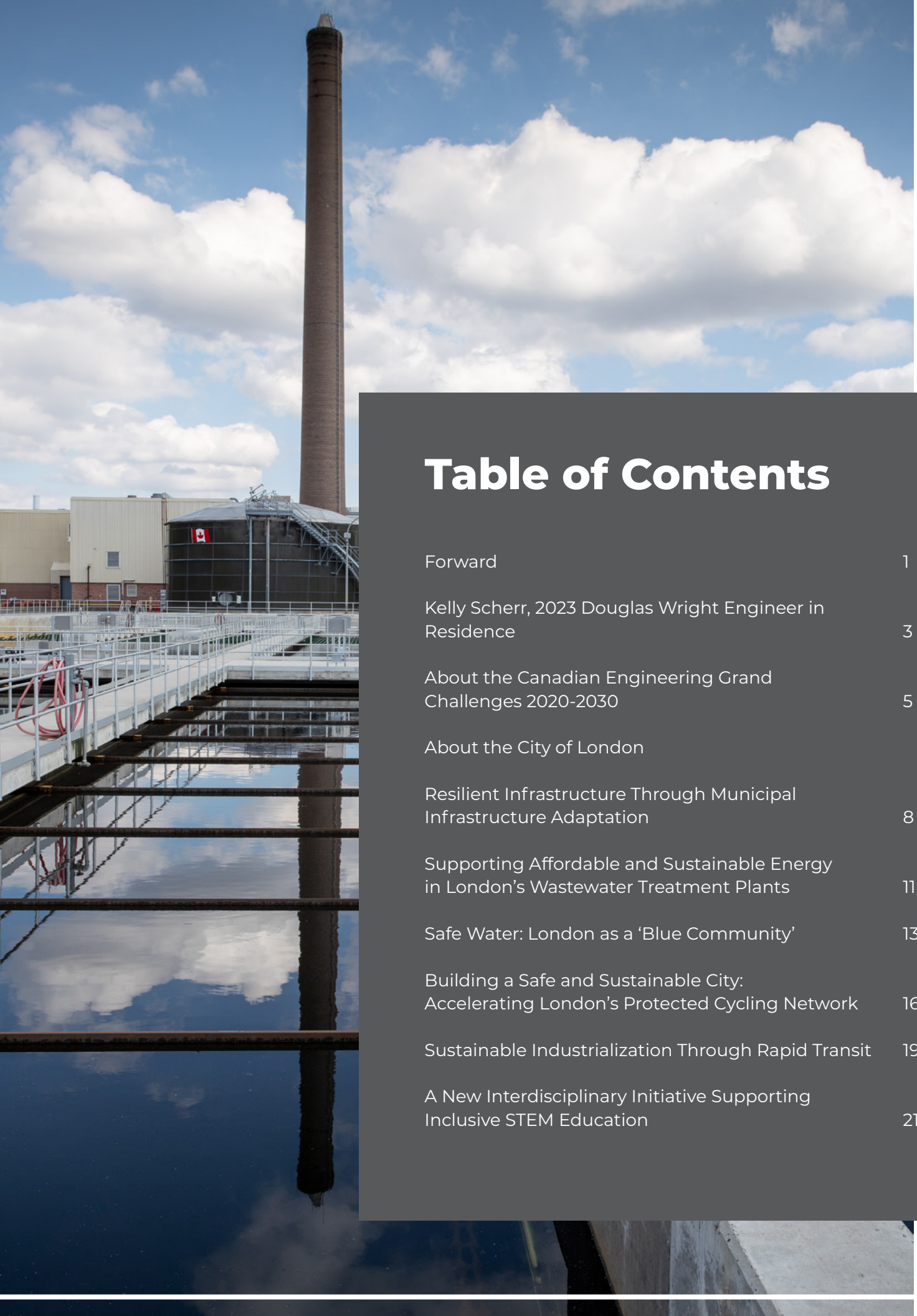
CANADIAN ENGINEERING GRAND CHALLENGES

SUPPORTING OUR GROWING COMMUNITY

CITY OF LONDON CASE STUDIES ADDRESSING THE CANADIAN ENGINEERING GRAND CHALLENGES



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Nadine Ibrahim

Turkstra Chair in Urban Engineering, Civil & Environmental Engineering, University of Waterloo

Engineers have “wicked” problems to tackle nowadays, where engineers are called upon to address social problems such as housing, poverty, and food security. Engineers have devised creative ways to leverage the tools in their toolbox to plan, design and build innovative solutions that also contribute to human growth and prosperity. We take part in transforming our natural environment that influences the way we live now and into the future. The obligations and responsibilities associated with our engineering activities require us to be engineering leaders and technological stewards to safeguard people and the planet.

