJOR MOVE FOR 2030

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
Support an EV Charging Retrofit Advisor program for existing multi-unit residential buildings [2.2.3] *EQUITY OPPORTUNITY*		Partner with interested municipalities to develop a project scope and implementation plan for a regional EV Charing Advisor program for strata and rental apartment buildings	• •
		Work in partnership to identify incentives and secure funding for a regional-scale program	• •
		Work in partnership to launch and promote the new program, and engage strata councils	• • •
		Review policy, regulatory and program options to incentivize retrofit of existing parking spaces with EV charging capability	•
		Explore the City's ability to reduce the per-unit cost of electrical transformer upgrades in multi-unit residential, such as aggregating EV retrofit upgrades in adjacent buildings	•
Collaborate with other local governments to advocate for passage of provincial 'right-to-charge' legislation [2.2.4] *EQUITY OPPORTUNITY*		Work with Province of BC on regulatory support for residents in existing strata and rental apartment buildings so they can charge their vehicle at home	•
Support homeowners wanting to implement Level 2 EV charging at home [2.2.5]		Create how-to guides and bulletins on installing Level 2 EV charging in existing single-family, semi-detached homes, and townhouses	•

Policy and Regulation
Infrastructure
Incentives
Collaboration and Partnerships
Advocacy
Outreach and Education

RESOURCES
• Low
• • Medium
• • • High

IMPLEMENTATION ROADMAP

MAJOR MOVE FOR 2030

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
ENCOURAGE ZERO EMISSION VEHICLE ADOPTION			
Advocate for low-GHG requirements in ride-hailing services [2.3.1]	Advocacy	Work with other local governments to advocate for changes to Provincial regulations on ride-hailing services	•
	Policy and Regulation	Review regulatory options for local governments to require low-emission ride-hailing services within Richmond	•
Increase public awareness of, and support for, car-sharing and electric mobility [2.3.2]	Collaboration and Partnerships	Partner with organizations advocating use of low-carbon vehicles (e.g. Emotive, TransLink, car-share providers, Fraser Basin Council)	••
	Outreach and Education	Promote and distribute information on electric vehicles	•
Support implementation of Provincial Zero Emission Vehicle (ZEV) sales requirements, and advocate for further improvements [2.3.3]	Collaboration and Partnerships, Advocacy	Work with Metro Vancouver and other local governments to support continued implementation of, and improvements to, the BC ZEV sales mandate under the BC Zero-Emission Vehicles (ZEV) Act	•
	Collaboration and Partnerships, Advocacy	Work with Metro Vancouver and other local governments to advocate that BC adopt the California Air Resources Board (CARB) sales requirements for heavy-duty ZEVs	•
Work with partners to accelerate transition of heavy duty vehicles to zero emission fuels and/or battery electric power [2.2.4]	Policy and Regulation, Collaboration and Partnerships	Conduct technical review of electric and other low-carbon fuel options (i.e., hydrogen, renewable natural gas, and other biofuels)	•
	Policy and Regulation, Collaboration and Partnerships	Work with Metro Vancouver and other local governments to advance low-carbon fuel and EV charging infrastructure, as well as regulatory measures on land use to support this transition	•
	Infrastructure, Incentives	Position City of Richmond as an early adopter and innovator by participating in a local pilot project supporting heavy-duty zero emission vehicles	•••
ENCOURAGE LOWER EMISSIONS FROM INTERNAL COMBUSTION ENGINE VEHICLES			
Support continued implementation and further improvements to Federal vehicle fuel-efficiency regulations [2.4.1]	Advocacy	Work with Metro Vancouver and other local governments to support continued implementation and further improvements to Federal Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations	•
	Advocacy	Work with Metro Vancouver and other local governments to support continued implementation and further improvements to Federal Heavy-duty Vehicle and Engine Greenhouse Gas Emission Regulations	•

Policy and Regulation
Infrastructure
Incentives
Collaboration and Partnerships
Advocacy
Outreach and Education

