



2019 UPDATE

Climate Resilience Strategy

Environmental & Safety Management



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Introduction

This report provides an update to the end of the first year (2019) of The City of Calgary's Climate Resilience Strategy and Action Plans.

In partnership with service owners, business units and community partners, The City of Calgary (The City) has begun implementing the actions identified in the 10-year Mitigation and Adaptation Action Plans.

The issues surrounding climate change have continued to evolve, both globally and locally and citizens, governments, and businesses have responded. The City will focus on corporate leadership and community engagement on greenhouse gas (GHG) reduction, planning for

and managing adaptation risks, establishing partnerships, and ongoing education efforts.

The City's Mitigation and Adaptation Action Plans contain defined actions, outline The City's role in carbon and energy management and climate risk reduction over the next 10 years. These plans include 244 actions across the corporation and build on the strength and initiative of existing partnerships, and new, developing collaborations. One year into implementation most actions are underway, with many on-going actions now embedded into business processes or programs. By the end of 2019, 36 actions were completed.



244 TOTAL ACTIONS

36 Actions completed

166 Actions in progress

42 Actions not started

1. Buildings, infrastructure and energy
2. Transportation and land use
3. Consumption and waste
4. Natural infrastructure
5. Integrated watershed management
6. Community outreach and education
7. Leadership and governance



The governance of Calgary's Climate Resilience Strategy includes the Calgary Climate Panel (The Panel) as an advisory network. The panel includes 18 organizations from a range of sectors including the University of Calgary, industry associations like Building Industry and Land Development (BILD) Calgary Region and Building Owners & Managers Association (BOMA), the Calgary Airport Authority, ENMAX and ATCO. The Panel has prepared an independent report on its view of The City's Climate Program, which is included as Appendix 1 to the Climate Resilience Strategy Update 2019.

Climate actions are ongoing in three purposeful ways: City-led actions, partnerships with industry, and projects that are directed entirely by the community. Preparing and responding to the risks of climate change requires decades, not months. While Calgary has made progress, much work remains to ensure Calgary is a climate resilient community. Calgarians who depend on municipal services have a growing expectation that decision-makers will account for climate change when planning, building and operating infrastructure.

The City's constrained budget environment has had an impact on staff capacity to deliver programs in 2019. Administration will be seeking more collaboration through partnerships in the community to achieve results. As programs and projects to build climate resilience are developed and evaluated, budgetary implications will be considered and brought forward as necessary.

The ability of Administration to take on the challenges of climate change and integrate it into its business has been challenging. It requires intentional governance and inter-departmental collaboration to ensure The City leads and supports the community in meeting its climate obligations.



Background and context

Increasing global temperatures are leading to a myriad of impacts on Earth's biodiversity and societies and geographically-scaled climate responses. Climate change is contributing to more severe and more frequent environmental and weather hazards, including increased flooding, drought, wild fires and extreme weather events across the globe. These hazards have serious implications for cities, including impacts on natural resources, infrastructure damage and/or failure, effects on human health, economic disruption and increased intensity and frequency of disaster events.

In today's globally interconnected society, the impact of climate change in other parts of the world affects life in Calgary. While the land-ocean temperature index has increased by 0.99°C globally, Alberta's mean temperature has increased by 1.4°C.¹

Regional changes in the climate pose a serious risk to Calgarians and the ability of The City to provide services cost effectively. The inevitability of climate change requires The City of Calgary (The City) to integrate a climate response focused on decreasing the cause of climate change (Greenhouse Gas (GHG) emissions) and reducing risk to The City's services, operational costs, financial losses and citizen wellbeing. The Resilient Calgary Strategy that includes social, environmental and economic considerations for a resilient community recognizes the Climate Resilience Strategy as a key pillar.

Climate resilience requires collaboration with The City, other levels of government, industry, academia, environmental organizations and citizens. Success is dependent on active prioritization of the Climate Resilience Strategy's implementation by The City's Administration, including supportive funding and resourcing. Continued measurement, verification of targets, identification of external impacts and feedback-loops on Calgary's Climate Strategy are vital.

Preparing and responding to climate risks requires years, not months. While Calgary has made progress in implementing the Strategy since approval in June 2018 to the end of 2019, much work remains to holistically implement the 244 actions identified in the Climate Mitigation and Adaptation Action Plans. Ensuring Calgary is a climate resilient community will require not only the successful achievement of the Climate Resilience Strategy but the integration of climate risk into standard City and community practice.

Calgary's progress is a reflection of the commitment of The City's leaders and staff working with citizens, local communities and partner organizations to make Calgary a more resilient and prosperous city for the citizens we serve. The path toward an 80 per cent GHG reduction will require both financial and organizational changes to ensure Calgary is a low-carbon economic hub that is attractive to investment and less vulnerable to climate change impacts.

¹ NASA's Goddard Institute of Space Studies (NASA/GISS)



The evolving climate change context

Did you know?

The annual average temperature in Canada has increased by 1.7°C between 1948 and 2016, while average winter temperature has increased by 3.3°C.

The issues surrounding climate change have evolved rapidly over the past year. This section describes the changes that are occurring, from the global to local level. The City has been active since June 2018 in delivering the Climate Resilience Strategy. Key actions have focused on corporate leadership and community engagement on GHG reduction, planning for and managing adaptation risks, establishing partnerships and ongoing education efforts.

Climate change is observable on a global level. 2018 was the fourth warmest year globally since records began, and the forty second consecutive year that global land and ocean temperatures have been above the twentieth century average.² In 2018, the

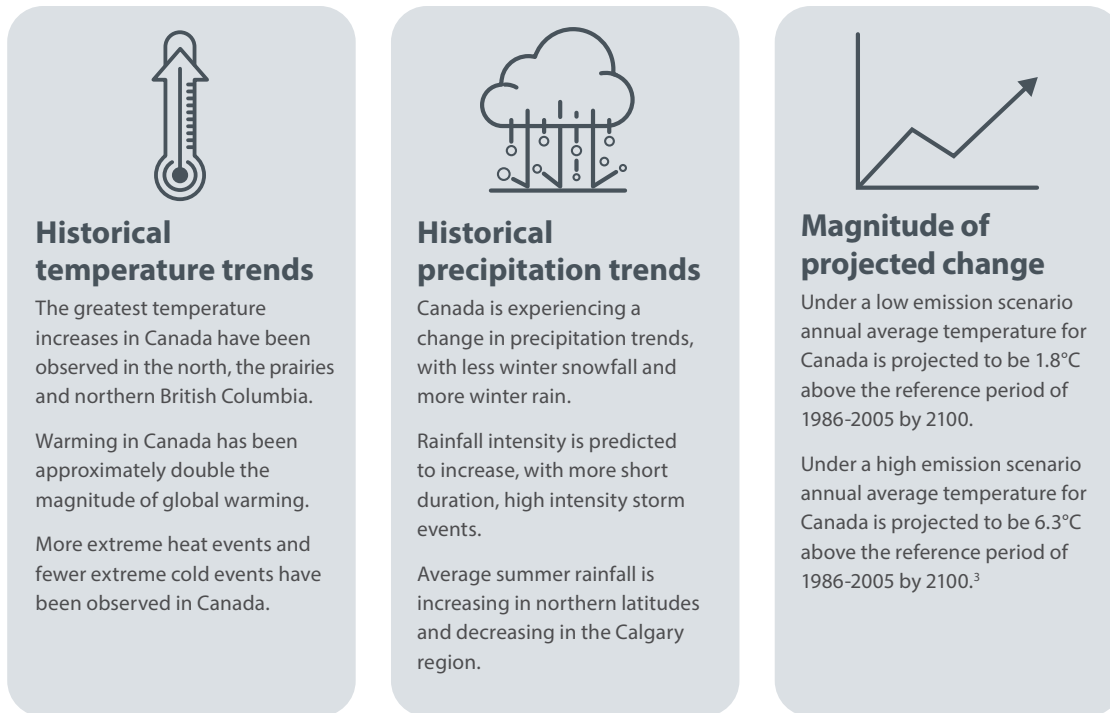
Intergovernmental Panel on Climate Change (IPCC) released a report that detailed the risks associated with greater warming. This resulted in an internationally accepted target for climate action to limit global temperature rise to 1.5°C, not 2°C as previously proposed in the 2015 Paris Agreement.

Canada's climate

Driven by global emissions from human activities, Canada's climate has warmed and will warm further in the future. Environment and Climate Change Canada released Canada's Changing Climate Report (CCCR) in April 2019 to assess the climate change impacts to Canada and how Canadians are reducing risks. This

² <https://climate.nasa.gov/news/2841/2018-fourth-warmest-year-in-continued-warming-trend-according-to-nasa-noaa/>

document is the first in a series of resources to be produced to advance adaptation decisions and actions. The following graphic is a high-level summary of the CCCR:



Public opinion and political stance

Scientists, media, climate activists and industry are increasingly mobilizing to adapt to and reduce the impacts of climate change.

Climate emergency declaration

A growing global climate emergency movement has been observed. As of January 28, 2020, over 1,300 jurisdictions in 26 countries have declared a climate emergency, including 460 in Canada.⁴

Global climate strikes

Youth climate activist Greta Thunberg staged a protest in August 2018, sparking an international movement of student strikes to demand action on climate change. In 2019, similar demonstrations took place elsewhere in the world, with roughly 4,500 marches and rallies across 150 countries.

Young Calgarians have also been participating in ‘Fridays for Future’ student strikes. During the ‘Global Week for Future’ climate strikes in September 2019, hundreds of Calgarians joined in the series of international strikes to demand action on climate change, including two citizen-organized climate parades starting at City Hall.

Calgarians’ climate change perspective

The City commissioned a Citizen Perspectives Survey in September 2019 to ask more than 500 Calgarians by phone about their attitudes on climate change, impacts on their lives and the actions they’re taking. To ensure the data was gathered from a representative group of Calgarians, sample quotas were set by age, gender and city quadrant of the general population aged 18 and older. The results found that Calgarians are concerned about climate change and support increased climate action.

³ <https://changingclimate.ca/CCCR2019/chapter/executive-summary/>

⁴ <https://climateemergencydeclaration.org/>

In 2019, Calgarians shared their perceptions on climate change

77% “I think we need to act now to address climate change.”

76% “I am concerned about climate change.”

73% “I want to do more personally to help prevent climate change.”

72% “I think Calgarians should be doing more to help prevent climate change.”

Extremes in 2019

February 2019 was the **third coldest** on record with an average daily temperature of -18.7°C , and 25 out of 28 days recorded snowfall. September 27, 2019, set a new September **single day snowfall record** of 24.6 cm in Calgary.

Calgary recorded the **hottest day ever** on August 10, 2018 at 36.5°C . Summer 2019 brought **71 days of rain, tied for a record**, with nearly 80 mm more than average through June, July and August.

In 2019, Alberta saw 23 tornadoes touch down, **nearly double the 30-year average** of 12 to 15.

Government policy in transition

This year two important elections occurred that affected the Climate Policy context for The City of Calgary. The federal election in the fall of 2019 resulted in a minority Liberal government, which has continued the climate change policy enacted under the Pan-Canadian Framework for Clean Growth and Climate Change.

The election of a new provincial government in spring 2019 resulted in changes in climate policy including the removal of the provincial carbon tax. Bill 19 (*Technology Innovation and Emissions Reduction Implementation Act*) was introduced to the legislature in the fall and targets emission reductions for large GHG emitters. Bill 19's implementation will focus on the reduction of emissions from electrical generating facilities (meeting best in class natural gas fired standards) and other facilities exceeding 100,000 tonnes of carbon dioxide emissions (10 per cent reduction by 2020 and one per cent reduction each year thereafter). The current Carbon Competitiveness Incentive Regulation will be phased out on January 1, 2020. The Technology Innovation and Emissions Reduction (TIER) system will utilize levied funds to advance new and cleaner Alberta-based technologies that reduce emissions.⁵

The City of Calgary adheres to policy set by other orders of government and works to coordinate with any energy and climate

programs that are active provincially and federally. In 2019, The City made adjustments to climate programming based on the new mandates, for example the changes in provincial energy efficiency and renewable programs and federal electric vehicle programs.

Industry accounting for climate change

Investment industry

According to the National Round Table on the Environment and the Economy report, *Paying The Price: The Economic Impacts of Climate Change for Canada*,⁶ timely and well-chosen measures can be extremely cost-effective and reduce the severity of climate impacts. Reports conclude that early planning and investment in climate resilience are a better use of public funds than delayed and reactive responses to climate change impacts.

On September 22, 2019, the United Nations (UN) launched the Principles for Responsible Banking with 130 banks across 49 countries, representing about one third of the global banking sector. The signatories commit to strategically align their business with goals of the Paris Agreement on Climate Change and the UN's Sustainable Development Goals and increase their contribution to achieve both goals with the Principles for Responsible Banking.

⁵ <https://www.alberta.ca/technology-innovation-and-emissions-reduction-engagement.aspx>

⁶ <http://nrt-trn.ca/wp-content/uploads/2011/09/paying-the-price.pdf>

Insurance industry

On September 26, 2019, the Federation of Canadian Municipalities (FCM) and the Insurance Bureau of Canada (IBC) released a report, stating that avoiding the worst impacts of climate change at the municipal level will cost an estimated \$5.3 billion per year shared amongst all three orders of government.

