

Guelph's Race To Zero Community GHG Emissions



Guelph is part of the United Nations' Race To Zero campaign for the whole community to reduce greenhouse gas (GHG) emissions:

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

Large community targets like these mean that this isn't just the responsibility of municipalities and utility companies—we all need to be part of the solution to fight climate change!

Year in review:

- 2022 GHG emissions are 7% lower than in 2018, but have increased by 8% (62,000 tonnes CO₂e) when compared to 2021. **Community GHG emissions are going in the wrong direction! Collective action from all sectors is needed to reduce emissions!**
- Emissions from residential, institutional, commercial and industrial buildings have gone up by 8% when compared to 2021.
- Transportation emissions have increased for the second consecutive year and are up by 13% when compared to 2021.

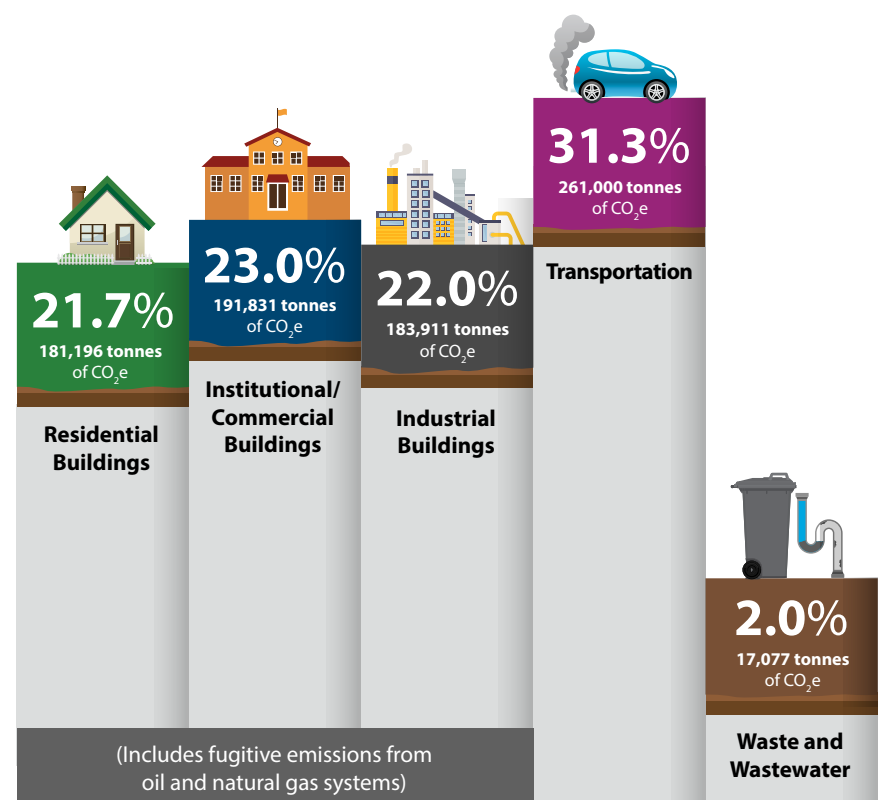
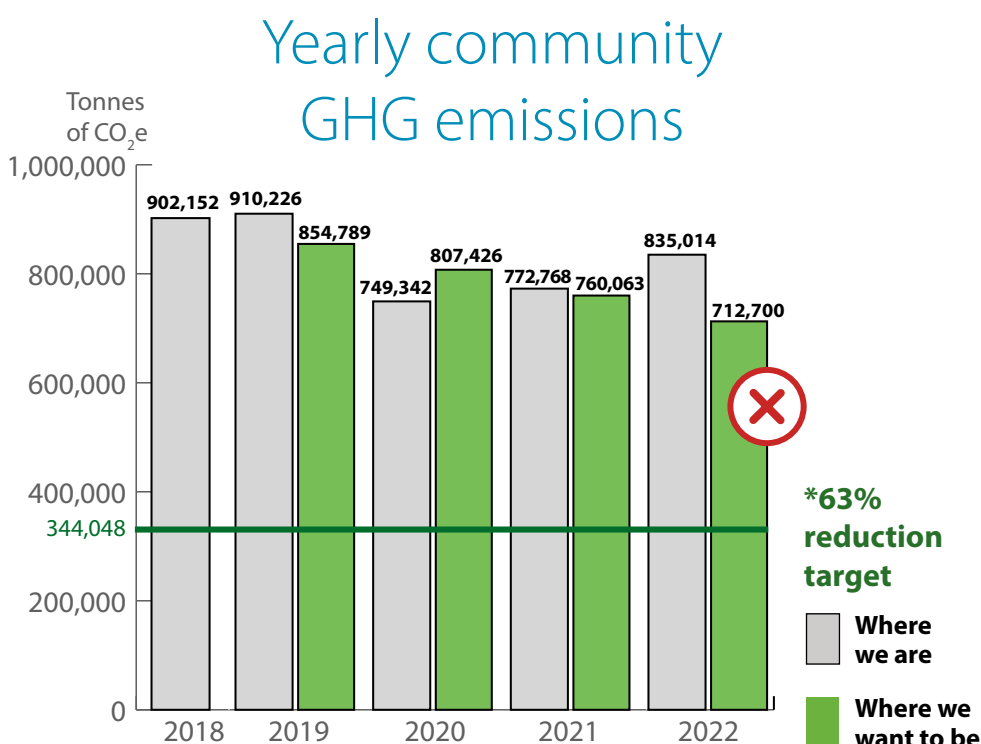
The City of Guelph incorporates environmental stewardship in all municipal operations and services to support the Race To Zero targets by:

- Reducing GHG emissions from municipal operations (Energy and Climate Change)
- Supporting and encouraging walking, cycling, carpooling, 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