The Engineering Deans Canada have framed a call to action around the Canadian Engineering Grand Challenges (CEGCs) centred around the most compelling and critical issues facing Canada and Canadians today and over the next decade. Inspiring action on the CEGCs empowers us to collaborate to improve life for Canadians and the world. The CEGCs were central to many of my conversations over the past couple of years, and certainly, many professionals and academics have used a “grand challenges” approach to focus their respective professions.

“ The Canadian Engineering Grand Challenges **inspire action to improve life for Canadians and around the world**. These actions will have a profound impact in Canadian cities, and they will challenge engineers to step outside of engineering boundaries and interact with other disciplines interfacing with engineering to create societal impact in our communities.”

Recognizing the critical role that engineers play as technological leaders and stewards, the engineering profession has a pressing responsibility to address these challenges with urgency, and respond to the world's call to action on the United Nations' Sustainable Development Goals. Thanks to Engineering Deans Canada (EDC) for creating and endorsing the Canadian Engineering Grand Challenges as a framework that reflects the unique characteristics of our people, our natural landscape and the challenges we face as Canadians, which motivates and inspires our collective problem-solving sights.

I am very grateful that this publication is an opportunity to bring the CEGCs to light and to showcase projects and initiatives from the City of London, ON that are relevant to addressing each of the grand challenges. By raising awareness about these challenges, students develop attributes and competencies by collaborating with peers and mentors from other disciplines. These attributes include: the ability to design and create, the ability to integrate and solve, the understanding of business and innovation, the practice of being multicultural and diverse and the commitment to social consciousness and community.

I wish to extend many thanks and appreciation to Kelly Scherr, Deputy City Manager, Environment & Infrastructure, City of London for giving her time, energy, insight and experience to the University of Waterloo as the 2023 Douglas Wright Engineer-in-Residence. Because of Kelly, we had many thought-provoking discussions around infrastructure that is sustainable and kind. Many thanks to the City of London staff who helped produce a very meaningful publication by contributing to the ideas, development, and design of this publication. They've put London on the CEGC map!
Thanks to the late Carl Turkstra for his vision for establishing the Turkstra Chair in Urban Engineering that creates excitement for our future cities and for making this work possible.

Thanks to the all the readers who will find this valuable. My hope is that this publication continues to be compiled by future Engineers-in-Residence representing different municipalities across Canada.

Kelly Scherr,
2023 Douglas Wright Engineer-In-Residence

Kelly is a proven executive leader in municipal infrastructure who is committed to building resilient, inclusive, and effective teams to deliver and manage great assets for cities. As the Deputy City Manager of Environment & Infrastructure with the City of London, she leads a team of over 800 people who deliver a full suite of water, wastewater, drainage, solid waste, environmental, transportation, construction administration, infrastructure operations, rapid transit, major projects, forestry and parks to a city of over 430,000 people.

As the Chief Administrative Officer for the Elgin and Lake Huron Area Primary Water Supply Systems, Kelly also leads the provision of safe, reliable, and affordable drinking water to over a half-million Ontarians in fifteen member municipalities covering an area the size of Prince Edward Island.

Kelly has over 20 years experience delivering infrastructure plans, projects, programs, and policies. Prior to joining the City of London in 2016, Kelly spent 14 years in a variety of roles at the City of Regina, where she led the on-time and on-budget construction of a new P3 wastewater treatment plant and CFL stadium, the planning of 37.5 acres of inner-city revitalization, and the creation of a new corporate centre of excellence in project management. She also held leadership roles in urban planning, development management, construction administration, and municipal enforcement, including zoning, building standards, bylaw enforcement and parking.

Kelly attended the University of Regina, where she received her degree in Regional Environmental Systems Engineering. Kelly also has a Master of Business Administration, a Graduate Certificate in Leadership and is a Fellow of Engineers Canada.

Reflections from Kelly Scherr

It has been an exceptional experience to serve as the 2023 Douglas Wright Engineer-in-Residence with Dr. Nadine Ibrahim, Turkstra Chair in Urban Engineering. Connecting with the faculty and students at the University of Waterloo has been an incredible adventure as we explore not only how to manage well the cities we have, but to envision the cities we will need in the future.

As engineers in the municipal world, we have a unique privilege and challenge: we work in the communities where we live delivering critical services to our families, friends, and neighbours every single day. Now, perhaps as never before, the interdisciplinary role of the urban engineer is increasingly critical. We know we must build sustainable cities that not only reduce greenhouse gas emissions but are resilient in the face of a changing climate. We know we must plan and build for growth and in the context of good financial and ecological stewardship.

> What's becoming increasingly important is for us to recognize the intersectionality of our work as engineers in designing and building cities that are **inclusive, prosperous, and healthy** .

