

Committee of the Whole (2) Report

DATE: Tuesday, May 13, 2025

WARD(S): ALL

TITLE: INTEGRATED URBAN WATER PLAN – FIRST ANNUAL
UPDATE

FROM:

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ACTION: FOR INFORMATION

Purpose

To provide an overview of the 2024 advancements of the servicing infrastructure projects and system optimization programs identified in the City-wide Integrated Urban Water Plan and highlight the current efforts in improving the City of Vaughan's water, wastewater and stormwater systems. Progress on the actions of the Integrated Urban Water Plan recommendations and adjustments to the implementation plan will be tracked and reported annually. This report is the first update since the completion of the Integrated Urban Water Plan in 2024.

Report Highlights

- The Integrated Urban Water Plan prioritizes strategic investments that enables growth in key water, wastewater, and stormwater infrastructure improvements while maintaining the current level of service and protecting the natural environment through robust policy measures.
- Growth and intensification have an impact on the City's existing infrastructure, financial and environmental sustainability. The Integrated Urban Water Plan will inform the City's Asset Management Strategy, development of 10-year Capital Plan Programming, and Development Charges By-law Updates.
- This report provides a summary of the 2024 Integrated Urban Water Plan implementation priorities, servicing-related studies, programs, and capital projects.

Recommendations

1. THAT the 2024 accomplishments in advancing the Integrated Urban Water Plan implementation, as outlined in this report, be received for information.

Background

The Integrated Urban Water Plan aligns with the 2022-2026 Citizens First Through Service Excellence Strategic Plan.

The City-wide Integrated Urban Water Plan was approved in 2024. It aligns with the City's 2022-2026 Citizens First Through Service Excellence Strategic Plan to provide safe, reliable, and sustainable services in support of the City's Growth Management Strategy. Current estimates indicate that by 2051, the City's population is projected to increase to over 570,000, and over 350,000 people will be employed in the City.

The Integrated Urban Water Plan established the framework for sustainable water, wastewater, and stormwater infrastructure and provides direction for future servicing-related studies, projects, initiatives, and policies to guide decision-making and continue providing a safe and well-managed system.

The Integrated Urban Water Plan is a comprehensive study incorporating water, wastewater, and stormwater management infrastructure planning with land-use planning and environmental protection in accordance with the City's Growth Management Strategy.

The holistic approach employed through the Integrated Urban Water Plan ensures infrastructure plans are coordinated, solutions are optimized to minimize costs, and growth pressures are addressed to best inform cost recovery planning.

The Integrated Urban Water Plan identified the efficiency of the City's current infrastructure and where and how additional capacity may be provided to address the needs for new development areas, as well as re-development and intensification within the built boundary. Implementing the recommendations of this study will advance water conservation and efficiency initiatives, including mitigation of inflow and infiltration within the wastewater collection system in order to maintain levels of service for new and existing communities. The various programs recommended by the study ensure these efficiencies are maximized throughout the existing network of pipes and provide for expansion to facilitate growth as envisioned by the Official Plan.

The Integrated Urban Water Plan provides a City-wide analysis of the infrastructure systems with the context necessary to recommend infrastructure upgrades, improvements, and system optimization.

The report concluded the City should plan for the full extent of the identified proposed infrastructure and continuously monitor system performance to ensure the minimum expected level of service is met with increased demands as the area develops.

Previous Reports/Authority

[Item 2, Report No. 19, of the Committee of the Whole \(Working Session\), which was adopted, as amended, by the Council of the City of Vaughan on May 22, 2024.](#)

Analysis and Options

The Integrated Urban Water Plan analyzed the infrastructure needs, growth projections, policies, and housing trends, incorporating national and international best practices, that support the Official Plan as well as the City's Strategic Priorities, with a vision to provide sustainable, cost-effective solutions that meet the City's immediate and long-term needs. It serves as a strategic blueprint for infrastructure investments while balancing policy actions and forward-thinking planning. The strategies are future-focused and include three key actions to implement the plan over the short-term (one to four years), medium (five to eight years), and long-term (nine to twenty years).

