

Committee of the Whole (Working Session) Report

DATE: Wednesday, May 8, 2024

WARD(S): ALL

TITLE: INTEGRATED URBAN WATER PLAN

FROM:

Vince Musacchio, Deputy City Manager, Infrastructure Development

ACTION: DECISION

Purpose

To inform Council and obtain endorsement of the conclusions and recommendations of the Integrated Urban Water Plan (IUWP). The IUWP summarizes long-term servicing projects required to meet growth needs to 2051. Upon Council endorsement, staff will notify agencies, Indigenous communities, partners, public and stakeholders of the report finalization and commencement of the 30-day review period in accordance with the Municipal Class Environmental Assessment process.

Report Highlights

- The City-Wide Integrated Urban Water Plan was initiated in 2020 to support projected growth to 2051.
- The IUWP builds on the 2014 plan, continues to meet the servicing needs of the City's growing communities, and supports greater resilience in our water, wastewater, and stormwater systems to guide decision-making.
- A comprehensive listing of capital expenditures for new and expanded water, wastewater, and stormwater infrastructure, and supporting programs has been finalized.
- The IUWP supports all planning studies for intensification areas and will inform the City's Asset Management Strategy and Development Charges By-law Updates.

Recommendations

1. That Council approve in principle the conclusions and recommendations of the 2024 Integrated Urban Water Plan;

2. That the 2024 Integrated Urban Water Plan be used to guide the direction for future servicing infrastructure investments and policies and be incorporated into the City's Official Plan; and
3. That a copy of this report be forwarded to the Regional Municipality of York.

Background

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

The IUWP 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. The recommendations of this report will assist in advancing:

- ✓ Community Safety and Well-being
- ✓ Environmental Sustainability
- ✓ City Building
- ✓ Service Excellence and Accountability
- ✓ Transportation and Mobility
- ✓ Active, Engaged and Inclusive Communities

The Integrated Urban Water Plan establishes 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 City is updating its Official Plan in response to provincial and regional planning mandates. Provincial planning policies mandate that "...municipalities undertake an integrated approach to land use planning, infrastructure investments, and environmental protection to achieve the outcomes of the (Growth) Plan." The Integrated Urban Water Plan was initiated in 2020 to support Vaughan's integrated planning approach for growth. Current estimates indicate that by 2051, Vaughan'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 (IUWP) is a comprehensive study integrating water, wastewater, and stormwater management infrastructure planning with land-use planning and environmental protection in accordance with the City's Growth Management Strategy. The IUWP was completed with the following overall objectives:

- Review of background information, servicing principles and policies;
- Confirmation of design criteria and level of service requirements;
- Review and update the City's water and wastewater hydraulic models;

- Presentation of draft alternative servicing approaches, evaluations of the alternatives, and preferred servicing recommendations;
- Public engagement and communication activities including three Public Information Centres, communication with indigenous communities, and several Technical Advisory Committee (TAC) meetings;
- Preparation of a detailed priority list and implementation plan (including high level costs) for new infrastructure;
- Provide direction on infrastructure, policies, and programs to optimize the existing system; and
- Strategic positioning to respond to new technology, climate change, and development pressures.

Long term planning studies are supported by the Integrated Urban Water Plan.

Staff are undertaking Secondary Plan studies in the following intensification areas, in support of the ongoing Official Plan Review:

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

The IUWP provides a city-wide analysis of the infrastructure systems with the context necessary to recommend infrastructure upgrades and improvements.

The holistic approach employed, through the IUWP, ensures infrastructure plans are coordinated, solutions are optimized to minimize costs, and growth pressures are addressed to best inform cost recovery planning. The IUWP will be used to update Development Charge Background Studies, rate calculations and associated bylaws.

Stakeholder input ensures the needs of citizens and businesses are met.

The input of provincial agencies, regional government, the business community, the land development industry, residents, and the public ensures the consideration of various perspectives and serves to build broad support for recommendations. Communication and outreach activities to gather feedback, address comments, and collaborate on elements of the Integrated Urban Water Plan have included the following:

- Issuance of Public Notices
- Hosting of three Public Information Centers
- Public Service Announcements
- Online newspaper notices
- Online surveys
- Social media advertisements
- Direct communications to Council and the Senior Leadership Team
- Presentations to the Growth Management Committee
- Workshops with members of the development community
- Consultation with Indigenous Communities

The final public and agency contact point is the statutory 30-day review. During this period, documentation of the study findings is shared with the public thereby providing one final opportunity for comments.

Previous Reports/Authority

[Memorandum from the Acting Deputy City Manager, Infrastructure Development, dated November 26, 2021.](#)

More information on the Integrated Urban Water Plan can be found the project's webpage: vaughan.ca/UrbanWaterPlan

Analysis and Options

The IUWP has established the overall direction for water, wastewater and stormwater infrastructure development in Vaughan through initiatives, policies and guidelines 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.

The IUWP provides an implementation strategy for the City's water, wastewater and stormwater infrastructure development in Vaughan up to 2051.

