



CARBON BUDGET

2023-2026

Edmonton

CITY OF EDMONTON
DECEMBER 2022

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THE STRATEGIC CONTEXT



THE STRATEGIC CONTEXT



DIRECTION



CHOICES

ConnectEdmonton and The City Plan

The City's long-term goals are outlined in two documents:

[ConnectEdmonton](#) sets the direction for the future and identifies where changes are required. ConnectEdmonton is based on an aspirational vision for Edmonton in 2050 and focuses on four strategic goals for 2019-2028 that require transformational change: Healthy City, Urban Places, Regional Prosperity and Climate Resilience.

[The City Plan](#) combines a Municipal Development Plan and

Transportation Master Plan and includes direction for environmental planning, social planning and economic development. The City Plan's five Big City Moves are bold, transformative priorities that advance ConnectEdmonton's goals and point the way as we deliberately build our city on our journey towards a population of two million Edmontonians.

Together these elements support the ConnectEdmonton goals as our strategic direction and The City Plan Big City Moves as our choices to have the systems and physical networks in place to support up to two million residents in the city Edmontonians envision for 2050. The Carbon Budget focuses on the ConnectEdmonton goal of Climate Resilience, to support the transition to a low-carbon future and The City Plan Big City Move of Greener as We Grow.



CONNECTEDMONTON GOAL HEALTHY CITY

Edmonton is a neighbourly city with community and personal wellness that embodies and promotes equity for all Edmontonians.

City Plan Big City Move Inclusive and Compassionate

We are rooted in concepts and efforts to improve equity, end poverty, eliminate racism and make clear progress towards Truth and Reconciliation.



CONNECTEDMONTON GOAL

URBAN PLACES

Edmonton neighbourhoods are more vibrant as density increases, where people and businesses thrive and where housing and mobility options are plentiful.

City Plan Big City Moves

Community of Communities

Making big city life feel less anonymous and more personal by developing housing, recreation, schools and employment in all of our districts that can be better accessed through all forms of transportation.

Rebuildable City

A way of planning for the flexibility and imagination we must demonstrate to keep our city vibrant, livable and efficient in the face of shifting local and global trends.



CONNECTEDMONTON GOAL REGIONAL PROSPERITY

Edmonton grows prosperity for our Metro Region by driving innovation, competitiveness and relevance for our businesses at the local and global level.

City Plan Big City Move Catalyze and Converge

Putting Edmonton into position to continually improve its competitiveness and readiness in a changing world.



CONNECTEDMONTON GOAL

CLIMATE RESILIENCE

Edmonton is a city transitioning to a low-carbon future, has clean air and water and is adapting to a changing climate.

City Plan Big City Move

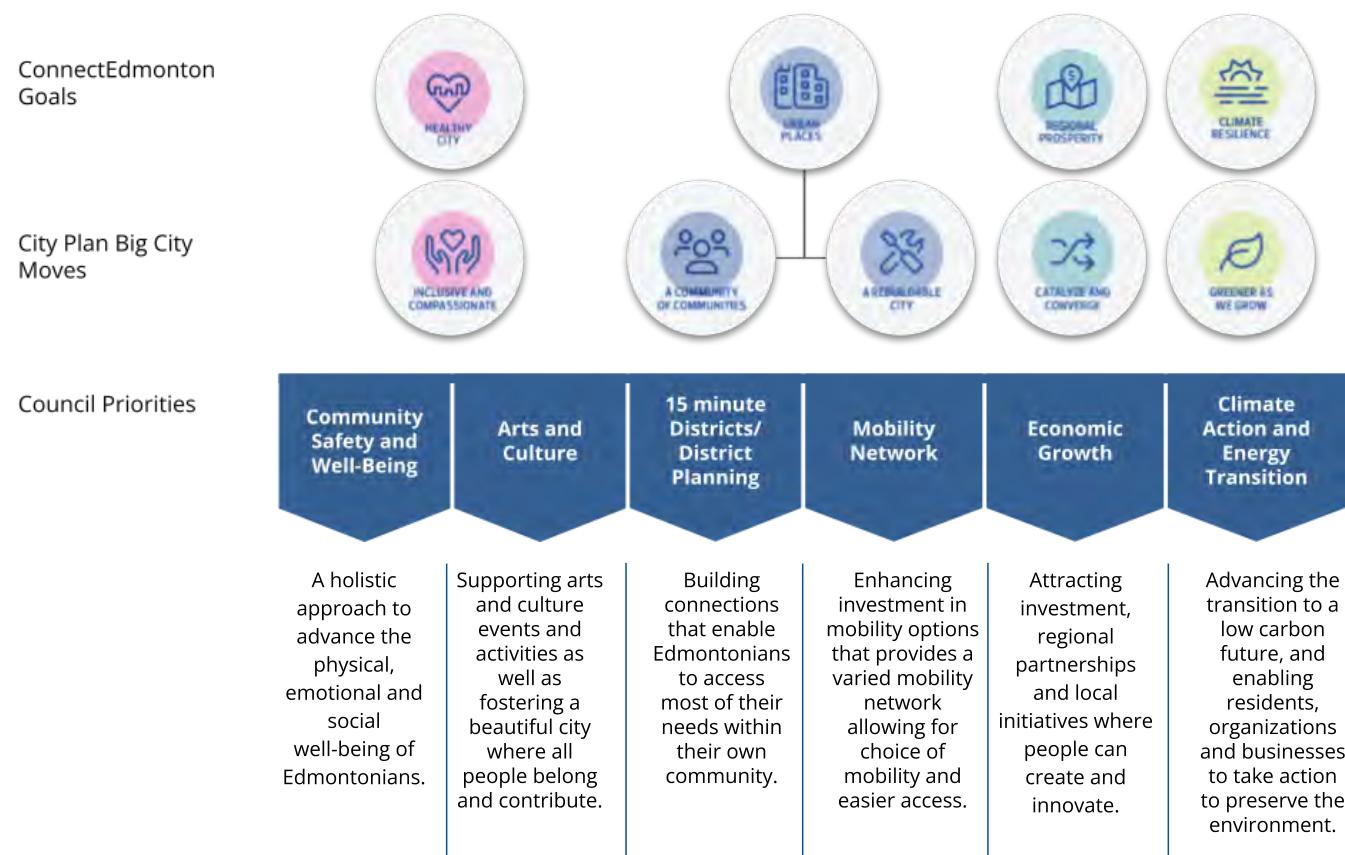
Greener as We Grow

A commitment to protecting and enhancing our land, air, water and biodiversity by using growth as a catalyst for good design and conscientious decisions.

2023-2026 Council Priorities

On August 27, 2019, City Council declared a climate emergency, recognizing the urgency of climate change and the need to reduce the City's carbon footprint. This is highlighted in both the ConnectEdmonton Goal "Climate Resilience" and the Council priority "Climate Action and Energy Transition." Climate resilience is about Edmonton's capacity to respond to the impacts of climate change and protect people, businesses and infrastructure from those impacts. Climate action and energy transition focuses on advancing the transition to a low-carbon future and enabling residents, organizations and businesses to take action to preserve the environment.

Council identified six priorities for the 2023-2026 cycle for Transforming for the Future and Serving Edmontonians. These priorities are influenced by both formal engagement with residents and the regular interactions Councillors have with their constituents. The Council Priorities help focus Administration's efforts to advance the strategic goals in ConnectEdmonton and The City Plan.



Transforming for the Future

The City of Edmonton collaborates with public, private and non-profit organizations in achieving Edmonton's long-term goals. With limited resources, being clear about the projects and actions that have the greatest impact enables the City to be intentional in its planning. The Strategic Actions have a transformational impact that residents would notice if they left and came back to Edmonton 10 years from now. They have high strategic value and a clear connection to the four ConnectEdmonton strategic goals, The City Plan Big City Moves and the 2023-2026 Council Priorities.

The strategic actions below have been prioritized for 2023-2026 as focused actions that will work to transform Edmonton through tangible changes that will be experienced now and by future generations. The Carbon Budget focuses on the Energy Transition Strategy.

Strategic Actions	
Community Safety and Well-Being Strategy	Anti-Racism Strategy Implementation
Affordable Housing and Homelessness Investment Strategy	Indigenous Framework Implementation
Zoning Bylaw Renewal	Development Projects
Growth Management Framework	
Economic Action Plan Implementation	Downtown Vibrancy Strategy
Foster Regional Partnership	
Climate Adaptation Strategy	Energy Transition Strategy

Climate Crisis

The world is in a climate crisis, which the Intergovernmental Panel on Climate Change (IPCC) has declared a threat to human well-being and planetary health.¹ The IPCC has stated every tonne of carbon dioxide (CO₂) emissions adds to global warming, therefore increased climate action is needed.² Over the last 50 years, Edmonton has been warming at one of the fastest rates in the world and a 2022 study³ found that social and Gross Domestic Product (GDP) costs for Edmonton increase with each degree of additional warming. It forecasts billions of dollars of impacts annually if no action is taken. Climate change impacts, including changing temperature, precipitation patterns, extreme weather events and ecosystems, will have consequences on Edmonton's infrastructure, economy, public health and safety, and natural environment.

¹ IPCC's Climate Change 2022: Impacts, Adaptation and Vulnerability Report

² IPCC's Climate Change 2021: The Physical Science Basis Report

³ Economic Analysis of Edmonton's Climate Risks Report, [Boyd](#), 2022

Edmonton is committed to climate action and protection, through the implementation of two climate strategies:

1. [Community Energy Transition Strategy](#), the City's greenhouse gas emissions (GHG) reduction plan
2. [Climate Resilient Edmonton: Adaptation Strategy and Action Plan](#), Edmonton's plan to prepare for changing climate impacts

Community Energy Transition Strategy

On April 19, 2021 Council approved the revised Community Energy Transition Strategy and Action Plan. The Energy Transition Strategy outlines how Edmonton can achieve transformational change to a low-carbon city as outlined in ConnectEdmonton and The City Plan and sets targets for Community and Corporate GHG emissions. Community emissions refers to the amount of GHG emitted by the municipality of Edmonton; Corporate emissions refers to GHG emissions from City-owned and operated assets and operations.

Community Energy Transition Strategy Targets

Achieving transformational change means setting ambitious targets. While the City of Edmonton has not yet established formal corporate targets, it is demonstrating its climate leadership by setting the target to be an emissions neutral corporation in 2040, 10 years earlier than the community target. The following targets reflect a community-wide and corporate accelerated energy transition journey:

Table 1: Corporate and Community-Wide Accelerated Energy Transition Journey

Target	Community	Corporate
Reducing net GHG emissions by 35% (compared to 2005 levels)	By 2025	N/A
Reducing net GHG emissions by 50% (compared to 2005 levels)	By 2030	N/A
Emissions neutral	By 2050	By 2040

The 2005 baseline was selected to align with the 2005 baseline year the federal government adopted for the national GHG emission target. While the City took earlier actions to reduce greenhouse gas emissions, 2015 was a significant milestone in changing the City's approach to GHG reductions when Edmonton's first ever Community Energy Transition Strategy was unanimously approved by City Council. The Strategy outlined how we could collectively make Edmonton into a sustainable energy city and was designed to accelerate Edmonton along a low-carbon pathway by taking direct and indirect actions to reduce GHG emissions and increase renewable energy and energy efficiency across all sectors.

Four Pathways

The Community Energy Transition Strategy is centered around four bold and transformative pathways that are areas of transformative action and interconnected to achieve Edmonton's low-carbon future. Each pathway has goals that set out what needs to be achieved for a low-carbon, prosperous, and just and equitable future.

1. A **Renewable and Resilient Energy Transition** that attracts the next generation of energy innovators to the region while transitioning Edmonton to 100 per cent decarbonized energy.
2. **Emission Neutral Buildings** that are highly energy efficient, powered by renewable energy and create a thriving energy efficiency industry.
3. A **Low-Carbon City and Transportation** that continues to build on the transformative city building efforts outlined in The City Plan and those that are currently underway, such as the Blatchford carbon neutral development.
4. **Carbon Capture and Nature-Based Solutions** that catalyze innovative technology and efforts to make a greener and healthier city.

Acceleration Approach



The Community Energy Transition Strategy's 10-year action plan has 105 actions with varying degrees of complexity, GHG reduction possibility and funding requirements. The first phase of implementation (2021-2022) focused on "Connecting": connecting the level of ambition with a plan to achieve that ambition; connecting with the network of stakeholders, partners and collaborators who will make this transition a reality; connecting the plan with regional, provincial and federal initiatives, and finally connecting the ambition to the financial resources needed for Phase 2 of implementation. The actions in 2021-2022 focused on building the foundation to implement and scale up further accelerated and transformative climate actions. There are 60 actions that were identified to begin in the 2021-2022 time frame, as outlined at the end of the [Community Energy Transition Strategy](#). Approximately 90 per cent of these actions have commenced.

While progress has been made, there is still more to do. Phase 2 of implementation (2023-2030) is "Accelerating," which requires rapid and significant scaling up of climate action. This will need to be done strategically, to create a large emissions reduction impact and economic prosperity by catalyzing and creating a new era of economic growth and job creation in the region driven by low-carbon energy.

This phase includes actions that will transform the city and economy in the coming decades. The Accelerating phase builds on work initiated in the Connecting phase to further accelerate Edmonton's climate response and is critical to begin the transformational change required to meet the 2050 goal.

The third phase of accelerated action is "Transforming." This phase builds off the rapid and significant scaling up during Phase 2. This phase sees the outcome of earlier transformational decisions that are changing the city: energy systems, the way people move around, and the buildings in which they live, work and play. While the actions taken in the previous phases will initiate and enable this transformational change, ongoing transformational actions will be needed to achieve carbon neutrality or net zero emissions.

Climate Resilient Edmonton: Adaptation Strategy and Action Plan

City Council adopted Climate Resilient Edmonton: Adaptation Strategy and Action Plan on December 7, 2020. This is the first adaptation plan for Edmonton and sets Edmonton on a path to adapt to changing climate impacts including: changing temperatures, precipitation patterns, extreme weather events and ecosystems. Quantifiable targets are not set in this strategy, as climate adaptation is a relatively new and emerging field, and the impacts of climate change are very local and context-specific. However, climate change impacts are already being felt and Edmonton's adaptation strategy includes actions and projects to prepare both the community and the corporation to these climate impacts and mitigate those risks.

Climate action requires both climate adaptation and energy transition actions. The Carbon Budget only measures the energy transition component to becoming a climate-resilient city.

BUDGET IN BRIEF



BUDGET IN BRIEF

Setting the Context

As presented in the Community Energy Transition Strategy, the City of Edmonton's community emission reduction targets are 35 per cent by 2025, 50 per cent by 2030 (both from 2005 baseline levels) and becoming a carbon neutral community by 2050.

The Community Energy Transition Strategy needs to stand on a foundation where the City of Edmonton demonstrates climate solution leadership in its own decision-making, actions and advocacy. The City of Edmonton is demonstrating climate solution leadership in several ways:

- Establishing the corporate target of becoming an emissions neutral corporation by 2040, a decade ahead of the community's target.
- Procurement of a green electricity contract that will come into effect in 2024, effectively transitioning all corporate electricity to green electricity.
- Adoption of City Policy C627 Climate Resilience Policy, which requires all new City-owned construction be built to an emissions neutral standard, thereby limiting emissions increases while growing as an organization.
- Being one of the first municipalities to implement a carbon budget alongside financial budgets, to guide the organization and Council in understanding how the City's financial investment decisions impact the achievement of emissions reductions targets.

To support Edmonton's transition to a low-carbon future, the 2023-2026 budget was the first time a carbon budget was completed and delivered to Council in conjunction with the capital, operating and utility budgets.

The Carbon Budget helps guide decision-making and actions by providing additional carbon emissions information. GHG emissions impacts for each budget request within the 2023-2026 capital, operating and utility budgets were used to inform financial investment decisions throughout the budget deliberation process. The carbon budget is not the same as a capital and operating budget in that it is not deliberated or approved, rather it is presented for information to augment capital and operating budget decisions.

Carbon budgeting is a new field of work. The City of Edmonton is one of the first municipalities across Canada that is incorporating a carbon budget into its financial budgeting process. As with the development and implementation of any new process, the City gained a better understanding of the process itself and all the work involved in effectively integrating the carbon budget process into the City's existing processes. This is the first iteration and the carbon budget will continue to evolve as Administration applies its learnings, and as the organization and process matures.

All budget requests (capital profiles and operating service packages) have been assessed for both qualitative carbon impacts and more detailed quantitative carbon impacts where possible. The qualitative assessment

links direct emissions impacts to the four pathways in the Energy Transition Strategy and indicates indirect emissions impacts. Indirect emissions impacts would not have a direct impact on the pathways, rather they would enable other work that either increases or decreases emissions. For example, for facilities that are built to support transit (e.g., new LRT station), the enabling impact will be transportation system usage, the direct impact would be related to the building's energy use and any land use impacts.

Carbon Budget Highlights

The 2023-2026 Carbon Budget makes it clear that action is needed to achieve community and corporate carbon emissions targets. The approved 2023-2026 capital, operating and utility budgets include limited investments in initiatives that will have a meaningful impact on current GHG emissions levels. This is due to limited municipal funding and other urgent priorities.

While the City has direct control over corporate emissions, it represents only two per cent of community emissions; financial investment in corporate emissions reductions alone is not enough. Municipal funding will have a limited impact to meet community emissions targets. Climate change is a collective problem that requires collective action. Climate solution leadership through reduction of operational emissions is part of a much larger effort, one that involves policy development, collaboration and support from other orders of government, private investment and the actions of all Edmontonians to achieve the targets outlined in the Community Energy Transition Strategy.

The approved 2023-2026 capital and operating budgets include budget items related to the energy transition strategy that would decrease emissions and bring the community and corporation closer to achieving emission reductions targets. However, many of these initiatives have not been quantified for GHG emissions impacts, largely due to the fact that these projects are in initial planning phases and project specifics required for GHG quantification are not yet available. As the projects advance and additional details become known, GHG emission reduction impacts would be quantified and provided with future carbon budget reporting.

Although limited in its ability to meet the community and corporate GHG emission reduction targets strictly through municipal funding, the City has already taken steps to limit GHG emissions through various actions, including:

- Establishment of district energy systems such as Blatchford Renewable Energy Utility and the Downtown District Energy Initiative.
- Installation of solar photovoltaics (PV) on City facilities.
- A long-term renewable electricity contract has been signed that will come into effect in 2024. The total GHG emissions reduced by this contract is 226,000 less tonnes CO₂e over the 2023-2026 budget cycle.
- Adoption of City Policy C627 Climate Resilience Policy, which requires all new City-owned buildings be built to an emissions neutral and climate resilient standard.

- Launch of various focussed programs that support energy efficiency such as the Voluntary home energy labeling program, the Home Energy Retrofit Accelerator, the Building Energy Retrofit Accelerator, the Building Energy Benchmarking Program, Change Homes for Climate: Residential Solar Program and a two-year Clean Energy Improvement pilot program.
- Previously completed retrofits that include energy efficient upgrades on City facilities.
- LED street light conversion program.
- Extension of Edmonton's LRT network and Edmonton Transit Services deployment of its first battery-electric buses into service and the single largest purchase of electric buses (40) in Canadian history. The City of Edmonton now owns 60 electric buses and two hydrogen fuel cell buses which contribute to emissions reductions.
- Development of protected bike lanes in the downtown core and expansion of the bike network to connect beyond the core.
- Purchasing Renewable Energy Certificates to offset the City of Edmonton's carbon emissions associated with its electricity use.

These are just some examples of the initiatives that the City has already started in order to reduce community and corporate GHG emissions.

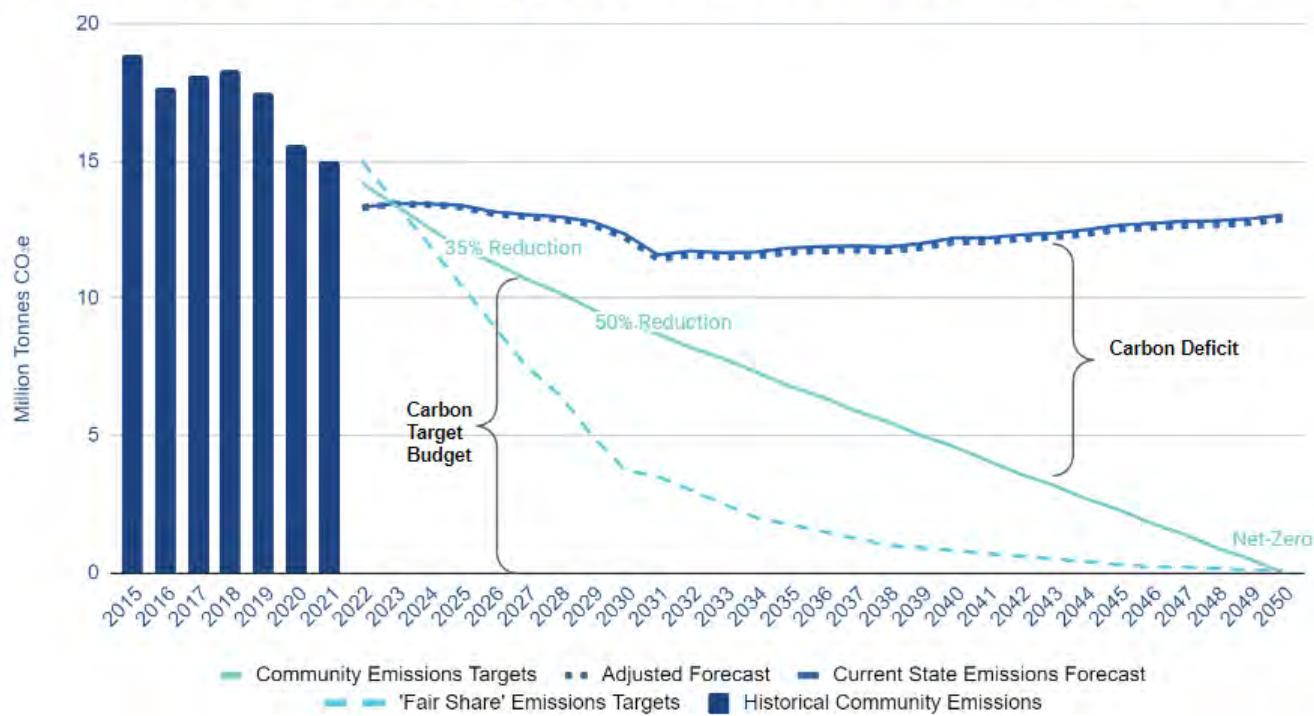
Policy development from all orders of government to help with emissions reductions will also play a significant role in meeting targets.

Community Carbon Budget Highlights

- Edmonton has set community greenhouse emission reduction targets of 35 per cent by 2025, 50 per cent by 2030 and being emissions neutral by the year 2050 as defined in the Community Energy Transition Strategy.
- The 2023-2026 approved capital, operating and utility budgets include funding for projects that will reduce GHG emissions by an estimated 180,000 tonnes carbon dioxide equivalents (CO₂e) over the four-year period for the community.
- Based on the adjusted emissions forecast, including GHG impacts of the quantifiable capital projects and operating service packages approved in the 2023-2026 budget, Edmonton as a community will have an annual carbon deficit of 12.88 million tonnes CO₂e by 2050. This means by 2050 when emissions are expected to be neutral with no net impact, the community will still have GHG emissions of 12.88 million tonnes CO₂e annually.
- The community carbon target budget, which is the maximum total emissions allowed, is 176 million tonnes CO₂e. The community is forecasted to deplete the allowable emissions by 2037.

Figure 1: Community Carbon Budget 2023-2026

Community Carbon Budgeting 2023-2026 (based on approved budgets)

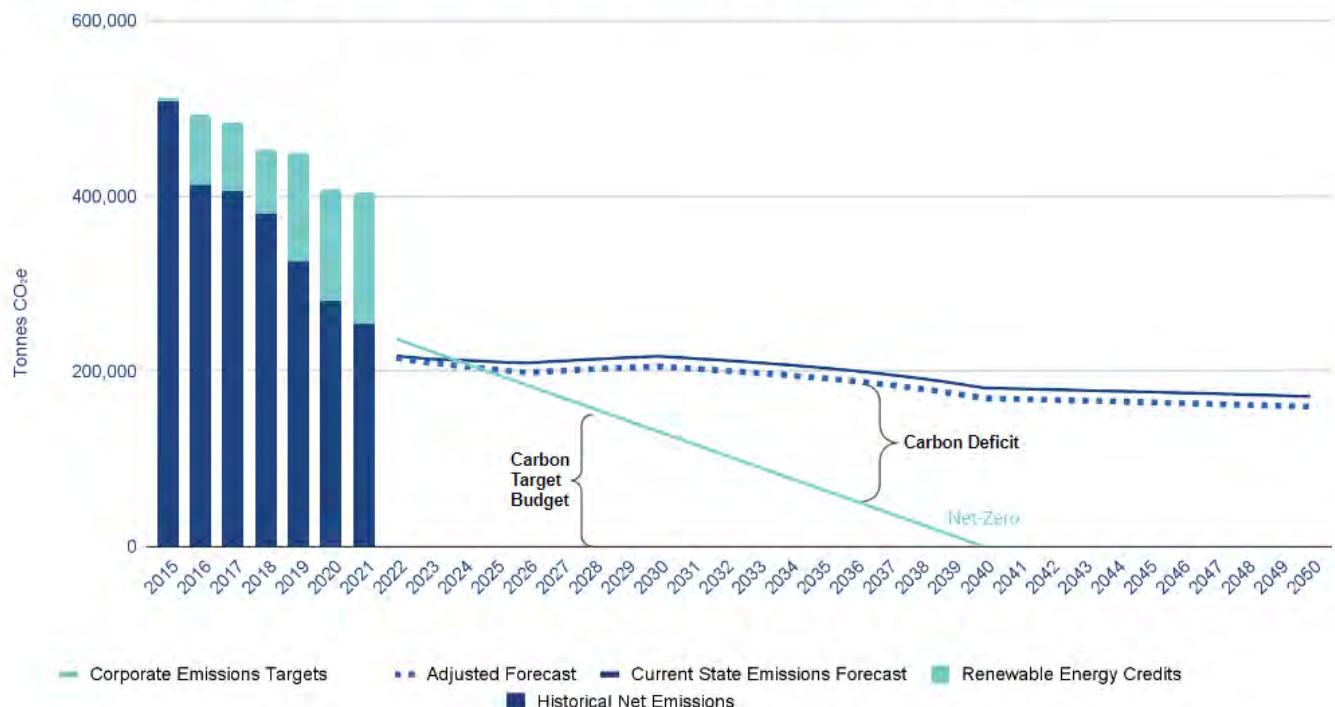


Corporate Carbon Budget Highlights

- The City of Edmonton (the corporation) has set a target to be emissions neutral by the year 2040.
- The 2023-2026 approved capital, operating and utility budgets include funding for projects that will reduce corporate GHG emissions by an estimated 31,000 tonnes CO₂e over the four-year period for the corporation.
- Based on the current state emissions forecasts, including GHG impacts of the quantifiable capital projects and operating service packages approved in the 2023-2026 budget, the City of Edmonton as a corporation will have an annual carbon deficit of 169,000 tonnes CO₂e by 2040. This means by 2040 when the corporate emissions are expected to be neutral with no net impact, the City will still have GHG emissions of 169,000 tonnes CO₂e annually.
- The corporate carbon budget, which is the maximum emissions allowed for the corporation, is 2.25 million tonnes CO₂e. The corporation is forecasted to use the corporate carbon budget, or deplete the allowable emissions, by 2033.

Figure 2: Corporate Carbon Budget 2023-2026

Corporate Carbon Budgeting 2023-2026 (based on approved budgets)



2023–2026 CARBON BUDGET



2023-2026 CARBON BUDGET

Overview

The City has completed a GHG impact assessment of each budget request to provide decision-makers with a holistic view of the GHG impacts in the capital, operating and utility budgets. Refer to Appendix A: Listing of Approved Budget Requests and GHG Impacts for a complete listing of individual budget requests and associated qualitative and quantitative GHG emissions impacts.

A carbon budget includes annual emission limits, annual emissions and deficits/surpluses (annual emission limit minus annual emissions). The 2023-2026 Carbon Budget aligns with decision-making frameworks used for capital and operating budgets; frameworks in which investments, costs and benefits are assessed over multiple years and often involve trade-offs based on strategic priorities and available resources. When combined with effective monitoring of emissions, the carbon budget also provides a framework for reporting progress on a consistent, annual basis.

