

Guelph's Race-to-Zero Community GHG Emissions



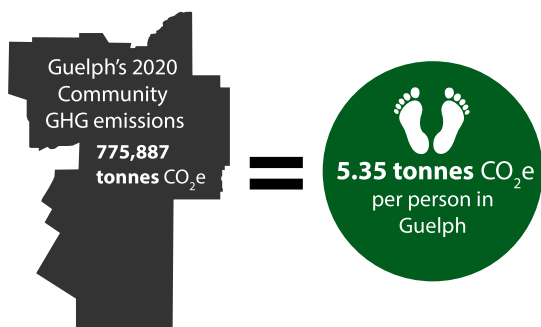
The City of Guelph is committed to the United Nations Race-to-Zero campaign and has set targets for the whole community to reduce greenhouse gas (GHG) emissions:

- Reduce our community GHG emissions by 63 per cent against the 2018 baseline by 2030**
- Work together to become a net zero carbon community by 2050

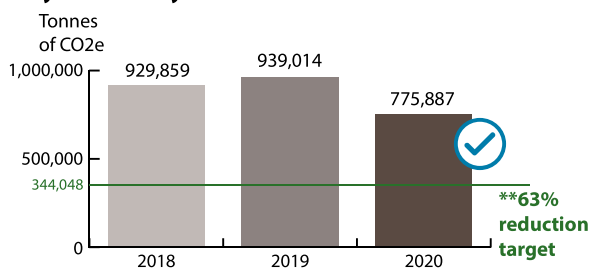
City staff incorporate environmental stewardship in municipal operations and services to support the Race-to-Zero targets by:

- Reducing GHG emissions from municipal operations (Energy and Climate Change)
- Supporting and encouraging walking, cycling, car-pooling, car-sharing and transit-use within Guelph (Sustainable Transportation)
- Leading in sustainable waste management (Solid Waste Resources)
- Protecting Guelph's natural heritage system and urban forest (Urban Forest and Natural Heritage)
- Restoring clean water (Wastewater Services)
- Efficiently supplying high quality drinking water (Water Services)

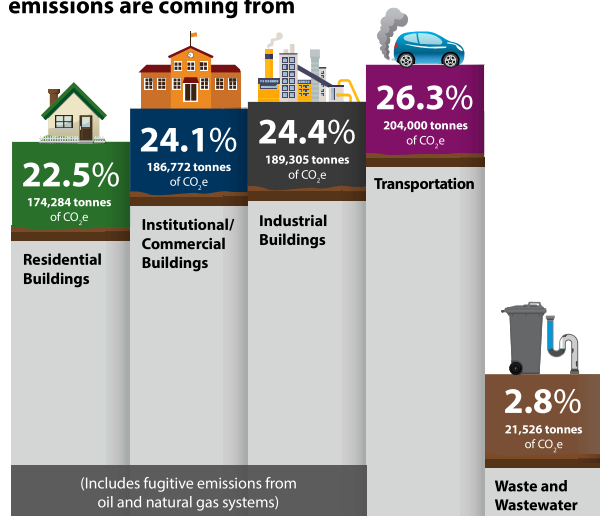
The amount of GHG emissions the community emitted each year



Yearly community GHG emissions



Where in the community GHG emissions are coming from



*2021 data requests have been submitted to utility companies (Alectra Utilities and Enbridge) in 2022 Q1. The data was not available at the time of report writing.

** 63 per cent reduction target applies to per capita emissions. Target line depicts GHG reduction based on 2018 population.

Accessible formats available by calling 519-822-1260 extension 2672 or TTY 519-826-9771.

Energy and Climate Change

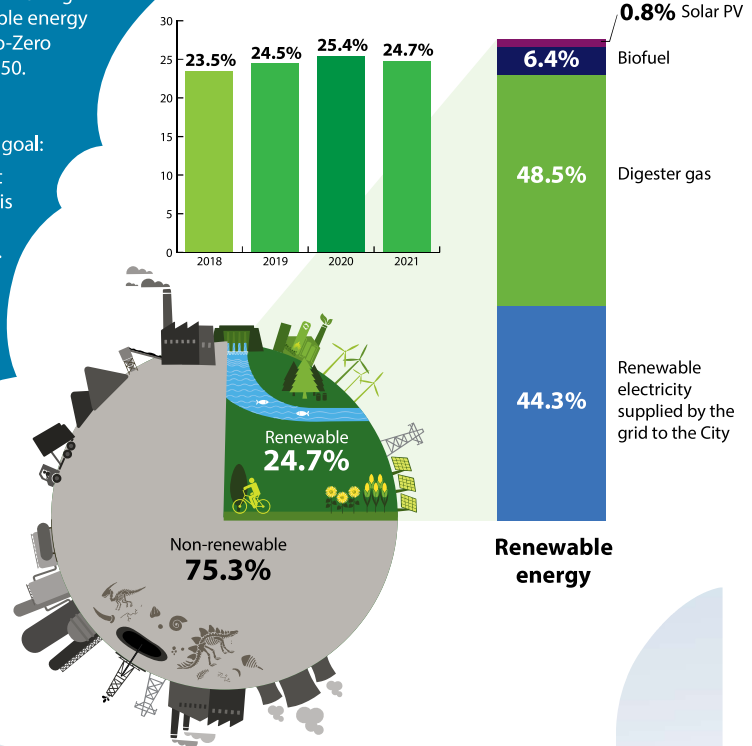
The City is taking an energy conservation and greenhouse gas (GHG) emissions reduction approach to reach our goal of having City facilities and operations using 100 per cent renewable energy (100RE) sources by 2050. This supports the City's Race-to-Zero commitments to be a net zero carbon community by 2050.