Where in the community GHG emissions are coming from



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

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

Energy and Climate Change

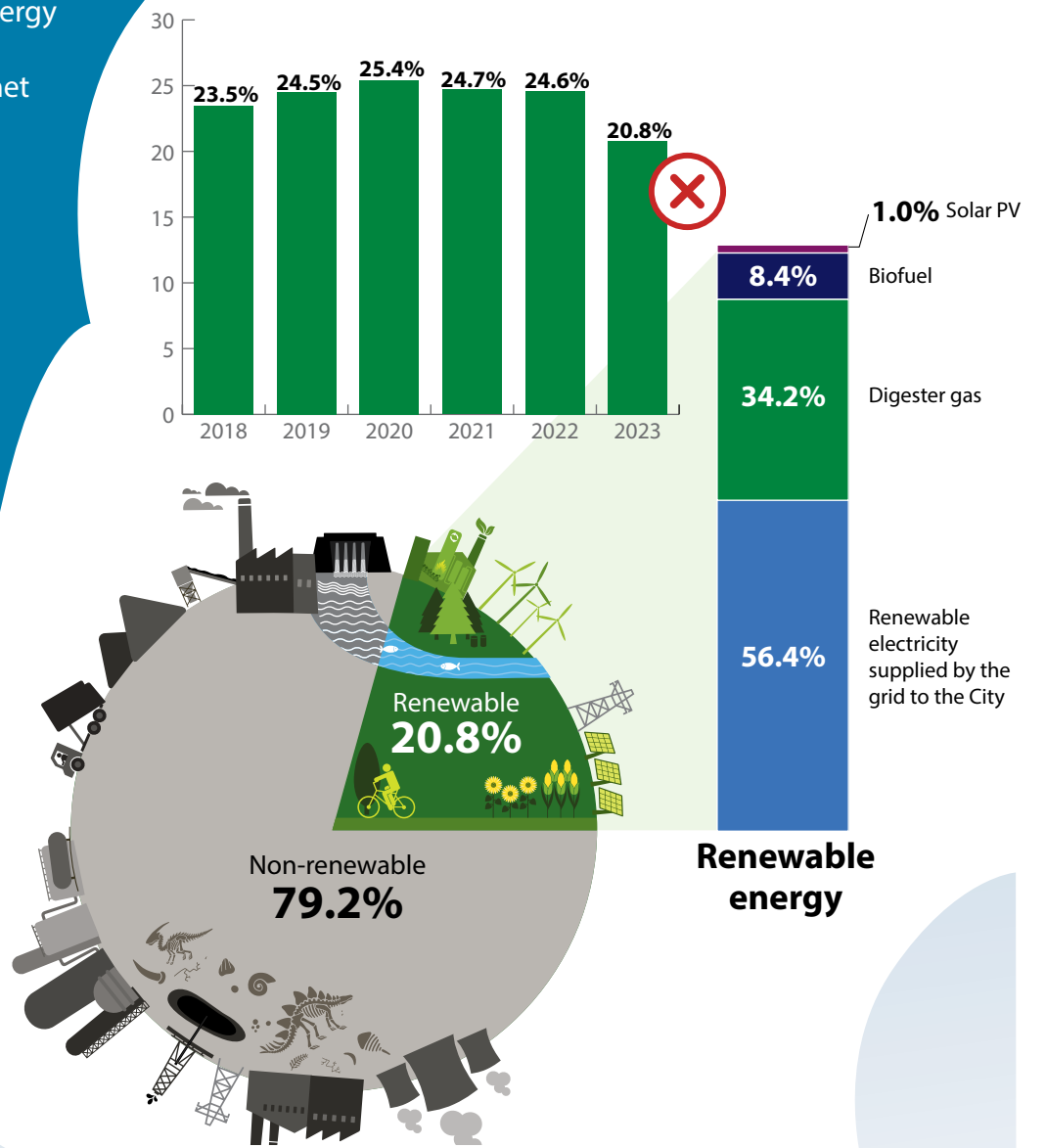
The City is taking an energy conservation and greenhouse gas (GHG) emissions reduction approach to reach our goal of having City facilities and operations using 100 per cent renewable energy (100RE) sources by 2050. This supports Guelph's Race To Zero commitments to reduce emissions by 63% by 2030 and be a net zero carbon community by 2050.

2023 year in review

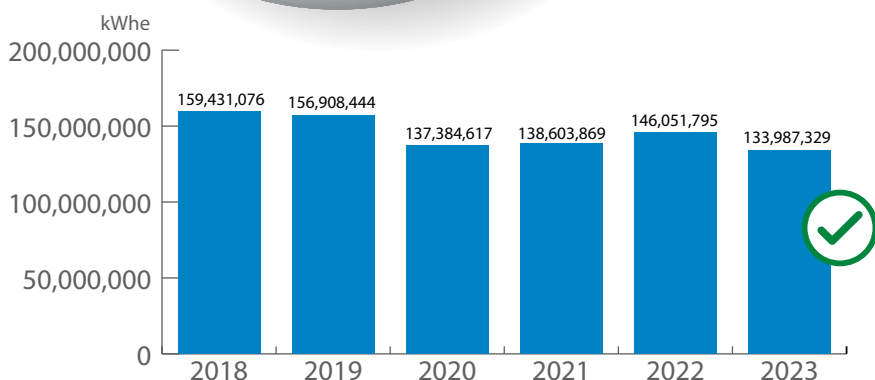
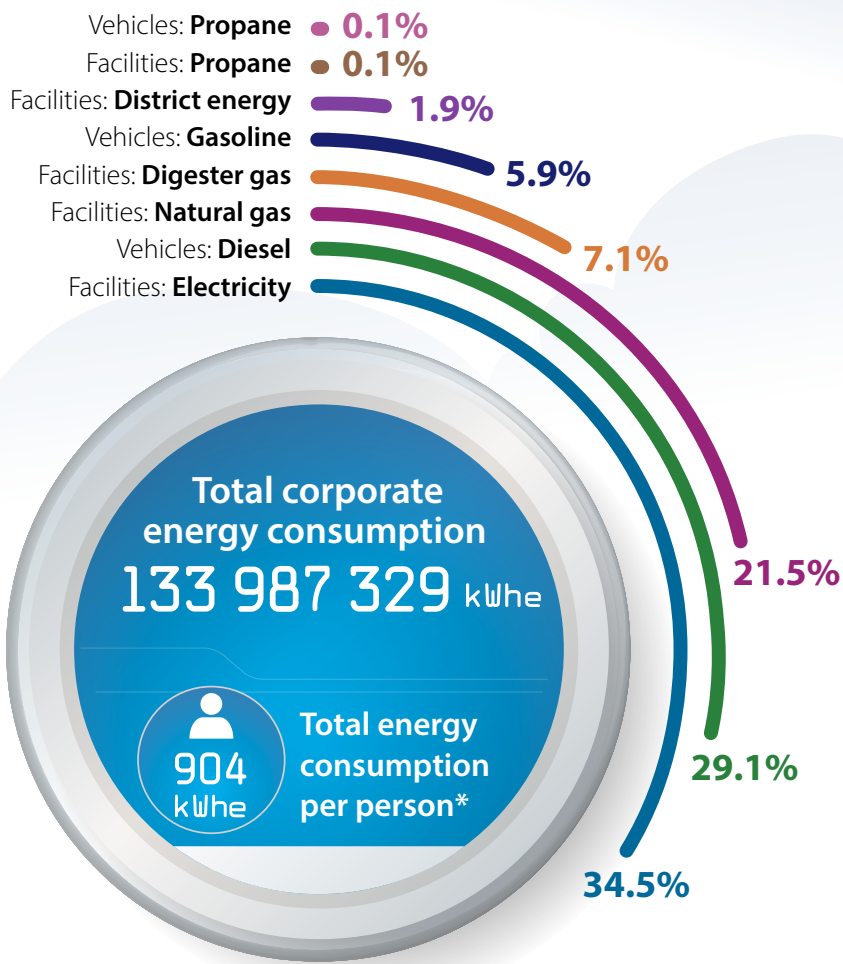
The City continues efforts to drive down GHG emissions and energy consumption:

- We're bending the curve! Energy consumption is at the lowest level since setting the 2018 baseline!
- Overall emissions were down by 4% compared to last year and are 7% lower than the 2018 baseline year. We are making progress with past and ongoing initiatives, but need to continue with climate action!
- Facility emissions from natural gas use dropped by 14% in 2023 when compared to 2022.
- Renewable generation took a hit with digester gas volumes lower in 2023.
- Fleet emissions remained at similar levels to last year. As more emissions are coming from fleet vehicles, right-sizing and electrifying vehicles continues to play a key role in pushing these emissions down.

