Subject: Infrastructure Master Plan

File Number: ACS2024-IWS-AM-0003

Report to a joint Environment and Climate Change Committee and Planning and Housing Committee on 20 June 2024

and Council 25 June 2024

Submitted on June 11, 2024 by Susan Johns, Director, Asset Management, Infrastructure and Water Services Department

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Ward: Citywide

Objet: Plan directeur des infrastructures

Numéro de dossier: ACS2024-IWS-AM-0003

Rapport déposé à la réunion conjointe du Comité de l'environnement et du changement climatique et du Comité de la planification et du logement le 20 juin 2024

et auprès du Conseil municipal le 25 juin 2024

Soumis le 11 juin 2024 par Susan Johns, Directrice, Gestion des actifs, Direction des services d'infrastructure et des services de l'eau

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Quartier: À l'échelle de la ville

REPORT RECOMMENDATION(S)

That the Environment and Climate Change Committee and Planning and Housing Committee recommend Council:

1. **Approve the Infrastructure Master Plan as attached in Document 1 and as described in this report including;**
    a. **The Infrastructure policies as summarized in Section 1 of this report.**
    b. **The water and wastewater projects described in Section 2 of this report, detailed in Document 2, and direct staff to complete Class Environmental Assessments and functional design studies for these projects as required.**
    c. **The Stormwater Management Strategy as outlined in Section 3 of this report.**
    d. **The proposed Infrastructure Capacity Management Program including staff investigation of alternatives for funding capital projects identified under the program in Section 5.3 of this report.**

2. **Approve two permanent FTE resources funded from rate to support the requirements of the Infrastructure Capacity Management Program**

3. **Direct staff to review the funding splits and the Post Period Capacity to be provided for the Tewin / South Urban Community water and sewer infrastructure for Council approval through the Class Environmental Assessment and functional design process.**

4. **Direct staff to publish Notice of Master Plan to initiate a 30-day public review period, after which the Class Environmental Assessment requirements for Master Plans will have been satisfied and the IMP will be considered final.**

RECOMMANDATION(S) DU RAPPORT

Que le Comité de l’environnement et du changement climatique et le Comité de la planification et du logement recommandent ce qui suit au Conseil :

1. **d’approuver le Plan directeur des infrastructures reproduit dans la pièce 1 et décrit dans ce rapport, dont :**

a. **les politiques sur les infrastructures dont la synthèse est reproduite dans la section 1 du rapport;**
b. **les projets d'aqueduc et d'égouts décrits dans la section 2 du rapport et précisés dans la pièce 2, en plus de demander au personnel de mener les évaluations environnementales de portée générale et les études de conception fonctionnelle pour ces projets dans les cas nécessaires;**
c. **la Stratégie de gestion des eaux pluviales exposée dans la section 3 de ce rapport;**
d. **le Programme proposé pour la gestion de la capacité des infrastructures, dont l'analyse, par le personnel, des solutions de rechange pour le financement des projets d'infrastructures indiquées pour ce programme dans la section 5.3 du rapport.**

2. **d'approuver deux ressources permanentes en ETP, financées à même les redevances pour répondre aux besoins du Programme pour la gestion de la capacité des infrastructures.**

3. **de demander au personnel de revoir la répartition du financement et la capacité postpériodique à prévoir pour les infrastructures d'aqueduc et d'égouts de la collectivité de Tewin et de la collectivité urbaine sud à faire approuver par le Conseil municipal dans le cadre du processus de l'évaluation environnementale de portée générale et de la conception fonctionnelle.**

4. **de demander au personnel de publier l'Avis du Plan directeur pour lancer la période d'examen public de 30 jours, après quoi on aura répondu aux exigences de l'évaluation environnementale de portée générale pour les plans directeurs et on pourra considérer que le PDI est définitif.**

EXECUTIVE SUMMARY

The City's Official Plan establishes the City's goals, objectives and policies to guide growth and manage physical change to the year 2046, when the population is projected to rise to 1.4 million. The primary objective of the City's supporting Infrastructure Master Plan (IMP) is to ensure sufficient drinking water, wastewater, and stormwater capacity is

available to support this planned growth to 2046 and beyond.

The IMP establishes policies and addresses key infrastructure considerations to support sustainable growth in the form of greenfield development in the expanded urban envelope and intensification development in existing communities, in accordance with the Official Plan. These considerations include: planning for backbone water and wastewater systems; identifying individual projects and costs; preparing a citywide stormwater management strategy; providing a plan for infrastructure supporting growth through intensification; and addressing rural servicing. The IMP identifies infrastructure requirements and associated costs which are necessary to inform the City's update of the Development Charges Background Study and By-Law in 2024.

Responding to climate change, enabling intensification, and pursuing affordability and sustainability are key principles guiding the IMP's design and implementation. The IMP advances the City's approach to comprehensive asset management.

The IMP has been prepared within an open and consultative public involvement process over approximately three years. This process fulfills the requirements for Master Plans as set out in Ontario's Environmental Assessment process.

IMP policies align with and support the policies of the Official Plan. This is achieved in part by clarifying roles, responsibilities and expectations related to the planning of infrastructure needed to achieve growth objectives of the Official Plan.

New Water and Wastewater Master Plans identify growth-driven upgrades to the backbone of the City's central systems; these are key components to the IMP. These plans considered key factors such as projected growth, demand trends, system performance under existing and future conditions, stress tests under major failure and climate change scenarios, and the expected level of service to the City's residents. These considerations support the identification of major capital projects to meet growth needs to 2046. The IMP identifies 16 water distribution system projects and 37 wastewater collection system projects, with cost estimates and implementation timelines. These projects are planned to serve intensification and greenfield development in existing urban areas as well as the urban expansion areas, identified as future neighbourhoods, in the new Official Plan. In addition to these projects, separate master plans for the City's central water purification and wastewater treatment plants have identified a total of nine projects that will benefit growth citywide.

The IMP includes a citywide Stormwater Management Strategy which provides high-level guidance on the management of stormwater to protect watercourses against the

impacts of development and to protect properties from flooding. The strategy includes flood plain mapping, introduces a stormwater management planning and Low Impact Development (LID) framework for future neighbourhood areas, provides a plan for completing citywide stormwater retrofit plans to address impacts on local watercourses, and provides recommendations to review climate change considerations in the City's design guidelines.

The IMP documents established servicing strategies for rural areas, including villages. There are no new rural projects identified in the IMP given that no expansions to villages were approved in the Official Plan. New policies guiding development adjacent to villages are provided.

The Official Plan projects intensification rates to increase to 2046. Higher density residential intensification will concentrate in specific nodes and along transit corridors, whereas lower-density intensification will occur throughout other existing built-up areas. New programs are needed to manage local infrastructure capacities, while maintaining service levels to existing residents as intensification occurs.

Two new IMP programs are in development to address intensification challenges. This is noteworthy because it is the first IMP to outline new programs to proactively support intensification and limit risks associated with potential capacity shortfalls in existing local pipe networks.

The first program is the Infrastructure Capacity Management Program, developed to track the cumulative impacts of intensification, implement local watermain and sanitary sewer upgrades, and manage overland storm drainage systems. The second program is the On-Site Stormwater Management for Small Residential Developments Program developed to mitigate impacts of intensification on existing storm drainage systems.