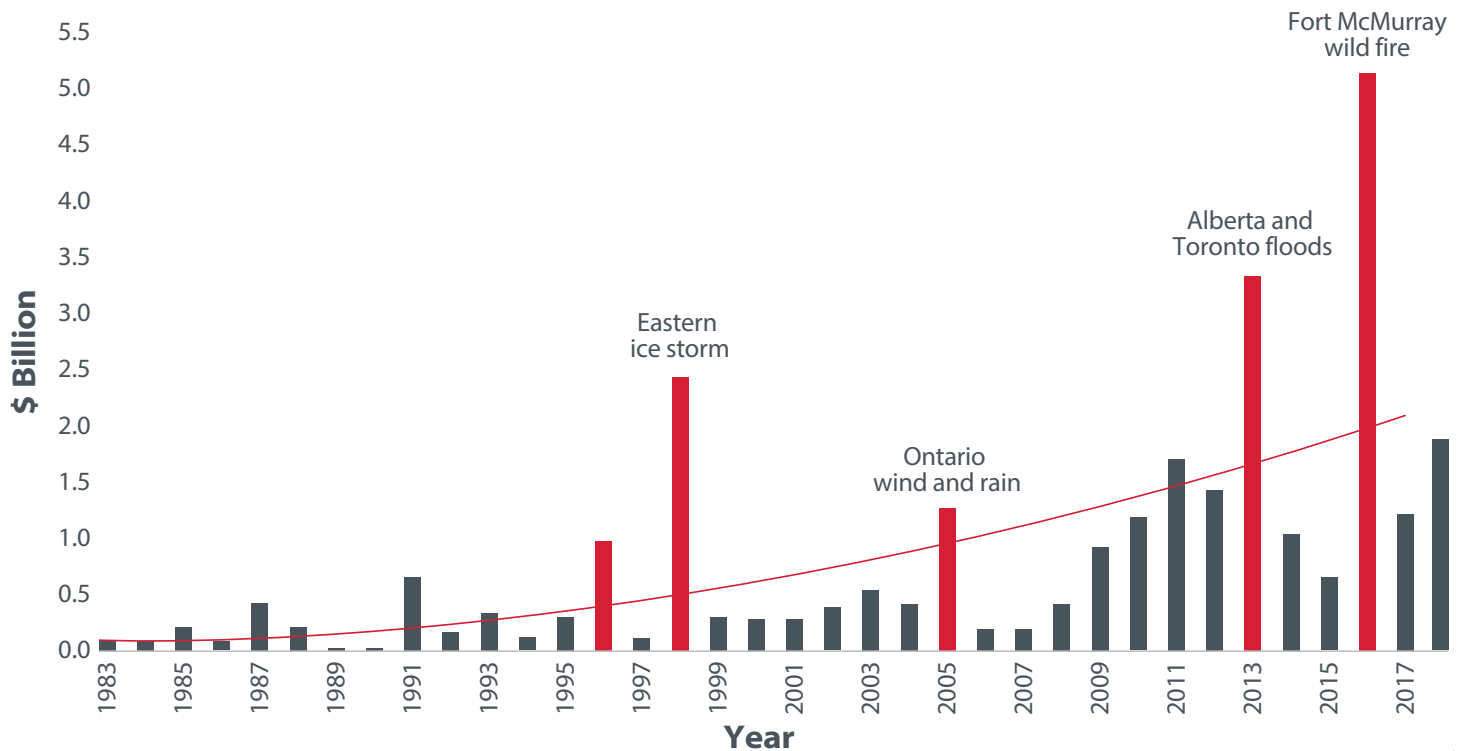
The IBC has found that “property and casualty insurance payouts from extreme weather have more than doubled every five to ten years since the 1980s,” with water-related losses contributing to more than 50 per cent of the increase.⁷

Flooding is the most pervasive and costly risk impacting Canadian communities. Catastrophic losses were responsible for \$1.9 billion in insured damage in 2018, the fourth highest year on record.⁸

For Calgary, these changes in the finance sector will have impacts over time. Investments in infrastructure and buildings will consider the climate impacts on a per-project basis. For anyone relying on insurance, the real-world risk factors specific to Calgary are beginning to be priced-in.

Investments in adaptation are critical for local communities as **every dollar invested today** in local resilience **saves six** in future costs.

Catastrophic losses in Canada and trend – 1983 to 2018



⁷ <https://www.intactcentre.ca/wp-content/uploads/2017/09/Preventing-Disaster-Before-It-Strikes.pdf>

⁸ <http://www.ibc.ca/on/resources/media-centre/media-releases/severe-weather-causes-190-million-in-insured-damage-in-2018>

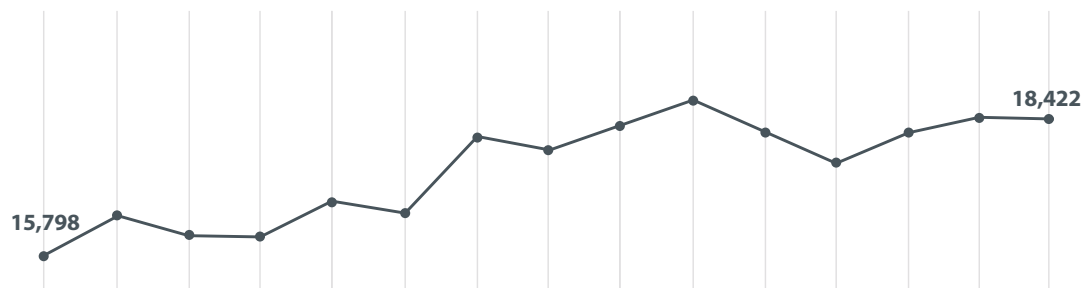
⁹ http://assets.ibc.ca/Documents/Facts%20Book/Facts_Book/2019/IBC-2019-Facts.pdf

The state of Calgary's emissions

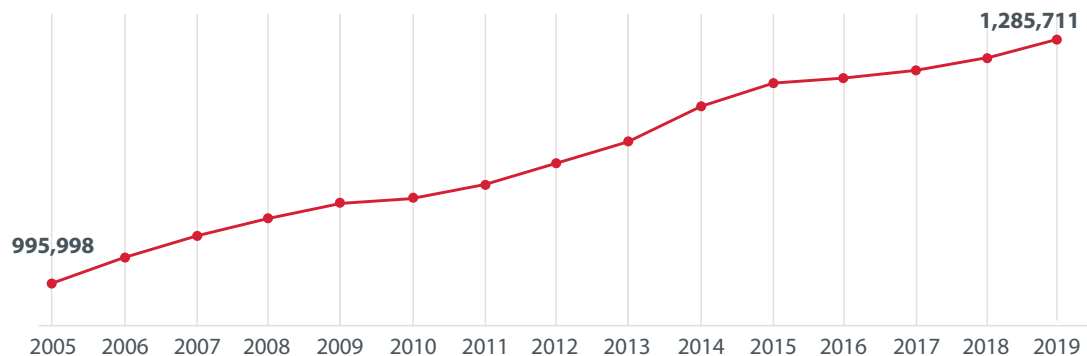
Calgary's carbon footprint has grown by 18 per cent between 2005 and 2019. The state of Calgary's emissions between the years of 2005 and 2019 can be characterized by overall city growth in conjunction with economic and population growth. The share of emissions from different sectors over those 14 years has been consistent, with non-residential buildings remaining as the largest source of

GHG emissions. For comparison, The City of Calgary contributed four per cent of the Calgary community-wide GHG emissions. Emissions are reported annually to the Carbon Disclosure Project including building and energy use (electricity and natural gas), transportation (on-road and off-road vehicles) and waste (solid waste and wastewater).

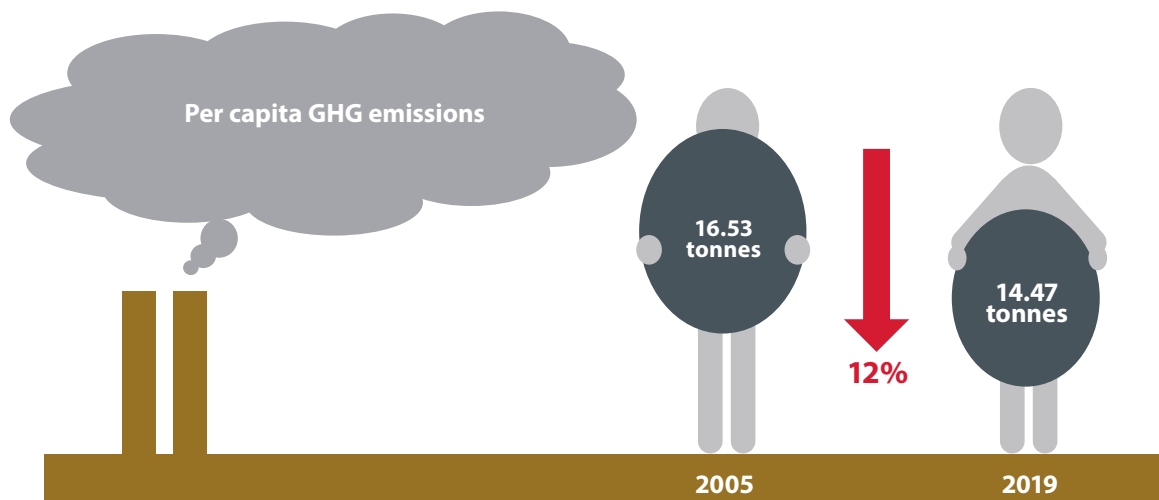
Calgary community-wide GHG emissions (kilotonnes CO₂e)



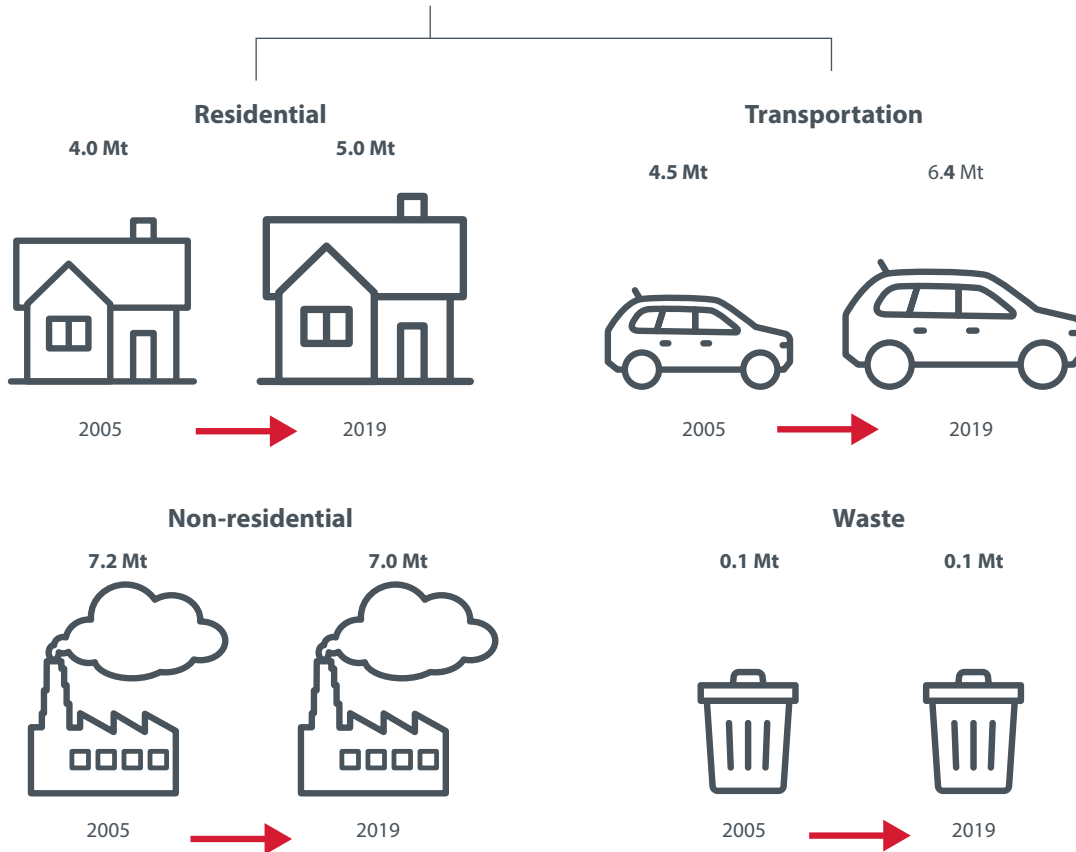
Calgary population



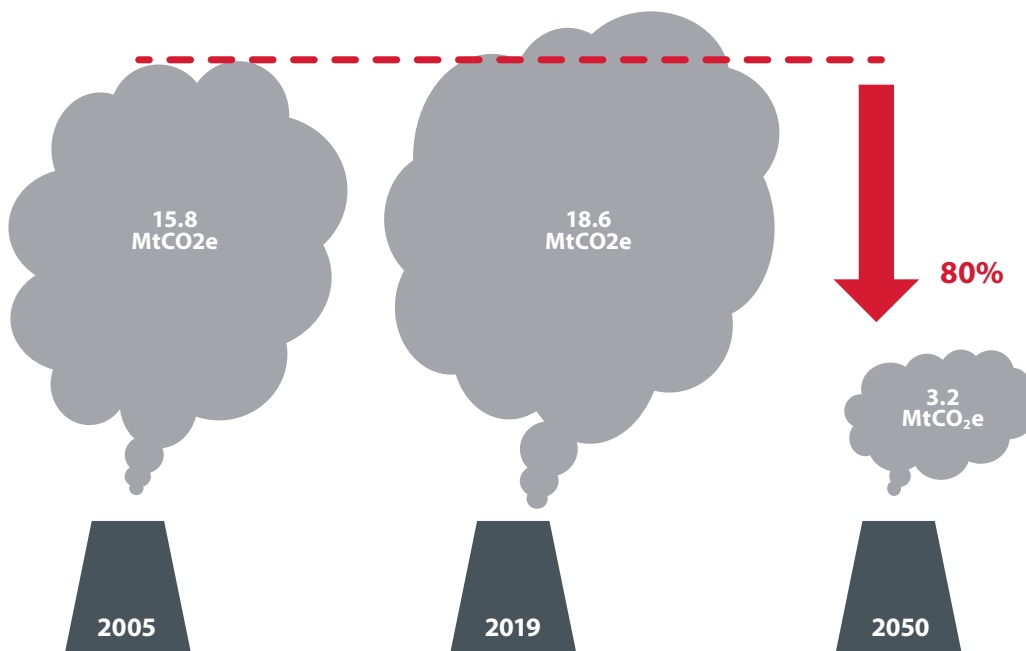
Despite the overall upward trend, GHG emissions per capita have decreased since 2005



City-wide GHG emissions change: +18 per cent

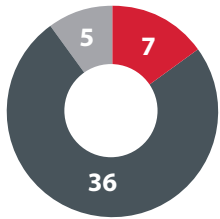


The City of Calgary's 2050 target is to reduce GHG emissions 80 per cent below 2005 levels



The Climate Resiliency Strategy – Progress update

In 2019, The City of Calgary had its first full year under the 2018 Calgary Climate Resilience Strategy. Progress update areas are organized by the same themes identified in the Strategy. The number of actions are shown along with status updates and certain City of Calgary projects are highlighted. Some specific community-led climate actions are noted as well, but are not included in the count of City completed actions.