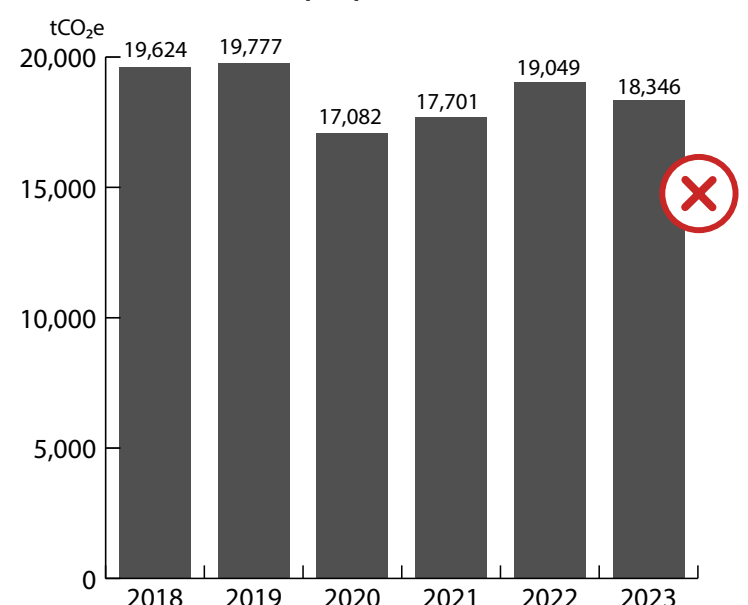
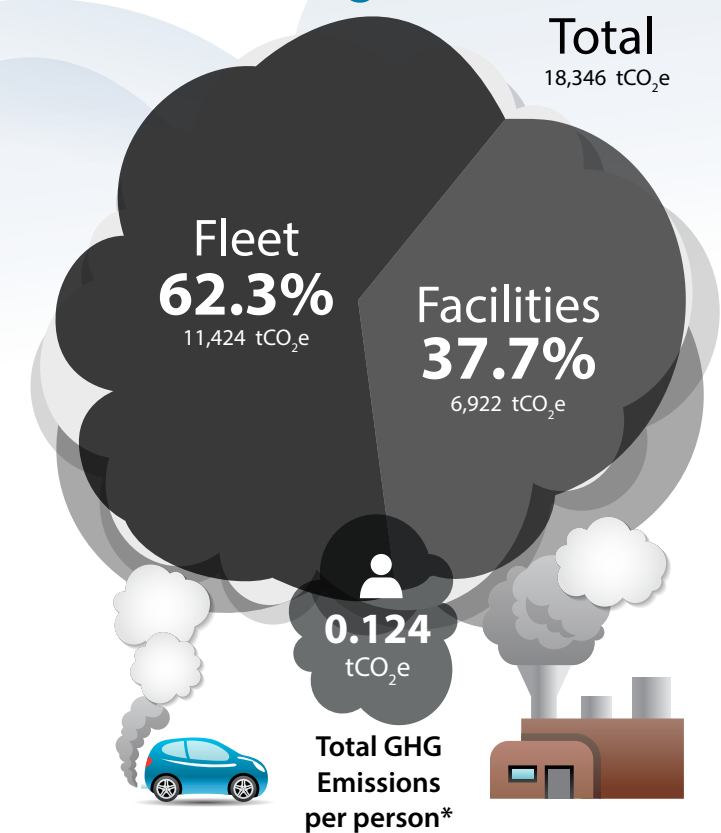
100 RE status



Total corporate energy consumption



Greenhouse gas emissions



*based on 2022 City of Guelph population.

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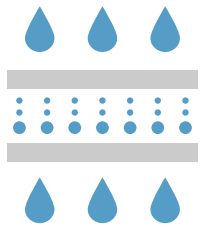
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Reported GHG emissions exclude biogenic CO₂ emissions.

What we've done

2023 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



Water Resource Recovery Centre aeration upgrades

Construction was completed with the multi-year aeration plant upgrades at the City's Water Resource Recovery Centre. The project included upgrading electrical infrastructure and replacing inefficient fixed speed blower equipment with dissolved oxygen controlled modulating blowers to optimize the treatment process, make it more reliable and significantly reduce energy use.

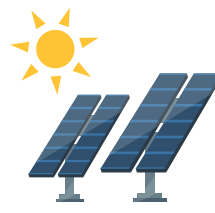
- 6,750,000 kWh/yr**
- 202,500 kgCO₂e/yr**
- \$945,000**
- \$10,500,000**
- Complete**



Lighting upgrades - multiple locations

Several LED lighting upgrades were completed at locations including the Guelph Sports Dome, Fire Halls, Downtown street lighting, Riverside Greenhouse, and more. This has improved lighting conditions and help those energy savings blossom!

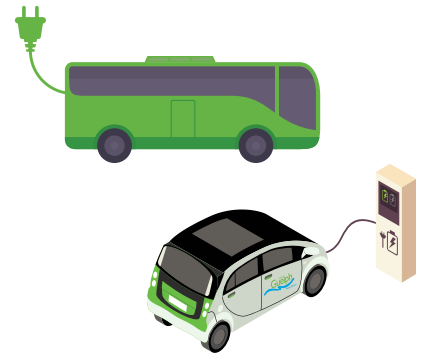
- 237,900 kWh/yr**
- 7,100 kgCO₂e/yr**
- \$33,000**
- \$850,000**
- Complete**



Burke Well solar PV

Bring on the sun as we've got more solar at the Burke Well pumping station. This energy efficient pumping station just got a renewable energy boost with some rooftop solar.

- 11,000 kWh/yr**
- 300 kgCO₂e/yr**
- \$2,000**
- \$39,000**
- Complete**



Fleet electric vehicles

We've kept things rolling by replacing those gas guzzlers with electric vehicles, adding 8 more EVs and 7 more E-buses to join the fleet.

- 683,500 kWh/yr**
- 5,200 L/yr gasoline**
264,000 L/yr diesel
- 732,600 kgCO₂e/yr**
- \$362,000**
- \$11,000,000**
- Complete**



Sports dome HVAC and heat pump

We've scored big time by getting the dome HVAC controls and equipment in tip top shape while also upgrading the office space with a full electric heat pump, energy recovery system and on-demand water heater.

