

City of Toronto

GREEN BOND NEWSLETTER

August 2020



A Message from the Chief Financial Officer and Treasurer



As the Chief Financial Officer and Treasurer, I am pleased to present the City of Toronto's second Green Bond newsletter – your source of information for the City's Green Bond program.

A lot has changed since the last newsletter, including the declaration of a State of Emergency for the City of Toronto, enacting the City's COVID-19 pandemic response and restrictions to save lives and livelihoods.

Although the City's immediate focus remains on the municipal response to COVID-19, it's important that we don't lose sight of the efforts being made in the areas of environmental sustainability. The climate crisis is real and the City of Toronto, as Canada's largest city, has a responsibility to lead and take action to stop this global threat.

The City continues to invest in projects that are financially and environmentally sustainable. The 2020 approved budget includes a 10-year capital budget of \$43.4 billion, which provides the City with the funding it needs to make a difference in this area.

After the enormous success of the City's first Green Bond issuance of \$300 million in July 2018, we issued a second Green Bond offering of \$200 million in September 2019. Toronto was one of the first municipalities in Canada to establish such a program.

The net proceeds raised continue to help fund capital projects that meet the City's environmental objectives, including:

- mitigation and adaptation to the effects of climate change
- abatement and avoidance of greenhouse gas
- resource recovery and a hierarchical approach to waste management, and
- air, water and soil pollution prevention and control.

Green bond offerings are an important tool that help the City deliver tangible and sustainable outcomes, financially and environmentally. Global cities must be accountable for their actions to combat climate change while creating environmentally and socially responsible investment opportunities. The City of Toronto is proud to be a leader in the public sector by making real change and reducing our carbon footprint.

I encourage you to learn more about the City's [TransformTO Climate Action Strategy](#) and [Green Debenture Program](#).

A handwritten signature in blue ink, appearing to read 'Heather Taylor'.

Heather Taylor
Chief Financial Officer and Treasurer
City of Toronto

City of Toronto Green Bonds

Assurances

Sustainalytics, an independent sustainability rating firm, reviewed Toronto's Green Bond Framework and provided an assessment of the City of Toronto's environmental credentials as it relates to the Green Bond Principles.

Alignment with Green Bond Principles

Sustainalytics is of the opinion that Toronto's Green Bond Framework is credible and impactful, and aligns with the four pillars of the Green Bond Principles, 2017.

Impact Reporting

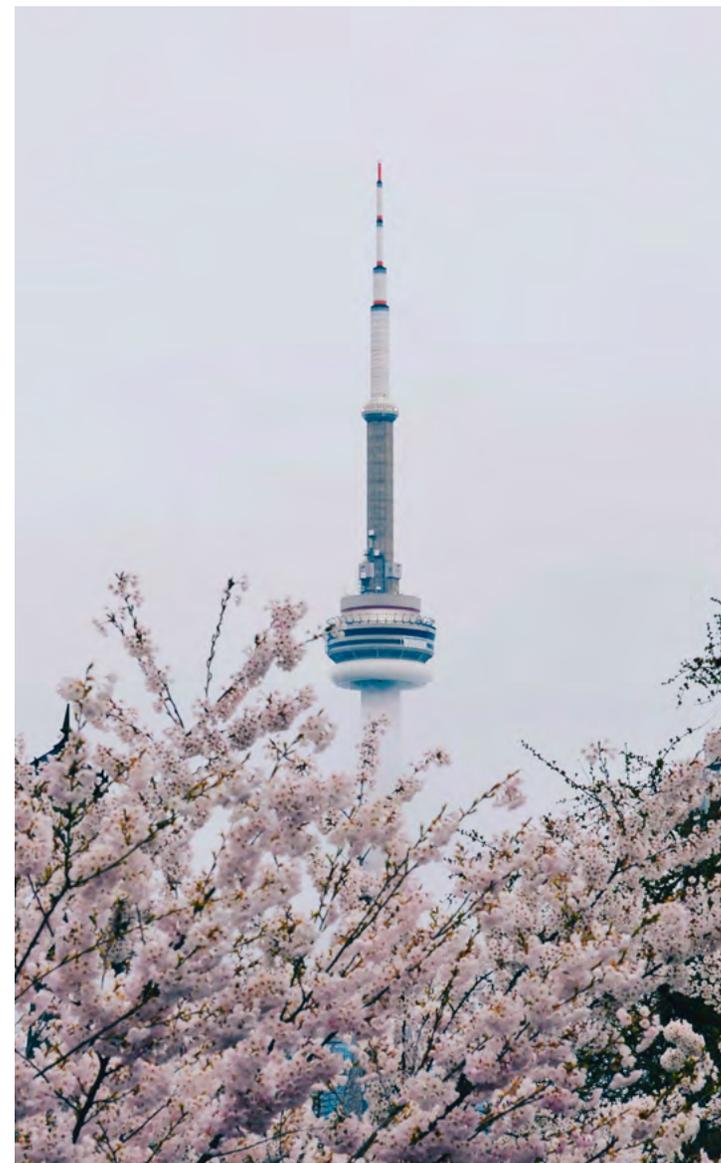
The City of Toronto will use the best available methodologies to select and report on project indicators.