- Completed
- In progress
- Not started

1. Buildings, infrastructure and energy – 48 actions

Accounting for 65 per cent of Calgary’s overall GHG emissions, the built environment represents the largest portion of citywide emissions. The mitigation action plan focuses on three programmatic areas for buildings: energy performance standards in new and existing buildings, energy consumption information and on-site and neighbourhood scale renewable energy systems.

City actions

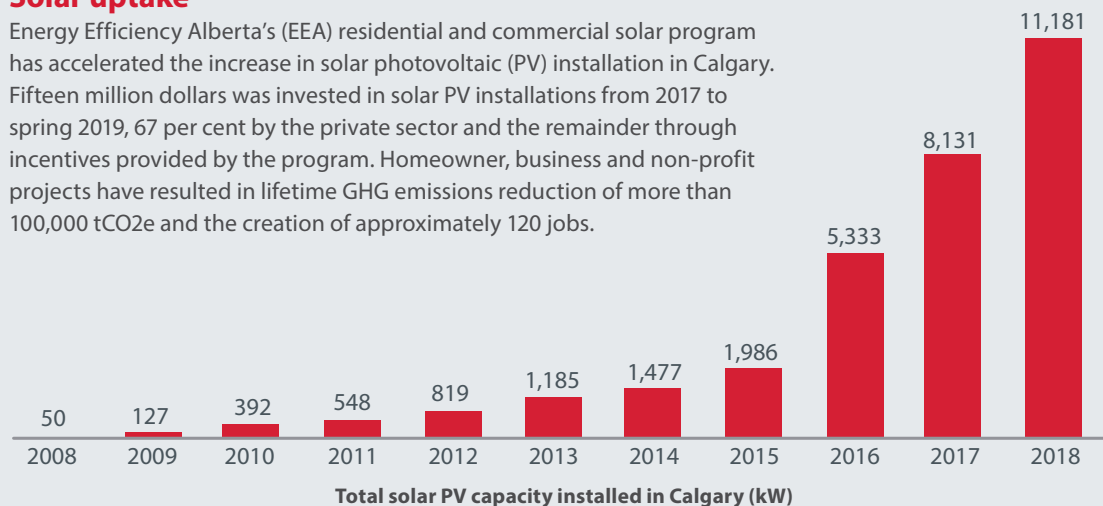
New development design for Affordable Housing in Calgary

Across the city, more than 1,000 new affordable housing units are targeting 16 per cent improved energy efficiency compared to National Energy Code for Buildings (NECB) 2017 guidelines. This includes 62 townhomes

and stacked townhomes in Bridlewood with 42 per cent more energy efficient design than NECB 2015. An additional 437 multifamily units integrated with a fire station, child care, corporate offices and a public library are in progress to achieve 26 per cent better energy efficiency than NECB 2015.

Solar uptake

Energy Efficiency Alberta’s (EEA) residential and commercial solar program has accelerated the increase in solar photovoltaic (PV) installation in Calgary. Fifteen million dollars was invested in solar PV installations from 2017 to spring 2019, 67 per cent by the private sector and the remainder through incentives provided by the program. Homeowner, business and non-profit projects have resulted in lifetime GHG emissions reduction of more than 100,000 tCO₂e and the creation of approximately 120 jobs.



Reducing barriers for energy efficiency

Calgary Building Services have focused efforts on reducing barriers to energy efficiency for those who want to implement change. The relaxation of minimum separation requirements is a practical and enabling solution for building owners to improve building envelope insulation. To facilitate passive house construction in Calgary, the Passive House Planning Package was recognized by The City as energy code compliant.

Partnerships

The commercial and institutional energy benchmarking program has drawn upon expertise from a broad range of stakeholders with an interest in advancing energy consumption information. A working group was established in 2019 to guide the development of the program, which included both Calgary Climate Panel members and other important stakeholders. This ongoing working group includes: ATCO, BILD Calgary Region, BOMA Calgary, Calgary Board of Education, ENMAX, Siemens, and Strategic Group.

In the community

Carbon capture technology as an option for new construction. Carbon capture and storage technology is being used at Calgary International Airport in the construction of new deicing aprons. This is a collaboration between WestJet, Air Canada, Canadian North and the Calgary Airport Authority.

Producing renewable power while protecting from extreme weather. Audi Royal Oak was the first car dealership to install a solar canopy in Canada. The project provides 60 per cent of the car dealership's annual energy, while protecting its inventory from costly hail damage.

Did you know?

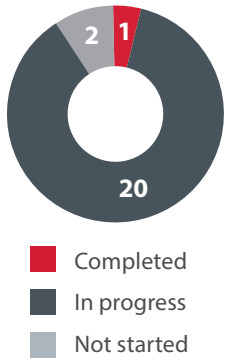
The total annual energy cost for all of Calgary is **\$2.6 billion**. That's three per cent of all money earned in the city. Energy efficiency directly reduces costs and translates to fewer carbon emissions.

Did you know?

In 2018, installations of solar photovoltaic (PV) systems grew by 42 per cent. The City made amendments to the Land Use Bylaw in June 2019 to exempt building owners from development permits for most small-scale PV installations. This is a progressive step that prepares The City for increased demand in future years.

Solar photovoltaic panels installed at a local car dealership. *Source: Audi Royal Oak*





2. Transportation and land use – 23 actions

The transportation sector is the second largest emissions source in Calgary, primarily from the use of diesel and gasoline fuels. Switching to more energy efficient transportation modes, as well as lower carbon, cleaner fuel and electric vehicles, is an important step to reduce GHG impacts. Effective planning and policy decisions on transportation infrastructure and services impacts the ability to endure climate and extreme weather events throughout the intended service life.

City actions

Implement and support rapid transit corridors as defined in RouteAhead

In November 2018, Calgary Transit began service on three new MAX bus rapid transit (BRT) lines, with the fourth MAX line launched in Q4 2019. Benefits of the MAX lines include more frequent service, fewer stops, dedicated bus lanes, signal priority, heated shelters, real-time information displays and more direct connections to destinations to help make public transit a preferred travel mode. Planning and design work for the Green Line light rail transit (LRT) is also ongoing. All of these initiatives enhance our public transit system to encourage transit ridership, provide mobility choices for Calgarians, and reduce the number of cars on the road.

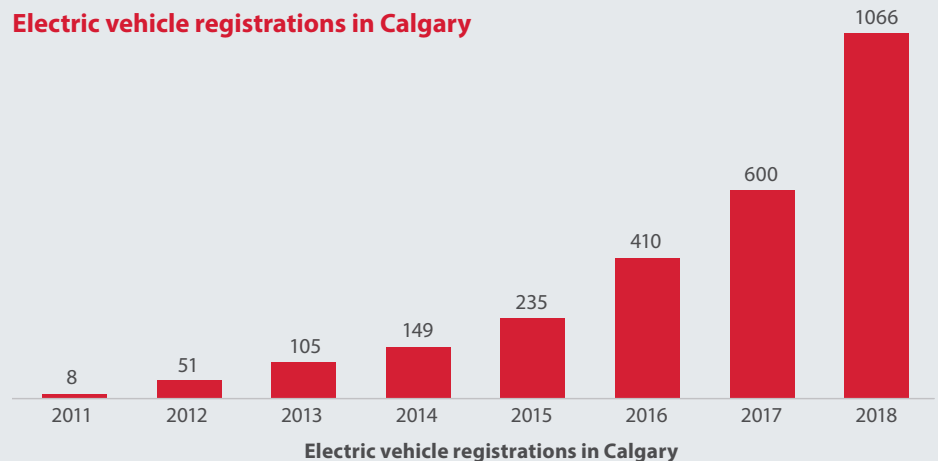
Review and update design guidelines for transportation infrastructure to increase resilience to changing climate conditions

The Transportation department updates design guidelines for transportation infrastructure and is continuing to make adjustments, where necessary, to account for changing climate conditions. City employees actively participate in national organizations, such as the Transportation Association of Canada, that set design standards and codes for Canada. Several areas that are being updated to address climate changes include bridges and structures, transit maintenance facilities, snow and wind loading on roadway infrastructure and equipment, as well as asphalt and concrete mix designs.

Electric vehicle uptake

The increase in electric vehicles (EVs) registered in Calgary has grown from single digits at the start of this decade to slightly above 1,000 by the end of 2018. This trend tracks both battery electric vehicles and plug-in hybrid electric vehicles. With limited electric models available on the market to date, the adoption rate in Calgary is still low, however, 2020 looks to be a breakthrough year, with most major auto manufacturers committing to deliver more EV models. There are no provincial incentives to purchase EVs, but effective May 1, 2019, the federal government has a rebate up to \$5,000 for zero-emission vehicles.

Electric vehicle registrations in Calgary





Energy savings from green building design of transit facilities

The focus of transit facility development in 2018 was on continuing construction of the Stoney Compressed Natural Gas (CNG) Bus Storage and Transit Facility. This was delivered through a Design-Build-Finance-Maintain procurement model of public-private partnership and opened for service in March 2019.

The state-of-the-art Stoney CNG Transit Facility provides indoor storage and servicing for The City's diesel buses and for a new and expanding fleet of buses fueled by CNG. It has a design capacity of 450 buses (40-foot equivalent) in total. The CNG fleet is being procured for lifecycle replacement of existing diesel buses in the fleet. With a 550 pound per square inch feed off of the ATCO high pressure gas line nearby, the energy consumption required for gas compression on site is much reduced. It is the largest indoor CNG bus fueling facility in North America at 44,300 m². Having achieved a Leadership in Energy and Environmental Design (LEED) Gold facility rating, the Stoney CNG Transit Facility is water and energy efficient. It includes a combined heat and power system (CHP) that utilizes waste heat and is designed to allow solar photovoltaic panels to easily be installed on the roof. The storage capacity of this facility supports diesel bus operations and

provides space for buses that are currently stored outside at other garages. This additional indoor storage reduces idling time for buses before leaving the garage, and associated fuel consumption and emissions.

Shifting to lower carbon fuels for buses

Calgary Transit monitors the evolution of technology and product availability for its fleet through involvement with the Canadian Urban Transit Association and other industry networks. The fleet comprises approximately 1,000 buses and shuttles fueled by diesel and gasoline, plus a growing number of CNG buses. Shifting to CNG fuel from diesel is motivated by fuel cost savings and a commitment to continual environmental performance improvement. There are significantly reduced tailpipe emissions, including nitrogen oxides



Transportation-related indicators

Bike lanes: As of April 2019, Calgary's total cycling network includes 1,219 km of lane kilometres, with 905 km being off-street pathways.

EV charging stations:

As of September 2019, Calgary has 168 Level 2 Stations and six Level 3/DC Fast Charging stations.

Public transit: For transit ridership, there were 105,348,000 total trips in 2018.

Fuel consumption:

In 2018, Calgarians consumed 1,493 million litres of gasoline and 943 million litres of diesel.

Total GHG emissions emitted from transportation sector in 2018:

6.4 million tonnes CO₂e or 5.05 tonnes CO₂e per capita.



Did you know?

According to the 2019 Civic Census, Calgary's active suburbs continue to absorb the largest share of city-wide population growth. In 2019, 79 per cent of city-wide population growth occurred in Calgary's 29 active suburbs, while 13 per cent and 8 per cent of city-wide population growth occurred in established area communities and Centre City communities, respectively.

(NOx) that contribute to smog formation, as well as reduced GHG emissions.¹⁰ By the end of 2019, Calgary Transit added 84 new CNG buses to its fleet and an additional 30 are expected in Q1 2020. Future bus purchases will focus on the use of alternative fuels including CNG to operate out of Stoney Transit CNG Facility. Calgary Transit continues to explore emerging technologies like electric battery powered buses to achieve, among other benefits, reduced GHG emissions as well as reduced tailpipe emissions affecting local air quality.

Implement Calgary's Electric and Low Emissions Vehicles Strategy

In 2019, The City published its Electric and Low Emissions Vehicle (EV) Strategy. The document provides additional detail on how The City



will implement multiple actions in the Climate Resilience Strategy related to electric vehicles and alternative fuels, which were identified as the single largest opportunity to reduce emissions from the transportation sector in Calgary. The EV Strategy is also closely linked with the Transportation Department's Future of Transportation portfolio.

The City has participated in several partnerships with other Alberta municipalities and private companies to increase access to public charging infrastructure and assess new regulatory requirements for home and workplace charging, as described in the Partnerships section below. Additional opportunities to pilot public charging infrastructure at several City facilities are being pursued in early 2020. The City is also increasing efforts to engage businesses and the general public to build awareness and understanding of electric and low emission vehicle technologies.

Expand pedestrian infrastructure along the Primary Transit Network, and complete missing links in transit oriented developments, Main Streets and high intensity industrial areas

A range of different programs are being undertaken to enhance pedestrian infrastructure in high demand locations.

As part of the One Calgary 2019-2022 Budget, new funding was approved to upgrade the 42nd Avenue S.E. 'Barley Belt' walking and cycling corridor. Partial funding has also been approved to continue piloting the installation and use of adaptive sidewalks where regular sidewalks are not present. These use low concrete curbs with white posts installed on the roadway to separate pedestrians from traffic.

Design Guidelines for Subdivision Servicing

Pathway guidelines in the Design Guidelines for Subdivision Servicing have been updated to better support the cycling network and account for alternative transportation routes in the event of roadway closures. New regional pathway

¹⁰ While the actual combustion of CNG fuel has reduced GHG emissions compared with diesel fuel, the compression required for CNG (to boost from 550 psi to 3500 psi) normally may offset the reduction to a degree, however, compression is powered by electricity, and The City has GHG emissions-free electricity supply as described above.

connections that form part of the primary cycling network should be routed outside of the 1:100 year floodway, where applicable.

Municipal Development Plan and Calgary Transportation Plan Update – Next 20

As of February 2020, The City is engaging the public on the recommended updates to the Municipal Development Plan (MDP) and Calgary Transportation Plan (CTP). The scope of the Next 20 project was revised in July 2019 to focus on text and plain language edits, without new targets or policies. Previously approved Council direction will be incorporated in the MDP and CTP as needed, including direction from Calgary's Climate Resilience Strategy.

The MDP will continue to support the city-wide parks and open space network, watershed management, green infrastructure and growth in compact urban centres supported by an accessible transportation network.