- 15,980 m³/yr**
- 30,900 kgCO₂e/yr**
- \$6,000**
- \$38,000**
- Complete**



ISO 50001 certification

The City of Guelph is the first municipality in Canada to achieve corporate-wide certification to the globally recognized ISO 50001 Energy Management Systems Standard, which confirms that the City is:

- Setting clear energy targets for the whole organization that support climate change mitigation efforts in everyday operations.
- Continuously monitoring and evaluating energy use and GHG emissions.
- Using data to make informed decisions to improve energy efficiency.
- Taking action to improve processes and upgrade equipment to reduce energy use and GHG emissions.



Guelph Greener Homes Program

The City started a program, with support from the Federation of Canadian Municipalities, that offers interest free loans and low income household grants to Guelph residents to do energy efficiency home improvements. This will help Guelph homeowners get projects done like add insulation, upgrade to heat pumps, and install solar panels, all to reduce GHG emissions in the community while saving households money with their utility costs.



Public Works and Maintenance Facility heat pumps

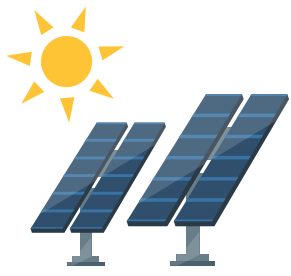
More heat pumps at our Public Works and Building Maintenance facilities to reduce GHG emissions while supporting the critical work they do everyday.

- 3,300 kWh/yr**
- 13,620 m³/yr**
- 26,200 kgCO₂e/yr**
- \$5,000**
- \$333,000**
- Complete**

What we're planning




2024 key prospect highlights

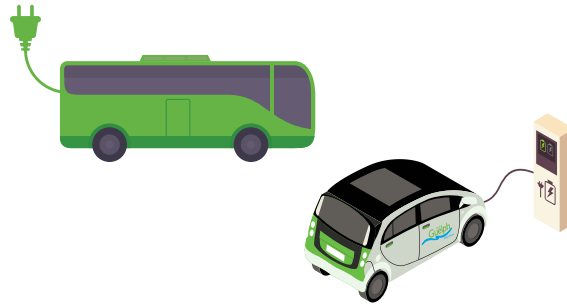
-  Electricity savings
-  Natural gas savings
-  Other fuel savings
-  Water savings
-  Greenhouse gas emissions reduction
-  Energy cost savings/year
-  Project cost
-  Project status



River Run solar PV expansion





Construction is underway to do a solar panel encore! By adding more solar panels to the roof of the River Run Centre, they will generate more renewable energy for that 'electric' performance!

-  **176,600 kWh/yr**
-  **5,300 kgCO₂e/yr**
-  **\$25,000**



More fleet EVs and chargers





We're gearing up to replace more gas engine vehicles with 7 more fleet EVs and charging equipment to keep them going. Let the fuel savings and GHG emissions reduction keep rolling in!

-  **29,100 kWh/yr**
-  **18,900 L/yr gasoline**
-  **46,500 kgCO₂e/yr**
-  **\$22,400**



River Run recommissioning



We're setting the stage at the River Run Centre by recommissioning the heating and cooling hydronic systems so we can save energy while the performances keep bringing the house down!

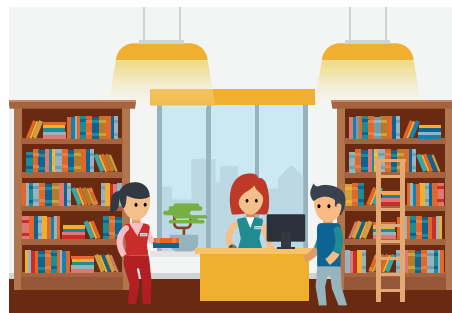
-  **47,800 kWh/yr**
-  **10,480 m³/yr**
-  **22,400 kgCO₂e/yr**
-  **\$11,000**



More lighting upgrades—multiple locations





LED lighting upgrades are planned for more locations including Eastview Park, Organic Waste Processing Facility, Downtown streetlights and more. This will improve lighting conditions and help light up the town!

-  **59,300 kWh/yr**
-  **1,800 kgCO₂e/yr**
-  **\$8,000**



Guelph Central Library—Zero Carbon Building

Construction will start for the new Guelph Central Library, which is the first library in Canada certified to the Zero Carbon Building design standard. This will be a low carbon destination for the community to create, innovate, congregate and enjoy.

-  **-122,000 kWh/yr**
-  **36,230 m³/yr**
-  **64,700 kgCO₂e/yr**
-  **-\$3,000**



South End Community Centre—Zero Carbon Building

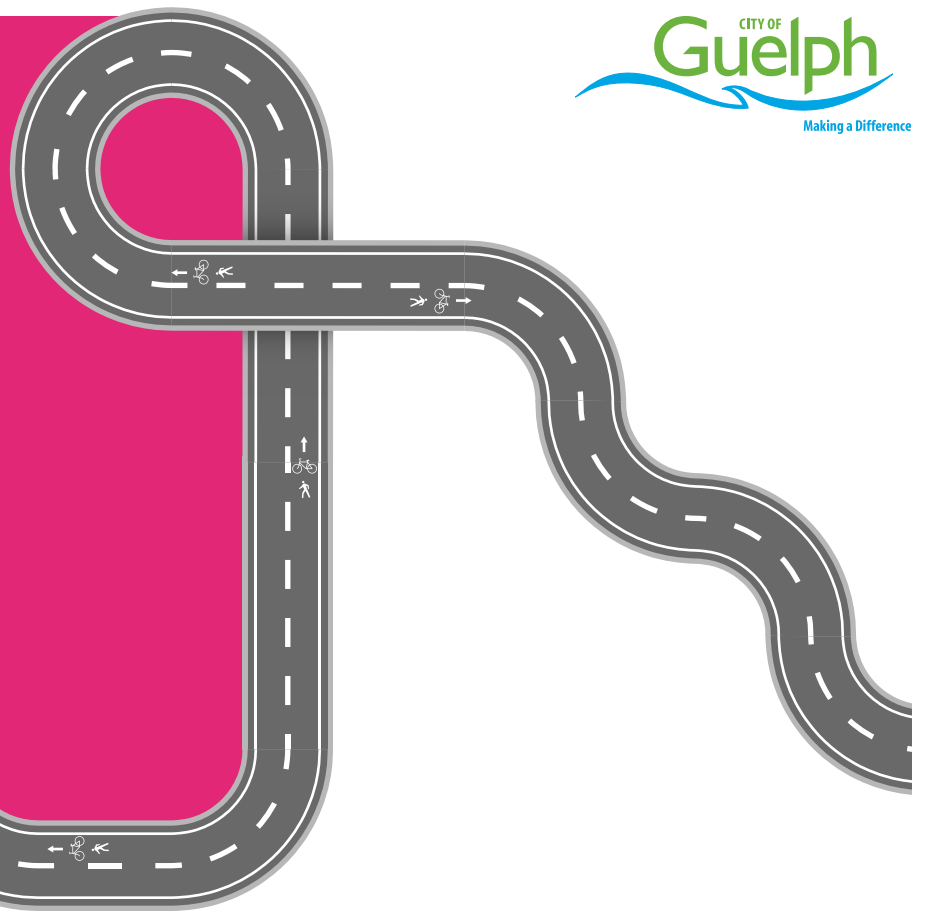
Construction of the new South End Community Centre will begin and will meet the Zero Carbon Building design standard. Design elements have been included to make this a low carbon, high performance building, so we can save lots of building energy and use our energy towards the things that count like having fun swimming lessons and cheering on those buzzer beaters!