The IUWP provides infrastructure recommendations associated with a 2051 population growth planning horizon. The 2051 forecast assumes the urban expansion of all remaining white-belt areas in the City and the emergence of secondary suites in single and semi-detached dwellings in the City. The population growth categories included in this study are:

- Major Transit Station Areas (MTSAs)
- Regional Intensification Corridors
- Interim Servicing Strategy (ISS) Areas
- Ministerial Zoning Orders (MZOs)
- Employment conversions
- Secondary Plan / Focus Areas
- Properties on private systems
- Properties along City boundaries currently connected to neighbouring municipalities (inter-regional connections)
- White Belt/Urban expansion areas (residential and employment)
- Secondary suite allowance / sensitivity analysis

In addition to City-wide planning areas, specific infrastructure needs for functional servicing strategy areas / focus areas (as listed above) are also part of the IUWP study.

Additional servicing studies may be completed (or amended) as required to facilitate approval of all Secondary Plans / Primary Centers as necessary. The City-Wide Master Plan has established the higher order framework/servicing requirements such that all linear infrastructure needs for current Secondary Plans and intensification corridors are protected.

The IUWP recommends programs and implementation strategies for water and wastewater infrastructure. It provides guidance on how to strengthen existing and future communities, what municipal infrastructure is required, and ensures continued minimum levels of service to residents and businesses are sustained.

The Integrated Urban Water Plan (IUWP) follows the Municipal Class Environmental Assessment Master Plan Process requiring the identification and evaluation of infrastructure options.

In accordance with the *Environmental Assessment Act*, the Municipal Class Environmental Assessment (MCEA) process provides guidance regarding the analysis and recommendation of municipal infrastructure solutions and stakeholder consultation

requirements. The IUWP identifies infrastructure options, undertakes a systematic evaluation of these options, and recommends the preferred infrastructure solutions required to support population and employment growth. The evaluation of infrastructure solutions considers the impact of each of the options on the environment, including the natural, social/cultural, technical, and economic/financial environments, as well as any issues raised during public and stakeholder consultation. Thus, the IUWP offers a rigorous and traceable process that recommends the most appropriate solutions for the City.

Meaningful public and stakeholder engagement was a fundamental component of developing the IUWP. The goal of the public and stakeholder engagement process was to facilitate robust conversations on future directions for developing long-term linear infrastructure needs.

The responsibility for water and wastewater services are jointly provided between the City and the Region of York. Water treatment and bulk distribution as well as wastewater treatment and bulk collection are the responsibility of the Region. Local collection of sewage and distribution of water is the responsibility of the City. For stormwater this service is fully the responsibility of the City other than on Regional roads and rights of way where the Region is responsible. During the development of IUWP alternatives and recommendations, the City actively engaged with the Toronto and Region Conservation Authority, York Region and other external agencies to align initiatives and projects.

The IUWP provides a roadmap of necessary infrastructure improvements coupled with network monitoring and optimization programs.

The IUWP identifies the efficiency of the City's current infrastructure and where and how additional capacity may be provided to address the needs of new development areas, as well as redevelopment 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 (further detailed below) 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 individual components/recommendations of the IUWP are summarized below.

System Optimization Programs include the following:

Inflow and Infiltration Reduction:

Inflow and Infiltration (I/I) 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 performance and capacity of the infrastructure. This leads to reduced costs, minimized risk of system overflows and backups, and enhanced operational efficiency.

Sanitary Sewer Flow Monitoring:

Sanitary sewer flow monitoring plays a crucial role by providing valuable insights into system performance and identifying opportunities for optimization. By continuously monitoring flow rates and patterns within the sewer network, the City can detect and quantify sources of inflow and infiltration (I/I), such as leaks, illegal connections, and groundwater infiltration. This enables utilities to prioritize infrastructure repairs and upgrades, target I/I reduction efforts effectively, and minimize the volume of extraneous water entering the system. Additionally, flow monitoring 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, sanitary sewer flow monitoring serves as a proactive and data driven approach to managing wastewater systems, ensuring reliable service delivery and sustainable resource management.

Water Conservation Program:

This program includes public education and outreach campaigns to raise awareness about the importance of water conservation and encourage behavior change among consumers. This can include providing incentives for water-saving measures such as installing low-flow fixtures, water-efficient appliances, and landscaping practices that minimize outdoor water use. It is recommended these initiatives continue, and the City lead local programs where there is benefit to the community.

Water Loss Management:

This 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.

Water Recycling and Reuse:

This 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. It can include investing in advanced treatment technologies such as membrane filtration, reverse osmosis, and UV disinfection to ensure water quality and safety for reuse.

Optimized Pumping and Distribution Systems:

This considers installing energy-efficient pumps, valves, and controls to optimize the operation of water distribution systems and minimize energy consumption. Where feasible, some improvements may be possible such as implementing pressure management systems and zones to reduce energy costs and minimize pipeline stress.

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 type of 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 has an ongoing water meter replacement program which is bringing these benefits to the consumer as more replacements are occurring.

Implementation of the IUWP will involve annual monitoring and recalibration of the capital plan as needed.

