

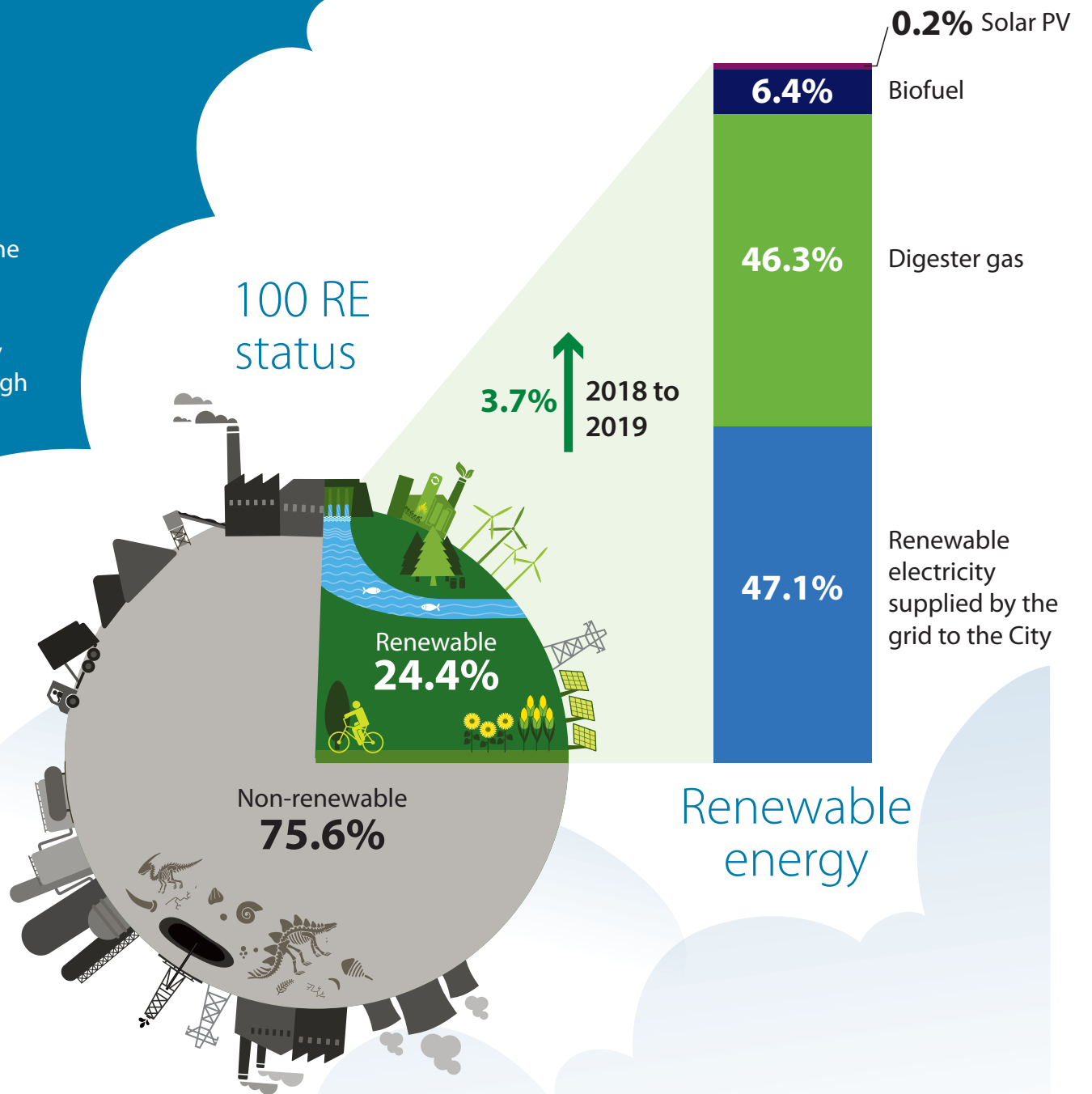
Energy and Climate Change

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.

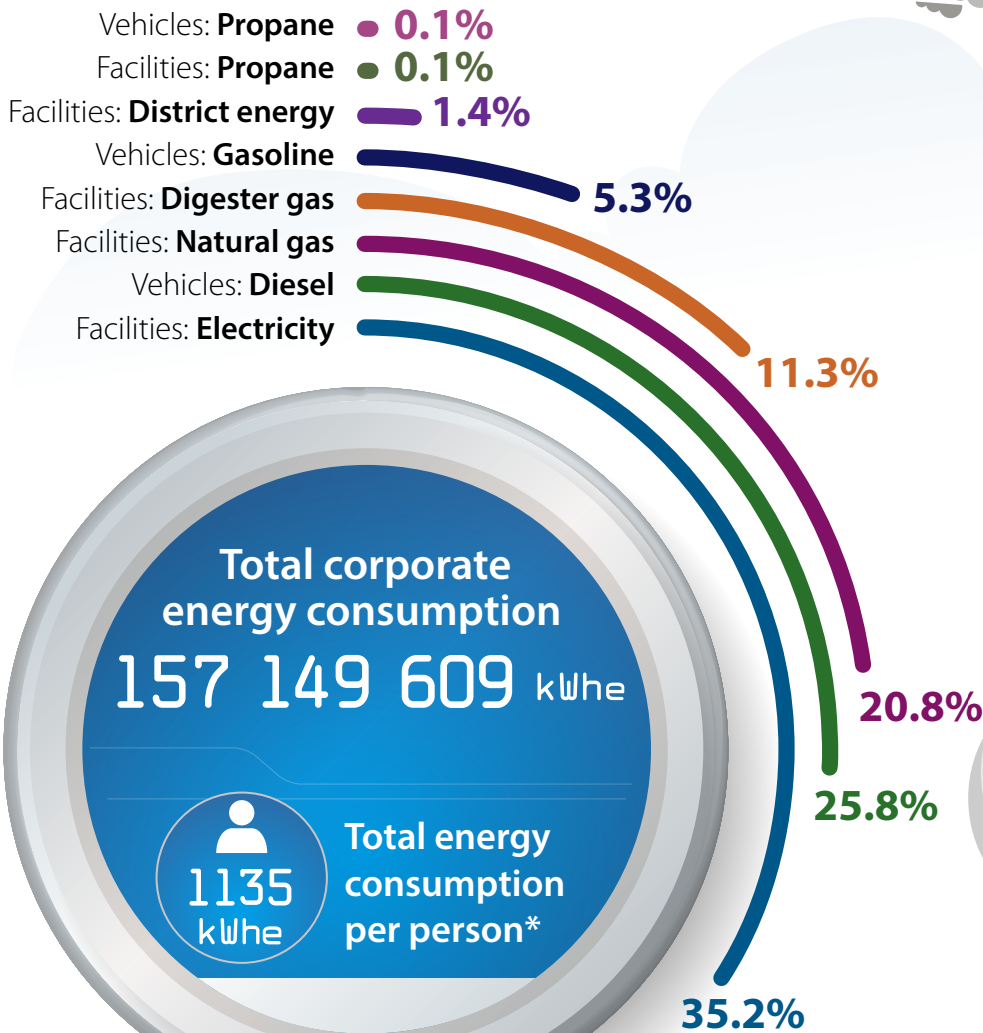
2019 Year in review:

The City has made great progress towards our 100RE goal:

- GHG emissions have flat lined with less than 0.1 per cent increase since 2018
- We've reduced City facilities and fleet energy consumption by 2.2 million kWh (1.45 per cent)—enough to power over 250 homes for a year!
- Increased our renewable energy supply by 1 million kWh (3.7 per cent)—enough to power over 100 homes for a year!

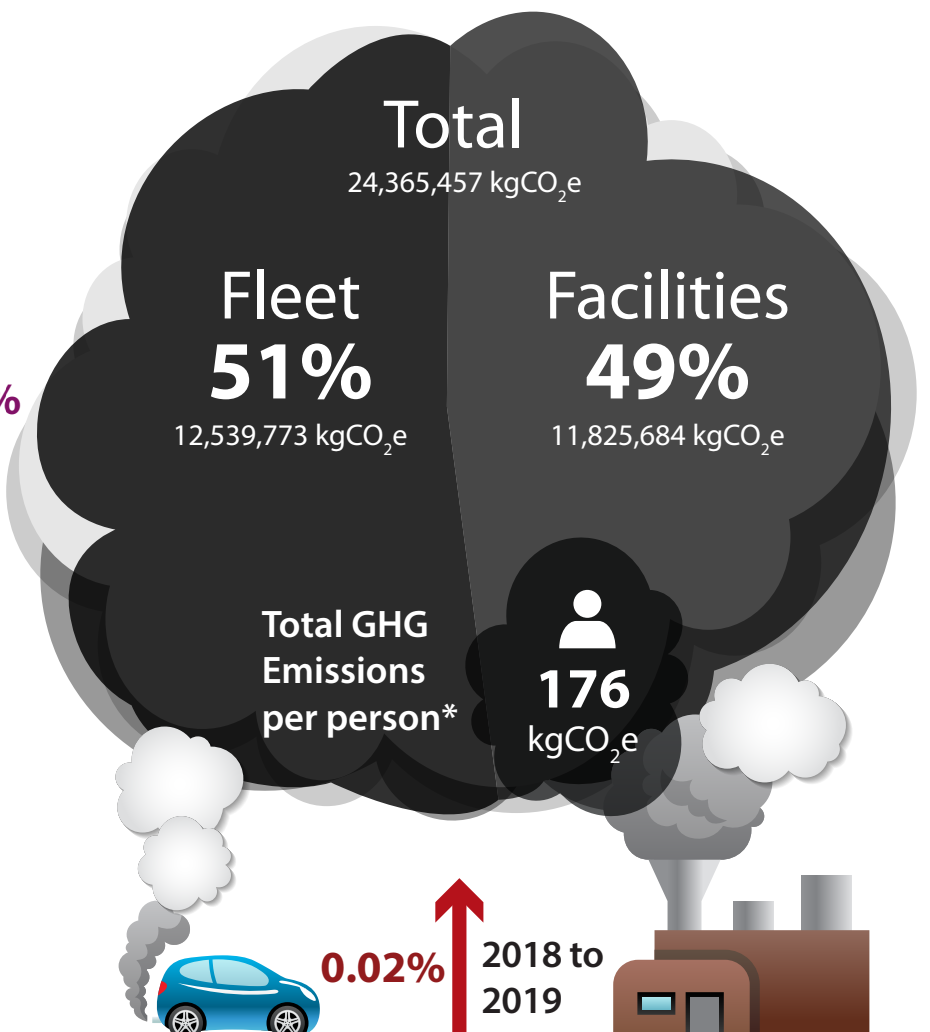


Total corporate energy consumption



1.45% ↓ 2018 to 2019

Greenhouse gas emissions



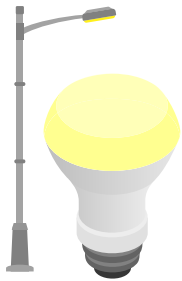
*based on 2019 City of Guelph population
All data and analysis are based on current information at the time this report was prepared. This information is subject to be updated from time to time.