-  **-1,290,300 kWh/yr**
-  **-42,300 kgCO₂e/yr**
-  **-\$155,000**

Sustainable Transportation

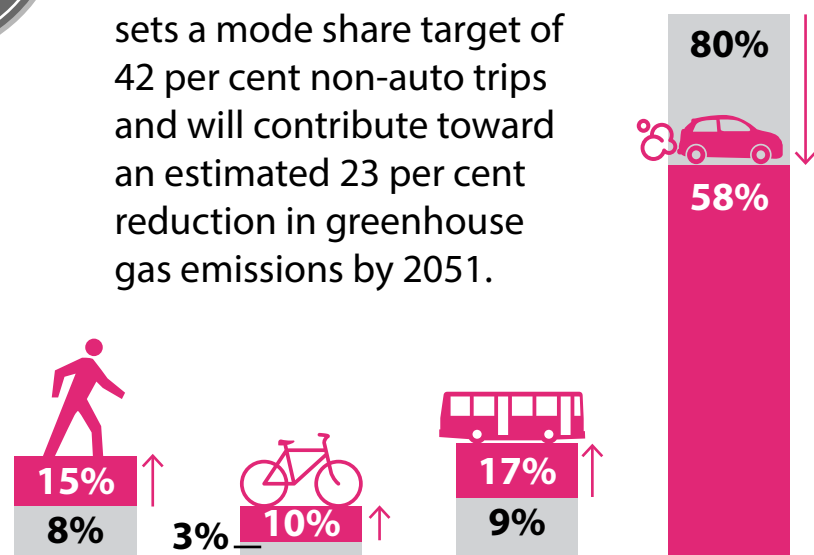
Sustainable Transportation supports the development and implementation of programs, policies and infrastructure to support walking, cycling, carpooling, car-sharing and transit-use within Guelph.

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



Shaping the future of transportation in Guelph

The 2022 Transportation Master Plan lays out how residents and visitors will move through the city over the next three decades. It sets a mode share target of 42 per cent non-auto trips and will contribute toward an estimated 23 per cent reduction in greenhouse gas emissions by 2051.

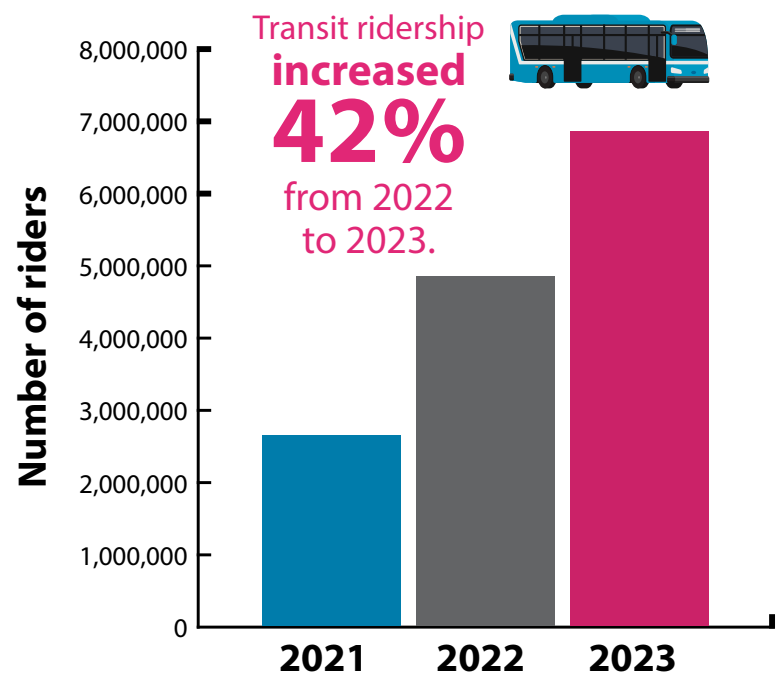


■ 2051 targets

■ 2016 percentages

Source: 2016 Transportation Tomorrow Survey

Growing transit ridership

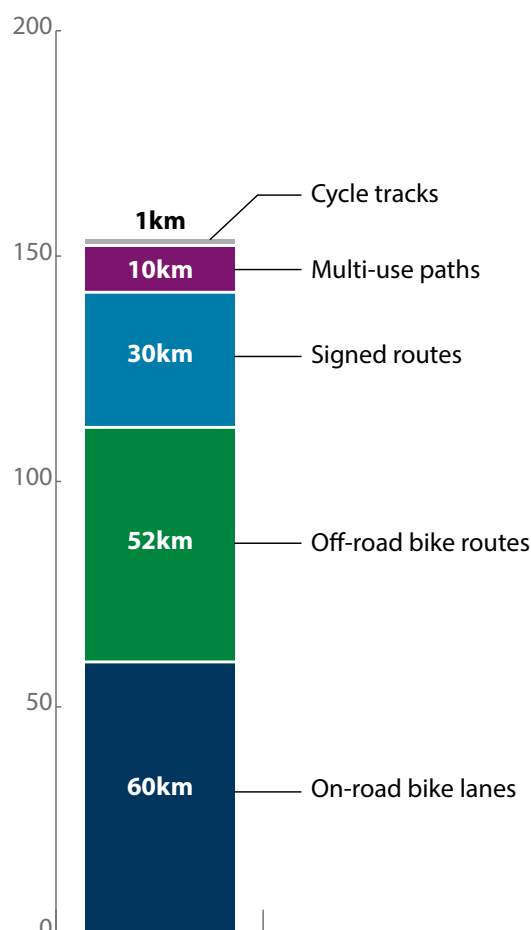
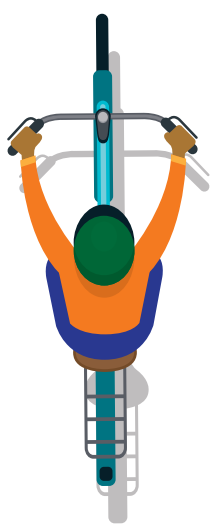


Note: 2021 was unusually low due to COVID.