The CTP places increasing emphasis on sustainable mobility options such as public transit, walking and cycling, in coordination with natural infrastructure. Consistent with the Climate Resilience Strategy, amendments to the CTP would direct The City participate in and promote actions that will achieve a 100 per cent zero-emission community vehicle fleet by 2050.

Partnerships

Peaks to Prairies Network

Peaks to Prairies is a new southern Alberta electric vehicle fast-charging network. The City of Calgary is one of the founding partners, along with the Alberta Southwest and SouthGrow regional economic development agencies, the Cities of Lethbridge and Medicine Hat, and Medicine Hat College. The Federation of Canadian Municipalities and the Province of Alberta are major funding partners. The non-profit agency Community Energy Association is project managing development of the network on the partner's behalf, and ATCO has been hired to own and operate the network using renewable energy sourced from southern Alberta.



The City has provided seed funding as well as project planning and procurement support over the course of the project. Buildout of the network began in 2019, with fast charging stations installed across southern Alberta. The entire network is expected to be complete by spring 2020.

Charging infrastructure in downtown

In April 2019, 42 new electric vehicle charging stations were installed in three Calgary Parking Authority (CPA) parkades in downtown Calgary (City Hall, McDougall Parkade and the Convention Centre). The charging stations were provided by Tesla, with 28 of the stations being for Tesla vehicles, and the remaining 14 usable by all types of electric vehicles. This brings the total number of charging stations provided by the CPA in the downtown to 48.

By the end of 2019, there were approximately 180 public charging stations available across Calgary, including several fast charging stations. This is in the target range for public charging infrastructure as identified in Calgary's Electric and Low Emissions Vehicle Strategy.

Home and Workplace Charging Infrastructure Study

As one of the key actions from the EV Strategy, The City of Calgary is collaborating with the City of Edmonton on an electric vehicle home and workplace charging readiness study. In spring 2019, the cities hired ICF Canada to review current best practices in comparable North American jurisdictions and to engage a range of stakeholders to develop recommendations for Calgary and Edmonton. Stakeholders included the building development industry, building managers, utility companies and electric vehicle users.

ICF Canada is in the process of finalizing their report, which is anticipated to be publicly available in late March of 2020. The report will include recommendations on EV Ready charging requirements for new developments, preliminary concepts for community charging hubs and information to develop informational

brochures for home owners and building managers on how to install charging stations. Additional work will need to be completed by both The City of Calgary and the City of Edmonton on how to finalize and implement the recommendations of the study.

In the community

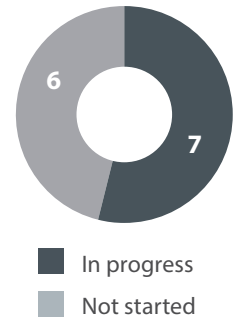
Electric scooters

The shared electric scooter pilot program started in July 2019 and will be running for 16 months. The pilot program has 1,500 scooters from two companies, Lime and Bird, available for use around the downtown core. Since implementation, 540,000 rides covering more than 1.1 million kilometres were logged. A portion of these rides replace the use of vehicles for short journeys, thus reducing emissions. More data will be available on the impacts in 2020.



3. Consumption and waste – 13 actions

The City of Calgary’s waste-related facilities contribute about one per cent of total city-wide GHG emissions. Emissions are primarily from landfills, the composting facility and the wastewater treatment plants. Actions to reduce waste related emissions focus on waste volume reduction and the capture and processing of landfill gas. The City of Calgary’s aspirational waste management goal is to achieve zero waste, where all discarded materials are resources that can be reused (recycled, composted, repurposed, etc.) and no garbage sent to landfills. The current target is 70 per cent diversion of waste from landfills by 2025.



City actions

Landfill cover technology for reduced infiltration and emissions reduction

At the Spyhill Waste Management Facility, The City has completed two novel evapotranspiration (ET) landfill covers with several more under construction. These ET covers use natural processes to better manage potential risks of water infiltration, while also being more resilient than traditional clay covers to long-term changes in climatic conditions. The ET covers are expected to reduce landfill methane emissions by promoting a robust microbial community that will consume methane before it is emitted.

Alternative fuel assessment for waste collection trucks

A study of alternative fuel waste collection vehicles was underway in 2019. It is considering the economic, environmental and social impacts for different technologies and scenarios. This study is intended to support The City’s decision-making on the transition to a greener fleet, which will help achieve reductions in GHG emissions and air contaminants, improve community health and maintain the natural



environment. The technologies being compared are: diesel, diesel hybrid (diesel-electric powertrain with electrically powered collection lift/collection/compaction), battery electric and compressed natural gas. The final report will be completed in 2020 Q1.

Did you know?

Landfill waste: In 2018, 345 kg of total waste was sent to The City of Calgary landfills per person. **55 per cent** of residential waste was diverted from landfills through the Blue and Green Cart programs.

Total greenhouse gas emissions emitted from City waste facilities in 2018: 0.14 million tonnes CO₂e or 0.11 tonnes CO₂e per capita.

Did you know?

In Canada, the equivalent of **30 to 40 per cent** of the food produced is lost along the value chain, with much of it finding its way to landfill or composting. (*Uzea, Gooch & Sparling, 2014, p. 5*)



Landfill gas capture

The City has constructed a landfill gas (LFG) collection facility at each of our active landfills (East Calgary, Shepard and Spyhill) in Calgary, with the last LFG facility construction at Spyhill completed in late 2018. With the addition of the Spyhill LFG facility, The City will reduce GHG emissions by approximately 70,000 tCO₂e annually. That’s about the same amount of emissions produced by 4,837 Calgarians in a year.

The City recently completed a feasibility study for converting LFG to energy at each of the LFG facilities. The study reviewed five technologies, finding that electricity generation at East Calgary and Spyhill landfill sites provided the highest rate of return. At the Shepard landfill site, due to low landfill gas rates, leachate evaporation was most feasible. The City is currently reviewing potential funding opportunities for project implementation.

Partnerships

Reduction of food waste with local restaurant

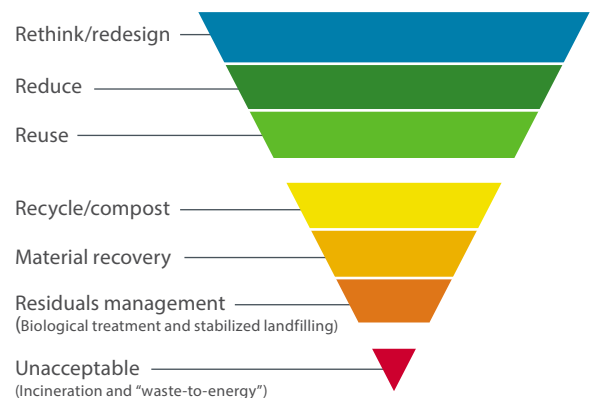
The City partnered with a local Chinese buffet restaurant to reduce food waste over a one-year project period. Waste assessments guided by the waste hierarchy were completed, focusing on food waste reduction at all stages:

Storage, preparation, serving, consumption and discarding to identify opportunities and problem areas. This project is an example of managing food waste at the point of consumption to achieve GHG and resource conservation benefits.

**In the community
University of Calgary**

The University of Calgary strives to become a zero-waste community. By 2020, the University is committed to diverting 80 per cent of its waste from landfill while hosting 30,000 to 35,000 people per day.

Zero waste hierarchy of highest and best use 7.0



4. Natural infrastructure – 37 actions

The Climate Resilience Strategy highlights the climate adaptation and mitigation benefits found in a native-type of urban landscape and the multiple benefits that are provided by natural infrastructure. Natural infrastructure includes a range of assets, from natural through engineered, which rely on ecological and hydrological processes to provide municipal, ecosystem and social services.

City actions

Resilient Calgary Strategy

The Resilient Calgary Strategy (June 2019) highlights municipal natural infrastructure as a key pillar in a resilient city. We will better protect and manage the natural systems we rely on for municipal services through:

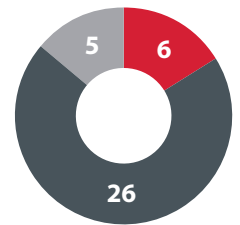
- Understanding the multiple benefits provided by natural infrastructure.
- Incorporating natural infrastructure in the asset management process.
- Embedding the value of natural infrastructure into core decision-making processes and policy.

The natural infrastructure program is a multi-year initiative involving cross-corporation collaboration. Over 100 municipal, not-for-profit, academic and industry representatives from across Alberta and British Columbia were engaged in September 2019 to discuss

the value of including natural infrastructure within the municipal asset management and financial frameworks.

Biodiversity Action Plan (2020)

In 2015, Council approved *Our BiodiverCity: Calgary's 10-year Biodiversity Strategic Plan*, which provides direction for initiatives to improve and enhance biodiversity conservation actions. Its goal is to integrate biodiversity principles into the protection, development and management of Calgary's natural and built environments with one key benefit being urban ecosystems that are more resilient under future climate change stresses. In 2019, Calgary Parks initiated the development of a supplemental Action Plan which includes specific targeted actions to achieve the objectives of the Our BiodiverCity strategy. The Action Plan is projected to be completed in mid-2020.

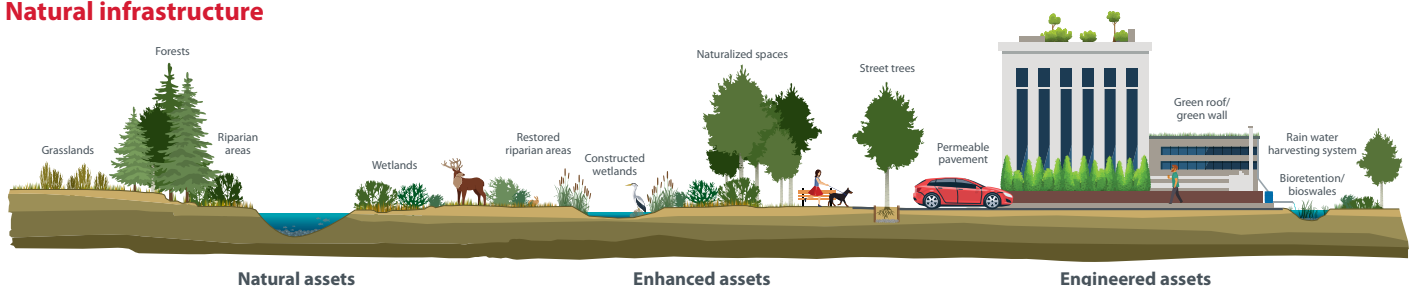


- Completed
- In progress
- Not started

Desired outcomes of the Natural Infrastructure Program

- To **avoid** an unfunded liability.
- To **enhance** natural functions and ecosystem services.
- To **adapt** to a changing climate.
- To **reduce** life-cycle costs for infrastructure.
- To **realize** the multiple social, economic and environmental benefits of natural infrastructure.

Natural infrastructure



2019 feature projects

West Springs community

The creation of a 3.5 ha conservation reserve was one of the first uses of the new Conservation Reserve Designation under the amended *Municipal Government Act* (MGA).

Rockland Park community

The Haskayne Area Structure Plan included road alignment and slope rehabilitation considerations along the Bears paw Dam Road to protect and restore a section of Bow River native escarpment. This policy included a much larger escarpment slope setback (18 m) than standard practice.

Urban conservation portfolio

Conservation of environmentally significant areas is critical to protecting existing natural assets, with benefits for biodiversity, climate resilience, stormwater management, and city livability. The Calgary Parks Urban Conservation Portfolio works in a number of areas that focus on the conservation, planning, management and restoration of natural environments in the City. Focus in 2019 was placed on natural area protection in new community development, improved invasive species management and restoration of natural environments.

Habitat restoration

One of the key targets of the Biodiversity Strategic Plan is restoring 20 per cent of Calgary's open spaces by 2025. One way The City continues to achieve this goal is through the Biodiverse Communities Project, which is developing and formalizing the processes for planning and delivering restoration projects with community engagement and support. This involves working with citizens to improve understanding about the benefits that restored spaces provide to both citizens and wildlife. Restoration projects incorporate a variety of native and drought-tolerant species, which has a

number of benefits including improved control of invasive species, lowering of long-term maintenance costs and improved ecological resilience in the face of climate change.

Climate change is expected to make it more challenging for preferred vegetation to thrive, particularly in the urban landscape. In 2019, vegetation trials were conducted throughout the city to select drought and salt tolerant species of grasses, shrubs and trees to build a more resilient urban landscape. Hardy native vegetation with a wide tolerance for suboptimal conditions may contribute to cost effective landscapes, as they can survive with limited watering and less frequent mowing, leading to a reduction in water use and maintenance costs.

Urban forestry portfolio

Healthy trees are more resilient to the effects of a changing climate. Additionally, they provide mitigation of GHG emissions, improve air quality, provide shade and relief from the urban heat island effect, absorb stormwater, and decrease risks of damage in a storm event.

In 2019, City trees were pruned based on a new tree condition assessment risk matrix. A new staff training program, implemented in 2019,



ensures pruning practices maximize public and worker safety and optimize tree health. To improve the health of street trees, when underground work is required, tree vaults are removed and replaced with trenches where possible to increase the soil volume available to the trees.

Calgary's urban forest was damaged by the 2013 flood, the snow event in 2014 and several wind events in 2017. Meeting the Municipal Development Plan long-term target of 16 per cent tree canopy coverage is at risk given our current level of 8.25 per cent. The target includes both public and private trees, therefore, public education and tree stewardship promotion is an important piece of the urban forestry portfolio. Calgary's urban forest has an estimated value of \$1.3 billion. The City utilizes an online tool to illustrate the location, value, ecological benefit and condition of Calgary's urban trees. In 2019, Calgary Parks began developing a similar tool to quantify the benefits provided by grasslands and wetlands.