The financial implications of the IMP include a summary of capital cost and cost apportionment. A preliminary affordability analysis will be completed over the next four years. Further refinements to the IMP affordability analysis will be completed over the next year following updates to any *Development Charges Act (1997)* regulations; the City's front ending policy; the 2024 Development Charges Background study; the City's Fiscal Framework; and various Asset Management Plans.

RÉSUMÉ

Le Plan officiel établit les buts, les objectifs et les politiques que la Ville a adoptés pour orienter sa croissance et gérer son évolution physique jusqu'en 2046; sa population

devrait alors se chiffrer à 1,4 million d'habitants. Le Plan directeur des infrastructures (PDI) de la Ville a pour objectif premier de s'assurer que la capacité de gestion de l'eau potable, des eaux usées et des eaux pluviales est suffisante pour assurer cette croissance planifiée jusqu'en 2046 et au-delà.

Le PDI établit les politiques et porte sur des considérations infrastructurelles essentielles pour assurer une croissance durable dans l'aménagement des zones vertes du périmètre urbain étendu et dans l'aménagement de la densification des collectivités existantes, conformément au Plan officiel. Ces considérations consistent à planifier les principaux réseaux d'aqueduc et d'égouts, à désigner les projets et en calculer les coûts, à préparer une stratégie municipale de gestion des eaux pluviales, à élaborer un plan et de nouveaux programmes pour les infrastructures qui assurent la croissance grâce à la densification, ainsi qu'à viabiliser les zones rurales. Le PDI détermine les besoins en infrastructures et les coûts correspondants à engager pour éclairer la mise à jour du *Règlement municipal sur les redevances d'aménagement* en 2024.

La réaction aux dérèglements du climat, la densification, ainsi que l'abordabilité et la durabilité sont les grands principes qui guident la conception et la mise en œuvre du PDI. Le PDI promeut l'approche de la Ville dans la gestion intégrale des actifs.

Le PDI a été préparé dans le cadre d'un processus de participation citoyenne ouvert et consultatif, qui s'est étendu sur trois ans environ. Ce processus répond aux exigences relatives aux plans directeurs et établis dans le processus de l'évaluation environnementale du gouvernement de l'Ontario.

Les politiques du PDI cadrent avec celles du Plan officiel et permettent de les appliquer, notamment en précisant les fonctions, les attributions et les attentes liées à la planification des infrastructures nécessaires pour atteindre les objectifs de croissance du Plan officiel.

Les nouveaux plans directeurs de gestion des réseaux d'aqueduc et d'égouts font état des travaux de modernisation portés par la croissance et consacrés au dorsal des réseaux centraux de la Ville; il s'agit de constituantes essentielles du PDI. Ces plans prennent en compte des facteurs clés comme la croissance projetée, les tendances de l'évolution de la demande, le rendement des réseaux dans les conditions existantes et projetées, les essais de contraintes dans les scénarios de pannes majeures et de changements climatiques, ainsi que le niveau de service auquel s'attendent les résidents de la Ville. Ces considérations permettent de recenser les grands projets

d’infrastructures afin de répondre aux besoins en croissance jusqu’en 2046. Le PDI fait état de 16 projets de réseaux de distribution d’eau et de 37 projets de réseaux de collecte des eaux usées, ainsi que de l’estimation des coûts et du calendrier de la mise en œuvre. Ces projets sont planifiés pour assurer la densification et l’aménagement des zones vertes dans les secteurs urbains existants, ainsi que dans les secteurs de l’expansion urbaine portant la désignation de « quartiers projetés » dans le nouveau Plan officiel. Outre ces projets, les plans directeurs distincts pour les centrales de purification de l’eau et de traitement des eaux usées de la Ville font état, au total, de neuf projets qui feront rejaillir des bienfaits sur la croissance de toute la ville.

Le PDI comprend une stratégie de gestion des eaux pluviales qui porte sur tout le territoire de la ville et qui définit l’orientation globale à adopter dans la gestion des eaux pluviales afin de protéger les cours d’eau contre les impacts de l’aménagement et de protéger les propriétés contre les inondations. Cette stratégie, qui comprend la cartographie des plaines inondables, institue une structure-cadre pour la planification de la gestion des eaux pluviales et les aménagements de moindre impact (AMI) dans les quartiers projetés, en plus d’établir un plan pour réaliser les projets de réaménagement des réseaux de gestion des eaux pluviales dans toute la ville afin de contrer les incidences produites sur les cours d’eau locaux et comprend des recommandations pour revoir les considérations relatives aux dérèglements du climat dans les lignes de conduite de la Ville sur la conception.

Le PDI fait état des stratégies de viabilisation établies pour les zones rurales, dont les villages. Il n’indique pas de nouveaux projets en zone rurale, puisqu’aucune expansion de villages n’a été approuvée dans le Plan officiel. Il comprend les nouvelles politiques qui orientent les projets d’aménagement non loin des villages.

Selon les projections du Plan officiel, les taux de densification devraient augmenter jusqu’en 2046. Les aménagements résidentiels de plus grande densité seront concentrés dans des nœuds spécifiques et à la périphérie des couloirs de transport en commun, alors que les aménagements de moindre densité seront réalisés dans d’autres secteurs bâtis existants. Il faut adopter de nouveaux programmes pour gérer la capacité des infrastructures locales, tout en maintenant, dans la densification, les niveaux de service offerts aux résidents actuels.

Nous sommes en train de mettre au point deux programmes du PDI pour résoudre les difficultés de la densification. S’il est utile de le mentionner, c’est parce qu’il s’agit du premier PDI à décrire dans leurs grandes lignes les nouveaux programmes permettant de promouvoir proactivement la densification et de limiter les risques liés aux déficits de

capacités potentiels dans les réseaux de canalisation locaux existants.

Le Programme de gestion de la capacité des infrastructures, mis au point pour suivre les impacts cumulatifs de la densification, pour mettre en œuvre les mises à niveau des conduites principales d'aqueduc et des réseaux d'égouts sanitaires locaux et pour gérer les réseaux de drainage des eaux pluviales en surface, constitue le premier programme. Le Programme de gestion des eaux pluviales sur le site pour les petits aménagements résidentiels, mis au point afin de maîtriser les impacts de la densification sur les réseaux existants de drainage des eaux pluviales, constitue le deuxième programme.

La synthèse des dépenses en immobilisations et de la répartition des coûts fait partie des documents financiers qui constituent le PDI. Nous mènerons dans les quatre prochaines années une analyse préliminaire de l'abordabilité. D'autres mises au point seront apportées à l'analyse d'abordabilité du PDI dans la prochaine année, dans la foulée des mises à jour qui seront apportées aux règlements d'application de la *Loi sur les redevances d'aménagement* (1997), à la Politique de la Ville sur les ententes préalables, à l'Étude du contexte des frais d'aménagement 2024, au Cadre budgétaire de la Ville et aux différents plans de gestion des actifs.

BACKGROUND

The existing Infrastructure Master Plan (IMP) was approved by Council in 2013 (ACS2013-PAI-PGM-0216). The focus of the 2013 plan was a capital program involving major water and wastewater projects to support growth to 2031. City Council adopted the new Official Plan in 2021 (ACS2021-PIE-EDP-0036) and received Provincial approval in 2022. The new comprehensive Official Plan guides development, including urban expansion, to 2046, when the population is projected to rise to 1.4 million.