RESOURCES
• Low
•• Medium
••• High

CARBON NEUTRAL NEW BUILDINGS

IMPLEMENTATION ROADMAP

MAJOR MOVE FOR 2030

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
ACCELERATE TRANSITION TO THE TOP LEVEL OF BUILDING PERFORMANCE			
Support the construction of flagship high-performance, low-carbon buildings in Richmond [3.1.1] *EQUITY OPPORTUNITY*	Incentives	Continue to develop incentives to drive construction of low-carbon buildings to the top level of the Energy Step Code (i.e., Passive House / Net Zero Energy Ready)	• •
	Collaboration and Partnerships, Incentives	Partner with local governments and organizations to develop a regional high-performance incentive program, with targeted incentives and support for new affordable housing	• • •
	Collaboration and Partnerships, Outreach and Education	Partner with Zero Emissions Building Exchange and Passive House Canada on industry education by showcasing leading buildings	•
	Collaboration and Partnerships, Outreach and Education	Work with partners to support demonstration projects and publish case studies on low-carbon mechanical systems	•
	Policy and Regulation	Support local field tests and certification of promising new low carbon technologies within new buildings	• •
Support training on designing, constructing and commissioning of high performance buildings [3.1.2]	Incentives, Outreach and Education	Offer subsidized training on the Energy Step Code for homebuilders, designers and trades, to build competency with advanced envelope and mechanical systems	• •
	Policy and Regulation, Outreach and Education	Continue Richmond's Builder Breakfast engagement with homebuilders, designers and trades, with updates on the City's policies, incentives and compliance requirements	• •
	Collaboration and Partnerships, Outreach and Education	Develop technical training on design, installation and commissioning of heat pump system technology, HVAC integration, and use of existing guidelines	• •
	Incentives, Outreach and Education	Promote technical bulletins, training sessions and accreditation opportunities offered by BC Institute of Technology (BCIT), BC Housing, Small Planet Supply, Passive House Canada and Zero Emission Building Exchange (ZEBx)	• •
Accelerate use of low-embedded carbon content materials in new construction [3.1.3]	Policy and Regulation, Incentives	Assess policy and incentive options to help drive use of construction materials with low embodied carbon	• •
	Policy and Regulation	Introduce reporting requirements on total embodied carbon in new construction projects	•

Policy and Regulation
Infrastructure
Incentives
Collaboration and Partnerships
Advocacy
Outreach and Education

RESOURCES
• Low
• • Medium
• • • High

IMPLEMENTATION ROADMAP

MAJOR MOVE FOR 2030

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
SUPPORT CONTINUOUS IMPROVEMENT TO THE BC ENERGY STEP CODE			
Support ongoing improvements to Energy Step Code regulation and performance standards [3.2.1]		Advocate for improvements (as needed) to existing Provincial Step Code regulations	•
		Advocate for extending the Energy Step Code to other building types not currently covered in regulation	• •
		Ensure ongoing Provincial commitment to meet CleanBC efficiency targets for new buildings in BC Building Code: 20% better in 2022, 40% better in 2027, and 'net zero energy ready' by 2032	•
Advocate for adoption of emission intensity (GHGI) targets that local governments can reference in tandem with the Energy Step Code [3.2.2]		Encourage the Province to develop and enact GHG intensity targets within BC Building Code by 2022	•
		Participate in a Province-led process to develop recommended GHG intensity targets for the BC Energy Step Code that local governments can choose to adopt	• •
Ensure good practices in mechanical equipment design, installation and commissioning [3.2.3]		Work with Technical Safety BC and industry associations to help establish mechanical system permitting guidelines and requirements	•
		Work with Technical Safety BC to enable City building inspectors to review the records of equipment installations by contractors	•
ADVANCE IMPLEMENTATION OF LOW CARBON ENERGY SYSTEMS IN NEW CONSTRUCTION			
Raise awareness of the benefits of building electrification [3.3.1]		Support implementation of recommendations from the Building Electrification Roadmap (BERM) and outreach and awareness through the Building to Electrification (B2E) Coalition	• •
Maximize low carbon energy in new construction [3.3.2]		If the Province delays GHGI standards in BC Building Code, provide a two-option approach for all Step Code regulated buildings, with a relaxation in Step level available for buildings connecting to or installing a low carbon energy system (LCES)	•
		Develop Energy Step Code and greenhouse gas intensity (GHGI) Bylaw requirements in consultation with local development community, and ensure that information on future requirements is signaled well in advance	•
		Implement Provincial GHGI requirements for new construction when available, and increase stringency of these requirements to near zero emissions by 2027	•
		Review policy options to secure higher energy performance and GHG intensity limits in new developments not regulated by the Step Code during Rezoning or Variance Permit process	•
		Review policy options to secure commitments to install a low carbon energy system at Tenant Improvement stage, during Rezoning or Development Permit process	•