2021

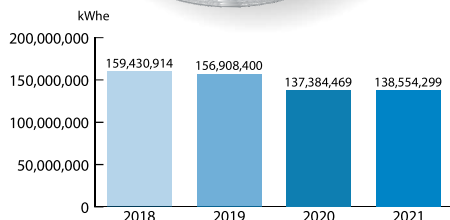
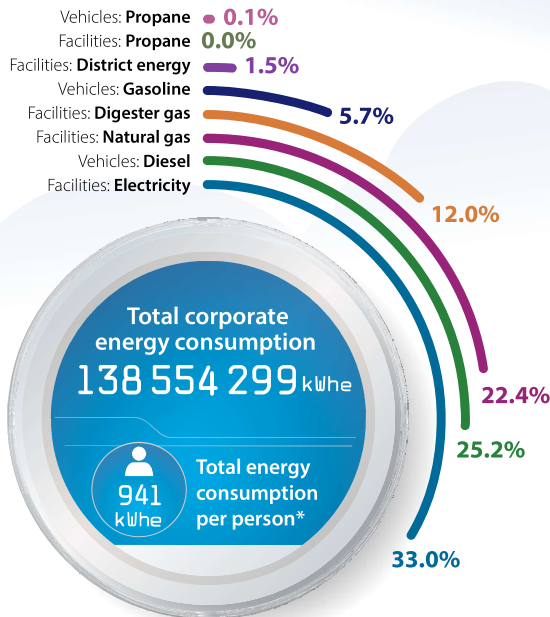
The City continues efforts towards the Corporate 100RE goal:

- GHG emissions were up 3.6 per cent compared to last year but remains well below 2018 and 2019 levels. This indicates that although activity levels increased with reopening, majority of the GHG reductions remained. We are making progress and we need to keep at it.
- Keep on conserving! Despite more activities in our facilities than in 2020, energy conservation keeps on going with facilities using the same amount of energy.
- More renewable generation. Utilizing Corporate facilities for solar PV generation has increased by nearly 22 per cent, with more green energy coming!

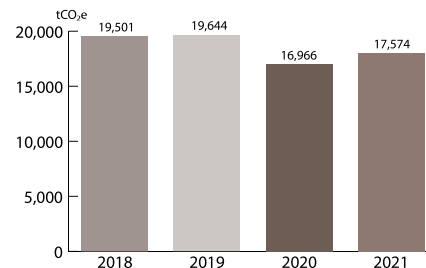
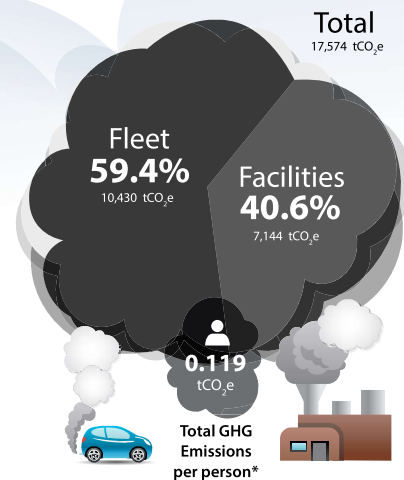
100 RE status



Total corporate energy consumption



Greenhouse gas emissions



Corporate GHG reporting has been updated to follow the [Greenhouse Gas Protocol](#) more closely. Reported GHG emissions exclude biogenic CO₂ emissions.

*based on 2021 City of Guelph population.

All data and analysis are based on current information at the time this report was prepared. This information is subject to be updated from time to time.

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What we've done







2021 key project highlights

-  Electricity savings
-  Natural gas savings
-  Other fuel savings
-  Water savings
-  Greenhouse gas emissions reduction
-  Energy cost savings/year
-  Project cost
-  Project status



Net-zero energy Hanlon Splash Pad





The first splash pad in Guelph got a refresh, and its better than ever. The new fully accessible splash pad saves energy and generates renewable energy too. The new splash pad has a high-efficiency recirculation water system, that uses less chemicals to treat the water. A solar shade canopy and more panels on the washroom roof generate renewable energy to supply 100 per cent of the splash pad's energy needs.

-  **15,400 kWh/yr**
-  **370 m³/yr**
-  **500 kgCO₂e/yr**
-  **\$4,000**
-  **\$42,000**
-  **Complete**



West End Community Centre HVAC upgrades to air source heat pump






Roof top HVAC equipment at the West End Community Centre were upgraded with new units that recover waste heat, are better insulated, and use air source heat pump technology instead of natural gas to heat and cool the community centre. This significantly reduces the GHG emissions of the community centre while keeping it comfortable inside.

-  **-951,200 kWh/yr**
-  **390,030 m³/yr**
-  **707,800 kgCO₂e/yr**
-  **\$1,750,000**
-  **Complete**



Pilot electric bus chargers and battery electric buses

Guelph Transit is going electric to significantly reduce GHG emissions. This will change the way we power our buses and how we continue to move people on public mass transit. The City is installing pilot-scale chargers to help give a boost to our first four battery electric buses later this year.

-  **134,200 L/yr diesel**
-  **363,500 kgCO₂e/yr**
-  **\$105,000**
-  **\$7,140,000**
-  **In progress**



Ice arena heat exchangers and controls upgrades







Heat exchangers used for ice rinks at West End Community Centre and Exhibition Arena were upgraded with energy efficient equipment that hold significantly less harmful chemicals in the building. In addition, ice plant controls were installed and updated at all of the recreation ice arenas to improve operation and save energy.

-  **380,500 kWh/yr**
-  **11,400 kgCO₂e/yr**
-  **\$57,000**
-  **\$428,000**
-  **Complete**



Greenhouse controls

Greenhouse controls at Riverside were installed to reduce energy use and help grow and maintain all of those beautiful plants and flowers you see across this vibrant city.

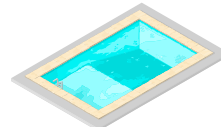
-  **25,200 kWh/yr**
-  **4,500 m³/yr**
-  **9,300 kgCO₂e/yr**
-  **\$5,000**
-  **\$37,000**
-  **Complete**



Public electric vehicle (EV) charging







Twenty fully accessible electric vehicle charging stations were installed at several City locations. This is to support the adoption of low emissions vehicles in the community and for visitors to Guelph. This initiative received funding from the Federal Government.

-  **\$252,000**
-  **Complete**



Pool boiler upgrades

Pool boilers and distribution systems at West End Community Centre, Victoria Road Recreation Centre and Lyons Pool were upgraded with energy efficient equipment to keep the pools running at tip top shape for all the summer camps and aquafit lessons.