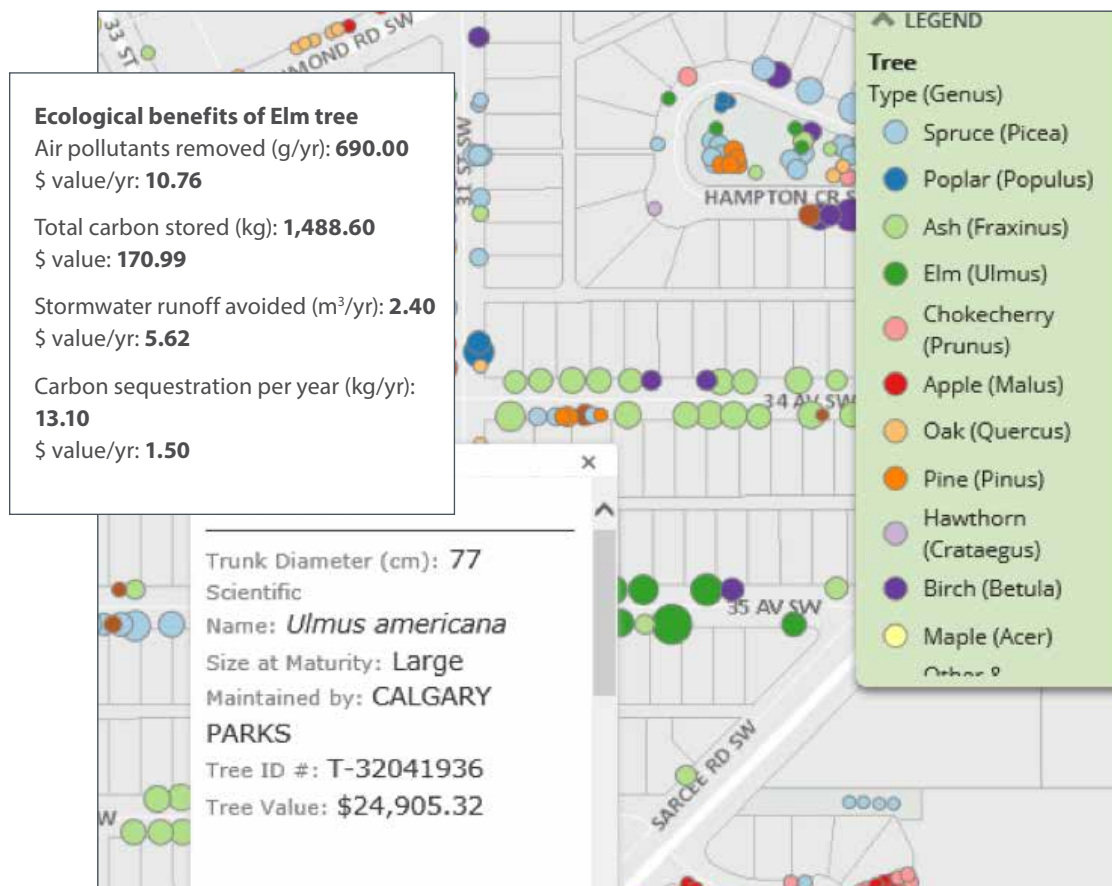


**Indicators:
Habitat
restoration**

Active restoration area (Parks): 143 ha

Completed restoration area (Parks): 23 ha

Goal of restoring 20 per cent by 2025



**Indicators:
Tree canopy**

Percent of land covered by tree canopy: 8.25 per cent

Tree canopy cover goal: 16 per cent

Number of trees planted in 2019 by Urban Forestry: Approximately 25,000

Number of assessed street trees: Over 50,000

Number of pruned street trees: Over 13,000

Development Guidelines and Standard Specifications: Landscape Construction (DGSS)

The DGSS are updated annually and include the following guidance:

- The 2020 version is proposed to contain a recommended plant list to guide restoration projects.
- Soil Management Guidelines were included as a companion to the 2019 DGSS.
- City of Calgary seed mixes were included as a companion to the DGSS in late 2018 to recommend seed mixes based on habitat type and maintenance regime along with best practices regarding timing, application rate, methodology, seed storage and project design.

The noted updates to the DGSS will help to direct developers and The City towards the construction of a more climate resilient landscape, improve restoration efficiency and minimize operational costs.

Partnerships

The Alberta Low Impact Development Partnership in conjunction with the University of Calgary, The City and other partners are conducting stormwater bioretention research at a site located at the Town of Okotoks Operations Centre. In 2019, specific research on the performance of various media types, plant species and soil amendments to bind phosphorous are being investigated for water quality and water quantity outcomes. The research is intended to improve stormwater management tools and practices to provide for a more flood resilient community and healthier waterways.

The Calgary Metropolitan Regional Board is working to regionally define Environmentally Sensitive Areas to better align guidelines for their improved protection.

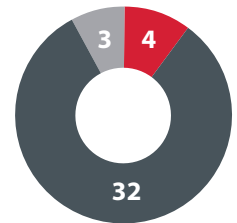


5. Integrated watershed management – 39 actions

Increased pressure from regional growth and the impacts of climate change make integrated watershed management one of Calgary’s critical resiliency challenges. Climate change not only impacts the quality and availability of water supply, but also the demand for water.

A special session of Council was held on 2019 May 13, to explore water supply security and the future of stormwater management in a changing climate.

Details on The City’s integrated watershed management activities are highlighted in the 2019 IWM Update.



■ Completed
■ In progress
■ Not started

City actions

Water efficiency

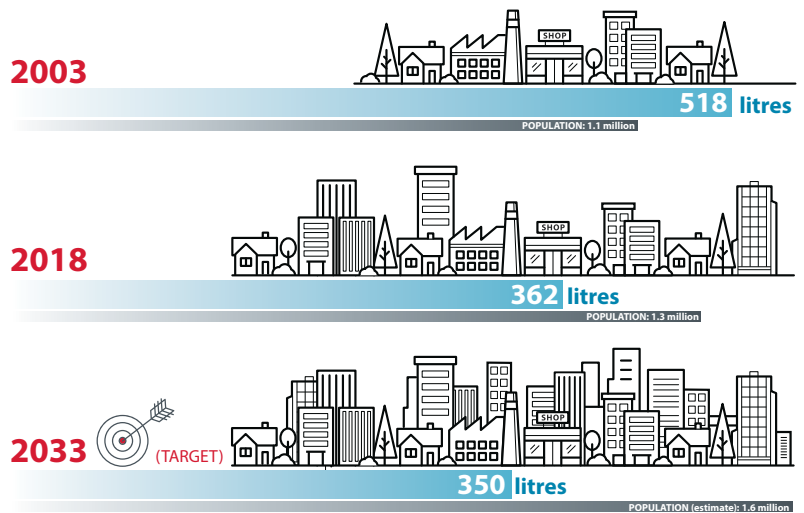
Water efficiency and conservation is a tool to use water more wisely, as well as a method of decreasing energy consumption in water treatment and distribution. The City has actively focused on water conservation and plant efficiency since the 1980s. This foresight has helped prepare Calgary for population growth and a changing climate. The Water Efficiency Plan is a key program which aims to hold withdrawals from the river steady at the 2003 baseline level, despite a growing population. In 2018, Calgarians used 362 litres per capita per day, on track to meet the 2033 target of 350 litres per capita per day.

The City has monitored water loss for many years. A targeted Water Loss Strategy is being developed by the City to better quantify non-revenue water including water loss through leakage and authorized municipal purposes. Ninety-seven per cent of water customers are metered. Metering combined with improved access to billing data and water consumption information has led more informed customers and a resulting reduction in water use.

Drought management

Drought is a key risk to water supply in the Calgary region that will be intensified by climate change. The City’s internal Drought Risk and Vulnerability Assessment was substantially completed in 2019. The City examined future climate scenarios and evaluated the risks and vulnerabilities to seven drought impacted

Total water use by community, per person, per day



Total water used by the community = water used by residents, businesses, institutions, as well as water lost through leaks, unaccounted for, or not billed. This total is then divided by the number of people living in Calgary.

systems. This work will help prioritize systems which may have significant consequences, determine which critical operations and customers may be impacted and better plan to manage these increasing risks due to climate change.

Riparian Action Program

Climate change is projected to increase flood risk in the future. Healthy riparian areas are more resilient to flooding and flood related damage. The City’s Riparian Action Program (RAP) aligns to the natural infrastructure pillar of the Resilient Calgary Strategy and the Climate Resilience Strategy. The RAP implements a comprehensive



Energy and water efficient riparian restoration

Three riparian restoration projects were completed with native plants and watered with river water through solar-powered drip irrigation systems in 2019. This low cost, low energy solution helped establish healthy riparian areas.

and coordinated approach to protect riparian areas in Calgary and contains three specific program areas:

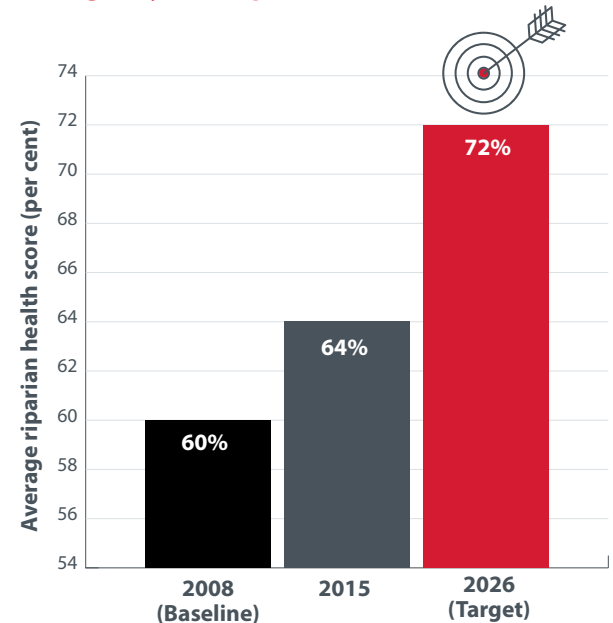
1. Riparian health restoration and monitoring
2. Riparian land use planning
3. Outreach and education

In 2019, The City continued its efforts to improve riparian health and restore riparian areas through bioengineering using a combination of vegetation and built components. Approximately thirty bioengineering and riparian planting projects were implemented in 2019. The City is now implementing a long-term five-year Riparian Monitoring Program to measure the improvement of riparian health over time and to evaluate the efficiency of restoration practices.

Stormwater Management Strategy update

Since the 2005 Stormwater Management Strategy was implemented, municipal stormwater management practices have advanced and the potential impacts of climate change on stormwater runoff are better understood. The City has also implemented an integrated watershed management approach to providing customer-centric services and policies. The City

Average city-wide riparian health score



is updating the 2005 Stormwater Management Strategy to incorporate these elements and to set a strategic course forward for how stormwater is managed over the next twenty years. The Strategy will also align with other corporate strategies and policies such as The City's Climate Resilience Strategy, the Corporate Resilience Strategy, Municipal Development Plan, Our BiodiverCity and Wetland Policy.

Flood mitigation

Building flood resilience remains a top priority for The City of Calgary. The City's Flood Resilience Plan includes a combination of upstream, community and property-level flood mitigation to ensure that Calgary becomes more resilient to flooding, considering climate uncertainty and continued urban development. Seven years after the 2013 flood, many projects have been completed, reducing Calgary's flood risk. In 2019, construction of the Eau Claire Promenade continued, incorporating the downtown flood barrier and connecting with flood barriers in

The community of Renfrew Integrated Stormwater Management Study (2019)

A test case that considers future climate change and redevelopment is underway to formulate potential design criteria and solutions to flood control, storm water quality and stream bank erosion. Information from this test case may inform integrated stormwater management practices throughout redevelopment areas.

West Eau Claire Park and the Centre Street Bridge to provide an increased level of protection to Calgary's downtown.

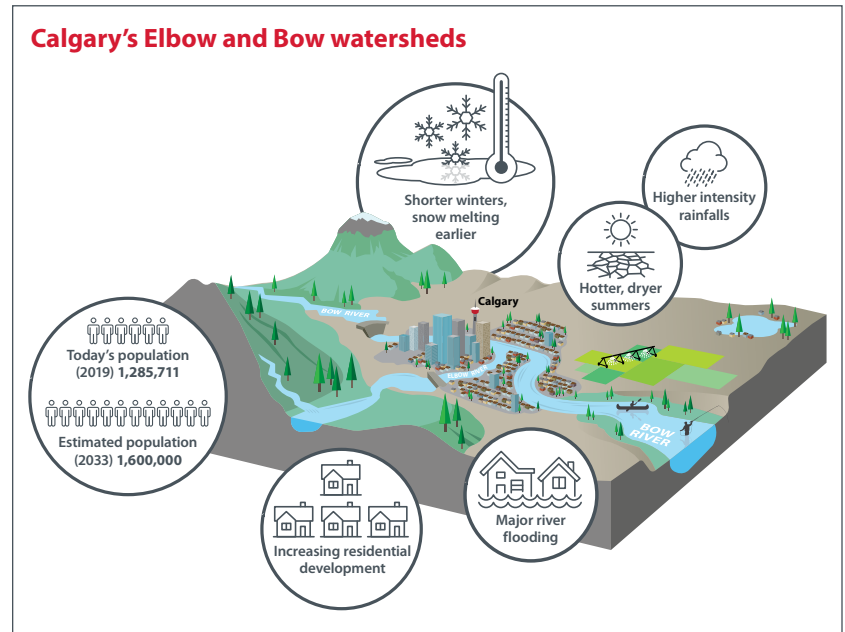
Environmental measurement, modelling and monitoring

Drinking water infrastructure, including treatment plants and distribution systems are long-term assets that must be resilient to changing demand. The City's GoldSim Water Demand Forecasting Model has been updated to integrate the impacts of climate change, economic conditions, water rates, and distribution water loss with population growth. This model is one tool used to determine infrastructure requirements based on future water demand.

For the Calgary region, it is expected that climate change will cause changes in seasonality, shifting peak river flows earlier in the year and causing reduced summer flows¹¹ and water availability. The Bow River Water Quality model is being refined to address changes in waterflow conditions and pollutants entering the waterways. This model informs design of wastewater and stormwater infrastructure to protect water quality for downstream users and aquatic life, while maintaining regulatory compliance.

Similarly, climate change is shifting the frequency and intensity of precipitation events. The City has partnered with the Calgary Airport Authority on a project to produce a comprehensive climate change dataset to develop updated Intensity Duration Frequency (IDF) curves for the Calgary region. Updated IDF curves can aid in designing stormwater drainage systems, minimizing the risks posed by stormwater flooding, protecting public safety and preventing infrastructure damage.

Extensive monitoring across the Calgary region provides data that improves the understanding of local weather and river systems. Continuous improvement in precipitation and stream level monitoring enhances data capture to support decision making, modelling and provide early flood warning.