The challenge that always comes to mind for me is: "how do we build kinder communities?" Kindness may be an unusual word to use to describe urban engineering, but our work is intrinsically tied to so many decisions that benefit from consideration through a lens of kindness: mobility equity and transportation poverty, protection of natural spaces and ecosystems, inclusive programs and communities, healthy and active communities, housing supply and affordability, intergenerational equity, neighbourhoods that meet the needs of all residents throughout their lives, and the economic prosperity of the cities we call home.

My time as the Engineer-in-Residence has allowed me to connect the work of our team here at the City of London to the Canadian Engineering Grand Challenges for the first time and we are pleased to share some London examples that advance the Challenges.

I am truly grateful to have been part of the University of Waterloo community this past year; we have built connections between the university and the City of London that will continue for years to come. I am also incredibly grateful to my City of London, who have enthusiastically volunteered their time and expertise to support my work as the Engineer-in-Residence throughout the year.

About the Canadian Engineering Grand Challenges 2020-2030

The United Nations' 17 Sustainable Development Goals (SDGs) are our world's call to action on the most pressing challenges and opportunities facing humanity and our natural world. Recognizing the critical role that engineers play as technological leaders and stewards, the Canadian Engineering Profession and Engineering Deans Canada believe engineers have a pressing responsibility to address these challenges with urgency. The six Canadian Engineering Grand Challenges focus the thoughts and actions of our engineering community on the most compelling and critical issues facing Canada and Canadians today and over the next decade. More information can be found at **engineeringdeans.ca**

Resilient Infrastructure

Infrastructure is key for a prosperous Canada. When fit for purpose it enables economic productivity; supports a healthy lifestyle and can address issues of social inequality. Infrastructure in Canada is most at risk due to climate change. Coastal communities rely on the management of climate risks on essential infrastructure that is reaching or exceeding its useful life. The consequence of damage and failures to infrastructure and buildings increases due to the changing stresses from climate change. When infrastructure fails it can disrupt everything

Access to affordable, reliable and sustainable energy

Energy is a critically important facet of the Canadian social and economic landscape. Due to its climactic conditions and relatively sparse landscape, Canadian residents and industries consume significant amounts of energy. contributing to over 11% of the national gross domestic product. Ensuring that future energy systems will be clean, safe, reliable, accessible and affordable for all Canadians is a key issue.

Access to safe water in all communities

Water is life. Provision of safe water is a basic human right. Issues of flooding, water scarcity, and invasive biological contaminants threaten the provision of safe water to communities and are further heightened through climate change. While Canada has an abundance of water its freshwater systems are under significant strain due to climate change, aging infrastructure and contamination. Also, the provision of safe water continues to be delivered, but there are significant challenges for small urban and Indigenous communities

Inclusive, safe and sustainable cities

Cities are home to over 80% of Canadians – and are the arenas where many of Canada's toughest environmental and socio-economic challenges play out. Complex environmental stresses, including climate change and global biodiversity loss, among others, intersect with social challenges of widening inequality, and changing demographics. The 'design' of cities has substantial impacts on human health, linked to auto-dependent lifestyles. Addressing these challenges will necessitate changes to the ways that engineers participate in the planning of urban infrastructure and the development of urban technologies more broadly.

Inclusive and sustainable industrialization

Inclusive and sustainable industrial development depends on achieving longterm economic prosperity from industrial activities while minimizing resource use and safeguarding our natural environment. Inclusive industrialization ensures that industrial development in Canada and internationally offers equal opportunities to everyone and ensures an equitable distribution of the benefits from industrialization. Technological progress is vital in this process and can mobilize and contribute to the energy-efficiency of our industries and minimize the use of our natural resources or waste generated.

Access to affordable and inclusive stem education

Although engineering education in Canada has grown substantially over the past 165 years, female enrollment in engineering programs persists at 20 percent despite focused efforts to close the gender gap over the past decade. Also, Indigenous peoples are significantly underrepresented in Canadian engineering programs; Indigenous peoples make up 4.9 per cent of the Canadian population but only account for 1.2 per cent of total undergraduate enrollment in engineering programs. Diversity in education and the workforce would significantly contribute to economic growth; diversity of thought will benefit future innovation.

About the City of London

London, Ontario is situated in Southwestern Ontario's Middlesex County between Lake Huron and Lake Erie at the fork of the Thames River. The City of London provides services to 430,000 residents across an area of 437 square kilometres.

London's population grew by 10 per cent between 2016 and 2022 – a rate twice the national average – making it the fastest growing city in Ontario. Its population is projected to grow by 200,000 over the next 30 years.

