

Update on the Net Zero Buildings Strategy and Implementation of Mandatory Emissions Performance Standards

Date: September 6, 2023

To: Infrastructure and Environment Committee

From: Executive Director, Environment & Climate Division

Wards: All

SUMMARY

Context

Existing buildings are Toronto's largest source of greenhouse gas (GHG) emissions, accounting for approximately 58% of total community-wide emissions. In July 2021, City Council adopted the Net Zero Existing Buildings Strategy (the Strategy) to address the challenge of achieving net zero emissions from existing buildings. The Strategy was developed with a net zero by 2050 target, which was then accelerated to net zero by 2040 upon City Council's adoption of the TransformTO Net Zero Strategy (TransformTO) in December 2021. Meeting the City's ambitious net zero by 2040 target will require rapid action to scale up existing programs and significant levels of investment and coordination with other levels of government. Toronto's community-wide emissions from buildings have been reduced 37% between 2008 and 2020. These emissions must be nearly cut in half in the next seven years to meet the 2030 target. TransformTO confirms the establishment of mandatory performance standards for existing buildings as a key action and calls for GHG emissions from existing buildings to be cut in half, from 2008 levels, by 2030.

The Strategy was developed with extensive technical modelling and analysis, stakeholder engagement, and best practices research. The Strategy identified nine actions for the City to undertake to achieve net zero emissions from existing buildings and includes key design and implementation considerations for each action. The Strategy also presents the potential impacts on emissions, costs, and co-benefits of resilience, social equity, health, and local economic development.

The Strategy recommends an approach of first introducing voluntary programs followed by a transition to mandatory requirements in the medium to long-term (2025-2030). Key insights from the Strategy included that voluntary measures will not be sufficient to catalyze the scale of action required to achieve net zero emissions and that mandatory requirements are necessary. The Strategy estimates that retrofitting existing building stock to net zero performance levels by 2050 will require more than \$145 billion beyond

business-as-usual investment by all levels of government and the private sector. Accelerating the Strategy's net zero goal to reach a 2040 target will require accelerated investment and a greater focus on mandatory measures to ensure success.

Update Report Overview

The Update on the Net Zero Existing Buildings Strategy and Implementation of Mandatory Emissions Performance Standards report provides a general update on implementation progress of the Strategy and reports back to City Council on direction received following adoption of the Strategy, including progress on:

- Mandatory emissions performance reporting for all buildings, providing data to better understand the performance of buildings
- Emissions-based labelling program for low-rise residential buildings that begins as voluntary and transitions to mandatory
- Mandatory emissions performance standards for all existing buildings that will require improved emissions performance over time, taking into consideration the City's authority to implement
- Phased-in mandatory energy and emissions audits, re-commissioning and retrofit roadmaps planning for larger buildings.
- Programs which support commercial, institutional, and multi-unit residential buildings in undertaking retrofits including guidance, financing and collaboration.
- Promotion and education efforts to engage property owners and other building sector stakeholders including designers, architects, engineers, developers, builders, property managers, tenants and other stakeholders in the implementation of the Strategy and the benefits of retrofits

This report also provides information on efforts underway to realign the modelling and proposed pathways in the Strategy with the accelerated net zero by 2040 TransformTO target adopted by City Council in December 2021. Preliminary key findings include:

- fuel-switch-focused packages for all building sectors are less costly and easier-to-implement;
- the requirement to decarbonize the Provincial electricity grid is now even more critical than before; and
- current market conditions have resulted in significant increases to upfront capital costs for retrofits.

These preliminary findings mean that the transition to net zero will be more difficult, making even more critical providing additional supports for building owners and the expedited introduction of mandatory requirements for existing buildings.

Environment & Climate Division intends to bring forward an emissions performance reporting by-law covering buildings with a floor area greater than 600 square metres (6,458 square feet) for City Council's consideration in Q4 2023. This initial by-law will have reporting requirements similar to the Provincial Energy & Water Reporting and Benchmarking program. Once the Environment & Climate Division has determined the best reporting mechanism for smaller buildings, an amendment will be proposed to cover commercial, institutional and multi-unit residential buildings under 600 square metres and low-rise residential.

Mandatory emissions performance standards are planned to apply to all buildings in Toronto, from the largest office towers to low-rise residential homes. The emissions performance standards will set appropriate emissions limits so that Torontonians have reasonable, achievable pathways to make improvements to their buildings over time. Building owners need to start planning for these requirements as soon as possible. Staff anticipate that an emissions performance standards by-law will be presented to City Council for consideration in 2024.

Environment & Climate Division staff will also develop additional by-law proposals to be presented to City Council in the future, as described in the Strategy, including:

- Emissions Performance Labelling for Low-Rise Residential Buildings
- Amendment to Emissions Performance Reporting for buildings under 600 square metres, including low-rise residential.
- Emissions Auditing Requirement for Large Buildings
- Recommissioning Requirement for Large Buildings
- Retrofit Roadmap Planning Requirement for Large Buildings

Toronto Building, City Planning and Legal services provided input into the preparation of this report.

RECOMMENDATIONS

The Executive Director, Environment & Climate Division, recommends that:

1. City Council receives this report for information.

FINANCIAL IMPACT

There are no immediate financial implications resulting from this report.

Any financial impacts related to future Net Zero Existing Buildings Strategy (2024-2027) actions will be included in future budget submissions, beginning with the 2024 budget.

Financial impacts related to by-law implementation will be presented along with proposed by-laws or through the budget process.

The Environment & Climate Division is also exploring funding opportunities provided by other levels of government to support the implementation of the Net Zero Existing Buildings Strategy.

The interim Chief Financial Officer and Treasurer has reviewed this report and agrees with the financial impact information.

EQUITY IMPACT

The TransformTO Net Zero Strategy (TransformTO) and contributing City plans and strategies have the potential to impact equity significantly and positively in Toronto. The outcomes of climate action can improve equity, economic prosperity, community resilience and health when implemented with equity as a core focus. The Net Zero Existing Buildings Strategy (the Strategy), a key City Strategy supporting the City's net zero by 2040 target, is designed to accelerate the update of retrofits by home and building owners, while maximizing benefits and minimizing potential harms to building owners and tenants.

The recommendations of the Strategy have the potential to dramatically improve equitable access to safe, healthy and high-quality buildings if affordability challenges are adequately addressed in its implementation. The retrofits and upgrades that reduce emissions in our buildings also improve the quality, safety, and longevity of the places we live, work, and play.

Mandatory emissions performance reporting and emissions performance standards for existing buildings present significant opportunities for building owners to improve energy and water use efficiency and maintain or reduce operating costs. By-laws associated with the Strategy will be developed with a lens on equity to minimize cost impacts for low-income communities and tenants. The Strategy recognizes that the considerable capital costs of the building improvements needed to achieve net zero emissions targets will be directly borne by building and home owners. The main challenge in the residential sector is to prevent or minimize these costs being passed down to tenants, which could exacerbate housing affordability challenges in Toronto. This same affordability challenge can impact business tenants who are typically responsible for costs under commercial leases. These affordability challenges are often felt most by Toronto's equity-deserving groups. Consideration will be given to affordability concerns of owners of both commercial and residential sector buildings during development of by-laws and mandatory requirements.

Environment & Climate Division is in the process of developing equity indicators for actions associated with the TransformTO. Subsequent progress reports on the TransformTO and the Strategy will include more detailed analysis about the impacts of climate actions on equity deserving groups.

DECISION HISTORY

On September 6, 2023 City Council adopted the "Updated Long-Term Financial Plan" (2023.EX7.1) (LTFP) which included recommendations for Environment & Climate Division to accelerate the development of proposed by-laws for emissions performance reporting that would require existing buildings in Toronto to annually submit to the City

of Toronto building-level performance data and to require existing buildings in Toronto to meet specific greenhouse gas emissions performance standards.

The City Council Decision document can be viewed at:

<https://secure.toronto.ca/council/agenda-item.do?item=2023.EX7.1>

On May 10, 11 and 12, 2023, City Council adopted "TransformTO 2022 Annual Report: Laying the Foundation for Net Zero" (2023 IE 3.3) which included an update on short-term implementation actions for the TransformTO Net Zero Strategy (TransformTO), and directed staff to review options to discourage the installation of new combustion uses of methane as part of the Toronto Green Standard Version 5 update; provide a copy of the Annual Report to Federal and Provincial Ministries to highlight the enormous gap between Toronto's growing fiscal responsibilities and the limited revenue tools available to it; develop and intergovernmental advocacy approach that identifies the scope and scale of investments needed to support implementation of the TransformTO Net Zero Strategy and works towards a reliable, long-term funding model; collaborates with Greater Toronto and Hamilton Area municipalities on a regional approach to intergovernmental advocacy, and encourages the Government of Canada to enact and enforce strong and robust Clean Energy Regulations consistent with a net zero electricity grid.