Key Features

- Rank *pari passu* with conventional City of Toronto bonds, payable without preference or priority
- Carry the full faith and credit of the City of Toronto
- Investors do not assume any project-related risks
- Complies with the City's Green Bond Framework
- City of Toronto green bonds align with the Green Bond Principles, which promote integrity in the market through transparency, disclosure, and reporting

Future Issuances

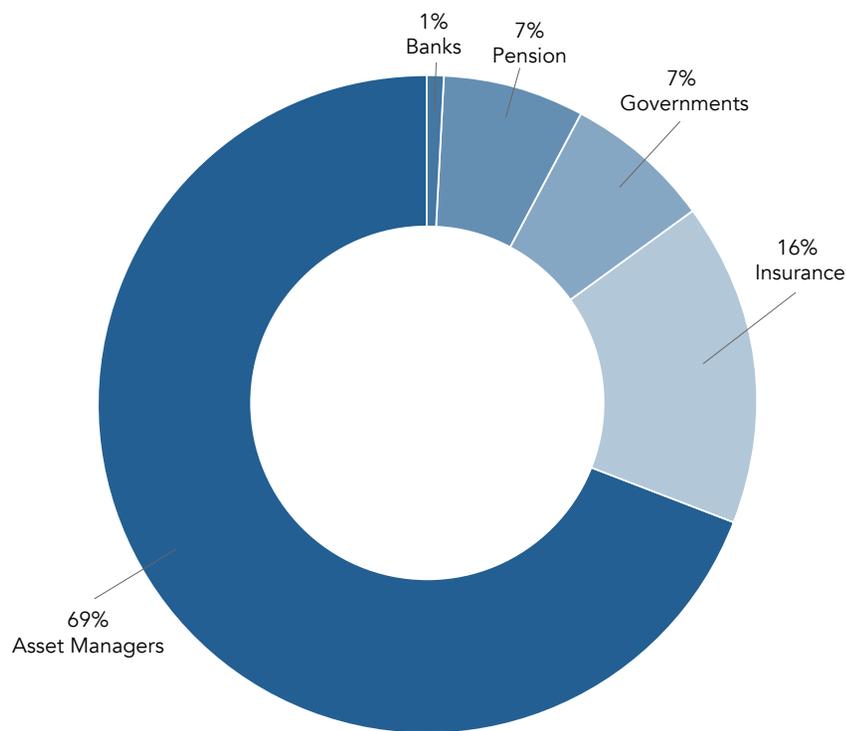
City of Toronto plans to have regular green bond issuances, with the next offering expected in 2020.



2018 Green Bond

As a part of the City of Toronto's (AA/Aa1/AA) overall capital borrowing program, the City initiated a Green Bond Program in 2018. Under the Program, net proceeds from bonds are used to fund Council approved capital projects that align with TransformTO, Toronto's Climate Action Strategy.

2018 Investor Type



On July 18, 2018, the City successfully issued a C\$300 million Green Bond. The bond was priced to yield 3.21 per cent with an August 2048 maturity. The offering marked the City's first-ever green bond issue and the largest municipal green bond in Canada.

Net proceeds from the 2018 green bond issue are funding eligible projects for sustainable clean transportation, including the purchase of subway cars, the renewal of core and supporting infrastructure of electric rail, building the Scarborough Subway extension, revitalizing Union Station, and making Leslie Barns more energy efficient and resilient to climate change.

The issue was over-subscribed with orders from 36 domestic investors.