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IMPLEMENTATION ROADMAP

MAJOR MOVE FOR 2030

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
Assess the feasibility of using Renewable Natural Gas (RNG) for residual or peak heating needs in new buildings [3.3.3]		Assess future prospects for RNG production, and determine best approach to secure use of RNG during lifecycle of equipment within a building	•
Encourage local availability of low-carbon domestic hot water and space heating systems with a high coefficient of performance [3.3.4]		Partner with other local governments, MVRD and/or Province of BC to provide training on heat pump systems	•
		Consider incentives for purchase and installation of heat pumps in new buildings	•
		Engage Province of BC and heat pump suppliers to advocate for increased availability of higher coefficient of performance (COP) equipment	•
EXPAND LOW-CARBON DISTRICT ENERGY SYSTEMS			
Continue expansion of City's low carbon district energy systems and explore new opportunities outside existing district energy service areas [3.4.1] *EQUITY OPPORTUNITY*		Maintain current City policy, and assess potential for shared renewable heating and cooling systems to serve new development in Richmond's Neighbourhood Service Centres	• • •
		Engage with affordable housing providers to identify challenges and incentives that could be provided with respect to low carbon energy provision	• •
IMPLEMENT BUILDING ENERGY AND EMISSIONS PERFORMANCE REPORTING AND DISCLOSURE			
Build capacity and momentum for a mandatory energy and emissions reporting requirement for new buildings [3.5.1]		Advocate for a Provincial requirement that owners of larger (Part3) commercial, institutional and multi-unit residential buildings annually measure, report and/or disclose their properties' energy usage and greenhouse gas emissions	•
		Partner with other local governments to support voluntary energy and emissions benchmarking and reporting initiatives (e.g. Building Benchmark BC initiative)	• •
		Report as-built energy performance information for smaller (Part 9) residential buildings built to Energy Step Code requirements, once data on a sufficient number of buildings is available	•
		Advocate that the Province implement mandatory home energy labelling at the time of listing properties for sale	•

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IMPLEMENTATION ROADMAP

MAJOR MOVE FOR 2030

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
ENCOURAGE ON-SITE RENEWABLE ENERGY			
Encourage cost-effective on-site renewable energy generation in new construction [3.6.1]		Develop a policy and incentive approach to encourage on-site renewable energy, such as solar photovoltaic and solar thermal systems, electric heat pumps, and waste heat recovery with a net positive internal rate of return	•••
		Promote and distribute information on new building-scale renewable energy systems	•
ACCELERATE ADOPTION OF LOW GLOBAL WARMING POTENTIAL TECHNOLOGIES			
Support local certification of promising new building technologies not yet certified in Canada [3.7.1]		Support local field test of promising new low-GHG technologies within new buildings	•
Encourage Provincial and Federal governments to enact more stringent regulation related to high global warming potential (GWP) coolants and technologies [3.7.2]		Encourage the Federal Government to accelerate the phase-out of high GWP coolants in building mechanical equipment	•
		Encourage the Province to include GWP requirements for refrigerants in the Energy Efficiency Standards Regulation	•
		Support action by the Province to ensure a quick market transition to low-GWP technologies and best practices	•