Partnerships

Source Water Protection

A changing climate is predicted to increase the frequency and intensity of forest fires in western Canada. One of the greatest risks to Calgary's source water is contaminated run-off from landscapes burned by wildfires in our watersheds. Collaboration at the provincial and regional level is on-going to ensure the source of our high-quality drinking water is protected from risks exacerbated by climate change. The City spearheaded a Wildfire Source Water Partnership Task Force. In 2019, this group worked to enhance understanding of critical wildfire impacts in the source watershed.

Watershed management

The City is an active stakeholder in the province's Bow Basin Water Management Options Project, which is examining options for a reservoir on the Bow River. A new reservoir would be a major component in flood mitigation and potentially improve the availability of water for the region during drought. A new reservoir is crucial as we expect more extreme climate events in the future. The province hosted three public open houses in

¹¹ Bonsal, B.R., Peters, D.L., Seglenieks, F., Rivera, A., and Berg, A. (2019): Changes in freshwater availability across Canada; Chapter 6 in Canada's Changing Climate Report, (ed.) E. Bush and D.S. Lemmen; Government of Canada, Ottawa, Ontario, p. 261–342.



October 2019 to present the public with initial information on three options. The scope of the current work includes identifying engineering, environmental, social, economic, cultural and traditional land use factors that should be considered for the projects. The province has completed this conceptual study.

Bioengineering and education

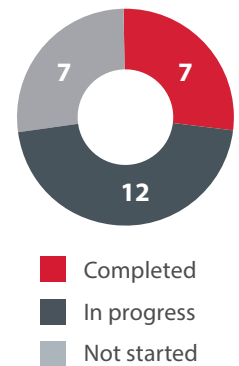
Construction of a demonstration project in Inglewood was completed in 2019 as a partnership with Alberta Environment and Parks to restore the riparian area, improve fish habitat and stabilize slopes using a variety of bioengineering techniques. Healthy and intact riparian areas can protect many City assets and infrastructure such as roads, pathways, utilities and buildings during flood events. The project now moves into post-construction monitoring of fish and habitat, wildlife, riparian health and bioengineering structure integrity over a 10-year period. In 2019, a number of education initiatives related to the project were piloted including a one-day parks school, in partnership with Calgary Parks and Trout Unlimited Canada. Interpretive signage and a website are in development and will be completed in 2020.

In the community

The new Integrated Water Management diploma at SAIT had its first course on campus explicitly dedicated to climate adaptation. The climate course is solution-oriented and aims to develop competencies in planning, policy, technology, risk management, emergency response and natural infrastructure. SAIT focuses on applied skills and works closely with multiple sectors to develop graduates aligned with industry needs. Students will possess an awareness of the complexity of the different elements, interfaces and approaches that need to be considered to support practical integrated water management.

6. Community outreach and education – 26 actions

The City of Calgary is not able to achieve our climate change mitigation and adaptation targets solely through our own activities. It is important to communicate climate change information, to provide education opportunities for Calgarians, and to enable innovation and collaboration with citizens and the private sector. Climate change education workshops and support have been provided for City of Calgary public educators in Waste & Recycling Services, Water Resources, Transportation Planning and Parks to support the integration of climate change information into existing City public education programs.



City actions

Eco-Leaders and Mayor’s Environmental Expo

Climate change is the theme of the 2019-2020 Eco-Leaders Program, a City youth environmental leadership program that helps school-based student teams research, design and implement curriculum-linked projects in their community. Thirty student teams were chosen to implement projects related to climate change mitigation or adaptation. Climate change will be the primary theme of the 2020 Mayor’s Environmental Expo, which will now be conducted virtually due to social distancing measures related to the COVID-19 pandemic.



Calgary Emergency Management Agency (CEMA)

CEMA shares disaster risk information, including current highest priority climate risks, with citizens via their Disaster Risk Explorer (launched in 2019), Disaster Risk Report, GetReady website and community outreach programming. CEMA continues to update this public information as Calgary’s disaster risk environment changes.

Calgary Neighbourhoods

In late 2018, Calgary Neighbourhoods established a Non-profit Organization Liaison to enhance communication and coordination between non-profit organizations and CEMA for emergency response and preparedness planning. The Integrated Non-Profit Business Continuity Project provides capacity development opportunities for non-profit

organizations to adapt to risks including climate change. These initiatives will better protect vulnerable populations who are most at risk from the impacts of climate change.

Climate change training for City planning and policy service line

Climate change training was provided to community planners in late 2019 and will continue into 2020 with additional onboarding training. This will help to enhance their understanding of the critical role Community Planning has in achieving The City’s climate mitigation and adaptation goals. It includes information on how to encourage applicants to incorporate climate action into development applications and how to include climate action into planning reports to Commission, Committee and Council.

“Over the past year more than 22,000 Calgarians have been educated about home energy efficiency, over 980 energy savings kits have been provided to multicultural and multi-lingual Calgarians, over 144 energy-savings workshops have been facilitated and greenhouse gas emissions have been reduced by 7,538 tonnes in Calgary due to behaviour changes inspired by the Empower Me program.

This is equivalent to taking 1,600 cars off the road for one year, or the energy used by 870 homes for one year. Empower Me would like to thank The City for their strong partnership that has helped to make this possible”

– Yasmin Abraham,
Vice President
Empower Me



Partnerships

Energy efficiency education for new Canadian audiences

Since 2018, The City has supported a home energy conservation and behaviour change program facilitated by Empower Me. This program is administered by members of multicultural and multilingual communities in their native language via presentations, workshops and individual home visits. This successfully delivers energy efficiency, water conservation, waste reduction and climate change messages to the region’s diverse populations within a trusted context.

Canadian Parks and Wilderness Society Southern Alberta Chapter – City of Calgary Partnership

To inspire youth to learn about local issues surrounding climate change, and what they can do to help, The City has partnered with the Canadian Parks and Wilderness Society (CPAWS) Southern Alberta Chapter to deliver climate change specific programs through classroom workshops and wilderness hikes. In addition, The City of Calgary climate change messaging is now infused into environmental literacy

community workshops and interpretive hikes for adult new Canadians. In total, CPAWS anticipates reaching approximately 8,125 students and approximately 950 adult new Canadians with The City of Calgary climate change-specific messaging in the 2019-2020 school year.

Calgary schools for climate action working group

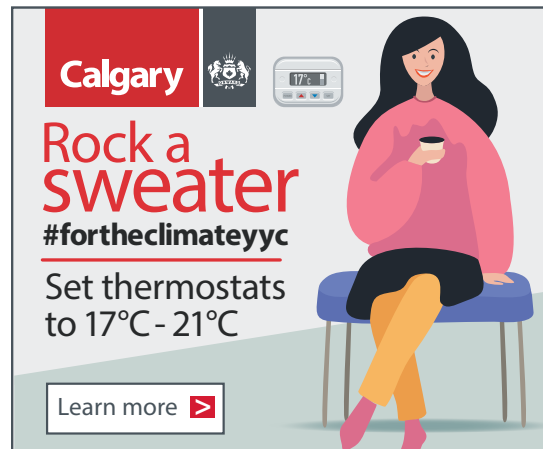
As the principal providers of education for Calgary’s youth and cumulatively the second largest landowner in Calgary, school districts have a large role to play in climate mitigation and adaptation. In 2019, The Alberta Council of Environmental Education (ACEE) and The City of Calgary established the Calgary Schools for Climate Action initiative, along with the Calgary Board of Education, the Calgary Catholic School Division, the Calgary Regional Consortium, the Calgary City Teachers’ Convention Association and the University of Calgary. The aim of this group is to build a program that helps schools reduce greenhouse gas emissions while providing new learning for students around climate and energy, using The City’s Climate Resilience Strategy as an organizing framework for collective action.

In the community

Calgary Climate Symposium

2018: The City of Calgary hosted the first annual Calgary Climate Symposium in 2018, with five public events and a breakfast session for Council and the Administrative Leadership Team. The goal of the symposium was to increase climate literacy for informed decision-making at all levels of society including City Council, City Administration, business, organizations, community and individuals. All events were fully subscribed with 1,230 attendees.

2019: In November 2019, The City hosted the second annual Calgary Climate Symposium, which featured eight free public events including speakers, panel discussions and demonstrations designed to increase awareness about the local impacts of climate change, empower Calgarians to reduce their contributions to climate change, and help residents prepare for and adapt to a changing climate. Similar to 2018, all events during the second annual Calgary Climate Symposium were sold out with a total of 1,729 attendees.



Climate actions public information campaign

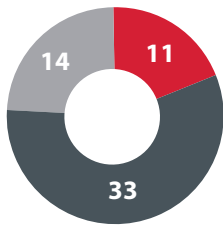
The Climate Program's first public information campaign was launched on November 4, 2019, coinciding with the Calgary Climate Symposium, to empower Calgarians with knowledge about everyday actions they can take to manage their energy use and take action on climate change. Climate program staff rated more than 40 actions on a spectrum from one for good impact, up to five for greatest impact based on greenhouse gas emissions data for Calgary, and created an online resource at calgary.ca/climateaction. This solutions-focused campaign combined guerrilla marketing, traditional and new media, and partnered with social media influencers to spark discussion and connect with audiences, reaching almost one in five Calgarians.

Community outreach

The 2018 and 2019 Calgary Climate Symposiums were sold out attracting more than 3,000 attendees. The 2019 climate actions campaign empowered almost one in five Calgarians with information on how to manage energy use and take climate action. Annual visits to calgary.ca/climateprogram and calgary.ca/climateaction have increased to approximately 25,000. These activities gained positive media coverage from CBC Calgary Television News, CBC Radio Calgary's The Eyeopener and The Homestretch, CBC Calgary Online, 660 News Radio, CTV Calgary Television News and the Daily Hive.



7. Leadership and governance – 58 actions



The City of Calgary has a responsibility to be a leader in the implementation of the Climate Resilience Strategy and Actions. Embracing collaboration, enabling innovation and demonstrating leadership in climate actions are the keys to success.

City actions

Sustainable Building Policy

One of the ways The City has demonstrated leadership to Calgarians and industry is through the updated Sustainable Building Policy (SBP). The updated SBP implements mitigation and adaptation actions for owned and funded building projects by The City. To date, The City's SBP has resulted in the LEED certification of 58 projects.

Some climate-related SBP updates include:

- **Optimize energy performance:** To achieve an energy use and energy cost performance improvement of at least 40 per cent above the National Energy Code for Buildings
- **Future resiliency planning:** Design the facility to be solar PV-ready and electric vehicle charging station-ready at minimum.
- **Stormwater management:** Manage stormwater for the 90th percentile of rainfall events on-site using green stormwater infrastructure to reduce flood risk.
- **Responsible landscaping:** Reduces potable water use, manages stormwater, promotes biodiversity and makes landscaping accessible for facility occupant and visitor use.

Corporate Emissions and Energy Plan

The City is developing the Corporate Emissions and Energy Plan, which will provide a coordinated approach to manage The City's emissions risks while reducing operating costs. This will be presented to Council in late 2020. By integrating both carbon emissions and energy management considerations into operational decision-making processes, The City can be better prepared to manage carbon risks and become more resilient in its service delivery while reducing energy costs.

Climate Lens Assessment

The federal government's Climate Lens requires a climate change mitigation and adaptation evaluation for large infrastructure projects seeking federal funding to realize their contribution to GHG emissions reduction and demonstrate consideration of climate change risks. The intention is to improve decision making, reduce climate impacts and develop more resilient infrastructure by avoiding future damages and disruptions. In 2019, The City began to develop its Climate Lens Assessment guidance and tools for the first group of projects to be subject to the new requirements.

This process will improve consideration of climate in decision-making processes and better align with provincial and federal grant priorities to maximize funding leverage.

Partnerships

It is valuable to bring together the leading thinkers from industry, business, academia, funding agencies, different levels of government and the wider public to share knowledge and leverage expertise to accelerate the collective pace of GHG emission reductions and climate risks to Calgary. In 2019, The City began collaboration with the Calgary Airport Authority to develop a regional climate projection dataset, to be delivered in the first half of 2020. This robust and regionally-specific dataset will be used to inform infrastructure design, resource allocation requirements and to shape operational decision making to adapt to shifting climate driven risks.

Current CCP working groups

Commercial and Institutional Building
Benchmarking
Climate Action and Education in the Calgary
School Community
Utilities and Industry Working Group

Calgary Climate Panel

The governance of Calgary's Climate Resilience Strategy includes an external body called the Calgary Climate Panel as a strategy and advisory network. The Panel provides broad strategic advice and communications regarding progress on Calgary's Climate Resilience Strategy. The Calgary Climate Panel was established in November 2018 and includes 18 organizations collaborating with The City.

The Panel's role:

- Each member sees value in working together to advise on priorities and share best practices.
- Strategic guidance for initiatives including prioritization, funding and financing opportunities.
- Communication of research findings, best practices and general information exchange on climate mitigation and adaptation.
- Representation from key organizations in public, private, not-for-profit and academic sectors that can directly contribute to climate mitigation and adaptation with organizational support to engage in action.

Working groups, made up of CCP members, City Administration and additional partners, pursue actions that require close partnership for success. Those collaborative efforts are happening in industry, educational institutions, and the broader community toward the goal of lowering carbon emissions and developing a more resilient city. The Calgary Climate Panel's report on their work and the City Climate Program is included as Appendix 1 to this document.

**Academia**

Local post-secondary institutions and The City have been collaborating to support student research projects on climate issues as well as to support corporate climate initiatives. Since 2018, graduate students from the Sustainable Energy Development (SEDEV) Program at the University of Calgary have been examining real world problem statements with The City such as Barriers and Incentives for Residential Solar PV Adoption in the Calgary Area and Food Waste Reduction at the Grocers in the city of Calgary.

QUEST Smart Energy Communities Benchmark

As a community, learning from other cities in Canada through consistent indicators and identifying gaps will help Calgary to achieve smart energy community status. The Smart Energy Communities Benchmark is a prototype tool, completed by QUEST that municipalities may use to benchmark progress toward becoming a Smart Energy Community. Throughout 2019, The City of Calgary has been supporting this benchmark prototype tool development. The results for the first nine pilot communities, including Calgary, are available at <https://smartenergycommunities.ca/>.

"We appreciate that the students had the opportunity to work with organizations to help research issues of concern to the city. Working on real issues allows them to apply their knowledge base experientially, similar to a work place setting. We hope we can continue this relationship in the future. Our students have enjoyed their association with The City of Calgary and the opportunity to do their part in helping to make our city an even more sustainable place to live."