What we've done

2019 key project highlights

- ⚡ Electricity savings
- 🔥 Natural gas savings
- ⦿ Other fuel savings
- 💧 Water savings

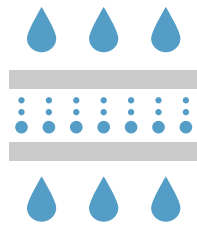
- 🌫️ Greenhouse gas emissions reduction
- 💰 Energy cost savings/yr
- 📊 Project cost
- 📋 Project status



LED streetlights and controls

Nearly 13,000 non-decorative streetlights have been upgraded to LED with network controls. This improves light quality and reduces our operating and maintenance costs.

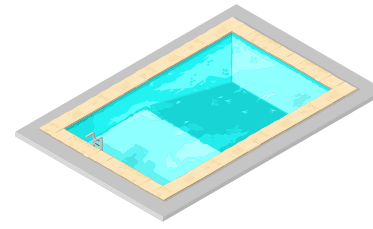
- ⚡ **9,465,000 kWh/yr**
- 🌫️ **189,300 kgCO₂e/yr**
- 💰 **\$946,000**
- 📊 **\$9,000,000**
- 📋 **Complete**



Wastewater treatment plant aeration upgrades

A detailed design for the upgrades to the aeration blowers is currently underway. The upgrades will improve control of air supplied to the treatment process and significantly reduce energy demands by 6,750,000 kWh/yr at the City's Wastewater Treatment Plant.

- 📋 **Ongoing**



West End Community Centre pool drain and heat recovery system upgrade

System upgrades were made to optimize pool water drainage rates and reduce wasting water. The new system also allows for heat to be recovered from the drained pool water and used to preheat fresh pool water.

- 🔥 **9,000 m³/yr**
- 💧 **1,460 m³/yr**
- 🌫️ **16,992 kgCO₂e/yr**
- 💰 **\$8,000**
- 📊 **\$30,000**
- 📋 **Complete**



Victoria Road Recreation Centre and Exhibition Arena zero-emissions electric ice resurfacers upgrade

The battery electric ice resurfacers are in operation. Now there are no more tailpipe emissions in the Victoria Road Recreation Centre and Exhibition arenas. This improves indoor air quality while lowering fuel costs and building ventilation requirements. The new units are a lot quieter, too!

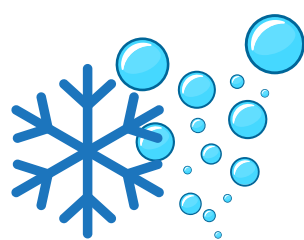
- 🔥 **11,000 m³/yr**
- ⦿ **3,300 L/yr propane**
- 🌫️ **25,876 kgCO₂e/yr**
- 💰 **\$4,000**
- 📊 **\$100,000**
- 📋 **Complete**



West End Community Centre cooling tower replacement

The cooling tower was upgraded to a new, energy efficient tower with a variable speed drive. The cooling tower can now run as needed and not waste energy.

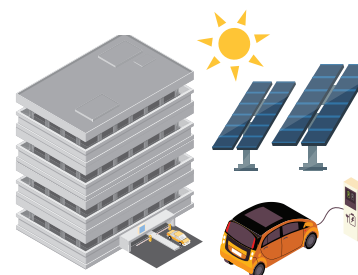
- ⚡ **19,500 kWh/yr**
- 🌫️ **390 kgCO₂e/yr**
- 💰 **\$3,000**
- 📊 **\$30,000**
- 📋 **Complete**



Victoria Road Recreation Centre cold water ice flooding system replacement

The new cold water ice flooding system requires the arena's refrigeration equipment to work less while reducing GHG emissions, and also removes air bubbles from the water making for a safer, better quality sheet of ice.

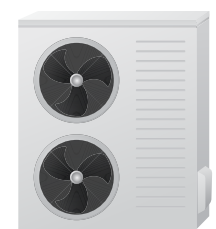
- ⚡ **44,000 kWh/yr**
- 🔥 **6,500 m³/yr**
- 🌫️ **13,152 kgCO₂e/yr**
- 💰 **\$8,000**
- 📊 **\$40,000**
- 📋 **Complete**



Market Parkade is a net zero energy building

The new Market Parkade on Wilson Street was built with energy efficient lighting, public electric vehicle charging stations and 188kW of solar capacity on the roof, making it a net-zero energy building!

- ⚡ **206,800 kWh/yr**
- 🌫️ **4,136 kgCO₂e/yr**
- 💰 **\$31,000**
- 📊 **\$350,000**
- 📋 **Complete**



Clair Road Emergency Centre HVAC recommissioning

The HVAC systems were reviewed to address heating, cooling, humidity and noise issues. HVAC controls system upgrades were made to make the facility more energy efficient, comfortable and a lot less noisy.