The City Council Decision document can be viewed at:

<https://secure.toronto.ca/council/agenda-item.do?item=2023.IE3.3>

On May 11 and 12, 2022, City Council adopted "Accountability and Management Framework for the TransformTO Net Zero Strategy" (2022.IE29.10) which provided a reporting schedule for the TransformTO Net Zero Strategy. The Framework identified that a TransformTO Net Zero Strategy progress report will be provided to the Infrastructure & Environment Committee in the first quarter of 2023. This report identified cross-Corporate progress in 2022 on implementing the 30 actions of the TransformTO Net Zero Strategy Short-term Implementation Plan 2022-2025, included the latest findings from the greenhouse gas (GHG) Inventory, indicating progress towards the community-wide 2025 and 2030 GHG targets and the 2040 net zero target, and summarized key activities to date from the Climate Advisory Group (CAG) and Joint TransformTO Implementation Committee (JTIC).

The City Council Decision document can be viewed here:

<https://secure.toronto.ca/council/agenda-item.do?item=2022.IE29.10>

On December 15, 16, and 17, 2021, City Council adopted "TransformTO - Critical Steps for Net Zero by 2040" (2021.IE26.16). In adopting the report, City Council endorsed the TransformTO Net Zero Strategy (TransformTO) on climate, including the TransformTO Short-Term Implementation Plan 2022-2025 and the community-wide target of net zero greenhouse gas emissions by 2040 and interim targets.

The City Council Decision document can be viewed here:

<https://secure.toronto.ca/council/agenda-item.do?item=2021.IE26.16>

On July 14, 15, and 16, 2021, City Council adopted – “Net Zero Existing Buildings Strategy” (2021.IE23.1). In adopting the report, City Council endorsed the Net Zero Existing Buildings Strategy and provided direction on short term implementation goals including developing work plans towards requiring annual energy and emissions performance reporting and disclosure for Toronto's homes and buildings and establishing sector-specific mandatory emissions performance standards.

The City Council Decision document can be viewed at:

<https://secure.toronto.ca/council/agenda-item.do?item=2021.IE23.1>

At its meeting of October 2 and 3, 2019, the City Council declared a Climate Emergency and endorsed a net zero greenhouse gas emissions target that is in line with keeping global average temperature rise below 1.5 degrees Celsius by adopting "Declaring a Climate Emergency and Accelerating Toronto's Climate Action Plan" (MM10.3). The declaration of the Climate Emergency immediately strengthened the goal of making Toronto net zero before 2050. At the meeting City Council committed to looking for opportunities to invest in and accelerate timelines for high priority greenhouse gas emission reduction areas outlined in TransformTO, including the building sector.

The City Council Decision document can be viewed at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2019.MM10.3>

On July 4, 5, 6 and 7, 2017, City Council adopted "TransformTO: Climate Action for a Healthy, Equitable and Prosperous Toronto – Report 2 – The Pathway to a Low Carbon Future" (2017.PE19.4) (TransformTO). TransformTO identified a pathway for Toronto to reduce city-wide greenhouse gas emissions by 80% by 2050. At the meeting City Council adopted three acceleration campaigns for reaching the City's greenhouse gas reduction targets, including the 'Building Energy Performance and Comfort' campaign which focuses on increasing the energy performance of existing buildings and ensuring new ones are built to high energy performance targets.

The City Council Decision document can be viewed at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2017.PE19.4>

On December 13, 14, and 15, 2016, City Council adopted "TransformTO: Climate Action for a Healthy Equitable, and Prosperous Toronto" (PE15.1) which identified improving energy efficiency in buildings as a key priority in the City's greenhouse gas emissions reduction strategy.

The City Council Decision document can be viewed at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2016.PE15.1>

On July 7, 8, and 9, 2015 City Council adopted “Update on Energy Reporting and Benchmarking by-law for Large Buildings” (2015.PE4.2) which reiterated its commitment to an energy reporting and benchmarking requirement for large commercial and multiresidential buildings, as a strategy for achieving the City's energy conservation and greenhouse gas emission reduction goals and directed the City to support the implementation of a Provincial energy reporting and benchmarking regulation, or

alternatively, on the City's own energy reporting and benchmarking by-law and implementation plan, should the Province not proceed with a regulation.

The City Council Decision document can be viewed at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.PE4.2>

COMMENTS

The TransformTO Net Zero Strategy (TransformTO) is the City's climate action strategy to reach net zero greenhouse gas (GHG) emissions by 2040 and was adopted by City Council in December 2021. It includes a set of low-carbon goals and short-term actions to reduce Toronto's GHG emissions while improving health, encouraging economic growth, improving social equity and increasing climate resilience. TransformTO identifies key GHG emitting sectors – buildings, transportation and waste. Achieving Toronto's goals will require:

- coordination and accountability across all City divisions, agencies and corporations;
- engaging with Toronto residents, organizations and businesses;
- seeking additional City authorities to effectively scale-up and implement strategies and programs; and
- significant investment and coordination with other orders of government.

The full financial impacts for the required investments to achieve net zero by 2040 are still to be determined. Technical modelling suggests that over the next thirty years, the total investment required by the entire community, that is, the City corporation, the business community, other levels of government, and individual residents, to retrofit existing buildings is \$145 billion. Annual investments between \$4-9 billion per year will be needed over the next 17 years, with most investments needed in the near term. This number includes the financial investments made by homeowners towards retrofitting an estimated 476,000 homes and buildings, or about 27,000 home retrofits each year until 2040, as well as individual purchases of 333,000 electric vehicles before 2030. These investments will need to be complemented by provincial government actions to support and maintain a clean and carbon-free provincial electricity grid.

The City will work to regulate, advocate and facilitate transformation in five priority areas:

- Demonstrate carbon accountability by establishing a carbon budget for its own operations and the community as a whole.
- Accelerate a significant reduction in natural gas use.
- Establish emissions performance standards for existing buildings across Toronto.
- Increase access to low-carbon transportation options, including walking, biking, public transit and electric vehicles.
- Increase local renewable energy to contribute to a resilient, carbon-free grid.

Mandatory GHG emissions performance standards for existing buildings are a critical step required for the City to reach the ambitious net zero by 2040 target. Building sector emissions are the primary source of GHG emissions in Toronto, contributing 58 per cent of the community-wide total (2020 GHG inventory). The Net Zero Existing Buildings Strategy (2021.IE23.1) (the Strategy) and the TransformTO 2022 Annual Report: Laying the Foundation for Net Zero (2023.IE 3.3) highlighted that development of mandatory emissions performance standards as a key component of reaching Toronto’s net zero targets.

The Strategy was adopted by City Council in July 2021 as a contributing plan to facilitate the implementation of the City’s climate goals. As outlined in Table 1, the Strategy presented a set of nine critical actions for the City to consider in reducing emissions from the community-wide building stock. The Strategy targets all building types and owners across Toronto and envisions improving building enclosures (insulation, windows/doors, etc.) while shifting heating energy use in existing buildings from fossil fuel heating systems to efficient heat pumps powered by a low carbon electricity grid. The Strategy includes a target of net zero GHG emissions from existing buildings across the City by 2050, which was further accelerated to net zero by 2040 through adoption of the TransformTO. The nine key actions of the Strategy are presented in Table 1.

Table 1. Overview of Nine Recommended Actions in the Strategy

Purpose	Action(s)
Set requirements to assess building performance and create a path to net zero	<ol style="list-style-type: none"> 1. Require annual emission performance reporting and public disclosure for all existing buildings 2. Establish emissions performance standards 3. Require energy and emissions audits and tune-ups
Provide support and resources to make retrofits easier and more affordable	<ol style="list-style-type: none"> 4. Provide integrated retrofit support 5. Expand and enhance retrofit financing 6. Support permitting and approvals processes for deep retrofits
Lay the groundwork for market transformation	<ol style="list-style-type: none"> 7. Build awareness and capacity of home and building owners for emission reductions strategies and supports 8. Support workforce development and training 9. Advocate and partner with other levels of government

The Strategy recommended setting requirements to assess building emissions performance, providing supports and resources for the building sector, and finally phased-in mandatory emissions performance standards for all existing buildings that will require improved emissions performance over time. An expedited introduction of mandatory emissions performance standards is essential to reaching the City’s target of net zero community-wide emissions by 2040. Emissions performance standards are a common way to drive deep emissions reductions in existing buildings for a variety of reasons:

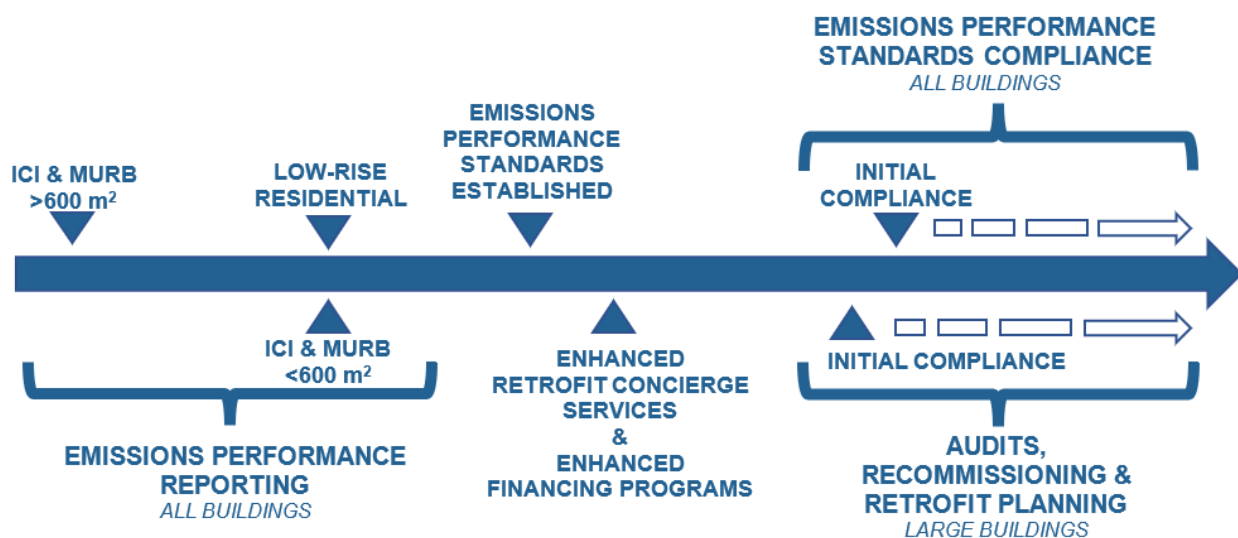
- Firm requirements for compliance offer clarity on necessary levels of emissions performance required to meet net zero targets, allowing particular building sectors (including owners, suppliers, workforce, etc.) to plan ahead and make appropriate retrofit choices now.
- Directly motivate deep retrofit action, where voluntary measures will not drive sufficient change
- Allow building owners the flexibility to determine the most cost-effective and appropriate means of improving emissions performance in their buildings

Annual emissions performance reporting from existing buildings is required to enable emissions performance standards. Emissions performance reporting allows both the City and building owners to establish a baseline for buildings' emission performance and compare performance over time. Data from emissions performance reporting will inform setting emissions performance standards and help identify the best ways for the City to provide support and resources to make building retrofits easier and more accessible. The City's accelerated net zero by 2040 target lends increasing urgency to implementation of emissions performance reporting and emissions performance standards.

Environment & Climate Division continues to deliver voluntary programs for existing buildings that accelerate the transformation to net zero and support early adopters in retrofitting their homes and buildings.

The introduction of both programs, supports and by-laws based on the 9 actions outlined in the Strategy requires a complex timeline with many interconnected dependent activities. A high-level summary of the expected order of introduction for major items is provided on the timeline shown in **Figure 1**.

Figure 1: Conceptual overview timeline for major Strategy actions



This report provides a proposed implementation plan for phased-in mandatory emissions performance reporting for buildings over 600 square metres (6,458 square feet) and emissions performance standards for all existing buildings. A proposed implementation timeline for mandatory requirements is appended as Attachment 1. The initial emissions performance reporting by-law will have reporting requirements similar to the Provincial Energy & Water Reporting and Benchmarking program. Once Environment & Climate Division has further determined the best reporting mechanism for smaller buildings, an amendment will be proposed to cover commercial, institutional and multi-unit residential buildings under 600 square metres and low-rise residential.

Plans for an emissions performance labelling program and by-law for low-rise residential buildings is then outlined. An overview of lessons learned from voluntary programs supporting net zero retrofits across the City and next steps for program expansion are outlined along with a summary of outreach and engagement efforts supporting the Strategy. Finally, the report provides an update on work to realign the Strategy's proposed pathways and targets to the accelerated net zero GHG emissions by 2040 TransformTO targets and discusses use of financial incentives and/or financing programs to drive retrofits of existing buildings.

Future work includes development of additional by-law proposals, as described in the Strategy, which include:

- Emissions Performance Labelling for Low-Rise Residential Buildings
- Amendment to Emissions Performance Reporting for buildings under 600 square metres, including low-rise residential.
- Emissions Auditing Requirement for Large Buildings
- Recommissioning Requirement for Large Buildings
- Retrofit Roadmap Planning Requirement for Large Buildings

Development of Toronto's Mandatory Emissions Performance Standards By-law

The implementation of mandatory GHG emissions performance standards was identified in TransformTO as one of the five key actions critical to Toronto's transition to net zero by 2040 that will enable the scale of action necessary for the decarbonization of Toronto's building sector. Emissions performance standards are also alternatively referred to as building performance standards in some jurisdictions.

Overview of Proposed By-law

Environment & Climate Division is developing emissions performance standards for all buildings in Toronto, from the largest office towers to low-rise residential homes. The emissions performance standards would be set so that Torontonians have reasonable, achievable pathways to make improvements to their buildings over time. Building owners need to start planning for these requirements as soon as possible.

Authority

Upon adopting the Strategy, City Council directed Staff to report back on the regulatory and legislative changes that may be required for the implementation of mandatory emissions performance standards for all existing buildings across the Toronto.

Environment & Climate Division is proposing to utilize the City's authority under the Section 8(2)(5) of the City of Toronto Act, 2006 (COTA) to bring forward a by-law, for City Council's consideration, to require existing buildings within Toronto to meet set GHG emissions performance standards. This subsection of COTA allows the City to enact a by-law with respect to the "*environmental well-being of the City, including respecting climate change*". There are, however, limitations to the City's authority under COTA which staff will consider during development of the by-laws. Environment & Climate Division will include these considerations as the development of a proposed by-law continues.

Background

Laws mandating building performance standards for existing buildings have been adopted in other jurisdictions, including in the City of Vancouver in Canada; in the United States of America both cities and states including cities of New York, NY, St Louis, MI, Washington, DC, Boston and Cambridge, MA, Madison, WI, and Denver, CO and the states of Oregon and Washington. Compliance begins in 2024 in New York City, St. Louis (most buildings), and Denver, 2025 in Boston, and 2026 in Vancouver, BC, Washington, DC, St. Louis (affordable housing), and Washington State.

For the examples of New York City and Vancouver, while these cities operate under different regulatory frameworks to the City of Toronto, they provide good examples of emissions performance standards implemented in other jurisdictions:

- New York City adopted Local Law 97 in 2019 which established building energy and emissions limits for most buildings over 25,000 square feet. New York City will begin enforcement of their local ordinance in 2024, and the outcomes of the compliance effort will provide additional guidance for staff in developing a by-law for Toronto.
- Vancouver adopted their Annual Greenhouse Gas and Energy Limits By-Law in July 2022 which established mandatory emissions performance reporting starting in 2024 and emissions performance standards including emissions limits starting in 2026 and space heating energy limits (i.e. requirements for building envelope improvements) in 2040. By identifying these future limits in their by-law the City of Vancouver is helping to signal to building owners to incorporate envelope improvements into their retrofit plans well in advance of these limits becoming mandatory.
- Both the City of Vancouver and New York City's laws impose financial repercussions to building owners for exceeding the emissions limit with a cost around \$350 per tonne CO₂ equivalent. This financial repercussion is approximately equivalent to \$0.66/m³ of natural gas used above the limits set for the building.

- The City of Vancouver's by-law imposes an additional financial repercussion of \$100/GJ for space heating energy used above the limit (i.e. where building envelope improvements have not been made by 2040) – this fee is approximately equal to \$3.83/m³ of natural gas used for space heating above the limits set for the building.
- It is important to remember that these financial repercussions apply to emissions above the limit set for a building, and that the limits are based on a reasonable transition to better building performance.
- Both Cities offer a range of programs funded through their tax base to assist building owners make improvements to their buildings
- Neither City has entered the compliance phase of their laws yet, but revenues from financial repercussions could help fund additional climate action.

By-law development

An important step in the implementation of the Strategy was engaging an external consultant to complete updated modelling and realignment of the Strategy's proposed pathways (originally targeted to net zero by 2050) with the net zero by 2040 target adopted by City Council under the TransformTO in December 2021. While the overall direction of the Strategy remains relatively consistent, this recent modelling provides updated draft targets for each major building sector to the City's accelerated 2040 targets to inform the proposed emissions performance standards by-law. For more details see the section below titled *Realignment of Technical Modelling and Pathway Analysis for the Net Zero Existing Buildings Strategy to a Net Zero by 2040 Target*.