~ Dr. Irene M. Herremans,
Professor at the
SEDEV Program, CPA
Managerial Faculty
Fellow, Haskayne
School of Business,
University
of Calgary

"The City of Calgary participated in the Smart Energy Communities Benchmark Pilot Project, contributing to the development of a prototype benchmarking system for community energy planning across Canada. The City worked closely with QUEST, alongside eight other pilot communities, and convened local utilities – ENMAX and ATCO – in collaborative working sessions to provide detailed feedback that directly influenced the benchmarking framework." – Michael Lee, Senior Lead, Analytics & Services, QUEST

Funding

Federation of Canadian Municipalities

Low Carbon Cities Canada (LC3) is an initiative that will enable and accelerate urban carbon-reduction solutions.



The partnership between seven local centres and the Federation of Canadian Municipalities (FCM) will be self-sustaining – safeguarding and leveraging the federal investment and generating ongoing revenue for grants, projects and operations.

The Calgary LC3 centre received \$22 million from FCM in 2019 to accelerate and scale local projects that focus on deep energy retrofits in the commercial and residential sectors and local deployment of renewable energy. The funding is not provided directly to The City, but rather to this new entity, which has a mandate to support Calgary’s Climate Resilience Strategy goals through partnering with local organizations.

The fund is intended to be self-sufficient once it is established. The Calgary LC3 Centre will work with The City and community partners to ensure low-carbon actions generate valuable local equity. The establishment of the LC3 will enable and attract business investment by helping businesses find efficiencies and de-risk projects leading to innovative solutions.

Municipal Climate Change Action Centre

The Municipal Climate Change Action Centre, a partnership between the Alberta Urban Municipalities Association, Rural Municipalities of Alberta and the Government of Alberta, supports municipalities across Alberta in developing and implementing energy efficiency and renewable energy solutions. Since 2016, The City has received \$2.9 million for 11 energy projects with a total installed energy generation capacity of 5.6 MW. These projects, mostly solar photovoltaic installations, are projected to produce 6.75 GWh of electricity per year and have a total estimated lifetime emissions reduction of 108,055 tonnes CO₂e. The City is also exploring upgrades to recreation facilities including lighting, building automation systems, sensors and heat recovery solutions.



**Municipal
Climate Change
Action Centre**

“By harnessing the hidden fuel of energy efficiency, Calgary’s actions are adding up to real dollars saved. As they travel the path of green growth, The City is inspiring other municipalities and sectors to make changes that create resilient and sustainable communities.”

– Trina Innes, Director,
Municipal Climate
Change Action Centre



Moving forward

Climate risk

To ensure Calgary maintains its high standard of living, social and economic wellbeing and reputation, climate risk should be quantified, modelled and managed into the future. Climate risk reduction will look at addressing both the cause of climate change, increasing GHGs, and the effect of direct and indirect climate impacts.

Climate change is being recognized as a major threat to the insurance and finance industries and to municipalities' economic investment value. Climate regulations that support economic resiliency have not yet been implemented due to a lack of precise understanding of what impacts will be felt and how to best manage them. Work is ongoing in these areas and will evolve through the efforts of organizations such as the Task Force on Climate-Related Financial Disclosures (TCFD), Global Risk Institute, Insurance Bureau of Canada and the Intact Centre for Climate Adaptation.

Addressing challenges in moving forward

Meeting the Calgary Climate Resilience Strategy's objectives will require ongoing prioritization of climate change within municipal operations, steadfast commitment, and appropriate resourcing. The economic outlook for 2020 indicates that future budget will continue to be constrained and that, consequently, implementation timelines and priorities will need to be re-evaluated to match the resources available.

The Calgary Climate Panel noted within their 2019 Annual Report (Appendix 1), that while the creation of the Panel was a vital first action following the adoption of the Climate Strategy and that they play an important role in moving the Strategy forward, delays have arisen in partnership actions due to The City's staff resourcing constraints. In 2020, the Panel

is looking to cement a common vision and specific 2020 goals, actions, accountability, resources and contingencies to move projects forward. They have identified that The City's support and resources are critical for the Panel to collaboratively evolve, provide benefit to their own organizations and leverage their partner resources to build initiatives that are not possible for The City to undertake alone.

Climate Governance within City Administration was a demonstrated challenge in 2019. The experience of distributed climate governance and implementation has not delivered the expected results or certainty of future results. Complex challenges such as climate change mitigation and adaptation require integrated, systems level solutions. The Climate Resilience Strategy cannot be successfully implemented without strong senior leadership, commitment across the departments and clear accountability. If any of these elements is lacking, the initiative will not meet the goals in the expected timelines. The Corporation is looking for greater assurance, consistency and efficiency of work plans, and to continue developing a culture of collaboration. During 2020 new climate governance structures will be studied and recommended for implementation.

Understanding and recalibrating investments in infrastructure, people and systems will become

more important for not only The City of Calgary, but also for the community. The City will need to ensure infrastructure and development integrate climate risk reduction approaches and reduced carbon strategies. In the community, the new Low Carbon Canada Centre for Calgary will start to assess opportunities for the investment of \$20 million into significant carbon reduction projects. Collaboration and alignment with City and other community low carbon projects will provide additional large scale capacity for carbon reductions and meeting the 80 per cent target.

Climate Program – 2020 workplan

Building upon efforts already underway in Calgary, the Climate Team will continue to reach out and engage internal and external stakeholders to help address the challenges of climate change. The Climate Team will identify, coordinate and with work with other departments for implementation of actions within their service areas throughout 2020. In addition to the current actions already underway, several other initiatives have been identified for development by the Climate Team in 2020. A high-level summary and examples are described below.

Climate strategy outcome	Strategy/approach	Activity examples Note: these are high level descriptions of the activities, many of which are multi-year
An efficiently, effectively and consistently managed climate program	Reporting on climate program results	<ul style="list-style-type: none"> • Annual update of Climate Resilience Strategy • One Calgary reporting
	Internal corporate climate governance	<ul style="list-style-type: none"> • Establish corporate climate action accountability and decision making • Lead internal cross-functional working groups to holistically implement the Climate Action Plans
	External climate governance	<ul style="list-style-type: none"> • Coordination of Calgary Climate Panel and working groups
	Funding and financing	<ul style="list-style-type: none"> • Low Carbon Cities Canada (LC3) • Disaster Mitigation and Adaptation Fund (DMAF) • Infrastructure Canada (IC) Climate Lens Assessment for major capital projects: (GHG assessment and climate resilience assessment, e.g. Green Line)
	Collaboration with Infrastructure Calgary	<ul style="list-style-type: none"> • Capital project climate prioritization and investment criteria (internal Climate Lens Assessment)

Climate strategy outcome	Strategy/approach	Activity examples Note: these are high level descriptions of the activities, many of which are multi-year
Reduce corporate and community GHG emissions	GHG and carbon offset management	<ul style="list-style-type: none"> • Annual GHG reporting through Climate Disclosure Project (CDP) • Corporate GHG and carbon cost forecast/guidance • Carbon offset governance
	Implementation of corporate climate actions	<ul style="list-style-type: none"> • Corporate Emissions and Energy Plan • Technical specifications (i.e. low-carbon concrete, EV charging stations) • Coordinate Infrastructure Canada (IC) Climate Lens GHG Assessments for major capital projects
	Reduce energy use and GHG emissions in buildings	<ul style="list-style-type: none"> • Commercial and Institutional Building Energy Benchmarking Program • Residential Building Energy Labeling Program • Update/improve existing solar potential map • Lead the industry partner group on developing energy policy • Integrate climate actions into planning and development
	Support other corporate-led and community-led GHG projects	<ul style="list-style-type: none"> • Energy planning for Victoria Park re-development with Utility Working Group • Affordable housing energy/cost savings project(s) • Electric vehicle adoption • Replacement of buses with lower carbon options
Reduced corporate climate risk and vulnerability	Measurement and verification of climate adaptation	<ul style="list-style-type: none"> • Development of performance measures and metrics that can drive future adaptation scoring/budgets
	Develop corporate staff climate risk reduction programs	<ul style="list-style-type: none"> • Continue to develop an internal staff heat and air quality management, response and business continuity programs for business units (with a climate lens)
	Connect with external expertise on adaptation to guide investment and identify financial risk and liability	<ul style="list-style-type: none"> • Establish mutual working and advisory relationships with the insurance and banking/finance investment industries
	Develop and implement corporate infrastructure climate risk reduction program & projects	<ul style="list-style-type: none"> • Integration of a climate vulnerability and risk assessment, and gap analysis process into corporate asset management and facility management • Develop climate informed infrastructure typologies and risk criteria to inform engineering standards • Climate vulnerability and risk analysis on IC funded capital projects
	Support other corporate-led adaptation projects	<ul style="list-style-type: none"> • Co-lead Natural Infrastructure (NI) Program with Resilience Program • Collaborate on the development of water management strategies (drought, stormwater, and source water protection) • Collaborate on the corporate habitat restoration program

Climate strategy outcome	Strategy/approach	Activity examples Note: these are high level descriptions of the activities, many of which are multi-year
Reduced community climate risk and vulnerability	Community infrastructure climate risk reduction programs and projects	<ul style="list-style-type: none"> Collaborate to integrate a climate risk lens/ assessment into the Green Line and Victoria Park Redevelopment projects
	Community development climate risk avoidance and reduction projects	<ul style="list-style-type: none"> Co-develop a climate risk matrix on development in flood hazard areas (financial indicators) Integrate a climate risk lens advisory service into various planning and development processes
	Community health climate risk reduction projects	<ul style="list-style-type: none"> Develop a holistic extreme heat management strategy for the community
Calgarians aware, engaged and action-ready on climate change	Internal business units focused climate education courses	<ul style="list-style-type: none"> Provide Climate 101 Education Program to internal business units to enhance internal climate change literacy
	Community focused Calgary climate campaign (awareness, education and choice campaign)	<ul style="list-style-type: none"> Development of multi-media material, website update, public workshop series and events, Climate Symposium and Calgary Schools classroom programming Climate themed EcoLeaders Conference and Mayor's Expo
	Citizen climate action campaign	<ul style="list-style-type: none"> Implementation of Empower Me program (climate change, energy efficiency and water/water reduction information)
	Climate data sharing and education material for public consumption	<ul style="list-style-type: none"> Develop an online climate dashboard Creation of an online climate technical data centre/library

Appendix 1

Calgary Climate Panel Annual Report 2019

Executive Summary

The Climate Resilience Strategy is in the early stages of implementation. Panel members recognize the urgency of taking action on climate change and know that the Panel is an important pillar for effective climate action in Calgary.

Most of the first year's efforts focused on building strong partnerships and a platform for collaboration that is needed to achieve success over the long term. Panel members have come together from across sectors and communities in Calgary in support of the Climate Resilience Strategy, and are committed to working together to achieve the Strategy's goals through a range of specific initiatives and by aligning our broader strategies. Each organization represented has taken its own steps to advance climate adaptation and mitigation.

Several key collaborative initiatives that emerged in the Panel's first year are:

- Calgary Schools for Climate Action
- Utilities and Energy Working Group
- Commercial and Institutional Energy Benchmarking Program Working Group

Progress has been made during the Strategy's start-up year, which included some setbacks and resourcing challenges. Some first small steps toward implementation have been made representing a positive direction with growing awareness that much work is yet to be accomplished.

The Panel recognizes the urgency for quick and decisive action by not only The City, but all Calgarians. To accomplish this, the Panel has identified strategic level, next steps to ensure success going forward:

1. A focus on implementation
2. Prioritizing for delivery of desired outcomes
3. Ramping up partnerships
4. Aligning climate actions with other City initiatives
5. Communicating effectively and regularly with stakeholders and the public
6. Establishing priorities and clear, precise targets and performance measures

Calgary can be a leading community in climate action, and the panel is a foundational part of future successes. Continued City leadership and resourcing of the Climate program is necessary to gain real momentum and leverage external partner resources.

Calgary Climate Panel

The Calgary Climate Panel was created by The City as the first major action following adoption of the Strategy. The Strategy is City-led and supported; and requires significant community and industry effort to implement. The Panel's strength comes from its diverse and dedicated membership.

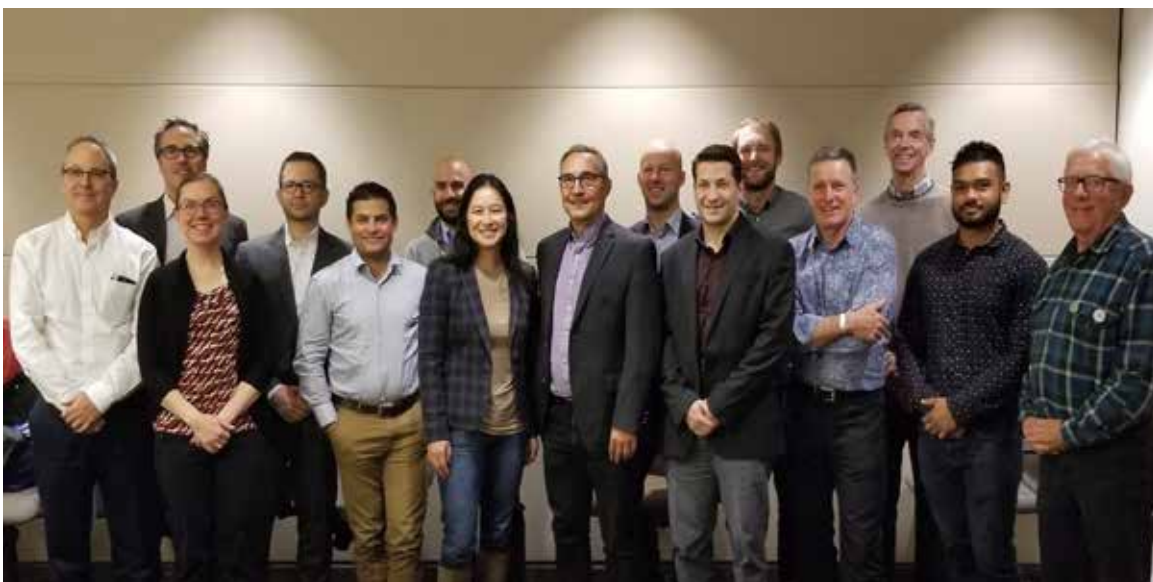
Panel members support the Climate Resilience Strategy and have committed to the Panel's dual roles: advisor to The City and a partner in implementation.