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COMPLETE COMMUNITIES

IMPLEMENTATION ROADMAP

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
APPLY A CLIMATE LENS AS RICHMOND'S OCP AND LOCAL AREA PLANS ARE IMPLEMENTED			
Assess the impacts on energy use and greenhouse gas (GHG) emissions as new local area plans are introduced,and when amendments or updates are made to the Official Community Plan (OCP) [4.1]		Review leading approaches to utilize data visualization and GHG emissions modelling to inform decision-making on land use and transportation options, and medium-term monitoring of progress toward plan objectives	• •
		Integrate greenhouse gas intensity metrics for new buildings and existing buildings, as these are developed and released by Province of BC, and identify target metrics for embodied carbon in construction materials for buildings and infrastructure, in tandem with regional partners	•
		Create a model for calculating trip demand by travel mode to understand the GHG emission impacts of potential land-use options	• •
Achieve a net reduction of community GHG emissions as new development occurs and transportation infrastructure is replaced or extended [4.2] *EQUITY OPPORTUNITY*		Work with partners to increase awareness and use of transit services, and engage on active mobility infrastructure and travel options to trip destinations	• •
		Monitor progress toward climate equity objectives as new development and transportation improvements occur	•
		Assess building energy use, embodied and operation GHG emissions, travel mode changes and emissions avoided as a result of land use changes and transportation improvements	•
ENHANCE CHOICES FOR HOUSING AND SERVICES WITHIN NEIGHBOURHOODS			
Encourage development of compact and complete communities with a wide range of affordable housing options throughout Richmond, as per OCP direction [4.3] *EQUITY OPPORTUNITY*		Understand the role of innovative building design and construction approaches (prefabrication), low-carbon energy systems and incentives in supporting improved housing affordability	•
		Facilitate the use of innovative approaches that provide high energy performance, low GHG emissions and climate resiliency in purpose-built affordable housing	• •
Determine the land use and transportation policy implications of an increased number of residents working from home [4.4] *EQUITY OPPORTUNITY*		Assess local changes in transportation patterns as a result of COVID-19 pandemic, and resultant impact on building energy use and GHG emissions	•
		Review projections of percentage of employees working from home to 2030, and required neighbourhood services and travel options	• •

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ACTIVE MOBILITY FOR ALL

IMPLEMENTATION ROADMAP

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
ACCELERATE CITYWIDE USE OF ACTIVE TRANSPORTATION			
Prioritize walking, rolling and cycling as a preferred way to travel in Richmond [5.1.1] *EQUITY OPPORTUNITY*	Policy and Regulation	Consider opportunities as they arise where traffic lanes could be temporarily closed to traffic during the summer months, and reallocated to pedestrians and cyclists	••
	Policy and Regulation	Consider opportunities as they arise where road space could be permanently reallocated to active mobility (road diet)	••
	Policy and Regulation	Complete work on the update to the Cycling Network Plan for new and upgraded walk / roll / cycle routes	••
	Infrastructure	Implement All Ages and Abilities (Triple A) bike lane infrastructure protected from vehicle traffic along major streets	•••
	Policy and Regulation	Review current inventory of public bicycle parking in Richmond, and bring forward recommendations on new bike parking infrastructure where needed	•
	Infrastructure	Leverage senior government funding opportunities as they arise to accelerate build-out of active mobility infrastructure within a 400-metre radius of Neighbourhood Service Centres	•••
	Infrastructure	Continue to improve existing walkways and sidewalks that are uneven due to growth of adjacent tree roots	•••
Allocate annual capital funding for active transportation infrastructure sufficient to achieve OCP 2041 mode share goal by 2030 [5.1.2] *EQUITY OPPORTUNITY*	Infrastructure	Coordinate active infrastructure investment with anticipated new development, prioritizing connectivity and expansion of active travel routes	•••
	Infrastructure	Develop a plan to provide e-bicycle and e-scooter charging opportunities at City facilities and mobility hubs	••
	Policy and Regulation, Collaboration and Partnerships	Consider opportunities as they arise to prioritize active travel infrastructure that connects with regional and provincial-controlled roads and bridges, thereby improving inter-municipal links.	•••