On October 23, 2023, the Province of Ontario announced the reversal of Official Plan decisions for numerous municipalities, including the City of Ottawa, and invited comments from impacted municipalities on which modifications should remain. On December 6, 2023, Bill 150, under the *Planning Act(1990),* received Royal Assent and removed the expansion lands the Province added to the Official Plan through its 2022 approval. On May 16, 2024, Bill 162 (Get It Done Act), received Royal Assent, confirming the removal of expansion lands added by the Province through Bill 150 and re-establishing the 2022 modifications for increased heights on Minor Corridors.

The IMP works in harmony with the City's overall administrative and policy context. In addition to supporting the recently approved Official Plan, it informs the City's update to

the Development Charge By-law. The City's new Zoning By-law is being prepared in coordination with the development of these programs. The IMP aligns with the City's Comprehensive Asset Management program, a program that takes an integrated business approach involving the disciplines of planning, finance, engineering, maintenance and operations to effectively manage existing and new infrastructure.

DISCUSSION

The main objective of the IMP is to ensure that there is sufficient drinking water, wastewater, and stormwater capacity available to support growth adequately and sustainably to 2046 and beyond. The IMP (Document 1) includes sections on the following topics: IMP policies, backbone system Master Plans, servicing needs for the new Tewin Community, a citywide Stormwater Management Strategy, a rural servicing plan, and recommendations for new Intensification Servicing Programs. The IMP also provides summaries of the City's water purification and wastewater treatment Master Plans, which are being conducted as separate initiatives.

1. Infrastructure Master Plan Policies

The IMP policies provide supporting detail to relevant policies within the Official Plan and establish additional technical policies to guide infrastructure planning and approvals processes. The policies ensure that infrastructure required for growth is planned and implemented appropriately and cost-effectively, considering potential impacts on existing communities and the natural environment. The 2013 IMP focused largely on providing direction to internal City programs, whereas the new policies include a focus on clarifying a consistent set of expectations and a level playing field for the development community.

The policies included in the new IMP address the following topics:

- **Level of Service:** Level of Service, in the context of the IMP, generally relates to quantifiable system performance criteria that govern the identification and sizing of projects needed to support growth within the City's water, wastewater, and stormwater systems. It is the intent of the IMP to ensure that existing levels of service do not degrade as a result of growth. As such, IMP policies highlight the City's application of a risk-based approach to managing system performance.
- **Public Service Areas:** Public Service Areas are defined areas of the City where municipal water and/or wastewater system servicing exists or is permitted. The IMP provides exceptions to related Official Plan policies for developments within

rural Public Service Areas. The new policies also require that any Master Servicing Studies supporting development of lands adjacent to existing rural estate development on private water and wastewater services consider potential future public servicing of the existing development.

- **Master Servicing Studies:** Master Servicing Studies define the main infrastructure needed within a particular development expansion area. The IMP policies provide guidelines for the preparation of these studies and clarifies when and where they are applicable.

- **Capacity Planning:** The Capacity Planning policies address related City and development industry responsibilities, planning horizons, infrastructure oversizing, and capacity allocation in cases where available capacity for designated growth is limited.

- **Greenfield Infrastructure Planning and Design:** Greenfield development occurs on vacant land and the expansion lands identified in the Official Plan. Policies focus on infrastructure in vacant or expansion lands, ensuring apt planning, environmental mitigation, and addressing issues of country lot subdivisions near serviced villages.

- **Intensification:** Existing infrastructure systems have finite capacity based on standards existing at the time of development. The intensification policies require that minimum service levels for existing neighbourhoods under future development conditions be based on the better of the original design assumptions or the existing level of service. The intensification policies also require that development projects involving net increases in impervious area be subject to on-site stormwater management, even if no *Planning Act (1990)* approval is required. The policies also commit the City to review funding and financing of intensification-driven infrastructure upgrades to ensure associated costs are fairly distributed and do not compromise the City's renewal program.

- **Legal Stormwater Outlets:** Stormwater drainage system outlets within the City consist of natural watercourses and municipal drains. The IMP policies specify requirements for establishing stormwater outlets, ensuring legal and sufficient outlets for development applications or that progress has been made to achieving this requirement.

- **Riverine Flood Hazards:** The IMP policies address potential flood risks, requiring new infrastructure planning near watercourses to consider extreme

flooding scenarios.

- **Groundwater Resource Protection:** The City applies various regulatory tools and programs to manage local groundwater resources. The IMP provides new policies to formalize these requirements. The policies also commit the City to conducting and updating groundwater characterization studies to identify potential risks to public health.

- **Low Impact Development:** Low Impact Development is a stormwater management strategy that aims to manage runoff as close to the source as possible to reduce impacts of small to mid-scale rainfall events on local watercourses. The IMP provides policies that require Master Servicing Studies to include conceptual Low Impact Development plans that meet targets where they are established in approved local Subwatershed Studies or Environmental Management Plans.

- **Monitoring, Modelling, and Forecasting:** Monitoring and modelling are essential to support the planning, design, and operation of stormwater, wastewater, and drinking water systems, and to ensure optimal capacity utilization and availability to support growth. The IMP provides policies pertaining to monitoring and modelling requirements for the development industry in support of community planning.

- **Affordability and Financing:** IMP capital projects are identified to meet the demands of development within the 2046 Official Planning horizon. Policies are provided related to the oversizing of infrastructure and the allocation of costs. Currently, limited funds are recovered from intensification growth to cover servicing costs. Growth has leveraged excess capacity in existing infrastructure systems and has benefited from the City's renewal program, which considers oversizing as part of the replacement of aging infrastructure. As intensification continues, the City anticipates that more intensification-driven replacement will be needed, and the City is seeking alternative funding mechanisms to ensure developments incur the appropriate share of costs. On this basis, the IMP provides new policies that support the establishment of a new program focused on the planning of intensification-driven infrastructure and new mechanisms to fund implementation.

2. Backbone System Master Plans

2.1 Overview

An updated capital program for the City's drinking water and wastewater systems is a crucial component of the new IMP. Responding to climate change, affordability, intensification, and sustainability are the key principles that guide the preparation and implementation of the IMP, ensuring that the City's water-related services are delivered to support growth effectively and responsibly.

Water and Wastewater Master Plans have been prepared to inform the overall IMP and identify recommended infrastructure investment projects to serve growth and development to year 2046. These two plans identify upgrades to the City's backbone water and wastewater infrastructure needed to support growth. The term "backbone" refers to major facilities, including pumping and storage facilities, as well as large diameter distribution/collection pipes that are the foundation of these systems.

Master Plans for the City's water purification plants and wastewater treatment facility are being prepared as separate initiatives and are summarized in the IMP based on the most current information available.

The Water and Wastewater Master Plans include a focus on optimizing the capacity of the existing system and providing resiliency to potential major failures and climate change, as well as flexibility to support potential post-2046 servicing needs. Intensification-related capacity issues and upgrade needs for local watermains and sewers are addressed by the proposed Infrastructure Capacity Management Program, as discussed in Section 5.3 of this report.

The following key considerations have informed the development of the Water and Wastewater Master Plans:

- Review of design criteria and level of service against previous plans and industry best practices.
- Assessing demand trends including pandemic and climate related impacts.
- Evaluating system performance under existing, 2046 and potential longer-term conditions.
- Testing performance under different scenarios, including typical daily operation, peak demand / extreme weather conditions, and potential major failures.

The IMP identifies individual capital projects and provides cost estimates and timing of implementation. These projects and cost estimates will be used to inform an update to the City's Development Charges By-Law.