Expanding the cycling network

9% ↑
153 km
in 2023

139 km
existing
in 2022



Measuring active transportation



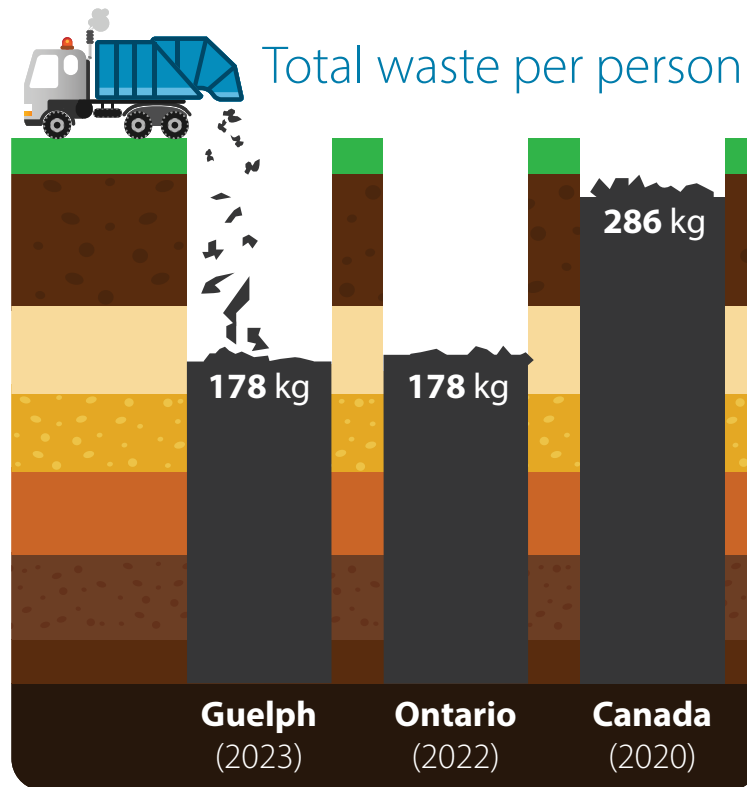
The City gathered continuous pedestrian and cyclist count data at 32 intersections across the city. We use the data to help us make informed decisions about future sustainable transportation projects.

Solid Waste Resources

In 2023, the City continued to build on Guelph's leadership in sustainable waste management.

In 2023...

- Guelph residents disposed of about 108 kg less waste per person compared to the national average.
- Guelph residents diverted 55 per cent of their waste away from landfill through proper sorting. Enhanced communications to households through promotion and education tactics will help improve sorting and the City's curbside diversion rate.
- The City's organic waste processing facility diverted 30,330 tonnes of organics from landfill, which was converted into 8,490 tonnes of finished compost. The 2023 tonnage does not include yard waste that is received for composting off site.
- Each household in Guelph disposed an average of 283 kg of waste in 2023. More work needs to be done for the City to reach its 2030 target of 250 kg of waste per household.



18,320 (2022)
tonnes of CO₂e
emissions was reduced by capturing landfill gas used to generate electricity and is equivalent to taking 5613 cars off the road for a year per Natural Resources Canada's Greenhouse Gas Equivalencies Calculator.

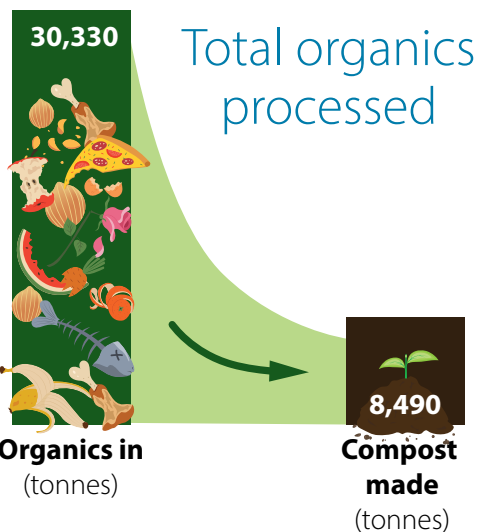
Total residential waste collected at the curb (tonnes)



19,635 (2022)
tonnes of CO₂e

emissions was reduced by capturing landfill gas used to generate electricity and is equivalent to taking 6015 cars off the road for a year per Natural Resources Canada's Greenhouse Gas Equivalencies Calculator.

Total waste generated = 283 kg per household
The City's 2030 target = 250 kg per household



Solid Waste Management Master Plan and the Circular Economy

The SWMMP is focusing on supporting a circular economy, waste reduction policies and service level reviews, enhanced promotion and education, and community sharing and repair initiatives and has advanced:

- Supporting the circular economy by developing a Circular Economy Policy and Supporting Framework,
- Implementing the Zero Waste Economy Transformation Lab to reduce or redirect waste from construction, renovation and demolition (CRD) materials,
- Preparing for the Blue Box Program transition to full producer responsibility,
- Developing the Single-Use Items Reduction Strategy and ban,
- Piloting a curbside "gold star" recognition program to improve food waste diversion, and
- Collaborating with Guelph Tool Library on community repair cafes, car seat recycling and Guelph's Largest Clothing Swap.