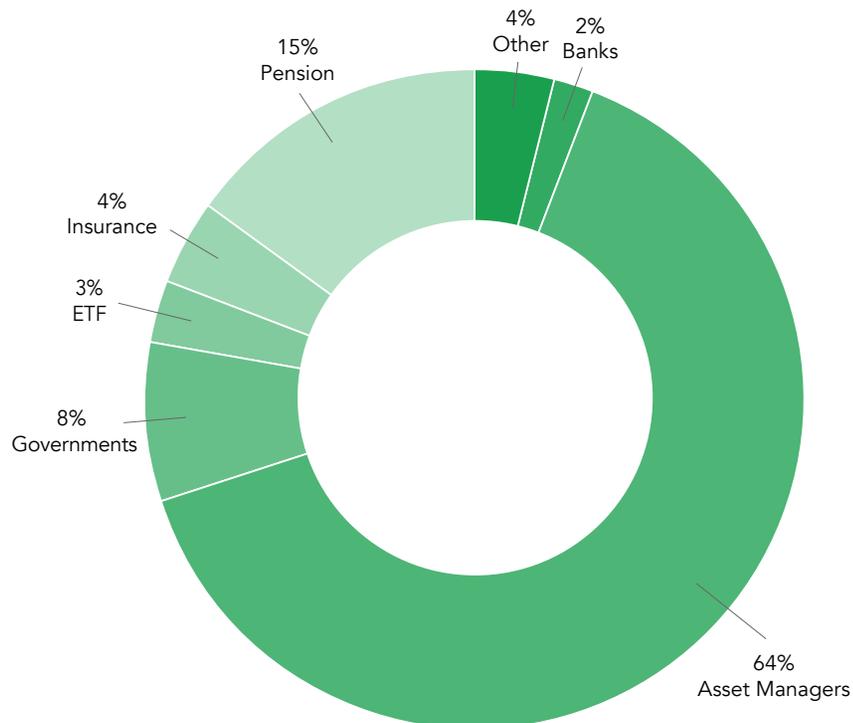
2019 Green Bond

On September 9, 2019, the City successfully issued another C\$200 million Green Bond. The bond was priced to yield 2.646 per cent with a September 2039 maturity.

Net proceeds from the 2019 Green Bond issuance are funding eligible projects for Toronto Community Housing energy retrofits, energy efficiency projects financed by the Sustainable Energy Plan Financing program, arena lighting retrofits, Port Lands flood protection, cycling infrastructure, renewal of infrastructure for electric rail, and solar photovoltaic projects.

The issue was over-subscribed with orders from 53 domestic and international investors.

2019 Investor Type



Bonds included in the index are independently evaluated and meet established Green Bond Principles. Indices include the S&P Green Bond, Solactive Green, and Bloomberg Barclays MSCI Green Bond Indices.

Use of Proceeds

2018 Green Bond

All bond proceeds have been disbursed for the 2018 Green Bond. Proceeds from green bonds are assigned to specific projects at the time of issuance and listed in the debenture by-law #1059-2018.

Project Name	Total Allocation (\$000s)	Funds Disbursed (\$000s)	% Disbursed
Sustainable Clean Transportation			
Supporting Infrastructure			
Bridges and Tunnels	36,733	36,733	100%
Subway Track	42,173	42,173	100%
Leslie Barns LRT Maintenance and Storage Facility	42,000	42,000	100%
Scarborough Subway Extension	35,099	35,099	100%
Union Station Revitalization	117,295	117,295	100%
Fleet			
Purchase of Subway Cars	26,700	26,700	100%
	300,000	300,000	100%

Use of Proceeds

2019 Green Bond

The majority of bond proceeds (93 per cent) have been disbursed for the 2019 green bond issuance. The remaining funds will be tracked to ensure compliance with the future funds allocation to the debenture by-law #1297-2019. Proceeds from green bonds are assigned to specific projects at the time of issuance and listed in the debenture by-law.

Project Name	Total Allocation (\$000s)	Funds Disbursed (\$000s)	% Disbursed	Funds to be Disbursed (\$000s)	% To be Disbursed
Sustainable Clean Transportation					
Supporting Infrastructure					
Cycling Infrastructure	24,353	9,550	39%	14,802	61%
Surface Track	4,694	4,694	100%	-	-
Sustainable Energy and Environment					
Social Housing Revitalization and Retrofit	111,961	111,961	100%	-	-
Port Lands Flood Protection	44,108	44,108	100%	-	-
Community Energy Efficiency Projects	14,884	14,884	100%	-	-
	200,000	185,198	93%	14,802	7%

TransformTO – Toronto’s Climate Action Strategy

TransformTO is the City of Toronto’s ambitious climate action strategy. TransformTO seeks to reduce greenhouse gas (GHG) emissions community-wide and increase climate resilience while improving social equity, health, and economic prosperity.

In October 2019, City of Toronto Council declared a climate emergency, deepening the City’s commitment to addressing climate change. As part of the climate emergency declaration, Toronto’s long-term GHG emissions target was revised to achieve net zero emissions by 2050 or sooner.