Services provided by the City of London include transportation services, water, wastewater, solid waste management, construction and infrastructure services, parks planning, forestry and emergency services.

To support its growing population, London's infrastructure must continue adapting to meet the challenges of future demand, climate change, and extreme weather.

Resilient Infrastructure Through Municipal Infrastructure Adaptation

Being prepared for environmental changes is critical to building resilient cities. Adapting municipal infrastructure for increasing frequency and intensity of rainfall within the changing climate not only protects properties from flooding but can be leveraged as an opportunity to enhance urban ecosystems. The benefits of combining structural and natural engineering techniques include more sustainable infrastructure, enhanced wildlife habitat, and increased public access to nature.

The City of London is increasing its resiliency to riverine flooding by applying structural and natural engineering techniques to its existing urban watercourses. Two projects that demonstrate the city's commitment to climate change adaptation include the reconstruction of the city's downtown floodwall, the West London Dyke, and the Mud Creek urban channel naturalization project.

" The City of London is applying the philosophy of 'complete corridors' to move water, wildlife, and people. The natural channel systems that we are rebuilding today set the groundwork for **healthier urban streams** and a more sustainable future. Access to nature in the city can improve the mental health of people living in urban centres while **increasing connectivity for wildlife mobility**."

Shawna Chambers, P.Eng., Division Manager, Stormwater Engineering

Mud Creek culvert replacement and natural channel reconstruction (2020-2022)

West London Dyke

The original West London Dyke was constructed along the Thames River in the 1880s to protect the Blackfriars neighbourhood, just west of the city's downtown core. After extreme floods in 1937 and1947 left thousands of homes underwater, sections of the dyke were raised in order to increase protection.

In 2005, an assessment was completed on the dyke and it was determined that most sections needed to be fully replaced due to structural deficiencies. To further protect the homes within the floodplain, the new dyke was designed and constructed to protect against the 1:250 year flood event with an additional 0.9 m of freeboard protection.

To date, over 1.4 km of the West London Dyke spanning from the Forks of the Thames to Oxford Street has been upgraded to this higher level of protection. The remaining west leg spanning from the Fork to Cavendish Park will be completed by 2028. Once completed, the dyke will protect approximately 2000 homes near the within the floodplain from riverine flooding.

Above: West London Dyke Reconstruction

Mud Creek

The Mud Creek Natural Channel reconstruction project was initiated to:

- alleviate urban flooding along Oxford Street and surrounding properties;
- improve ecological health of the urban channel;
- accommodate future development of 54 hectares, and
- create an active mobility network for the existing high-density neighbourhood

The primary cause of flooding was the original 1650 mm-diameter culvert constructed in the late-1800s under the Canadian National (CN) Railway that was installed two meters higher than the existing channel bed. The flooding problem was exacerbated by runoff from the high-density development upstream that started in the 1960s. In 2020, the first phase of the project involved constructing two, 2.0-meter-diameter culverts, at a lower elevation under the CN Railway using trenchless boring techniques.

The subsequent phases of the project involve reconstructing the channel to the north and south of the new culverts, all to expand flow conveyance and match the lower elevation, while incorporating the philosophy of the 'complete corridor' to accommodate wildlife and pedestrians. The first channel reconstruction section, south of the culverts, involved 280 meters of natural channel as well as a constructed. In 2024, the City will construct 775 meters of natural channel north of the culverts, which will include an accessible paved pathway adjacent to the channel, promoting active mobility and access to nature. The final phase of the channel reconstruction project will be completed with the future development project, resulting in public and wildlife access to 2 km of natural channel within the urban center.

Above: Mud Creek constructed wetland feature. Above right (top): Original culvert circa 1890s
Above right (bottom): One of two twin culverts (2020)

Supporting Affordable and Sustainable Energy in London's Wastewater Treatment Plants

Municipalities have an obligation to provide adequate treatment of their wastewater, to limit negative impacts to human health and the environment; however, conveyance and treatment of wastewater consumes large amounts of energy.

The City of London operates five wastewater treatment plants which treat a combined total of more than 71 billion litres of wastewater and generate over 17,000 dry tonnes of waste solids annually.

Wastewater treatment accounted for 27% of the total energy consumed by the City of London, the second-highest consumer next to the energy consumed across all the City's other facilities combined. Wastewater treatment processes are one of the biggest opportunities for the City of London to reduce its energy use and greenhouse gas emissions.

To this end, Wastewater Treatment Operations staff have pursued several significant projects to achieve real savings in terms of electricity consumed and greenhouse gases produced.

> " Even though the need for wastewater treatment is unavoidable, that's no reason it can't contribute to a municipality's sustainability goals. In fact, it's quite the opposite; it's in those mandatory activities that run 24-7 that we find the biggest opportunities for **reducing our impact on the planet**."

