
TO: MAYOR, J. LEHMAN AND MEMBERS OF COUNCIL

FROM: S. DIEMERT, P. ENG., DIRECTOR OF INFRASTRUCTURE

NOTED: B. ARANIYASUNDARAN, P. ENG., GENERAL MANAGER OF INFRASTRUCTURE AND GROWTH MANAGEMENT

M. PROWSE, CHIEF ADMINISTRATIVE OFFICER

RE: 4-YEAR INFRASTRUCTURE STORY (ALL WARDS)

DATE: NOVEMBER 7, 2022

The purpose of this Memorandum is to provide members of Council with a snapshot of significant infrastructure projects completed during this term of Council (2018-2022). The topics include the following: overview of the infrastructure team; operational improvements and initiatives; and select capital project examples. Together, we have done some amazing things for the City.

Infrastructure Team

What and who is the infrastructure team? In 2020, the Infrastructure and Growth Management Division completed a reorganization to align and strengthen functional areas within the Division. All departments that touch major municipal infrastructure were brought together so that there is a seamless transition between design, construction, and operation. This approach means that the staff that are ultimately responsible for operations are involved in how the infrastructure is designed and constructed. The result is incredible value-add at every stage and an engaged team who have a sense of ownership in the City's infrastructure throughout the lifecycle.

The Infrastructure Team accounts for 170 staff within three branches:

- Design and Construction (grouped into three areas Linear, Vertical, and Developer and Special Projects (previously the Engineering Department);
- Wastewater Operations; and
- Water Operations.

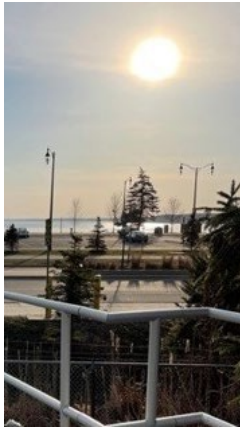
Operational Improvements and Initiatives

Operational improvement and initiatives are intended to address issues that ensure the City's infrastructure is performing well and/or address issues that have been brought to our attention by regulatory agencies, members of the public, or specific management directive related to Council's strategic priorities.

The **Wastewater Operations Branch** focus has been on public health and safety, health of Lake Simcoe, the use of best available technology, and reducing costs.



- Plant optimization continues with the goal to reduce both trucking costs and carbon emissions;
- Integrating the Wastewater Collections group into the plant team raised the level of service provided to residents and other City departments, while reducing costs of contracted services; and
- Creating the Operational Technology team aligned resources given the increasing reliance on technology at the Wastewater Treatment Facility. New initiatives include enhanced data acquisition, electronic logbooks, revised Computerized Maintenance Management System, and site security improvements.



Beyond everything else the Wastewater Branch does, meeting all regulatory effluent water quality requirements through diligent process operation and maintenance is the number one job. The facility once again had no Provincial Officer Report or Order is issued for the 2021 inspection. This achievement confirms compliance with Ministry of the Environment and Climate Change legislation and control documents, as well as conformance with related Ministry policies within the inspection review period of approximately January 2020 to July 2021.

Water Operations Branch has focused its public facing efforts around awareness and understanding of the vital role tap water plays in daily life, the infrastructure that is required to carry it to home and businesses and the critical work that water professionals do each day.

Starting in 2018, the Water Operations Branch initiated “Experience Water Day”. The Experience Water Day invites Grade 8 classes throughout the City of Barrie to participate in a one-day workshop developed by educational consultants and Water Operations staff to meet the curriculum expectation of the Grade 8 Science and Technology - Water Unit. Water Operations staff and students facilitate these workshops learn about drinking water sources, monitoring of water usage, bottled water versus tap water and careers in the water industry. In 2022, approximately 60 members of the public toured the surface water treatment plant and watched staff operate and flush a hydrant during Drinking Water Week.

- Approximately 60 km of new watermain have been commissioned, as the City continues to grow and develop;
- Timely response to an average of 35 watermain breaks per year and 20 water service breaks. This work is in addition to the many programs the team completes daily to maintain the critical infrastructure to avoid emergency work, ensure fire flow is available, and provide excellent customer service to the public, as a high degree of calls are handled on the phone without a truck leaving the plant.
- Wastewater Treatment Facility reduced potable water usage by 97% saving over 400,000 m³ of water and generating a cost avoidance of \$1.25 million dollars.
- Groundwater services installed variable frequency drives, generating over \$100,000 in incentive revenue while reducing electricity costs.
- Optimization of the Surface Water Treatment Plant chiller reducing electricity costs by \$45,000.
- Participation in the provincial ICI program has reduced electricity costs at the Wastewater Treatment Facility by \$1.35 million dollars and is estimated to reduce SWTP hydro costs in 2023 by \$116,000.



Barrie's Drinking Water was once again recognized for achieving a 100% score from the Ministry of Environment, Conservation and Parks for drinking water quality. The rating will be published in the Ministry's Chief Drinking Water Inspector's Annual Report.

The integrated organizational structure within the Infrastructure team has allowed the Wastewater and Water Optimization Teams to leverage opportunities to reduce energy and water consumption by optimizing processes.