Achieving net zero emissions will require transformational changes in how we live, work, build, and commute. Everyone will have a role in making Toronto a low-carbon city. To reduce the worst impacts of climate change, TransformTO has set the following goals.



Home and Buildings

By 2030, all new buildings will be built to produce near-zero (GHG) emissions.

By 2050, all existing buildings will have been retrofitted to achieve net zero emissions.



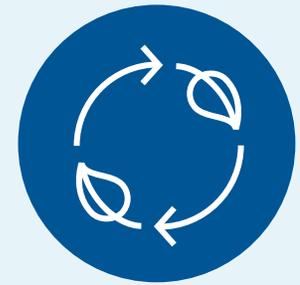
Energy

By 2050, 100% of energy will come from renewable or low-carbon sources.



Transportation

By 2050, 100 per cent of vehicles in Toronto will use low-carbon energy; 75 percent of trips under 5 km will be walked or cycled.



Waste Diversion

By 2050, we will have advanced towards a zero waste circular economy.

Project Eligibility and Selection

The selection of eligible projects is the responsibility of the Corporate Finance Division in consultation with internal and external expert stakeholders. Eligible projects are selected in accordance with the City of Toronto guidelines for use of proceeds, which includes financing or re-financing of new and/or existing capital projects that meet the City’s environmental objectives, in addition to other criteria described in the City of Toronto Green Bond Framework.

Following the identification of eligible projects, the Corporate Finance and Energy and Environment divisions verify the suitability of projects by reviewing the expected climate and resilience impacts. After the projects have been verified, the City follows its current debt issuance procedure with the Mayor or the Mayor’s Alternate and the Chief Financial Officer authorizing the issuance of debt.

In 2019, 18 projects received funding across four of the seven eligible categories. The table presents the program areas that received funding in the 2018 and 2019 issuances.

Eligible Categories	2018 Issuance	2019 Issuance
Sustainable Clean Transportation	✓	✓
Renewable Energy		✓
Energy Efficiency		✓
Pollution Prevention and Using Waste as a Resource		
Sustainable Water and Wastewater Management		
Climate Change Adaptation and Resilience		✓
Eco-efficient and/or Circular Economy Principles Integration		
Green Buildings		



Sustainable Clean Transportation

In Toronto's 2017 GHG emissions inventory, 38 per cent of GHG emissions are generated by transportation, with 80 per cent of those emissions attributed to personal vehicles. Investments in core and supporting infrastructure such as public transit and cycling systems will positively contribute to GHG reduction targets while improving the health, economic, and social equity outcomes of the community.

The City of Toronto Green Bond program funded six sustainable transportation programs:

2018:

- Union Station Revitalization
- Scarborough Subway Extension
- Leslie Barns
- TTC Fleet and Infrastructure Renewal and Upgrades

2019:

- Cycling Infrastructure
- TTC Infrastructure Renewal and Upgrades

Profiles for each of the six program areas are outlined in the subsequent pages.





Union Station Revitalization

Union Station is Canada’s busiest, multi-modal passenger transportation hub, a designated national historic site, and a significant part of Toronto’s history and identity. The work underway today is focused on improving the quality and capacity of pedestrian movement, while maintaining and restoring heritage elements. The revitalization of Union Station will improve train capacity and increase access to public transportation, while continuing to serve the more than 300,000 visitors that pass through the station every day.

Work currently underway includes:

- Significant restoration of The Great Hall to preserve and maintain the original heritage of the station
- Renovating and tripling the size of the Bay Concourse to improve pedestrian access
- Opening of retail space that has driven financial benefits for the City and servicing the local communities
- Installation of enclosed glass covers to protect pedestrians from inclement weather and provide natural light

Harvesting Rainwater

A rainwater harvesting program has been installed and covers part of Union Station and the train shed roof. Since the system has been in service, over 11.5 million litres of rainwater has been collected and used, resulting in a number of benefits such as reduced costs from the downstream management of stormwater, energy savings associated with reduced use of treated municipal water, and reduced GHGs from energy savings. The harvesting program also reduces stormwater run-off, which decreases pressure on sewer systems, thereby increasing climate resilience.

Cooling Union Station Naturally

Union Station uses Enwave's Deep Lake Water Cooling (DLWC) system which harnesses the cold temperature at the bottom of Lake Ontario to cool the Station. DLWC was installed as a source of cooling instead of conventional electricity-based cooling, with a potential to reduce energy use by 90 per cent. Connecting to the network can reduce water consumption and operating costs, provide more predictable energy costs, and improve building resilience.