The three key actions of the Integrated Urban Water Plan implementation strategy are to Construct, Optimize, and Invest in water, wastewater, and stormwater infrastructure development in the City from now through 2051.

Construct Infrastructure

Construct Infrastructure action focused on initiating the 10-Year Capital Program and commencing select Municipal Class Environmental Assessments and studies to support future infrastructure development.

10-Year Capital Program

The Integrated Urban Water Plan laid the foundation for the development of the 10-Year Capital Program (the Capital Program). Development of the Program has commenced, and annual updates will be provided to Council. It will serve as a valuable tool for internal planning, budgeting, and strategic alignment of servicing infrastructure within the City.

- The purpose of this Capital Program is to outline and prioritize the servicing infrastructure projects over the next decade.
- The Capital Program will be similar to the York Region's 10-year water and wastewater construction programs. It will follow a similar format and structure.

- The Capital Program will be used internally by staff to inform the annual budget review process. It will enable decision-makers to allocate resources (such as funding, personnel, and materials) effectively. It will also facilitate budget planning by prioritizing projects based on need and impact.
- It will involve key considerations like urgency and risk assessment, impact analysis, cost and funding availability, strategic alignment, feasibility, and readiness to ensure the most critical needs are addressed first.

Class Environmental Assessments and Studies

An environmental assessment is a planning and decision-making process that promotes environmentally responsible decision-making. In Ontario, this process is defined, and its authority is in the Environmental Assessment Act. Recently, the Province has proposed significant changes to the Environmental Assessment Act in an effort to streamline and simplify the 50-year-old environmental assessment processes, particularly for what are considered “low-risk” municipal infrastructure projects. The City remains committed to ensuring effective consultation, design and successful completion of any environmental studies to support the construction of servicing infrastructure.

The following Class Environmental Assessments and Studies have been programmed to start in 2025 as an outcome of the recommendations of the Integrated Urban Water Plan:

- Concord Go Flood Risk Assessment;
- Jane Trunk Sewer and Watermain Upgrade Planning Study; and
- McNaughton West Sewer Feasibility Study.

Optimize Infrastructure

Optimize Infrastructure initiative focused mainly on the Infrastructure Systems Optimization Program.

Infrastructure Systems Optimization Program

The Integrated Urban Water Plan provides a roadmap of necessary infrastructure improvements coupled with system monitoring and optimization programs. The City has initiated an Infrastructure Systems Optimization Program in 2024. The Infrastructure Systems Optimization Program aims to optimize the City's existing infrastructure systems (water, wastewater, and stormwater) and facilitate re-development and intensification areas. The systems will be optimized through inflow and infiltration reduction, leak detections and repairs, water reduction, water conservation initiatives, and implementation of low-impact development measures as appropriate.

The Infrastructure Systems Optimization Program necessitates the need for engineering analysis, Geographic Information System data management and hydraulic simulation. It will allow staff to identify inefficiencies in the municipal services infrastructure systems and develop a plan to remediate these inefficiencies to improve overall system performance and, therefore, reduce overall capital expenditure. Identifying and remediating system efficiencies will extend the life of the existing servicing infrastructure and increase system capacity, ultimately contributing to the City's long-term financial and environmental sustainability.

The Infrastructure Systems Optimization Program will be composed of various projects and will use best practices and industry-standard processes/methodologies for investigation (desktop analysis and fieldwork), monitoring, testing, and real-time analysis of servicing infrastructure systems.

The individual projects/programs of the Infrastructure Systems Optimization Program are summarized below.

City's Sewer Flow Monitoring Program

Sanitary and storm sewer flow monitoring plays a crucial role by providing valuable insights into system performance and identifying opportunities for optimization. Continuously monitoring flow rates and patterns within the sewer network helps utilities optimize hydraulic capacity, anticipate future demand trends, and improve system efficiency, ultimately leading to reduced treatment costs, minimized risk of sewer overflows, and enhanced operational resilience. Overall, sewer flow monitoring is a proactive and data-driven approach to managing wastewater systems, ensuring reliable service delivery and sustainable resource management.

The City is currently monitoring the sanitary and stormwater systems in key areas and participating in the York Region's (Region's) flow monitoring program. In 2025, the City has planned to expand its flow monitoring program to include 30 locations and align them with intensification and growth areas.