Each capital project identified in the plan will be subject to further planning through a functional design process. This process will consider alternative infrastructure corridors and locations that would be consistent with the project concept as defined in the IMP. Some of the projects will also be subject to a Class Environmental Assessment process under the *Environmental Assessment Act (1990)*, and some projects will require Federal approvals.

Upon completion of the Class Environmental Assessments and functional design studies, project charters will be prepared for design and construction by the City. If the City's project timing does not align with development needs, developers would need to front-end the related projects (through an agreement with the City). The developer would agree to finance the design and delivery of the capital works in accordance with the Front Ending policy approved by Council. Planning for other backbone projects will be completed through developer-driven Master Servicing Studies for specific expansion areas and implemented through the subdivision approval process.

2.2 Water Master Plan

The IMP includes the Water Master Plan, which informs the City's future planning and implementation of water infrastructure and identifies major individual proposed water distribution projects and their estimated costs. These consist of some projects identified in the 2013 IMP, but have yet to be implemented, as well as new projects identified in the 2024 Water Master Plan. A total of 16 projects are identified in the Water Master Plan, at a total estimated cost of approximately $711 million as shown on Table 1, which provides a summary of total costs per five-year period from 2024 to 2046. The list of individual projects and their costs is provided in Document 2.

Table 1: Water Master Plan Capital Costs and Timelines

Period	Total Capital Cost	Benefit To Existing
2024-2029	$95.2M	$9.5M
2029-2034 **	$492.4M	$4.6M
2034-2039	$114.2M	$11.1M
2039-2044	$9.1M	$1.4M
2044-2046	$0.0M	$0.0M
Totals	**$710.9M**	**$26.7M**

*Dollar amounts in this table are in millions (2024 dollars)
** Includes all Tewin-related water projects

Table 1 also includes the portion of costs to be allocated to existing development. These amounts represent the “Benefit to Existing” development (BTE) that the projects provide. These benefits typically involve an improvement to the performance of infrastructure that currently serves the City’s existing residents and businesses, such as reduced risk of flooding, increased water pressures, or improved system reliability. BTE costs are covered by the City’s rate budget, and the remaining costs are covered by growth.

The Water Master Plan includes a major reconfiguration of pressure zones in the South Urban Community, which will result in pressure increases in some areas and reductions in other areas where existing pressures are at the high end or above the range specified by City design guidelines. This pressure zone reconfiguration, which was originally identified in the 2013 IMP, will ensure appropriate water pressures for growth areas in this part of the City.

No improvements to the backbone of the system are required specifically to address intensification needs. Upgrades to small diameter local watermains needed to support intensification will be identified and discussed through the proposed Infrastructure Capacity Management in section 5.3 of this report.

2.3 Wastewater Master Plan

The IMP includes a new Wastewater Master Plan which informs the City’s future planning and implementation of wastewater infrastructure and identifies major individual proposed wastewater collection system projects and their costs. These consist of projects identified in the 2013 IMP, and have yet to be implemented, as well as new projects identified in the 2024 Wastewater Master Plan component of the IMP. A total of 37 projects are identified in the Wastewater Master Plan, including Tewin wastewater servicing, at a total estimated cost of $798 million as shown on Table 2 below, which provides a summary of costs per five-year period from 2024 to 2046. The list of individual projects and their costs is provided in Document 2. Table 2 also summarizes the “Benefit to Existing” allocations.

Table 2: Wastewater Master Plan Capital Costs and Timelines

Period	Total Capital Cost	Benefit To Existing

2024-2029	$139.1M	$42.0M
2029-2034 **	$440.2M	$53.6M
2034-2039***	$171.7M	$118.4M
2039-2044	$39.2M	$8.1M
2044-2046	$7.3M	$4.1M
Totals	**$797.5M**	**$226.3M**

*Dollar amounts in this table are in millions (2024 dollars)

** Includes Tewin wastewater project.

*** Includes the O'Connor Flood works project, which has a high BTE component.

The Wastewater Master Plan includes 11 new projects that will support intensification. Many backbone sewers in the City core have limited available capacity. The plan recommends a strategic approach involving a combination of upgrades and diversions to sewers that have excess capacity. This approach makes the most efficient use of the existing infrastructure.

It is expected that additional projects will be needed to support intensification, involving upgrades to smaller diameter local sewers. These needs will be addressed through the proposed Infrastructure Capacity Management in section 5.3 of this report.

2.4 Infrastructure Servicing for the Tewin and South Urban Communities

The IMP provides a servicing strategy for the Tewin Community. At 445 hectares, Tewin is the largest urban expansion area approved through the 2022 Official Plan. The development is not adjacent to the existing urban area and will require major infrastructure extensions through the NCC Greenbelt to provide water and wastewater servicing. The following factors are key considerations that have informed infrastructure servicing of the Tewin Community:

- As with other IMP projects, potential growth of Tewin and adjacent areas beyond 2046 informs infrastructure sizing. Given the magnitude of the required investment, oversizing costs are substantial to avoid the potential need for additional major, costly, and potentially disruptive future infrastructure extensions through the Greenbelt after 2046.

- The majority of infrastructure required to support Tewin will be needed before the first home is occupied. This resulting low demand on high-capacity infrastructure

in the initial years of development creates significant operational challenges that require both capital and operational solutions.

- The broader South Urban Community (Leitrim, Riverside South, Barrhaven) will become limited by drinking water transmission capacity through the NCC Greenbelt before the end of the planning period. This provides an opportunity for an integrated solution that will meet the needs of both Tewin and the South Urban Community. A less costly integrated solution will lower infrastructure costs for both the Tewin and the South Urban Community.

The proposed water infrastructure to service Tewin and the South Urban Community includes:

- A primary water feedermain extending northwest, 11 kilometers from Tewin to the Conroy elevated tank;
- A secondary feedermain extending west, five kilometers from Tewin to the Leitrim area;
- A 10.7 million litre on-site reservoir and water pumping station; and
- Upgrades to the existing water feedermain system between Billings Bridge and the Conroy elevated tank.

The proposed wastewater infrastructure to service Tewin includes a trunk sanitary sewer extending north eight kilometers to the existing backbone of the wastewater collection system where there is sufficient available capacity.

As with all other projects identified in the IMP, the Tewin-related infrastructure will be subject to a project-specific Class Environmental Assessment and functional design process following approval of the IMP. Alternative pipe corridors and facility locations will be considered as part of these studies.

Per Annex 12 of the Official Plan, a Special Area Charge for Tewin will be established. Consequently, the apportionment of costs for the new water infrastructure described in the IMP would be split between the Tewin Special Area Charge and the “Outside Greenbelt” Development Charge, in accordance with the benefits provided. The Outside Greenbelt Development Charge is intended to cover the growth-related cost of projects that benefit urban areas outside the NCC Greenbelt, except for Tewin.

A total of $168 million of the Tewin / South Urban Community water and sewer costs will

be allocated to “Post Period Capacity”. This refers to additional capacity provided by oversizing infrastructure to accommodate potential growth needs beyond the planning period ending in 2046. Oversizing reduces the cost of any post-2046 servicing and represents cost-effective and efficient use of infrastructure. Per Annex 12 of the Official Plan, Post Period Capacity (oversizing) costs associated with Tewin infrastructure are to be front-ended by Tewin. However, given the magnitude of these costs and the multiple landowners that could potentially benefit from the provision of Post Period Capacity, discussions about how these costs will be financed are on-going. Furthermore, additional consideration should be given to the allocation between funding sources and how much over-sizing is appropriate and affordable through the Class Environmental Assessment and functional design process for the Tewin / South Urban Community infrastructure. Development Charges would be updated to include these Post Period Capacity costs as part of a future by-law update if and when there is an urban expansion in the potentially benefiting area through an Official Plan review, allowing for recovery of the oversizing costs.