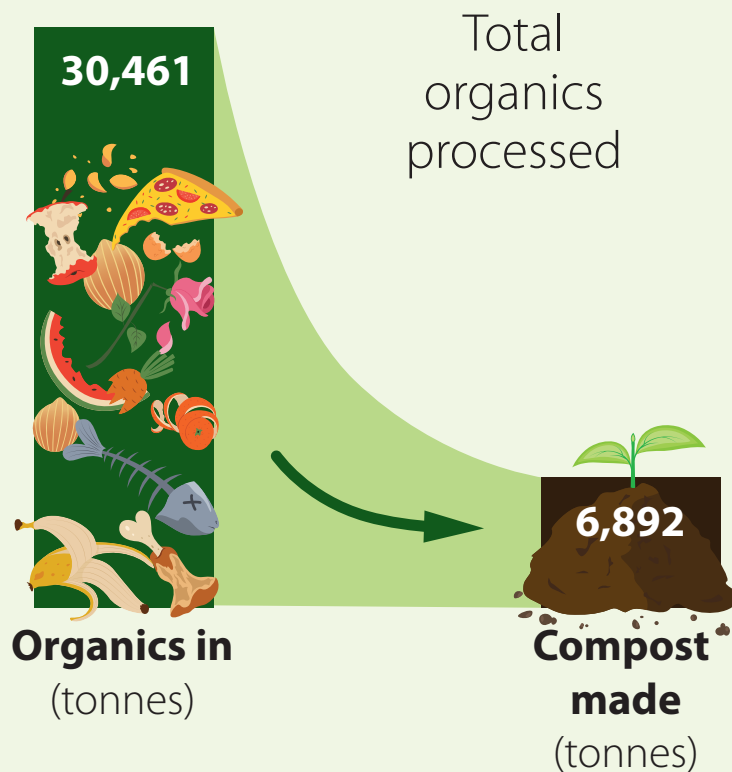
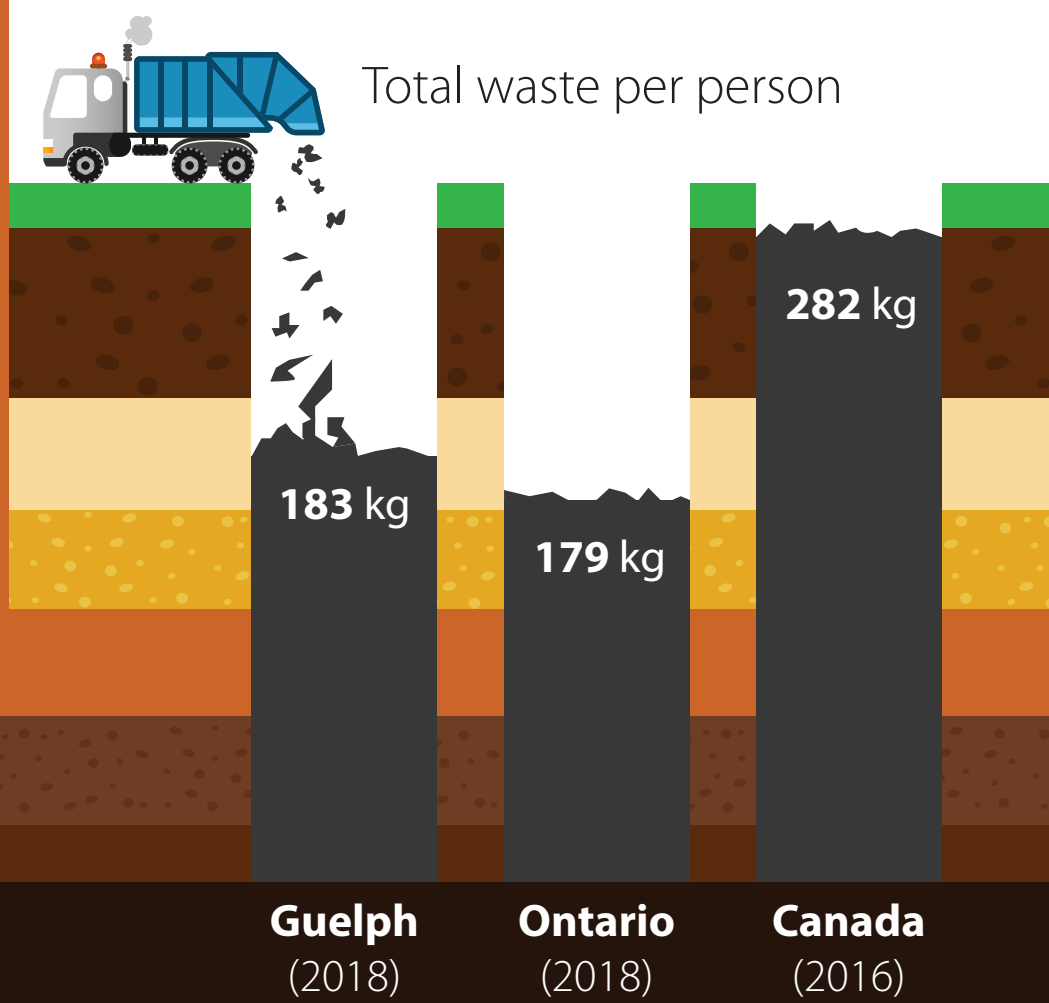
- ⚡ **41,868 kWh/yr**
- 🔥 **16,212 m³/yr**
- 🌫️ **31,446 kgCO₂e/yr**
- 📊 **\$15,000**
- 💰 **\$10,000**
- 📋 **Complete**

Solid Waste Resources

In 2019, the City continued to build on Guelph's leadership in sustainable waste management.

In 2019...

- Guelph residents disposed of close to 100 kg less waste per person compared to the national average.
- Guelph residents diverted 60 per cent of their waste away from landfill through proper sorting
- The City's organic waste processing facility diverted 77 per cent of organics from landfill and produced 6,892 tonnes of finished compost—that's almost equivalent to the weight of 1,000 elephants!



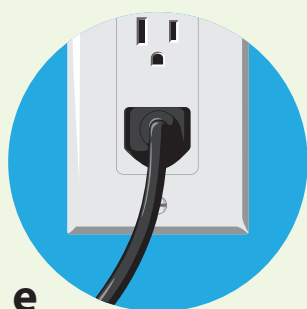
Guelph's waste diversion rate (percentage of waste diverted from landfill)

60%



35,000 tonnes of CO₂e

was captured from landfill gas and stored to be used as electricity



21,000 tonnes of CO₂e was captured from organics processing

What we've done

2019 key project highlights



LED lighting retrofit

Completed LED lighting retrofits at the Waste Resource Innovation Centre to reduce energy consumption and enhance lighting.