The **Design and Construction Branch** has implemented many capital budget preparation and monitoring improvements to ensure cost certainty. Budget estimates are tested and set early in the project. A project cost report is prepared, which included the hard costs, soft costs, and appropriate contingencies that should be maintained using a risk-based approach. This budget will only change from year to year by inflation. Changes that increase the project budget are reviewed by the Change Control Board to ensure they are valid and valued appropriately.

The team is also using an innovative and collaborative approach, to deliver \$125M in construction upgrades at the Wastewater Treatment Facility, being the first in Canada to embark an Integrated Project Delivery (IPD) of this magnitude. Installation of the best available technology, the Barrie Wastewater Treatment Facility will be a flag ship facility featuring the most advanced treatment systems in Canada for a plant of this size.

Partnerships are key to a successful infrastructure program. The **Infrastructure Team** has implemented several meaningful collaborations and partnerships with external organizations in the last few years including:

- University of Toronto research work on membrane aging using the City's Wastewater Treatment Facility as a case study;
- Provincial COVID Wastewater Surveillance Initiative working closely with the Provincial government and local health unit to track trends in COVID infection waves; and
- In response to the hospital crisis during COVID, working with RVH to find a solution for the wastewater storage, disposal, and treatment requirements needed for their new Pandemic Response Unit.

Capital Construction Project Highlights

The City's Capital Budget 2018-2022 was \$756 million. 55% of that, or \$415 million, was delivered by the Infrastructure Team. This investment and reinvestment in our City will help people to get around easier, ensures that the taps turn on and toilets flush when residents and businesses need them, and protects people and property from the impacts of flooding.

A few of the projects include:

1. Harvie Road and Big Bay Point Road New Crossing - Highway 400:



One of the most anticipated and largest construction projects for decades. A new 5-lane Highway 400 crossing at Harvie Road and Big Bay Point Road between Bryne Drive and Bayview Drive. The crossing includes buffered bike lanes, sidewalks and protection for a future 7-lane crossing and interchange. Total project cost is \$43 million.

2. Bell Farm Road ROW Expansion - St. Vincent Street to Duckworth Street:

No longer a fixture of the worst roads in Ontario list, Bell Farm Road was upgraded from a 2-lane rural cross-section. This corridor is a primary route for both Fire and Police Services, so its expansion is a critical component of keeping our City safe. Implementation of cycling lanes and pedestrian facilities promote the use of Active Transportation by Georgian College students to access student residences and St. Vincent Street. This project included the addition of stormwater management and replacement of both water and sanitary. Total project cost is \$9.6M.

3. Dunlop Street West ROW Replacement – Eccles Street to Toronto Street:

This area has been completely changed with the demolition of many structures and reduction of the flooding issue previously experienced. Construction focused on an open flow channel and increasing the culvert capacity by installing new culverts. This project includes the reconstruction of the Dunlop Street right of way including sidewalks, watermains, and local storm and sanitary sewers. Total project cost is \$24M.

4. Holly Pumping Station Upgrades and Expansion:



This was the first growth project to be completed for the secondary plan area. Expansion and upgrade of the Holly Pump Station increases pumping capacity, provides emergency storage, increases standby power supply, and upgrades the building. A new forcemain services growth and provides redundancy to the existing system. The total project cost is \$11.6M.

5. Lovers Creek New Bridge - Tollendal Mill Road, West of Cox Mill Road:



What is more fascinating than a bridge pour? This project required the replacement of the existing Tollendal Mill Road culvert at Lovers Creek with a new bridge structure. The project includes road reconstruction, watercourse rehabilitation, and a new watermain. Total project cost is \$6M.

6. Kidd's Creek Restoration:

Lake Simcoe Regional Conservation Authority was a strategic partner and helped fund this project. Watercourse improvements of upper Kidd's Creek took place with the goal of restoring the health of the creek by taking a proactive ecological approach. The result is a positive effect on one of Lake Simcoe's tributaries. Total project cost is \$1.5M.

7. Dunlop Street East Corridor Improvements – Toronto Street to Mulcaster Street:

This is an award-winning project in the category of Urban Building Initiatives by the Economic Developers Council of Ontario. Reconstruction of the Dunlop Street East right of way, including new pavement structure, enhancement of the pedestrian environment via sidewalk replacement/widening, and creation of a flexible boulevard, curb replacement, landscape/streetscape programming replacement, street lighting and duct replacement, and cathodic protection of existing watermain. This project has contributed to a new vibrancy and visual aesthetic in the downtown core. Total project cost is \$15M.

8. Kidd's Creek Storm Pond Upgrade:

This is a significant first in the City and is the result of years of internal work. This is the first storm pond to incorporate a Low Impact Development function collecting the stormwater during an event and releasing it slowly. Lake Simcoe Region Conservation Authority has recognized this project with a Healthy Water Award. This project expanded existing storm facilities peak flow control capacities and introduced storm water quality component. Total project cost is \$1.4M.

9. Maplevue Drive East Improvements - Country Lane to Yonge Street:

Widening of Maplevue Drive East from Country Lane to Yonge Street to 5 lanes including: road widening and reconstruction; sanitary sewer and service installation; local storm sewer installation; water service installation; new transmission watermain; multi-use asphalt trail on the north side; streetlight installation; and new traffic signal installation at Madelaine Drive and at Dean Avenue. Total project cost is \$18M.

These infrastructure projects align with the strategic goals of Council