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IMPLEMENTATION ROADMAP

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
REDUCE BARRIERS TO ACTIVE TRANSPORTATION WITHIN NEIGHBOURHOODS			
Expand existing walking and rolling connectivity within and between neighbourhoods [5.2.1] *EQUITY OPPORTUNITY*	Policy and Regulation, Infrastructure	Review development requirements and urban design guidelines as necessary to ensure streets, lanes, and walk / roll infrastructure are accessible, and easy to navigate for all ages and abilities.	•••
	Policy and Regulation, Infrastructure	Identify gaps and implement upgrades to existing zero-emission active mobility infrastructure, prioritizing areas within City Centre and 400 metres of Neighbourhood Service Centres.	•
Identify opportunities for creating walking and rolling connections between nonconnecting streets [5.2.2] *EQUITY OPPORTUNITY*	Policy and Regulation, Infrastructure, Incentives	Accelerate OCP policy to provide new walk / roll pathways between non-connecting streets within neighbourhoods as opportunities arise	••
	Policy and Regulation, Incentives	Consider opportunities for infill multiplex housing or row housing that include provision for new active mobility right-of-ways	•
ENGAGE RICHMOND RESIDENTS ON ACTIVE TRANSPORTATION			
Expand active transportation programs and services (e.g. e-bike and e-scooter services) in Richmond [5.3.1] *EQUITY OPPORTUNITY*	Collaboration and Partnerships, Outreach and Education	Partner with organizers to co-sponsor community events (e.g., Car Free Day, Go by Bike Week, Emotive EV test drive, e-bicycle test drive)	•
	Collaboration and Partnerships	Continue funding of cycling education classes for the community and Richmond elementary school students	•
	Outreach and Education	Engage residents and business owners to encourage e-mobility and active travel modes.	•
MAKE ACTIVE TRANSPORTATION THE CONVENIENT CHOICE FOR SHORTER TRIPS			
Ensure supportive land use along frequent transit routes so that active transportation is a convenient choice for shorter trips [5.4.1] *EQUITY OPPORTUNITY*	Policy and Regulation	Review current land use and zoning along frequent transit routes for alignment with 'Goal One' in TransLink's Transport 2050 plan, as part of Richmond's Official Community Plan (OCP) review	•
Maintain and expand investments in walking, rolling and cycling infrastructure within City Centre and within 400 metres of Neighbourhood Service Centres [5.4.2] *EQUITY OPPORTUNITY*	Infrastructure	As opportunities arise, implement improved sidewalks, upgraded pedestrian crossings, protected cycling routes, and re-allocation of road space to public-serving and active transportation within these areas.	•••

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ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
Maintain and expand investments in walking, rolling and cycling infrastructure within a 400 metre pedestrian catchment zone along Frequent Transit (FTN) routes [5.4.3] *EQUITY OPPORTUNITY*		Consider opportunities as they arise to implement improved sidewalks, upgraded pedestrian crossings, and protected cycling routes along FTN routes within 400 metres of these routes.	•••
SET PARKING STANDARDS TO SUPPORT SUSTAINABLE TRAVEL OPTIONS			
Establish further reductions for parking space requirements in new development, where appropriate [5.5.1]		Consider establishing a maximum number of parking stalls allowed for new commercial properties within the City Centre Area and Neighbourhood Service Centres, and along Frequent Transit Network	•
		Extend current policies to allow further reductions in parking stall minimum requirements in proportion to transit service levels within the City Centre Area and within 400 metres of Neighbourhood Service Centres and FTN routes	•
		Review existing policy allowing for deeper reductions in parking stall requirements in exchange for the provision of additional low-carbon transportation demand measures, and adjust as needed	•
Explore options to enable the conversion of parking spaces within existing buildings to support active transportation [5.5.2] *EQUITY OPPORTUNITY*		Investigate conversion of parking stalls in existing residential buildings to dedicated space for bicycles and e-scooters, including secure storage	•
		Investigate conversion of parking stalls in existing commercial buildings into dedicated space for bicycle commuting with secure storage	•