Document 4 summarizes the capital costs, cost allocations, and implementation time frames for the water and wastewater infrastructure requirements to service Tewin and augment water supply to the South Urban Community. The projects listed in Document 4 may be combined or phased differently than shown. Project phasing and the potential need for interim measures to address affordability concerns will be considered as part of the Class Environmental Assessment and functional design process.

2.5 Water Purification and Wastewater Treatment Master Plans

The Water Master Plan and Wastewater Master Plan address the City’s central water distribution and wastewater collection systems. However, the scope of these plans do not include the City's two water purification plants (Lemieux Island and Britannia) and the City's wastewater treatment plant (Robert O Pickard Environmental Centre – ROPEC). Master Plans for the plants are being completed as separate initiatives. The Master Plans for the drinking water plants have been finalized and the ROPEC Master Plan is expected to be completed by Q4 2024. The IMP summarizes available information on these plans to provide a more complete picture of the infrastructure requirements associated with the 2046 and longer-term growth projections. The plant Master Plans will address a broad range of non-growth related concerns, such as the planned renewal of existing assets, climate resiliency, and energy efficiency.

The Lemieux Island and Britannia Water Purification Plants draw water from the Ottawa River and supply the City’s central water distribution system. The rated capacities of the

plants are 400 megaliters per day at Lemieux and 360 megaliters per day at Britannia. However, under cold water conditions in the winter, the actual treatment capacities are only 250 megaliters per day and 320 megaliters per day, respectively.

Based on the 2046 projections and the planned water storage projects recommended in the Water Master Plan, capacity expansion is not required at either plant within the planning horizon to meet future peak summer demands under normal operating conditions. However, capacity upgrades at Lemieux Island are required to provide sufficient capacity to meet future winter demands. This project is already included in the current Development Charges By-law. The current cost estimate is $35 million and the Benefit to Existing allocation is $9 million (25 per cent) of this cost, with implementation required within the 2029-2034 growth period. No growth-related projects are required at the Britannia plant.

The ROPEC facility treats all sanitary sewage generated in the City's central wastewater collection system. The plant has an average day flow capacity of 545 megaliters per day and a peak capacity of 1,362 megaliters per day. Specific treatment processes at the plant have capacity restrictions, and upgrades to these processes will be required to meet 2046 demands. These will need to be addressed through a prioritized series of capital projects.

The growth-related projects and current cost estimates costs associated with the Lemieux Island Water Purification Plant and ROPEC are listed in Document 2.

3. Citywide Stormwater Management Strategy

The stormwater management strategy differs from the water and wastewater master plans. Unlike the water and wastewater systems, the City's stormwater system is decentralized. In other words, there are many independent storm drainage systems across the City, based on local topography. Each system has its own outlet to an existing watercourse. All of the growth-driven greenfield and expansion area stormwater projects are planned and delivered by the development industry, subject to City requirements and approvals. Therefore, the IMP does not identify major growth-related stormwater projects. However, the IMP provides a citywide Stormwater Management Strategy.

The 2013 IMP did not include a Stormwater Management Strategy. Stormwater requirements were dispersed and housed within various documents, such as the Official Plan and provincial requirements. Now, for the first time, staff are consolidating these requirements into a comprehensive strategy to guide stormwater management in ways

that support growth and meet environmental protection goals. The predominant focus of the Stormwater Management Strategy is to support urban growth. The 2024 IMP strategy refreshes and aligns objectives with the new Official Plan policies. Notably, certain Official Plan policies are integrated within the IMP directives, while several IMP policies are operationalized via the Stormwater Management Strategy.

The main purpose of the strategy is to provide high-level guidance on:

- the management of stormwater to protect watercourses against water quality and erosion impacts resulting from development; and
- the protection of properties from flooding risks associated with growth, under future climate conditions.

To support these goals the strategy outlines recommendations targeting primary aspects of stormwater planning:

1. The scoping of climate change considerations be expanded in the planning and design of stormwater infrastructure, beyond what is the current standard practice.
2. Establishing master planning and floodplain mapping requirements for the new urban expansion areas.
3. Providing direction on the application of Low Impact Development (LID) in development projects.

A key objective of LID is to mimic the hydrology of a natural watershed to the extent possible.

The Stormwater Management Strategy presents the first opportunity to clarify and coordinate stormwater requirements, collectively providing a transparent and comprehensive outlook for all stakeholders.

4. Rural Infrastructure

The IMP summarizes established servicing strategies for development in the rural area, including villages. Projects to support growth in serviced villages could involve construction of new (or upgrades to) existing infrastructure involving either decentralized facilities and/or the extension of services from the City’s central systems. Decentralized facilities could involve communal well systems, where the supply of water originates within the village, and/or communal wastewater systems, where treatment and disposal takes place within the village.

Decentralized facilities are identified through village Master Servicing Studies, rather than the IMP.

There are five projects planned to support growth in the villages of Carp, Manotick and Richmond that involve connections to the central wastewater system. All wastewater projects are identified in the Wastewater Master Plan and were previously identified in the 2013 IMP. All planned water system projects involving connections to the central water system as identified in previous master planning processes have already been implemented or are in the process of being implemented.

No new rural area projects are identified in the 2024 IMP, as the new Official Plan does not expand any of the villages connected to central services.

There are on-going Master Servicing Study updates for the Villages of Richmond and Carp. Both studies are considering options to extend drinking water services from the central system and are expected to be completed by Q1 2025.

Extension of wastewater services to the Village of Notre-Dames-des-Champs is also anticipated to support a proposed subdivision. These services will be identified through a separate servicing study. This project provides an opportunity for existing residents in the village to connect to public wastewater services through a Local Improvement process.

5. Intensification Servicing

5.1 Overview

The Official Plan targets intensification rates to increase from 40 percent of urban development to 60 percent by 2046. Intensification is introducing new challenges to the City, and new programs are needed to manage local infrastructure capacities while maintaining service levels to existing residents as intensification occurs.

5.2 Intensification Challenges

Intensification servicing needs that align with housing goals and new provincial legislation pose new challenges for city water, wastewater and stormwater infrastructure.

Two challenges stand out: ensuring sufficient capacity in local water, wastewater and stormwater infrastructure to support intensification and ensuring existing urban drainage service levels remain consistent after development occurs in existing neighbourhoods.

An additional challenge is managing the potential impacts of climate change and flooding. These challenges increase the impact of community flooding and drainage problems.

As it stands, specific development and building permit applications and the cumulative impacts of these applications on local infrastructure capacity are challenging to forecast. Exactly where, when, and in what form these developments will occur depends on individual landowner decisions and market conditions. While we can expect some capacity will be available to support intensification in local neighbourhoods, there are limits that will vary from street to street and neighbourhood to neighbourhood.

Stormwater also presents unique and complex challenges to the management of intensification impacts. Incremental increases in hard surfaces create more runoff and a greater risk of flooding in small and large rain events. Residential intensification magnifies this problem reducing space for overland drainage on and between properties, and reducing space available for pervious surfaces and trees, which help to reduce runoff.

Climate change can exacerbate these effects, which tend to increase rainfall volume and intensity, as noted in the City's Climate Resiliency Strategy.