-  **15,700 kWh/yr**
-  **40,500 m³/yr**
-  **76,900 kgCO₂e/yr**
-  **\$13,000**
-  **\$480,000**
-  **Complete**



Multiple facility lighting upgrades

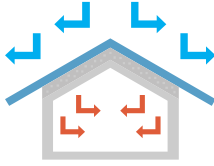
Lighting at the Fleet Services and Public Works Yards, Courts, and West End Community Centre were upgraded to long-lasting, energy-efficient light emitting diode (LED). This drastically improves lighting conditions, reduces maintenance and saves energy.

-  **227,000 kWh/yr**
-  **\$28,000**
-  **\$264,000**
-  **Complete**

What we're planning





2022 key prospect highlights

-  Electricity savings
-  Natural gas savings
-  Other fuel savings
-  Water savings
-  Greenhouse gas emissions reduction
-  Energy cost savings/year
-  Project cost
-  Project status



Clair Road Emergency Services Centre building envelope upgrades

Insulation and air sealing improvements are being added to the emergency services building to save energy by keeping the heat in and the cold out.

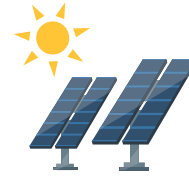
-  **9,000 kWh/yr**
-  **2,470 m³/yr**
-  **4,900 kgCO₂e/yr**
-  **\$2,000**



More lighting upgrades - multiple locations

LED lighting retrofits at several facilities (locations include Exhibition Arena, Sports Dome, Library Branches and the Clair Road Emergency Services Centre) will be done to not only save energy, but also improve lighting conditions.

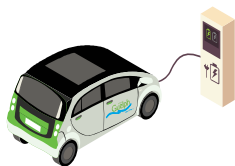
-  **500,000 kWh/yr**
-  **15,000 kgCO₂e/yr**
-  **\$62,000**



River Run solar panels expansion

Design work is currently underway to add solar panels to the roof of the River Run Centre that will generate renewable energy while you sit inside and enjoy a stellar performance.

-  **176,600 kWh/yr**
-  **5,300 kgCO₂e/yr**
-  **\$22,000**



Fleet electric vehicles





The City's fleet of electric vehicles is growing with the scheduled replacement of four vehicles. These gas guzzlers will be replaced with quiet, zero-tailpipe emissions vehicles that save energy and help improve air quality.

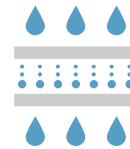
-  **6,300 kgCO₂e/yr**



Victoria Road Recreation Centre heating, ventilation and air conditioning (HVAC) upgrades to air source heat pump





Applying the learnings from West End Community Centre, roof top HVAC units are being upgraded with new HVAC units that will recover waste heat and use air source heat pumps instead of natural gas to heat and cool the recreation centre.

-  **-4,900 kWh/yr**
-  **20,420 m³/yr**
-  **38,400 kgCO₂e/yr**
-  **\$5,000**



Water Resource Recovery Centre aeration upgrades

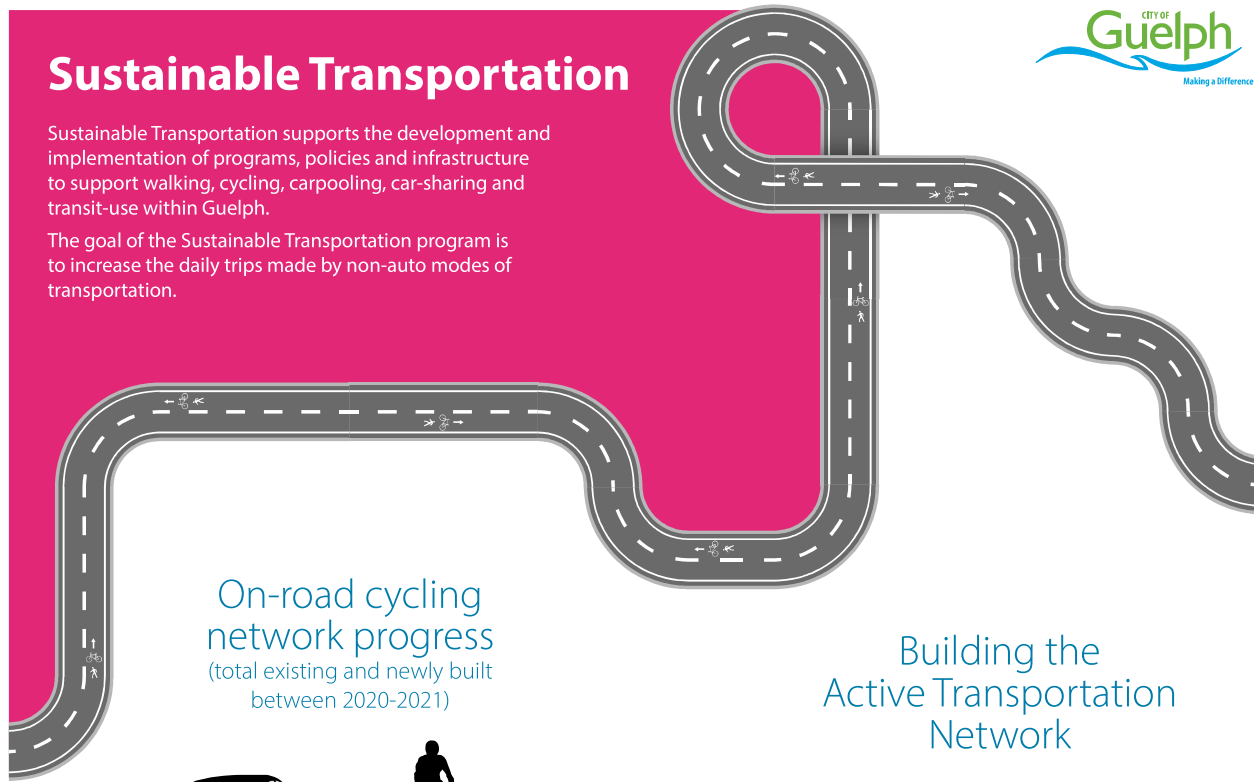
Construction will continue with the multi-year aeration plant upgrades at the City's Water Resource Recovery Centre. The upgrade includes replacing inefficient fixed speed blower equipment with dissolved oxygen controlled modulating blowers to optimize the treatment process and significantly reduce energy use.