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SUPPORT FREQUENT TRANSIT

IMPLEMENTATION ROADMAP

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
ENSURE TRANSIT-SUPPORTIVE LAND USE			
Ensure supportive land use along high frequency transit routes so that transit is a convenient choice for most trips [6.1.1] *EQUITY OPPORTUNITY*	Policy and Regulation	Review current land use and zoning along Frequent Transit Network (FTN) for alignment with 'Goal One' in TransLink's Transport 2050 plan, as part of Richmond's Official Community Plan (OCP) review	•
Increase the range of housing types, supply and tenure close to frequent transit [6.1.2] *EQUITY OPPORTUNITY*	Policy and Regulation	Ensure mix of land uses, diversity of housing types, tenures and incomes along frequent transit routes (per 'Goal Three' in TransLink's Transport 2050 plan)	•
INCREASE TRANSIT PROVISION AND SERVICE IMPROVEMENTS			
Facilitate expansion of high-frequency local and regional transit service [6.2.1]	Collaboration and Partnerships, Advocacy	Partner with the Mayors' Council and TransLink to secure additional funding from senior level governments for identified transit improvements	• • •
Work with TransLink to introduce rapid bus service on frequent transit routes and implement other transit service improvements identified in the Southwest Area Transport Plan [6.2.2] *EQUITY OPPORTUNITY*	Collaboration and Partnerships, Advocacy	Work with TransLink to support accelerated implementation of transit service improvements in Richmond as identified in TransLink's Southwest Area Transport Plan (SWATP)	•
ENCOURAGE HIGHER TRANSIT RIDERSHIP			
Reduce barriers to transit by investing in supportive, accessible, people-friendly infrastructure [6.3.1] *EQUITY OPPORTUNITY*	Infrastructure, Collaboration and Partnerships	Continue to install transit shelters at bus stops with daily average boarding greater than 25 passengers, prioritizing Frequent Transit Network routes	• •
	Infrastructure	Work towards 100% of bus stops and connecting pedestrian facilities being wheelchair accessible	• •
	Policy and Regulation, Infrastructure	Define sustainable travel services and infrastructure that would be available to transit riders at Mobility Hubs in Richmond, and synchronize funding of Hub infrastructure with transit service improvements	• • •
	Infrastructure, Collaboration and Partnerships	Implement street improvements such as connecting pathways, accessible crosswalks, wider sidewalks, and cycling connections to support transit ridership	• • •

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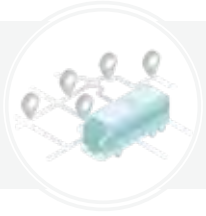
IMPLEMENTATION ROADMAP

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
SUPPORT TRANSITION TO 100% ZERO EMISSION TRANSIT			
Expand battery electric bus service and implement e-bus charging facilities within Richmond [6.4.1]		Work with TransLink on to implement the 2050 Low Carbon Fleet Strategy to advance battery electric bus service in Richmond	•
ENGAGE RESIDENTS ON TRANSIT SERVICE AND MOBILITY HUB IMPROVEMENTS			
Engage residents on transit service and mobility hub improvements and benefits [6.5.1] *EQUITY OPPORTUNITY*		Encourage TransLink's TravelSmart outreach team's continued participation in local community events	•
		Build local awareness of Mobility Hub benefits for public EV charging, access to car sharing, cycling and walk / roll infrastructure, and seamlessly integrated with transit	• •
		Promote the benefits and necessity of the transit system in meeting our social, economic and environmental objectives, and re-establish confidence in safety of the system as the COVID pandemic recedes	•



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ENHANCE GREEN INFRASTRUCTURE