	2017 (Baseline)	2018	2019	% Change Year-Over- Year	% Change from Baseline
Chilled Water Usage (Ton-Hr)	1,962,438	2,358,017	2,749,055	17%	40%
Electricity Equivalent (kWh)	6,901,606	8,292,799	9,668,022	17%	40%
Avoided Electricity Cost	\$587,099	\$372,814*	\$538,028	44%	(8%)
Annual GHG Emissions Avoided (tonnes eCO ₂)	50	148	245	66%	390%

*There were changes to Union Station's electricity payment structure which resulted in lower unit rates for energy costs.



Scarborough Subway Extension

The proposed Scarborough Subway Extension will add three new stations, bringing the TTC's Line 2 subway service nearly eight kilometres farther into Scarborough. The extension is expected to serve approximately 105,000 transit users daily.

The extension will encourage residential intensification and urbanization of Scarborough Centre, one of four designated 'centres' in the city of Toronto.

An important regional gateway for population, employment, and transportation for eastern Toronto, this extension can help facilitate compact land use and encourage greater walkability, ultimately reducing GHG emissions.

It is expected that approximately 38,000 people and 34,000 jobs will be located within a 10-minute walking radius to the station.

Planning for the project continues with Metrolinx and Infrastructure Ontario, estimating project completion by 2029-2030.



Leslie Barns

Leslie Barns is a 6.4 acres state-of-the-art facility for Toronto's new streetcar fleet. The first new storage and maintenance facility in 93 years, the site has a number of environmental and energy features designed into the facility.

Environmental and Energy Features



Resilience

- 10,000+ square metre green rooftop with a cool roof area designed to reflect more sunlight and absorb less heat
- Stormwater drainage and permeable pavement
- Flood mitigation by raising the site one metre
- Hundreds of native trees and water efficient vegetation planted throughout the property

Energy and Water Efficiency

- High-efficiency heating and ventilation equipment with heat recovery
- Energy efficient glazing with built-in shading on south and west facing windows
- Natural lighting features and interlayer frit patterns on windows to deter birds from colliding with glass
- Indoor energy efficient light fixtures and outdoor dark sky-compliant light fixtures to control light pollution
- Water efficient toilets and fixtures

Clean and Active Transportation

- Cycling infrastructure with indoor and outdoor bicycle parking
- Connectivity to the City of Toronto cycling network through the Martin Goodman Trail
- Public transit accessible by bus and streetcar