As an advisor, the Panel provides guidance to The City on climate opportunities, risks, policy options and priorities. The Panel provides insights on climate action that Administration may not be aware of; and offers industry and community perspective on implementation opportunities and challenges. As a partner, Panel members join with The City in climate action and, through their leadership, strengthen the climate actions of their own organizations.

Upon reflection of the last year, the Panel members are in agreement that the Panel provides strong value in moving the Strategy forward and they are dedicated to continuing their efforts.

2019 Membership

- Alberta Council for Environmental Education
- Alberta Ecotrust
- Alberta Health Services
- ATCO
- BILD Calgary Region
- BOMA
- Brookfield Residential
- Calgary Airport Authority
- Calgary Board of Education
- Calgary Chamber of Commerce
- Calgary Climate Hub
- Calgary Emergency Management Agency
- ENMAX
- Fuse Collective
- Public Member
- Siemens Canada
- The City of Calgary
- University of Calgary



Progress on the City's Climate Resilience Strategy

The first year of the Strategy has seen progress on some initiatives and delays on others. There are two types of initiatives to consider:

- 1. Existing projects:** A number of internal City initiatives are completed or underway (see Administration's Climate Resilience Strategy Update 2019). These tended to be initiatives that existed prior to the Strategy's approval and projects that could easily be modified to include a climate action.

In the Panel's opinion, many of these internal projects did not include substantial climate goals that engaged external partners. Some climate actions appeared to be siloed efforts that risk not being implementable because the project did not consider the full scope of climate goals and implementation factors. For example, recent land use bylaw updates and proposed policy amendments intended to encourage greater adoption of solar energy in housing; however, did not consider a wholistic approach that would require solar easements or considerations where there are potential conflicts between density goals and solar policy.

- 2. New projects:** Delays have arisen on new, externally focused projects where stakeholders were prepared to contribute resources, but The City could not contribute due to resource constraints. These tended to be the more complex projects with higher likelihood of significant impact.

Calgary Climate Panel: Contributions

As 2019 was a start-up year there was strong focus on:

- The Panel's advisory role to The City
- How the annual report would provide an independent voice
- Contributions to ongoing prioritization efforts based on each member organization's readiness and interest in collaborating
- Active participation in the City-led working groups

Panel members made substantial and meaningful contributions to three working groups:

1. Calgary Schools for Climate Action:

- The Alberta Council for Environmental Education led this initiative with The City and Calgary Board of Education and brought together 7 organizations (including Calgary Catholic School Division, the Calgary Regional Consortium, Calgary City Teachers' Convention Association, and the University of Calgary) to engage Calgary's educational community in climate change solutions.
- A framework will be developed to enable student-developed, school-wide climate action plans which students can then implement with the help of teachers, school administrators, and parents.
- Teachers will be engaged in climate-related professional development, such as a four-part climate series and a full-day climate workshop at the 2020 Calgary City Teachers' Convention.

2. Utilities and Energy Working Group:

- Panel members initiated a working group in the fall of 2019 to focus on the role utilities play in achieving the climate goals. For example, electric vehicles along with consumer generated energy and energy storage are likely consumer driven trends and a significant market moving forward. These evolving market conditions are anticipated to spur a significant shift in the ways consumers and utilities interact. Continued coordination and cooperation between customers, utilities, community stakeholders and The City of Calgary is required to maximize the benefit of these technologies.
- In 2020, the Utilities and Energy Working Group will focus on topics such as:
 - Energy Needs, Sources and Transmission Outlook: alignment of major partners with long-term plans and policy direction
 - Renewable and Distributed Energy Generation: practical and feasible energy options to support development projects
 - Residential Building Labelling: creating public and industry energy literacy tools

3. Commercial and Institutional Energy Benchmarking Program Working Group:

- Panel members provided advice and guidance through the program development phase and will promote the implementation phase.

Calgary Climate Panel: Delayed Initiatives

Panel members had planned to move forward with more partnership actions in 2019. Project delays stemmed largely from The City's staff resourcing constraints. The delays were further exacerbated by budget assessment and cuts during the summer. Examples of delayed initiatives are:

- **Residential Building Labelling:** Commercial and Institutional Energy Benchmarking Program was prioritized first in this program area with the residential building labelling intended to start mid-2019. City staff resources were impacted by budget cuts, resulting in a delay to the start of the initiative. Industry partners have been in a holding pattern and may lose momentum.
- **Climate Developer Advisory Group:** While preliminary discussions and events have been hosted, the working group has not yet been formally struck. The building and development industry is willing to provide some resourcing to assist on prioritized actions. These types of delays risk losing the confidence of the partners and stakeholders that this initiative is a priority.
- As a result of staff resource limitations, communication flow between The City and the Panel has been hampered which has resulted in the Panel not having clarity on:
 - How areas of work are being identified and aligned with other City initiatives
 - Whether/how prioritization was happening across The City's organization
 - What the Strategy's specific action plan is and how implementation will be coordinated

Panel Next Steps and Resources Required

The Panel's Next Steps

Over the past year, the Panel members have realized they can contribute even greater value through active project partnerships. The partnership approach will take advantage of external resources and create collective solutions. 2020 work planning is underway and will confirm a common vision and specific 2020 goals, actions, accountabilities, resources and contingencies for acceleration on projects such as:

- Residential Energy Building Labelling
- Climate Developer Advisory Group
- Education: continued support for education offerings through future professional development workshops, and convention day teachings

Resources Necessary to Succeed

- **City resources:** Continued City support for the Panel is critical to engage the Panel in a meaningful way resulting in direct benefits for all parties. City resource support continues to be required to support the alignment of efforts across City departments and with external partners on jointly identified priorities.
- **External funding:** The Panel will continue to work with funders to bring external funding resources to City and Panel initiatives.
- **Leverage partner resources:** Panel members will assess how to leverage their own organizations' efforts to align with the Climate Resilience Strategy and build initiatives that are not possible for The City to undertake alone.

Implementation Recommendations for 2020

The Panel recognizes the urgency for quick and decisive action by not only The City, but all Calgarians. To accomplish this, the Panel has identified strategic level, next steps to ensure success going forward:

1. A focus on implementation
2. Prioritizing for delivery of desired outcomes
3. Ramping up partnerships
4. Aligning climate actions with other City initiatives
5. Communicating effectively and regularly with stakeholders and the public
6. Establishing priorities and clear, precise targets and performance measures

What Does that Mean

- **A focus on implementation.** Past and current efforts have been hampered by resource challenges. Calgary's current GHG emission trend indicates that we need to act quickly and effectively to achieve the climate goals. Execution is vital in maintaining momentum and credibility as further delays will likely undermine The City's ability to convey to community and industry that climate goals are truly a priority.
- **Prioritizing for delivery of desired outcomes.** Prioritize projects and focus on successfully completing initiatives before taking on new ones unless new capacity has been created.
- **Ramping up partnerships.** Collaboration builds buy-in, enables partnerships to leverage efforts on climate actions, and is necessary to implement the Strategy. With the Panel moving towards a stronger partnership role with The City, it is still imperative that The City continues to support the Council-approved Strategy.
- **Aligning climate actions with other City initiatives.** Current and future City initiatives should develop climate project goals (Climate Lens) in conjunction with external stakeholders. Using climate goals as a project driver will ensure that project processes review all options and solutions. City policies, programs, and projects should be planned and implemented using a Climate Lens where applicable.
- **Communicating effectively and regularly with stakeholders and the public.** Strong communication will keep key partners and stakeholders invested and clear on what are priorities, next steps and why projects may be delayed. Better communication creates motivation to keep the actions moving forward and demonstrates progress to public as well as stakeholders.
- **Establishing priorities and clear, precise targets and performance measures.** Targets and performance measures for initiatives requires focus on how funds are spent (private and public) to yield the best results (\$/GHG reduction or \$/risk reduction).

“The City has played and should continue to play a leadership role in bringing stakeholders with common interests in the climate resiliency arena together through The Panel. If The City wishes to be successful in implementing the Climate Resiliency Plan, this committee and the Working Groups, in particular, will be critical!”

Council's Support

1. Funding and Resources:

Funding is key. Successful outcomes will be directly tied to continued City staffing and resource support. The Climate Change and Environment business unit will require full staff resourcing to implement the Strategy's commitments.

The Panel advises against any future reductions in staff positions or funding.

If resource reductions are required, they should be assessed alongside an understanding of the commensurate reduction program deliverables, and should be communicated publicly.

2. Leadership and Alignment in Decision-making:

The Panel recognizes the leadership of City Council in approving the Strategy. Council's leadership in climate decision-making is central to advancing the conversation, changing policy, and action on the ground. Lead faster, further and together.

Additional Panel recommendations are provided in Appendix B for context.

Final Thoughts

Calgary competes with other world class cities to attract new talent and diversify its economy. Climate action progress is an integral part of competing globally which cannot be neglected nor delayed. The City and the Panel have an opportunity to work together in unprecedented ways - with a solution mindset, a partnership mentality, and a practical bent that will get us to our goals. Calgary can be a leading community in climate action, and the panel is a foundational part of future successes.

These are the first small steps and there are many challenges and opportunities that lie ahead. With the appropriate resources and the desire to grow momentum, The City, alongside their partners, will be well positioned to achieve the Strategy's climate goals and target.

Appendix A: Minority Report Comments

The Calgary Climate Panel uses a consensus decision-making model and reports on our common perspectives. The report includes an opportunity for Panel members to provide any additional context or comments where they may not be in full agreement. There are no additional panel member comments for this report.

Appendix B: Additional Recommendations

The Panel's annual report process also resulted in ideas that will be considered for future climate actions or for the Panel's future success. The ideas are provided here for context. The panel members will review these options alongside the other commitments for the 2020 work plan.

- Additional interaction between panel meetings is required to explore and advance initiatives across panel members.
- Clear expectations on deliverables within set time expectations are needed (e.g. what it hopes to be able to achieve in a year or quarter).
- Additional insight and alignment with other short, mid and long-term initiatives underway through different corporate departments that complement the Strategy.
- Reallocate funding as needed to support climate actions.
- Continue to support education initiatives. It is through education that community members will understand what they can do to the make the necessary changes to decrease their own consumption rates.
- The City should encourage ongoing 'AND' conversations about Canada's potential to be a leader in natural resource development and fight global climate change simultaneously, this includes how parties can work together going forward.
- The City of Calgary should implement by 2022, programs to achieve by 2030 the financially neutral and positive measures identified in the Economics of Low Carbon Development report.
- The City of Calgary should implement by 2022 a progressive fee structure for electrical, heating, water, wastewater, and road use within the City.
- The City of Calgary should refine and develop tools to inform Calgarians of their carbon footprint and assess their housing and locational choices.
- The City of Calgary should provide moral and, where appropriate, resource support to other jurisdictions in their efforts to eliminate human contributions to climate change.
- Integration of climate criteria into development planning decisions.
- Ensuring new infrastructure, asset purchases or retrofits are always done in a manner than considers climate mitigation and adaptation in procurement and design criteria.
- Energy storage is a key area of market development and should be prioritized.

Appendix C: Calgary Climate Panel Overview

With the adoption of the Climate Resilience Strategy, Council provided direction to immediately begin collaboration efforts by working with partners through a Climate Resilience group to focus on implementation; finance and funding; and monitoring progress and reporting.

Climate Panel Purpose, Strategic Priorities and Scope

The Calgary's Climate Panel purpose, strategic purpose and scope was determined early in the process and forms the basis of the Terms of Reference.

Purpose: The Calgary Climate Panel (the Panel) is expected to provide broad, strategic advice and communications regarding the Climate Resilience Strategy's process.

Strategic Priorities and Scope:

The Calgary Climate Panel

- Acts as an independent voice providing advice on climate strategy opportunities, risks and policy options to The City
- Is responsible for contributing to The City's annual reporting to measure progress of the Climate Resilience Strategy
- Identifies and connects working group members resulting in direct climate action
- Acts as strategic advisors for working group initiatives – participate in coordination when necessary and act as a problem-solving forum for testing ideas
- Connects initiatives to funding and financing opportunities by building a robust network of funding partners and searching out new opportunities
- Acts as a strategic guide for distribution of research findings, best practices and general information exchange on climate mitigation and adaptation

Panel Structure, Role and Responsibilities

To achieve the Strategy's goals, targets and governance objectives, the governance model identifies the Calgary Climate Panel as a strategic panel, and the working groups as implementation groups, that effectively deliver approved actions and achieve the climate goals.

Panel Members are to act as champions of the Climate Resilience Strategy and actively participate and contribute to the Panel's strategic priorities. Members are expected to act in the shared interest of the Strategy and be solution-oriented. The Panel is co-chaired by a City of Calgary member and an external member.

To fulfill the responsibilities of the Panel, members have met quarterly through 2019, contributed to the prioritization of working groups, and the content of this annual report.

Appendix D: Membership/Partners

The Panel is represented by 18 members from a diverse range of business, non-profit, government, and post-secondary organizations. Membership for the first year also represents diversity of the Climate Resilience Strategy's action themes:

- Building and Energy Systems
- Transportation and Land-Use
- People
- Natural Infrastructure
- Infrastructure
- Water Management
- Governance
- Climate Education

The 2018/2019 membership included:

Organization	Member
Alberta Council for Environmental Education	Gareth Thomson
Alberta Ecotrust	Rod Ruff
Alberta Health Services	Dr. David Strong
ATCO	Ryan Germaine
BILD Region Calgary	Grace Lui
BOMA	Lloyd Suchet
Brookfield Residential	Doug Owens
Calgary Airport Authority	Harris Switzman
Calgary Board of Education	Olena Olafson
Calgary Chamber of Commerce	Duncan Webster / Jayeful Islam
Calgary Climate Hub	Bob Morrison
Calgary Emergency Management Agency	Chief Tom Sampson
ENMAX	Mirela Hiti / Justin Jacober
Fuse Collective	Ben Huang / Ben Walsh
Public Member	Rev Bill Phipps
Siemens Canada	Adrian Francese
The City of Calgary - UEP General Manager	David Duckworth / Dan Limacher
The City of Calgary - Councillor	CIlr Peter Demong
University of Calgary	Dr. Jennifer Winter