Central to the success of carbon budgeting is a carbon accounting framework to support both the qualitative and the quantitative tracking and management of GHG emissions throughout the community. The accounting framework is a set of tools that will provide the City with the ability to:

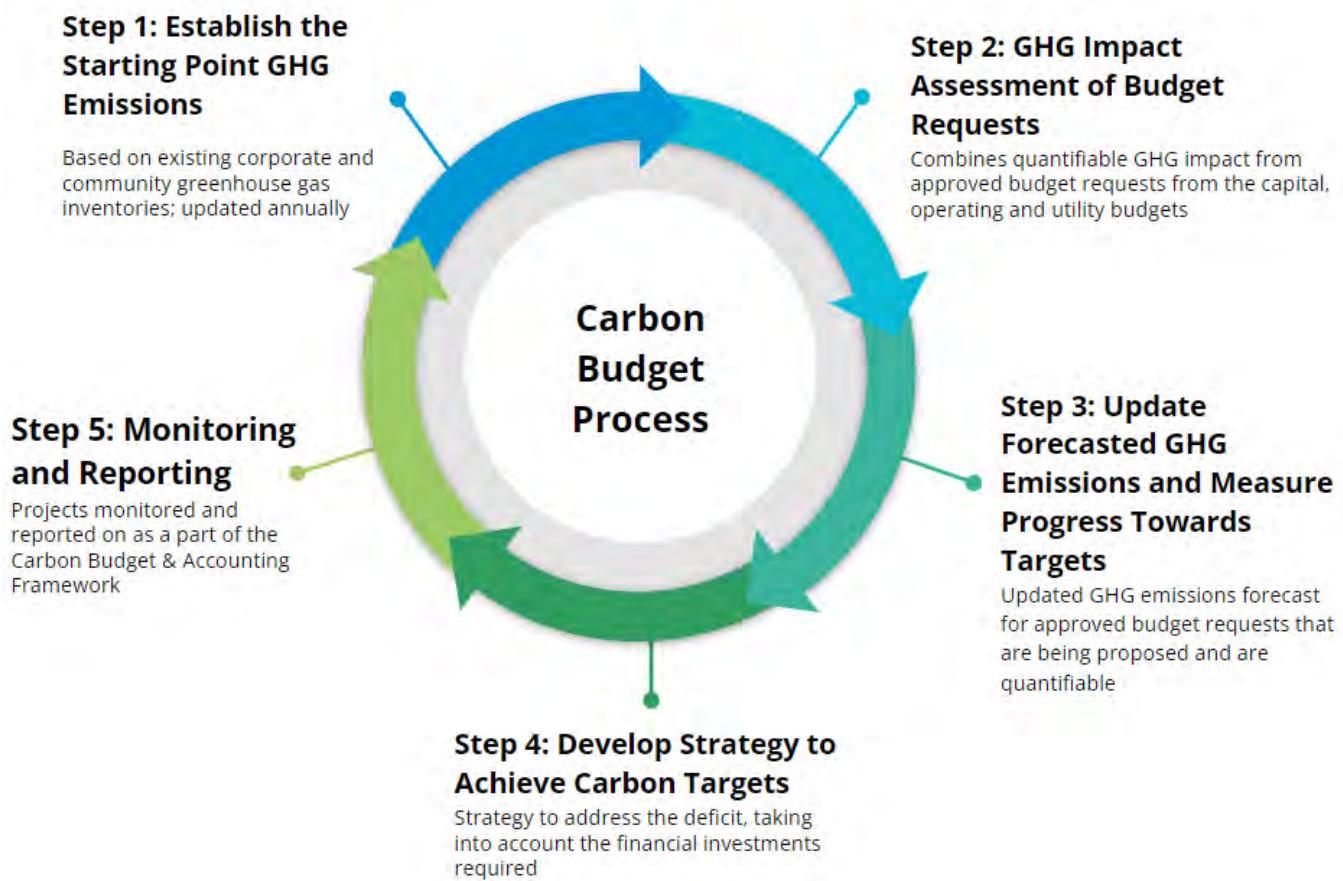
- Estimate GHG emissions or reductions that will result from projects, programs, initiatives or operating processes;
- Estimate using consistent formulas, factors and assumptions that are aligned with international best practices; and
- Incorporate these estimates into initial proposals, ongoing status reporting and project completion reports.

The 2023-2026 Carbon Budget will support the transition to a low-carbon city by measuring and reporting progress towards short term and long term goals. This will allow Council and Administration to adjust strategies as necessary to achieve the targets outlined in the Community Energy Transition Strategy.

Process

In general, the process to develop the 2023-2026 Carbon Budget involved establishing the GHG emissions starting point and then measuring the change in GHG impacts of budget requests approved for funding within the 2023-2026 budget. The process is outlined further below. Steps 1 to 3 were completed for this iteration of the carbon budget and will lead into established processes for Steps 4 and 5.

Figure 3: Carbon Budget Process



The process is explained below:

Step 1: Establish the Starting Point GHG Emissions

- To effectively build a carbon budget, the City had to clearly define its scope. The City's carbon budgeting process is based on its existing community and corporate GHG inventories, which are updated annually. The starting point for the 2023-2026 Carbon Budget is the City's 2021 GHG emissions.
- The scope of the City's GHG inventories only includes operational GHG emissions. This means that GHGs emitted during construction and from building materials (embodied emissions) will not be captured for this initial carbon budget. As an example, if a road was being built, the embodied carbon that was used in making the road would be out of scope, but the operational emissions for cars driving on the road would be included. A detailed description of the assumptions made in this scope-defining process are provided in Appendix B: Assumptions. Future plans related to embodied emissions are discussed in the Looking Forward section.

Step 2: GHG Impact Assessment of Approved Budget Requests

- The 2023-2026 Carbon Budget document combines GHG emissions impacts from the capital, operating, capital and utility budgets into one carbon budget document to provide a holistic view of carbon impacts associated with the City's approved budget requests for 2023-2026.
- These budgets were prepared using a prioritized approach to balance the service delivery expectations of Edmontonians with current financial constraints. Details on individual budget requests are available in the complementary budget documents (2023-2026 Approved Capital Budget, 2023-2026 Approved Operating Budget, 2023-2026 Approved Waste Services Utility Budget and 2023-2026 Approved Blatchford Renewable Energy Utility Budget). Appendix A: Listing of Approved Budget Requests and GHG Impacts includes a listing of budget requests in the approved budget documents and provides GHG emissions impact assessments for each request.
- The City completed a qualitative GHG impact assessment for each budget request that advanced for Council consideration. A qualitative GHG impact assessment provides a high level overview of whether the budget request will increase, decrease or have no impact on the baseline GHG emissions. There were some budget requests where the GHG impact was uncertain. Where possible, more detailed quantitative GHG impacts were completed. The qualitative and quantitative GHG assessment approach is discussed further below within the Assessment Methodology section.

Step 3: Update Forecasted GHG Emissions and Measure Progress Towards Targets

- The current state emissions forecast was then updated for the GHG emissions impact for those budget requests that could be quantified and are approved within the 2023-2026 capital, operating and utility budgets. The updated GHG emissions forecast only includes those budget requests that are approved and are quantifiable.
- Where budgets involve new emissions sources that did not exist in the 2021 inventory, increases to emissions are included. Where budgets involve the elimination of existing emissions sources, decreases to emissions are included.
- After developing the updated GHG emissions forecasts, the City is able to assess its progress towards achieving its targets and gain an understanding of the carbon deficit that remains.

Step 4: Develop Strategy to Achieve Carbon Targets

- Next steps include formulating a strategy to address the deficit, taking into account the financial investments required. Council approved the Energy Transition Strategy in 2021.
- The strategy will need to be operationalized and implemented.
- Selected projects will proceed and be evaluated for GHG impacts.

Step 5: Monitoring and Reporting

- Projects will be monitored and reported on as a part of the carbon budget and accounting framework.
- Emissions estimates will need to be refined to provide overall surveillance of the City's emissions trends and its progress towards its targets.
- This includes annual reporting to Council, as required by the City Charter Regulation, but also includes extensive environmental reporting, which is already being completed, for the:
 - Task Force for Climate-Related Financial Disclosures (TCFD), which is a section in the City's annual financial report that follows a defined structure based on accounting standards
 - Carbon Disclosure Project (CDP), which is a global carbon disclosure system
 - World Council on City Data, which has established International Organization for Standardization (ISO) standards for cities and communities.
 - Alberta Specified Gas Reporting Regulation and federal Greenhouse Gas Reporting Program, which are regulatory programs for reporting of larger scale GHG emissions, such as landfill gas.
 - Global Destination Sustainability Movement through Explore Edmonton that benchmarks cities for the tourism industry
 - Open Data and the Change for Climate group, which publishes GHG inventory information annually

This iterative process will allow the City to evolve the carbon budget and its climate strategies to achieve GHG emissions targets. Through this process, the City will be able to proactively identify carbon deficits, and adjust strategies and actions to remain on track to achieve the City's emissions targets.

Assessment Methodology

All budget requests for 2023-2026 received a qualitative assessment for GHG emissions impacts. Where possible, a detailed quantification of GHG emissions related to each budget request was completed, with the exception of those related to transportation, which were quantified on a holistic basis.

Refer to Appendix B: Assumptions for a list of assumptions related to qualitative and quantitative GHG emissions assessments.

Qualitative Assessment

The qualitative assessment evaluates direct and indirect (enabling) GHG emissions impacts associated with each budget request. It identifies if there is an increase, decrease, uncertain or no impact on GHG emissions when compared to City emissions, operations and services in 2021.

The assessment of direct impacts was completed in relation to the four pathways in the Community Energy Transition Strategy:

- Pathway #1: Renewable and Resilient Energy Transition
- Pathway #2: Emission Neutral Buildings
- Pathway #3: Low-Carbon City and Transportation
- Pathway #4: Nature-Based Solutions and Carbon Capture

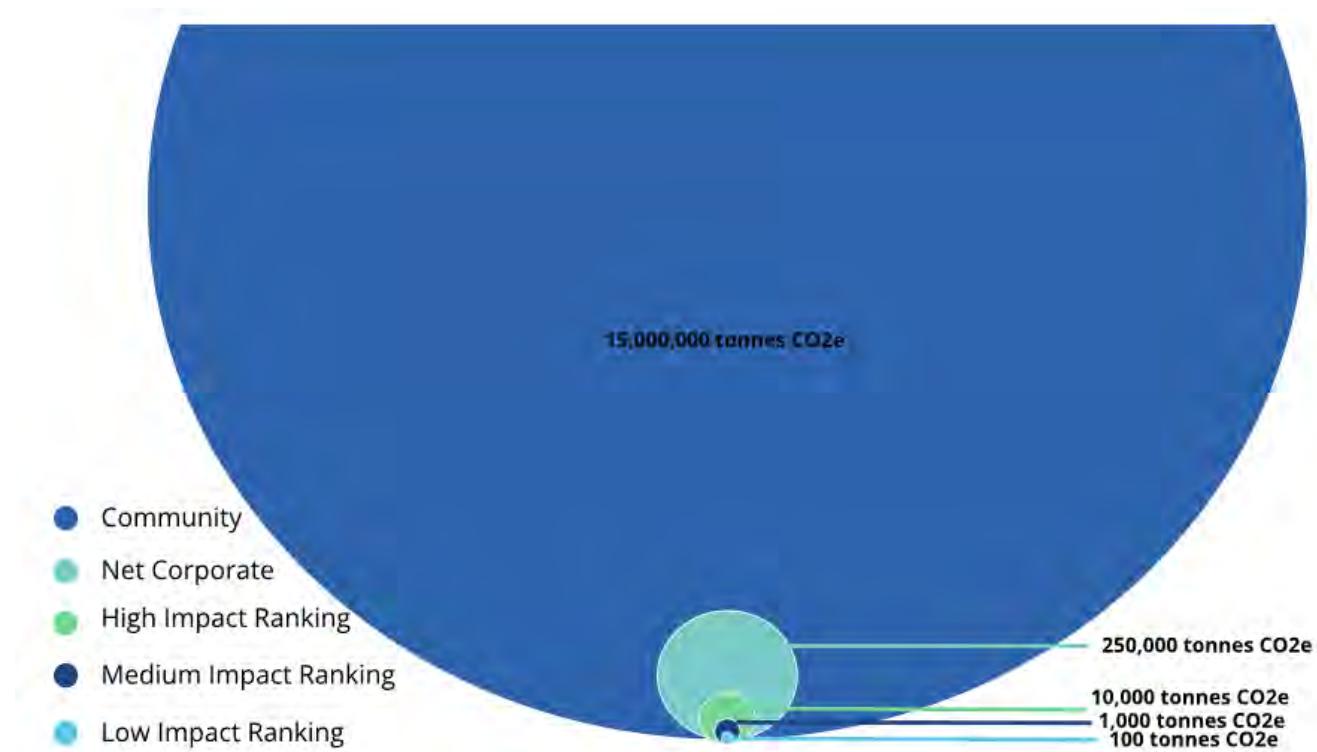
Additionally, budget requests were assessed for indirect (enabling) emissions impacts to identify requests that in isolation do not impact emissions, but have the potential to enable emissions increases or decreases. For example, purchasing and operating new organics collection vehicles that run on fossil fuels will increase direct emissions for Pathway #3, since there will be more vehicles on the road that are not zero emissions vehicles. However, the organics collection vehicles will enable increased composting of waste generated in the City by transporting source-separated organics to compost cure sites and the Anaerobic Digestion Facility, allowing for the production of compost and useful biogas that would otherwise generate harmful greenhouse gas in our regional landfills.

Figure 4: Example Assessment of a Budget Request and GHG Impacts

Profile/ Package/ Project Name	CETS Action	Pathway				2026 GHG Emissions (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request (\$000s)	Description of GHG Impacts
		1	2	3	4					
Three-stream Communal Collection	✓	-	-	↑	-	300	⬇️	Both	10,390	<p>This profile increases Pathway #3 emissions due to new collection routes but is expected to enable emission reduction through waste reduction and increased diversion. No impacts for Pathway 1, 2 or 4 emissions.</p> <p>Direct Emissions Impact - Low: associated with the energy use of new recycling and organics collection vehicles.</p> <p>Enabling Emissions Impact - Medium: associated with waste reduction and increased diversion.</p>

Emissions impacts were calculated for GHGs and measured in carbon dioxide equivalents (CO₂e), which includes carbon dioxide, methane, nitrous oxide and other GHGs. The direct and indirect emissions impacts were assessed for low (100 to 1,000 tonnes of CO₂e), medium (1,000 to 10,000 tonnes of CO₂e), or high (10,000 or more tonnes of CO₂e) impacts. Any emissions impact that is below the low impact ranking was deemed immaterial. Professional judgment and subject matter expertise was used to evaluate and define the expected emissions impact levels. The diagram below represents the impact thresholds compared to the corporate and community GHG footprints based on 2021 emissions. Note that corporate emissions are approximately two per cent of the total emissions from the community.

Figure 5: Qualitative Assessment - Impact Thresholds



Quantitative assessment

Changes in operational emissions of budget requests were quantified where possible, through various methods, including manual calculations using internal energy use data, existing analysis and assessments, or by using one or more of the City's four GHG quantification tools:

- Integrated Carbon Accounting & Budget Model
- Corporate Climate Management Model
- Natural Asset Sequestration Model
- Edmonton Regional Travel Model

Just over 200 approved budget requests were evaluated for GHG impacts and received a qualitative ranking. 120 were assessed to have direct GHG emissions impacts. Of those, 40 had quantifiable GHG emissions impacts. The remaining budget requests that had direct GHG emissions impacts were not quantified for various reasons, including:

- Projects that are in initial planning phases, where critical details required to quantify GHG impacts have yet to be defined. These include capital projects in the very early design phases. As these projects advance through the Project Development and Delivery Model (PDDM) and further project details become available, it will be possible to quantify GHG impacts. It is important to note that although high-level assumptions could be established to complete a quantification of GHG emissions for each budget request, the resulting GHG emissions estimates would have little to no value for decision-makers. A primary technical objective for carbon budget quantification is for the estimates to be relevant and accurate to inform City Council and Administration.
- Projects for which development details are expected to be informed in the future by public engagement and community input, such as land development profiles. The City will complete GHG quantifications once the required project development details are available or known and will be required to develop new tools and quantification methods.
- Projects or initiatives that will have GHG impacts, but at this stage are requesting funding for strategy and implementation development. At this time the impacts of these projects are highly uncertain and dependent on many distinct and discrete decisions that may not be clearly identified. An example of this would be the Urban Planning and Economy City Plan Implementation service package.
- Projects that are replacing assets for modern equivalents, that may result in small emissions reductions but to maintain conservativeness and not overstate the GHG impact, the reductions were not quantified. An example of this would be projects such as replacement of energy-using equipment, such as replacing a refrigerator, which would be more efficient but not emissions neutral.
- Projects that were not quantified due to data and quantification limitations. In these instances, data is either unavailable, or the means to quantify is not available at this time. This relates to the maturity of the organization in developing processes to align with the carbon budgeting and accounting framework. An example of this is the City purchasing agricultural land to convert to a cemetery; the City currently does not have an agricultural emissions factor as part of the Natural Asset Sequestration Model, therefore emissions impacts cannot be quantified for this project. The City is working to develop quantification methodologies and practices for these types of projects.

Quantification of transportation infrastructure

All transportation infrastructure works together as an integrated system of roads, transit routes and active networks. The operational GHG emissions expected from a particular transportation infrastructure project will be inherently impacted by the presence or absence of other transportation infrastructure within the system. Therefore, quantification of the GHG emissions for individual transportation infrastructure projects will not provide an accurate measure of GHG impacts.

Adopting the system approach, the transportation related budget requests (e.g., LRT extensions, Mass Transit network and Ambleside Park and Ride as Transit composite; Terwillegar Drive Expressway, Yellowhead Trail Freeway Corridor, 50 Street Grade Separation as Road composite; and District Connector Bike Network as Active mode composite) were all combined as a composite to estimate travel demand and the resultant impacts of GHG emissions for the entire transportation system. To provide further perspective of the emissions impacts related to different transportation modes, the Transit, Road, and Active mode composites were evaluated separately for quantified GHG emissions. Some projects within the composites may increase emissions, while others may decrease; the net GHG impact of the composite is presented. The idea is that investment in transportation infrastructure is one long-term component of achieving the overall emission reductions targets of the Community Energy Transition Strategy. Emissions increases and decreases were measured against a 'current state' road transportation system design that is reflective of the system in 2021, therefore emissions impacts are measured against a "no development" scenario.

Quantification of solar photovoltaics (PV)

The City of Edmonton has established a contract for procurement of green electricity that will come into effect in 2024, effectively transitioning all corporate electricity to green electricity, meaning that the City will have emissions neutral electricity. Therefore, any solar PV projects will have no net impact to corporate GHG emissions and will be quantified as "0 tonnes CO₂e" emissions impacts.

While not having direct impacts on corporate GHG emissions, solar PV provides other benefits to the City. It contributes to decarbonizing the grid, leads to decreases in electricity demand from the grid and reduces costs for the City by reducing the need to purchase electricity. Solar PV contributes to the Energy Transition Strategy's target to: Generate 10% of Edmonton's electricity locally by 2030. Solar PV also contributes to a goal from the 'Climate Resilient Edmonton: Adaptation Strategy': Edmonton has resilient energy systems, by having distributed energy systems.

CARBON BUDGET BY THE NUMBERS



CARBON BUDGET BY THE NUMBERS

The 2023-2026 Carbon Budget is presented through two different lenses. First, the community carbon targets and corporate carbon budget is presented graphically, showing current state emissions and forecasts, and the impact on those forecasts of approved budget requests reflected in the 2023-2026 capital, operating, and utility budgets. In addition to this, each budget request and its related GHG impact relative to current state emissions (for those that were quantifiable) is summarized and presented for each of the four pathways in the Community Energy Transition Strategy: Renewable and Resilient Energy Transition, Emission Neutral Buildings, Low-Carbon City and Transportation and Nature-Based Solutions and Carbon Capture.

It was necessary to make various assumptions in the establishment of the budgets and emissions trajectories. The forecast information presented as well as GHG impacts for budget requests is based on various assumptions, and is likely to change as the City refines its approach on achieving our targets and improves its methods of GHG quantification. Those assumptions are discussed below within the Community Carbon Targets and Carbon Budget section as well as Appendix B: Assumptions.

Providing the carbon budget for the City and larger community demonstrates the order of magnitude of the emissions impact of the current quantifiable budget requests. This will also highlight the remaining gap to meet the City's carbon goals and to discuss the path forward to reduce the gap. The carbon accounting framework will identify areas for improvement in processes and decision-making to help direct the budget more purposefully towards items that will help reduce emissions.

The quantified carbon budget results provide a short-term perspective of climate impacts from Council budget decisions with immediate emissions impacts, rather than a long-term prediction of target achievement. The forecast is only based on 2023-2026 investments. The long-term strategy will be impacted by future decisions, including implementation of The City Plan. As new projects are developed, they will be quantified and presented through the budget process. Over time, the quantified carbon budget from each budget cycle will illustrate how the investments contribute together to meet the City's GHG emissions targets.

2023-2026 Approved Investments with GHG Impacts

The following table outlines capital, operating and utility budget investments approved in the 2023-2026 budgets with more significant quantifiable community and corporate GHG emissions impacts. Further details on approved budget requests, including those with less significant impacts and unquantifiable impacts, are included in Appendix A: Listing of Approved Budget Requests and GHG Impacts.

Negative (bracketed) emissions are considered favourable and emissions reducing, and positive emissions are unfavourable, increasing emissions compared to 2021 levels.

Table 2: Approved Budget Requests with Significant Quantifiable GHG Emissions Impacts

Name of Budget Request (Capital profile or Operating service package)	2026 Quantified Emissions Impact (tonnes) <i>Brackets indicates GHG Reductions</i>	Community /Corporate /Both	2023-2026 Approved Budget Request (\$000s)
District Energy Network Strategy and District Energy Nodes (Capital profile)	(24,800)	Community	34,500
Transit Composite* (Capital profile): <ul style="list-style-type: none"> • Capital Line LRT Extension • Metro Line LRT Extension • Valley Line West • Windemere North (Ambleside) Transit Centre and Park and Ride • Mass Transit Network 	(23,700)	Community	2,381,407
Landfill Gas to Renewable Natural Gas (Utility Capital profile)	(22,000)	Both	11,290
Energy Transition Strategy Implementation Composite (Operating service package)**	(3,300)	Both	16,000
Edmonton EXPO Centre Rehabilitation (Capital profile)	(1,700)	Corporate	61,120
Natural Areas Acquisition (Capital profile)	(1,100)	Community	6,500
Active Mode Composite (Capital profile): Complete district connector bike network and bike facilities within neighbourhood profiles	(700)	Community	168,700
Kinsmen Sports Centre Facility Rehabilitation (Capital Profile)	(700)	Corporate	16,800
Enhanced Snow and Ice Control Service Standards (Operating service package)	1,100	Corporate	33,022
Lewis Farms Community Recreation Centre and Library (Capital profile)	1,400	Both	278,000
Road Composite (Capital profile): <ul style="list-style-type: none"> • Terwillegar Drive Expressway • Yellowhead Trail Freeway • 50 St. CPR Grade Separation 	12,800	Community	748,624

*Adopting the system approach, the transportation-related budget requests were all combined as a composite to estimate travel demand and the resultant impacts of greenhouse emissions for the entire transportation system. Therefore the GHG emissions impacts quantification includes items that are not approved for funding in the capital budget, but included for the GHG emissions impacts quantification.

**The quantified emissions impact from the Energy Transition Strategy Implementation Composite reflects the annual estimated reduction due to implementation of the Clean Energy Improvement Program (CEIP), which is included within the Energy Transition Strategy Composite profile. Estimate is based on conservative assumptions related to CEIP and may change. This service package will have additional decreases to GHG emissions, however, specific details are unknown at this time, so the impact has not been quantified.

Community Carbon Targets and Budget

The following graph shows the community current state emissions forecast and a revised forecast updated for the GHG impacts of budget requests approved in the 2023-2026 budget, compared to Edmonton's reduction targets that align with the Paris Agreement, and the community "fair share" carbon emissions targets.

Figure 1: Community Carbon Budget 2023-2026

Community Carbon Budgeting 2023-2026 (based on approved budgets)

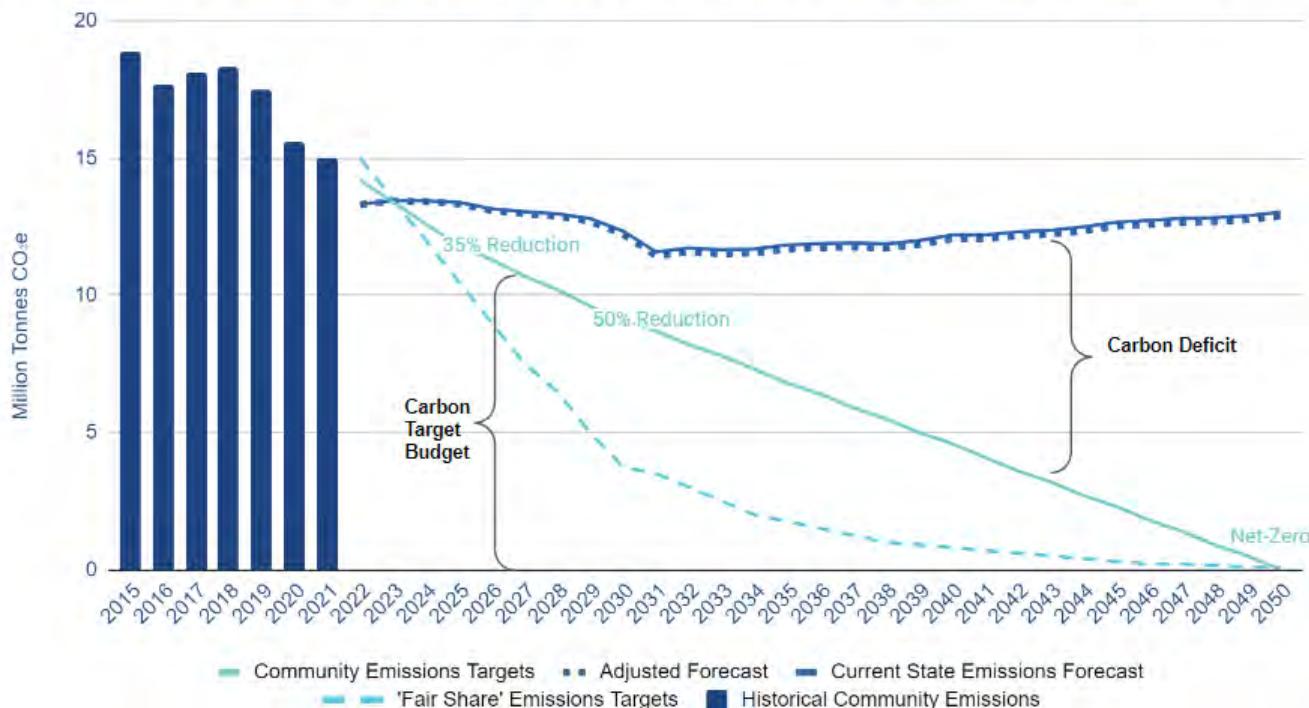


Table 4: Community Carbon Budget

	Carbon Budget 2022-2050 (Available GHG Emissions)	Year Carbon Budget is Depleted (Based on Adjusted Forecasts)
Community Carbon Budget <i>(targets that align with the Paris Agreement)</i>	176 million tonnes CO2e	2037

Table 5: Community Carbon Target and Deficit

Annual tonnes CO2e	2025	2030	2050
Current State Emissions Forecast (A)	13,380,000	12,340,000	13,030,000
2023-2026 Approved Budget Requests GHG Impacts (B)* (Brackets indicate GHG Reductions)	(50,000)	(120,000)	(150,000)
Adjusted Forecast (C) = (A + B)	13,330,000	12,220,000	12,880,000
Community Emissions Target (D)	11,800,000	9,100,000	0
Carbon Deficit (C - D)	1,530,000	3,120,000	12,880,000

*Values presented in the table for GHG impacts of approved budget requests for 2050 are based on extrapolations and are subject to change.

Historical Community Emissions and Current State Emissions Forecast

Historical Community Emissions are the actual emissions tracked for the community based on the City's GHG inventory from 2015 to 2021.

For the carbon budget, the 'Business-as-Planned' Scenario from The City Plan has been adopted as the current state emissions forecast, which is the most recent for community emissions. This scenario assumes that growth occurs according to the City's approved statutory land use plans and historical growth patterns prior to adoption of The City Plan. Therefore the carbon budget impacts compared against the current state community emissions illustrate the progress towards carbon reductions as The City Plan is implemented.

A number of climate efforts have been announced by other orders of government since adoption of The City Plan that will eventually impact the emissions forecast. For example, the federal commitments to a net-zero electricity grid and all new vehicle sales to be electric by 2035). Future carbon budget efforts will require ongoing updates to the current state emissions forecast to account for new and developing actions from other orders of government to provide an understanding of the layered effects of all climate actions.

Adjusted Forecast

The adjusted forecast emissions takes the current state emissions forecast and incorporates the cumulative impact of quantifiable requests that are approved within the 2023-2026 capital, operating and utility budgets. Because not all requests were quantifiable, the actual impact of the budget requests will be different from what is displayed; emissions could be higher or lower than what is presented. For 2025, 2030 and 2050 the annual GHG emissions forecast for Edmonton is 13.33, 12.22 and 12.88 million tonnes, respectively.

Community Emissions Targets

The City of Edmonton has two carbon budgets: a community “fair share” carbon budget based on equitable reductions using the C40 method “fair share” carbon emissions targets have been determined and graphed related to this budget. Community carbon reduction targets based on targets proposed under the Paris Agreement to limit the increase of global temperature to 1.5 degrees Celsius. Both trajectories have the same end point of achieving net zero per person greenhouse emissions by 2050. However, the cumulative emissions released under each trajectory are different. The City uses the community carbon reduction targets defined in the Community Energy Transition Strategy (Paris Agreement to limit the increase of global temperature to 1.5 degrees Celsius) to track GHG reduction progress.

Community Carbon Reduction Targets

The community carbon reduction targets were adopted from the global targets aligned with the Paris Agreement’s ambition to limit the increase of global temperature to 1.5 degrees Celsius. These targets are what is required across the globe, and is considered to reflect Edmonton’s equal share to meet global targets. Edmonton has set greenhouse emission reduction targets of 35 per cent by 2025, 50 per cent by 2030 and being carbon net neutral by the year 2050 from the baseline year of 2005, and are defined in the Community Energy Transition Strategy. These are referred to as the Community Targets in the Community Carbon Budget 2023-2026 chart above. For 2025, 2030 and 2050 the target is for Edmonton to have net annual GHG emissions of 11.8 million tonnes, 9.1 million tonnes and net-zero, respectively.