5.3 Infrastructure Capacity Management Program

As previously highlighted, the Water and Wastewater Master Plans detail necessary upgrades to the backbone infrastructure capacity to facilitate growth and intensification. However, analysis of the impacts of ongoing intensification on local infrastructure capacity is well beyond the scope of what a citywide master plan could accomplish. Therefore, new programs are required to address the cumulative servicing needs of intensification development, leveraging available local infrastructure capacity while maintaining levels of service to existing residents. These programs will also help the City respond to new provincial housing targets in excess of Official Plan projections and new permissions under *Bill 23 (2022)*, allowing up to three dwelling units per lot, and consideration of a fourth dwelling unit through the proposed Zoning By-law as per the Housing Accelerator Fund.

The Infrastructure Capacity Management program is important in addressing such capacity challenges and its objectives are twofold: ensure that adequate local water and wastewater servicing capacity is available to meet the intensification goals of the Official Plan; and that development is not degrading service to residents over time.

The Infrastructure Capacity Management program will need to be coordinated with local intensification planning initiatives such as Secondary Plans for existing communities. These plans will need to be supported by servicing studies managed under the new program that will identify growth-driven upgrades to local infrastructure. Servicing studies will also be needed for other areas where significant intensification is occurring in the absence of an intensification planning study.

The program will also include the scoping and delivery of projects identified by these servicing studies. These projects would be tailored to meet the collective needs of developers, and leveraged to build resilience and enhance service levels if needed.

Further components of the program consist of capacity assessments for incoming development applications, sewer flow monitoring, infrastructure modelling, and tracking of local infrastructure capacity. Opportunities to remove wet weather flows from local sanitary systems through redevelopment will be identified, effectively freeing capacity for increased sanitary flows. Additionally, overland drainage patterns will be analyzed to ensure that individual properties are protected from flooding as redevelopment takes place. The program will also consider the need to maintain adequate fire protection from the water system as development densities increase. This will be achieved primarily through local watermain upgrades and revisions to the fire department's response models.

Future capital projects identified by the proposed Intensification Capacity Management program will support the needs of developers building in existing areas. Funding and financing of these projects may vary depending on the scale of the project, the benefit that the project provides to existing development, and the desired project timing. Larger projects with longer lead times, such as those identified in the Infrastructure Master Plan are be funded mainly through Development Charges. Upgrades to local systems will generally not meet the criteria to be eligible for project-based Development Charges funding. Various options for funding growth-driven upgrades to local systems are being considered including:

- A Municipal Act (2001) Charge*;*
- A program-based Development Charges; and
- Direct funding by benefiting developer or property owners' group.

Servicing studies supporting Secondary Plans for existing development areas will require a Financial Plan that explains how each project recommended in the study is to

be funded and financed. These plans will be of particular importance in the short term before a new funding mechanism for intensification-driven infrastructure is in place.

Staff recommend initiating the Infrastructure Capacity Management program with two new permanent positions within the City's Asset Management Service. The cost of these positions would be funded by the City's rate budgets. The rationale for rate funding is that the information generated through the program will provide an improved understanding of the performance of existing local water and sewer systems and support the City's asset management programs.

Staff will report back to Council with detailed recommendations on funding infrastructure projects under this program, including resourcing needs.

5.4 New On-Site Stormwater Management for Small Residential Developments Program

Continued intensification will eventually lead to significant cumulative impacts on the City's local storm drainage systems, which are required to manage more and more stormwater runoff volume.

Central to mitigating these impacts will be the new On-Site Stormwater Management for Small Residential Developments Program. The future program will support the dual goals of meeting the servicing needs of intensification while not increasing flood risk to existing properties. Staff continue to work on refining the program details, with a future report recommending the program's implementation to be presented to Council in 2025.

The options evaluated below in the IMP will inform future staff recommendations on a new program. Options include:

- Status Quo
- Municipal Upgrades
- On-Site Stormwater Management for Small Residential Developments

Option 1: Status Quo

As intensification continues to increase, more hard surfaces on private property are added and, therefore, more stormwater runoff drains to local streets and adjacent properties. Impacts include spillover of rear yard drainage to neighbouring properties, more frequent and higher ponding levels on streets, leading to increased risk of both

surface and basement flooding on public and private property.

The status quo option will support the goal of the IMP to allow development to proceed however, staff do not recommend this option since it will overwhelm local storm drainage systems resulting in the incremental degradation of existing service levels and increased risk of flooding.

Option 2: Municipal Upgrades

The second option to manage increased storm runoff from new development is upgrading municipal stormwater infrastructure throughout the urban area. Based on pilot area studies, this option is estimated to require upgrades to roughly 650 kilometers of storm sewers citywide at an estimated cost of $3 billion for just the area inside the Greenbelt where intensification is forecast. This option would have major construction impacts and take many decades to implement.

Furthermore, it is not possible to retrofit old storm drainage systems to provide an engineered overland flow system that would meet current design standards for greenfield development, nor would such upgrades address rear yard drainage problems. As a result, local communities would continue to experience increased flooding risks while drainage network upgrades are underway, and these upgrades would still not sufficiently address all of the impacts. Flood risks will continue to increase.

The municipal upgrade option supports the goal of the IMP to support intensification however, staff do not recommend this option due to affordability, time to complete upgrades, high construction impacts, and its inability to adequately mitigate the impacts of increased storm runoff to public and private property.

Option 3: On-Site Stormwater Management for Small Residential Developments

The third option, an On-Site Stormwater Management for Small Residential Developments Program would complement existing on-site stormwater management requirements currently required for developments subject to Site Plan Control.

On-site stormwater management retains and stores stormwater on the property and reduces peak runoff rates into the City's drainage systems. Options for on-site stormwater management measures on small residential development projects include rooftop storage, surface storage, underground storage, and infiltration elements like rain gardens and soak-away pits. Consistent application of on-site stormwater management to developments that increase hard surface areas on a property would effectively

mitigate the impacts of intensification as it occurs and where it occurs.

Recent amendments to Ontario's *Planning Act (1990)* exclude residential developments of 10 or fewer units from Site Plan approval; previously, the City mandated on-site stormwater management for projects with four or more units. This future program would extend on-site stormwater management to developments ranging from one to 10 units, crucially covering one to three-unit projects representing the bulk of citywide redevelopment properties historically.

The proposed program would enable the City to require on-site stormwater management for small residential developments despite not being subject to Site Plan Control and thus maintain existing service levels in neighbourhoods.

Given the significant progress the IMP has achieved in understanding intensification challenges and potential solutions, staff will be in a position to recommend that Council approve implementation of the On-Site Stormwater Management for Small Residential Developments program in 2025. While progress has been achieved in shaping this program, certain elements require further work, such as a guide and design tools for developers, by-law amendments, business process changes, a proposed fee structure, and staff requirements.

This progress has greatly benefited from the in-depth participation of the Greater Ottawa Home Builders Association and the Planning, Development and Building Services Department. Continued collaboration with these stakeholders is important to refine further and establish the program's specifics.

6. Infrastructure Master Plan Implementation and Next Steps

Following Council approval of the Infrastructure Master Plan, the City will publish a Notice of Master Plan to initiate a 30-day public review period, after which the Class Environmental Assessment requirements for Master Plans will have been satisfied and the IMP will be considered final. The City will respond to any comments received through this review.

Once the IMP is final, implementation activities would include: update of the Long Range Financial Plan and affordability model; update of the Development Charges By-law; capital project planning and implementation; Stormwater Management Strategy implementation; further development and implementation of the proposed Intensification Servicing Programs; and other related tasks as detailed in this report.