Carbon credit reduction

The City sold \$590,000 worth of carbon credits through capturing 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 (MRF)

The City, with help from the Guelph community, diverted from landfill and sold back to market over 5,000 tonnes of paper products and 2,000 tonnes of containers (cans, glass, plastic bottles, etc.).



Curbside waste audits

Conducted over 600 curbside waste audits to help educate Guelph residents and improve their sorting. 50 per cent of audited households had improved their sorting throughout all three waste streams.



Waste Resources Innovation Centre

The Waste Resource Innovation Centre helped divert 24,000 tonnes of waste away from landfill, which is made up of:

- Construction demolition waste: 2,400 tonnes
- Yard waste: 7,600 tonnes
- Organics: 7,000 tonnes
- Recycling: 7,000 tonnes



Reuse programs

487 bikes diverted from landfill through the ReCycle bike reuse program and 4,500 L of paint was diverted from landfill through the Paint+ reuse program.



Household hazardous waste

We ensured safe disposal of 251 tonnes of hazardous waste, diverting it from landfill while also helping to protect our water supply and environment, prevent fires and keep our staff and community safe.



Multi-residential waste collection

The City started collecting waste from multi-residential buildings, helping ensure more Guelph residents are sorting and diverting their waste. We on-boarded 15 properties consisting of 825 units.



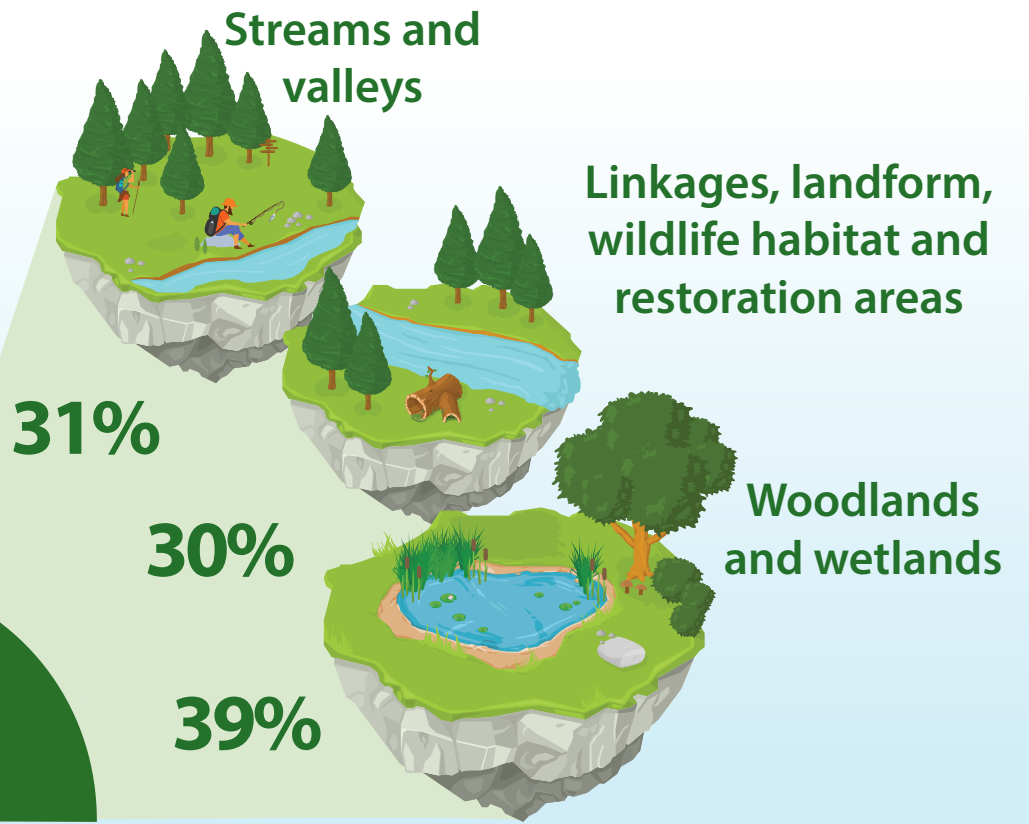
Customer service and public education

The City supported 50 local events by providing three stream waste bins and sorting education; provided 137 facility tours for students and residents at the City's Waste Resource Innovation Centre; and provided customer service assistance to over 12,000 customers in person, by phone and through email.

Urban Forest and Natural Heritage

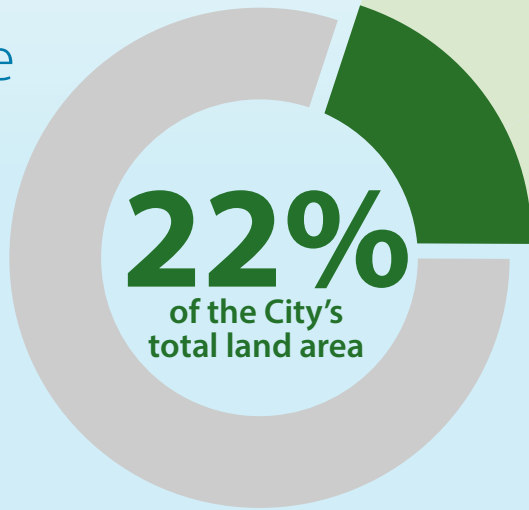
The City maintains, protects and restores Guelph's natural heritage and urban forests which helps us to:

- 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

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 target **40%**

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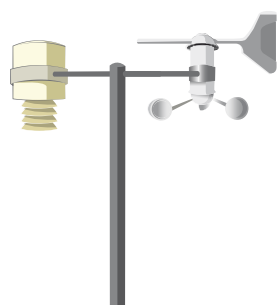
What we've done

2019 key project highlights



Niska Road reconstruction wildlife tunnels

Three wildlife tunnels were installed on Niska Road to provide safe paths for animals to move under roads between natural spaces safely. There are now a total of 18 wildlife tunnels in Guelph.