IMPLEMENTATION ROADMAP

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
EXPAND RICHMOND'S URBAN TREE CANOPY			
Achieve a robust, long-term urban forest on public and private land [7.1.1] *EQUITY OPPORTUNITY*		Implement the Public Tree Management Strategy 2045 (adopted by Council, November 2019)	• • •
		Develop a city-wide urban forest management strategy for private land, as part of Richmond's Ecological Network Management Strategy	• •
		Consider an incentive framework to encourage tree planting and retention on private urban lands within Richmond	•
PROTECT EXISTING STOCKS OF SEQUESTERED CARBON			
Implement citywide strategy and actions to preserve Richmond's natural carbon stores [7.2.1]		Identify policy and regulatory options to protect carbon already stored within Richmond soils, peatlands and urban tree canopy, and investigate additional sequestration opportunities.	•
		Maintain and enhance water table levels on City-owned central wetlands to preserve carbon stored in peat soils, partnering with the Federal Government and Province of BC.	• • •
		Implement an outreach and education campaign to protect carbon in soils, increasing resiliency for agricultural landowners, in partnership with other organizations.	• •
		Advocate for a stronger policy mandate over carbon sequestration within agricultural lands (e.g., authority to designate Environmental Site Assessments on agricultural land).	•
		Promote the value of central wetlands, Sturgeon Bank, and Richmond's urban tree canopy as long-term carbon storage using natural systems.	•
PROMOTE SUSTAINABLE REUSE OF SOIL AND WASTE BIOMASS			
Promote sustainable reuse of soil and waste biomass [7.3.1]		Consider opportunities to use agricultural waste as biomass fuel, collaborating with the Agricultural Land Reserve (ALR) Commission and Kwantlen Polytechnic University.	•
		Assess potential to preserve Richmond soils for use as future agriculture, in partnership with developers and landowners.	•

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ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
PLAN NOW TO SCALE UP CARBON SEQUESTRATION AND OFFSETS IN RICHMOND			
Develop strategy to achieve up to 200,000 tonnes of CO_2 equivalent sequestration annually by 2050 [7.4.1]		Assess the ongoing carbon sequestration capacity of Richmond's Ecological Network, including the Sun Hor Lum Conservation Area and the Garden City Lands, as contributions toward the 2050 annual carbon sequestration target	• •
		Review options to sequester carbon using current and enhanced land management approaches in BC, and identify areas where Richmond could generate additional carbon offsets from land management. Derive the cost-per-tonne for emission credits	• • •
		Assess current and projected performance of emerging technologies, including direct air capture, to offset large amounts of carbon, and derive the cost per tonne for emission credits	• •

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TRANSITION TO A CIRCULAR ECONOMY

IMPLEMENTATION ROADMAP

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
ADVANCE IMPLEMENTATION OF CIRCULAR ECONOMY INITIATIVES BY CITY OF RICHMOND			
Integrate Circular Economy principles into the City's corporate plans, processes and standards to lead by example [8.1.1]		Integrate product footprint analysis and life-cycle assessment into the City's procurement process	•
		Incorporate circular economic thinking into City project development and operations management, with the goal to 'design out' waste and pollution	•
		Transition the City's product and service suppliers to utilize a circular approach in their business model	•
		Analyze material flows to improve utilization and longevity as part of minimizing embodied energy in products and materials that the City uses	• •
		Increase proportion of recycled and reclaimed materials used by the City, to help drive the market toward a circular economy	• •
		Provide additional space at City facilities for end-of-life sorting and reprocessing of products and materials	• •
		Stimulate regional innovation though pilot demonstration projects, incubators, and showcasing leading solutions by businesses and organizations	• •
SUPPORT IMPLEMENTATION BY RESIDENTS			
Inspire residents to participate in the Circular Economy and accelerate demand for products derived from circular processes [8.2.1]		Engage and educate the community on the need to transition toward a circular economy	•
		Support take-back programs that enable residents to return products or materials at end-of-life	• •
EQUITY OPPORTUNITY		Encourage use of products derived from renewable materials, contributing to efficient use of sustainable natural capital	•
		Improve public awareness of best practices to prevent food waste, and support transition away from single-use plastic	•
		Enable innovation by local students in discovering new opportunities to apply a circular approach on material consumption and waste generation	•
		Create a City of Richmond Ideas Forum to stimulate innovation by exchanging knowledge across sectors and between organizations	• •