Edmonton’s annual emission reduction target is seven per cent per year until 2025, and 3 per cent from 2026 to 2030, as approved by Council in June 2022. The target emissions trajectory from 2030 to 2050 was calculated by applying a linear reduction between target years to achieve the required emissions reduction. This does not include any planned actions, grid factor changes or additional inputs. Future changes to emissions targets based on future investments and carbon budget methodologies may be reflected in a revised emissions trajectory.

“Fair Share” Carbon Targets

In addition, as presented in the Community Energy Transition Strategy and The City Plan, in 2019 the City of Edmonton established a community-wide “fair share” carbon budget of 135 million tonnes of GHG emissions, using the carbon budget method developed by C40. The C40 methodology is based on the theory that cities with above average GHG emissions and with high per capita GDP need to reduce emissions on a steep decline to do their fair share and be equitable to other countries with lower per capita emissions and

GDP. Based on the historical emissions and in accordance with the “fair share” carbon budget, at the start of 2022 Edmonton can only emit another 107 million tonnes of GHG emissions in total by the end of 2050. Maintaining this carbon budget is considered to reflect Edmonton’s “equitable” share of reducing global GHG emissions.

The Paris Agreement aligned targets and “fair share” carbon budget were decoupled to allow Edmonton to better understand the need for fair share actions within the national context.

The UN Climate Change Conference of the Parties that took place in Glasgow in November of 2021 (COP26) brought together world leaders to outline commitments for accelerating global co-operation and action on climate change. At COP26 the federal government committed to doubling its international climate finance commitment, from \$2.65 billion to \$5.3 billion over the next five years. This commitment represents Canada acknowledging the need for developed countries to do their fair share to help low and middle income countries already affected by climate change. A better understanding is required on if additional fair share actions are needed by Edmonton given Canada’s current increased fair share actions. As well, a better understanding is required on if the federal government will offset Canada’s, and by extension Edmonton’s, GHG emissions to achieve its international emission reductions commitments. Action 4.12 in the Energy Transition Strategy’s 10-year Action Plan is for Administration to continue to monitor offset efforts by other orders of government and explore pathways to offset community emissions/reach carbon neutrality.

Carbon Deficit

The community emissions target is the amount of GHG emissions permitted annually for Edmonton based on emission targets from 2022 to 2050. For 2025, 2030 and 2050 the community emissions target is 11.8 million tonnes, 9.1 million tonnes and net-zero, respectively. The community carbon deficit is the gap between the annual adjusted forecast of GHG emissions and the community emission targets. A deficit implies that the annual emissions are unfavourable compared to the target emissions. For 2025, 2030 and 2050 Edmonton’s projected community carbon deficit is 1.53 million tonnes, 3.12 million tonnes and 12.88 million tonnes, respectively.

Community Carbon Budget

Looking further to 2050, as shown in Table 4, the maximum allowable community emissions for Edmonton from 2022 to 2050 can only be 176 million tonnes based on the community target trajectory. This figure represents the community carbon budget. Based on the adjusted forecast, the entire community carbon budget would be used by 2037.

2023-2026 Focus

Tables 4 and 5 above focus on the community targets from the Community Energy Transition Strategy from 2022 to 2050. This section provides insight specifically for the 2023-2026 budget period and how the approved budget requests impact the emissions forecast.

Table 6: 2023-2026 Community Carbon Targets and Deficit

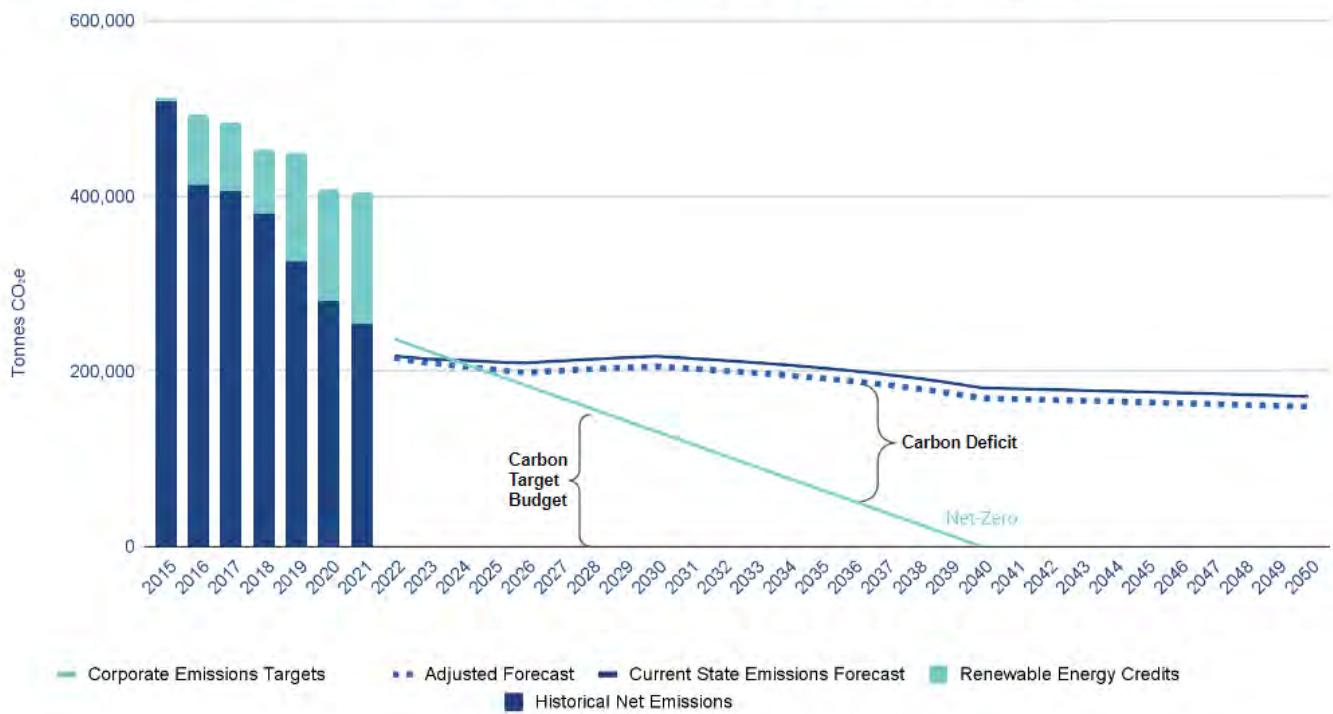
	GHG Emissions (thousand tonnes CO₂e) 2023-2026
Current State Emissions Forecast (A)	53,430
2023-2026 Approved Budget Requests Impacts (B)	(180)
Adjusted Forecast (C) = (A + B)	53,250
Community Emissions Target (D)	49,100
Carbon Deficit (C - D)	4,150

Based on the current state emissions scenario, the community emissions would be 53.43 million tonnes of CO₂e over 2023-2026. The quantifiable impacts of the 2023-2026 budget requests would reduce emissions by 180,000 tonnes, resulting in 53.25 million tonnes of emissions between 2023-2026, and a carbon deficit of 4.15 million tonnes.

Corporate Carbon Targets and Budget

In contrast to the community carbon emissions, which relies primarily on policy, other orders of government and private investment, the City of Edmonton is able to have a direct impact on its corporate emissions with its investment decisions.

The following graph provides a summary of the preliminary annual corporate emission targets compared to the current state emissions. The corporate emissions target is to be net neutral by the year 2040, as indicated in the Community Energy Transition Strategy.

Figure 2: Corporate Carbon Budget 2023-2026**Corporate Carbon Budgeting 2023-2026 (based on approved budgets)****Table 7: Corporate Carbon Budget**

	Carbon Budget 2022-2040 (Available GHG Emissions)	Year Carbon Budget is Depleted (Based on Adjusted Forecasts)
Corporate Carbon Budget	2.25 million tonnes CO2e	2033

Table 8: Corporate Carbon Target and Carbon Deficit

Annual tonnes CO2e	2040*
Current State Emissions Forecast (A)	181,000
2023-2026 Approved Budget Requests Impacts (B)*	(12,000)
Adjusted Forecast (C) = (A + B)	169,000
Corporate Emissions Target (D)	0
Carbon Deficit (E) = (C - D)	169,000

*Values presented in the table for GHG impacts of approved budget requests for 2040 are based on extrapolations and are subject to change.

Historical Corporate Emissions and Current State Emissions Forecast

Historical corporate emissions are the actual emissions tracked for the corporation based on the City's GHG inventory from 2015 to 2021. The renewable energy certificates (RECs) are used to keep the corporate emissions aligned with the trajectory to achieve emissions neutral by 2040. While procurement of RECs has been done on an annual basis previously, a long-term contract has been signed that will come into effect in 2024, effectively transitioning all corporate electricity to green electricity.

Corporate emissions are regularly forecasted by the City. Since these emissions are within the direct control of the City, forecasting corporate emissions is comparatively easier than community emissions and is based on the budget and business plans of City departments.

The corporate current state emissions forecast includes the City's planned REC purchases and green electricity procurement, which eliminates the emissions generated by the City's corporate electricity use. The forecast does not assume growth in the City's transit, waste or vehicle fleet and assumes modern equivalent replacement of any vehicles reaching their end of life.

Adjusted Forecast

The adjusted forecast emissions takes the current state emissions forecast and incorporates the cumulative impact of quantifiable 2023-2026 approved budget requests that are recommended for funding. Because not all requests were quantifiable, the actual impact of the budget requests will be different from what is displayed; emissions could be higher or lower than what is presented. By 2040 the annual GHG emissions forecast for the corporation is 169,000 tonnes.

New buildings that were designed before the effective date of City Policy C627 Climate Resilience Policy, which requires the design and construction of emissions neutral buildings, may result in increases in net emissions compared to current state emissions. Although a newer building of this nature would have fewer GHG emissions than an older facility, the GHG emissions impact is assessed against current state GHG emissions, and would reflect an increase in GHG emissions.

Corporate Emissions Target

The City of Edmonton's corporate emissions target refers to GHG emissions from City-owned and operated assets and operations. The corporate target of becoming an emissions neutral corporation by 2040, a decade ahead of the community's target, is a way for the City to demonstrate climate solution leadership. The target emissions trajectory from 2022 to 2050 was calculated by applying a linear reduction between target years to achieve the required emissions reduction.

Carbon Deficit

The corporate emissions target is to become an emissions neutral corporation by 2040. The corporate carbon deficit is the gap between forecasted annual GHG emissions and the emissions target. A deficit implies that the annual emissions are greater than the target emissions. For 2040, the corporate carbon deficit is 169,000 tonnes CO₂e based on approved investment decisions.

Corporate Carbon Budget

As shown in Table 7, the corporation can only emit 2.25 million tonnes of GHG emissions between 2022 to 2040. Based on the current state emissions forecast, the corporate carbon budget would be used up by 2033.

2023-2026 Focus

The chart and table above focus on the corporate targets from the Community Energy Transition Strategy from 2022 to 2040. This section provides insights into the 2023-2026 budget period and how the budget requests impact the emissions forecast.

Table 9: 2023-2026 Corporate Carbon Targets and Deficit

	GHG Emissions (thousands of tonnes) 2023-2026
Current State Emissions Forecast (A)	847
2023-2026 Approved Budget Requests GHG Impacts (B)	(31)
Adjusted Forecast (C) = (A + B)	816
Preliminary Corporate Emissions Target (D)	816
Carbon Deficit (C - D)	<1

Based on the forecasted current state emissions scenario (which includes the renewable electricity purchase), the corporate emissions would be 847,000 tonnes of CO₂e over 2023-2026. The quantifiable impacts of the 2023-2026 budget requests would reduce emissions by 31,000 tonnes, resulting in 816,000 tonnes CO₂e of emissions between 2023-2026. This would nearly meet the preliminary corporate emissions targets over the 2023-2026 time period of approximately 816,000 tonnes CO₂e, resulting in a carbon deficit of less than 1,000 tonnes.

Although the City is close to achieving its corporate emissions reduction target over 2023-2026, there is much more investment required to achieve the emissions reductions targets by 2040. The path forward to setting and achieving the corporate targets for becoming an emissions neutral corporation by 2040 is discussed in the Looking Forward section.

GHG Emissions Impacts by Pathway

Each budget request was evaluated and quantified, if possible, for GHG emissions relative to the four pathways in the Community Energy Transition Strategy. The following tables show the aggregate impacts of all quantifiable budget requests for each pathway, broken out into subcategories based on the specific budget requests approved in the 2023-2026 budgets. Some budget requests may have impacts to more than one pathway. Negative (bracketed) emissions are considered favourable and emissions reducing, while positive numbers are increases to emissions and unfavourable compared to 2021 levels. The GHG emissions impact of the approved budget requests has been identified, as well as the total GHG emissions impact of all budget requests. This shows the range of quantifiable impacts based on all capital project and operating service package options presented to Council in the 2023-2026 budget.

A qualitative ranking summary table is also provided for each pathway, which summarizes the number of qualitative assessments completed as part of the carbon budgeting process for each pathway. Totals will not sum to the total number of profiles and packages presented as part of the budgeting process, as some projects include both increasing and decreasing emissions in different pathways. Enabling impacts are not included in the summary tables. Utility projects are included as part of the capital and operating columns.

GHG emissions impacts associated with individual budget requests can be found in Appendix A: Listing of Funding Requests and GHG Impacts.

Pathway #1: Renewable and Resilient Energy Transition

Renewable and Resilient Energy Transition is about attracting the next generation of energy innovators to the region while transitioning Edmonton to 100 per cent net-zero energy sources. For the projects that can be quantified in the 2023-2026 budget cycle, district energy systems and renewable natural gas production and use within Edmonton will have the largest impacts on Pathway #1 community emissions, while landfill gas collection enhancements will impact Pathway #1 corporate emissions.

Table 10: Quantified GHG Impacts for Pathway #1: Renewable and Resilient Energy Transition

Pathway #1: Renewable and Resilient Energy Transition		
Emissions Scope Description	Approved Budget Request GHG Impact 2026 (tonnes CO2e)	Community /Corporate /Both
District Energy Systems		
District Energy Systems: Potential impact of enabling district energy system development	(24,800)	Community
Waste to Energy Systems		
Landfill Gas Collection Improvement: Renewing and expanding Landfill Gas Collection System	(7,600)	Both
Renewable Natural Gas Production and Use: System to process captured landfill gas and convert it to usable renewable natural gas	(14,400)	Community

Table 11: Qualified Ranking Summary for Pathway #1: Renewable and Resilient Energy Transition

Pathway #1: Renewable and Resilient Energy Transition		
# of approved budget requests	Capital	Operating
that may increase emissions	0	0
that may decrease emissions	6	4
with no material impact	131	66
with impact unknown	3	1
that are quantified	6	0

Current actions related to Renewable and Resilient Energy Transition

Actions already underway include:

- Approval and funding of the Downtown District Energy Initiative.
- Launch of Change Homes for Climate: Residential Solar Program that offers a rebate to install rooftop solar and is complemented by an online solar potential map.

- Installation of solar PV systems on: Meadow's Fire Station, Queen Elizabeth Pool, Davies Garage, Jasper Place Fire Hall, Blatchford Energy One, and 200 kilowatts of building-integrated PVs were installed as part of the Edmonton Convention Centre's atrium glazing replacement project.
- A long-term renewable electricity contract has been signed that will come into effect in 2024. This change is already built into the base budget, and is therefore included in the current state baseline emissions forecast. The total GHG emissions reduced by this contract is 226,000 less tonnes CO₂e over the 2023-2026 budget cycle, or an average 56,500 tonnes per year through 2023-2026. Budget requests that are impacted by this include street lighting and installing new solar panels on City-owned buildings. These requests have been quantified for GHG emissions impacts with and without the impact of the green electricity contract. However, since the green electricity contract is built into the current state emissions forecast, the emissions impacts associated with these budget requests would be zero.

Pathway #2: Emission Neutral Buildings

Emission Neutral Buildings focuses on constructing and renovating buildings that are highly energy efficient, powered by renewable energy and create a thriving energy efficiency industry. For the projects that can be quantified in the 2023-2026 budget cycle, financing and grants that enable community retrofits will impact community emissions, while City-owned new buildings and retrofits will affect corporate emissions.

Table 12: Quantified GHG Impacts for Pathway #2: Emission Neutral Buildings

Pathway #2: Emission Neutral Buildings		
Emissions Scope Description	Approved Budget Request GHG Impact 2026 (tonnes CO₂e)	Community /Corporate /Both
Community Emissions Impacts		
Community Retrofits: Financing and grants that enable community energy retrofits	(3,300)	Community
City Owned Emissions Impacts		
City Owned Retrofits: Emissions associated with funding specifically allocated to energy retrofits	(2,300)	Corporate
City Owned New Builds: City owned new buildings that were designed before 2021 (when C627 was adopted) will have operational emissions. Those designed afterwards must be emissions neutral. This is the operational emissions associated with those projects being built that were designed prior to 2021	1,400	Corporate

Table 13: Qualified Ranking Summary for Pathway #2: Emission Neutral Buildings

Pathway #2: Emission Neutral Buildings		
# of approved budget requests	Capital	Operating
that may increase emissions	14	9
that may decrease emissions	10	5
with no material impact	110	52
with impact unknown	6	5
that are quantified	13	2

Current actions related to Emission Neutral Buildings

Actions already underway include:

- Adoption of City Policy C627 Climate Resilience Policy, which requires all new City-owned buildings be built to an emissions neutral and climate resilient standard. This helped reduce required calculations and analysis associated with these budget items and did not contribute to any emissions increase despite organizational growth.
- Launch of various community focussed programs such as:
 - the Voluntary home energy labeling program that publicly shares EnerGuide home energy evaluations on a Home Energy Map;
 - the Home Energy Retrofit Accelerator, a program that offers rebates to homeowners for energy efficiency retrofit investments;
 - the Building Energy Retrofit Accelerator, a program that provides rebates for energy efficiency retrofits on commercial buildings 10,000 sq ft and larger; and
 - the Building Energy Benchmarking Program, a voluntary program that invites Edmonton's large commercial, institutional, industrial and multi-family buildings to submit their energy performance data to the City for benchmarking and disclosure purposes - the first program of its kind to be hosted by a municipality in Canada.
- Launch of a two-year Clean Energy Improvement pilot program.
- Previously completed retrofits that include energy efficient upgrades on City facilities.

Pathway #3: Low-Carbon City and Transportation

Low-Carbon City and Transportation continues to build on the transformative city building efforts outlined in The City Plan as well as capturing transportation system impacts.

All transportation infrastructure works together as an integrated system of roads, transit routes and active networks. The operational GHG emissions expected from a particular transportation infrastructure project will be inherently impacted by the presence or absence of other transportation infrastructure within the

system. Therefore, quantification of the GHG emissions for individual transportation infrastructure projects will not provide an accurate measure of GHG impacts.

Adopting the system approach, the transportation-related budget requests were all combined as a composite to estimate travel demand and the resultant impacts of greenhouse emissions for the entire system. To provide further perspective of the emissions impacts related to different transportation modes, the Transit, Road, and Active mode composites were evaluated separately and quantified the greenhouse emissions. Emissions increases and decreases were measured against a 'current state' road transportation system design that is reflective of the system in 2021. Transportation system layout and use of the transportation system (e.g., use of different travel modes such as car, transit and active) have a significant influence on community emissions, and currently represents 30 per cent of Edmonton's GHG emissions. Corporate emissions are impacted by changes in corporate fleet and City street lights.

Table 14: Quantified GHG Impacts for Pathway #3: Low-Carbon City and Transportation

Pathway #3: Low-Carbon City and Transportation		
Emissions Scope Description	Approved Budget Request GHG Impact 2026 (tonnes CO2e)	Community /Corporate /Both
Transportation System Impacts : Emissions impact of the full implementation of three LRT lines, yellowhead expansion, Terwillegar Drive project, bike network expansion, and Mass Transit network expansion.		
Transportation System Design Total (Roads, Transit, and Active Mode Composite)*	(11,600)	Community
Road Composite (includes overall growth of the network but is related to the following profiles) - Terwillegar Drive Expressway - Yellowhead Freeway Program - 50 St CPR Grade Separation	12,800	Community
Transit Composite (includes overall growth of the network but is related to the following profiles) - Capital Line LRT Extension (Century Park to Heritage Valley Town Centre) - Metro Line LRT Extension (Blatchford to Castledowns)* - Valley Line West (Downtown to Lewis Farms) - Windemere North (Ambleside) Transit Centre and Park and Ride* - Mass Transit Network*	(23,700)	Community
Active Mode Composite: Includes the complete district connector bike network and bike facilities within listed neighborhood profiles	(700)	Community
City Owned Fleet Impacts		
City Fleet Growth: Emissions associated with expanded fleet either with new vehicles or increased service hours with non Zero Emissions Vehicles	1,600	Corporate
City Fleet Zero Emissions Vehicles: Emissions associated with funding for corporate fleet Zero Emissions Vehicle expansion including charging infrastructure	(400)	Corporate

**Note that as the transportation system is presented as an aggregate, the approved budget requests column includes some items that are not approved for funding in the capital budget but rather reflect the total forecasted funding needs over the longer term.*

Table 15: Qualified Ranking Summary for Pathway #3: Low-Carbon City and Transportation

Pathway #3: Low-Carbon City and Transportation		
# of approved budget requests	Capital	Operating
that may increase emissions	11	9
that may decrease emissions	29	10
with no material impact	93	46
with impact unknown	7	6
that are quantified	11	4

Current actions related to Low-Carbon City and Transportation

Actions already underway include:

- Approval of the City Plan, the first municipal development plan in Canada to include a carbon budget, limiting the amount of greenhouse gases that can be emitted.
- Energy performance clauses are considered for all sales and incorporated in most City property sale agreements.
- LED street light conversion program has replaced 80,000 street lights on collector, arterial roadways and alleys with LED lights.
- Extension of Edmonton's LRT network and Edmonton Transit Services deployment of its first battery-electric buses into service and the single largest purchase of electric buses (40) in Canadian history. The City of Edmonton now owns 60 electric buses and two hydrogen fuel cell buses which contribute to emissions reductions.
- Development of protected bike lanes in the downtown core and expansion of the bike network to connect beyond the core.
- Development of Blatchford, planned to be a carbon-neutral community for 30,000 residents that uses 100% renewable energy.

Pathway #4: Nature-Based Solutions and Carbon Capture

Nature-Based Solutions and Carbon Capture targets opportunities that catalyze innovative technology and efforts to make a greener and healthier city. For the projects that can be quantified in the 2023-2026 budget cycle, natural asset protection will impact community emissions, while the urban tree canopy affects corporate emissions.

Table 16: Quantified GHG Impacts for Pathway #4: Nature-Based Solutions and Carbon Capture

Pathway #4: Nature-Based Solutions and Carbon Capture		
Emissions Scope Description	Approved Budget Request GHG Impact 2026 (tonnes CO2e)	Community /Corporate /Both
Natural Asset Changes		
Natural Asset Protection	(1,100)	Community
Canopy (Tree) Removal or Addition		
Trees: This is the emissions associated with the urban tree canopy expansion including work from root for trees and building great neighbourhoods	(500)	Corporate

Table 17: Qualified Ranking Summary for Pathway #4: Nature-Based Solutions and Carbon Capture

Pathway #4: Nature-Based Solutions and Carbon Capture		
# of approved budget requests	Capital	Operating
that may increase emissions	3	2
that may decrease emissions	21	7
with no material impact	106	57
with impact unknown	10	5
that are quantified	7	0

Current actions related to Nature-Based Solutions and Carbon Capture

- Development and launch of Edmonton's Urban Primary Vegetation and Land Inventory that can be used to track how municipal greenhouse gas emission levels are being impacted by land use change, among other applications.
- 49+ hectares of turf area in Edmonton naturalized.
- 560+ hectares of priority natural areas secured.
- 100,000+ trees, shrubs and forbs planted through Root for Trees.
- Development of the Ribbon of Green strategy that will support and sustain an interconnected river valley system.
- Purchasing RECs to offset the City of Edmonton's carbon emissions associated with its electricity use.

LOOKING FORWARD



LOOKING FORWARD

Carbon Budget Process Improvements

Carbon accounting and budgeting provide a way to measure progress towards the GHG emission targets outlined in the Energy Transition Strategy. This first iteration of completing a carbon budget alongside financial budgets provided valuable learnings that will be incorporated into future processes. The focus of carbon accounting and budgeting will shift to developing a work and resource plan for continued expansion of the carbon accounting framework. This would include activities such as implementing carbon checks, assessing decision-making points and developing new quantification methodologies to start quantifying some projects that were not possible to quantify for the 2023-2026 Carbon Budget.

Maturity of the Corporation

Continued maturity of the corporation will enable refinements to the carbon budgeting process. The City will continue to grow into an organization that integrates carbon budgeting into its internal and decision-making processes. This will include having emissions alternatives included as part of business cases, and having carbon checkpoints throughout the life of a project. This will require efforts from City leadership and staff, and may also require oversight and review from internal—and perhaps at times external—technical and carbon accounting experts. A key element in maturing the organization will be ongoing training and education to build internal capacity.

The City's internal GHG quantification tools were instrumental in undertaking the quantitative assessments. It will be critical to keep these tools up to date (e.g., incorporating new features, new factors or standards, ongoing collection of travel behaviour data using continuous household travel survey) and to develop new tools for reliable carbon assessments.

Administration will also continue to work with the Energy Transition Climate Resilience Committee to advance carbon budgeting and accounting, seeking their feedback for improvements and enhancements to the process.

Emissions Quantification

A key learning from implementing the 2023-2026 Carbon Budget was the need for standardized processes for GHG assessments and quantifications.

Specific methods for calculation of project emissions will need to be reviewed, refined, updated and new methods may need to be developed. This would include developing appropriate carbon emissions calculators for the varying nature of City projects and services. Considering various types of projects and different categories of emissions over the project life-cycle, a systematic process flow map will be developed to standardize the carbon quantifications.

Capital projects at the City of Edmonton go through the Project Development and Delivery Model (PDDM), a series of defined checkpoints as projects advance through the planning, design, procurement and

construction phases. Alignment of the carbon budget to the PDDM model is under consideration, where there are numerous carbon checks along the way. The process will need to be defined, but generally a qualitative carbon assessment will be completed at the start of the project, when the capital project is still in the design phase and project specifications are not well-defined. As the project gets closer to the build stage, it would be possible to provide more detailed assessments on GHG impacts. A similar approach would be applied for operating projects, where defined carbon budget checkpoints are established.

The quantification work revealed a need for categorization of budget profiles to streamline the carbon budget quantification process, and focus only on those profiles that would have relevant and accurate data available to support quantification. Carbon checks would help by categorizing projects at the start when the qualitative assessment is completed, and having defined processes and checks to follow for each category and then incorporating carbon checks into projects so that there is reporting and accountability.

Embodied Carbon and Emissions Reductions through Procurement

Embodied carbon includes all of the GHG emissions associated with materials used in projects. To understand the full GHG impacts of a capital project investment decision, it is important to quantify the embodied emissions. Currently, this is not included in the corporate GHG inventory, as the inventory is focused on operational emissions once the asset is in service.

Emissions reductions through procurement include both procuring low embodied carbon materials and procuring services with contractors, including requiring them to have a certain level of maturity with regards to climate resilience. For example, this approach could include requiring an emissions neutral construction project.

Embodied carbon action starts with measurement and then progresses to target setting. The City's administrative procedure for Climate Resilient Design and Construction of City Buildings attached to City Policy C627 Climate Resilience requires embodied carbon disclosure and reporting to Administration of all new City-owned facility construction. Targets have not yet been set for corporate projects, however the community Energy Transition Strategy includes an action for the City to implement embodied carbon disclosure into procurement processes of building materials and products.

Corporate Interim Carbon Targets

With the adoption of the Community Energy Transition Strategy, a new corporate target was established to become emissions neutral by 2040. This new target necessitates an updated (and renamed) Corporate Climate Change Management Plan (formally known as the 2019-2030 City Operations GHG Management Plan).

Foundational technical background research has already been completed to support revision of the plan. The next step will be establishing ambitious interim carbon targets for corporate emissions in line with achieving net zero emissions by 2040.

Planning and Strategy

The Community Energy Transition Strategy needs a foundation where the City of Edmonton demonstrates climate solution leadership in its own decisions, actions and advocacy. While the City has direct control over corporate emissions, it represents only two per cent of community emissions; financial investment in corporate emissions reductions must be augmented with contributions from other parties. Climate solution leadership through reduction of operational emissions must therefore balance with policy, other orders of government and private investment to achieve the targets outlined in the Community Energy Transition Strategy.

Strategies to Achieve Community Targets

There are federal and provincial policies that will impact the City's community carbon emissions. These will have a large influence on the community carbon emissions, but are not demonstrated or quantifiable in the 2023-2026 Carbon Budget at this point. This may be because there is currently not enough information available to complete a forecast, the information has not yet been applied to the City's modelling, or the impact of the policy cannot be understood well enough to model. Some of these items can be modelled and incorporated into analysis for future iterations of the budget. Understanding the interactive effects may help with future action prioritization. For example, a green grid commitment can help to justify electrification of buildings and electric vehicle use as the source of energy will no longer create GHG emissions. The uptake of policies is dictated by consumer behaviour, resulting in uncertain impacts.