Establishing a city-wide weather network

Improved our local weather monitoring capabilities by installing two new weather monitoring systems. These help us understand and identify trends in local climate and the impacts it has on our waterways and ecosystems. We now have a total of five weather network monitoring systems across Guelph.



Storm water monitoring to assess stream health

The City started monitoring seven stormwater facilities and streams to look at how rain water runoff impacts stream health. Monitoring includes water chemistry and benthics (aquatic insects) as indicators of stream health.



Restoration and enhancement of natural spaces

As part of the Natural Heritage Action Plan, the City completed seven stormwater pond clean outs to help keep Guelph's waterways clean and planted native species trees, shrubs, wildflowers and grasses to help support enhancement of biodiversity at the ponds.



Natural heritage advisory committee

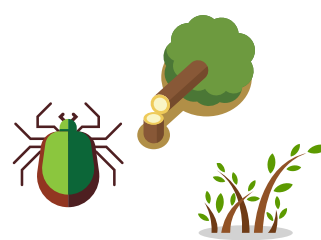
As part of the Natural Heritage Action Plan the City created a natural heritage advisory committee made up of nine members who provide City Council with input and perspectives on strategic, high-level natural heritage conservation matters relating to City-led initiatives.



Tree planting

As part of the Urban Forestry Master Plan recommendations, the City increased our canopy coverage and replaced trees removed because of emerald ash borer, by planting:

- 400 trees on streets
- 3,300 trees in parks and natural areas
- 3,026 shrubs in parks and natural areas



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 90 hectares of invasive species (species like buckthorn, dog strangling vine, etc.)
- Removed 600 ash trees killed by emerald ash borer
- Treated 376 healthy ash trees with TreeAzin™ (insecticide)

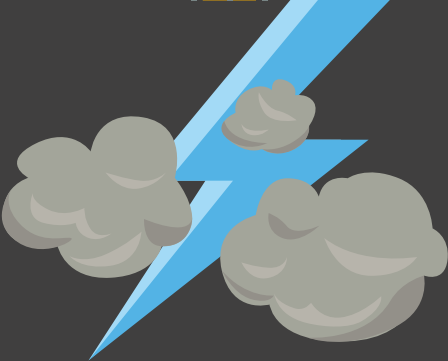


Clean and green community clean up

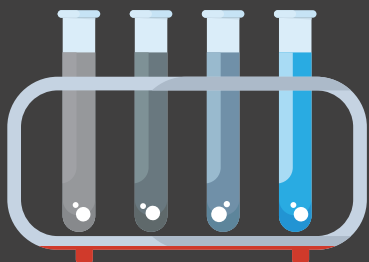
With the help of 1,200 volunteers, the City collected 3,300 kg of garbage in Guelph's parks. That's twice as heavy as an average-sized car!

Wastewater Services

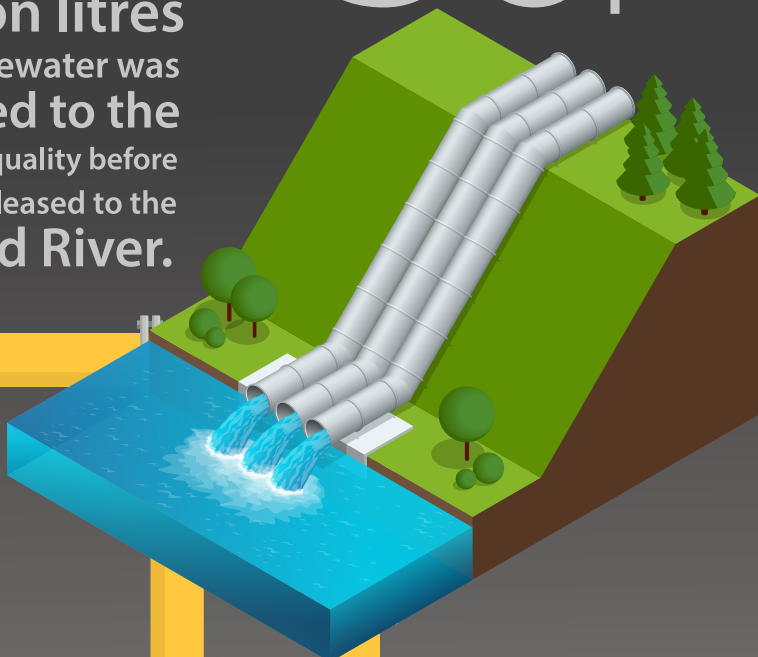
Environmental stewardship drives all of the City's Wastewater Services programs. Whether it be reusing digester gas (methane) and biosolids (organic solids removed from sewage) recovered from the treatment process to power our wastewater treatment plant, or developing new educational programs to engage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



2,630,811m³ of reused digester gas powered the wastewater treatment plant. That's enough to power 1,975 houses.



20.6 = 56 million litres per day!
billion litres of wastewater was treated to the highest quality before being released to the Speed River.