Inflow and Infiltration Reduction Program

Inflow and Infiltration reduction initiatives offer significant benefits by addressing sources of extraneous water entering the collection system, such as through leaks, cracks, or improper connections. The City can optimize the infrastructure's performance and capacity, leading to reduced costs, minimizing risk of system overflows and backups, and enhanced operational efficiency.

This has been achieved through the City's ongoing operation and maintenance efforts, which include Closed-Circuit Television inspections and trenchless repairs. The Inflow

and Infiltration program is set for further expansion, leveraging the insights and data collected from the City's Flow Monitoring Program.

Water System Optimization Program

A comprehensive Water System Optimization Program is under development and will include the following distinct streams. They are a combination of monitoring, conservation, research, education and utilizing smart technologies. Each of these components will continue to evolve and be implemented on a regular basis through various coordinated activities and reported annually.

a) Smart Metering and Monitoring

This program considers deploying smart metering and monitoring systems to track water consumption in real-time, detect leaks, and identify opportunities for efficiency improvements. This program provides consumers with access to water usage data and insights to empower them to make informed decisions about their water consumption habits. The City's ongoing water meter replacement program builds consumer confidence in the water billing process.

b) Water Conservation Program

The Water Conservation Program includes public education and outreach campaigns through City's annual Public Works Day to raise awareness about the importance of water conservation and encourage behaviour change among consumers. Staff are exploring potential programs providing incentives for water-saving measures such as installing low-flow fixtures, water-efficient appliances, and landscaping practices that minimize outdoor water use. These initiatives are recommended to continue, and the City lead local programs that benefit the community.

c) Water Loss Management

The Water Loss Management program considers the implementation of leak detection programs, pressure management strategies, and water pipe maintenance programs to reduce water losses from leaks and breaks in the water distribution system. Techniques can include using advanced technologies such as acoustic sensors, satellite monitoring, and data analytics to identify and address water loss hotspots. It is recommended that current water loss programs continue with the goal of identifying and reducing water loss.

d) Water Recycling and Reuse

The Water Recycling and Reuse program considers implementing water recycling and reuse programs to treat and reuse wastewater for non-potable applications such

as irrigation, industrial processes, and toilet flushing. Staff are exploring potential programs, including advanced treatment technologies such as membrane filtration, reverse osmosis, and UV disinfection, to ensure the quality and safety of water for reuse.

e) Optimized Pumping and Distribution Systems:

Optimized Pumping and Distribution Systems consider installing energy-efficient pumps, valves, and controls to optimize the operation of water distribution systems and minimize energy consumption. Where feasible, staff are exploring potential implementing pressure management systems and zones to reduce energy costs and minimize pipeline stress.

f) Water Pricing and Rates

Staff are exploring potential Water Pricing and Rates programs that consider a tiered water pricing structure, conservation-based pricing, or seasonal pricing incentives to encourage water conservation and discourage excessive water use. The current pricing model considers a single unit rate and tiered pricing may be possible.

g) Greywater and Rainwater Harvesting

Greywater and Rainwater Harvesting initiatives focus on promoting recycling systems and rainwater harvesting to capture and reuse water for non-potable applications, such as irrigation, toilet flushing, and landscape maintenance. Staff are exploring potential incentive programs to encourage new developments to adopt greywater and rainwater harvesting on a site-specific basis. This may include providing guidance and incentives for the installation of rain barrels, cisterns, and greywater treatment systems in both residential and commercial buildings.

h) Water Audits and Efficiency Programs

Water Audits and Efficiency Programs consider conducting water audits and efficiency assessments for residential, commercial, and industrial facilities to identify water savings and efficiency improvement opportunities. Environmental Services department retained an external consultant, Black and Veatch, in 2024 to conduct annual water audits to pinpoint sources of Non-Revenue Water and track Infrastructure Leakage Index. Water audit enables evaluation of water system performances, monitoring, benchmarking and identify and implement initiatives to reduce Non-Revenue Water. It is recommended that current water audit and efficiency programs continue with the goal of identifying and reducing water loss.