Examples of policies that may significantly reduce the carbon deficit include:

- Federal 2035 net-zero electricity grid target in Alberta
- Federal 100 per cent new light-duty EV sales by 2035
- New federal building and energy code performance requirements, as adopted by provincial governments
- Provincial renewable fuel standards and clean fuel standards target set by the federal government
- Impacts of the federal carbon capture, utilization and storage tax credit
- Impact of the federal carbon price schedule and related climate action incentive payments, and the induced changes individuals and families make due to these financial mechanisms

As an example, the compounding effects of electric vehicle (EV) adoption will have a significant impact on emissions reductions. Although not a specific budget request, the impact of EV adoption was quantified and estimated to result in a reduction of additional 151,200 tonnes in 2026 for the city's community emissions. The quantification was based on adoption of EVs from current Statistics Canada data and projections including federal policy announcements, and the AESO (Alberta Electricity System Operator) Net-Zero Emissions Pathways study's EV adoption input assumptions. The planned and budgeted City infrastructure along with expected electric vehicle adoption within the community will result in significantly more emissions reductions.

The City of Edmonton is committed to achieving the targets outlined in the Community Energy Transition Strategy. These actions, some of which are already underway, provide examples of how the City is able to directly impact the transition to a low-carbon city. They include:

- Increasing Zero-Emission Transportation - Complete build out of a citywide active transportation network; expansion of public and mass transit network; advancement of a citywide zero-emissions charging network; pilot low emissions zone/corridor.
- Accelerating Emission Neutral Buildings - Expand and scale up retrofit initiatives including full implementation of the Clean Energy Improvement Program; provide development incentives to build better than code; support initiatives to alleviate home energy poverty and increase energy efficiency in affordable buildings; and support emission neutral building capacity in the industry. The application of the emissions neutral city buildings requirement in City Policy C627 Climate Resilience Policy ensures that emissions, at a minimum, do not continue to increase over time. However, the market has not yet adopted an emissions neutral set of building practices, reducing the ability to reach the community targets. The City will continue to support the building industry's transition in this regard.
- Accelerating Low-Carbon Urban Development - Zoning bylaw renewal that allows for increased density; financing tools and incentives to advance priority growth areas; climate resilient urban planning starting with District Planning; and accelerating efforts to support neighbourhoods and communities to advance climate action.
- Advancing Low-Carbon Energy Planning - Partnering to implement the District Energy strategy to advance district and major node district energy systems; advocating for the supply of low-carbon energy (e.g., piloting a hydrogen-heated neighbourhood); and supporting the acceleration of regional carbon capture storage and utilization technologies.
- Accelerating Nature-Based Solutions - Community investment in natural carbon storage, including conservation offsets; implementing nature-based climate solutions efforts (restoration, conservation, naturalization and daylighting); accelerating tree planting, including applying to the Federal Government's 2 Billion Tree Fund; and developing and implementing a nature-based solutions and urban restoration plan so every community's connection to nature is strengthened.

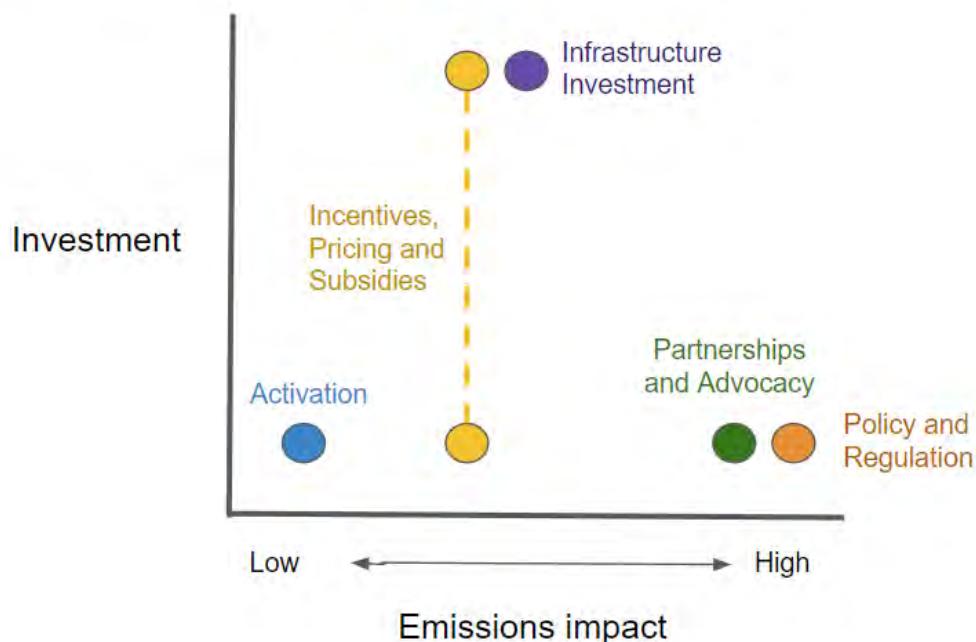
The City has limited direct control over community related emissions. Often, City-funded infrastructure decisions can help enable Edmontonian action to reduce emissions, for example bike lane development can enable greater use of this mode but is dependent on individual choices. In comparison, catalyzing community efforts through policy and regulation can have a greater impact. Beyond the actions identified above, substantial investment is required to significantly impact community emissions and support is needed from other orders of government and private investment.

Climate action levers

Funding is limited and needs to be used effectively to make the most of what is available. This includes consideration of what can be completed by other orders of government (such as rebates, which can be given out by federal or provincial governments) versus things that only the City can do.

While this first version of the carbon budget does not specifically identify which projects to invest in, Administration has identified emissions impacts for the various levers of change to help inform where limited resources could be spent to make the biggest impacts. The scale of investment varies for the levers of change.

Figure 6: Scale of City Investment varies for Levers of Change



Activation is about providing awareness, filling knowledge gaps and building capacity to encourage and support energy transition outcomes. Activation has a relatively low financial investment and low impact on emissions reductions as it relies on individual behaviour to take action.

Incentives, pricing and subsidies include applying a premium to cost or a reduction in cost to support a shared outcome or influence behaviour. This can include offsetting the costs of services and amenities for certain user groups or types of activities, or applying charges and fees for users through available financial mechanisms. Incentives, the financial investment for Pricing and Subsidies ranges, and impact is low to medium, as this lever incentivizes but still relies on individual choices and behaviour.

Infrastructure Investment is about providing capital or operational investment in physical infrastructure, City assets, services and planning activities to activate and encourage specific energy transition outcomes.

Infrastructure Investment has a high financial investment and medium impact, due to the magnitude of costs required for infrastructure upgrades and the operational emissions associated.

Partnerships and Advocacy require fostering relationships with private, community, institutional and not-for-profit entities to activate strategies, initiatives and actions to advance common goals, recognizing shared interests and aspirations. Partnerships and Advocacy are considered to be low financial investment, with a potentially high impact.

Policy and Regulation is a municipal planning instrument that can guide, direct, manage or shape how the City provides strategic direction for land, infrastructure or services to influence or change the behaviour of residents and markets or market groups. Policy and Regulation has low financial investment, and will have a high impact over time on reducing emissions for the areas that the policy or regulation apply. Policy and regulation apply on a much broader scale than incentives, which is why the impact is higher.

Strategies to Achieve the Corporate Target

The target of becoming a carbon neutral corporation is a decade ahead of the community's target, as a way for the City of Edmonton to demonstrate climate solution leadership. Transitioning to a Carbon Neutral corporation by 2040 would include:

- Embedding climate resilience into City services and processes (e.g., procurement, financial investments and others)
- Using new decision-making processes and tools that prioritize climate and energy transition considerations, including business case development, contracts and use of social cost of carbon in decision-making
- Continuously looking for ways to reduce operational emissions
- Procuring low-carbon energy and carbon offsets where appropriate
- Scaling up climate resilience retrofits for City facilities and energy efficiency improvements to assets
- Scaling up solar photovoltaics and energy storage on City infrastructure
- Accelerating the City's transition to zero emission fleet and equipment, including fleet charging/fueling infrastructure
- Exploring and developing appropriate hydrogen infrastructure and hydrogen using equipment
- Establishing an Internal Climate Action Leadership Task Force
- Establishing a governance framework to implement the City's climate change plans, that supports climate leadership by Council, Administration and the community
- Using policy and establishing transformative and ambitious targets to accelerate the transition

CONCLUSION

Adding a carbon budget into the City of Edmonton's GHG reduction targets and financial budgets highlights the urgent need to reduce emissions. With a carbon budget superimposed over a city's projected emissions, the impact of delaying reductions in emissions becomes clear. Edmonton's carbon target budget is 176 Megatonnes. If the city as a whole continues as it is now, this budget will be exhausted in 2037. The corporation's carbon budget is 2.25 million tonnes and that budget will be depleted by 2033 with current operations.

Formalizing the 2023-2026 Carbon Budget and implementing a carbon accounting framework is a significant step for the City of Edmonton. Doing so will help Administration and Council's awareness about how budget decisions reduce or increase emissions relative to the carbon budget targets.

There is much more work to do. The 2023-2026 Carbon Budget is the City's first iteration of the carbon budget and the City is one of the first municipalities across Canada that is incorporating a carbon budget into its financial budgeting process. Administration has gained a better understanding of the process itself and all the work involved in effectively implementing a carbon accounting framework. Administration's quantification methodologies, reporting and monitoring against the emissions target, and integration of the framework into organizational decision-making will improve as the City continues to evolve the process and apply its learnings.

One thing is clear: current investments are not enough. Action is needed to achieve targets as the carbon deficit continues to grow under the current state. While the City has direct control over corporate emissions, it represents only two per cent of community emissions. Municipal funding will have a limited impact on meeting emissions targets for Edmonton. Climate solution leadership through reduction of operational emissions is part of a much larger effort, one that involves policy, collaboration and support from other orders of government, private investment and the actions of all Edmontonians to achieve the targets outlined in the Community Energy Transition Strategy.

Climate change is a collective problem that requires collective action.

APPENDICES



APPENDIX A

LISTING OF APPROVED BUDGET REQUESTS AND GHG IMPACTS



Listing of Approved Budget Requests: GHG Impacts Guide

Budget requests for 2023-2026 received a qualitative assessment for greenhouse gas (GHG) emissions impacts. Where possible, a detailed quantification of GHG emissions related to each budget request was completed, with the exception of those related to transportation, which were quantified on a holistic basis. The order in which the budget requests are listed aligns to the order they are presented in each of the respective budgets. Below is an example assessment as listed in the appendix:

Profile/ Package/ Project Name	CETS Action	Pathway				2026 GHG Emissions (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request (\$000s)	Description of GHG Impacts
		1	2	3	4					
Three-stream Communal Collection	✓	-	-	↑	-	300	⬇️	Both	10,390	<p>This profile increases Pathway #3 emissions due to new collection routes but is expected to enable emission reduction through waste reduction and increased diversion. No impacts for Pathway 1, 2 or 4 emissions.</p> <p>Direct Emissions Impact - Low: associated with the energy use of new recycling and organics collection vehicles.</p> <p>Enabling Emissions Impact - Medium: associated with waste reduction and increased diversion.</p>

Below is an explanation of each field in the table.

Field	Description
Profile Name/Service Package Name	Name of budget request
CETS Action	Indicates if the budget request is an action identified in the Community Energy Transition Strategy.
Pathway	The assessment of direct impacts was completed in relation to the four pathways in the Community Energy Transition Strategy.
1	Pathway 1: Renewable and Resilient Energy Transition
2	Pathway 2: Emission Neutral Buildings
3	Pathway 3: Low-Carbon City and Transportation
4	Pathway 4: Nature-Based Solutions and Carbon Capture
2026 GHG Emissions Impacts (tonnes CO2e)	<p>These are the annual GHG emissions impacts for 2026, the last year of the 4 year budget cycle. Emissions are shown as of 2026 to reflect the emissions impact of investment decisions during this budget cycle. Emissions impacts are calculated for GHGs, and measured in tonnes of carbon dioxide equivalents (CO2e), which includes carbon dioxide, methane, nitrous oxide, and other GHGs.</p> <p>2026 was chosen as this is the final year in the budget cycle, in theory, most projects would be complete or near complete.</p> <p>Quantification has been completed for elements of projects where possible. In some cases, there will be more GHG impacts, but they are not quantifiable.</p> <ul style="list-style-type: none"> • Negative (bracketed) emissions are favourable and emissions reducing, and positive emissions are unfavourable, increasing emissions compared to 2021 levels. • "0" indicates zero emissions impact due to the project being emissions neutral or the green electricity contract that will come into effect in 2024, effectively transitioning all corporate electricity to green electricity. • Not Quantified means that quantification was not completed for the project. This could either be because the project does not have GHG impacts, or it was not quantifiable for a variety of reasons (see "Projects Not Quantified" below for further details).

Enabling	<p>Indicates if there is an indirect impact on emissions.</p> <p>Refers to the indirect emissions impact of a project. A project or initiative that would not have a direct impact on GHG emissions within a pathway, but rather support other work to be done to either increase or decrease emissions.</p>
Community /Corporate /Both	<p>Identifies if the GHG emissions impact is for the municipality of Edmonton (community), or the corporation (corporate), or both.</p> <p>All corporate impacts are included in the community impacts, as the City of Edmonton corporation is a part of the larger community.</p> <p>In certain cases, a project or initiative will have both corporate impacts and community impacts. For example, an LRT project would impact road traffic (community) and utility costs for the City of Edmonton (corporate).</p> <p>N/A indicates that there are no direct or indirect emissions impacts, so neither Community nor Corporate emissions are impacted.</p>
2023-2026 Budget Request (\$000s)	The total cumulative dollar value (in thousands of dollars) of the related budget request over the 4 years of the 2023-2026 operating, capital, or utility budget.
Description of GHG Impacts	<p>Description of the GHG impacts, as well as magnitude of direct and enabling GHG impact (if any). The direct and enabling GHG emissions impacts were assessed for:</p> <ul style="list-style-type: none"> • immaterial (<100 tonnes of CO₂e), • low (100 to 1,000 tonnes of CO₂e), • medium (1,000 to 10,000 tonnes of CO₂e), • or high (10,000 or more tonnes of CO₂e) impacts. <p>The impacts are not necessarily directional. For example there may be uncertain impacts that are considered “medium” because they could have emissions impacts in the 1,000 to 10,000 tonnes of CO₂e range increasing and also have some impacts that are decreasing.</p>

Greenhouse gas impacts have been evaluated qualitatively for direct and enabling (indirect) impacts to the four pathways in the Community Energy Transition Strategy.

Symbol	Description
	Decrease in emissions, which are favourable towards meeting emissions targets
	Increase in emissions, which are unfavourable towards meeting targets
	Uncertain impact at this time, may have both increasing and decreasing impacts or the type of impact is unknown.
-	No impact to operational emissions as defined by the City's greenhouse gas inventories and as associated with the specified emissions pathways or enabling impacts.
N/A	Quantification was not completed for the project. This could either be because the project does not have GHG impacts, or it was not quantifiable for a variety of reasons (see "Projects Not Quantified" below for further details).

Projects Not Quantified

- GHG emissions impacts that were not quantified for various reasons, including:
 - Project is substantially complete prior to 2023, and emissions impacts will be included in future inventories (these projects will not be listed in the Appendix).
 - Projects that are in initial planning phases, where critical details required to quantify GHG impacts have yet to be defined. These include capital projects in the very early design phases.
 - Projects for which development details are expected to be informed in the future by public engagement and community input, such as land development profiles.
 - Projects or initiatives that will have GHG impacts, but at this stage are requesting funding for strategy and implementation development. At this time the impact of these projects are highly uncertain, and dependent on many distinct and discrete decisions that may not be clearly identified.
 - Projects that are replacing assets with modern equivalents, that may result in small emissions reductions but to maintain conservativeness and not overstate the GHG impact, the reductions were not quantified.
 - Projects that were not quantified due to data and quantification limitations. In these instances, data is either unavailable, or the means to quantify is not available at this time.

APPENDIX A

CAPITAL BUDGET REQUESTS AND GHG IMPACTS



Profile ID	Profile Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request (\$000s)	Description of GHG Impacts							
			1	2	3	4												
Proposed Profiles Requesting Funding by Asset Category (2023-2026 Proposed Capital Budget Appendix A)																		
Equipment																		
CM-66-2597	Automated Enforcement Assets	□	-	-	-	-	Not Quantified	-	Community	3,670	This profile is for renewal of automated enforcement equipment, including Mobile Photo Enforcement (MPE) and Intersection Safety Devices (ISDs). No emissions impacts are expected from this profile.							
CM-21-2010	Commonwealth Stadium Equipment	□	-	?	-	-	Not Quantified	-	Corporate	1,200	This profile is for the planned replacement of energy using equipment at Commonwealth Stadium to maintain services at events. The specific replacements use a number of factors for selection, including their sustainability and ability to reduce the environmental footprint of their operation. Due to the lack of information about the specific replacements, direct impacts to Pathway 2 emissions are uncertain. No enabling emissions impacts.							
CM-21-5601	Community Recreation and Culture - Equipment Conservation	□	-	-	-	-	Not Quantified	-	Corporate	4,098	This is a renewal composite for existing Community Recreation and Culture equipment. No change in energy use is expected from this equipment, and therefore no direct or enabling emissions impacts.							
CM-21-0012	Community Standards and Neighbourhoods - Equipment Conservation	□	-	-	-	-	Not Quantified	-	Corporate	432	This profile is for assessing the condition of equipment and replacement of equipment reaching end of life within the current inventory. No increased energy use is expected from equipment replacement, and therefore no impacts to Pathway 2 emissions. No enabling emissions impacts.							
CM-70-0001	Fire Rescue Equipment Replacement	□	-	-	-	-	Not Quantified	-	Community	3,384	This profile is for replacement of critical Fire Rescue Services equipment that is employed in emergency situations. No change in energy use is expected from this equipment, and therefore no direct emissions impacts. No enabling emissions impacts.							
CM-25-3002	Fleet Fluid Storage, Dispensing and Disposal Systems	□	-	-	-	-	Not Quantified	-	Corporate	1,223	This is a renewal composite for existing Fleet Fluid Storage, Dispensing and Disposal Systems. No change in energy use is expected from this equipment, and therefore no direct or enabling emissions impacts.							
CM-20-0052	Library Furniture and Equipment	□	-	-	-	-	Not Quantified	-	Corporate	2,039	This profile is for library equipment renewal including vehicles. None of the replacement will be emissions reduction focused and therefore has no material impact on any of the four pathways and no enabling emissions impacts.							
CM-66-0013	Parks and Roads Services - Equipment Renewal	□	-	-	-	-	Not Quantified	-	Corporate	727	This profile is for the renewal of sander racks that are used to hold and store sander boxes and dump boxes while not in use. No additional energy use or emissions are expected. No direct or enabling emissions impacts.							
CM-60-1771	Police Equipment	□	-	↑	-	-	Not Quantified	-	Corporate	2,054	This profile includes new equipment that would increase electrical load and therefore increase Pathway 2 emissions. No enabling emissions impacts.							
CM-60-1425	Radio Life Cycle	□	-	-	-	-	Not Quantified	-	Corporate	3,407	This profile is for the maintenance of the EPS two-way radio communications equipment. The related equipment is not expected to significantly impact energy use. No direct emissions impacts. No enabling emissions impacts.							
CM-25-3005	Tools & Shop Equipment Program	□	-	-	-	-	Not Quantified	-	Corporate	705	This is a renewal composite for existing tools and shop equipment. No change in energy use is expected from this equipment, and therefore no direct or enabling emissions impacts.							
CM-25-3003	Vehicle and Equipment Service Lift Program	□	-	-	-	-	Not Quantified	-	Corporate	591	This is a renewal composite for the Vehicle and Equipment Service Lift Program. No change in energy use is expected from this equipment, and therefore no direct or enabling emissions impacts.							
Facilities																		
19-10-1013	Ambleside Integrated Site - Phase 1	□	-	-	-	-	Not Quantified	-	Corporate	78,285	This profile is related to a City owned site development where buildings will meet C627 policy and be designed to be emissions neutral with renewable energy production. This neutrality means it will have no impact to Pathway 1 or 2 emissions. The land for this project is already developed, so Pathway 4 emissions will not be impacted. No enabling emissions impacts.							
CM-10-0001	Climate Resilient City Facility Upgrades (Linked to City's Renewal Program)	✓	⬇️	⬇️	-	-	Not Quantified	⬇️	Corporate	53,000	This profile is specifically targeting facility deep energy retrofits to generate emissions reductions. Projects include various solar PV and fuel switching projects reducing Pathway 1 emissions. Also includes building energy efficiency improvements reducing Pathway 2 emissions. The project may enable future connection to low carbon district energy sources in the future.							
											Direct Emissions Impacts - High: associated with energy retrofits across all City facilities and potential deployment of solar PV.							
											Enabling Emissions Impacts - Immaterial: associated with the uncertainty of final projects with specific district energy impact to be included.							
15-21-5801	Coronation Park Sports and Recreation Centre	□	-	↑	-	⬇️	Not Quantified	-	Both	130,400	This profile was designed prior to 2021 when C627 was adopted and therefore the building is not emissions neutral and will increase Pathway 2 emissions. A net increase in total number of trees is expected through the project decreasing Pathway 4 emissions. No enabling emissions impacts.							
											Direct Emissions Impact - Medium: associated with the emissions footprint of a new recreation facility.							
21-12-0320	Edmonton Convention Centre Rehabilitation	✓	-	⬇️	-	-	Not Quantified	-	Corporate	31,681	This profile is for a retrofit that has some emissions reductions, decreasing Pathway 2 emissions. A solar photovoltaic (PV) system was installed at this location and was operational in 2021 baseline therefore no impact to Pathway 1 emissions. No enabling emissions impacts.							
											Direct Emissions Impact - Low: associated with reduced emissions expected through the rehabilitation.							
21-12-0350	Edmonton EXPO Centre Rehabilitation	✓	⬇️	⬇️	-	-	(1,700)	⬇️	Corporate	61,120	This profile is for a retrofit that indicates a requirement to increase ventilation rates at the facility which lead to increased energy use and emissions from the baseline condition of the facility. However, rehabilitation efforts are outlined in 3 phases, with each phase resulting in decreases to emissions from the new expected energy load. This project makes design decisions today that will enable future deep energy savings therefore resulting in an overall emissions reduction in Pathway 2. Project includes installation of Solar, and therefore decreased Pathway 1 emissions are expected.							
											Direct Emissions Impact - Medium: associated with Pathway 2 reductions and Pathway 1, due to relatively high energy loads at the facility.							
											Enabling Emissions Impact - Medium: associated with the design enabling even further future reductions due to relatively high energy loads at the facility.							

Profile ID	Profile Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request (\$000s)	Description of GHG Impacts
			1	2	3	4					
21-11-9600	EPS-Police Headquarters Rehabilitation	<input checked="" type="checkbox"/>			-	-	500	-	Corporate	13,575	This profile is for a project where the energy audit identified approximately 40% emissions savings from recommended measures. Includes Solar PV which reduces Pathway 1 emissions. Pathway 2 emissions reduced due to improved building energy performance. No enabling emissions impacts. Direct Emissions Impact - Low: associated with solar PV deployment and reducing emissions through the rehab.
CM-19-0000	Facilities - Minor Renewal Program	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	30,000	This profile is used to support minor renewal projects to address asset failures within City owned facilities. The scope of work may include replacement of energy using components with modern equivalent replacements which will not have material emissions reductions. No direct emissions impacts and no enabling emissions impacts.
CM-10-1010	Facility: Planning and Design - Growth	<input type="checkbox"/>					Not Quantified		Both	21,102	This profile is a composite. Specific projects within this composite have not yet been defined, only includes the planning and design of potential growth projects. Direct emissions impacts are unknown for all pathways. Uncertain enabling emissions impacts due to uncertainty of the specific growth projects to be developed. Direct Emissions Impacts - Medium: associated with application of these planning and design activities across the entire City. Enabling Emissions Impact - Medium: associated with application of these planning and design activities across the entire City.
CM-11/12/13-0000	Facility: Safety and Security - Renewal; Facility: Service Delivery - Renewal; Facility: Service Support - Renewal	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	138,704	This profile only includes modern equivalent replacement and not any extensive energy renovation work. Energy renovations related to these facility renewals will be identified in the "Climate Resilient City Facility Upgrades (Linked to City's Renewal Program)" profile. Therefore no direct or enabling emissions impacts.
21-10-9105	Fire Station #8 Relocation - Blatchford	<input checked="" type="checkbox"/>	-	-	-	-	0	-	Corporate	17,731	This profile is for a new fire station that will replace an existing fire station. The facility is expected to meet C627 policy and be designed to be emissions neutral with renewable energy production. This neutrality means it will have no impact to Pathway 1 or 2 emissions. No enabling emissions impacts
20-10-9003	Fire Station No.19 Rehabilitation	<input checked="" type="checkbox"/>	-		-	-	<(100)	-	Corporate	2,185	This profile is for a general rehab project where the proposed design will achieve an 8.5% reduction in energy use compared to the 2017 Alberta building code requirements. This would result in energy savings and reductions in Pathway 2 emissions. No enabling emissions impacts. Direct Emissions Impact - Immaterial: associated with reduced energy consumption / emissions due to the rehab.
20-10-9002	Fire Station No.3 Rehabilitation	<input checked="" type="checkbox"/>	-		-	-	<(100)	-	Corporate	3,488	This profile is for capital renewal work. Energy modelling indicates that Pathway 2 emissions will decrease compared to code compliant building as well as compared to historical energy use at facility. No enabling emissions impacts. Direct Emissions Impact - Immaterial: associated with reduced energy consumption / emissions due to the rehabilitation work.
21-10-9103	Iron Works Building Rehabilitation	<input checked="" type="checkbox"/>	-		-	-	200	-	Corporate	8,952	This profile is to rehabilitate a building that has not been operational for over 10 years and will increase Pathway 2 emissions. This project will rehabilitate this building to be a LEED Silver Building. No enabling emissions impacts. Direct Emissions Impact - Low: associated with new energy consumption / emissions following operationalizing the building again.
21-12-0330	Kinsmen Sports Centre Facility Rehabilitation	<input checked="" type="checkbox"/>	-		-	-	(700)	-	Corporate	16,800	This profile is for a retrofit that has no solar PV considered in Energy Model, therefore no impact to Pathway 1 emissions. Energy model defines a range of emissions reductions for Pathway 2 emissions (hundreds of tonnes to thousands of tonnes annually). No enabling emissions impacts. Direct Emissions Impact - Low: associated with reduced energy and emissions from the rehabilitation and some degree of uncertainty in the final reductions generated.
15-21-5785	Lewis Farms Community Recreation Centre and Library	<input type="checkbox"/>	-				1,400	-	Both	248,000	This profile was designed prior to 2021 when C627 was adopted and therefore the building is not emissions neutral and will increase Pathway 2 emissions. The addition of trees and vegetation planted on the currently cleared undeveloped lot will decrease pathway 4 emissions. New parking lot will increase personal vehicle capacity and increase Pathway 3 emissions. No enabling emissions impacts. Direct Emissions impact - Medium: associated with the emissions footprint of a new recreation facility developed on a previously undeveloped lot and new parking lot. Some minimal savings from additional trees in landscaping.
22-12-9008	Mill Creek Pool Rehabilitation	<input checked="" type="checkbox"/>	-		-	-	<100	-	Corporate	3,878	This profile is for the renewal of Mill Creek Pool. While the scope includes additional ventilation which increase emissions, overall the rehabilitation is expected to reduce Pathway 2 emissions. No enabling emissions impacts. Direct Emissions Impacts - Immaterial: associated with increased energy use for ventilation offset by rehab energy use reductions.
20-12-0230	Ortona Armoury Arts Building Renewal	<input checked="" type="checkbox"/>	-		-	-	-100	-	Corporate	1,700	This profile is related to renewal and rehabilitation work. Energy assessment indicated reduced energy use from 2019 operation of building. Building was closed in 2020 and 2021, and resuming operations will increase Pathway 2 emissions. No enabling emissions impacts. Direct Emissions Impact - Immaterial: associated with resuming operations of the facility and the related energy use.
21-12-0310	Peter Hemingway Fitness & Leisure Centre Rehabilitation - Phase 1	<input checked="" type="checkbox"/>	-		-	-	(100)	-	Corporate	585	This profile is a rehabilitation with no solar PV to be integrated onto site and therefore no impact to Pathway 1 emissions. Rehabilitation is expected to reduce Pathway 2 emissions. No enabling emissions impacts. Direct Emissions Impact - Medium: associated with the expected energy efficiency improvements incorporated into the rehabilitation.
21-12-0340	The Orange Hub Phase II Rehabilitation	<input checked="" type="checkbox"/>	-		-	-	(400)	-	Corporate	1,050	This profile is for a retrofit (Pathway 2 reductions), that has no solar PV considered in Energy Model, therefore no impact to Pathway 1 emissions. No enabling emissions impacts. Direct Emissions Impact - Low: associated with reduced energy and emissions from the rehabilitation, defined by the energy model.
CM-61-3235	Transit Facility and ROW Renewal	<input type="checkbox"/>	-	-	-	-	Not Quantified		Corporate	3,324	This profile is a renewal composite and all work is modern equivalent replacements. No direct emissions impacts. General renewal of transit serves to enable decreases in emissions from increased transit ridership. Emissions impacts deemed immaterial due to uncertainty. Enabling Emissions Impact - High: associated with this profiles contribution to the mass transit strategy.