Kirby Oudekerk, MPA, P.Eng,
Division Manager, Wastewater
Treatment Operations

Greenway Wastewater Treatment Plant is London's largest wastewater treatment facility.

Solids disposal is an essential but challenging part of wastewater treatment. Solids trucked from the smaller satellite plants, plus those generated at Greenway, are all dewatered and then incinerated at the Greenway Wastewater Treatment Plant. The first step in reducing energy consumption in solids disposal was to improve dewatering processes to produce drier solids for incineration. By reducing the water content of the waste solids, the incinerator was able to run without natural gas fueling the combustion. As a result, 1.18 million m3 less natural gas has been consumed annually in that process. Even with the associated increase in electrical consumption, the net result was a reduction of 3,580 tonnes CO2e per year.

Aeration of wastewater during treatment is necessary to maintain the biological activity responsible for the treatment. A fine balance is struck between providing sufficient air for biological processes and saving electricity by not providing more than is necessary. Historically it has been estimated that aeration can consume up to 50% of the electricity in a treatment plant. The City has pursued a policy of replacing less efficient aeration blowers with new turbo blowers. Through a combination of higher efficiency and improved ability to tailor airflow to actual process demands, turbo blowers are estimated to reduce electrical consumption by 20-30%. Conversion of the City's aeration blowers is not yet complete, but the conversions to date have resulted in a total reduction of approximately 6,340 MWh per year, equivalent to 1,400 tonnes CO2e.

Harnessing wasted heat is another opportunity to reduce impacts. Greenway's incinerator produces a lot of heat, some of this heat had been captured and used to heat areas of the plant; however, the remaining heat was lost through the exhaust stack. This wasted heat energy represented an opportunity for the City. To capture this heat, the City installed an Organic Rankine Cycle (ORC) power generation system in 2021. This system is the first of its kind in Canada, and represents the largest single effort undertaken by the City of London to date to cut energy use in its facilities. By installing the ORC, the City has created the ability to produce net electrical power of 500-650 kW simply by harnessing previously wasted heat. This power has the potential to displace over a quarter of Greenway's average electrical distribution grid demand. Since the heat source for the Greenway ORC stems from an existing and necessary process fueled by organic source material rather than from burning new fossil fuels, the ORC helps displace the greenhouse gas emissions generated by the Ontario power grid, estimated at 800 tonnes CO2e per year.

Above left: On the left is a rendering of the Organic Rankine Cycle system before its arrival and installation in London. Above right: the Organic Rankine Cycle system is pictured in 2021 now in operation.

Safe Water: London as a ‘Blue Community’

In 2021 London City Council endorsed London becoming a Blue Community.

> “ Part of every resilient city is providing safe, reliable drinking water to its residents. To do that, we must continuously renew and replace our drinking water infrastructure. We must take a long view when doing this so that the drinking water system continues to be **sustainable for future generations**. We must also be mindful of how critical drinking water is to all of us as human beings and work to ensure access to those most vulnerable in our communities.”
>
> Aaron Rozentals, P.Eng, GDPA, Division Manager, Water Engineering, City of London

Finished concrete topping

Cities and other organisations can become a Blue Community by committing to three principles:

1. **Restricting the sale of bottled water in City of London facilities**

   To reduce the impact of water bottles on the environment and promote drinking tap water a blue community cannot sell bottled water in its facilities. The City of London has had this policy in place for more than a decade.

2. **Publicly owned and operated water and wastewater system**

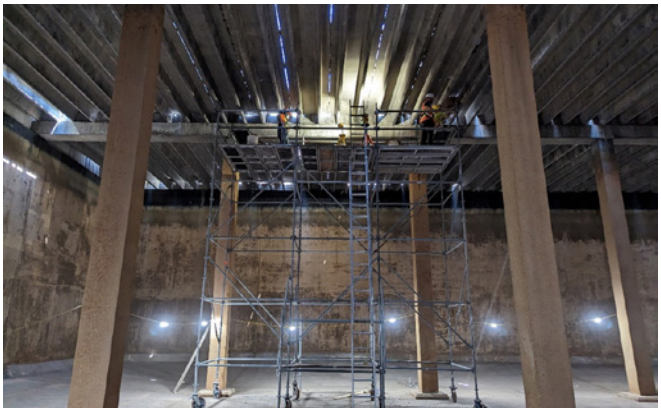
   To ensure that the system is working to meet the needs of the community as opposed to a for-profit corporation. London's Water and Wastewater system as always been public with no intention of changing.

3. **Water as a human right**

   The key portion of this resolution is that it requires the City to state that it will not shut off water to customers that have an inability to pay.