-  **6,750,000 kWh/yr**
-  **202,500 kgCO₂e/yr**
-  **\$837,000**
-  **In progress**

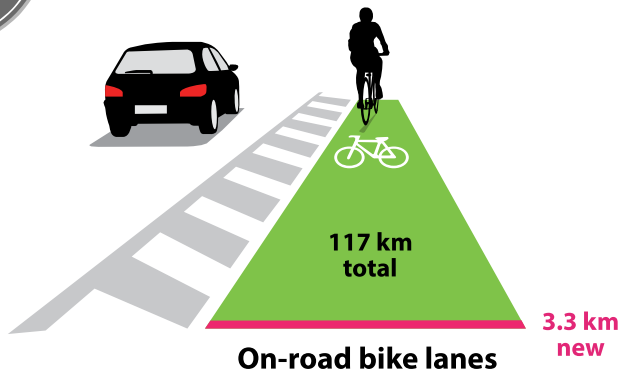
Sustainable Transportation

Sustainable Transportation supports the development and implementation of programs, policies and infrastructure to support walking, cycling, carpooling, car-sharing and transit-use within Guelph.

The goal of the Sustainable Transportation program is to increase the daily trips made by non-auto modes of transportation.



On-road cycling network progress
(total existing and newly built between 2020-2021)

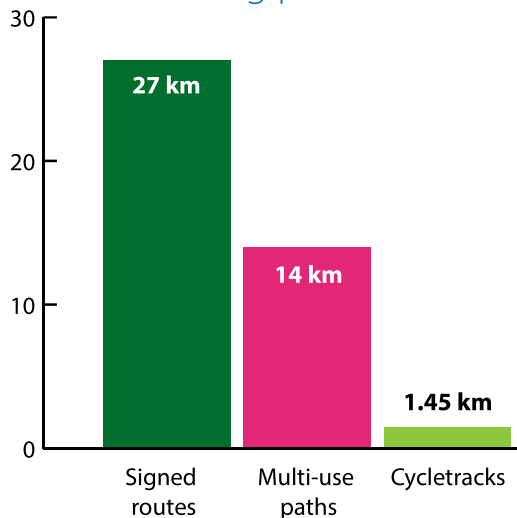


Building the Active Transportation Network

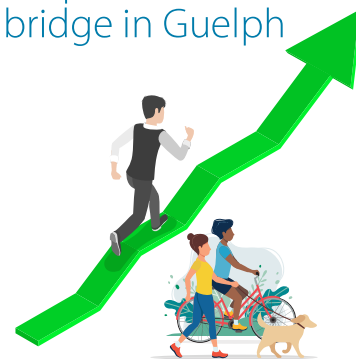
\$900,000
in federal grants

Staff secured \$900,000 from the federal covid relief program to support two active transportation construction projects in Guelph.

Existing paths



Active transportation counts at the Speedvale Avenue bridge in Guelph



Walking and wheeling increased **54%** at this location in 2021 compared to 2020

*Based on 2021 City of Guelph population. All data and analysis are based on current information at the time this report was prepared. This information is subject to be updated from time to time.

What we've done

2021 key project highlights



Making developments more Active Transportation friendly

Sustainable Transportation staff reviewed and provided comments on over 110 development applications, to advocate for a range of Sustainable Transportation measures such as indoor secure bike parking, visitor bike parking, carpool spots and vehicles, pedestrian connectivity, unbundled parking and transit supportive measures.



Community Engagement completed for Stone Road cycle tracks

Underwent community engagement to share the design drawings and welcome comments for protected cycling infrastructure coming to Stone Road, from Edinburgh to the Hanlon.



Transportation Master Plan

In May 2021, City Council approved the preferred solution, "Sustainability + Resiliency focus" that will support a mode share target of 42 per cent non-auto trips and contribute toward an estimated 23 per cent reduction in greenhouse gas emissions by 2051. The supporting policies and programs were developed for the preferred solution and a final round of engagement was held in the fall, prior to completing the Transportation Master Plan.



Protected cycling infrastructure study

Feasibility study, conceptual design and community engagement have been initiated for 13 km of protected cycling infrastructure in Guelph. This work is being supported by \$3.39 million dollars in funding from the Investing in Canada Infrastructure Plan.



Cycling end-of-trip amenities

The City installed 40 new bicycle racks in the downtown core which has created 80 new bicycle parking spaces.



Active Transportation data collection

The City gathered 1,548 hours of count data across 27 locations and counted a total of 82,552 active transportation trips!

What we're planning

2022 key prospect highlights



Transportation Master Plan: Moving Guelph Forward

The 2022 Transportation Master Plan was approved in January 2022 prior to publishing this report. To begin implementing the plan in 2022, staff are developing a Complete Street Design Guideline, a Goods Movement Strategy as well as a Transportation Demand Management Action Plan.



New pedestrian crossing locations this year

In 2022, the City will add seven new pedestrian crossovers to improve safety and accessibility for people walking in Guelph.



Bike signals coming to Guelph!

Implementing bike signals at several key intersections to improve safety and functionality of the transportation system.



Bike path construction: Speedvale Avenue West multi-use path

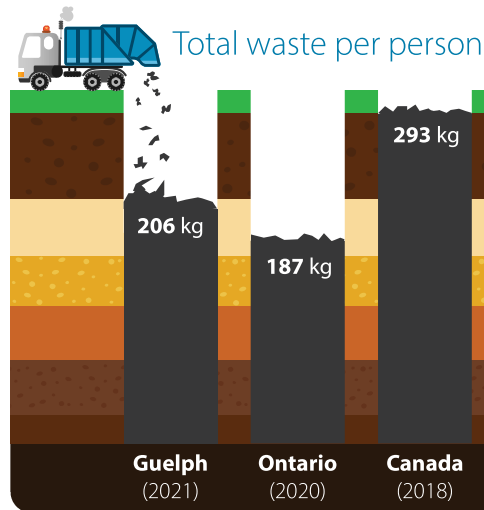
This project will add separated pedestrian and cycling infrastructure between Elmira Road and Imperial Road, and will also upgrade the intersections in the area to be bicycle-friendly.