TTC Fleet and Infrastructure Upgrades

2018 2019 Green Bond

Transit Fleet Improvements

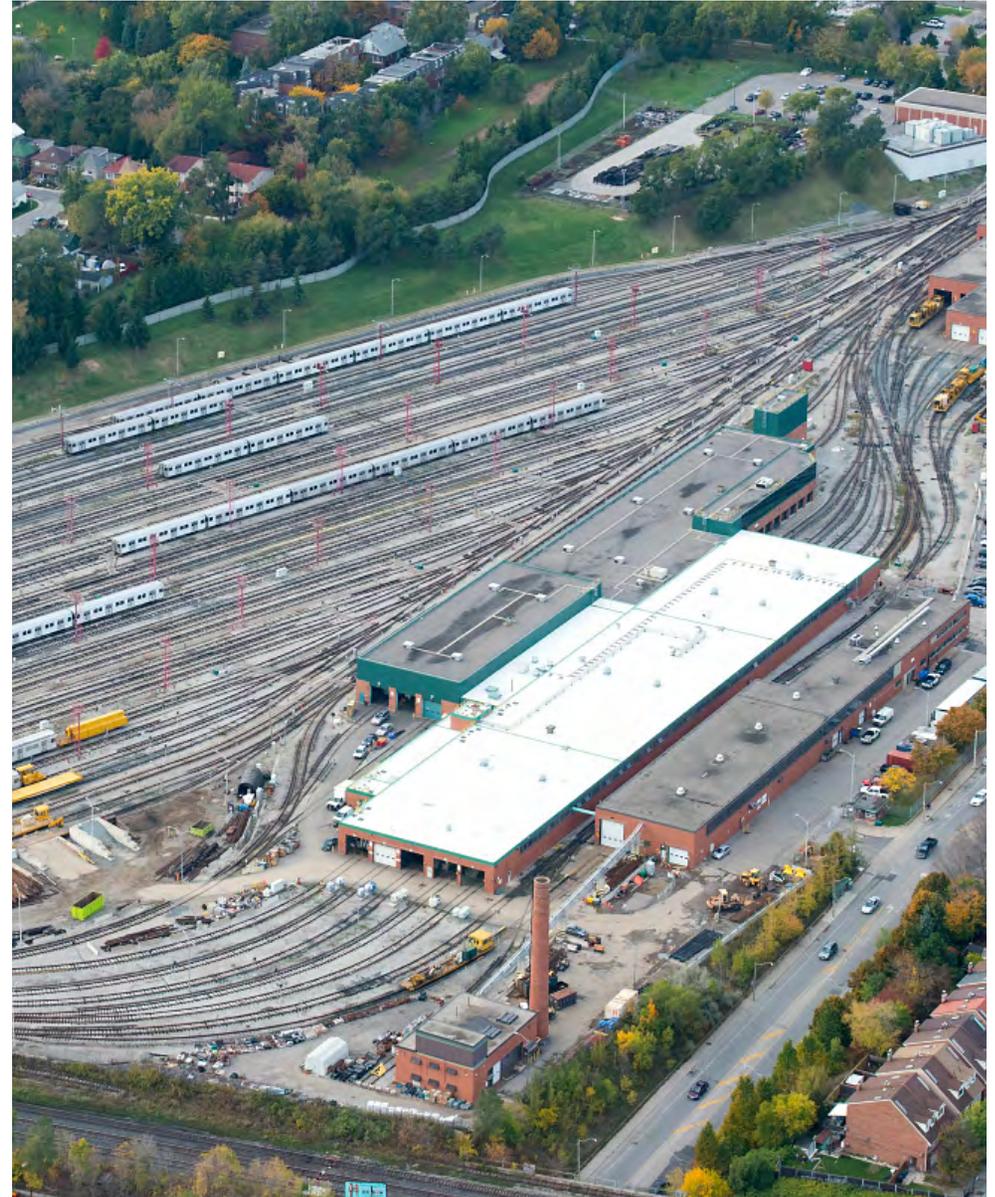
Toronto has added 60 Toronto Rocket (TR) trains to its subway system. With speeds up to 88 km per hour, the TR has increased the capacity of Line 1, Canada's busiest rapid transit line. When the fleet was initially fully converted, Line 1 carried approximately 29,000 passengers (an increase of 6 per cent) between Bloor Station and Wellesley Station during the morning rush hour.

The new TR trains consume 11 per cent less energy than the vehicles they replaced with recorded savings of 1,570 megawatt hour. The TR also produces 99.9 per cent less GHG emissions per passenger than a single-occupant personal automobile.

Transit Infrastructure Improvements

To support access to transit and the operation of the TTC, work is done to maintain and improve bridges, tunnels, and rail tracks for subways and streetcars. Transit infrastructure improvements can reduce GHG emissions through increased use of public transit, and further cost savings as transit assets are improved and its life extended.

Since 2018, work has been done to replace over 17,700 feet of subway rails and 4,600 feet of powerline on the Scarborough Rapid Transit line. Over 13,100 feet of surface track has also been overhauled through the Streetcar Track Plan, which uses a new construction method that is expected to provide 25 years of service, an increase of 10 years over prior track overhaul methods.



Greenhouse Gas Reductions

Annual Emissions Avoided by Public Transit Vehicle Type*

	2016 GHG Reductions (baseline, tonnes eCO ₂)	2018 GHG Reductions (tonnes eCO ₂)	2019 GHG Reductions (tonnes eCO ₂)	% Change Year-Over-Year	% Change from Baseline
Streetcar	61,063	41,374	104,833	153%	72%
Scarborough Rapid Transit	14,142	21,556	18,401	(15%)	30%
Subway	390,455	533,474	616,304	16%	58%
Total	465,660	596,404	739,538	24%	59%

*The GHG reductions are estimated by calculating per passenger emissions for each transit vehicle type and comparing it to the emissions from a typical single-occupant passenger vehicle. This analysis uses the 2018 emissions factor for electricity.



More people are riding bicycles in Toronto than ever before. In some neighbourhoods, over 20 per cent of residents have chosen cycling as their primary mode of transportation. Toronto is working towards bringing all residents within one kilometre of a designated cycling route and achieving its long-term climate action target of 75 per cent of trips under five kilometres being walked or cycled by 2050.

Green Debenture funding supported a variety of cycling projects including those outlined in Toronto's Cycling Network Plan.