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CM-12-0300	Valley Zoo Animal Enclosure Renewal and Enhancement	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	35,917	This profile is for renewal and enhancement of existing features to required levels of animal care. No impact expected to direct or enabling emissions.
Fleet											
CM-61-3609	Bus Equipment Renewal	<input checked="" type="checkbox"/>	-	-	-	-	Not Quantified		Community	4,790	This profile is for the replacement of aging/end of life onboard technology systems and supporting software. Overall these replacements maintain or improve rider experience, and are expected to enable more use of the transit system and therefore decreases in emissions. No direct emissions impacts. Enabling Emissions Impacts - Medium: Associated with the potential to improve transit ridership.
CM-17-2000	Emissions Neutral City Fleet and Equipment	<input checked="" type="checkbox"/>	-	-		-	Not Quantified		Corporate	11,200	This profile includes the installation of new infrastructure required to charge/fuel an emissions neutral fleet which will enable emissions reductions. It also includes the purchase of emissions neutral fleet and equipment which reduces Pathway 3 emissions. Direct Emissions Impacts - Medium: associated with the reductions of emissions from fleet. Enabling Emissions Impacts - Medium: associated with the expansion of EV charging networks and induced use of EVs.
CM-66-3400	LRV Fleet & Equipment Renewal	<input checked="" type="checkbox"/>	-	-	-	-	Not Quantified		Corporate	4,724	This profile is a renewal composite and all work is modern equivalent replacements. No direct emissions impacts. General renewal of transit serves to enable decreases in emissions from increased transit ridership. Emissions impacts deemed immaterial due to uncertainty. Enabling Emissions Impact - High: associated with this profiles contribution to the mass transit strategy.
25-21-1000	LRV Replacements	<input checked="" type="checkbox"/>	-	-	-	-	Not Quantified		Corporate	55,000	Light rail vehicle (LRV) replacements considered to be modern equivalent renewal, and therefore no impacts to Pathway 3 emissions. Renewal of LRVs supports the Mass Transit Strategy, and therefore enable emission decreases. Enabling Emissions Impacts - Medium: associated with the contribution to the Mass Transit Strategy.
CM-25-1001	Vehicle and Equipment Replacement	<input checked="" type="checkbox"/>	-	-	-	-	Not Quantified		Corporate	112,554	This is only fleet renewal and therefore no growth in fleet is included. No direct emissions impacts. Potential for adoption of hybrid or electric vehicle options through renewal, which would enable emissions decreases. Enabling Emissions Impact - Low: associated with the potential adoption of hybrid or electric vehicle through the replacement.
CM-60-1765	Vehicle Replacements	<input checked="" type="checkbox"/>	-	-		-	(400)	-	Corporate	30,648	This profile would include both growth and renewal of the fleet. Expectation is to transition to hybrid vehicles, going from current 3% to around 30 or 40% of the fleet. This serves to decrease Pathway 3 emissions. No enabling emissions impacts. Direct Emissions Impact - Low: associated with the expected adoption of hybrid/electric vehicles (EVs) into the fleet.
Information Technology											
CM-50-0010	Business Intelligence and Analytics - Capital Renewal	<input type="checkbox"/>	-	-	-	-	Not Quantified		Community	2,050	This profile is for the renewal of geospatial information systems and traffic monitoring software and hardware that is used in the planning, design and efficiency of the transportation system and network. Replacements are not expected to significantly impact energy use. No direct emissions impacts. Enabling emissions impacts - Inmaterial. Associated with the use of data collected by these systems for more informed decision making with regards to fleet replacement with zero emissions vehicles.
23-51-1906	Corporate Integrated Data Solution (CIDS)	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	3,000	This profile is related to software. Any necessary additional energy demand from such software would be evaluated if and when growth in server capacity is proposed. No direct emissions or enabling emissions impacts.
21-60-1472	CRIMM - CAD-RMS Integration, Modernization and Maximization	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	4,170	This profile is for IT information management system with no direct or enabling emissions impacts.
19-18-1901	Information Security and Disaster Recovery Enhancements	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	3,000	This profile is related to software. Any necessary additional energy demand from such software would be evaluated if and when growth in server capacity is proposed. No direct emissions or enabling emissions impacts.
CM-20-0050	IT Infrastructure Renewal	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	2,461	This profile is related to IT renewal and is not expected to impact energy use. No direct or enabling emissions impacts.
19-51-1904	Next Generation 9-1-1 (NG911) IP Call Handling	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	3,000	This profile is related to software. Any necessary additional energy demand from such software would be evaluated if and when growth in server capacity is proposed. No impacts to Pathway 1, 2, 3 or 4 emissions and no enabling emissions impacts.
CM-60-1461	Police IT - Applications Enhancement	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	11,835	This profile is related to software. Any necessary additional energy demand from such software would be evaluated if and when growth in server capacity is proposed. No direct or enabling emissions impacts.
CM-60-1460	Police IT - Applications Sustainment	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	4,824	This profile is for the renewal of EPS software applications and systems that support EPS operations and not expected to impact energy use. No impacts to direct or enabling emissions.
CM-60-1433	Police IT - Infrastructure Sustainment	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	7,131	This profile is for the maintenance of foundational infrastructure components including hardware, software and telephone systems. The related equipment is not expected to significantly impact energy use. No direct emissions impacts. No enabling emissions impacts.
23-51-1905	Taxation Assessment Collections System (TACS) Transformation	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	2,816	This profile is related to software. Any necessary additional energy demand from such software would be evaluated if and when growth in server capacity is proposed. No direct emissions or enabling emissions impacts.
CM-18-1510	Technology Applications - Renewal	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	9,621	This profile is related to software applications and systems renewal and are not expected to impact energy use. No impacts to direct or enabling emissions.
CM-18-1514	Technology Implementation - Growth	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	2,000	This profile is related to software. Any necessary additional energy demand from such software would be evaluated if and when growth in server capacity is proposed. No direct or enabling emissions impacts.
CM-18-1515	Technology Infrastructure - Renewal	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	11,997	This profile is related to IT renewal and is not expected to impact energy use. No direct or enabling emissions impacts.
CM-17-2040	Urban Planning & Economy Service Transformation	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	N/A	5,600	This profile will support the Urban Planning & Economy Service Transformation initiative to fund investment in technology, business process optimization, and staff capability related to City services. No operational emissions impacts or enabling emissions impacts are expected.

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Land											
CM-17-1022	District Park Land Acquisition (New ASPs)	<input type="checkbox"/>	-	-	-	?	Not Quantified	-	Both	6,500	<p>This profile is for purchasing land in Riverview, Decoteau, and Horse Hill for district parks. Park development emissions impacts would be evaluated once designs are proposed. Specific lands purchased and the natural areas currently present on those lands will impact Pathway 4 emissions, but are currently uncertain. No enabling emissions impacts.</p> <p>Direct Emissions Impacts - Immaterial: associated with uncertainty of natural assets that will be impacted.</p>
CM-17-5046	Edmonton Exhibition Lands	<input checked="" type="checkbox"/>	-	⬇️	⬇️	⬇️	Not Quantified	⬇️	Both	53,119	<p>This profile is for the redevelopment of the Exhibition Lands which is intended to conform to the objectives of the Community Energy Transition Strategy. The redevelopment will include a multi modal mobility network that will expand active travel capacity and decrease Pathway 3 emissions. Further, mixed use built form and proximity to the mass transit system, is expected to enable expanded use of transit and enable emissions decreases. Redevelopment of buildings is targeting emissions neutrality and increased density to reduce Pathway 2 emissions. Expected increase tree plantings related to redevelopment decrease Pathway 4 emissions.</p> <p>Direct Emission Impacts: Medium: Associated with reduced building emissions, increased active travel, and new tree planting.</p> <p>Enabling Emission Impacts: Medium: Associated with inducing more transit use in alignment with the overall vision of the City Plan.</p>
19-16-5055	Heritage Valley Land Development	<input type="checkbox"/>	-	⬆️	⬆️	⬆️	Not Quantified	⬆️	Community	7,000	<p>This profile includes rezoning for land development. This project will allow new construction of buildings/streetlights which will increase Pathway 2 emissions. Additional road capacity will increase Pathway 3 emissions. The majority of land was originally agriculture as well as a small wetland that once removed will increase Pathway 4 emissions. No energy production envisioned in area and therefore no impact to Pathway 1 emissions. Development will enable more personal vehicle transportation to and from the community and enable emissions increases.</p> <p>Direct Emissions Impact - Medium: associated with substantial new development and associated energy use and land impacts across a large area.</p> <p>Enabling Emissions Impact - Medium: associated with induced transportation to and from the community in a remote part of the City.</p>
CM-16-2015	Industrial-Commercial-Investment Land Acquisition	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Both	15,000	<p>This profile is for the purchase of land, not modification. Associated emissions would be added to corporate inventory but would not change overall community emissions. No operational emissions impacts are expected.</p>
CM-16-2010	Industrial-Commercial-Investment Land Development	<input type="checkbox"/>	-	-	⬆️	-	Not Quantified	⬆️	Community	41,164	<p>This profile includes land development activities for industrial/commercial development in Ellerslie, Goodridge Corners, Rampart and Roper. Land development includes roadway construction, increasing road capacity and increasing Pathway 3 emissions. Enables construction of new commercial/industrial development, enabling emissions increases.</p> <p>Direct Emissions Impacts - Medium: Associated with the construction of new roadway capacity.</p> <p>Enabling Emissions Impacts - Medium: Associated with enabling new commercial/industrial development.</p>
CM-17-1020	Mature Area Land Acquisition	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Community	8,000	<p>This profile is for the purchase of land for parks in mature/redeveloping areas that lack green space. It is assumed that the land being acquired would already be developed to a certain extent, therefore there would be minimal carbon sequestration ability. There will be no material impact of emissions by this work.</p>
CM-17-3017	Natural Areas Acquisition	<input checked="" type="checkbox"/>	-	-	-	⬇️	(1,100)	⬇️	Community	6,500	<p>This profile includes acquisition of the land which will prevent it from becoming developed and can enable natural asset protection and allow for ongoing carbon sequestration of these lands impacting Pathway 4.</p> <p>Direct Emissions Impacts - Medium: associated with purchasing land that would otherwise be developed.</p> <p>Enabling Emissions Impacts - Medium: associated with the long term protection of land from development.</p>
CM-16-5110	Real Estate Investment Purchase	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Both	8,000	<p>This profile is for the purchase of land, not modification. Associated emissions would be added to corporate inventory but would not change overall community emissions. No operational emissions impacts are expected.</p>
CM-17-5120	Real Estate Transportation Legacy Land Acquisition	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Both	2,000	<p>This profile is for the purchase of land, not modification. Associated emissions would be added to corporate inventory but would not change overall community emissions. No operational emissions impacts are expected.</p>
CM-16-2020	Residential/Mixed-Use Land Development	<input type="checkbox"/>	-	-	⬆️	-	Not Quantified	⬆️	Community	35,239	<p>This profile includes land development activities for residential/mixed-use land development in Goodridge Corners, Schonsee and Aster. Land development includes roadway construction, increasing road capacity and increasing Pathway 3 emissions. Enables construction of new residential/mixed-use development, enabling emissions increases.</p> <p>Direct Emissions Impacts - Medium: Associated with the construction of new roadway capacity.</p> <p>Enabling Emissions Impacts - Medium: Associated with enabling new residential/mixed-use development.</p>
CM-16-2025	Residential/Mixed-Use Land Development Acquisition	<input checked="" type="checkbox"/>	?	?	?	?	Not Quantified	?	Both	2,000	<p>This profile is for land development, although no specific sites are identified. The exact amount of land is not known nor the locations. This is 'opportunistic' purchasing that would be guided by policy. All pathways have uncertain impacts.</p> <p>Direct Emission Impacts: Immaterial. Associated with Pathway 1, 2, 3, and 4 emissions.</p> <p>Enabling Emission Impacts: Immaterial. Associated with Pathway 3 emissions related to higher automobile use.</p>

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CM-17-5047	River Crossing Redevelopment	✓	-	-	-	-	Not Quantified	?	Community	3,000	This profile is related to engagement, planning, engineering, and design work. Future construction activities would be evaluated when budget is requested. Uncertain enabling emissions impacts. Enabling emissions impacts - Medium: Associated with the full development of River Crossing.
CM-17-1001	River Valley Land Acquisition	✓	-	-	-	⬇️	Not Quantified	⬇️	Community	10,000	This profile is for land purchase within River Valley. The profile will have key focus areas such as protection of natural areas, securing/protecting carbon sinks, increasing the number of hectares of open space which will allow for ongoing carbon sequestration of these lands and will reduce Pathway 4 emissions. Direct Emissions Impacts - immaterial: associated with eliminating development of river valley land. Enabling Emissions Impacts - immaterial: associated with the long term protection of purchased natural lands from development.
CM-17-1004	Suburban School and Park Land Acquisition	◻	-	-	-	⬆️	Not Quantified	-	Community	8,000	This profile is for undeveloped land that is being purchased to be turned into park land on school sites. Specific school site developments once designed and proposed would be evaluated for their emissions impacts. This land acquisition removes the natural area's ability to sequester carbon, increasing Pathway 4 emissions. No enabling emissions impacts. Direct Emissions Impacts - Immaterial: associated with naturalized land being turned into park land.
CM-17-5037	Surplus School Sites - First Place Program	◻	-	⬆️	-	-	Not Quantified	-	Community	100	This profile is related to the City's First Place Program which provides housing options for first-time home buyers. The profile includes the development of vacant surplus school sites for residential homes, increasing Pathway 2 emissions. No enabling emissions impacts. Direct Emissions Impacts - Low: Associated with the emissions generated from new residential buildings.
CM-17-5045	Transforming Surplus City Lands	◻	-	-	-	-	Not Quantified	⬆️	Community	16,338	This profile is related to developing City surplus land into serviced lots for building development. No direct emissions impacts. Enables emissions increases due to the subsequent development of the lots after sale. Enabling Emissions Impacts - Low: Associated with the emissions generated from new buildings developed.
Neighbourhoods											
23-40-9030	Balwin and Belvedere Neighbourhood Revitalization	✓	-	-	⬇️	?	Not Quantified	⬇️	Both	22,000	This profile is for neighbourhood renewal which will replace existing street lighting with LED which will reduce Pathway 3 emissions. This will also add missing sidewalks to increase walkability which will likely increase pedestrian circulation within neighborhood and decrease Pathway 3. Uncertain impact to Pathway 4. Direct Emissions Impact - immaterial: associated with LED replacements and new sidewalk connections. Enabling Emissions Impact - immaterial: associated with induced active travel.
22-10-9312	Commonwealth Recreation Centre Solar Photovoltaic Project	✓	⬇️	-	-	-	0	-	Corporate	1,505	This profile is for the installation of solar PV systems which displace the use of grid electricity and eliminate the emissions associated with electricity use thereby decreasing Pathway 1 emissions. No enabling emissions impacts. Direct Emissions Impacts - Low: associated with the new generation of electricity from solar PV.
CM-50-5050	CRL Projects - Planning and Design	◻	See composite item rankings			Not Quantified	See composite item rankings	N/A	N/A	14,386	This is a composite that includes: 100 Street Pedestrian Bridge, 107 Street Streetscape, 99 Street Streetscape and Library Parkade Membrane Replacement, Beaver Hills House - Michael Phair Parks, Green and Walkable Downtown - Emerging Opportunities, Harbin Gate, Jasper Avenue New Vision (102-109 Street). See composite item rankings.
CM-74-4100	Downtown Community Revitalization Levies Delivery	◻	?	?	?	?	Not Quantified	?	Both	110,370	This profile is a composite that will include numerous other CRL projects that are reviewed under other budget profiles. Uncertain impact to all Pathway emissions and uncertain enabling emissions impacts. Direct Emissions Impacts - Medium: associated with the broad application of this profile including multiple projects. Enabling Emissions Impacts - Medium: associated with the broad application of this profile including multiple projects.
	107 Street Streetscape	✓	-	-	⬇️	⬇️	Not Quantified	⬇️	Community	Part of CM-50-5050 and CM-74-4100	This profile is part of the "Green and Walkable Downtown" catalyst project for improving downtown roadways and streetscapes that support safe pedestrian movement, and therefore is expected to enable emissions decreases. Profile includes installation of wider sidewalks, increasing active travel capacity and decreasing Pathway 3 emissions. With the additional greenery, the profile will also likely support emissions sequestration, therefore reducing Pathway 4 emissions. Direct Emission Impacts: Immaterial. Associated with increased active travel and additional greenery. Enabling Emission Impacts: Low. Associated with the project's contribution to the Green and Walkable Downtown catalyst project, and potential to induce greater active travel.
	99 Street Streetscape and Library Parkade Membrane Replacement	✓	-	-	⬇️	⬇️	Not Quantified	⬇️	Community	Part of CM-50-5050 and CM-74-4100	This profile will construct a permanent bike facility which will address a current gap in the active transportation network within the greater downtown network, expanding active travel capacity and reducing Pathway 3 emissions. The profile also include enhanced lighting and additional greenery which will also have small carbon impacts in Pathways 3 and 4. Direct Emission Impacts: Immaterial. Associated with increased active travel capacity, enhanced lighting, and additional greenery. Enabling Emission Impacts: Immaterial. Associated with the profiles contribution to addressing a current gap in the active transportation network and potential to induce more trips using active mode of transportation.

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	Beaver Hills House Park/Michael Phair Park Upgrades	<input checked="" type="checkbox"/>	-	↑	-	-	Not Quantified	⬇️	Community	Part of CM-50-5050 and CM-74-4100	This profile includes the Capital City Downtown Plan's vision and includes the addition of green spaces that also allows and facilitates active frontages with adjacent buildings that promote active travel and enable decreased emissions. The project will also include the design and construction of a permanent washroom facility that will provide an essential service to those in the Downtown neighbourhood and increase Pathway 2 emissions. Direct Emission Impacts: Immaterial - Associated with emissions generated from new washroom facility. Enabling Emissions Impacts: Immaterial - Associated with promotion of active travel.
	Green and Walkable Downtown - Emerging Opportunities	<input checked="" type="checkbox"/>	-	-	⬇️	⬇️	Not Quantified	⬇️	Community	Part of CM-50-5050 and CM-74-4100	This profile, "Green and Walkable Downtown" is a coordinated program of street and public realm improvements that will result in a interconnected pedestrian network with street trees and landscaping on all downtown streets. Profile includes tree planting that reduce Pathway 4 emissions. Traffic calming measures reduce road capacity and added active travel capacity together decrease Pathway 3 emissions. New street lighting would increase Pathway 3 emissions, but is not expected to offset decreases from transportation capacity change. Overall decrease to Pathway 3 emissions. This profiles contribution to Green and Walkable Downtown will enable emissions decreases through promotion of active travel. Direct Emission Impacts - Immaterial: Associated with new tree plantings, new street lighting, and reduced road capacity from traffic calming measures. Enabling Emission Impacts - Low: associated with the promotion of active travel throughout the downtown aligned with the Green and Walkable Downtown project.
	Harbin Gate	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	N/A	Part of CM-50-5050 and CM-74-4100	This profile is a landmark project in downtown. No meaningful operational carbon impacts are expected.
	Jasper Avenue New Vision (102-109 Street)	<input checked="" type="checkbox"/>	-	-	⬇️	⬇️	Not Quantified	⬇️	Community	Part of CM-50-5050 and CM-74-4100	This profile will create wider, safer, more accessible public realm which will encourage walking and other active modes of transportation. The profile will also add to the number of trees and tree canopy in downtown, providing carbon sequestration benefits in Pathway 4 and mitigating the urban heat island effect. There may be small increases in emissions for lighting. Direct Emission Impacts: Low. Associated with Pathway 3 and 4 emissions. Enabling Emission Impacts: Immaterial. Associated with Pathway 3 emissions and its contribution towards the overall downtown vibrancy context.
22-40-9028	Killarney Neighbourhood Reconstruction	<input checked="" type="checkbox"/>	-	-	⬇️	⬇️	Not Quantified	?	Both	17,130	This profile is related to neighbourhood renewal. Project will add active travel paths and traffic calming infrastructure to lead to reductions in Pathway 3 emissions. There is no indication of switching existing street lighting to light-emitting diode (LED), therefore no additional impact to Pathway 3 emissions. Includes addition of trees and therefore decreases Pathway 4 emissions. Potential to enable more active travel use but these emissions impacts are uncertain. Direct Emissions Impacts - Immaterial: associated with new active transport capacity, traffic calming measures, and addition of trees. Enabling Emissions Impact - Immaterial: associated with potential induced active travel.
21-40-9024	NRP Recon - Calder	<input checked="" type="checkbox"/>	-	-	?	⬇️	<(100)	⬇️	Both	22,047	This profile is related to neighbourhood renewal. Additional lighting is proposed which increase Pathway 3 emissions. Project also expands active transportation infrastructure and therefore expected reductions to Pathway 3 emissions. Overall uncertain impact to Pathway 3 emissions. Net increase in total number of trees, and therefore decreases Pathway 4 emissions. Generally renewal will enable more active travel within the neighbourhood potentially enabling emissions reductions. Direct Emissions Impact - Immaterial: associated with additional lighting, trees, and new active travel capacity. Enabling Emissions Impact - Immaterial: associated with potential to induce more active travel.
21-40-9025	NRP Recon - Garneau	<input checked="" type="checkbox"/>	-	-	⬇️	⬇️	<(100)	⬇️	Both	9,780	This profile is related to neighbourhood renewal. Project expands active transportation infrastructure and therefore expected reductions to Pathway 3 emissions. Net increase in the number of trees, and therefore decreases to Pathway 4 emissions. Generally renewal will enable more active travel within the neighbourhood and enable emissions decreases. Direct Emissions Impacts - Immaterial: associated with expanded active travel capacity and net increase in number of trees. Enabling Emissions Impact - Immaterial: associated with potential to induce active travel use.
21-40-9023	NRP/NARP Recon - Beaumaris Neighbourhood and Alleys	<input checked="" type="checkbox"/>	-	-	⬇️	-	Not Quantified	?	Both	14,652	This profile is related to neighbourhood renewal which will switch existing street lighting with LED which will reduce Pathway 3 emissions. The project does not expand any transportation infrastructure and therefore no impact to Pathway 3 emissions related to active travel. No indication of tree removal or addition, and therefore no impact Pathway 4 emissions. Generally renewal will enable more active travel within the neighbourhood potentially enabling emissions reductions. Emissions impacts deemed to be immaterial due to uncertainty. Direct Emissions Impact - Immaterial: associated with LED conversion of streetlighting within a single neighbourhood. Enabling Emissions Impact - Immaterial: associated with potential enabling more active travel.

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			1	2	3	4					
22-40-9029	Pleasantview Neighbourhood Reconstruction	<input checked="" type="checkbox"/>	-	-			<100)		Both	23,710	This profile is related to neighbourhood renewal. Project will add active travel paths and traffic calming infrastructure to lead to reductions in Pathway 3 emissions. There is no indication of switching existing street lighting to LED, therefore no additional impact to Pathway 3 emissions. Includes addition of trees and therefore decreases Pathway 4 emissions. Potential to enable more active travel use but these emissions impacts are uncertain. Direct Emissions Impacts - Immaterial: associated with new active transport capacity, traffic calming measures, and addition of trees. Enabling Emissions Impact - Immaterial: associated with potential induced active travel.
CM-66-2596	Safe and Livable Community Streets	<input type="checkbox"/>	-	-		-	Not Quantified		Community	17,148	This profile includes traffic calming programs which will improve fuel economy of vehicles from reduced speeding and decrease Pathway 3 emissions. Traffic calming can also enable emissions reductions through safer streets enabling more active travel. Direct Emission Impacts: Low. Associated with decreased residential speeds increasing vehicle fuel efficiencies. Enabling Emission Impacts: Immaterial. Associated with potential increase in active travel.
CM-66-2585	Safe Crossings	<input type="checkbox"/>	-			-	Not Quantified		Community	25,875	This profile will include installation and signal upgrades, new signalization options (i.e., lead pedestrian intervals), and solar rapid flashing beacons. Installation of new non-solar signals will increase Pathway 2 emissions. These safe crossing signals could also slow traffic flow increasing Pathway 3 emissions. However, safe crossing signals will also make active travel modes more safe which may encourage more travel by active modes and enable emissions decreases. Direct Emission Impacts: Low. Associated with signal energy use and slowing road traffic. Enabling Emission Impacts: Immaterial. Implementing safe crossing signals will make corridors safer which may encourage more travel by active modes thus decreasing emissions.
CM-27-0000	Transportation: Neighbourhood Alley Renewal Program	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	N/A	81,310	This profile is for alley renewal and does not include expansion of transportation routes. There are no direct or enabling emissions impacts.
CM-25-0000	Transportation: Neighbourhoods - Renewal	<input type="checkbox"/>	-	-	-	-	Not Quantified		Community	545,717	This profile includes specific scope of work that is not yet defined project by project. Projects only include road, sidewalk, and trail renewal. Renewal of transportation system enables ongoing emissions from each transportation mode. No direct impacts, and uncertain enabling emissions impacts. Enabling Emissions Impacts - Medium: associated with the broad application of these renewals across the City and potential transformational change induced.
Open Spaces											
21-10-9104	Centennial Plaza Renewal	<input checked="" type="checkbox"/>	-	-	-		Not Quantified		Corporate	1,950	This profile includes the renewal of open space including increased tree planting, reducing Pathway 4 emissions. Potentially enables active transportation. Direct Emissions Impact - Immaterial: associated with additional tree plantings. Enabling Emissions Impact - Immaterial: associated with induced active travel.
CM-33-3001	Commemorative Programs	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	N/A	620	This profile includes adding commemorative benches. There are no material direct or enabling operational emissions impacts.
CM-16-1232	Dry Pond Land Acquisitions	<input type="checkbox"/>	-	-	-		Not Quantified		Community	13,000	This profile includes acquisition of the land which will prevent it from becoming developed and can enable natural asset protection and allow for ongoing carbon sequestration of these lands impacting Pathway 4. Direct Emissions Impact - immaterial: associated with the uncertain sequestration from the dry ponds. Enabling Emissions Impact - immaterial: associated with the long term sequestration from the dry ponds.
CM-35-1000	Greener As We Grow Tree Planting Program	<input checked="" type="checkbox"/>	-	-	-		(400)		Both	32,441	This consolidated capital profile is focused on tree planting and includes continuation of existing tree planting services levels and enhanced tree planting to meet the City Plan's 2 million tree planting goal and work towards growing Edmonton's urban forest canopy to 20%. The profile will lead to decreases in Pathway 4 emissions, and enabling ongoing growth of the sequestration capacity of the City in alignment with the City Plan objectives. Direct Emissions Impacts - Low. Associated with tree planting throughout the City. Enabling Emissions Impacts - Medium: Associated with the ongoing growth of the sequestration capacity of the City and contribution to the overarching City Plan objectives.
16-23-9805	Malcolm Twaddle & Edith Rogers Dry Ponds	<input type="checkbox"/>	-	-	-	-	Not Quantified		Community	1,989	This profile is related to a dry pond expansion and does not increase natural area footprint, only drainage capacity. While this does not impact Pathway 4 emissions it does serve to reduce damages from flooding events, and enables reductions in emissions related to emergency response from eliminating those events. Enabling Emissions Impact - Low: associated with reduced emergency response and recovery from urban flooding events.
CM-36-3636	Neighbourhood Park Development Program - New	<input type="checkbox"/>	-				Not Quantified	-	Both	5,000	This profile is related to the Neighbourhood Park Development Program that provides matching funding for community partners for development of playgrounds, landscaping, shelters, community gardens, spray parks, trails and seniors amenities. Due to projects being community initiated priorities, the emissions impacts are uncertain for Pathways 2, 3, and 4. No enabling emissions impacts. Direct Emissions Impacts - Immaterial. Associated with any new park facilities and trails.