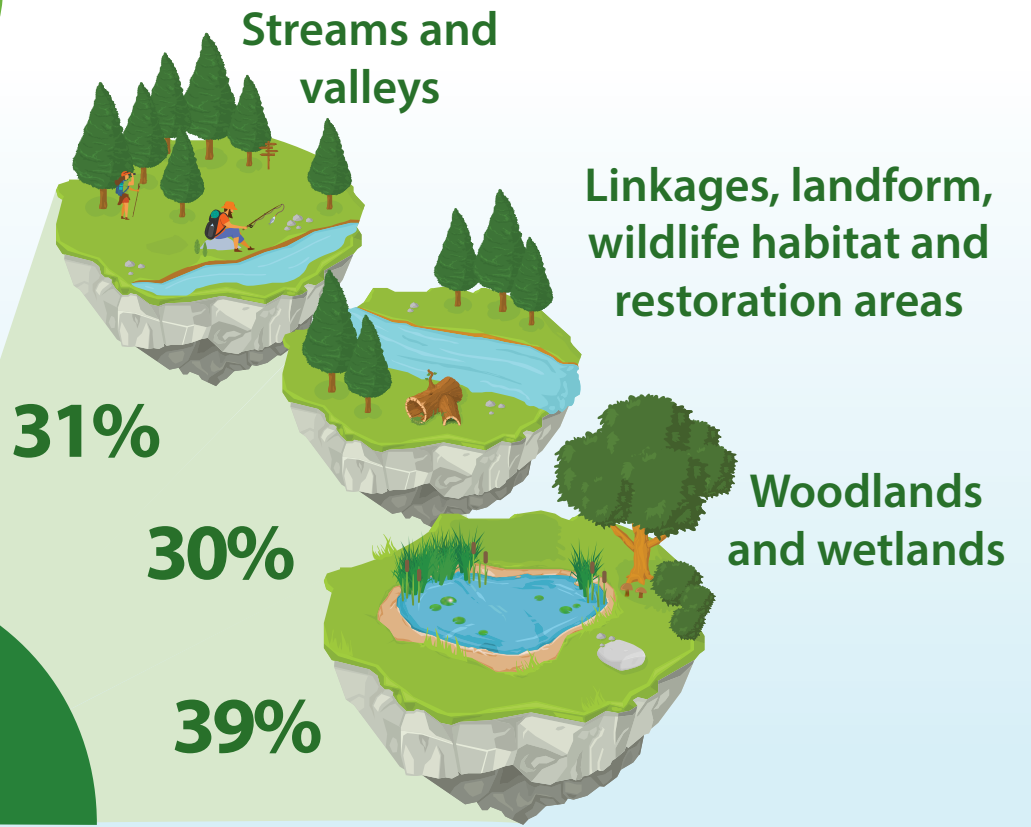
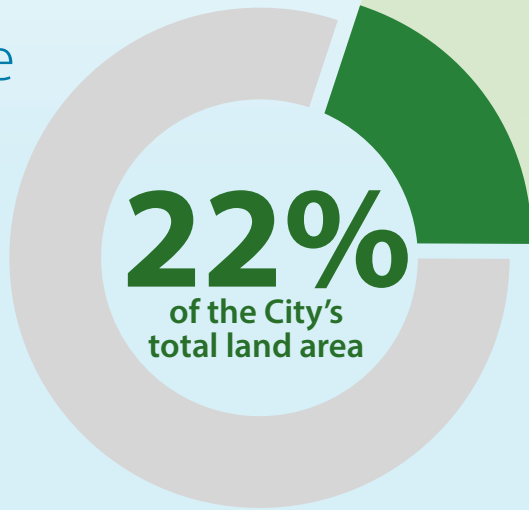
Urban Forest and Natural Heritage

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

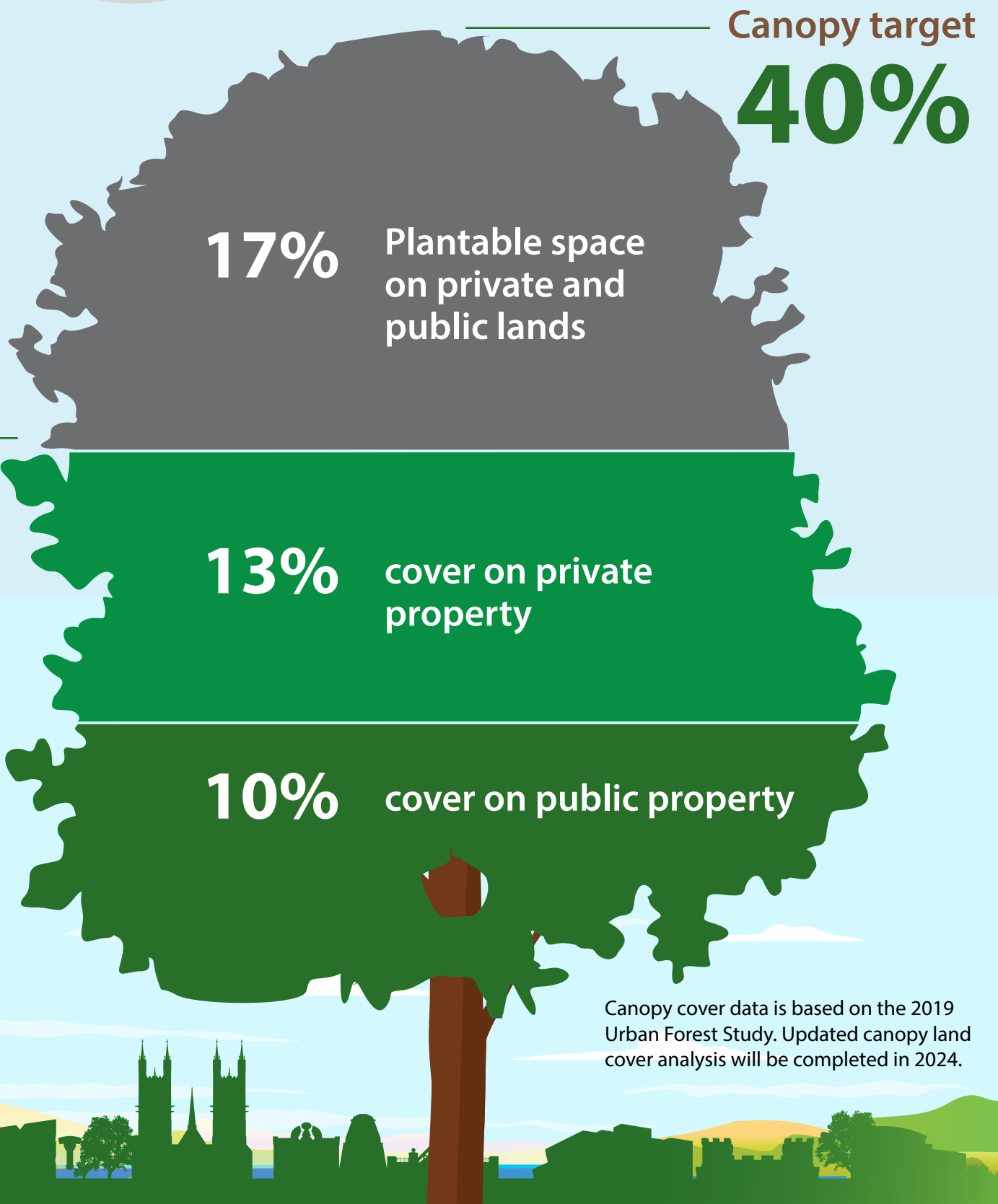


Urban forest

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

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

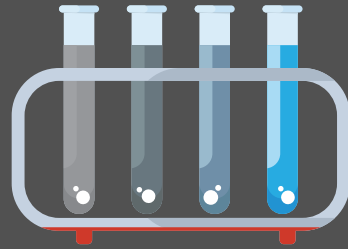
Most canopy cover is in woodlands, natural areas and mature neighbourhoods