In addition to the report to update the Development Charges By-law, subsequent

reports to Council that will address implementation of the On-Site Stormwater Management program, and a new process to verify infrastructure capacity for development applications involving four to 10 dwelling units. Staff will monitor and evaluate the new programs and report back to Council on their performance and the adequacy of supporting resources.

Subsequent updates to the IMP will be prepared in coordination with future Official Plan reviews based on updated projections and provincial housing targets.

FINANCIAL IMPLICATIONS

The financial implications of the IMP are addressed under the following sections below:

- Summary of estimated capital costs;
- Affordability analysis of IMP capital projects; and
- Staffing requirements for the Infrastructure Capacity Management Program.

Summary of estimated capital costs

The estimated capital costs before 1.76 per cent of HST in 2023 dollars associated with the implementation of the Infrastructure Master Plan are presented in Document 2 which lists individual projects and associated estimated capital costs. Document 3 provides a summary of costs. In short:

- The total estimated cost of the proposed growth-related upgrades related to water distribution and wastewater collection is $1.508 billion, including Tewin-related costs.
- There are 20 proposed water distribution infrastructure projects identified, with an estimated total cost of approximately $711 million;
- There are 37 wastewater collection infrastructure projects identified, with an estimated total cost of approximately $798 million;
- The estimated cost of providing water and wastewater services to the Tewin Community is approximately $591 million. This includes costs associated with augmenting water supply to the South Urban Community.
- The estimated cost of the proposed growth-related upgrades to the Lemieux Island Water Purification Plant and ROPEC is approximately $494 million.

The IMP infrastructure requirements, capital costs and cost apportionment will inform the City's update of Development Charges By-Laws in 2024 and Long Range Financial Plan.

Affordability analysis of IMP capital projects

As a public service, affordability must be defined from the perspective of current and future ratepayers. Affordability in the context of growth planning is whether there is adequate funding to deliver the service and provide the related infrastructure from forecasted revenue sources using conservative assumptions.

This affordability analysis is limited in scope and must be considered preliminary but is required to inform the City's update of Development Charges By-Law in 2024. This affordability analysis includes the estimated costs for the IMP and plant master plans but does **not** include capital costs for Tewin (aside from the $97.4 million of the total infrastructure required to service Tewin that supports the buildout of the South Urban Community identified in Document 4). Staff continue to work under the assumption that Tewin will pay for Tewin putting no additional burden on City finances. Lastly, this affordability analysis assumes that other area-specific wastewater capital costs for villages will be fully recovered through area specific development charges. Further refinements to the IMP affordability analysis will be completed over the next year following updates to:

- Any *Development Charges Act (1997)* regulations;
- The City's front ending policy;
- the Rate Supported Long Range Financial Plan for Water, Wastewater and Stormwater
- the 2024 Development Charges Background study;
- the City's Fiscal Framework; and
- various Asset Management Plans.

Achieving affordability requires that:

- Net cash flow generated by the plan must be greater than or equal to zero;
- If cash flows fall below zero, the City must either issue debt to pay for capital works or defer projects to prevent cash from falling below zero;

- The total City cost of servicing debt for all tax- and rate-supported services will not exceed the annual provincial debt servicing limit of 25 per cent of own source revenues;
- The amount of debt servicing funded from rate-supported services will not exceed 15 per cent of City own source rate revenues;
- The annual cost of debt servicing on development charges-supported debt for water and wastewater cannot exceed annual development charges collections. However, more conservative limits may be imposed by the updated Fiscal Framework; and
- The debt issued for any capital work will be fully retired before the end of the asset's expected service life.

Water and wastewater services are capital intensive services and rate revenue requirements need to keep pace with the increases in both operating and capital costs for both renewal needs and the share of growth costs that benefit existing ratepayers.

Revenues related to the renewal of infrastructure assets, and the share of growth costs that benefit existing ratepayers (BTE portion) are currently increased annually to meet the revenue requirement defined in the 2017 Long Range Financial plan (ACS2017-CSD-FIN-0023).

The current affordability model identified the required level of investment in the renewal of assets, BTE portion of growth, regulatory and strategic initiatives and provided a schedule of revenue increases to meet the need. The updated BTE of $252M over the 2024-2046 timeframe represents an increase of an additional 5 per cent to the forecasted required level of investment. The current revenue requirement cannot support the updated BTE portion of the IMP, in addition to the targets previously set. An update to the Rate LRFP (Q2 2025) will provide guidance to the rate revenue requirement, incorporating the pressures identified in the IMP and the various asset management plans that are to be completed that will also identify capital asset renewal requirements.

Growth-related revenues, namely development charges, also need to keep pace with increases in capital costs. Growth costs in the IMP are concentrated in the 2028 to 2033 time period when considering the estimated timing of when costs will be incurred following project initiation through to project completion. Although the IMP achieves the

level of growth envisioned in the Official Plan, this concentration of spending creates unique financing challenges for the City that impacts the plan's affordability.

The 5-year historical average of water and wastewater development charges collections was used to establish a baseline for what may be achievable in the future. Mandatory discounting and conservative indexing was applied to this baseline to estimate future development charges revenues for water and wastewater.

Under the current level of collections, the forecasted development charges revenue is considered affordable for wastewater growth-related capital costs but **unaffordable** for water growth-related capital costs.

The parameters to achieve affordability for the water growth-related capital costs could include the following or a combination thereof:

- Increasing overall water development charges revenue by 2 times the 5-year historical average collections; and
- Fund the unaffordable portion with increased water development charges supported debt, to be recovered over a longer period of time with future water DC collections; and/or
- Deferring projects until sufficient water development charges reserve balances can finance the project costs.

Front ending is not assumed in the affordability analysis. However, if projects are deferred and developers chose to front end projects it will reduce the amount of debt required. The recommended financing strategy will be developed as part of the 2025 Rate LRFP.

Staffing requirements for the Infrastructure Capacity Management Program

The Infrastructure Capacity Management Program will be initiated with two new permanent positions within the City's Asset Management Service. The cost of these positions would be funded by City rate budgets.

LEGAL IMPLICATIONS

The Infrastructure Master Plan is identified as a supporting document in the Official Plan. Where such documentation is relevant in a hearing before the Ontario Land

Tribunal documents that have gone through a review and approval process will normally attract greater weight at such hearing. As noted in the report, the Infrastructure Master Plan upon completion of the public review process will have status as a Master Plan under the Municipal Class Environment Assessment.

In addition, as noted in this report, the Infrastructure Master Plan will provide essential background information to the update of the development charges background study and by-law to permit a revision of the relevant components of the City's development charges.

COMMENTS BY THE WARD COUNCILLOR(S)

This is a citywide report.

ADVISORY COMMITTEE(S) COMMENTS

There was no advisory committee consultation as part of this report.

CONSULTATION

The IMP process was conducted to meet the requirements of the Environmental Assessment process for Master Plans and included a broad and inclusive stakeholder involvement program. Consultation with Indigenous Communities was conducted in accordance with City of Ottawa policy. Numerous meetings were held with representatives of the Greater Ottawa Home Builders Association, including workshop series on specific topics such as: the development of the On-Site Stormwater Management for Small Residential Developments Program; and cost estimations for capital projects. Details of the public and stakeholder participation process are provided in the IMP (Appendix I).