Work completed in 2019 includes:

- 8.8 km of protected cycle tracks on Conlins Road, Hoskin Road, Bloor Street, and Scarlett Road
- 4.3 km of new bike lanes on Lawrence Avenue East and Blue Jays Way
- 28.7 km of upgrades to bike lanes across the city
- 0.7 km of an important trail link for the Waterfront Trail along Unwin Avenue

Future work will include:

- Over 120 km of new cycling infrastructure
- Additional upgrades to existing infrastructure through the Vision Zero Road Safety Plan
- Studies of over 70 km of routes within the near-term (2019 - 2021) for potential implementation



Renewable Energy

Solar Photovoltaics (PV)

Many of the City's over 100 rooftop solar PV systems were installed through the Provincial Feed-in Tariff (FIT) program, where the energy produced generates revenue for the City over a 20-year contract. Solar PV systems are an attractive financial investment for the City due to the revenue generated by the FIT program and avoided energy costs. They are also beneficial to the environment due to the emissions avoided from the generation of energy.

Renewable Energy Project Profile

Building Integrated Photovoltaics (BIPV)

The City is exploring emerging solar technologies such as BIPV, which replaces conventional windows with a solar glass that generates electricity while allowing natural light to come through. This technology is particularly well suited for buildings with limited roof space. The City recently installed a three kilowatt system at the North York Civic Centre to demonstrate the application of this technology in a dense urban environment.

2019 Green Bond

Greenhouse Gas Reductions Attributed to Solar PV Systems

	2011 (Baseline)	2018	2019*	% Change Over Baseline
Annual Energy Output (kWh)	370,137	11,279,640	11,279,640	2,947%
Annual GHG Reductions (tonnes eCO₂)	11	328	328	2,882%
# of Homes that Could be Powered by Energy Generated	40.5	1,236	1,236	2,952%
Total Projects	6	100	100	1,567%

*Due to the dissolution of the FIT program by the Province, no new projects were installed between 2018 and 2019 with staff efforts instead focused on preparing the City for new Net Metering projects which are expected to come online in 2021.

Energy Efficiency

Retrofits to buildings can save energy and make buildings more efficient and resilient to adverse climate events. Substantial cost savings and GHG reductions can also be realized, while providing community benefits and increased local economic and job opportunities.

Energy Efficiency Project Profiles

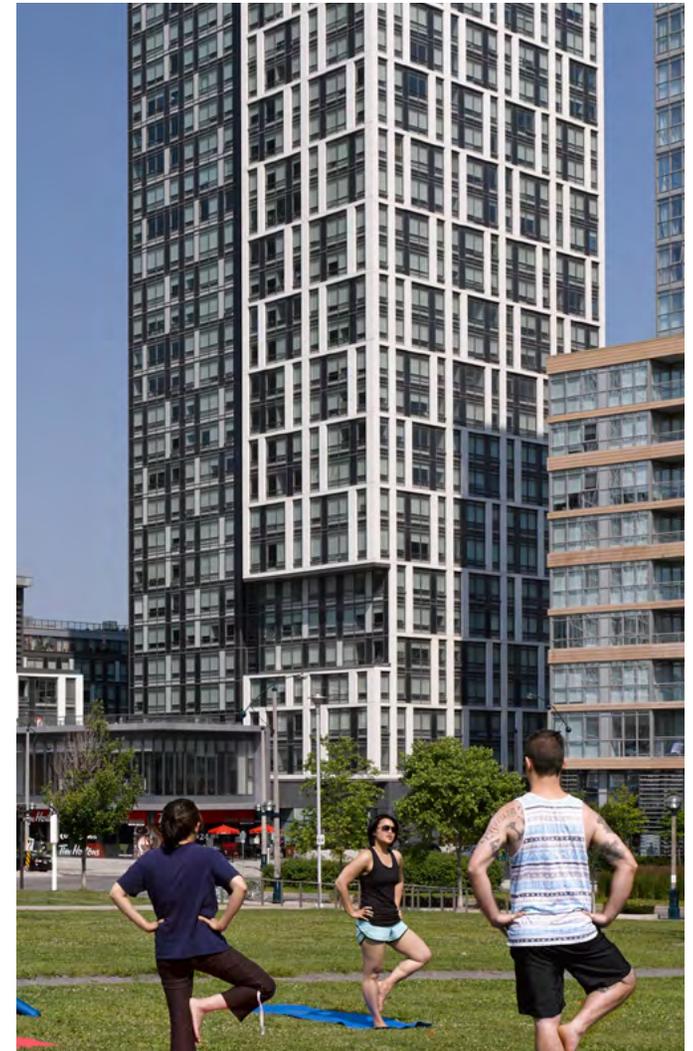
Toronto Community Housing - Energy Retrofits

Toronto Community Housing Corporation (TCHC) is transforming its aging public housing infrastructure to build better homes and neighbourhoods. These efforts will create a resilient network of sustainable buildings that will act as a safe haven for residents, as well as offer shelter to the local community during power outages.