Solid Waste Resources

In 2021, the City continued to build on Guelph's leadership in sustainable waste management.

In 2021...

- Guelph residents disposed of about 87 kg less waste per person compared to the national average but more work is to be done to move Guelph's disposal rates lower than Ontario's.
- Guelph residents diverted 60 per cent of their waste away from landfill through proper sorting.
- The City's organic waste processing facility diverted 38,873 tonnes of organics from landfill, which was converted into 7,045 tonnes of finished compost.



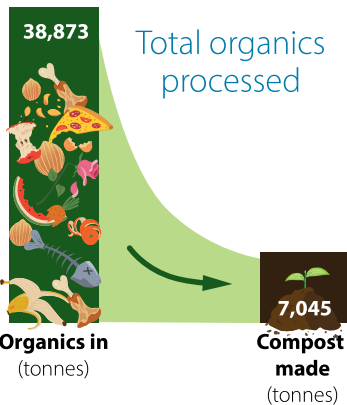
19,500 tonnes of CO₂e emissions was reduced by organics processing which is equivalent to taking 6,434 cars off the road for a year.

Total residential waste collected at the curb (tonnes)



23,600 tonnes of CO₂e

emissions was reduced by capturing landfill gas used to generate electricity and is equivalent to taking 10,723 cars off the road for a year.



60%



of Guelph's curbside waste was diverted from landfill through proper sorting

Circular economy

A key finding from the City's Solid Waste Management Master Plan (SWMMP) is the emergence and growing community interest to move towards a circular economy. This recognition highlights the importance for the City to prioritize and adopt a circular economy framework to further the City's aspiration towards zero waste goals. The current linear 'take-make-dispose' pattern, in which resources are extracted, made into products that are used for a short period of time, and then disposed – pays insufficient attention to the high social, environmental, and economic costs of waste.



What we've done

2021 key project highlights



Curbside yard waste collection

In 2021, the first year of the curbside yard waste collection program, 15,000 vehicles dropped off yard waste at the Waste Resource Innovation Centre (WRIC) compared to 57,000 vehicles in 2019. That's a decrease in vehicles by 74 per cent, reducing emissions and traffic congestion at the WRIC.



Carbon Credit Sales

The City sold \$237,000 worth of carbon credits generated from the capture of CO₂e from landfill and organics processing and converting it into electricity. Funds will be used to help achieve the City's 100 per cent renewable energy by 2050 goal.



Material Recovery Facility

The City, with help from the Guelph community, diverted over 3,500 tonnes of paper and 1,470 tonnes of containers (cans, glass, plastic bottles, etc.) from landfill and sold the materials back to market.



Curbside waste audits

Conducted over 8,000 curbside waste audits to help educate Guelph residents and improve their sorting. 57 per cent of audited households improved their sorting in the grey cart, 36 per cent improved their sorting in the blue cart and 27 per cent improved their sorting in the green cart.



Waste Resource Innovation Centre

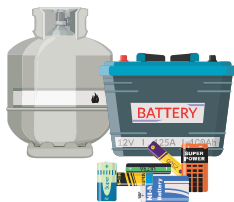
The Waste Resource Innovation Centre helped divert 25,392 tonnes of waste away from landfill, which is made up of:

- Electronic waste: 135 tonnes
- Construction demolition waste: 1,572 tonnes
- Scrap metal: 441 tonnes
- Yard waste: 7,500 tonnes
- Organics: 10,725 tonnes
- Recycling: 5,000 tonnes
- Textiles: 19 tonnes



Reuse programs

About 385 bikes diverted from landfill through the ReCycle bike reuse program and 3,758 L of paint was diverted from landfill through the Paint+ reuse program.



Household hazardous waste

We ensured safe disposal of 241 tonnes of hazardous waste, diverting it from landfill while also helping to protect our water supply and environment, preventing fires and keeping our staff and community safe.



Multi-residential waste collection

The City collects waste from multi-residential buildings with carts and front-end bins, helping ensure more Guelph residents are sorting and diverting their waste. We added 11 properties and 861 units to multi-residential collection.



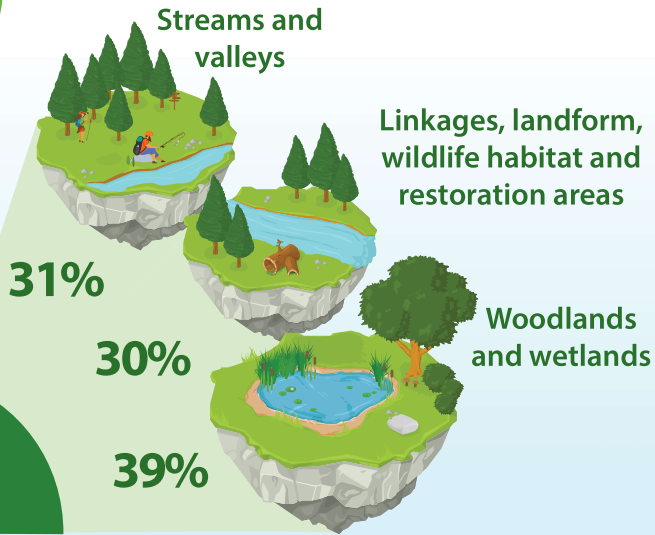
Customer service and public education

Waste Resource Innovation Centre staff provided customer service assistance to an estimated 15,438 customers in person, over the phone and by email.