Environment & Climate Division will perform further analysis of subsector specific emissions performance to inform targets as additional building performance data becomes available, with the first rounds of additional data to inform this analysis expected in Q4 2023. The City intends to source additional data to be used to understand the performance of Toronto buildings from several sources:

1. City by-laws to be proposed (see sections on *Development of Toronto's Emissions Performance Reporting By-Law* as well as *Emissions Performance Labelling for Low-Rise Residential Buildings* below)
2. City programs (see *Update on Programs supporting implementation of the Strategy - August 2021 to July 2023* below)
3. Provincial Energy & Water Reporting and Benchmarking reporting program (see *Development of Toronto's Emissions Performance Reporting By-Law* below)

Environment & Climate Division is in the process of developing a framework for an emissions performance standards by-law. The framework will include the following elements:

Scope: Establishing the scope of the by-law will involve decision making around the types and size of buildings that will be required to meet a performance target during a specific compliance period. Modelling for the Strategy considered 4 broad building sectors which include 32 specific building typologies grouping together buildings that have similar emissions performance and retrofit requirement characteristics. A by-law scope needs to balance the appropriate

granularity to reflect specific building uses while maintaining broad-enough categories to simplify the compliance and implementation process.

Compliance Periods: Compliance Periods will be triggered based on a temporal schedule but may also be triggered by other events (for example, renovation, purchase or sale, change of use, etc.).

Performance Targets: The by-law will establish a minimum level of performance that each building must meet in each compliance period. Emissions performance data for existing buildings will inform the target setting process. The Strategy's pathways to net-zero and additional modeling will inform the rate at which emission performance standards are strengthened over time. Affected building owners will be provided with a clear path for achieving performance requirements and the time to plan for and transition to new requirements.

Alternative Compliance Pathways: While the main compliance pathway for buildings will be meeting the emissions performance standards set out in the by-law, compliance with the by-law should be achievable by all buildings. A variety of alternative compliance options are being considered by Environment & Climate Division staff in the event a building cannot meet its emission performance standards, including assessment at a building owner portfolio level, low-income accommodations, cost recovery fees for excess emissions, carbon offset credits. Any potential alternative compliance pathway will have to be evaluated to ensure the City has the authority to implement.

Enforcement: Environment & Climate Division will discuss enforcement of the bylaw with the Municipal Licencing and Standards Division and other relevant divisions and plans to request appropriate resourcing along with any proposed by-laws.

Additionally, the scale up of companion programs will be critical for success. These include Environment & Climate Division's existing programs, as well as forthcoming policies which are integral to enabling the required pace of change and to the success of the by-law. For instance, a critical part of an equitable implementation of the by-law is providing financing tools and technical assistance for property owners lacking the financial or technical capacity to meet the by-law's emissions performance standards.

Implementation Plan

The scope and scale of an emissions performance standards by-law necessitates that its development is undertaken with appropriate care and comprehensive stakeholder engagement. Building typologies will be impacted differently by emissions performance standards. As an example, energy use for a hospital is vastly different than a restaurant or office building. Ownership structures, such as condominium properties, or tenant/landlord relationships, will need to be considered when developing requirements and the final by-law must provide clarity on the responsibilities. Major building sector and subsector targets will be presented to stakeholders during consultation and engagement activities related to the development of the emissions performance standards by-law.

Environment & Climate Division is leading the process of developing the structure of a proposed emission performance standards by-law. An Emissions Performance Standards Working Group with representatives from Toronto Building and City Planning has been coordinated to consider elements of a proposed by-law, how to best utilize existing City resources and to identify new resources which may be required to ensure successful implementation. The scope of a proposed emissions performance standards by-law will potentially impact operational areas of multiple City divisions.

Once the structure of a proposed by-law has been developed, Legal Services will support drafting a final by-law to be presented to City Council for consideration. Figure 2 in Attachment 1 outlines the proposed implementation plan for adopting mandatory emissions performance standards for existing buildings. Staff anticipate that an emissions performance standards by-law will be presented to City Council for consideration and adoption in 2024 and the initial compliance requirement of the emissions performance standards would come into effect soon after (i.e. when the first subset of existing buildings would be required to meet the first set of performance levels). Between now and when Environment & Climate Division plans to present the by-law to City Council, staff will be conducting stakeholder engagement, undergoing further development of the by-law, and to develop the City's supporting infrastructure to operationalize the by-law.

Development of Toronto's Emissions Performance Reporting By-Law

The data provided by an emissions performance reporting by-law is foundational to understanding the performance of Toronto buildings. The reporting of energy and water usage data by existing buildings will inform the target setting process for mandatory emissions performance standards across specific building typologies and support compliance with an emissions performance standards by-law.

City staff are developing a proposed emissions performance reporting by-law, that will be presented to City Council at a later date for consideration. Environment & Climate Divisions will initially present a by-law, that will require commercial, institutional and multi-unit residential buildings greater than 600 square metres to report emissions, energy and water data to the City and then at a later date present a further by-law that will require buildings less than 600 square metres to report emissions, energy and water data (the Emissions Performance Reporting by-law). The proposed emissions performance reporting by-law will likely parallel the Ontario Regulation 506/18: Reporting of Energy Consumption and Water Use under the Electricity Act (Regulation) as much as possible in order to provide consistency for building owners who may already be reporting building data to the Province. However, the City's by-law may include additional metrics, beyond those collected under the Regulation, required to support future emissions performance standards. These parallels between the proposed emissions performance reporting by-law and the Regulation will help to streamline reporting for buildings owners as the same data in the same online tool (Energy Star Portfolio Manager) can be shared with both the City and the Province.

2015 City By-Law Development and Provincial Regulation

The City previously explored implementing a similar energy, water, and emissions performance reporting and public disclosure by-law in 2014 – 2015. By June 2015, City staff had conducted extensive planning, research, and stakeholder consultations, which included joint City-Province outreach to industry. In July 2015, Toronto City Council passed a motion to support the implementation of a Provincial energy reporting and benchmarking regulation, or alternatively, to support the implementation of the City's own energy reporting and benchmarking by-law and implementation plan, should the Province not proceed with a regulation by December 31, 2015.

The City's 2015 proposed energy, water, and emissions performance reporting and public disclosure by-law laid the groundwork for Ontario Regulation 506/18 and the establishment of the Energy & Water Reporting and Benchmarking (EWRB) program. Under this regulation the Province requires large buildings to report their energy and water consumption (also used to calculate emission performance). Accordingly, the City of Toronto did not proceed with adopting its own emissions performance by-law in 2016. However, it should be noted that the Province's final implementation of the Regulation differed from the original vision explored by the City and the Province in that public disclosure of information was more limited and the reporting requirement has not been expanded to cover smaller buildings, and therefore limits the City's ability to receive some valuable building information under the Regulation from the Province.

This Regulation used a phased in approach to the annual reporting of performance data with buildings 250,000 square feet and larger starting to report their data in 2018, buildings 100,000 square feet and larger starting to report their data starting in 2019, and buildings 50,000 square feet and larger starting to report their data in 2023 (delayed from original 2020 requirement). As of this year, the Regulation requires all buildings above 50,000 square feet to report their performance data on an annual basis.

Provincial EWRB Data Set limitations

The Province currently only publicly discloses anonymous building-level data, limited to greenhouse gas and energy intensity metrics. Publicly disclosed data lacks several key fields including but not limited to the following: property address, gross floor area, source electricity and gas use, site electricity and gas use, GHG emissions, and year built. The City is unable to complete the types of analyses that are required to support the implementation of the City's Net Zero Existing Buildings Strategy using this limited public dataset. Reporting and public disclosure of a more comprehensive dataset would be valuable to target poor-performing buildings for participation in other City and utility support programs, to celebrate the top performing buildings, and to accelerate development emissions performance standards.

Environment & Climate Division support program for EWRB participants

From the first provincial EWRB reporting period under the Regulation onwards, the City of Toronto has educated and supported Toronto building owners on their EWRB reporting requirements. The City has engaged in mail, e-mail and telephone outreach campaigns to buildings required to report under the Regulation. The City has also provided training materials through informational webinars, a new training video library, and has provided 1-to-1 support via email, telephone, and online meetings. These efforts by the City have historically resulted in a significantly higher EWRB compliance rate for buildings within Toronto compared to the rest of the province.

Voluntary Emissions Performance Reporting to the City

In 2023, City staff have been working to implement a voluntary program allowing buildings to report their emission performance data directly to the City. The voluntary program is expected to be up and running by the end of the year and will allow participants to share their emission performance data with the City of Toronto using the same online tool used to report data to the province. This program supports the transition to a mandatory program as the process used to report data through the voluntary program is fundamentally similar and any buildings not required to report initially under the proposed by-law can choose to report voluntarily. The City currently collects some building performance data on a voluntary basis through other Environment & Climate Division programs, however future participation in these programs will require participants to submit data through the voluntary emissions performance reporting program, where not otherwise required to report under the by-law, in order to streamline the collection process and help prepare building owners for future requirements.