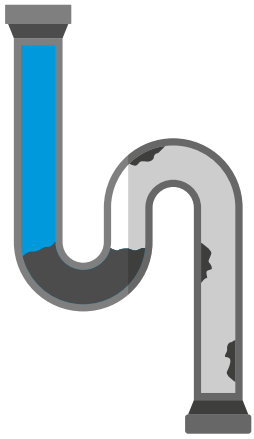


3,700 tonnes of biosolids were re-used by farmers as fertilizer, meaning 100 per cent of biosolids from the wastewater treatment plant were diverted from landfills.

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What we've done

2019 key project highlights



Sanitary system flushing program

The maintenance flushing program ensured that 107 km of the sanitary system was flushed as a way 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 Peterborough!



Environmental protection

The Environmental Protection Officers conducted over 600 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 398 calls to mitigate spills and to support Guelph Police Services, Guelph Fire Services and other City departments.



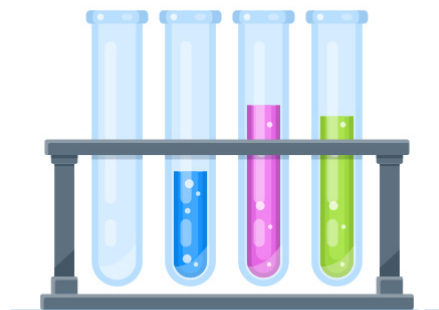
Education and outreach program

Wastewater Services hosted 42 tours of the wastewater treatment plant for over 800 guests, furthering our community's knowledge about wastewater. This includes tours for students, as well as peer groups, academics and industry partners.



Studying water re-use

In 2019, the City initiated a study to explore opportunities for re-using water and developing a reclaimed water program. This study will focus on using treated wastewater for things like sanitary sewer flushing, instead of treated drinking water. The study will be part of the Wastewater Treatment and Biosolids Master Plan, which is the City's long-term plan for managing wastewater in Guelph.



Sample collection and analysis

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 16,000 samples in 2019.



Responsible environmental steward projects

Environmental stewardship is important in our planning. Projects such as the aeration blower upgrade program will save significant energy and reduce our carbon footprint. The installation of best-in-class chemical delivery systems to manage phosphorus removal and disinfection ensure a high level of process control and treatment. Efforts are underway to develop an Environmental Management System that will oversee compliance and emergency planning for wastewater services which will further build trust and confidence for all stakeholders.

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.

2019 Year in Review

Awarded the American Water Works Association–Exemplary Source Water Protection Award for "establishing and maintaining source water protection programs that account for their unique local conditions, incorporate the interests of local stakeholders, and reflect sustainable long-term commitments to the process by all parties."



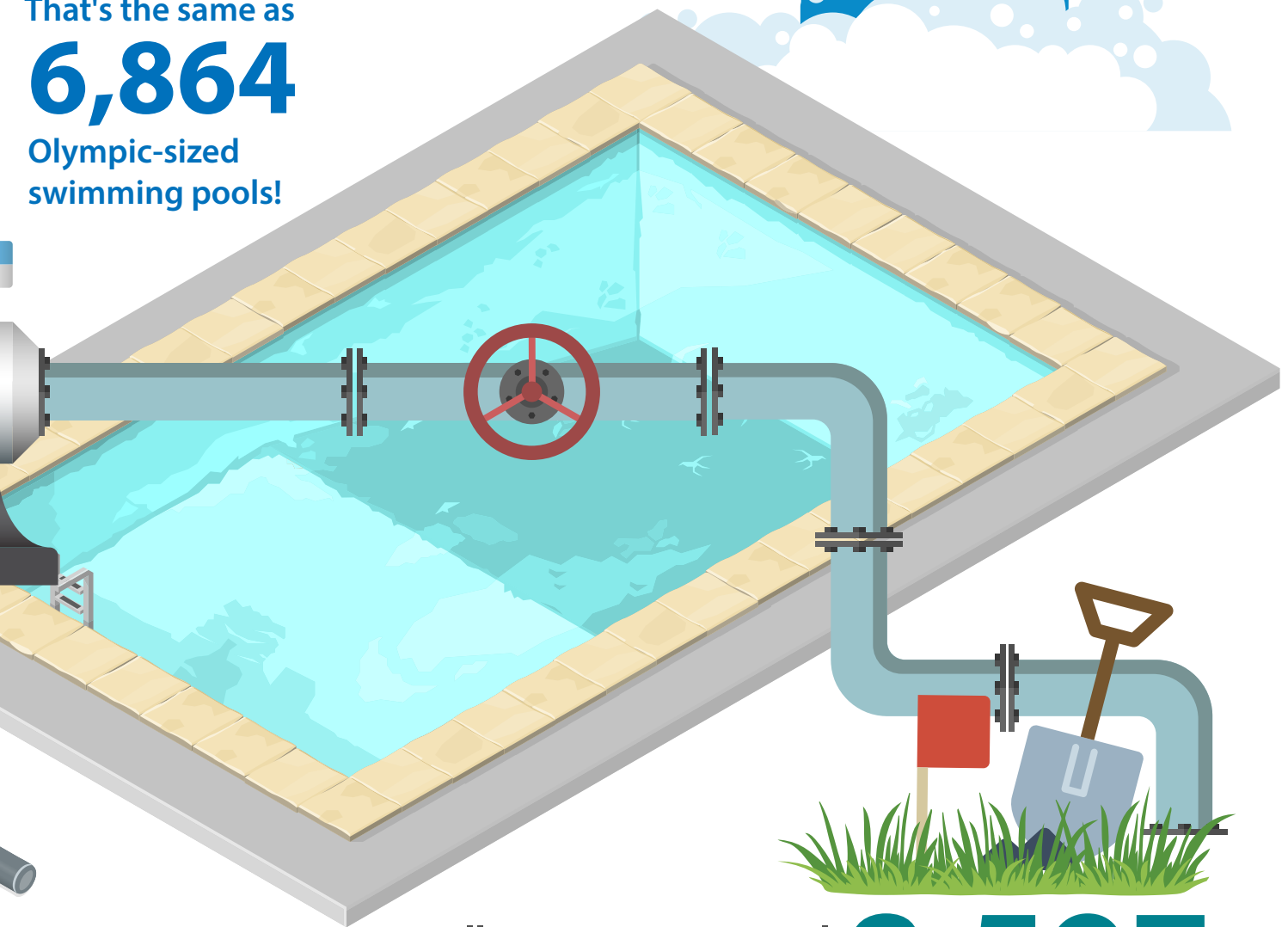
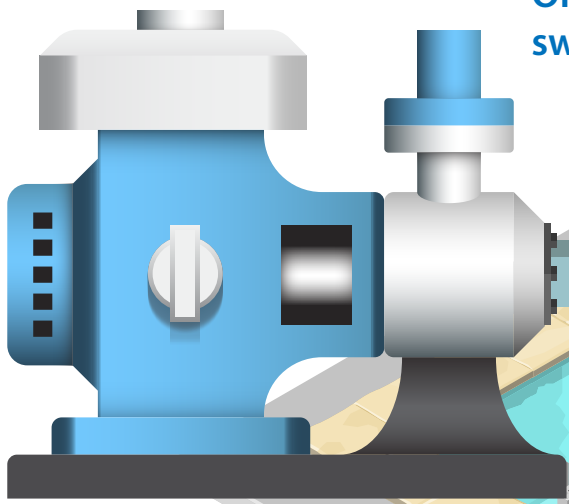
17.2