Urban Forest and Natural Heritage

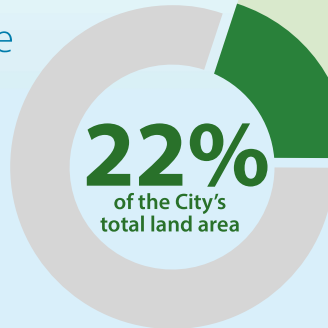
The City maintains, protects and restores Guelph's natural heritage system and urban forest which helps us to:

- reduce pollutants in the water and air
- save energy by cooling our community
- support the health and wellbeing of Guelph residents
- provide recreational spaces and opportunities for outdoor activities
- allow for local plants and wildlife to move throughout their lifecycles safely and healthfully
- support a wide range of native plants and wildlife
- mitigate floods



Natural heritage system

Guelph's natural heritage makes up 1/5 of Guelph's land area

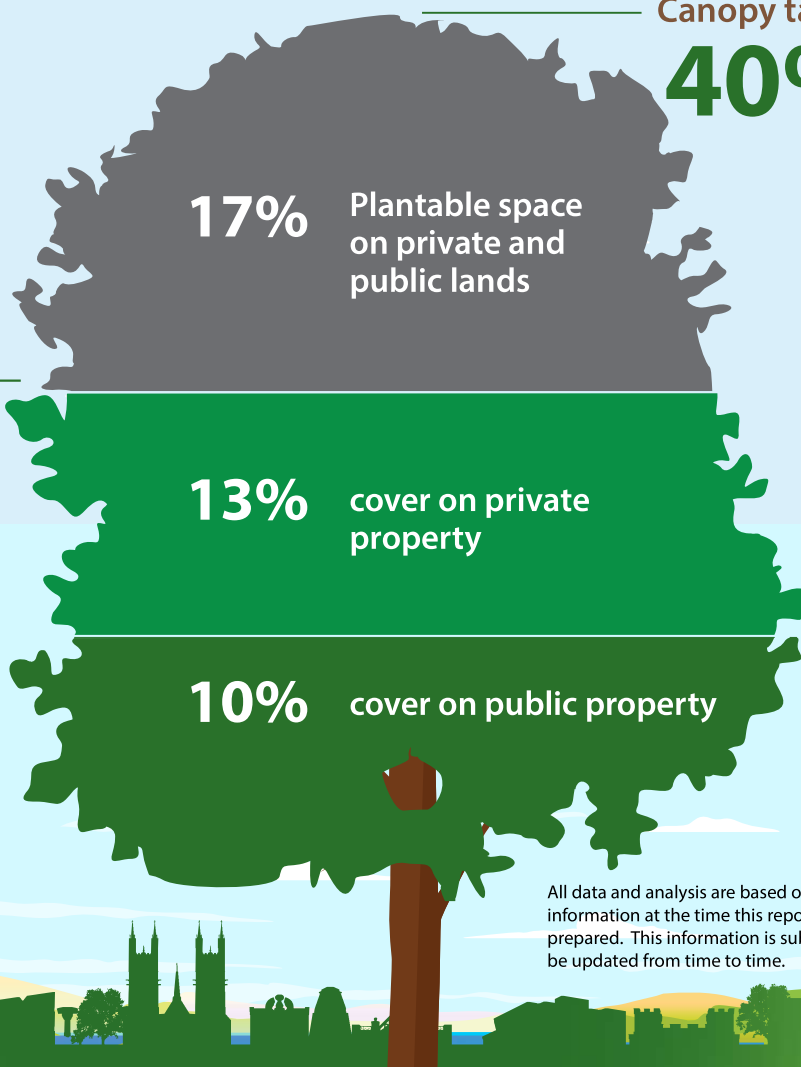


Urban forest

Guelph's urban forest provides valuable ecological, social and economical benefits to the community

Canopy target **40%**

Canopy cover is **23%**
of the City's total land area



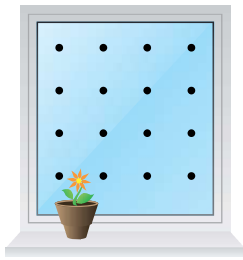
Most canopy cover is in woodlands, natural areas and mature neighbourhoods

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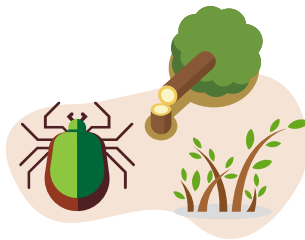
What we've done

2021 key project highlights



Bird-friendly Design Guidelines

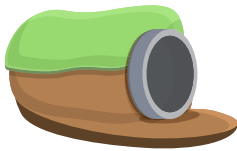
The Bird-friendly Design Guideline was completed as part of the Natural Heritage Action Plan. The guideline, which is implemented through the Site Plan Review Committee, helps to prevent bird-window collisions from occurring by requiring glass to be treated with visual markers and ensuring that buildings do not incorporate design traps for birds.



Invasive species management

The City removes invasive species throughout the year to maintain and improve Guelph's ecological health in our parks and natural areas

- Removed 104 hectares of invasive species (species like buckthorn and dog strangling vine)
- Removed 1,500 ash trees killed by emerald ash borer
- Treated 191 healthy ash trees with TreeAzin™ (insecticide)
- Monitored for spongy moth (*Lymantria dispar*)



Wildlife tunnels and funnel fencing

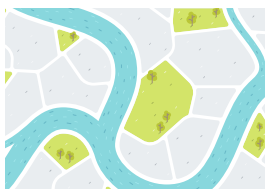
Wildlife tunnels have been constructed at seven (7) locations across the city to facilitate safe passage of wildlife under roadways. A total of 18 wildlife tunnels have been implemented, including six (6) that incorporate permanent funnel fencing to direct wildlife to tunnel crossing structures and exclude wildlife from roads.



Tree planting

As part of the City's efforts to grow our forest canopy

- 1,000 trees replaced ash trees removed because of emerald ash borer and an additional 6,450 trees and shrubs were planted in parks and natural areas
- 265 trees and shrubs planted as part of the \$25,000 "CN EcoConnexions, From the Ground Up" grant in partnership with Tree Canada
- The City received a \$145,000 Investing in Canada Infrastructure Program (ICIP) grant (to be implemented in 2022)

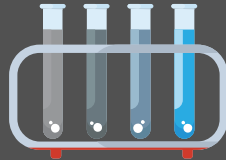


Tree planting strategy

Staff initiated the Tree Planting Strategy which builds on the Plantable Spaces Analysis completed as part of the Urban Forest Study in 2020. The purpose of this strategy is to evaluate and achieve our canopy cover targets.

Wastewater Services

Environmental stewardship drives all of the City's Wastewater Services programs. Whether it be reusing digester gas (methane) and biosolids (organic solids removed from sewage) recovered from the treatment process to power our wastewater treatment plant, or developing new educational programs to engage with our community, we're continually finding new ways to improve our processes to reduce our environmental footprint.