   As part of London's water and wastewater rate structure, there is a 25 cent "Customer Assistance Charge" on the bills of all single-family residential customers. Part of these funds are directed to the leak allowance program, which helps customers pay unusually large bills due to leaks. Another use of these funds is helping the most vulnerable members of our community through the Salvation Army Center of Hope's Housing Stability Bank which pay towards the water bills for customers in significant financial distress. We also offer flexible payment plans to customers that have fallen behind on their bills.

   Each of these programs help different customers in different ways. The leak allowance program could help a customer that might normally be able to afford their water bill but would struggle to pay a large one-time bill due to a leak. Payment plans help customers who may have gone through a time of temporary financial stress catch back up. Finally, our funding through the Salvation Army is designed to assist the most vulnerable of our customers.



Above left: Reservoir roof repairs. Above right: Reservoir floor repairs

Springbank Reservoir Complex Renewal Project

The Springbank Reservoir Complex has been the City of London's main drinking water storage site since the system began in the 1870's, and comprises three reservoirs: Springbank 1, Springbank 2 and Springbank 3. The site's location on a hill means that through gravity, good pressure is provided to the majority of the City.

Reservoir Rehabilitation

The City of London is rehabilitating Springbank Reservoirs 1 and 3, which are 60 years old. These 100 m x 100 m x 7 m deep reservoirs provide essential storage capacity for residents. Rehabilitation work includes roof membrane replacement and various repairs inside the reservoirs.

Traditional High Density Polyethylene (HDPE) and Ethylene Propylene Diene Monomer rubber (EDPM) roof membranes have a useful life of 20-25 years after which the soil cover must be removed from the reservoir to replace the membrane. For this membrane replacement, a 150 mm thick macro fibre-reinforced concrete topping slab was selected with blast furnace slag added to the mix for enhanced performance. While it has a higher upfront cost, this solution will require minimal maintenance and will minimize disruption to public's use of the area with an expected useful life of 50-75 years. This solution also has a lower climate impact since the cover will require replacing less frequently.

Reservoir Replacement

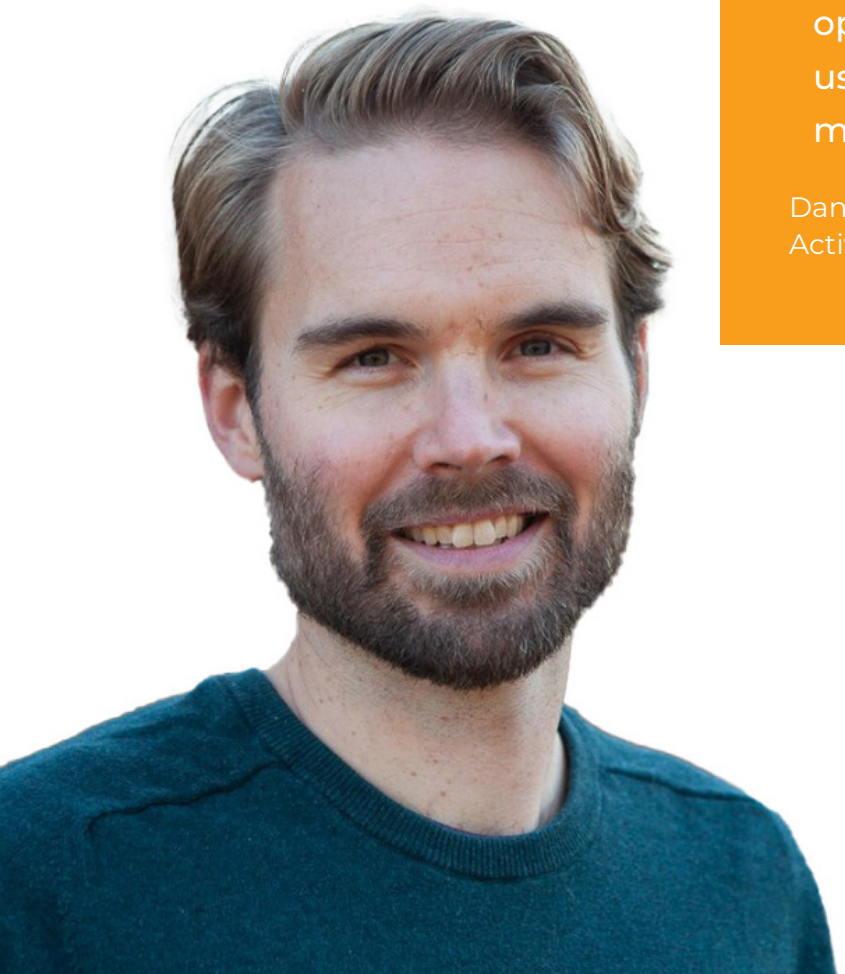
Springbank #2 reservoir is more than 100 years old and is not suitable for rehabilitation. It was built without a cover and has been retrofitted with a high maintenance floating cover. It also needs to expand to meet the needs of this growing City. Demolition of the existing reservoir and construction of the new 90 million litre reservoir will begin in 2024 and is expected to last approximately two years.