TCHC is committed to reducing energy consumption by 25 per cent by December 2028. In 2019, TCHC achieved a 6.4 per cent reduction in energy consumption from energy conservation measures implemented over the last three years. Highlights of conservation efforts include:

- LED lighting retrofits at 55 sites
- Elevator retrofits at 25 buildings
- Replacement of 84 heating boilers
- New higher-efficiency window projects at three Moss Park buildings
- Building automation system upgrades at 18 buildings
- New booster variable frequency drive pumps at 17 buildings
- Installation of 6,400 portable air conditioning units in high rise buildings
- Make-up air unit upgrades and high-efficiency chiller replacements

2019 Green Bond



Toronto Community Housing - Greenhouse Gas Profile

	Energy Use (kWh)	Energy Reduction from Baseline* (kWh)	Energy Reduction from Baseline* (%)	GHG Emissions (tonnes eCO ₂)	GHG Reductions from Baseline* (tonnes eCO ₂)
2019	4,829,531	331,128	6.4%	188,836	13,895

*The baseline is calculated based on the 2013 to 2017 five-year monthly energy usage. As TCHC has a diverse building portfolio, a 5-year data set can produce a more accurate regression equation for the baseline.



Arena Lighting Retrofits

The City of Toronto provides opportunities for residents to skate at its 40 indoor arenas. Aside from the refrigeration systems, arena lighting is the largest consumer of electricity. Lighting retrofits were completed in City-owned arenas where outdated and energy-intensive lights such as T12 and metal halide fixtures were replaced with high-efficiency light-emitting diodes (LED). Installation of occupancy sensors and light dimming controls were also completed in various buildings.

There are several benefits to be gained from lighting changes. LEDs produce less heat compared to older lighting technologies so chillers do not consume as much energy. LED lights also provide brighter arena lighting and these longer-lasting bulbs require fewer replacements, resulting in lower maintenance costs.



Lowering Emissions through Energy Retrofit Financing

The 2019 Toronto Green Debentures program helped lower emissions by providing funding for 12 major energy retrofit projects at Exhibition Place, the YMCA of Greater Toronto, Harbourfront Centre, Ford Performance Centre (previously known as the Mastercard Centre), co-operative housing buildings, and homes for the elderly. Energy retrofit work at the various locations included:

- Lighting retrofits (energy efficient lighting sources and lighting control systems installation)
- Building automation system installation, repairs, upgrades, and/or recommissioning
- Replacement or equipment upgrades (e.g. HVAC boilers, heating and domestic hot water systems, washers and dryers, air-to-air heat pumps, domestic hot water recirculation loop pump timers, Variable Frequency Drives retrofits, and electrical harmonizers)
- Building envelope repairs and insulation improvements (roof replacements and air sealing)
- Installation of a photovoltaic system to heat water

Reducing community emissions will put Toronto on a path to realizing the City’s GHG emissions target of net zero emissions by 2050 or sooner.

Estimated Greenhouse Gas Reductions from Retrofits*

Estimated Annual Energy Savings (MWh)	Estimated Annual Energy Cost Savings	GHG Intensity (KgeCO ₂ /m ²)	GHG Reductions (tonnes eCO ₂)
42,194	\$3,805,278	10.39	4,202

*The numbers in the tables are contingent on completion of the projects.



Climate Change Adaptation and Resilience

The Port Lands is currently home to a variety of industrial, port, film and creative sector businesses. Adjacent to downtown Toronto, intensification pressures have been inhibited by flood risk and soil contamination. Flood management and protection can enhance Toronto's resilience and help mitigate the impact of climate change on the city through the creation of new mixed-use communities, featuring naturalized areas, served by transit.

Resilience Project Profile

2019 Green Bond

Port Lands Flood Protection

The Port Lands Flood Projection Project is one of the largest infrastructure projects in Toronto's history and will protect Toronto's southeastern downtown area (Port Lands, South Riverdale, and Leslieville) from extreme flooding by creating a naturalized river mouth that reconnects the Don River to Lake Ontario.

Highlights include:

- Flood risk removed from 240 hectares of land
- Over 1,000 metres of a new river channel
- 13 hectares of new coastal wetland, with a 2-hectare wetland patch connecting to the Ship Channel
- 5 hectares of terrestrial habitat located within the constructed valley system
- Creation and enhancement of 14 hectares of aquatic habitat
- 25 hectares of publicly accessible green space and parkland for the community
- Cleanup of polluted land, along with new infrastructures such as roads, bridges, utilities, and public trails



City of Toronto Contacts

Learn more about the [City's Green Bond Program](#).

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