Emissions Performance Reporting By-law Development

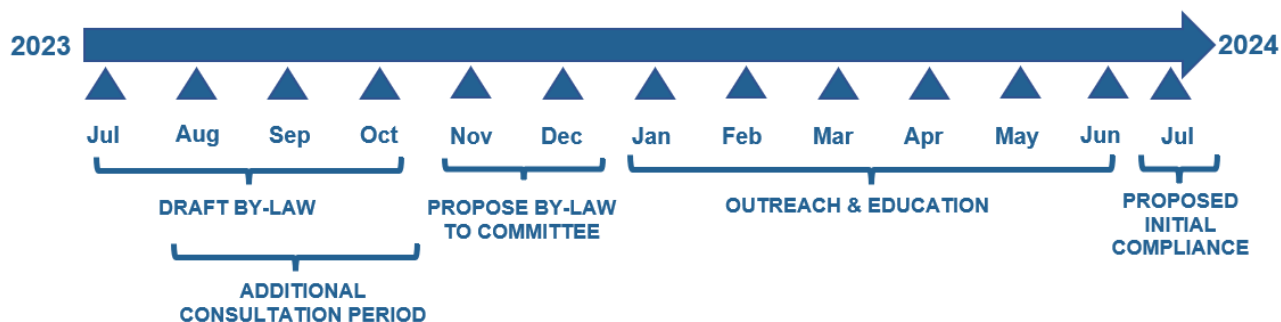
It is important for the City to obtain fulsome emission performance data from buildings in Toronto to support the development of the City's future mandatory emissions performance standards in Toronto and enable the successful implementation of the Strategy. The Province has made no indications of plans to expand their Regulation to cover building under 50,000 square feet and there are gaps in the emissions performance data the City receives from the Province for larger buildings. Environment & Climate Division plans to develop an emissions performance reporting by-law, which it will bring to City Council for consideration, for all buildings over 600 square metres (6,458 square feet) and then at a later date bring a by-law forward for consideration for all buildings less than 600 square metres.

The City's previous emissions performance reporting by-law development efforts included forming a cross-corporate working group, discussions with building industry associations and their membership, jurisdictional scan of best practices, a regulatory review, an analysis of Toronto's existing building stock, an impact study, a review of tools and data platforms, and stakeholder consultations. General sentiments from the stakeholder consultation is that the market is ready for a City of Toronto emissions

performance reporting and public disclosure by-law, and there was support for the City’s proposed building types and size thresholds that would be captured by the initial emissions performance reporting by-law, and the choice of reporting tool for the data. The stakeholders consulted thought that disclosure could motivate market transformation, but expressed concern around protecting proprietary information that may be used for a competitive advantage, and concern that data should be normalized so that benchmarks would be fair and meaningful and would help provide a level playing field.

Environment & Climate Division will conduct additional stakeholder consultations during Q3 2023 to inform the final emissions performance reporting by-law development with the intent to bring forward an initial by-law for buildings over 600 square metres to City Council’s consideration in Q4 2023. A high-level timeline for proposed implementation is shown in **Figure 2** below while a more detailed timeline is included as Figure 1 in Attachment 1.

Figure 2: Overview timeline for Emissions Performance Reporting



Additional Emissions Performance Reporting Requirements

Environment & Climate Division staff will develop additional emissions performance reporting requirements for proposal to Council at a future date, as described in the Strategy, including:

- Emissions Performance Labelling for Low-Rise Residential Buildings
- Amendment to Emissions Performance Reporting for buildings under 600 square metres, including low-rise residential.
- Emissions Auditing Requirement for Large Buildings
- Recommissioning Requirement for Large Buildings
- Retrofit Roadmap Planning Requirement for Large Buildings

Emissions Performance Labelling for Low-Rise Residential Buildings

The Strategy recommended that for low-rise residential buildings, the City should encourage voluntary home energy and emissions reporting, rating, and labelling

disclosure as soon as possible and introduction of a mandatory home energy rating and labelling requirement by 2025.

Environment & Climate Division staff are developing a voluntary home emissions rating and disclosure program and will later develop a proposed home emissions labelling by-law, that will be presented to City Council at a later date for consideration, that will mandate home emissions labelling for low-rise residential buildings.

Background

Home Energy Rating and Disclosure (HER&D) programs for low-rise residential buildings were first initiated by the Provincial Green Energy and Green Economy Act, 2009, c. 12 - Bill 150, under which the Ontario Ministry of Energy was granted a broad mandate for universal home energy rating. Although Ontario's Climate Change Action Plan (2016) included plans for a free HER&D program that would provide a home energy rating as part of the process for listing a home for sale, the program was never launched and the Green Energy and Green Economy Act was later repealed in 2019 confirming the end of this pathway.

The Strategy identified that HER&D programs can help tenants and future buyers to make an informed choice when deciding to lease, rent, or purchase a space or entire building. Labelling also helps new and existing homeowners to plan for and prioritize retrofit measures in the future, as well as gives them clear information on the scale of improvements following a renovation. It was noted that disclosure at time of sale or rent must happen early enough in the transaction process to meaningfully impact decision making.

Voluntary Labelling Program Development

In response to direction received from City Council in July 2021 (IE23.1) to investigate a program like HER&D specific to the City of Toronto, Environment & Climate Division staff have researched other jurisdictions, undertaken stakeholder engagement session, and are undertaking development of a full program design. The proposed program will be aligned with the City's emphasis on carbon emissions (rather than simply energy) and aims to distinguish the revised design from the HER&D model that failed to gain traction in the low-rise residential sector and garnered extensive opposition to its focus on influencing real estate transactions.

The initial voluntary labelling program design is based on the following principles:

- Take a market transformation approach that works to change the way Torontonians understand carbon emissions resulting from home energy use.
- Work upstream with industry to identify and overcome barriers homeowners face when undertaking carbon retrofits.
- Focus on engagement and providing information (rather than simply disclosure), while supporting other programs and initiatives that incent change.
- Participants can enroll using their EnerGuide Report or utility usage data, at no cost to the participant.

The City has submitted a funding proposal to Natural Resources Canada (NRCAN) to support program development and roll out. Staff are actively developing an emissions performance labelling program for low-rise residential buildings and is planning to launch it in late 2023 or early 2024. The program will begin with participation on a voluntary basis.

Staff are engaging with other municipalities that are exploring similar initiatives and in May 2023 began participation in a national working group, facilitated by NRCAN, which focussed on home energy rating and public disclosure.

Labelling By-law Development

Environment & Climate Division will bring back a proposed emissions performance labelling by-law, that will be presented to City Council at a later date for consideration, that will mandate home emissions rating and disclosure for low-rise residential buildings. It is expected this will be presented to City Council in 2025 following by-law development and stakeholder consultations.

Update on Programs supporting implementation of the Strategy - August 2021 to July 2023

The Strategy recommended building on the City of Toronto's strengths and successes, including its two major building support platforms. Notably, the City's Better Buildings Partnership already provides funding, expertise and support to improve energy efficiency and reduce emissions in Toronto's residential, commercial, industrial and institutional buildings. It provides building owners with a centralized resource to support them in understanding and accessing the various supports available to them in benchmarking and improving their assets' performance. Similarly, BetterHomesTO provides Toronto's residents with a one-stop platform to help improve their home's energy efficiency and reduce associated emissions.

To date, the primary focus of voluntary programs for existing buildings has been on development of voluntary programs providing guidance, training, and financial supports to help building owners carry out the deep retrofits required to achieve the desired net zero GHG outcomes. Results of these programs will help inform the City's approach to mandatory emissions performance reporting and emissions performance standards. Existing voluntary programs directly support actions recommended in the Strategy, including:

- Provide integrated retrofit support
- Expand and enhance retrofit financing
- Support permitting and approvals processes for deep retrofits
- Build awareness and capacity of home and building owners for emissions reduction strategies and supports
- Support workforce development and training

- Advocate and partner with other levels of government

Due to the pandemic, implementation of the Strategy's recommendations was delayed with program scale up occurring in late 2022 to early 2023. Details of the programs under the Environment & Climate Division, Public Energy Initiatives – Existing Buildings unit are outlined below.

The Green Will Initiative – Strategic Carbon Management

The Green Will Initiative (GWI) was developed based on an initial framework presented at the C40 Summit in October 2019. GWI brings together the City and building portfolio owners to make major strides in addressing the climate emergency and achieving Toronto's net zero emissions target. Recognizing that the path to net zero will be unique for each portfolio and building, GWI supports buildings owners in net zero planning and developing internal carbon management practices to empower them to continuously drive GHG emission reduction in the long-term through three pillars of the program:

Building a Pathway to Net Zero: Getting participants started on prioritizing net zero in their planning or advancing existing plans in alignment with the Net Zero Existing Buildings Strategy. Participants undergo Strategic Carbon Management (SCM) workshops focused on GHG emission reduction to develop organizational changes to drive towards net zero. Advanced training opportunities focus on specific subjects are available for more mature building portfolios that have already started their pathway.