Stormwater System Optimization Program

The Stormwater System Optimization Program considers implementing green infrastructure practices such as rain gardens, bioswales, permeable pavements, and retention ponds to capture, treat, and infiltrate stormwater runoff with the benefit of providing best management practices to reduce peak flows, mitigate flooding, and improve water quality being returned to the natural environment. This program was extensively evaluated for the Vaughan Metropolitan Centre and is planned to be expanded across the City.

As a first step to developing a comprehensive Storm System Optimization Program, a City-Wide Stormwater Management Modeling project has been initiated. This project aims to develop a detailed City-wide stormwater model. The model will be relied on to identify localized flood risk areas during extreme rainfall events, and, in turn, utilized to develop stormwater infrastructure upgrades to mitigate risks posed by these extreme rainfall events.

Many of the Optimization programs recommended in the Integrated Urban Water Plan have been integrated into the ongoing operational maintenance in collaboration with the Environmental Services department. This coordination aims to maximize efficiencies across the existing network of pipes and support future expansions to accommodate growth. This report, along with future annual reports, will track the progress of all servicing optimization programs and report to Council annually.

Invest in Infrastructure

Invest in Infrastructure initiative prioritized strategic investments that support early adoption, evaluation, refinement, and scaling of key projects and programs.

By directing resources toward targeted actions, the City aims to strengthen its infrastructure system and ensure long-term financial stability.

Asset Management Plans

In 2021 and 2022, the City updated its Asset Management Plans for core and non-core infrastructure, respectively, in compliance with Ontario Regulation 588/17. The objective of the Asset Management Plans is to establish a financial and technical roadmap for managing the City's infrastructure. This roadmap aims to help the City maximize the value of its assets while minimizing overall costs, maintaining service levels for residents, and promoting sustainable initiatives.

Ongoing collaboration and input to the Asset Management Plans aim to enhance assessment opportunities, prioritize maintenance activities, optimize asset life cycles, minimize downtime, and increase reliability and cost control strategies.

Development Charge Background Studies and By-laws

The Integrated Urban Water Plan recommendations will form the basis for Development Charge Background Studies review and update, rate calculations, and associated By-laws. Updates to the Development Charge Background Study, Area Specific Development Charges, Community Benefits Charge Strategy and related by-laws and policies are a vital step towards ensuring long-term financial sustainability for the City of Vaughan by ensuring that growth-related revenue collections are in line with anticipated growth pressures to be experienced by the City.

In early 2025 the City engaged Hemson Consulting Ltd. to complete and update the necessary Development Charge Background Studies and By-laws, and the Community Benefits Charge Strategy Update. This update will include a review and update of the historical growth-related capital program by reserve, in alignment with the changes to Provincial legislation created through Bill 23, updates to population and employment data, and updates to the growth-related capital program with a focus on an overall reduction of Development Charge rates. The local service policy and other necessary Development Charge-related policies will be reviewed and updated to support this objective.

Ongoing Collaboration and Alignment

Vaughan Official Plan 2025 and Secondary Plan Areas Update – Review and Integrated Urban Water Plan Alignment

The draft Vaughan Official Plan 2025 illustrates that all development in the urban area of the City shall be serviced by municipal water, sanitary sewers, and storm sewers. The development outside the urban area will be serviced by private communal water and sewage services, and where municipal infrastructure or private communal services are not available, planned or feasible, individual on-site sewage services and individual on-site water services may be used provided that site conditions are suitable for the long-term provision of such services with no environmental impacts.

Furthermore, more efficient water use will be encouraged, decreasing the need for water and wastewater treatment, saving money, and conserving valuable resources. As part of the Integrated Urban Water Plan, Functional Servicing Strategy Studies for the following Secondary Plan Areas have been completed. Staff will continue to collaborate with ongoing planning initiatives to ensure future growth-related servicing needs and alignment on policies and servicing strategies.

- Concord GO Centre
- Kipling Avenue and Highway 7
- Maple GO
- Promenade Centre
- Vaughan Mills Centre
- Steeles West Corridor
- Carrville Centre
- Woodbridge Centre
- Yonge Street and Steeles Avenue
- Weston Road and Highway 7
- Vaughan Metropolitan Centre

The Integrated Urban Water Plan is aligned with critical Regional Water and Wastewater Projects.