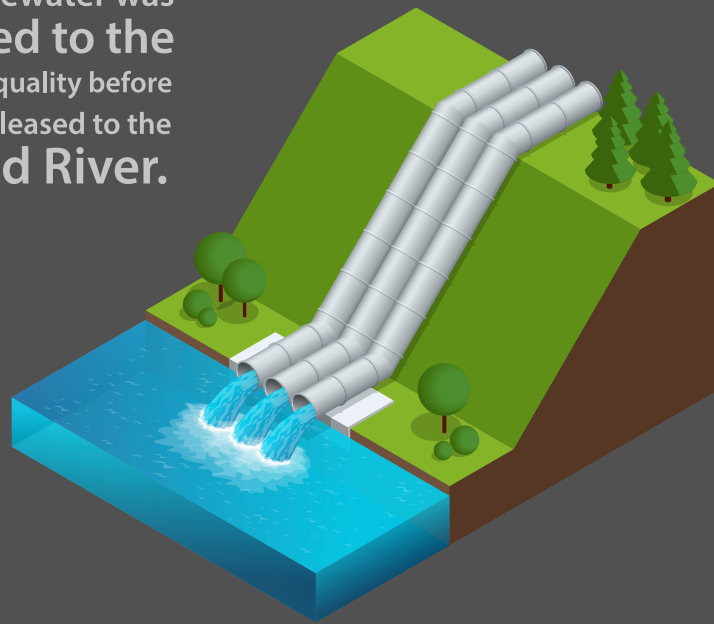
Canopy cover data is based on the 2019 Urban Forest Study. Updated canopy land cover analysis will be completed in 2024.

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 water resource recovery center, 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.



19.6 billion litres = 53.8 million litres per day!
of wastewater was treated to the highest quality before being released to the Speed River.



1,407,589 m³
of reused digester gas powered the Water Resource Recovery Center.
That's enough to power **1,056 houses**

3,972 tonnes
of biosolids were reused by farmers as fertilizer.



100 per cent
of biosolids from the Water Resource Recovery Center were diverted from landfills.

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.

2023 Year in Review

This year, the City treated and pumped 0.63 per cent more water than in 2022. Average annual consumption has increased by 2.4 per cent with a population growth of 15.8 per cent from 2013 to 2022. In June, Council approved an update to the Water Supply Master Plan. This plan ensures the City's water supply meets the needs of current and future demands.

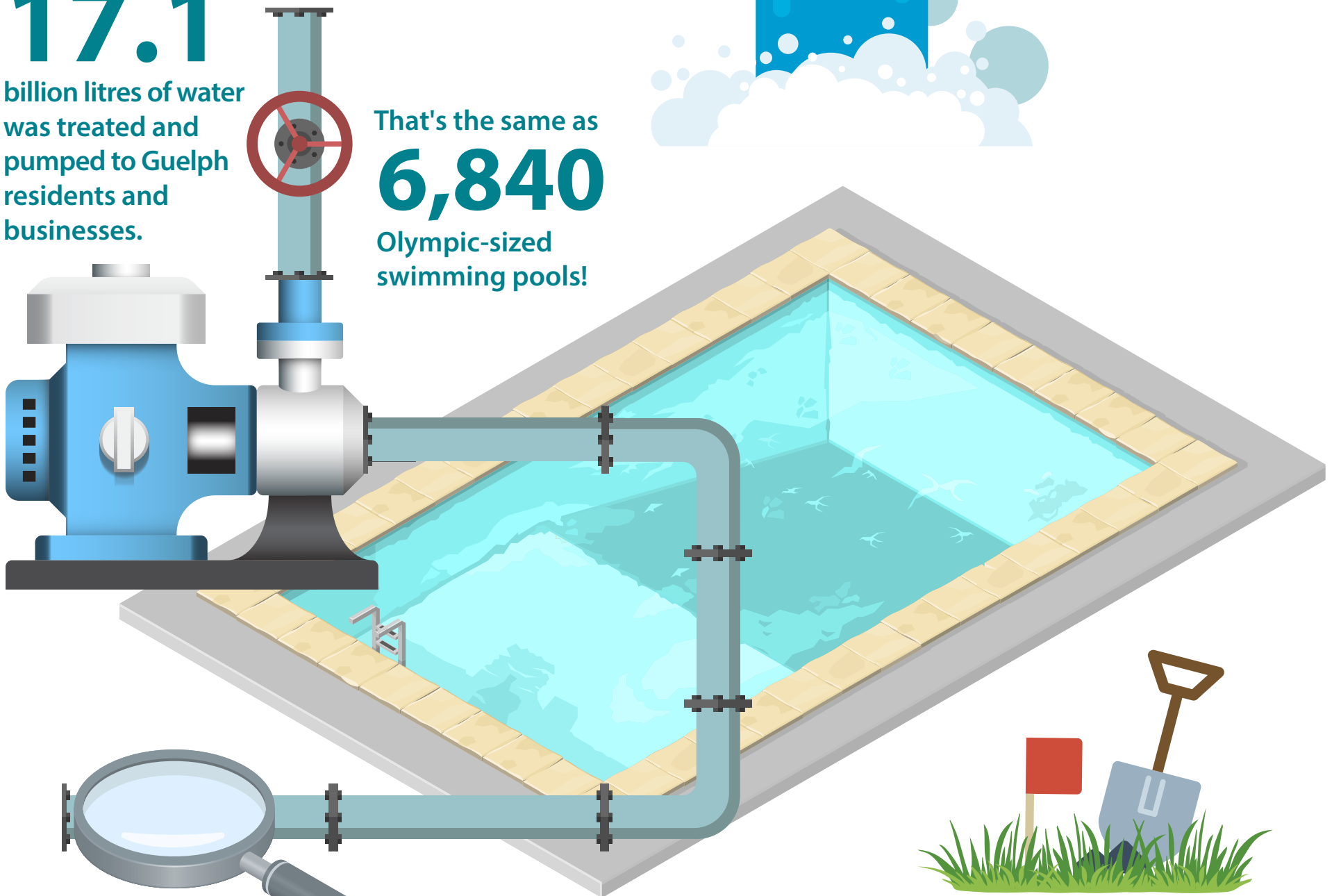
17.1

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

That's the same as

6,840

Olympic-sized swimming pools!



Inspected
545
kilometers of watermain for leakage and reclaimed
40m³
per day from found underground
leaks.

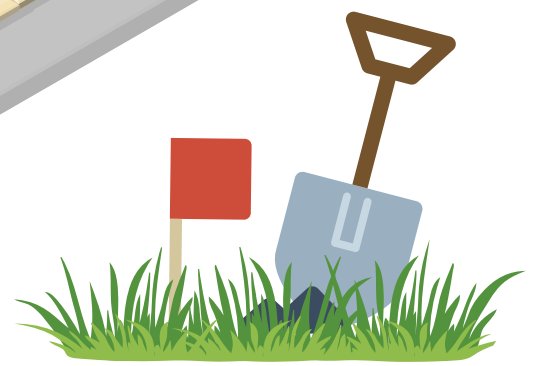
84,790

litres of water is saved per day through water-efficiency programs including water loss management!



7,610

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



The Guelph Water Wagon helped divert 30,968 water bottles from recycling and waste streams at local events.