Profile ID	Profile Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request (\$000s)	Description of GHG Impacts
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CM-39-0000	Open Space - Minor Renewal Program	<input type="checkbox"/>	-	-	-	-	Not Quantified	?	Community	11,000	This profile provides funding to support the renewal of smaller emergent projects for open space assets. Renewal is expected to be modern equivalent replacement, and is not expected to include any energy using equipment or expansion of transportation capacity. Replacements are likely to include renewal of access and circulation systems (trails, roads, and parking lots) leading to uncertain enabling emissions impacts.
											Enabling emissions impacts - Immortal: Associated with the renewal of trails, roads, and parking lots and maintaining the use of this infrastructure.
CM-37-0000	Open Space: Contaminated Site Management Program	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	6,000	This profile includes the ongoing evaluation, investigation and remediation of contaminated sites throughout Edmonton. There are no direct or enabling emissions impacts.
CM-34-0000	Open Space: Landslide and Erosion Management Program	<input type="checkbox"/>	-	-	-	-	Not Quantified	?	Community	21,308	This profile includes the geotechnical landslide and erosion management program and the PAC (Permanent Area Contribution) creek erosion control and protection program. The profile seeks to proactively monitor geotechnical risks and hazards and respond to emergent and unexpected impacts to City lands and infrastructure. No impact to direct emissions, but the profile does enable uncertain impacts in emissions related to the proactive maintenance of roads and trails to facilitate ongoing use.
											Enabling emissions impact - Immortal: Associated with the facilitating ongoing use of trails and roads under this profile.
CM-33-0000	Open Space: Open Spaces - Renewal	<input checked="" type="checkbox"/>	-	-	-	-	Not Quantified	?	Community	6,096	This profile is a open space renewal composite that includes roads, parking lots, utilities, irrigation, and trails. Utility and irrigation systems to be updated to modern equivalents and will not impact Pathway 2 emissions. General renewal of trail systems can enable more active travel and enable emissions reductions, whereas renewal of parking lots and roads will enable emissions increases. Uncertain enabling emissions impacts due to uncertainty in net change due to projects. Additional new tree plantings supported by other budget profiles and therefore no impact to Pathway 4 emissions.
											Enabling Emissions Impacts - Immortal: associated with the uncertain net change in emissions from renewal of active paths, roads and parking lots.
CM-38-0000	Open Space: Overland Drainage - Renewal	<input type="checkbox"/>	-	-	-	-	Not Quantified	⬇️	Community	4,000	This profile includes investigation and design/construction of overland drainage work and low impact development features to correct flooding and erosion problems. There are no direct emissions impacts expected.
											Enabling emissions impacts - Low. Associated with the profile's contribution to minimize flooding events and avoiding restoration work following flooding events.
CM-32-0000	Open Space: Parks - Renewal	<input checked="" type="checkbox"/>	-	-	-	-	Not Quantified	?	Community	46,770	This profile is for park renewal activities across the City related to trails, utilities, parking lots, and roads. Renewal of utilities and fixtures will be replaced with modern equivalents and not impact Pathway 2 emissions. General renewal of trail systems can enable more active travel and enable emissions reductions, whereas renewal of parking lots and roads will enable emissions increases. Uncertain enabling emissions impacts due to uncertainty in net change due to projects. Additional new tree plantings are supported by other budget profiles and therefore no impact to Pathway 4 emissions under this profile.
											Enabling Emissions Impacts - Immortal: associated with the uncertain net change in emissions from renewal of active paths, roads and parking lots.
CM-31-0000	Open Space: River Valley System - Renewal	<input checked="" type="checkbox"/>	-	-	-	-	Not Quantified	?	Community	19,410	This profile is a renewal composite for all aging trails, parking lots and roads located in the river valley. General renewal of River Valley trail systems can enable more active travel and enable emissions reductions, whereas renewal of parking lots and roads will enable emissions increases. Uncertain enabling emissions impacts due to uncertainty in net change due to projects. Additional new tree plantings are supported by other budget profiles and therefore no impact to Pathway 4 emissions under this profile.
											Enabling Emissions Impacts - Immortal: associated with the uncertain net change in emissions from renewal of active paths, roads and parking lots.
CM-35-0000	Open Space: Soft Landscaping: Renewal	<input type="checkbox"/>	-	-	-	-	Not Quantified	⬇️	Community	25,000	This profile is a open space renewal composite that will fund renewal of the urban forest canopy within the City but does not include new tree planting. This profile is directed by the objectives of the Urban Forest Asset Management Plan and the Urban Forest Management Plan. Renewal of the urban forest canopy will enable ongoing emissions decreases from the urban forest.
											Enabling Emissions Impacts - Immortal: associated with the renewal of trees to maintain and grow the City's sequestration capacity overtime.
21-30-9302	Urban Tree Canopy Expansion	<input checked="" type="checkbox"/>	-	?	-	⬇️	<100	⬇️	Corporate	1,159	This profile is for the expansion of urban tree canopy and will lead to decreases to Pathway 4 emissions. Uncertain impacts to Pathway 2 emissions, as expanded tree canopy can reduce cooling demands or increase heating demand dependent on final planting locations. Potential to enable reductions by promoting active modes of travel by providing shade.
											Direct Emissions Impacts - Immortal: associated with new tree plantings and potential to impact building energy use dependent on final planting locations.
											Enabling Emissions Impacts - Immortal: associated with potential for shading from urban canopy to support more active transportation use.
21-32-9101	William Hawrelak Park Rehabilitation	<input type="checkbox"/>	-	-	?	-	Not Quantified	?	Both	127,438	This profile is for the rehabilitation of William Hawrelak Park. The project does not include any installation of solar PV or other new energy systems therefore no Pathway 1 emissions impacts. The project will update mechanical/electrical systems and buildings with modern equivalents, not impacting Pathway 2 emissions. Addition of new active path and bike parking capacity will decrease Pathway 3 emissions but the addition of new security lights will increase Pathway 3 emissions. Uncertain impacts to Pathway 3 due to unknown net change. No indication of increased or decreased number of trees or inclusion of naturalization and therefore no impact to Pathway 4 emissions is assumed. Renewal of roads, parking lots, and trails all serve to enable emissions impacts, however the enabling emissions impacts are uncertain due to the unknown net change that would result from the renewal.
											Direct Emissions Impact - Low: associated with new lighting and expanded active transportation routes.
											Enabling Emissions Impact - Immortal: associated with potential increased road and active travel for accessing the site.

Profile ID	Profile Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request (\$000s)	Description of GHG Impacts
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Transportation											
21-50-9100	103A Avenue Pedway	<input checked="" type="checkbox"/>	-	↑	↓	-	Not Quantified	↓	Community	25,400	This profile is for an underground pedway that will be heated and will therefore increase Pathway 2 emissions. It will enable district energy systems expansion and therefore enable reductions in emissions. This will improve access to transit systems and add active travel routes and reduce Pathway 3 emissions. Direct Emissions Impacts: Low: associated with new energy demand and improved access to transit systems promoting use of that mode of travel. Enabling Emissions Impacts: Medium: associated with enabling district energy systems.
22-22-9700	124 Street - 109 Avenue to 118 Avenue	<input checked="" type="checkbox"/>	-	-	↓	↓	<100)	↓	Both	10,056	This profile is for street renewal. There is no expansion to roadways, but some expansion of sidewalks adding active travel capacity and decreasing Pathway 3 emissions. No indication of conversion of streetlights to LED, assumed no impact to Pathway 2 emissions. No inclusion of solar PV or energy systems and therefore no impact to Pathway 1 emissions. Includes new tree areas and therefore decreases Pathway 4 emissions. General streetscape improvements might enable more active travel however uncertainty to the emissions impacts. Direct Emissions Impacts - Immaterial: associated with expanded active transport capacity and new tree areas. Enabling Emissions Impacts - Immaterial: associated with potential induced active transportation.
21-20-2100	170 Street Pedestrian Bridge	<input checked="" type="checkbox"/>	-	-	-	?	Not Quantified	↓	N/A	471	This profile is for replacement of pedestrian bridge to maintain available active travel routes, no impact to Pathway 3 emissions. Some tree removals are included in plans, but expectation is for these trees to be restored after project completion, given unknowns Pathway 4 emissions impacts are deemed uncertain. Enables emissions reductions through maintaining active travel routes while population grows. Direct Emissions Impact - Immaterial: associated with uncertainty in tree planting related reductions. Enabling Emissions Impact - Immaterial: associated with potential increased active travel use as population grows.
18-66-6503	50 Street CPR Grade Separation	<input checked="" type="checkbox"/>	-	-	↓	-	Part of Road Composite 12,800	?	Both	94,201	This profile will create an overpass to replace current at-grade Canadian Pacific (CP) railway crossing along 50 Street and also widen the 50 St to 6 lanes. The project will significantly reduce current traffic delay and existing congestion resulting in direct reductions in Pathway 3 emissions. Direct Emissions impact - Medium: associated with reduced congestion on the roadway with existing congestion issues. Enabling Emissions Impact - Immaterial: associated with increased active travel routes and potential induced use of this mode.
CM-20-0330	Bike Plan Implementation - Approach 3	<input checked="" type="checkbox"/>	-	-	↓	-	Part of Active Mode Composite (700)	↓	Community	100,000	This profile is to fund approach 3 related to the development of the bike network. This profile would expand the bike network within the city and ensure residents have greater opportunity to access destinations by biking or other micro mobility modes. Profile will directly decrease Pathway 3 emissions through more use of active mode of travel and enable ongoing growth of active travel as the City grows. Direct Emissions Impacts - Low: associated with increased active mode capacity. Enabling Emissions Impacts - Medium: associated with the potential to induce more active travel and displace vehicle travel.
CM-66-3600	Bus Fleet & Equipment Rehab & Replacement	<input checked="" type="checkbox"/>	-	-	↓	-	Not Quantified	↓	Corporate	40,788	The profile is predominately bus fleet replacement with modern equivalent maintaining the diesel bus fleet. Profile includes exploration of hydrogen dual fuel on 2 buses and 3-4 other vehicles. Trials of hydrogen-bus would serve to decrease Pathway 3 emissions and potentially enabling further adoption of hydrogen buses enabling emissions decreases. Direct Emissions Impacts - Immaterial: associated with limited impact of hydrogen trials on 2 buses. Enabling Emissions Impacts - Medium: associated with ongoing trial/testing of alternative fuels for bus fleet operation.
16-66-7018	Capital Line South LRT: Century Park to Ellerslie Road	<input checked="" type="checkbox"/>	-	↑	↓	↑	Part of Transit Composite (23,700)	↓	Both	894,736	This profile is for development of LRT will increase transit access and capacity and plans include incorporation of active travel modes to support decreases in Pathway 3 emissions from fewer personal vehicle trips. Buildings and facilities related to station operation lead to Pathway 2 emissions increases. Route includes development of previously undeveloped land, increasing Pathway 4 emissions. New LRT can enable emissions decreases by shifting towards more dense urban form. Direct Emissions impact - Medium: associated with the increase use of transit and active travel offset by increased emissions from the energy use of the station and development of previously undeveloped lands. Enabling Emissions Impact - High: associated with shifting urban form to increase density.
21-25-9501	Central LRT Station Escalator Renewal	<input checked="" type="checkbox"/>	-	-	-	-	Not Quantified	↓	Corporate	100	This profile is for escalator renewal the current energy use included in Baseline. No expected direct emissions impacts. Maintaining LRT stations generally enables more transit use and therefore enables emissions reductions. Enabling Emissions Impacts - High: associated with maintaining the accessibility of the transit system and potential for increased usage as population grows.
	Chinatown Infrastructure Improvements	<input type="checkbox"/>	-	-	↑	?	Not Quantified	↓	Both	10,100	This profile is related to improvements to Chinatown infrastructure including 97 Street paving, 107A Avenue Streetscape rehabilitation, McCauley Neighbourhood Renewal (Streetscapes in Chinatown), Mary Burlie Park improvements, and Harbin Gate. There may likely be lighting increases leading to increase Pathway 3 emissions. No indication of tree removal or addition, and therefore unknown impact to Pathway 4 emissions. Generally renewal will enable more active travel within the neighbourhood potentially enabling emissions reductions. Direct Emissions Impact - Immaterial: associated additional lighting installation and due to uncertainty. Enabling Emissions Impact - Immaterial: associated with potential enabling more active travel and due to uncertainty.

Profile ID	Profile Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request (\$000s)	Description of GHG Impacts
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20-20-2024	Edmonton-Strathcona County Pedestrian Bridge	<input checked="" type="checkbox"/>	-	-		-	Not Quantified		Community	30,205	This profile supports development of a pedestrian bridge will add active transportation capacity and enable greater active transportation displacing personal vehicle transportation enabling reduced emissions and reducing Pathway 3 emissions. Direct Emissions Impact - Low: associated with new active transportation route. Enabling Emissions Impact - Immaterial: associated with increased active travel induced from the development.
22-22-9701	Gateway Blvd Renewal (University Avenue to 82 Avenue)	<input type="checkbox"/>	-	-	-	-	Not Quantified		Community	5,094	This profile is strictly renewal on some portions of the boulevard and advancing active modes on the remaining. Does not include any transportation capacity increases. Construction to occur over 2022-2023. Advancing active mode travel can enable emissions decreases. Enabling emissions impacts - immaterial: associated with induced active travel.
23-24-0300	High Level Bridge Rehabilitation	<input checked="" type="checkbox"/>	-	-		-	Not Quantified	-	Community	97,000	This profile includes the rehabilitation of the High Level Bridge and includes active travel enhancements that will expand capacity of that mode of travel. This will decrease Pathway 3 emissions. No enabling emissions impacts. Direct Emissions Impacts - Low. Associated with an increase in active travel capacity and the importance of this route.
CM-66-3300	LRT Signals and Electrification Renewal	<input checked="" type="checkbox"/>	-	-	-	-	Not Quantified		Community	7,550	This profile is for the renewal of LRT electrical and signal systems that have reached their end of useful life. These systems related to the maintaining reliability and safety of the system, which are expected to enable more use of the transit system and enable a decrease in emissions. No additional energy use is expected. No direct emissions impacts. Enabling Emissions Impacts - Medium: Associated with the contribution to City's Mass Transit Strategy.
16-66-7013	Metro Line LRT (NAIT - Blatchford) Extension	<input checked="" type="checkbox"/>		-		-	Part of Transit Composite (23,700)		Both	61,850	This profile will decrease Pathway 1 emissions through the use of solar energy. The station energy use is intended to be net zero, therefore no impact to Pathway 2 emissions. Development of LRT will enable transit to be used by more residents decreasing Pathway 3 emissions from fewer personal vehicle trips. New LRT can enable emissions decreases by shifting towards more dense urban form. Direct Emissions Impact - Low: associated with the increased capacity of transit and deployment of solar PV. Enabling Emissions Impact - High: associated with shifting urban form to increase density within existing neighbourhood
CM-20-2020, CM-99-9090	Missing and Enhanced Sidewalk Connections	<input checked="" type="checkbox"/>	-	-		-	Not Quantified		Community	13,615	This profile would help support a more complete and connected pedestrian network within the city and ensure residents have greater opportunity to access destinations by walking or rolling. Profile will decrease community Pathway 3 emissions through more walkability with better sidewalk connections. Direct Emissions Impacts - Low: associated with increased active mode capacity. Enabling Emissions Impacts - Medium: associated with the potential to induce more active travel and displace vehicle travel.
20-20-2022	New Transit Bus Garage	<input checked="" type="checkbox"/>	-	-	-		0		Both	285,000	This profile is for a new transit garage that is expected to meet C627 policy and be designed to be emissions neutral with renewable energy production. This neutrality means it will have no impact to Pathway 1 or 2 emissions. The location of this project is currently unknown and therefore Pathway 4 emissions impacts are uncertain. This project will support the Mass Transit Plan to assist in increasing transit system use, indirectly enabling emissions reductions. Direct Emissions Impact - Low: associated with the uncertain impact to land. Enabling Emissions Impact - High: associated with this facilities support of the Mass Transit Plan and efforts to increase transit ridership.
CM-66-2194	Regulated Safety Upgrades at Railway Crossings	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	720	This is a generic profile where railway crossings safety review will be conducted and crossings will be evaluated as per the priority. No material carbon impacts are considered at this time. No enabling emissions impacts. No Direct Emission Impacts.
21-31-9100	Rundle Park Road and Parking Lot Renewal	<input type="checkbox"/>	-	-	-	-	Not Quantified		N/A	181	This profile is strictly renewal, no expansion of paths, roads or parking included. No facilities or energy systems included. Renewal of roads and parking lot enables emissions increases from personal vehicle travel. Enabling Emissions Impacts - Immaterial: associated with renewal of the parking lot and enabling personal vehicle travel to the park.
19-22-9006	Terwillegar Drive Expressway Upgrades - Alternate Staging	<input checked="" type="checkbox"/>	-	-		-	Part of Road Composite 12,800		Community	161,021	This project is primarily a road project which includes a 4 lane expressway (3 for auto, 1 for transit) and 2 major interchange upgrade. It will build a shared use path. It will primarily increase road capacity and increase Pathway 3 emissions. However, the inclusion of the BRT lane and active travel paths will also contribute to reductions in Pathway 3 emissions. Overall, uncertain impacts to Pathway 3 emissions. Land use was previously developed and therefore no impact to Pathway 4 emissions. The emission from this project will be quantified in combination with the Yellowhead Trail to understand the system wide impacts. Together, the multimodal transportation route is expected to enable emissions reductions considering population growth and the high use of the route. Direct Emissions Impact - Medium: associated with reducing congestion and increasing transit and active transport routes. Enabling Emissions Impact - High: associated with induced transportation and avoided congestion from that travel.
CM-66-2525	Traffic Signals - Developer and ARA Funded	<input type="checkbox"/>	-			-	Not Quantified		Corporate	16,000	This profile is for the new signals in the developing area to provide efficient intersection crossing rather than 4-way stop signs. This will provide more efficient road transportation and safer movement for all travel modes reducing Pathway 3 emissions and enabling more active travel. New signals will increase Pathway 2 emissions. Direct Emission Impacts: Low. Associated with additional energy use for signals and more efficient intersection crossing. Enabling Emission Impacts: Immaterial. Associated with induced active travel.

Profile ID	Profile Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request (\$000s)	Description of GHG Impacts
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CM-66-3000	Transit Communications Renewal	✓	-	-	-	-	Not Quantified	⬇️	Community	7,918	This profile is for the replacement of communications equipment that has exceeded their end of life. Since the profile only considers equipment replacement, no additional energy use is expected. No direct emissions impacts.
CM-29-0000	Transportation: Minor Renewal Program	◻	-	-	-	-	Not Quantified	?	Community	15,000	Enabling Emissions Impacts - Immaterial. Overall these replacements assist in maintaining ETS reliability and thereby have the potential to enable emissions reductions from increased ridership.
CM-24-0000	Transportation: Bridges & Auxiliary Structures - Renewal	✓	-	-	⬇️	-	Not Quantified	-	Corporate	209,836	This profile includes bridge renewal and no expanded capacity of roadways. This profile does include minor elements that add active travel capacity, including the addition of sidewalks and shared-use paths on bridge replacements and sometimes widening of active mode facilities which reduces Pathway 3 emissions. No enabling emissions impacts.
CM-22-0000	Transportation: Goods Movement - Arterial Renewal	✓	-	-	⬇️	-	Not Quantified	-	Corporate	64,843	This profile includes the renewal of goods movement corridors and arterial roadways throughout Edmonton to address condition-based deficiencies. There are no road capacity increases associated with this profile. The profile does include some growth components that increase active travel capacity, allowing for improved active mode accommodation, completion of missing sidewalk or shared-use paths, safety improvements, or accessibility improvements which serve to reduce Pathway 3 emissions. No enabling emissions impacts.
CM-20-2020	Transportation: Planning and Design - Growth	◻	See composite item rankings			Not Quantified	See composite item rankings	N/A	Corporate	9,007	Direct Emissions Impacts - Immaterial: associated with the growth of active travel capacity.
	Imagine Jasper Avenue (114 to 124 Street) Detailed Design and Delivery	✓	-	-	⬇️	⬇️	Not Quantified	⬇️	Community	Part of CM-20-2020	This is a composite that includes "Imagine Jasper Avenue (114 to 124 Street)". See composite item rankings.
CM-21-0000	Transportation: Public Transit - Renewal	◻	-	-	-	-	Not Quantified	⬇️	Both	31,843	As part of the Imagine Jasper Avenue, this profile will convert the Jasper Avenue from 114 Street to 124 Street into a multi modal corridor where a traffic lane will be dropped and the road design will accommodate more options for transit, walking and cycling, decreasing Pathway 3 emissions. With the additional greenery, the profile will also likely support emissions sequestration, decreasing Pathway 4 emissions. This profile is considered as part of the Transportation System Composite for quantification.
CM-26-0000	Transportation: Traffic Systems - Renewal	◻	-	-	-	-	Not Quantified	-	Corporate	9,307	Direct Emission Impacts: Immaterial. Associated with reduction of Pathway 3, and 4 emissions.
	Valley Line LRT: Downtown to Lewis Farms	✓	-	⬆️	⬇️	⬇️	Part of Transit Composite (23,700)	⬇️	Both	1,398,325	Enabling Emission Impacts: Immaterial. Associated with Pathway 3 emissions due to being part of the vibrant downtown active mobility network.
16-66-7017	Yellowhead Trail - 156 Street to St Albert Trail	◻	-	-	⬆️	-	Part of Road Composite 12,800	⬇️	Community	54,634	This is a renewal composite with no growth components or fuel switching for vehicles. No direct emissions impacts. General renewal of transit will enable ongoing use and possible growth of transit use thereby enabling emission reductions and supporting the Transit strategy.
21-20-9301	Yellowhead Trail - Fort Road Widening	◻	-	-	⬆️	-	Part of Road Composite 12,800	⬇️	Community	54,597	Enabling Emissions Impacts - High: due to this profile's contribution to Edmonton's Transit Strategy.
21-20-9302	Yellowhead Trail - Fort Road Widening	◻	-	-	⬆️	-	Part of Road Composite 12,800	⬇️	Community	54,597	This profile is for replacement following critical traffic systems failure. Projects generally involve replacing poles and have no direct or enabling emissions impacts.
	Valley Line LRT: Downtown to Lewis Farms	✓	-	⬆️	⬇️	⬇️	Part of Transit Composite (23,700)	⬇️	Both	1,398,325	This profile is expected to increase the overall number of trees along the line decreasing Pathway 4 emissions. Development of LRT will enable transit to be used more broadly and plans include incorporation of active travel modes supporting decreases in Pathway 3 emissions from fewer personal vehicle trips. Buildings and facilities related to station operation would lead to Pathway 2 emissions increases. New LRT can enable emissions decreases by shifting towards more dense urban form.
	Yellowhead Trail - 156 Street to St Albert Trail	◻	-	-	⬆️	-	Part of Road Composite 12,800	⬇️	Community	54,634	Direct Emissions Impact - Medium: associated with the increase use of transit and active travel, expected increase to total trees offset by increased emissions from the energy use of the station.
	Yellowhead Trail - Fort Road Widening	◻	-	-	⬆️	-	Part of Road Composite 12,800	⬇️	Community	54,597	Enabling Emissions Impacts - High: associated with shifting urban form to increase density.
	Yellowhead Trail - Fort Road Widening	◻	-	-	⬆️	-	Part of Road Composite 12,800	⬇️	Community	54,597	This profile includes the expansion of roadway capacity leading to increased Pathway 3 emissions. Tree removal will adhere to City Tree Management Policy resulting in no impact to Pathway 4 emissions. Project is expected to reduce congestion and resultant emissions when considering City population growth, enabling decreases in emissions.
	Yellowhead Trail - Fort Road Widening	◻	-	-	⬆️	-	Part of Road Composite 12,800	⬇️	Community	54,597	Direct Emissions Impact - Medium: Due to the importance and high usage of the transportation route currently.
	Yellowhead Trail - Fort Road Widening	◻	-	-	⬆️	-	Part of Road Composite 12,800	⬇️	Community	54,597	Enabling Emissions Impact - Medium: Due to the importance of the route and uncertainty related to adoption of EVs within the community and induced increased use of the route.

Profile ID	Profile Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request (\$000s)	Description of GHG Impacts
			1	2	3	4					
CM-99-9600	Yellowhead Trail Freeway Conversion: Project Delivery	<input type="checkbox"/>	-	-		-	Part of Road Composite 12,800		Community	376,257	This profile is for a freeway project that is intended to increase capacity for vehicles which serves to increase Pathway 3 emissions. Considering increases in population the project can enable decreases in emissions related to reduced congestion. Direct Emissions Impacts - Medium: associated with the expanded capacity of the freeway. Enabling Emissions Impacts - Medium: associated with population growth and reduced congestion from capacity expansion.
CM-99-0060	Yellowhead Trail Freeway Conversion: Project Development	<input type="checkbox"/>	-	-		-	Part of Road Composite 12,800		Community	7,913	This profile is for a freeway project that is intended to increase capacity for vehicles which serves to increase Pathway 3 emissions. Considering increases in population the project can enable decreases in emissions related to reduced congestion. Direct Emissions Impacts - Medium: associated with the expanded capacity of the freeway. Enabling Emissions Impacts - Medium: associated with population growth and reduced congestion from capacity expansion.
Other Assets											
14-02-2106	Blatchford Redevelopment Implementation	<input checked="" type="checkbox"/>	-	-			Not Quantified		Both	103,743	This profile for the Blatchford redevelopment process. The development is to be emissions neutral powered by renewable energy therefore will not impact Pathway 1 or 2. Pathway 3 emissions reductions are related to increased capacity for accessible and appealing active transportation networks to induce more active travel. Tree planting generally accompanies active transport routes and therefore reduce Pathway 4 emissions. Direct Emissions impact - Low: associated with new active travel and tree planting. Enabling Emissions Impact - Immaterial: associated with induced active travel.
CM-83-0001	District Energy Network Strategy and District Energy Nodes	<input checked="" type="checkbox"/>		-	-	-	(24,800)		Community	34,500	This profile is for energy systems that supply building heating more efficiently and can be supplemented by the use of low carbon fuels, reducing Pathway 1 emissions. The systems will enable larger scale and rapid decarbonization of buildings connected to the systems when they are operated with low carbon fuel sources. Direct Emissions Impacts - High: associated with deployment of multiple district energy systems under the strategy. Enabling Emissions Impacts - High: associated with the use of district energy to supply building heat.
CM-99-9000	Infrastructure Delivery - Growth	<input type="checkbox"/>	-	-			Not Quantified		Both	158,604	This profile includes all growth projects including buildings, roadways, and open spaces. Growth buildings are assumed to adhere to C627 policy and be designed to be emissions neutral with renewable energy production. This neutrality means it will have no impact to Pathway 1 or 2 emissions. New roads would expand road capacity and therefore increase Pathway 3 emissions. Details about open space projects are not available and therefore uncertain impact to Pathway 4 emissions. Growth projects include both emissions increasing and decreasing projects and therefore there are uncertain enabling emissions impacts. Emissions impacts deemed to be High since this profile includes all growth projects. Direct Emissions Impacts - High: Associated with the broad scope of this profile. Enabling Emissions Impacts - High: uncertain impacts associated with the broad scope of this profile.
CM-20-0051	Library Materials	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	24,682	This profile is related to library collections renewal and salaries and has no direct or enabling emissions impacts.
14-66-2570	Parking Control Technology	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Community	2,100	This profile is for renewal of parking control technology. Expected that renewed equipment has more or less the same emissions as the existing technology and therefore has no emissions impacts.

APPENDIX A

OPERATING BUDGET REQUESTS AND GHG IMPACTS



Service Package Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request (\$000s)	Description of GHG Impacts						
		1	2	3	4											
Summary of Service Packages - Funded																
Funded Council Directed																
Standalone Service Packages																
City Operations - Parks and Roads Services																
Urban Farming and Community Garden Program	<input checked="" type="checkbox"/>	-	-	-		Not Quantified		Community	1,352	<p>This service package may transition turf to urban agriculture and increase the carbon sequestration ability of the land and decrease Pathway 4 emissions. Urban agriculture and community gardens provide opportunities for local food production. Local food production can enable reductions of emissions associated with importing food.</p> <p>Direct Emissions Impacts - Immaterial: associated with the small negligible impact of emissions sequestration from the gardening.</p> <p>Enabling Emissions Impacts - Low: associated with the reduced freight emissions from local food production from each farm.</p>						
Community Services - Community Recreation and Culture																
Edmonton Ski Club Replacement		-		-	-	Not Quantified	-	Community	4,000	<p>This profile is to fund the replacement of the existing Edmonton Ski Club facility. It is expected that the new facility will improve the energy performance compared to the existing facility which will be demolished, however there are currently no available information about the new facilities design and expected energy use and therefore there are uncertain impacts to Pathway 2 emissions. No enabling emissions impacts.</p> <p>Direct Emissions Impacts - Low: associated with the expected energy use of a new facility.</p>						
Festival Support and Growth		-			-	Not Quantified		Both	1,972	<p>This service package will result in growth in events and festivals that will increase emissions associated with power and heating requirements within any buildings associated with the events as well as transportation emissions. This impact is uncertain due to a lack of details about what growth events are supported.</p> <p>Direct Emissions Impacts - Low: associated with the broad application of this profile across the City but limited understanding in specific supports provided.</p> <p>Enabling Emissions Impacts - Low: associated with possible induced travel associated with events but lack of details about supports for alternative modes of travel.</p>						
Heritage Valley Project Development		-	-	-		Not Quantified		Both	447	<p>This service package is funding for the design for a new recreation facility on previously undeveloped land. There is therefore significant uncertainty associated with the resultant direct emissions impacts. Facility is assumed to adhere to C627, and be constructed to emissions neutral standards and therefore not impact Pathway 2 emissions. Policy requires Solar PV to be integrated into facility to reach emissions neutral standard, which does not impact Pathway 1 emissions.</p> <p>Direct Emissions Impacts - Low: associated with the development of previously undeveloped lands.</p> <p>Enabling Emissions Impacts - Immaterial: associated with induced transportation to the site once completed.</p>						
Reinstatement of Outdoor Pool Operating Season		-		-	-	<100		Corporate	1,294	<p>This service package will increase operational hours which will in turn increase the emissions associated with operations while providing better service for Edmonton residents. Increased service hours may enable more transportation related emissions by residents attending the pools if personal vehicles are predominantly used.</p> <p>Direct Emissions Impact - Immaterial: associated with the additional energy use of the pools.</p> <p>Enabling Emissions Impact - Immaterial: associated with increased personal vehicle travel to the pools due to increased operations.</p>						
Community Services - Social Development																
Affordable Housing and Homelessness Prevention	<input checked="" type="checkbox"/>	-		-	-	Not Quantified		Community	74,804	<p>This service package could impact emissions if funding resulting from the plan supports or enables the development of new housing units that are not emissions neutral therefore increasing Pathway 2 emissions. Historically, this housing has been at least 30% better than the building code in terms of energy use. Planning for higher efficiency affordable housing can alleviate energy poverty and ultimately reduce energy use, enabling a decrease in emissions indirectly.</p> <p>Direct Emissions Impacts - Low: associated with any new housing that is developed not meeting an emissions neutral standard.</p> <p>Enabling Emissions Impacts - medium: associated with the ability for this effort to assist in alleviating energy poverty associated with the potential to reduce the need for emergency services and the associated energy use.</p>						
Continue Subsidies for C5 North East Community Hub		-	-	-	-	Not Quantified	-	Community	1,200	This service package provides supporting funds to operate the C5 North East Community Hub. The community hub provides a number of City services centralized in one location for easy access. No direct or enabling emissions impacts.						
Missing and Murdered Indigenous Women and Girls Action Plan		-	-	-	-	Not Quantified	-	N/A	4,911	This service package has no direct or enabling emissions impacts.						