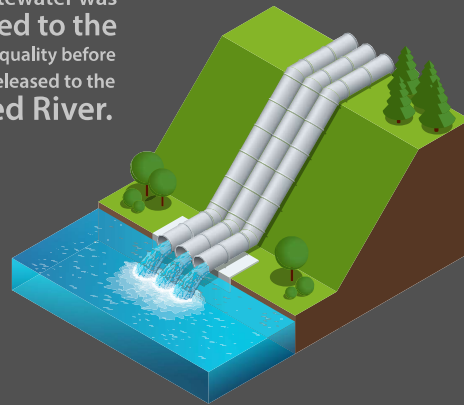


19 billion litres = 52 million litres per day!

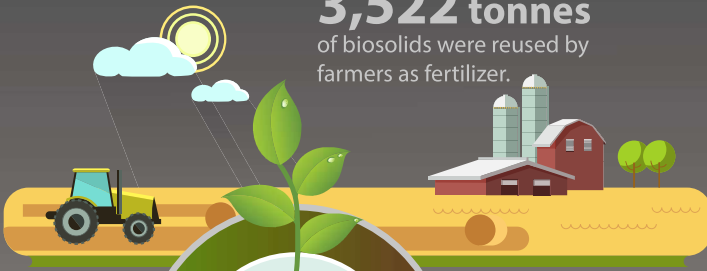
of wastewater was treated to the highest quality before being released to the Speed River.



2,250,000 m³ of reused digester gas powered the wastewater treatment plant. That's enough to power **1,688 houses**



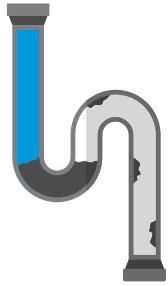
3,522 tonnes of biosolids were reused by farmers as fertilizer.



100 per cent of biosolids from the wastewater treatment plant were diverted from landfills.

What we've done

2021 key project highlights



Sanitary system flushing program

The maintenance flushing program ensured that 121 km of the sanitary system was flushed to prevent sewer backups and keep our environment and wildlife safe. That's enough distance to cover a drive from Guelph all the way to Oshawa!



Environmental protection

The Environmental Protection Officers conducted over 788 industrial inspections to ensure businesses are taking appropriate measures in reducing their environmental impact, like disposing of oils and grease properly. In addition, they responded to 279 calls to mitigate spills and to support Guelph Police Services, Guelph Fire Services and other City departments.



Education and outreach program

To protect Guelph's infrastructure and local water ways, Wastewater Services completed a direct-to-residents communication campaign to help pool and hot tub owners properly drain their pool water. This wastewater must be put into a household drain or onto their lawn, not directly to the storm drains in the street. Further, Wastewater Services started the development of a Public Education and Communications Strategy, to be unveiled in 2022 #WhatGoesDownComesAround.



Planning for our Future

In 2021, the wastewater treatment and biosolids management master plan continued to engage the community, indigenous partners and subject matter experts to inform a long term vision for Guelph's wastewater management. A strengthened focus and commitment to the resources that wastewater can provide was exemplified through the renaming of the Wastewater Treatment Plant to the Water Resource Recovery Centre.



Sample collection and analysis

It is with great pride that wastewater services incorporates a rigorous sampling program to support overall responsible environmental stewardship. Samples are collected and analyzed for process control, compliance reporting and river quality monitoring. The wastewater treatment operations team, environmental protection officers and accredited lab technicians collected and analyzed over 23,000 samples in 2021.



Responsible environmental steward projects

Environmental stewardship is important in our planning. Projects such as the aeration blower upgrade program that was awarded for construction in 2021 will save significant energy and reduce our carbon footprint. Aligned with this project is an update to the electrical components and control systems that will improve the reliability of these this critical system.

Water Services

The City provides Guelph residents with safe, high quality drinking water while meeting or exceeding, and continually improving on legal, operational and quality management system requirements.

2021 Year in Review

During 2021 we treated and pumped 1.5 per cent less water than in 2020. Average annual consumption has decreased by nine per cent despite a population growth of 14 per cent from 2010-2019.