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IMPLEMENTATION ROADMAP

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
SUPPORT IMPLEMENTATION BY BUSINESSES			
Accelerate adoption of Circular Economy approaches by the private sector in the design, manufacture and retooling of products and services [8.3.1]		Create a 'model guide' for reducing food waste to be included with local business licenses and permits	•
		Encourage local businesses to adopt circular approaches, such as [refuse, reduce, re-use], [repair or re-manufacture] and [re-purpose or recycle]	• •
		Enable sharing of products and assets to maximize use and longevity, enhance productivity and create value	• •
		Develop a waste by-product tracking database for local firms with online tools for recovering and reusing products and materials through closed loop recycling, industrial symbiosis initiatives and upcycling	• • •
		Implement a promotion and engagement program to drive circular innovation and create new business opportunities within the Richmond market	• •
TRANSITION TO LOW EMBODIED CARBON CONSTRUCTION MATERIALS			
Accelerate the use of construction materials with low embodied carbon content [8.4.1]		Implement a requirement to report embodied carbon content of materials used in new buildings (reported at Building Permit)	•
		Develop a technical guide showing embodied energy and carbon in typical construction materials used in buildings	• •
		Participate in regional efforts to develop embodied carbon targets for all new building archetypes, and disclosing the level of embodied energy and carbon at project completion	• •
		Lead by example and showcase a low embodied carbon approach in the design and construction of a new City of Richmond building / facility	• • •

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ADDITIONAL ENABLING ACTIONS

IMPLEMENTATION ROADMAP

ACTIONS	TOOLKIT	IMPLEMENTATION	RESOURCES
ENSURE REGULAR PROVISION OF MUNICIPAL GREENHOUSE GAS EMISSION INVENTORIES			
Increase Provincial resources to provide annual or bi-annual reporting of municipal greenhouse gas inventories for all local government jurisdictions in British Columbia		Partner with other local governments to assess efficiencies and net cost savings of regularized Community Energy and Emissions Inventories	• •
		Advocate with partners for increased Provincial resources to enable annual GHG emission inventories for local governments	•
ENABLE REGION-WIDE DELIVERY OF CLIMATE ACTION PROGRAMS			
Extend the mandate of Metro Vancouver Regional District (MVRD) to enable cost-effective, regional delivery of climate action programs, in cooperation with member municipalities		Develop a service establishment bylaw empowering MVRD to deliver climate action programs on behalf of member municipalities	• •
		Advocate for adoption of the service establishment bylaw by the MVRD Board	•
REDUCE EMISSIONS FROM PORTABLE GENERATORS AND GAS-POWERED EQUIPMENT			
Assess program, regulatory and technical options to encourage transition from fossil fuel-powered generators and handheld equipment to zero emission electric power		Advocate for MVRD to implement policy measures reducing emissions from electric generators and gas-powered equipment, including phase-out of gas-powered equipment.	•
		Assess City's role in advancing mobile battery power units for off-grid applications where gas or diesel electricity generator are used (i.e. movie shoots)	•
ENSURE PROVINCIAL COMMITMENT TO 100% CLEAN ELECTRICITY DELIVERY STANDARD			
Advocate for a clean electricity delivery standard to guarantee grid electricity with a reliable zero-GHG emission intensity no later than 2030		Ensure that the actual GHG intensity of BC grid electricity and the Provincial grid intensity factor used for emission calculation and reporting are equivalent.	•
		Advocate for Provincial adoption of the 100% clean electricity delivery standard as early as possible, maximizing the GHG reductions achievable through electrification.	•

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