Staff actively collaborate with York Region on multiple projects to ensure seamless coordination. This alignment is essential for maintaining and improving water and wastewater services, ensuring they meet the current demand and future growth. Current notable projects required within the City of Vaughan include:

- Humber Sewage Pumping Station to Black Creek Sewage Pumping Station Sewage Forcemain Rehabilitation;
- Humber Sewage Pumping Station Upgrades;
- Keele Trunk Watermain Field Studies;
- Northeast Vaughan Water - Phase One;
- Northeast Vaughan Wastewater - Keele Street and Langstaff Road Sewer;
- South Maple Reservoir Upgrades;
- West Vaughan Sewage Servicing Project;
- York-Peel Feedermain Rehabilitation;
- West Vaughan Water Servicing; and
- York-Peel Feedermain Upgrade.

Toronto and Region Conservation Authority – Ongoing coordination and strategy alignment

Staff are collaborating with Toronto and Region Conservation Authority to align strategies that mitigate flood and erosion risks to communities. Key ongoing initiatives include:

- Humber River Watershed Plan development; and
- Concord Go Flood Risk Assessment.

Looking Ahead to 2025/2026

The year 2024 has been characterized by significant changes and disruptions in our infrastructure planning and implementation practices. Amid uncertainty regarding Provincial legislation, we are working to position the City for accelerated housing development while also addressing geopolitical issues that may have domestic impacts. We are navigating a challenging landscape. The infrastructure planning work completed to date, along with the proposals for 2025 and 2026, is designed to be future-ready while remaining flexible enough to adapt to an evolving environment. The upcoming Capital Program has been designed to provide Council with the flexibility to adapt effectively to unforeseen circumstances.

Financial Impact

There are no financial impacts as a result of the report. All initiatives described in the report have been or will need to be approved through the annual budget process.

Operational Impact

As we progress through the implementation phase, ongoing consultation with both internal and external stakeholders remains essential. These stakeholders encompass diverse parties within the City, each contributing to the iterative process of shaping and refining the recommendations from the Integrated Urban Water Plan.

Stakeholders included are listed below.

- Environmental Services
- Development Engineering
- Policy Planning and Special Programs
- Infrastructure Delivery
- Development and Parks Planning
- Financial Planning and Development Finance
- Economic Development
- Infrastructure Planning and Corporate Asset Management
- Toronto and Regional Conservation Authority
- York Region

Broader Regional Impacts/Considerations

York Region completed an update to its Water and Wastewater Master Plan in 2022. The Region also amended the 2022 Water and Wastewater Master Plan to reflect the Supporting Growth and Housing in York and Durham Regions Act, 2022 (Act), and

other provincial guidance. Notice of Amendment Completion was issued on March 24, 2025, and City staff is currently reviewing the amended master plan to ensure alignment between the City's and Region's master plans.

The City and Region project teams meet regularly to coordinate efforts and ensure synchronization of Region and City plans. The City staff have actively engaged with the Region and emphasized that the growth projections outlined in the draft Vaughan Official Plan 2025 and Integrated Urban Water Plan need to be harmonized with the Region's population forecasts.

Conclusion

The ongoing implementation of Integrated Urban Water Plan is critical for ensuring sustainable water, wastewater, and stormwater management. It also plays a key role in improving our infrastructure's resilience and addressing climate change's impacts. By following the recommendations outlined in the Integrated Urban Water Plan, the City can enhance the efficiency of its infrastructure, adopt long-term planning and development strategies, reduce flood risks, protect natural water systems, and promote economic and environmental sustainability.

As part of this initiative, the Capital Program has been initiated to advance Capital Projects and the Infrastructure Servicing Optimization Program, while also supporting the update of the Development Charges By-Law. Progress on the implementing of the Integrated Urban Water Plan will be reported to Council through annual updates.

For more information, please contact: Selma Hubjer, Director, Infrastructure Planning and Corporate Asset Management ext. 8674.

Attachments

N/A

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