ACCESSIBILITY IMPACTS

As Ottawa continues to be developed through its Official Plan and the key infrastructure projects identified in the Infrastructure Master Plan, the City of Ottawa is committed to ensuring accessibility for persons with disabilities and older adults. This includes the provision of safe, affordable, and sufficient drinking water, as well as wastewater and stormwater capacity to maintain sanitation services.

ASSET MANAGEMENT IMPLICATIONS

The Comprehensive Asset Management program enables the City to effectively manage existing and new infrastructure to maximize benefits, reduce risk, and provide safe and reliable levels of service to community users. This is achieved by considering the implications of proposed policies and actions on the lifecycle costs, supported levels of service and risks to the City's infrastructure assets. These themes have influenced the development of the IMP.

The infrastructure projects recommended in the IMP will increase the City's inventory of assets to be managed over the long term. Some of the recommended projects will benefit existing communities by improving the performance of certain assets resulting in reduced basement flooding risks, improved drinking water system pressure, and/or improved reliability of service.

As with the creation of any new remote community, there will be operational challenges associated with the new Tewin Community given the high capacity and length of the required servicing extensions to this area, and the low servicing demands in the in the initial stages of development. This could require a significant level of effort by City operations staff in the commissioning and operation of the infrastructure during this period.

The recommended On-Site Stormwater Management program will involve the design and construction of measures which will be privately owned and managed. It will be important for the City to implement a monitoring program to ensure on-going compliance, as well as overall effectiveness in terms of storm system performance.

Implementation of the recommended Intensification Capacity Management program will require integration and alignment with the City's existing asset management programs to ensure coordination of intensification-driven and condition-driven upgrades to existing local system assets.

Effective Asset Management relies on adequate project funding. The principle of "growth pays for growth" is reflected in the IMP to the extent possible under current legislation. The majority of project costs associated with the IMP will be covered by development. The IMP establishes the basis for rate budget contributions where recommended projects or programs provide a benefit to existing communities or existing asset management programs.

CLIMATE IMPLICATIONS

Through the Climate Emergency declaration in 2019, Council directed staff to embed

climate change across all elements of City business. The Climate Change Master Plan is a framework for how Ottawa will mitigate and adapt to climate change over the next three decades. This Plan established greenhouse gas reduction targets of 100 per cent by 2050 for the city as a whole and 100 per cent by 2040 for the municipal corporation. One priority of the Climate Change Master Plan is the application of a climate change lens to the Official Plan and its supporting documents, asset management and capital planning. A high-level climate lens framework developed for the City's various master plans outlines considerations both for mitigation through greenhouse gas emissions reductions, and adaptation for climate change resiliency.

A Climate Change Vulnerability and Risk Assessment was prepared to inform the water, wastewater and stormwater servicing components of the IMP and future updates to the City's Asset Management Plans. In the context of the IMP, the climate lens has focused primarily on the need to adapt water resource systems to the changing climate, notably projected increases in the amount of rainfall and the frequency of both small and large rainstorms, as well as increased risk of low water conditions in the summer.

While there is limited opportunity for direct greenhouse gas emissions reductions in the planning and design of City infrastructure, the IMP notes opportunities to reduce emissions through Sewer Energy Exchange System (SEES) Pilot Project connections to the wastewater system as part of development and in considering opportunities to support district energy plans.

Planning for an increase in the severity and frequency of severe weather events has been an important consideration in the development of the IMP. The drinking water, wastewater and stormwater systems were modelled under various climate change scenarios to examine how these systems will perform, notably under low water, heavy rainfall and power outages.

Key recommendations to increase the resilience of water, wastewater and stormwater systems include:

- ensuring water infrastructure is suited for future climate conditions, by considering future climate conditions in servicing plans and revising the City's sewer design guidelines, especially for the planning and design of stormwater and drainage infrastructure;
- requiring development to mitigate risks from more severe riverine flooding (350 year flood event);

- establishing a new program to manage urban drainage from intensification;
- identifying how to manage the impact of stormwater runoff from older neighbourhoods on local watercourses through the development of Stormwater Management Retrofit plans; and
- promoting sustainable practices such as Low Impact Development (LID) to assist with managing runoff from more frequent storm events.

Climate risks to existing water infrastructure will be addressed through asset management plans and master plans for the water purification and wastewater treatment plants, and through existing wet weather management programs.

DELEGATION OF AUTHORITY IMPLICATIONS

There is no delegated authority associated with the recommendations in this report.

ECONOMIC IMPLICATIONS

The Official Plan aims to make Ottawa the most livable mid-sized city in North America. Building on this goal, and with the aim of supporting growth, the IMP supports economic development by planning for the necessary water and wastewater infrastructure and Stormwater Management strategies that provide vital service to existing and planned development. In addition to serving greenfield growth in the suburban areas of the City, the IMP has a particular emphasis on planning for infrastructure to support intensification in existing, serviced areas which are a priority of the Official Plan. Likewise, the IMP provides a framework for asset management objectives including maintaining levels of service and adopting a sustainable approach to infrastructure investment

ENVIRONMENTAL IMPLICATIONS

The Infrastructure Master Plan advances the City’s environmental strategies as documented in the Strategic Plan, Official Plan, Climate Change Master Plan, and other municipal policies, guidelines, and regulations. It also is consistent with the Provincial Policy Statement and other supportive legislation, policies, guidelines, and regulations.

Specifically, the IMP supports the City’s public health and environmental protection goals by providing plan that will ensure adequate drinking water, wastewater and stormwater capacities for growth. Protection from growth-related flood risks and adaptation to climate change are also key objectives of the plan. Environmental

implications of growth are addressed through the recommended policies, projects, and programs that are described in the plan.

The plan also provides a framework based on existing practice to ensure that the potential environmental impacts of growth within future urban expansion areas are mitigated through the preparation of Subwatershed Studies and Environmental Management Plans.

The IMP also provides a strategy for completing citywide stormwater retrofit studies that identify measures intended to mitigate impacts of existing development on water quality and erosion conditions in city watercourses.

RISK MANAGEMENT IMPLICATIONS

All risks associated with this report have been identified in the report.

RURAL IMPLICATIONS

This is a citywide report and all rural implications are consistent with the recommendations in this report.

TECHNOLOGY IMPLICATIONS

There are no technology implications to this report.

TERM OF COUNCIL PRIORITIES

Under the 2023-2026 Term of Council Priorities, the IMP is consistent with, and assists to advance the four strategic priorities by:

- Supporting and enabling the directions of the City’s Official Plan which guides growth to the year 2046;
- Supporting the economy by planning for vital water and wastewater infrastructure, together with storm water strategies to enable growth and development;
- Providing policies and new programs to support residential intensification and a mix of housing types in established areas where a wide range of services already exist;
- Maximizing the efficient utilization of existing infrastructure and municipal resources to keep the cost of servicing and development down wherever

feasible;

- Embracing green and environmentally friendly approaches such as Low Impact Development stormwater management solutions; and
- Building resiliency in the face of a changing climate and protecting communities from this risks of flooding associated with extreme weather events.

SUPPORTING DOCUMENTATION

Document 1	Infrastructure Master Plan
Document 2	Water and Wastewater Master Plan Individual Projects and Costs
Document 3	Overall Water and Wastewater Master Plan Infrastructure Costs
Document 4	Infrastructure Serving the Tewin and South Urban Communities

DISPOSITION

Upon Council approval of this report, the Infrastructure and Water Services Department will finalize the IMP documents and staff will undertake the next steps as outlined in the report.