Recognition of Accomplishments: By recognizing those that started early and made climate action investments through the City of Toronto's platform, GWI showcases accomplishments and best practises. This includes low carbon solutions in Toronto's market that local organizations are adopting as part of their pathway to net zero.

Toronto Peer Learning: Establishing a forum for information exchange and open discussion between building owners in Toronto. This is an important step to enabling climate action work in Toronto to build upon each other.

To date, the program has expanded to 30 building portfolios across Toronto representing over 4,500 buildings and 320 million square feet of gross floor area.

Navigation & Support Services

The Navigation & Support Services program provides building owners, operators, and property managers support navigating the process of improving the energy efficiency and reducing greenhouse gas emissions of their buildings. Owners, operators and property managers of most commercial, industrial, institutional and multi-unit residential buildings in Toronto are eligible to participate and can apply on the City's website.

The Navigation & Support Services program (the Nav program) has facilitated (since Q3 2021) the application process and approval for approximately \$1 million dollars in federal funding from the Federation of Canadian Municipalities to assist various not-for-

profit housing providers and housing corporations in Toronto to carry out greenhouse gas emissions reduction projects, with a focus on improving affordability and occupant comfort.

The City is undertaking energy and emissions audits for small and medium businesses (<50,000 square feet) to gather emissions performance data which will help inform future mandatory emissions performance standards. Since 2022, The Nav program has provided ASHRAE Level 1 Energy and Emissions audits to 19 small buildings hosting businesses and 7 multi-unit housing buildings, both co-operatives and condominiums. These audits have provided building owners with options for low-carbon retrofit opportunities to pursue.

The Nav program also provides guidance to building owners on the retrofit process and assistance with available utility program incentive applications to improve the financial business cases of retrofit and recommissioning projects.

Some examples of support the Nav program provided include:

The Bedford Glen Condo has established an ambitious project that aims to integrate the maximum achievable deep retrofit with planned capital renewal for the building in alignment with the pathways proposed in the City's Net Zero Existing Buildings Strategy. City staff have provided guidance to the Bedford Glen Condo to support development of their project as well as further support through collaboration with The Atmospheric Fund. Support helped to identify a technical scope of work that would decarbonize the building, renew the infrastructure and meet the City's Energy Retrofit Loan approval requirements. The current project to decarbonize the 156 units has provided significant technical learnings to the industry, demonstrated the impact of a successful low carbon engagement with residents, and identified challenges such as increasing capital costs.

Riverdale Hub, a local not for profit with a Green and Inclusive Community Buildings funding application. The project goal is for Riverdale Hub to install a new geothermal system to meet the full year-round heating and cooling needs of the building and to explore opportunities to improve the thermal performance of the building.

Additionally, the Nav program supported a small commercial building in its ability to receive support to improve the buildings façade, which included funds from the Facade Improvement program, to supplement the cost of window replacements that will improve energy performance and occupant comfort. This small commercial building is also pursuing heat pump solutions to replace electric baseboard heaters and reduce their operating costs and associated scope 3 emissions.

Another example, the Nav program has supported a large housing provider pursue opportunities identified through an audit provided by the Nav program in one of their large rental buildings, and the provider is now receiving incentives from both Enbridge and Save on Energy.

The Nav program also supported multiple not for profit housing providers including Toronto Community Housing (TCH) and the Scott Mission with applications for funding from Federation of Canadian Municipalities (FCM), collectively receiving over \$1 million to enable retrofit projects.

Starting in 2023, the Nav program is developing resources for owners of Toronto homes and buildings to aid in the transition to net zero operations, including retrofit roadmaps for various building archetypes, technology guides for building elements and equipment, as well as tools to support life cycle cost analysis and utility cost comparison calculators to support capital project planning. These resources will allow the Nav program to reach a broader audience required to help transition all buildings in Toronto to net zero.

The Deep Retrofit Challenge

In 2022, The City of Toronto signed a contribution agreement with Natural Resources Canada to receive up to \$5 million in funding for the Deep Retrofit Challenge (DRC), a competition-style program that will significantly reduce greenhouse gas emissions in the multi-unit residential and mid-tier commercial building sectors. The DRC program launched in August 2022, offering grants of up to \$500,000 for deeper-than-planned retrofit projects that result in significant GHG emissions reductions in the multi-unit residential building and mid-tier commercial office sectors. A total of 14 applications were received by the October 31, 2022 application deadline and evaluated by an internally-led Technical Review Committee. Of the 14 applications the City received, 11 of the applications were conditionally accepted and eight building owners have now fully committed to undertaking deep retrofits. The eight participants are all currently in the retrofit initiation stage, with retrofits undergoing an integrated design process aiming to further improve the savings and cost effectiveness of retrofits. Their retrofits are expected to meet the following requirements:

- Minimum 50 per cent reduction in the building's greenhouse gas emissions
- Minimum 50 per cent reduction in total energy use intensity
- Payback period of 20 years or less (lifecycle cost analysis)

Retrofits under the DRC program will be completed by early 2025. Once retrofits have been completed, the City will develop and publicly release comprehensive case studies on completion of the retrofits, including the retrofit designs, utility savings, project costs and lessons learned. The selected deep retrofit projects will soon serve as a demonstration of next generation retrofits with the goal of accelerating market transformation. The DRC is also expected to act as a catalyst for early voluntary compliance with the Strategy recommendations including data disclosure, emissions performance standards, and audits/recommissioning.

Energy Retrofit Loan Program

Through the Energy Retrofit Loan program, the City offers fixed, long-term, low-interest financing to enable building owners to invest in low-carbon, energy-efficient capital improvements.

The City of Toronto Energy Retrofit Loan (ERL) program received \$2.6 million in new applications in 2023 (as of July) and continues to support energy retrofit projects covering low carbon retrofits in 250,000 square feet of commercial office space, 150 affordable housing units, and 229 market-rent apartments, and a project at a large academic institution. The program has focused on bringing in innovation and progressive retrofits, however ERL program rules allow a broader range of projects.

One of the larger, transformational projects the ERL program is actively supporting is:

The Toronto Zoo Decarbonization Project

The ERL program provided a \$8.3 million loan to the Toronto Zoo for a multi-measure decarbonisation project that helps to put the Zoo on track to a future net zero campus. The project focused on to electrification of the Americas Pavilion heating system with a major investment in a new, innovative heat pump system which will both heat the pavilion and serve as an educational tool on the use of clean, efficient electric heat pumps. The Environment & Climate Division is also supporting the development of the Zoo's Net Zero Plan to help ensure this success will be replicated throughout the Zoo's campus with further applications to buildings across the city.

More information on the ERL program will be provided to City Council via the companion report *Design Principles for Next Generation Retrofit Financing Programs and Identifying Funding Solutions to Support Building Decarbonization*.

The enhanced Home Energy Loan Program and BetterHomesTO

As reported to Infrastructure and Environment Committee in March 2023, the City of Toronto was successful in securing from the Federation of Canadian Municipalities (FCM), through its Community Efficiency Financing program, providing up to \$9,712,000 in funding for zero-interest financing for homeowners to undertake projects through the enhanced Home Energy Loan Program (HELP). The City of Toronto also received a grant from FCM, of up to \$4,856,000 to provide incentives for specific measures: solar PV installations, heat pumps and deep retrofits. More than \$900,000 of these funds have been allocated to date.

More than 1,200 applications were received in 2022 by the Home Energy Loan Program. Presently all of the zero-interest funding available through HELP has been committed to projects across Toronto. Staff anticipate approximately 200 projects will be supported by HELP with the zero-interest financing, while 300 are expected to access HELP's available incentives. Given continued interest in the program, eligible applicants have been able to opt into the City's interest-bearing stream of the program. With funding available from the FCM grant, the City plans additional initiatives (e.g. training, outreach and community engagement) for 2023 to more broadly support retrofitting

efforts and support Toronto homeowners looking to decarbonize. Work is also underway to develop case studies and key learnings from deep retrofit projects supported through this work.

BetterHomesTO engages and educates Toronto residents to support the creation of more comfortable and climate-friendly homes. Launched in 2019 with the City's BetterHomesTO.ca website, the program has expanded to provide retrofit resources and opportunities for homeowners and design-build professionals. BetterHomesTO includes:

- Community engagement – ongoing outreach to residents and neighbourhood groups. The City is developing a Net Zero Communities toolkit to support neighbourhoods wishing to embark on collective or group emission reduction projects;
- Marketing materials, including brochures and videos to highlight retrofits and pathways for Toronto homeowners;
- BetterHomesTO Ask an Expert Webinar series allows design-build professionals to showcase the latest technologies and renovation pathways to residents;
- Net Zero Renovator Certification opportunities for design-build professionals; and
- an on-staff Registered Energy Advisor to support homeowners in their net zero renovation journeys.