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

That's the same as

6,864

Olympic-sized swimming pools!



Inspected
342
kilometers
of metallic
watermains
and proactively
maintained to
save an average of
534 million
litres a day



8,597

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

The Guelph Water Wagon helped divert

44,000

water bottles from recycling and waste streams at local events

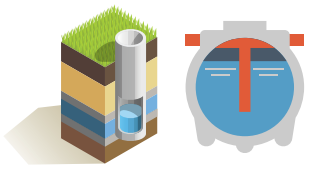


658.5

million litres of water is saved per day through water-efficiency programs!

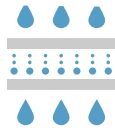
What we've done

2019 Key Project Highlights



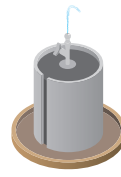
Private well and septic decommissioning rebate program

The City implemented a private well and septic decommissioning rebate program to help landowner's decommission unused private water wells and septic systems, further preventing contamination threats to our local drinking water supply.



Burke well water treatment upgrades

The City completed upgrades to Burke well that remove iron and manganese from the water and improve service delivery and reliability for 13,000 Guelph residents.



Jubilee park water fountain installation

A water fountain was installed at Jubilee Park to help residents stay hydrated and reduce the number of plastic water bottles entering our recycling and waste streams.



Rain barrel sale

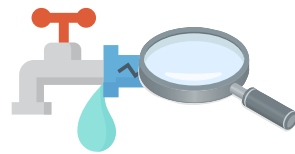
950 rain barrels were sold to support Guelph residents capturing rainwater for lawn and garden use. Combined, these barrels can hold up to 228,000 litres of water (about 1,500 bathtubs full). Using the rainwater later helps conserve tap water and retain stormwater to prevent flooding.



Healthy landscapes

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

- 500 residents participated in the speakers series and gardening workshops.
- 100 residents participated in the four-part landscape design course.
- 300 Healthy Landscapes property visits, with 20 residents seeking Blue Built Home certification.



Leak detection

The City tested 342 kilometers of watermains within the City's distribution system for leaks. 33 leaks were identified and repaired preventing the loss of approximately 534,000 litres of drinking water per day (enough to fill 78 Olympic-sized pools).



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 level escalated to Level 1-Yellow on July 29 during a sustained dry spell and returned to Level 0-Blue on October 2.



Water efficiency rebates and incentives

658.5m³/day of treated water saved through efficiency programs, which include:

- 984 approved rebates and audits through hallmark water efficiency programs such as the Blue Built Home Certification and Rebate Program, Multi-Residential Water Audit and the home tune-up water audit
- 38 incentives for municipal infrastructure improvements and Water Smart Business upgrades, including upgrades at the River Run Centre, Guelph Farmers Market, and a splash pad.



Youth and public outreach and education programs

- 32 class tours of Water Services with more than 690 students
- 70 interactive in-school presentations to 1,459 students
- H2Awesome, the award-winning grade 8 education program on Guelph water, engaged 570 students, and provided in-class workshops to 222 classes
- Planet Protectors for grades 2-4 classes offer an engaging, online platform for sustainability learning related to water, energy and waste, engaged 26 classrooms and 566 students
- H2O Go Festival, offered on World Water Day in conjunction with the eMERGE EcoMarket, hosted nine organizations contributing to a tremendously popular event of over 3,000 participants
- Waterloo Wellington Children's Groundwater Festival cultivates curiosity in water literacy for Grades 2 to 5. 4,898 students participated this year.



Pilot raingarden rebate program

The City piloted a raingarden rebate for Guelph residents to encourage water conservation and reduce stormwater runoff.

- 50 residents participated in the raingarden workshop
- 30 pre-qualified for a raingarden rebate through home-visit consultations
- 16 raingardens were installed and provided a rebate resulting in 39,800 litres of stormwater captured (an average rain garden hold about 2,490 litres).