Above left: Fibre reinforced concrete closeup. Above right: Pouring concrete topping

Building a Safe and Sustainable City: Accelerating London's Protected Cycling Network

Like many North American cities, London has an auto-dependent form with driving as the primary way Londoners move around the city. Personal vehicles represent the largest share of greenhouse gas emissions (27%) and represent a primary cause of injuries and fatalities on our roads. To respond to these challenges, the City of London developed a Road Safety Strategy, in collaboration with other partners, and a Complete Streets Design Manual, which considers and attempts to balance the needs of all road users.

Cycling is a focus area in both plans, prioritizing the safety of vulnerable road users and sustainable modes of travel.



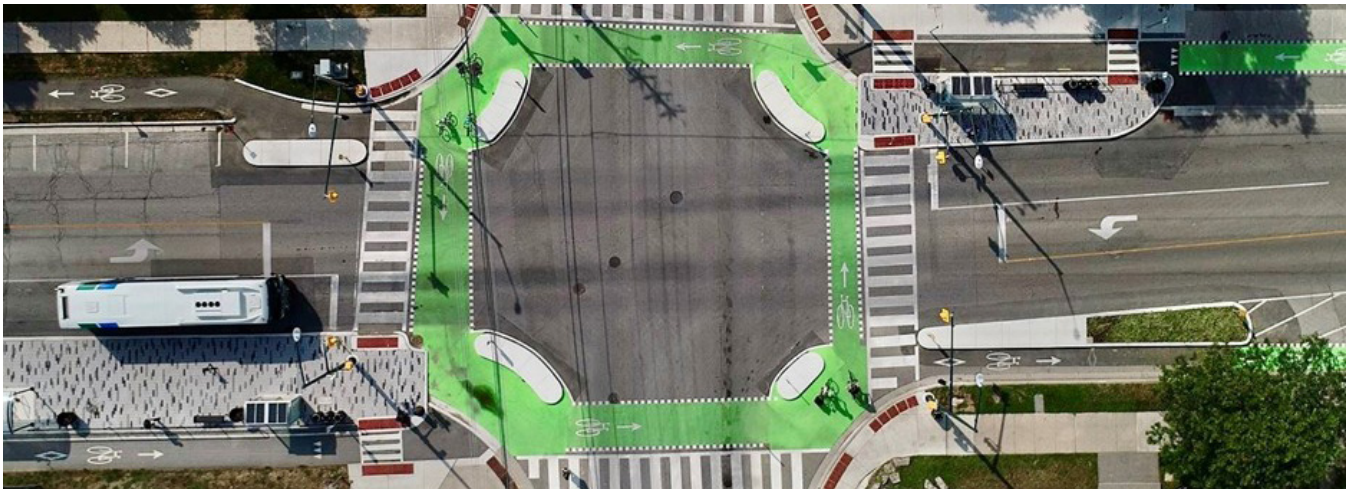
> " Expanding our protected cycling network is providing new mobility options, **improving safety** for all road users, reducing emissions, and helping more people **live an active lifestyle**."
>
> Daniel Hall, P.Eng, Program Manager, Active Transportation

In 2016, a new Cycling Master Plan (CMP) was adopted, with a comprehensive list of actions to enable cycling as a viable mode of transportation – bike lanes, maintenance, wayfinding, parking and supportive policies and programs. The plan led to the inclusion of cycling facilities in many capital projects and kick-started filling in long-standing gaps, including bridge connections in the recreational pathway network.

Concurrently with the adoption of the CMP, transportation planners and engineers in North America were reconsidering who cycling facilities were being designed for, with a rapid evolution toward facilities that are more equitable, serving all ages and abilities (AAA). London embraced this design approach and pivoted quickly, accelerating the implementation of a protected bike lane network.

Above: New cycling infrastructure in London's core area

The City of London introduced its first on-road protected bike lane on Colborne Street in 2018, reallocating road space from parking and travel lanes to bike lanes with pre-cast concrete curbs and bollards providing a physical buffer. The network expanded in 2020 and 2021 on Dundas Street, in a complete street project that included cycle tracks, streetscape enhancements, island transit stops, and London's first protected intersection at Dundas and Colborne Streets. Over the most recent 12 months, an average of 12,600 cyclists per month now traverse this intersection, a testament to the adage, "build it and they will come".