More information on the HELP program will be provided to City Council via the companion report *Design Principles for Next Generation Retrofit Financing Programs and Identifying Funding Solutions to Support Building Decarbonization*.

Next Generation Funding Solutions for Building Decarbonization

The Strategy identified that new and improved financing tools will be required to support the scale and pace of change required to reach Toronto's Net Zero by 2040 target.

The Environment & Climate Division is currently studying options for new financial tools designed to expand access to financing for low carbon building retrofit projects through third-party public and private sector funding and delivery. Results from the work will be used to inform the development of new or enhanced programs. More information will be provided to City Council via the companion report *Design Principles for Next Generation Retrofit Financing Programs and Identifying Funding Solutions to Support Building Decarbonization*.

Pledge Program

The Strategy identified that building owners disclosing emissions performance data and committing to the net zero transition should be prerequisite for participation in City programs.

Environment & Climate Division staff have been designing and developing a new initiative to encourage building owners to voluntarily adopt actions aligned with the planned requirements outlined in this report, as established in the Strategy. This initiative, currently internally referred to as the "Pledge Program," strategically creates

broad marketplace awareness of future requirements for existing buildings and encourages building owners to voluntarily prepare for and comply with key actions. The focus of this initiative will be on awareness, engagement and connection to existing City support programs and resources, as well as recognition of buildings that voluntarily comply with future requirements, aiming to catalyze and prime the Toronto marketplace for change before the compliance begins for proposed by-laws. The anticipated launch date for this initiative is in 2024.

Outreach and Awareness efforts to support Strategy Implementation Continue to Expand

A key action of the Strategy is building awareness and capacity of building owners to undertake emissions reduction measures. The goals of this Strategy action are to work with members of the buildings sector and supporting industries to increase access to existing education materials, to support development of new education materials specific to emerging deep retrofit topics and to leverage data and leading industry stakeholders and community groups to identify target markets, develop, and disseminate marketing materials on deep retrofit information, tools, and support services.

Environment & Climate Division lead engagement and outreach with existing buildings owners and sector professionals and has established a wide-reach through both speaking opportunities and direct contact with building owners, contractors, and industry organizations across Toronto. Outreach was performed both through general TransformTO/program awareness activities, as well as through program-specific interactions, with both opportunities used to promote knowledge of high-performance, low-carbon building retrofit opportunities as well as awareness of the various City programs available for building owners to participate in.

Environment & Climate Division has been active in building sector industry organizations to encourage climate action and align messaging with the Strategy. Staff are actively engaging with committees/industry organizations who form a key support of workforce development activities to increase industry capacity for low-carbon retrofits in the building sector.

To support the low-carbon building retrofit market transformation, staff have increased marketing efforts and updated promotional materials to provide more compelling display of information and have heavily increased its digital presence by leveraging new platforms and partner channels for advertising. A digital advertising campaign was recently conducted which targeted commercial building owners.

In the first half of 2023, the Environment & Climate Division has participated in numerous building retrofit focused speaking opportunities which engaged an audience in the building sector on the work, programs and future plans being implemented by the City under the Strategy.

The Environment & Climate Division participates in speaking opportunities, conferences and industry events to engage the building sector on elements of the Strategy. In addition to these larger forums for outreach on Strategy initiatives, the team is implementing more direct, targeted methods to reach out to building owners to offer support and assistance in achieving TransformTO goals.

Environment & Climate Division will be working closely with Strategic Public and Employee Communications (SPEC) to develop an existing buildings outreach plan for 2024 and beyond. The opportunities to scale engagement are primarily with volume outreach tactics within the contractor channel and building association/organization relationships. By engaging and developing programs and relationships in these organizations with wide industry member membership, Environment & Climate Division's outreach will multiply through these established networks to reach a large majority of building owners in Toronto. Planned future initiatives include:

- Building on the success of the 2022 campaign for residential homes by repeating and expanding marketing tactics to reach a broader audience.
- A second digital advertising campaign that targets commercial buildings will be executed, focusing on messages related to voluntary Strategy actions ahead of mandatory requirements.
- Expanding reach into external channels by providing more frequent and tailored content for these audiences.

Realignment of Technical Modelling and Pathway Analysis for the Net Zero Existing Buildings Strategy to a Net Zero by 2040 Target

In January 2023, the City engaged with the consultant who completed the Strategy's Impact Modeling and Assessment Technical Appendix to conduct a recalibration exercise to accommodate the City of Toronto's accelerated Net Zero by 2040 target. The recalibration analysis focuses on core data analysis with new information that has become available since the Strategy was completed, to understand what possible changes to the previous work can and should be made. The update will ensure consistency with the revised TransformTO Strategy and confirm current energy and emissions performance across major building sectors up to 2021. New citywide prototype pathway(s) have been proposed, indicating a need for increased pace, scale and associated investment to match the level of ambition of the accelerated Net Zero by 2040 goal. Preliminary highlights of the consultants' ongoing work include:

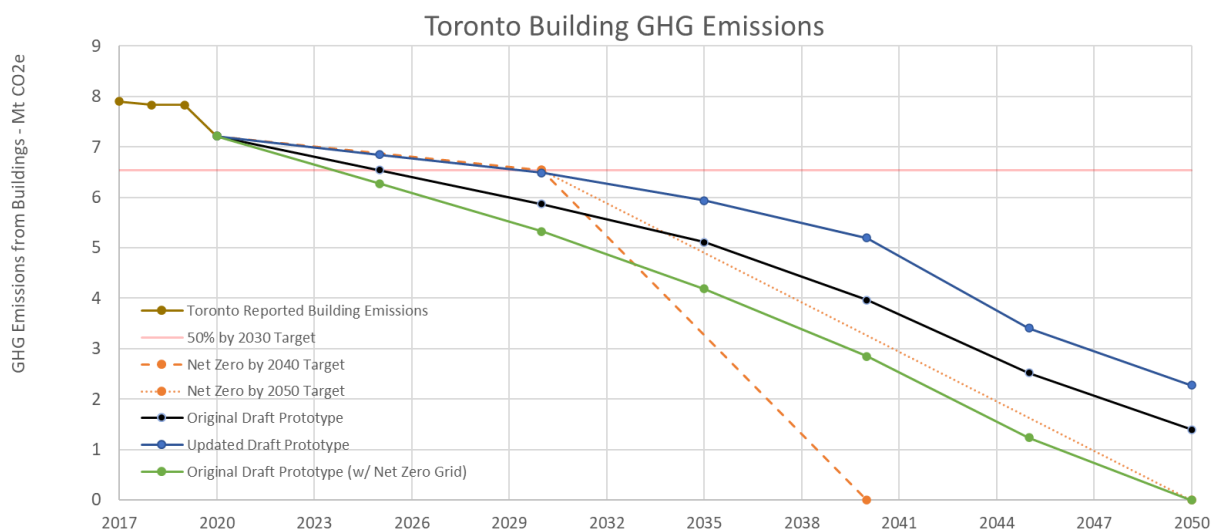
- To achieve the Net Zero by 2040 goal, the prototype pathway(s) for the Strategy must be revised to reflect a significant pace of change increase. This acceleration emphasizes two points: (a) fuel-switch-focused packages for all building sectors are less costly and easier-to-implement and (b) the requirement to decarbonize the Provincial electricity grid is now even more important than facility-scale action
- Current market conditions have resulted in significant increases to upfront capital costs (37% increase over pre-pandemic prices) which are likely to heavily influence the packages of retrofit building owners pursue in order to decarbonize their

buildings. The increase in upfront capital for retrofits may direct some owners towards more fuel-switch dominant packages, particularly in residential buildings, in the short- and medium-term, should by-laws or other regulations be put in place to drive change. This impact may be especially prevalent in the residential sector, leading owners to prefer fuel-switch dominant (or fuel switch only) packages which do not reflect the broader co-benefits available which influenced the recommendations in the Strategy

- Life-cycle cost per tonne performance is notably higher across all sectors and packages, except for fuel-switch-only options.
- Accounting for expected increased electricity grid emissions as the current policy direction demands further study and engagement on how the City can support accelerated electricity grid-level action. The updated city analysis shows significantly poorer GHG savings by 2050 due to Ontario’s electricity generation emissions being projected to significantly increase over the coming years as found in the Independent Electricity System Operator (IESO)’s 2022 Annual Planning Outlook. Further engagement with the IESO and Provincial electricity system decarbonization planning leaders is necessary to identify the actions the City of Toronto might take to advance and accelerate electricity grid decarbonization in Ontario.

Figure 3 below shows the preliminary findings of the updated year-over-year GHG performance of the Updated Draft Prototype pathway (blue line) compared to the Original Draft Prototype (black line) developed in 2020, as well as the previous analysis assuming a net zero grid (green line). These three potential pathways are compared, in the graph, to the three relevant building sector GHG reduction targets for the City: (a) the updated 50% reduction by 2030 (solid red line) continuing to either (b) the previous net zero by 2050 target (dotted orange trend line) or (c) the new net zero by 2040 target (dashed orange trend line).