Service Package Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request (\$000s)	Description of GHG Impacts
		1	2	3	4					
Financial and Corporate Services - Assessment and Taxation										
Development of Derelict Residential Subclass	<input type="checkbox"/>	-		-	-	Not Quantified		Community	1,164	<p>This profile is to support implementation of the derelict properties grant program and policy. These programs and policies together motivate either demolition or redevelopment/occupation of derelict properties. Redevelopment of these properties will likely serve to increase density/improve energy performance of these properties and therefore decrease Pathway 2 emissions. Demolition of these properties can enable new higher performance buildings to be constructed, and enabling emissions decreases.</p> <p>Direct Emission Impacts - Low: associated with increased density / redevelopment of derelict properties.</p> <p>Enabling Emissions Impacts - Low: associated with demolishing derelict buildings enabling construction of higher performance buildings. Increase in density within redeveloping area will enable more transit and active mode use.</p>
Integrated Service Packages										
City Operations - Parks and Roads Services										
Encampment and Unsheltered Homelessness Response	<input type="checkbox"/>	-	-		-	<100		Corporate	3,763	<p>This service package could see five vehicles (trucks) added to the City fleet. Also, the service increase has potential to reduce the need of emergency service (ambulances, etc.) and therefore may enable decreases in emissions.</p> <p>Direct Emissions Impacts - Immaterial: Associated with the additional vehicles.</p> <p>Enabling Emissions Impacts - Medium: associated with possible reduced need for emergency service response.</p>
Enhanced Snow and Ice Control Service Standards	<input type="checkbox"/>	-	-		-	1,100		Corporate	33,022	<p>This service package includes an increase in use of existing equipment that will be increased by 57% to 80-85%. This will result in increase fuel use in snow management equipment. Increased road accessibility will increase road usage and indirectly increase emissions.</p> <p>Direct Emissions Impacts - Medium: associated with the increased use of existing equipment.</p> <p>Enabling Emissions Impacts - Medium: associated with the increased road usage enabled by increasing snow clearing services.</p>
Community Services - Community Standards and Neighbourhoods										
Problem / Derelict Properties Initiative	<input type="checkbox"/>	-	-	-	-	Not Quantified		Community	4,736	This service package will not lead to any impacts to emissions from the vacant properties. City ownership and management of properties would reduce the risk to properties (such as risk of fire).
Urban Planning and Economy - Planning and Environment Services										
Urban Planning and Economy City Plan Implementation	<input checked="" type="checkbox"/>					Not Quantified		Both	8,235	<p>This service package will have significant impacts on all four Pathways by: facilitating the use of local renewable energy; pursuing emissions-neutral and net-positive infrastructure, buildings and neighbourhoods; building a low carbon mobility system and creating opportunities for carbon neutral city districts; and protecting and preserving Edmonton's ecological network, preventing the development on arable land, and supporting carbon sequestration.</p> <p>Direct Emissions Impacts - High: associated with the comprehensive nature of the plan, and the potential for this implementation to be highly transformative in terms of energy use and emissions.</p> <p>Enabling Emissions Impacts - High: associated with enabling lower emissions choices for housing and transportation throughout the City.</p>
Funded Council Driven										
Standalone Service Packages										
Community Services - Community Recreation and Culture										
Support for YMCA Castledowns	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Community	2,000	This service package will support continued operation of the Castle Downs YMCA. No direct or enabling emissions impacts.
Community Services - Social Development										
Free Play for Kids	<input type="checkbox"/>	-	-	-	-	Not Quantified		Community	1,200	<p>This service package will support the Free Play for Kids subsidized sports program. Profile includes the potential development of dedicated transportation for participants. No direct emissions impacts. Potential enabled increased emissions from development of dedicated transportation.</p> <p>Enabling emissions impacts - Immaterial: associated with the potential development of dedicated transportation for participants.</p>
Funded Growth on Existing Services										
Standalone Service Packages										
City Operations - Edmonton Transit Service										
On Demand Permanent Funding	<input checked="" type="checkbox"/>	-	-	-	-	Not Quantified		N/A	42,910	<p>This service package is asking to make the contracting dollars received permanent for the On Demand transit service. There is no material growth of services associated with this and therefore no direct emissions impact.</p> <p>Enabling Emissions Impact - High: associated with this profile's contribution to the Mass Transit Strategy.</p>
Employee Services - Workforce Safety and Employee Health										
Safety Service Evaluation	<input type="checkbox"/>	-	-	-	-	Not Quantified		N/A	1,738	<p>This service package results in service level increase for internal work around OHS. No direct emissions impact since it is assumed this is predominantly staff time. Additional OHS requirements developed through this profile may indirectly impact emissions, however this is uncertain since specific measures are not defined.</p> <p>Enabling Emissions Impacts - Immaterial: associated with uncertainty in resulting emissions impacts.</p>

Service Package Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request (\$000s)	Description of GHG Impacts
		1	2	3	4					
Office of the City Manager - City Manager										
Truth and Reconciliation	<input type="checkbox"/>	-	-	-	-	Not Quantified	?	Community	4,531	This service package is expected to be predominantly staff time, and not have any direct impact to emissions. Enabling Emissions Impact - Immaterial: associated with the uncertain results from increased inclusion and consideration of Indigenous interests impacting emissions production and general inclusion of Edmonton's community.
Office of the City Manager - Legal Services										
Agile Corporate Security Services	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Both	1,600	This service package has no operational emissions impacts.
Office of the City Manager - Office of the City Clerk										
2025 Election Costs	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	6,531	This service package is related to election costs and therefore no change in operational emissions.
Funded New or Enhanced Service										
Standalone Service Packages										
Edmonton Transit Service										
Transit Off Peak and On-Demand Service Growth	<input checked="" type="checkbox"/>	-	-		-	Not Quantified		Both	16,351	This profile is to fund expanded operating hours for on-demand and off-peak bus service. This will result in increased transit capacity and therefore decrease Pathway 3 emissions for the community. There would be an increase in corporate emissions from the expanded transit service, but this is expected to be offset from less personal vehicle emissions. Expanded bus service can facilitate more transit use as the population grows and enable emissions decreases. Direct Emissions Impacts - Medium: Associated with increased bus service levels. Enabling Emissions Impacts - Medium: Associated with inducing more transit use over personal vehicles.
City Operations - Fleet and Facility Services										
Fleet Strategy & Governance Implementation	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	4,866	This service package is a budget adjustment following cost reduction efforts associated with fleet strategy and governance. The adjustment accounts for cost reductions that did not materialize. No direct emissions impacts. No enabling emissions impacts.
Safety Compliance of Legislated Heating Plant	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	N/A	1,799	This service package is related to the maintenance and safety compliance of boiler systems. Enables ongoing use of heating plants, indirectly maintaining emissions levels. No growth in emissions.
City Operations - Parks and Roads Services										
Overhead Sign Maintenance	<input type="checkbox"/>	-	-	-	-	Not Quantified		Both	1,360	This service package funds the Intelligent Transportation Signs (ITS) Structures program to ensure a safe mobility system for all users. There is no expected direct emissions impact. Enabling Emissions Impacts - Low: associated with proper signage supporting reduced congestions
TSAER - Safe Mobility program Funding	<input checked="" type="checkbox"/>	-			-	Not Quantified		Community	45,000	This service package is for the operating impacts under numerous capital profiles, direct emissions rankings are the result of combining the rank of the related capital profiles. Objective of this service package is to improve safety on roads and reduce conflict between travel modes and users. New signals increase energy use and therefore increase Pathway 2 emissions. Uncertain direct impact to Pathway 3 emissions due to uncertainty in impacts to congestion and potential to increase active travel and transit use. This may enable emissions reductions due to less aggressive driving and safer streets for active travel. Direct Emissions Impacts - Low: associated with new signal energy use, and impacts to road, active travel, and transit use. Enabling Emissions Impacts - Medium: associated with the broad application of this strategy across the City.
Community Services - Community Recreation and Culture										
Arts Habitat Edmonton Service Agreement Funding	<input type="checkbox"/>	-	-	-	-	Not Quantified	?	Community	1,800	This service package is expected to be predominantly staff time and not have any direct impacts on emissions. The implementation may include infrastructure / space usage requirements and policy that would have implications for energy use and emissions. Enabling Emissions Impacts - Low: associated with the uncertain impacts to energy use and emissions.
Ortona Armoury Arts Habitat Edmonton Renewal	<input type="checkbox"/>	-		-	-	Not Quantified	-	N/A	2,069	This service package is for the operating impacts under capital profile # 20-12-0230. This profile is related to renewal and rehabilitation work. Energy assessment indicated reduced energy use from 2019 operation of building. Building was closed in 2020 and 2021, and resuming operations will increase Pathway 2 emissions. No enabling emissions impacts. Direct Emissions Impact - Immaterial: associated with resuming operations of the facility and the related energy use.
Recreation Partnership and Facility Investment Programs	<input type="checkbox"/>	-	-	-	-	Not Quantified	?	Community	5,650	This service package will support the implementation of the Partnership Framework. This framework will provide funding directly to partner organizations to plan and deliver projects that will increase or enhance recreation and culture opportunities in Edmonton. No direct impacts to Pathway 1, 2, 3 or 4 emissions. There are unknown emissions impacts associated with any capital work that is enabled. Enabling Emission Impacts: immaterial: associated with the uncertain emissions impact that result from actions under the strategy.

Service Package Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request (\$000s)	Description of GHG Impacts
		1	2	3	4					
Community Services - Community Standards and Neighbourhoods										
Animal Welfare	<input type="checkbox"/>	-	-		-	<100		Corporate	14,979	This service package is related to human resources and will increase fleet by six vehicles that include heating and cooling in the transportation space, it may also enable emissions by completing studies of facility and equipment changes. Direct emissions impacting larger equipment will be included in the associated Capital profile. Direct Emissions Impacts - Immaterial: associated with fuel use in new vehicles. Enabling Emissions Impacts - Immaterial: associated with uncertain emissions impacts from changes to facility and equipment.
Community Services - Social Development										
Anti-Racism Grants	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Both	4,800	This service package has no specific operational emissions impacts identified.
Community Safety and Well-Being Grants	<input type="checkbox"/>	-	-	-	-	Not Quantified		Community	2,000	This service package has no specific direct operational emissions impacts identified. Enabling Emissions Impacts - Immaterial: associated with reducing emergency service requirements.
Reinstatement of Community Investment Operating Grant	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Community	3,866	This service package will provide operating assistance to Edmonton non-profit organizations with a primary mandate of sport, recreation and social services. No direct emissions impacts. No enabling emissions impacts.
Employee Services - Talent Acquisition, Service and Solutions										
Expanding Diversity & Inclusion	<input type="checkbox"/>	-	-	-	-	Not Quantified		N/A	506	This service package is related to increasing service level increases for internal work around D&I. There is no direct emissions impact expected from this service level increase since it is expected to be predominantly be staff time. Expanding the inclusion and diversity of more views may reveal new solutions or options for reducing GHGs, and therefore potentially enables an indirect decrease in emissions. Enabling Emissions Impacts - Immaterial: associated with uncertainty in resulting emissions impacts.
Financial and Corporate Services - Assessment and Taxation										
Clean Energy Improvement Program (CEIP)	<input checked="" type="checkbox"/>	-	-	-	-	Not Quantified		Community	250	This service package is for one-time funding for one of the steps that will enable the CEIP program (Automation of the municipal tax repayment software). This program will support emissions neutral buildings through energy retrofits in the community. Enabling emissions impacts - High: associated with program potential to impact the whole City.
Financial and Corporate Services - Open City and Technology										
OCT Staff Training Requirements	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	N/A	726	This service package is related to staff training initiatives but not related to emissions reductions. No direct or enabling emissions impacts.
SAP MaxAttention	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	3,390	This service package is related to software service support. No direct or enabling emissions impacts.
Financial and Corporate Services - Service Innovation and Performance										
Corporate Integrated Data Solution (CIDS)	<input type="checkbox"/>	-	-	-	-	Not Quantified		Corporate	4,992	This service package is related to data management systems, energy use impacts associated with this will be reflected through server capacity increase requirements in other profiles. Better integration of data into decision making could improve decisions made that are related to energy use and emissions. Enabling Emissions Impact - Immaterial: associated with the uncertainty of the final use of data.
Office of the City Manager - Legal Services										
Core Insurance Functions	<input type="checkbox"/>	-	-	-	-	Not Quantified		Corporate	256	This service package enables Pathway #1 and #2 through integrated asset management/property loss control strategy, risk/insurance analysis and advice including that associated with District Energy and Renewable Natural Gas contracts and operational aspects. Enabling Emissions Impact - Low: provides guidance on a project by project basis that supports business case development - marked low as the data is not a requirement of funding but supports work.
Urban Planning and Economy - Development Services										
Zoning Bylaw Renewal Continuation	<input checked="" type="checkbox"/>					Not Quantified		Both	210	This service package will support greater climate resilience and energy transition; enable compact, walkable, mixed use, development that supports equitable access to employment, education and amenities; and mitigate land use impacts to preserve Edmonton's environment. Direct Emissions Impacts - High: associated with the direct impacts of zoning renewal to support energy transition and compact/efficient community development. Enabling Emissions Impacts - High: associated with the potential transformation impact that would be induced due to zoning renewal and the inclusion of climate change considerations.

Service Package Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request (\$000s)	Description of GHG Impacts
		1	2	3	4					
Urban Planning and Economy - Economic Investment Services										
Chinatown Strategy Implementation	<input type="checkbox"/>	-	-	-	-	Not Quantified	?	Community	1,224	<p>This service package includes implementation of the Chinatown Strategy to assist built economic resilience. Specific actions are to be defined, but are not expected to have any direct impacts to emissions. Uncertain enabling impacts due to specific actions undertaken in the strategy to be defined.</p> <p>Enabling Emissions Impact - immaterial: associated with the uncertain emissions impact that result from actions under the strategy.</p>
Downtown Vibrancy Strategy	<input type="checkbox"/>	-	-		-	Not Quantified		Community	20,871	<p>This service package will focus on the promotion of downtown as a destination, an economic hub, and making downtown safer. This will contribute to the densification of housing and employment within the inner core.</p> <p>Direct Emissions Impacts - High: associated with increased density and reduced commuting in personal vehicles due to the multiple mobility options.</p> <p>Enabling Emissions Impacts - High: associated with the transformational impact expected with implementation of the strategy.</p>
Edmonton Edge Fund Phase 1	<input type="checkbox"/>	-	-	-	-	Not Quantified	?	Community	5,000	<p>This profile is for a grant program to help organizations make investments that drive Edmonton's economic growth, build the economic ecosystem, improve opportunities for further investments and create jobs for Edmontonians. There will be no direct emissions impacts.</p> <p>Enabling Emission Impacts: immaterial: associated with the uncertain emissions impact that result from funding under the program.</p>
Funding for Edmonton Screen Industries Office	<input type="checkbox"/>	-	-	-	-	Not Quantified	?	Community	4,800	<p>This service package will support and develop screen industries in Edmonton. Support provided to build industry capacity with no expected direct impacts. No direct emissions impacts. Growth of screen industries may enable emissions impacts, but currently uncertain enabling impact to emissions.</p> <p>Enabling Emissions Impact - immaterial: associated with the uncertain impact of growth of screen industries.</p>
Urban Planning and Economy - Planning and Environment Services										
Climate Adaptation Strategy Implementation Composite	<input type="checkbox"/>					Not Quantified		Both	5,500	<p>This service package will create funding composite to support investment in resilience efforts to prepare and adapt the community and the corporation to the impacts of climate change. Direct impacts may increase and decrease emissions depending on the scope of work ultimately completed. Indirect decreases in emissions are likely due to better preparation for climate events leading to faster recovery time and therefore reduce emissions from recovery efforts.</p> <p>Direct Emissions Impacts - High: associated with the comprehensive nature of the strategy across the entire City, and the overlap with emissions reducing strategies often used for mitigation.</p> <p>Enabling Emissions Impacts - High: associated with improving preparedness and emergency response to help minimize the disruption due to climate change events.</p>
Energy Transition Strategy Implementation Composite	<input checked="" type="checkbox"/>					(3,300)		Both	16,000	<p>This service package will both lead to direct emissions reductions and enable significant reductions through all four Pathways. NOTE: The quantified emissions only represent the savings associated with the Clean Energy Improvement Program (CEIP) delivery.</p> <p>Direct Emissions Impacts - High: associated with the comprehensive nature of the strategy, and the impact of implementation in reducing energy use and emissions across the entire City.</p> <p>Enabling Emissions Impacts - High: associated with enabling lower emissions choices for City residents.</p>
Supplemental Community Energy Transition Implementation	<input checked="" type="checkbox"/>					Not Quantified		Community	5,500	<p>This service package will both lead to direct emissions reductions and enable significant reductions across all Pathways more specifically.</p> <ul style="list-style-type: none"> - Pathway #1: New partnerships to support a neighbourhood scale hydrogen heating pilot and advancing new policy or regulations for renewable energy access - Pathway #2: New initiatives to support emission neutral building construction and retrofit capacity and delivery of new programming to address energy poverty and new initiatives to mobilize and track voluntary carbon offset purchases <p>Direct Emissions Impacts - High: associated with the comprehensive nature of the strategy, and the reduced energy use and emissions across the entire City.</p> <p>Enabling Emissions Impacts - High: associated with enabling lower emissions choices for City residents.</p>

Service Package Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request (\$000s)	Description of GHG Impacts						
		1	2	3	4											
Integrated Service Packages																
City Operations - Parks and Roads Services																
Public Washroom Strategy	<input type="checkbox"/>	-	-	-	-	Not Quantified		N/A	14,828	This service package support a strategy that would enable new washrooms which could increase utility use and therefore emissions. These new washrooms would be introduced as Capital items and therefore this profile has no direct emissions impact. Enabling Emissions Impact - Low: associated with new utility use for new public washrooms constructed under the strategy.						
Community Services - Community Standards and Neighbourhoods																
Transit Safety Resource Stabilization	<input checked="" type="checkbox"/>	-	-		-	100		Corporate	13,553	This service package will result in operational emissions increase associated with new fleet vehicles. Increases to safety will enable increased transit system use. Direct Emissions Impacts - Low: associated with estimated fuel use of new fleet vehicles. Enabling Emissions Impacts - Medium: associated with the contribution to the Mass Transit Plan and improving the safety of transit use and potentially boosting its use.						
Community Services - Social Development																
Municipal Drug Poisoning Response	<input type="checkbox"/>	-	-	-	-	Not Quantified		Community	1,605	This service package is to continue coordination of the Community Liaison Committee. Potential to reduce need for emergency response related to drug poisoning, and enable emissions decreases. No direct emissions impacts. Enabling emissions impacts - Low: associated with potential reduced need for emergency response.						
Corporate Expenditures and Revenues - Corporate Expenditures and Revenues																
Affordable Housing Grant Program	<input checked="" type="checkbox"/>	-		-	-	Not Quantified		Community	25,834	This service package provides operating grants for affordable housing providers. Provision of affordable housing can indirectly reduce emissions due to reduced emergency service requirements. Direct Emissions Impacts - medium: associated with the City-wide nature of program and uncertain energy performance of housing. Enabling Emissions Impacts - medium: associated with potential to reduce the demand for emergency services and related energy use.						
Funded Operating Impacts of Capital																
Standalone Service Packages																
City Operations - Edmonton Transit Service																
Maintenance of Active Air and Surface Purification Systems	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	N/A	2,352	This service package is related to maintaining equipment that is already in place and does not include growth or fuel switching. Therefore there are no change in direct or enabling emissions.						
City Operations - Fleet and Facility Services																
Maintenance for Microgeneration Solar Profile	<input checked="" type="checkbox"/>	-	-	-	-	Not Quantified		Corporate	1,400	This service package is related to the maintenance of existing solar energy systems. It will not directly impact emissions but is required to maintain the ongoing success of the existing systems therefore enabling indirect reductions in emissions. Enabling Emissions Impacts - Low: associated with properly maintaining solar PV systems to ensure ongoing renewable energy generation.						
Windermere Fire Station	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	547	This service package applies to the maintenance and custodial services at the new Windermere Fire Station. No direct or enabling emissions impacts.						
City Operations - Parks and Roads Services																
137 Avenue / Anthony Henday Drive Ramps	<input type="checkbox"/>	-	-		-	Not Quantified	-	Community	131	This service package is for the operating impacts of the capital profile 137 Avenue / Anthony Henday Drive Ramps which is part of capital profiles CM-20-2020 and CM-99-9000. This profile is for the design and construction of interchange ramps at 137 Avenue to access the Anthony Henday. This project will increase road capacity and increase Pathway 3 emissions. No enabling emissions impacts. Direct Emissions Impacts - Low: associated with increase road capacity along high use route.						
Balwin/Belvedere Revitalization	<input checked="" type="checkbox"/>	-	-			Not Quantified		Both	22,000	This service package is for the operating impacts of the capital profile Balwin/Belvedere Revitalization. This profile is for neighbourhood renewal which will replace existing street lighting with LED which will reduce Pathway 3 emissions. This will also add missing sidewalks to increase walkability which will likely increase pedestrian circulation within neighborhood and decrease Pathway 3. Uncertain impact to Pathway 4. Direct Emissions Impact - immaterial: associated with LED replacements and new sidewalk connections. Enabling Emissions Impact - immaterial: associated with induced active travel.						
Chinatown Infrastructure Improvements	<input type="checkbox"/>	-	-			Not Quantified		Both	10,100	This service package is for the operating impacts of the capital profile Chinatown Infrastructure Improvements. This profile is related to improvements to Chinatown infrastructure including 97 Street paving, 107A Avenue Streetscape rehabilitation, McCauley Neighbourhood Renewal (Streetscapes in Chinatown), Mary Burlie Park improvements, and Harbin Gate. There may likely be lighting increases leading to increase Pathway 3 emissions. No indication of tree removal or addition, and therefore unknown impact to Pathway 4 emissions. Generally renewal will enable more active travel within the neighbourhood potentially enabling emissions reductions. Direct Emissions Impact - Immortal: associated additional lighting installation and due to uncertainty. Enabling Emissions Impact - Immortal: associated with potential enabling more active travel and due to uncertainty.						

Service Package Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request (\$000s)	Description of GHG Impacts
		1	2	3	4					
Developer and ARA Traffic Signals	<input type="checkbox"/>	-			-	Not Quantified		Community	320	This service package is for the operating impacts from traffic signals installed under capital profile # CM-66-2525. This is for the new signals in the developing area to provide safe movements for all travel modes. Any new signals will increase energy use and should be marked as an increase to Pathway 2 emissions. The impact would be immaterial because it expected to be under 100 tonnes annually. Pathway 3 carbon impacts for individual traffic signals would be related to the amount of reduction in traffic delay which would in turn reduce Pathway 3 emissions. Direct Emission Impacts: Immaterial. Associated with Pathway 2 and 3 emissions. Enabling Emission Impacts: Low. Associated with Pathway 3 emissions. Overall, traffic signals will improve traffic flow and thus reduce the carbon footprint.
LRT Traffic Systems Growth	<input checked="" type="checkbox"/>	-	-	-	-	Not Quantified		N/A	1,100	This service package is for Operating Impacts of Capital related to LRT Capital Profiles. This operating profile enables LRT expansion which will indirectly increase transit ridership and enable reduction from personal vehicle use. Enabling Emissions Impacts - High: associated with this profiles contribution to implementation of the Mass Transit Strategy.
Missing and Enhanced Sidewalk Connections	<input checked="" type="checkbox"/>	-	-		-	Not Quantified		Community	13,615	This service package is for the operating impacts of the capital profile Missing an Enhanced Sidewalk Connections. This profile would help support a more complete and connected pedestrian network within the city and ensure residents have greater opportunity to access destinations by walking or rolling. Profile will decrease community Pathway 3 emissions through more walkability with better sidewalk connections. Direct Emissions Impacts - Low: associated with increased active mode capacity. Enabling Emissions Impacts - Medium: associated with the potential to induce more active travel and displace vehicle travel.
Safe Mobility Strategy - Safe Crossings	<input checked="" type="checkbox"/>	-			-	Not Quantified		Both	0	This service package is for the additional full-time employees (FTEs) to support capital profiles, direct emissions rankings are the result of combining the rank of the related capital profiles. Objective of this service package is to improve safety on roads and reduce conflict between travel modes and users. New signals increase energy use and therefore increase Pathway 2 emissions. Uncertain direct impact to Pathway 3 emissions due to uncertainty in impacts to congestion and potential to increase active travel and transit use. This may enable emissions reductions due to less aggressive driving and safer streets for active travel. Direct Emissions Impacts - Low: associated with new signal energy use, and impacts to road, active travel, and transit use. Enabling Emissions Impacts - medium: associated with the broad application of this strategy across the City.
Safe Mobility Strategy Implementation Safe And Livable Community Streets	<input checked="" type="checkbox"/>	-			-	Not Quantified		Community	0	This service package is for the additional FTEs to support capital profiles, direct emissions rankings are the result of combining the rank of the related capital profiles. Objective of this service package is to improve safety on roads and reduce conflict between travel modes and users. New signals increase energy use and therefore increase Pathway 2 emissions. Uncertain direct impact to Pathway 3 emissions due to uncertainty in impacts to congestion and potential to increase active travel and transit use. This may enable emissions reductions due to less aggressive driving and safer streets for active travel. Direct Emissions Impacts - Low: associated with new signal energy use, and impacts to road, active travel, and transit use. Enabling Emissions Impacts - medium: associated with the broad application of this strategy across the City.
Snow Storage Site Upgrades	<input type="checkbox"/>	-		-		Not Quantified	-	Corporate	1,200	This service package is the operating impacts from snow storage site upgrades under a capital profile. The newer snow storage sites will prevent the loss of habitat, protect natural areas, including streams, rivers and water bodies, and reduce waste which will reduce the Pathway 4 emission. The technology installed for telecoms will likely increase operational emissions impacts associated with electrical loads in Pathway 2. No enabling emissions impacts. Direct Emissions Impacts - Low: associated with increased energy use offset by impacts to natural areas.
Financial and Corporate Services - Open City and Technology										
Increased Security Posture and Capabilities	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	7,000	This service package is related to increasing security posture that increases the number and type of security controls we have in place to better detect (or respond) to security threats. No direct or enabling emissions impacts.
Office of the City Manager - Fire Rescue Services										
Computer Aided Dispatch	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	716	This service package is operating impacts for capital profile #CM-18-1510. This profile is related to software service application renewal and does not directly impact emissions (any server growth required would be evaluated in separate profile if/when required). No known enabling emissions impacts.
Next Generation 9-1-1 (NG911) IP Call Handling	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	1,932	This service package is operating impact of capital related to capital profile #19-51-1904. This profile is related to software. Any necessary additional energy demand from such software would be evaluated if and when growth in server capacity is proposed. No direct or enabling emissions impacts.