Water Pricing and Rates:

This considers 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 there may be opportunity to consider tiered pricing.

Greywater and Rainwater Harvesting:

This program considers the continued promotion of recycling systems and rainwater harvesting systems to capture and reuse water for non-potable applications such as irrigation, toilet flushing, and landscape maintenance. This can include providing

guidance and incentives for the installation of rain barrels, cisterns, and greywater treatment systems in residential and commercial buildings.

Water Audits and Efficiency Programs:

This alternative considers conducting water audits and efficiency assessments for residential, commercial, and industrial facilities to identify opportunities for water savings and efficiency improvements. This can include offering technical assistance, rebates, and financial incentives for implementing water-saving measures and upgrading water infrastructure.

Stormwater Management:

This alternative 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 alternative was extensively evaluated for the Vaughan Metropolitan Centre and across the City.

Asset Management and Predictive Maintenance:

This alternative considers developing comprehensive asset management programs to prioritize maintenance activities, optimize asset life cycles, and minimize downtime and is currently in practice at the City. It is recommended to continue with this program and enhance assessment opportunities were warranted to further increase reliability and cost control strategies.

Implementation of the IUWP requires monitoring and a continuous partnership approach to balance fiscal, growth, and operational considerations.

Land Use Planning and Zoning:

This alternative considers incorporating water-efficient landscaping requirements, stormwater management practices, and water-sensitive urban design principles into land use planning and zoning regulations. In addition to the current planning approaches, this could include further requirements for native and drought-tolerant plants, permeable surfaces, and green infrastructure to reduce outdoor water demand and minimize runoff. Some of these alternatives are included in the stormwater design criteria to further require onsite treatment, storage, and reuse of stormwater.

Integrated Water Resources Management:

This is core to the approach of this plan and includes adopting an integrated approach to water resources management that considers the interconnectedness of water supply, wastewater treatment, stormwater management, and environmental sustainability. It is recommended that activities such as collaboration with stakeholders, agencies, industries, and communities continue to optimize water use, minimize conflicts, and enhance resilience to water-related activities.

Physical Infrastructure Improvements include the following:

Infrastructure Rehabilitation and Upgrades:

This includes retrofitting and upgrading aging water supply and wastewater treatment infrastructure to improve performance, reliability, and efficiency. Where capacity expansion is recommended, these expansions will be considered in conjunction with the condition of the existing infrastructure such that condition improvements will be implemented as part of a capacity increase project. An annual investment is identified based on the City's current Asset Management Plans and recommended investment strategy.

Build New Infrastructure:

Where growth exceeds existing capacity and optimization does not meet future demands, the alternative of building new infrastructure is considered the next best approach. This alternative identifies future constraints and necessary replacement or increases in capacity for new areas where intensification causes constraints in the existing system. The key driver for this alternative is the growth in population for the water and wastewater system. For the stormwater system, the impact is generally related to the expansion of the urban area where additional lands are required to drain into existing drainage areas that may not have necessarily contemplated the increase to the existing infrastructure capacity. Where optimization of existing infrastructure does not meet future needs, there are recommendations for expansion of the existing infrastructure in a manner that provides additional capacity as it is needed for the community. Evaluation of the available options were scored based on criteria that considered environmental, social, and economic conditions. These conditions were assessed to identify potential impacts and suitable mitigation measures where appropriate. The recommended capital projects program has been screened to balance the various criteria considering local conditions, the feasibility of implementation and routing that considered previously defined corridors where minimal environmental impacts will occur.

Financial Impact

There are no immediate financial impacts resulting from the conclusions and recommendations of this report. However, the implementation of the IUWP will consist of new capital project expenditures (funded primarily from Development Charges) and additional resource requests associated with ongoing maintenance and operational costs. These new capital and operating costs will be considered for Council approval annually through the budget process and will account for recent and on-going changes to provincial legislation such as the *Development Charges Act* and the *Planning Act*.

Broader Regional Impacts/Considerations

York Region completed its last Water and Wastewater Master Plan update in 2022. The City and Regional project teams met regularly to coordinate efforts and to ensure both Regional and City plans are synchronized.

Conclusion

The IUWP is the culmination of a four-year study that combined research and analysis with a public and industry conversation about the future of linear infrastructure. The study analyzed infrastructure needs and growth data, policies, future trends and national and international best practices. Public engagement took place in-person and online with a dedicated project website. Key community and industry stakeholders as well as other levels of government were also consulted in the process.

The IUWP is future-focused and includes a number of actions to implement the plan over the short term (1-4 years), medium (5-8 years) and long term (9-20 years). Actions in the IUWP will be undertaken by staff over the coming years. Those actions with budgetary implications will be presented to Council for consideration through the City's annual budget process. Progress on the actions of the IUWP and adjustments to the implementation plan will be tracked and reported annually, including any staffing requirements with comprehensive updates taking place in coordination with updates to the Vaughan Official Plan.

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

Attachment

1. Integrated Urban Water Plan 2024, Executive Summary (to be provided prior to the meeting).

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