Figure 3: Community-wide Emissions Reduction Pathway and the City's Targets



The key impacts of the updates to the Updated Draft Prototype pathway are decreased performance due to increased emissions from Ontario's electricity system, the updated 2030 target would be achieved without changes to the prototype scenario, a gap between remaining emissions and zero emission in 2050 that is 60% larger than the original; and that the Original Draft Prototype is not close to meeting the accelerated zero carbon by 2040 target while the Updated Draft Prototype is even further from achieving this target.

These preliminary findings mean that the transition to net zero will be more difficult for a number of reasons. However, an emissions performance standards by-law that drives building enclosure upgrades and not just greenhouse gas emissions reductions should still be part the City's policy due to the long implementation timeline of making upgrades to the electricity distribution system and the co-benefits that comprehensive retrofits provide to building owners and occupants. However, since the current economic conditions provide buildings owners less of a business case to undergo comprehensive retrofits, the City will most likely need to provide additional supports and to ensure mandatory requirements are commensurate with our net zero by 2040 target.

Additional supports may include ensuring all building owners have adequate access to financial supports that enable deep retrofits, increased levels of awareness of the pathways building owners must take to reach net zero, retrofit concierge services that provide guidance to building owners and support during permitting of projects. The Strategy provides additional detail on the recommended supports, and opportunity exists to expand and extend program delivery.

Role of the City in Financial Incentives and/or Financing to Drive Retrofits of Existing Buildings

The full financial impacts for the required investments to achieve the TransformTO net zero by 2040 target are still to be determined. Technical modelling suggests that over the next thirty years, the total investment required by the entire Toronto community, that is, the City corporation, the business community, other levels of government, and individual residents, to retrofit existing buildings is \$145 billion. Annual investments by the Toronto community of between \$4-9 billion per year will be needed over the next 17 years, with most investments needed in the near term. This total community cost includes the financial investments made by homeowners towards retrofitting an estimated 476,000 homes and buildings, or about 27,00 home retrofits each year until 2040, as well as individual purchases of 333,000 electric vehicles before 2030. These investments will need to be complemented by the Province of Ontario's actions to support and maintain a clean and carbon-free provincial electricity grid. Additionally, these numbers do not incorporate the most recent recalibration analysis showing that current market conditions have resulted in significant increases to upfront capital costs (37% increase over pre-pandemic prices).

The Strategy includes a recommended action to expand and enhance retrofit financing and explore the creation of new mechanism that support greater access to low-cost financing for retrofit projects. In addition to incentives, financing is one of the most

common and effective tools governments can use to encourage the acceleration of net zero retrofits. Lessons learned during initial implementation of the Strategy are expanded upon below.

Building owners retrofitting their existing buildings to net zero to meet emissions performance standards result in expensive projects, with projects costs that may exceed the equity and/or debt financing available for many building owners. Lenders including traditional, non-traditional and government providers have made substantial financial pledges to increase sustainable or green project financing, however, the business case for net zero retrofits is often negative and regulated lenders are likely unable to deliver the required financing. However, the business case for some retrofits is becoming more attractive, such as the example from the recalibration where fuel-switch-focused packages have become less costly and easier-to-implement. The introduction of mandatory emissions performance standards for all existing buildings that will require improved emissions performance over time. Toronto will need to ensure that building owners have reasonable and achievable pathways to meet emissions performance standards, considering both Toronto's ambition and the business case, affordability, and technical challenges. Setting these standards will provide confidence that investment in improvements to buildings will pay-off in the long-term. These standards will also help lenders to make the business case to lend to building owners using existing financial instruments such as through mortgages or operating loans

The preliminary results of the net zero recalibration work on the Strategy described above has demonstrated that scaling Toronto's net zero building retrofit projects is challenging as the business case for decarbonization is less attractive in the current economic climate. The majority of building owners, including those of large commercial buildings, condominiums, small and medium buildings, and mid-rise apartment buildings, do not qualify for any existing public grant and loan programs.

Toronto condominium buildings face additional challenges as building reserve funds are already stressed with post pandemic inflation. Condominiums will increasingly require the ability to access financing and technical services to undertake building retrofits. Given considerations like ownership structures and condominium corporation restrictions on borrowing, significant effort will be required to develop programs and services to support aging condominiums in retrofitting. At present programs to support condominium retrofits are extremely limited.

The Federal government has introduced programs for cooperative (co-ops) and affordable housing providers including through both the Federation of Canadian Municipalities (FCM) and Canada Mortgage and Housing Corporation (CMHC). FCM and CMHC offer financing and grants to support low-carbon project identification, design development and project development. In particular, the CMHC Canada Greener Affordable Housing funding program, which was open until July 31, 2023, offered up to \$170,000 per unit in loans – of which \$85,000 may be forgiven – which is likely adequate funding for a typical net zero, deep retrofit. Eligible building managers in Toronto were offered City support through our Navigation & Support Services (Nav) program to facilitate application development and submission.

The Canada Infrastructure Bank (CIB) has also sent a strong market signal designating over \$1 billion of low carbon building retrofit financing through innovative partnerships with banks and energy service companies. Several financing products have been introduced however additional financial support is required to improve the business case and meet the underwriting requirements to finance a net zero building retrofits. Commercial and residential building retrofit projects also often have a high cost per tonne of GHG savings that may exceed CIB expectations.

To meet the net zero by 2040 target, the Federal and Provincial governments will need to introduce new grants and loan programs that recognize the high cost of net zero and the lack of available resources. In particular, implementing programs in Ontario similar to British Columbia's CleanBC, which provides an incentive based on cost per tonne of lifetime greenhouse gas saving, could help to meet the City's net zero by 2040 targets. The CleanBC program offers tax credits ranging from \$40 - \$70 per tonne of GHG emissions avoided in order to fund retrofits which reduce building emissions, with the highest credits available to social housing projects.

Environment & Climate Division is developing a stakeholder engagement on the financial challenges to net zero retrofits including an evaluation on the constraints of existing financing offerings and an assessment of what financial tools are required to accelerate building decarbonization to meet ambitious net zero by 2040 target. Stakeholders will collaborate with the City to develop new financial models and loan calculators to improve lender underwriting for net zero retrofits that demonstrate a positive life cycle cost savings over the long term. Lenders and other stakeholders will also be tasked with reframing the business case to recognize low carbon building performance, future carbon regulation, and net capital cost savings value stream to support low carbon capital replacement plans. The importance of this lender collaboration will become increasingly relevant as capital replacement planning begins to recognize the importance and long-term savings of holistic low carbon retrofits.

The City must prioritize actions that maximize impact and develop new programs including additional financial supports for building decarbonization. Details of the City's role to finance projects have been included in the report *Design Principles for Next Generation Retrofit Financing Programs and Identifying Funding Solutions to Support Building Decarbonization*.

Next Steps and Future Reporting on Net Zero Existing Buildings Strategy Implementation

Achieving the ambitious goals of TransformTO will require:

- coordination and accountability across all City divisions, agencies and corporations;
- engaging with Toronto residents, organizations and businesses;
- seeking additional City authorities to effectively scale-up and implement strategies and programs; and
- significant investment and coordination with other orders of government.

Effective implementation of the Strategy, and acceleration to meet the new net zero by 2040 target will require similarly intense and integrated efforts by the City.

Continued expansion of existing City programs to support retrofit activities will focus on preparing participants for the City's adoption of mandatory emissions performance reporting and emissions performance standards (See Attachment 1 the proposed schedule for implementation).

Environment & Climate Division will conduct additional stakeholder consultations during Q3 2023 to inform the final emissions performance reporting by-law development for buildings greater than 600 square metres with the intent to bring forward a by-law for City Council's consideration in Q4 2023. A proposed implementation timeline is included appended as Figure 1 in Attachment 1.

Environment & Climate Division staff anticipate that an emissions performance standards by-law will be presented to City Council for consideration in 2024. A proposed implementation timeline is included appended as Figure 2 in Attachment 1.

Environment & Climate Division staff will develop additional by-law proposals, as described in the Strategy, including:

- Emissions Performance Labelling for Low-Rise Residential Buildings
- Amendment to Emissions Performance Reporting for buildings under 600 square metres, including low-rise residential.
- Emissions Auditing Requirement for Large Buildings
- Recommissioning Requirement for Large Buildings
- Retrofit Roadmap Planning Requirement for Large Buildings

Future updates on the progress of the Strategy implementation will be included with regular TransformTO reports to Committee.

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SIGNATURE

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ATTACHMENTS

Attachment 1 - Proposed Implementation Plan - Mandatory Emissions Performance Reporting and Mandatory Emissions Performance Standards to support the Net Zero Existing Buildings Strategy