Service Package Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request (\$000s)	Description of GHG Impacts						
		1	2	3	4											
Integrated Service Packages																
City Operations - Parks and Roads Services																
Bike Plan Implementation Acceleration - CM-20-0310 - Approach 3	<input checked="" type="checkbox"/>	-	-		-	Part of Active Mode Composite (700)		Community	4,383	<p>This service package is for the operating impacts under capital profile Bike Plan Implementation Approach 3. This profile is to fund approach 3 related to the development of the bike network. This profile would expand the bike network within the city and ensure residents have greater opportunity to access destinations by biking or other micro mobility modes. Profile will directly decrease Pathway 3 emissions through more use of active mode of travel and enable ongoing growth of active travel as the City grows.</p> <p>Direct Emissions Impacts - Low: associated with increased active mode capacity.</p> <p>Enabling Emissions Impacts - Medium: associated with the potential to induce more active travel and displace vehicle travel.</p>						
Community Services - Community Recreation and Culture																
Coronation Park Sports and Recreation Centre	<input type="checkbox"/>	-		-		Not Quantified	-	Both	130,400	<p>This profile was designed prior to 2021 when C627 was adopted and therefore the building is not emissions neutral and will increase Pathway 2 emissions. A net increase in total number of trees is expected through the project decreasing Pathway 4 emissions. No enabling emissions impacts.</p> <p>Direct Emissions impact - Medium: associated with the emissions footprint of a new recreation facility.</p>						
Lewis Farms Recreation Centre and Library	<input type="checkbox"/>	-	 		Not Quantified	-	N/A	N/A	316	<p>This service package is for the operating impacts under capital profile # 15-21-5785.</p> <p>This profile was designed prior to 2021 when C627 was adopted and therefore the building is not emissions neutral and will increase Pathway 2 emissions. The addition of trees and vegetation planted on the currently cleared undeveloped lot will decrease pathway 4 emissions. New parking lot will increase personal vehicle capacity and increase Pathway 3 emissions. No enabling emissions impacts.</p> <p>Direct Emissions impact - Medium: associated with the emissions footprint of a new recreation facility developed on a previously undeveloped lot and new parking lot. Some minimal savings from additional trees in landscaping.</p>						
Operational Planning for new River Valley Park	<input type="checkbox"/>	-	  	Not Quantified	-	Both	7,598			<p>This service package is an operating impact of capital for developing new river valley lands as part of the river valley network (related to capital profile CM-30-3030 and CM-99-9000). There are few details of the specific development that is required, but it is assumed to include landscaping, lighting, restrooms, trails, access roads and parking. Uncertain impacts for Pathway 2, 3 and 4 emissions. No enabling emissions impacts.</p> <p>Direct Emissions Impacts - Low: Associated with the site development and level of emissions expected from lighting, facilities, and transportation.</p>						
Community Services - Community Standards and Neighbourhoods																
Computer Aided Dispatch Implementation	<input type="checkbox"/>	-	-	-	-	Not Quantified	-	Corporate	2,715	<p>This service package is operating impacts for capital profile #CM-18-1514. This profile is related to software service application renewal and does not directly impact emissions (any server growth required would be evaluated in separate profile if/when required). No known enabling emissions impacts.</p>						
Office of the City Manager - Fire Rescue Services																
Cumberland Fire Station	<input type="checkbox"/>	-	-	 	Not Quantified		Corporate	4,687		<p>This service package is for the operating impacts from the new net-zero Cumberland Fire Station.</p> <p>This is a growth profile for a new emissions neutral fire station which will meet C627 policy and be designed to be emissions neutral with renewable energy production. This neutrality means it will have no impact to pathway 1 or 2 emissions. This is a vacant lot that has not been developed before and may have natural asset impacts. There will be fire trucks purchased for this location which will increase fleet emissions.</p> <p>Direct Emissions Impacts - Low: associated with solar PV deployment, new fire trucks, and potential impacts to natural lands. Enabling Emissions Impacts - medium: associated with maintaining fast response times for extinguishing fires and reducing emissions.</p>						
Walker Fire Station	<input type="checkbox"/>	-	-	 	Not Quantified		Corporate	2,273		<p>This service package is for the operating impacts from the new net-zero Walker Fire Station (CM-99-9000).</p> <p>This profile is related to a City owned site development. The facilities are expected meet C627 policy and be designed to be emissions neutral with renewable energy production. This neutrality means it will have no impact to Pathway 1 or 2 emissions. This is a vacant lot that has not been developed before and may have natural asset impacts, uncertain impacts to Pathway 4. There will be fire trucks purchased for this location which will increase fleet emissions.</p> <p>Direct Emissions Impacts - Low: associated with new fire trucks, and potential impacts to natural lands.</p> <p>Enabling Emissions Impacts - Medium: associated with maintaining fast response times for extinguishing fires and reducing emissions and reducing emergency service requirements by providing affordable housing.</p>						

APPENDIX A

UTILITY REQUESTS AND GHG IMPACTS



Profile Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request (\$000s)	Description of GHG Impacts						
		1	2	3	4											
Waste Services Utility																
Branch-wide																
Waste Services Facilities, Infrastructure & Process Equipment	<input type="checkbox"/>	-		-	-	Not Quantified		Corporate	19,410	This profile focuses on the modern equivalent replacement, upgrade, or improvement of equipment without specific emissions focus. There may be additional energy consumption required for the renewal, improvement or upgrade of equipment leading to increases in Pathway 2 emissions. These projects enable efficient operation of the waste management system, and decrease Pathway 1 enabling emissions. Direct Emissions Impacts - Low: associated with the uncertainty of specific projects. Enabling Emissions Impacts - Low: associated with the expectation for increased facility energy use offset by reduced waste related emissions.						
Waste Services IIS Infrastructure Planning and Design	<input checked="" type="checkbox"/>			-	-	Not Quantified	-	Corporate	2,270	This is the design component of the CM-81-2045 profile. This profile's scope has no specific projects related to emissions reductions. There may be additional energy consumption required for the ongoing operating of these projects leading to increases in Pathway 2 emissions. These projects enable efficient operation of the waste management system, and decrease Pathway 1 emissions. No enabling emissions impacts. Direct Emissions Impacts - Low: associated with the uncertainty of specific projects, and expectation for increased facility energy use offset by reduced waste related emissions.						
Waste Services IIS Infrastructure Delivery	<input checked="" type="checkbox"/>			-	-	Not Quantified	-	Corporate	20,500	This profile's scope has no specific projects related to emissions reductions. There may be additional energy consumption required for the ongoing operating of these projects leading to increases in Pathway 2 emissions. These projects enable efficient operation of the waste management system, and decrease Pathway 1 emissions. No enabling emissions impacts. Direct Emissions Impacts - Low: associated with the uncertainty of specific projects, and expectation for increased facility energy use offset by reduced waste related emissions.						
Collection Services Facilities																
Mayfield Eco Station (NW)	<input type="checkbox"/>	-		-		Not Quantified		Both	-	This profile is assumed to be designed prior to 2021 when C627 was adopted and therefore the building is not emissions neutral and will increase Pathway 2 emissions. Unknown what original land use was, and therefore uncertain impact to Pathway 4 emissions. Better separation of waste enables the utilization of waste within circular economies and can enable decreases in emissions. Direct Emissions Impact - Medium: associated with the emissions footprint of a new eco station facility. Enabling Emissions Impact - Low: associated with better separation of waste to enable improved waste management and landfill diversion.						
Sustainable Waste Processing Facilities																
Landfill Gas to Renewable Natural Gas (RNG)	<input checked="" type="checkbox"/>			-	-	(22,000)		Both	11,290	This profile includes renewal and expansion of landfill gas capture systems, reducing emissions from legacy waste deposited in the landfill. Captured landfill gas will either be destroyed (flare) or used for energy generation, and reduce Pathway 1 emissions. Additional facilities likely to increase Pathway 2 emissions. Depending on ultimate fate of captured landfill gas, may enable further reductions by displacing fossil fuels. Direct Emissions Impacts - Medium: associated with the expansion of the landfill gas capture system and elimination of methane releases. Enabling Emissions Impacts - Medium: associated with the displacement of fossil fuel energy with RNG.						
HSADF Digestate Screening and Mixing System	<input checked="" type="checkbox"/>	-		-	-	Not Quantified		Both	5,800	This profile will result in the addition of a screening and mixing system that will have increased energy use and emissions for Pathway 2. However, the system will enable efficient operation of the High Solids Anaerobic Digestion Facility (HSADF) resulting in decreased enabling emissions. Direct Emissions Impacts - Low to Medium: associated with energy requirements for the system. Enabling Emissions Impacts - Medium: associated with the reduced waste related emissions from system efficiency.						
Vehicles & Equipment																
Waste Containers	<input checked="" type="checkbox"/>	-	-	-	-	Not Quantified		Corporate	16,130	This profile is for containers purchased for multi unit and residential for both growth and renewal of waste services. No direct emissions impacts. Renewal of waste collection equipment enables proper waste management and emissions decreases. Enabling Emissions Impacts - Immaterial: associated with ongoing maintenance of the waste management system.						
Waste Services Fleet Assets	<input type="checkbox"/>	-	-		-	Not Quantified		Corporate	34,250	This profile only includes both fleet renewal and growth. Increased emissions for Pathway 3 associated with fleet growth. Maintaining the waste management system enables emissions reductions. Direct Emissions Impacts - Low: associated with slight fleet growth. Enabling Emissions Impacts - Immaterial: associated with maintaining waste management systems.						
Waste Services Fleet Assets (Pre-approved in Sept 2022)	<input type="checkbox"/>	-	-		-	Not Quantified		Corporate	10,830	This profile only includes both fleet renewal and growth. Increased emissions for Pathway 3 associated with fleet growth. Maintaining the waste management system enables emissions reductions. Direct Emissions Impacts - Low: associated with slight fleet growth. Enabling Emissions Impacts - Immaterial: associated with maintaining waste management systems.						

Profile Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request (\$000s)	Description of GHG Impacts
		1	2	3	4					
Waste Program Changes										
Three-stream Communal Collection	<input checked="" type="checkbox"/>	-	-	↑	-	300		Both	10,390	<p>This profile increases Pathway #3 emissions due to new collection routes but is expected to enable emission reduction through waste reduction and increased diversion. No impacts for Pathway 1, 2 or 4 emissions.</p> <p>Direct Emissions Impact - Low: associated with the energy use of new recycling and organics collection vehicles.</p> <p>Enabling Emissions Impact - Medium: associated with waste reduction and increased diversion.</p>
Profile Pending Approval										
Energy Transition	<input checked="" type="checkbox"/>	?	 ?	-	-	Not Quantified		Both	7,270	<p>This profile's intent is to reduce operational emissions associated with waste. However, the exact scope of work for this profile is not yet specifically known. Due to uncertainty, only Pathway 2 emissions are evaluated to be decreases. Uncertainty in emissions impacts of Pathway 1 and 3 due to no knowledge about the inclusion of energy systems or transportation equipment related to this profile.</p> <p>Direct Emissions Impacts - Medium: associated with the focus on energy transition for this profile and application of this profile to all waste services.</p> <p>Enabling Emissions Impacts - Low: associated with minimizing emissions from waste management.</p>
Blatchford Renewable Energy Utility										
Blatchford District Energy System (DES) (for Delivery of EC#1 Expansion)	<input checked="" type="checkbox"/>		-	-	-	Not Quantified	-	Both	3,180	<p>The Blatchford energy system is a net zero district energy system that enables buildings within Blatchford to be supplied with net zero heating decreasing Pathway 1 emissions. No enabling emissions impacts.</p> <p>Direct Emissions Impact - Medium: associated with supplying low carbon energy through the district energy system to service a large development.</p>
Distribution Piping System Development (include energy meters)	<input checked="" type="checkbox"/>		-	-	-	Not Quantified		Corporate	4,881	<p>This project installs a piping system for the Blatchford district energy system allowing for expanded use of the system, which will reduce Pathway 1 emissions associated with the source of heating energy. Enables emissions reductions through the use of district energy to displace conventional heating in buildings.</p> <p>Direct Emissions Impacts - Low: associated with expanded production of energy using district energy systems.</p> <p>Enabling Emissions Impacts - Medium: associated with expanding use of district energy to reduce building energy use emissions.</p>
Energy Center #4 - Blatchford Renewable Energy	<input checked="" type="checkbox"/>		-	-	-	Not Quantified	-	Both	14,675	<p>This profile includes the development of the Sewer Heat Exchange Energy Center in Blatchford. The Blatchford energy system is an emissions neutral district energy system that allows buildings within Blatchford to be supplied with net zero heating decreasing Pathway 1 emissions. The facility will be an emissions neutral building leading to no impact to Pathway 2 emissions. No enabling emissions impacts.</p> <p>Direct Emissions Impact - Medium: associated with supplying low carbon energy through the district energy system to service a large development.</p>

APPENDIX B

ASSUMPTIONS



Description of Assumption Categories

The development of the carbon budget required various assumptions that can be categorised as follows:

- 1. General assumptions:** these are assumptions that were made to help clarify and define the overall process that was developed. This may also include assumptions on how to deal with different types of profiles such as composites, strategy related profiles, and operating impacts of capital.
- 2. Assumptions specific to PATHWAY 1: Renewable and Resilient Energy Transition**
- 3. Assumptions specific to PATHWAY 2: Emission Neutral Buildings**
- 4. Assumptions specific to PATHWAY 3: Low-Carbon City and Transportation**
- 5. Assumptions specific to PATHWAY 4: Carbon Capture and Nature-Based Solutions**

<i>General Assumptions</i>	
Item	Assumption
General scope boundaries	<p>The community and corporate GHG inventories help to set the scope of the type of operational emissions that are considered in evaluation of the budget.</p> <p>Different sectoral emissions sources are provided to help clarify scope decisions.</p> <p>Community emissions align with the following sectors:</p> <ul style="list-style-type: none"> - Residential buildings - Agriculture, forestry and fishing activities - Manufacturing industries and construction - Non-specified sources - Commercial and institutional buildings and facilities - Energy industries - Fugitive emissions - On-road transportation - Transboundary transportation - Off-Road transportation - Aviation transportation - Rail Transportation - Waste - Agriculture, Forestry, and Other Land Use - Industrial Processes and Product Uses <p>Corporate emissions align with the following sectors:</p> <ul style="list-style-type: none"> - Buildings & Other Facilities - Streetlights & Traffic Signals - Vehicle Fleet - Transit Fleet - Waste Management

<i>General Assumptions</i>	
Scope of Emissions included in carbon budgeting	The quantified carbon budget only includes Scope 1 (direct emissions) and Scope 2 emissions (electricity related emissions). The corporate GHG inventory includes those emissions sources that are directly within the operational control of the City. The community GHG inventory includes emissions sources within the City boundary.
Projects substantially completed prior to 2023	The carbon budget does not include GHG impact assessment for capital projects that were approved through previous capital budgets, that are substantially complete, with cash flow extending into 2023 and beyond. The GHG emissions of these projects will be incorporated into annual GHG emissions updates once they are in service.
Boards and Commissions	Capital profile requests for all Boards and Commissions have been assessed for GHG impacts. Operating service package requests for Boards and Commissions have not been assessed for GHG impacts, but will be incorporated into annual GHG emissions reporting if approved by City Council.
Emissions quantified by pathway	Pathway 1: relates to emissions associated with energy supply including Solar PV deployment, and capturing landfill gas for energy use Pathway 2: relates to emissions associated with energy use within buildings and facilities Pathway 3: relates to emissions from transportation and urban design including street lighting. Pathway 4: relates to emissions from land use change, and sequestration from tree planting. This would also include any industrial carbon capture equipment if included.
Qualitative assessment benchmark	The comparison for the qualitative assessment of the pathway emissions is the 2021 emissions inventory.
Quantitative assessment benchmark (community current state emissions forecast)	For the community carbon budget, the 'Business-as-Planned' Scenario from Edmonton's City Plan has been adopted as the current state emissions forecast, which reflects the most recent emissions forecast prepared for community emissions. This scenario assumes that growth occurs according to the City's approved statutory land use plans and historical growth patterns prior to adoption of The City Plan. Therefore the carbon budget impacts compared against the current state community emissions illustrate the progress towards carbon reductions as The City Plan is implemented.

<i>General Assumptions</i>	
Quantitative assessment benchmark (corporate current state emissions forecast)	The corporate current state emissions forecast does not assume growth in the City's transit, waste or vehicle fleet, streetlighting electrical load and assumes modern equivalent replacement of any vehicles reaching their end of life. It assumes no new emissions producing facilities and decreasing emissions associated with the City's landfills.
Rounding	<ul style="list-style-type: none"> • All figures related to community emissions have been rounded to the nearest 10,000 tonnes. If less than 10,000 tonnes they will be presented as <10,000 tonnes. • All figures related to corporate emissions have been rounded to the nearest 1,000 tonnes. If less than 1,000 tonnes they will be presented as <1,000 tonnes. • Individual project quantifications are presented to the nearest 100 tonnes. If less than 100 tonnes they will be presented as <100 tonnes.
Materiality	<p>Description of the GHG impacts, as well as magnitude of direct and enabling GHG impact (if any). The direct and enabling GHG emissions impacts were assessed for:</p> <ul style="list-style-type: none"> • immaterial (<100 tonnes of CO2e), • low (100 to 1,000 tonnes of CO2e), • medium (1,000 to 10,000 tonnes of CO2e), • or high (10,000 or more tonnes of CO2e) impacts. <p>The impacts are not necessarily directional. For example there may be uncertain impacts that are considered "medium" because they could have emissions impacts in the 1,000 to 10,000 tonnes of CO2e range increasing and also have some impacts that are decreasing.</p>
City of Edmonton's green electricity procurement	The qualitative assessment does not consider the City of Edmonton's green electricity purchases as part of the evaluation. However, the quantitative calculation presented in the report does consider the City's green electricity purchases.
Operating impacts of capital (OIC)	Any related emissions from operations have been reported within capital GHG assessments.
Renewal (including fleet)	Renewal is considered to have no material emissions impact as this is not actively replaced with high energy efficiency equipment. In some cases there will be efficiency improvements due to modern equivalent standards, but these will not be quantified or evaluated. The general assumption is that renewal is

<i>General Assumptions</i>	
	considered business as usual, and any inherent efficiency improvements will be captured in future GHG inventories.
Quantification of capital project composites for the Neighbourhood Renewal Program and Energy Transition Strategy	<p>The scope of work included within the Neighbourhood Renewal Program and the Energy Transition Strategy Implementation composite profiles is vast. Due to the quantification limitations discussed in the 2023-2026 Carbon Budget, only portions of these composite projects were quantified for GHG emissions impacts. Once considering the full scope of the projects, and as more details become known, the projects will have more GHG emissions impacts than the amount reported.</p> <ul style="list-style-type: none"> • Neighbourhood renewal - only includes net impact of tree changes • Energy Transition Strategy Implementation composite - only includes estimate impact of Clean Energy Improvement Program
Profiles that involve enhancing data availability and use within the corporation	As per the foundation of the Community Energy Transition Strategy, data-driven decision making is critical to make informed decisions for energy use and emissions. Therefore any profiles or packages that result in improved data gathering and use will decrease enabling emissions.
<i>Pathway #1: Renewable and Resilient Energy Transition</i>	
Item	Assumption
Interaction of City installation of solar PV and green electricity procurement	In 2026 the City will have emissions neutral electricity. While solar PV will lead to a decrease in electricity requirements from the grid, that electricity will already be emissions neutral as per the City's green electricity contract and will therefore have no net impact.
Quantification of Landfill Gas to Renewable Natural Gas	Quantification of GHG impacts are estimated to align with the City's GHG Inventory methodology rather than other measurements and estimates taken related to Alberta's Technology Emissions Innovation Regulation.
<i>Pathway #2: Emission Neutral Buildings</i>	
Item	Assumption
Emissions impacts of City buildings designed prior to 2021 (when City Policy C627 was adopted)	These buildings meet the previous City Policy C532 that had a requirement that buildings would be designed with 40% lower emissions than energy code from 2011, but will still lead to an increase in emissions overall.

<i>General Assumptions</i>	
Solar PV generation in new City buildings that meet City Policy C627	Emissions associated with solar installations in new city owned buildings that adhere to City Policy C627 are included in the overall emissions neutrality of the building and are not broken out for quantification or qualifications. Pathway 1 emissions for any new City buildings adhering to City Policy C627 are ranked as 'no impact'.
Energy retrofits as part of renewal	Energy retrofits as a part of a facility renewal will be segregated into two pathways if the retrofit includes solar PV or other renewable systems. The emissions impact from the retrofit component will be reported as an emissions reduction within Pathway 2 and the solar component will be shown as a decrease for Pathway 1.
Retrofits to buildings that have not yet had any design or scoping work done	Retrofits to buildings that have not yet had any design or scoping work done, will not be going through construction this budget cycle, and have no land use changes will not be quantified until the scope and energy study are completed.
Energy "Plug Use" (Such as Computers)	Energy "Plug Use" (Such as Computers) directly impact Pathway 2 emissions similar to other building systems.
Open City Technology (IT) impacts	It is assumed that all budget requests related to Open City and Technology do not increase server room requirements. If at any point additional server space is required, this would be brought forward as a new growth or renewal profile and emissions increases associated with this growth would be assessed at that time.
Impacts of increased construction	Emissions from construction activities are considered 'embodied carbon' and are not currently assessed within carbon budgeting. Future iterations of this work may consider these impacts.
New emissions neutral buildings	Growth buildings are assumed to adhere to City Policy C627 and therefore be designed to be emissions neutral with renewable energy production. This neutrality means these buildings will have no impact to Pathway 1 or 2 emissions. In situations where a new emissions neutral building is constructed to replace an existing facility, the potential decreased emissions from the decommissioned facility is not assumed unless the decommissioning cost is specifically included as part of the capital profile request.
Building retrofits with increased emissions listed as part of the Community Energy	There are certain facilities that have not been operational for many years and will be undergoing retrofits that will improve energy efficiency, and therefore be in support of the Community Energy Transition Strategy's goals. However, there will also be a new overall emissions increase (low or immaterial) to the City

<i>General Assumptions</i>	
Transition Strategy	because the buildings have not been operational for the last few years.
New park facilities	New park facilities (bathrooms, pavilions, etc.) are expected to consume energy for their operation and lead to increases in pathway 2 emissions.
<i>Pathway #3: Low-Carbon City and Transportation</i>	
Item	Assumption
Quantification of transportation related projects	Transportation-related budget requests were combined as a composite to estimate travel demand and the resultant impacts of greenhouse emissions for the entire transportation system, which is a more accurate approach to quantifying GHG impacts rather than on an individual project basis. To provide further perspective of the emissions impacts related to different transportation modes, the Transit, Road, and Active mode composites were evaluated separately and quantified for GHG emissions impacts.
Transit, road, and active transportation profiles	<p>The direct emissions impacts of the transportation composite profiles were evaluated based on the changes in transportation system capacity and assumed use (e.g., increase or decrease capacity and use of each travel mode). For example, the direct impacts of a transit profile that expands transit capacity decrease pathway 3 emissions as the result of a shift of travel from personal vehicle use to transit. The decrease in automobile use results in decreased fuel consumption which in turn reduces pathway 3 emissions.</p> <p>Enabling emissions impacts of transportation composite profiles include the emissions impacts associated with potential induced travel on the respective mode considering the population and employment growth patterns as a result of the investments. For example, considering future population growth a new transit investment increases transit accessibility which could stimulate the Transit Oriented Development (TOD) along the related transit corridor. The expected growth of population and TOD typically provide opportunities for residents living in TOD to access amenities within a short distance by either transit or active modes. This would enable reduced automobile dependency for the residents living in TOD which in turn reduces the GHG emissions.</p>
New and renewed parking lots and bike racks	<p>New parking lots result in more personal vehicle trips. This would encourage driving and thus would increase pathway 3 emissions.</p> <p>New bike racks provide opportunities for safe/secure bike parking which would encourage more biking. This can shift driving trips to bike trips which would</p>

<i>General Assumptions</i>	
	<p>decrease pathway 3 emissions.</p> <p>Renewal work done to the active transportation network maintains current use, and considering future population growth this renewal enables emissions decreases.</p> <p>Renewal work done to parking lots maintains current use, and considering future population growth this renewal enables emissions increases.</p>
Transportation safety related profiles	<p>Enhancing and maintaining transportation safety can enable indirect emissions impacts and will likely reduce mobility/transportation related emissions. Programs or initiatives (such as automated enforcement, safe crossing or neighbourhood speed limits) tend to increase speed compliance, encourage use of active travel modes and thus reduce GHG emissions impacts.</p>
Bike paths and pedestrian paths (active network)	<p>Any addition to active transportation capacity (sidewalks, trails, etc.) results in direct emissions reductions for pathway 3.</p> <p>Renewal work done to the active transportation network maintains current use and enables emissions reductions when considering future growth of the City.</p>
Transit renewal	Transit renewal profiles maintain use of the route and enables emissions reductions when considering future growth of the City.
New transit garages	These facilities are emissions neutral facilities. The assets (LRV and buses) are not included in the direct impact assessment. These facilities enable significant emissions reductions associated with mass transit access and future emissions neutral bus housing requirements.
<i>Pathway #4: Carbon Capture and Nature-Based Solutions</i>	
Item	Assumption
Quantification for natural asset impacts of City owned development projects	If there are projects that do not have a defined location or footprint, quantifications will not be completed as it is too early to provide an accurate assessment.

<i>General Assumptions</i>	
Soccer fields and open space turf	Soccer fields and open space turf do not support emissions sequestration and would be considered the equivalent of developed land.
Natural asset protection	The assumption is that natural areas would have been developed if not protected. Ongoing enabling emissions are associated with the lands' increased ability to sequester carbon over time.
Naturalization, greenery, vegetation, landscaping, and low impact development (LID)	Naturalization is considered to decrease pathway 4 emissions related to returning developed lands back to a natural state. Profiles including greenery, vegetation, landscaping, and low impact development are not considered as decreases to pathway 4 due to these aspects not currently being included in the current quantification methodology.
Irrigation within capital profiles	Some capital projects include installation of irrigation. These were considered immaterial for assessment although increased water use and the associated energy of processing and pumping water do exist.
Trees added through development processes	Only corporately owned trees will be calculated, in alignment with the current inventory. Trees that are planted by the City along the right of way for new development will be captured. Privately planted trees are not included.
Transition to or from farmland or turf	Natural asset transitions to or from farmland or turf were not calculated in the quantifications. Farmland and turf cause emissions both from the land use and from the operations that maintain them. The City's natural asset calculation tool currently includes a factor for farmland that includes both the operations and the land use. However, the scope of the GHG inventory only includes the natural asset land use, not the emissions from operations to maintain. Since the inventory and the tool used to calculate emissions impacts are not aligned, the tool could not be used for quantification purposes.

APPENDIX C

KEY TERMINOLOGY



APPENDIX C: Key Terminology

Adaptation - Lowering the risks and negative impacts and embracing potential opportunities associated with climate change so that communities and ecosystems are prepared to cope with new climate conditions.

Climate Resilience - The ability to prepare for, recover from and adapt to severe weather; ocean warming and acidification; extended periods of drought and extreme temperatures, and other deleterious effects of climate change.

Community Carbon Budget - The amount of GHG emissions permitted for the municipality of Edmonton based on emission targets over a period of time.

Community Carbon "Fair" Share Budget - The amount of GHG emissions permitted for the municipality of Edmonton, over a period of time, based on C40's methodology to assign a "fair" proportion of the global carbon budgets to C40 cities.

Corporate Carbon Budget - The amount of GHG emissions permitted from City-owned and operated assets and operations based on emission targets over a period of time.

Current State Emissions - The amount of GHG emissions inventory (emissions actuals for the years 2015 to 2021) plus the long term emission forecast amounts (for the years 2022 through to 2050).

Carbon Capture - A process where carbon dioxide (CO₂) is separated (captured) from industrial and energy sources, and can be either stored and used to create a new product.

Carbon Deficit/Surplus - The annual difference between GHG emissions and the emission targets. A deficit implies that the current state emissions are greater than the target emissions. For future forecast purposes the deficit/(surplus) is measured against the forecasted emissions.

Carbon Neutral - A carbon neutral community or corporation is where the net per-person greenhouse gas emissions is zero. Carbon neutral energy is energy with net zero greenhouse gas emissions.

Decarbonization - *The process of stopping or reducing the release of greenhouse gases into the atmosphere.*

District Energy System - Local, centralized energy systems that produce and distribute thermal energy (heating and/or cooling) for customer use.

Embodied Carbon - The total of all GHG emissions that result from the manufacture and supply of construction products and materials, as well as the construction process itself.

Energy Model - A study that is done on a building to estimate the proposed energy use of a building after construction or a retrofit. These are the most accurate way to determine the emissions associated with new construction or a retrofit project.

Emission Targets - Desired levels of maximum annual GHG emissions based on a percentage reduction from the 2005 baseline year to achieve GHG emission goals.

Emissions Neutral/Emissions Neutral Building - An Emissions Neutral building is a building that is highly energy efficient and: a) uses only Renewable Energy for its operations on an annualized average basis (this may include either on or offsite generated Renewable Energy), OR b) produces and supplies onsite Renewable Energy in an amount sufficient to offset the annual greenhouse gas emissions associated with the energy consumed for its operations.

Enabling - Refers to the indirect emissions impact of a project. A project or initiative that would not have a direct impact on GHG emissions within a pathway, but rather support other work to be done to either increase or decrease emissions.

Energy Transition - A risk management approach designed to: (1) diversify a community's energy mix and reduce its dependence on fossil fuels, (2) reduce greenhouse gas emissions to levels that are consistent with limiting the long-term rise in the average global temperature to 2°C, (3) ensure energy delivery systems (for electricity and natural gas) are resilient and durable to the forces of climate change, (4) increase self-sufficiency with respect to its electrical power and heating needs and (5) position itself to participate in what is potentially the largest economic opportunity humankind has ever experienced

Green Electricity - Electricity that comes from natural sources such as sunlight, wind, rain, tides, plants, algae and geothermal heat. These energy resources are renewable, meaning they are naturally replenished.

Greenhouse Gas (GHG) - Gases such as carbon dioxide, methane and nitrogen oxide which actively contribute to the atmospheric greenhouse effect. GHGs also include gases generated through industrial processes.

Low-Carbon Energy - Energy that is produced using significantly lower amounts of carbon dioxide emissions than is emitted from fossil fuel energy.

Nature-Based Solutions - Actions to protect, sustainably use, manage and restore natural or modified ecosystems, which address societal challenges, effectively and adaptively, providing human well-being and biodiversity benefits.

Negative emissions - Negative emissions (or GHG removal) is the opposite of GHG emissions. Negative emissions refers to removing GHGs from the atmosphere through: i) technology (e.g. removal through carbon capture equipment), or 2) nature-based solutions (e.g. removal through increasing trees or other natural carbon sinks).

Net Zero - Net zero emissions are achieved when emissions of greenhouse gases are balanced by removals. Emissions should be reduced as close to zero as possible and remaining emissions would be balanced by an equivalent amount of carbon removal, through nature-based solutions or technology.

Renewable Energy - Energy that is obtained from natural resources that can be naturally replenished or renewed within a human lifespan. These resources include moving water, wind, biomass, solar, geothermal, and ocean energy.

Renewable Natural Gas - Renewable source of methane gas (the primary component of natural gas) created through the breakdown of organic matter in the absence of oxygen. There are many different processes and waste types that can be used to produce renewable natural gas.

Sequestration - Capturing and storing greenhouse gases in natural assets such as plants and vegetation, which reduces the amount of greenhouse gases in the atmosphere.

Social cost of carbon - An estimate of the economic damages associated with a small increase in carbon dioxide emissions (conventionally one metric tonne).

Solar PV - Photovoltaic cells (also known as solar panels) are semiconductors made up of silicon atoms that convert the sun's energy into electricity.