Above: London's first protected intersection at Dundas and Colborne Streets

Accelerating the protected cycling network required substantial investment made possible through civic and political leadership and accessing federal and provincial funding opportunities. Over the past five years, this has enabled the implementation of 19.5 km of protected cycling facilities, including seven protected intersections.

The adoption of dramatic changes on our streets has enabled more people than ever before to choose cycling to get where they are going. And City of London operations staff have ensured these new facilities can be used year-round, despite regular snowfall in London.

Above: One of seven new protected intersections recently added throughout the city

Sustainable Industrialization through Rapid Transit

City of London Rapid Transit projects are not just transit projects; they represent a city-wide transportation infrastructure opportunity that impacts all forms of mobility, makes commutes shorter and safer, relieves traffic congestion, and builds better transit. All Londoners – including those who drive – will have an enhanced experience, thanks to the projects' investments in intelligent traffic signals, road widening and streetscape improvements, plus dedicated bus lanes that help keep traffic moving smoothly.

The rapid transit projects will revitalize over 15 km of road, including 12 downtown blocks and extend east and south to transit villages where postsecondary institutions and shopping malls are located.

"By implementing higher-order transit we have an opportunity to not only **improve mobility,** but also shape **transit-oriented development**, which will support the City of London's vision of **strategic increased density** and shifts to **more active modal share goals**."

Ardian Spahiu, P.Eng, Transportation Design Engineer, Major Projects

In addition to improving transit, the projects are focused on making sure London is sustainable in the long term to support its growing population and help preserve the health of the Thames River. While rebuilding the roads, the project will coordinate necessary underground work, including replacement of sewers, watermains and utilities.

Construction of the Rapid Transit system's three Council-approved projects – Downtown Loop, East London Link and Wellington Gateway – commenced in 2021 and is expected to be complete by 2024, 2027 and 2028, respectively. Once built, the new rapid transit service will be operated by London Transit Commission as part of an integrated public transit system.

Supporting London's housing goals

Rapid transit implementation directly contributes to achieving London's pledge to create 47,000 dwelling units by 2031. The City of London's master planning document, The London Plan, encourages intensification in strategic locations to support growth in a way that is sustainable from a financial, environmental, and social perspective. London's Rapid Transit Corridors allow for intense, mixed-use neighbourhoods and business areas that foster connections to and from transit services, while promoting active forms of mobility. The rapid transit corridors have already seen many transit-oriented development applications and proposals since the completion of the Environmental Assessment in 2018 with potential for many more.

Supporting achieving London's mode share targets

London's ability to achieve the Master Mobility Plan modal share targets is most directly influenced by land use and transit investment. Rapid transit implementation is an important step in making transit service more reliable and competitive throughout the city.

Supporting London's climate goals

Building a rapid transit system contributes to the Climate Emergency Action Plan through the reduction in Greenhouse Gas (GHG) emissions and improved air quality. GHG emission savings will be realized through a mode shift from automobiles to transit, which is amplified when considering how the emissions intensity of bus-based transit

Above left: Building rapid transit in London's downtown. Above right: Conceptual rendering of the east corridor of rapid transit

A New Interdisciplinary Initiative Supporting Inclusive STEM Education

As a major employer of engineering graduates in southwestern Ontario, the City of London is committed to supporting inclusive STEM education. We need more engineers than ever to take care of and grow our city and we benefit when those engineers bring a diversity of perspectives and lived experiences to our team.

This year, staff from many different areas of the City of London had the opportunity to be part of the Global Challenge for Sustainability at the University of Waterloo. The program was part of a new interdisciplinary initiative called the Sustainability and Social Entrepreneurship Fellowship (SSEF), which was the idea of Chris Rennick, the engineering educational developer at the Pearl Sullivan Engineering IDEAs Clinic and Dr. Nadine Ibrahim, Turkstra Chair in Urban Engineering from the Department of Civil and Environmental Engineering.

The inaugural cohort included nine engaged engineering students from around the world who spent the summer at the University of Waterloo thinking about how to tackle a real-world interdisciplinary challenge.

Below: The inaugural SSEF cohort of students from around the world

That’s where London came in.

The More Homes Built Faster Act aims to have 1.5 million new homes constructed in Ontario in 10 years. The students were challenged to consider how London could accomplish its housing commitment under the act by proposing how we could build 47,000 new homes by 2031 in way that is both sustainable and kind.

The student teams focused on three critical urban development issues: transportation, climate and green space. In addition to a weekly lecture on community and infrastructure planning topics with the Deputy City Manager of Environment and Infrastructure, staff from throughout the organization got involved with the program. City staff provided mentorship, data, tours, and other supports to the teams, who ultimately presented their recommendations to senior City staff and the Acting Mayor.

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