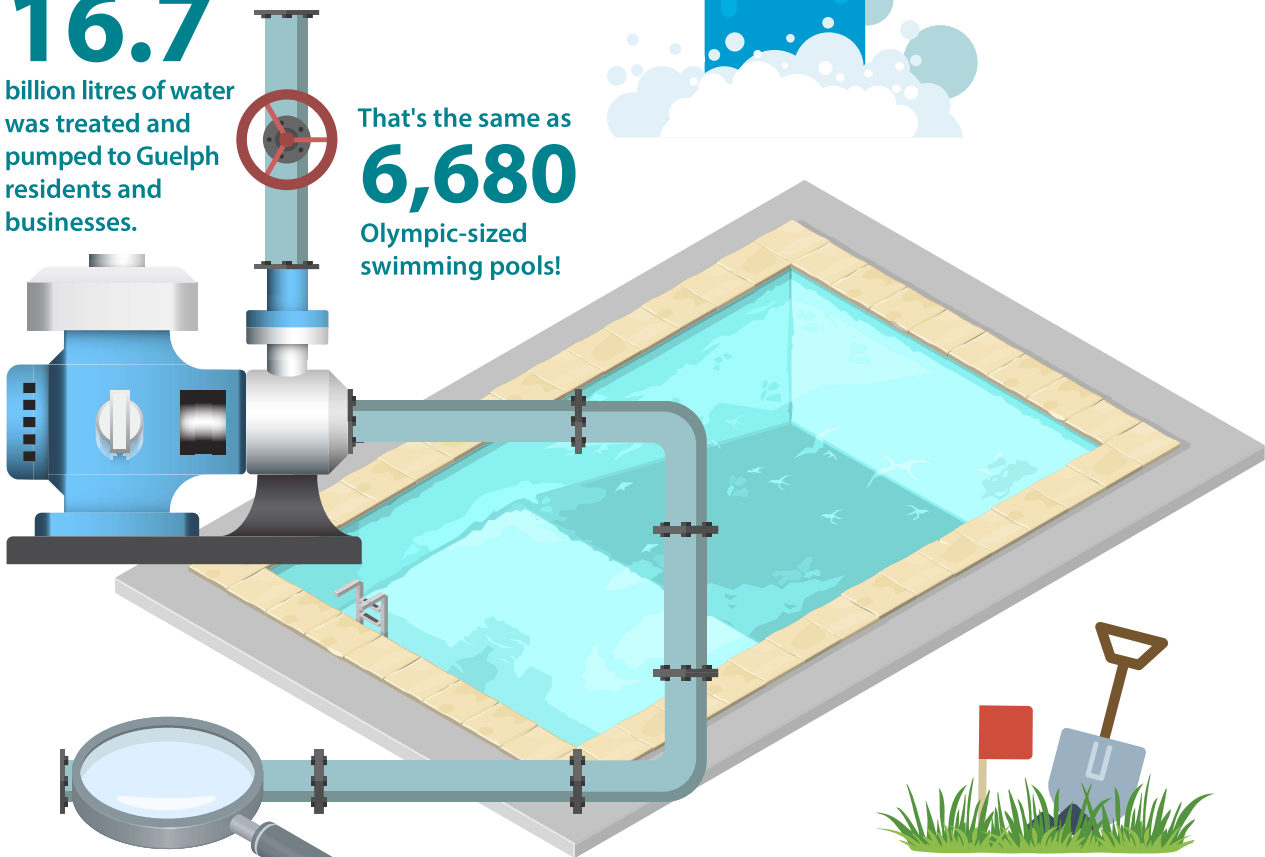
16.7

billion litres of water was treated and pumped to Guelph residents and businesses.

That's the same as

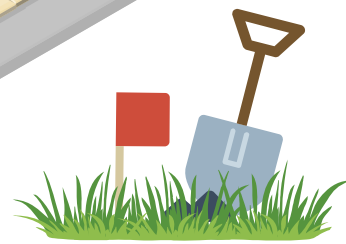
6,680

Olympic-sized swimming pools!

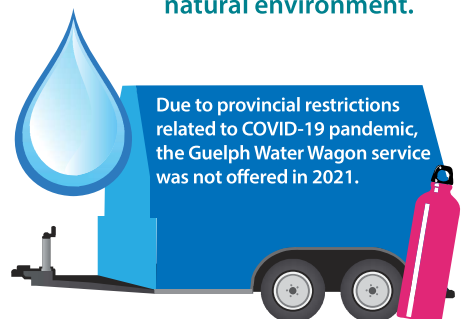


Inspected
527
kilometers of watermain for leakage and reclaimed
134m³
per day from found underground
leaks.

206,000
litres of water is saved per day through water-efficiency programs!



9,085
water utility locates completed to prevent damage to City water infrastructure and our natural environment.



Due to provincial restrictions related to COVID-19 pandemic, the Guelph Water Wagon service was not offered in 2021.

What we've done

2021 Key Project Highlights



Lead removal

Over 5,000 homes and businesses were sampled for lead. No samples exceeded the Ontario Drinking Quality Standard for lead, since commencing the Lead Reduction Program. Five Lead Service Lines were totally or partially replaced to a non-lead material.

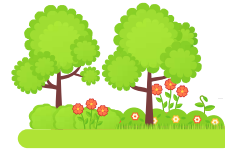


Water Efficiency Strategy Success

The following provides an update of some of the key deliverables of the 2016 Water Efficiency Strategy. To find a copy of the annual report, please visit <https://guelph.ca/plans-and-strategies/performance-reporting/>

Annual reports

The City of Guelph is committed to annual performance reporting to City Council and the community.



Healthy Landscapes

The Healthy Landscapes program helps Guelph residents learn more about outdoor water efficiency, preventative landscape maintenance practices and natural pest control alternatives.

- Healthy Landscapes property visits were resumed in June of 2021 with 145 complimentary one-hour visits completed.
- The annual Healthy Landscapes speaker series was again delivered online with an average of 700 participants at each of our five sessions. Topics included water efficient landscape design, plant selections and proactive maintenance to manage the impact of drought and pests.
- The annual Landscape Design Course had 1,392 participants who learned how to plan a low input, high impact sustainable yard.



Leak detection

The City tested 527 kilometres of water mains within the City's distribution system for leaks. Twelve leaks were identified and repaired preventing the loss of approximately 134,000 litres of drinking water per day (enough to fill 19 Olympic-sized pools annually).



Outside Water Use Program

This program continues to be an active and effective program to reduce peak season (summer) water use. The outside water use program monitors local conditions and reminds residents that Guelph uses water wisely. The program ran from May to October. Due to the hot and dry spring the program level escalated from Level 0-Blue to Level 1-Yellow on May 26. Ongoing summer above average temperatures caused the program level to stay in Level 1-Yellow with a return to Level 0-Blue on July 14 from increased precipitation. Low precipitation levels, with high temperatures caused a change to Level 1-Yellow on August 25 with a return to Level 0-Blue on September 29.



Water efficiency rebates and incentives

Since working to achieve the 2016 Water Efficiency Strategy programs, 1,409 m³ /day of water has been saved.

In 2021, 205.7 m³ /day of treated water was saved through efficiency programs, which prevented 38.0 tonnes of green house gas emissions and \$18,400 in electric costs to be avoided. These rebates and incentives include:

- 495 rebate applications and audits were completed through the City's residential rebate programs.
- Multi-residential water audit program achieved 11 m³ /day of water savings.
- 2 incentives for municipal infrastructure improvements and Water Smart Business upgrades.
- 6 all seasonal rainwater harvesting tanks installed and provided a rebate with a combined capacity of 8,205 litres.



Youth and public outreach and education programs

- 51 interactive school presentations engaging 1,065 students.
- Imagine-A-Day-Without Water Poster contest which drew over 200 student submissions.
- Due to the COVID-19 pandemic, tours of the Water Services facility were cancelled during 2021.



Raingarden Rebate program

The City's raingarden rebate for Guelph residents encourages water conservation and reduced stormwater runoff.

- 88 residents participated in workshops
- 52 home-visit consultations were conducted
- 19 raingardens were installed and provided a rebate resulting in over 42,000 litres of stormwater captured per rain event (an average of 2,212 litres per garden).