
TO: GENERAL COMMITTEE

SUBJECT: INFRASTRUCTURE MASTER PLANS

WARD: ALL

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SUBMITTED BY: B. ARANIYASUNDARAN, P. ENG., PMP DIRECTOR OF ENGINEERING

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CHIEF ADMINISTRATIVE OFFICER APPROVAL: M. PROWSE, CHIEF ADMINISTRATIVE OFFICER

RECOMMENDED MOTION

1. That the following six Infrastructure Master Plans related to growth from 2019-2041 be endorsed, and that staff file Notices of Completion in accordance with the Municipal Class Environmental Assessment process:
 - a) Water Supply;
 - b) Water Storage and Distribution;
 - c) Wastewater Treatment;
 - d) Wastewater Collection;
 - e) Drainage; and
 - f) Transportation.

PURPOSE & BACKGROUND

2. The purpose of this staff report is to request authority to finalize and issue notice of completion in accordance with the Municipal Class Environmental Assessment for the Infrastructure Master Plans for servicing requirements to the year 2041.
3. Following the Barrie-Innisfil Boundary Adjustment Act in 2009, the City of Barrie undertook a number of studies to develop a strategy for managing growth to the year 2031. Those studies, completed in 2013/ 2014 included infrastructure master plans for water, wastewater, drainage and transportation. It is accepted practice that master plans be updated on a 5 years basis. This staff report is presenting the scheduled master plan updates which now consider the time period to the year 2041.
4. The 2017 Provincial Growth Plan permits the City of Barrie to plan for a population of 253,000 and 129,000 jobs by the year 2041. A key part of preparing for this growth is ensuring that the infrastructure that is required to support this growth is identified, planned and in place.

5. A key input for the master plans is the growth forecast for the City. While the province identified the targets of 253,000 people and 129,000 jobs by 2041, there is a need to identify which areas of the City will receive the people and jobs, and what the numbers look like at interim timeframes. Watson and Associates were retained to develop growth projections for the City of Barrie in 5 year increments for both population and employment (jobs). These projections were mapped across the City of Barrie in 170 model zones across the City. The projections were developed considering the Provincial Growth Plan, City planning documents, currently planned growth and predicted demographic changes. The growth projections by zone are important for the development of infrastructure master plans as they guide where new or additional infrastructure is required to meet demand from growth.
6. The growth projections were used to develop the six infrastructure master plans:

Master Plan	Description
Water Supply Master Plan	The City of Barrie gets its drinking water from Kempenfelt Bay and groundwater wells. This Water Supply Master Plan looks at the infrastructure that brings water from these two sources to supply all the zones in the City.
Water Storage and Distribution Master Plan	The City's drinking water distribution system consists of pipes, reservoirs and pump stations. This water system provides water to residents and supplies water to fight fires. The Water Storage and Distribution Master Plan analyzes the future demands and recommends the infrastructure required to meet the target level of service for the City.
Wastewater Collection Master Plan	Wastewater (sanitary sewage) is collected from across the City and conveyed to the treatment plant through pipes and pump stations. The Wastewater Collection Master Plan recommends future infrastructure required to meet increased flows as well as makes recommendations on reducing extraneous sources of water into the system to minimize stress on the wastewater system.
Wastewater Treatment Master Plan	Prior to being discharged to Lake Simcoe, the City's wastewater must be treated to a high standard to protect this sensitive environment and meet provincial regulations. The Wastewater Treatment Master Plan looks at the processes and infrastructure at the wastewater treatment facility and recommends what is required to continue to meet our objectives.
Transportation Master Plan	The Transportation Master Plan is an update to the 2014 Multi-Modal Active Transportation Master Plan. The Transportation Master Plan covers road network improvements, active transportation improvements (pedestrian and cycling networks), trails, and transit.
Drainage Master Plan	The 2019 Drainage Master Plan represents the first time the City has had one drainage master plan to cover multiple watersheds across the City. The scope of the study is to identify drainage improvements required to meet current City standards and prepare for the intensification and development occurring in Barrie. The drainage master plan addresses flooding, drainage and water quality concerns through recommendations on storm sewers, culverts, stormwater ponds and low impact development infrastructure.

ANALYSIS

7. The Master Plans have been developed under the Municipal Class Environmental Assessment (EA) process that identify the preferred water, wastewater, drainage and transportation solutions to meet the City of Barrie’s growth requirements to the year 2041. A summary of each Master Plan is provided in Appendix A and Final Drafts of the Master Plans can be found on the City’s website at www.barrie.ca/eastudies.
8. The solutions outlined in the Master Plans, when implemented, will result in complete, connected communities where residents will continue to enjoy delivery of safe, clean drinking water to their homes and businesses, collection and treatment of wastewater and stormwater for protection of the environment, and a transportation network that provides choices for people to walk, cycle, take transit and drive as they move around the City.

Master Plans under the Environmental Class Environmental Assessment Process

9. The Municipal Engineers Association (MEA) Municipal Class Environmental Assessment Document (October 2000, as amended in 2007, 2011 and 2015) (the Class EA process) outlines options for completing master plans. These Master Plans were undertaken in accordance with Approach #2 of the Master Planning process outlined in the Class EA document. This process addresses Phases 1 (identify problem or opportunity) and Phase 2 (selecting preferred solution) of the Municipal Class EA process.
10. The Municipal Class EA document classifies projects in terms of schedules. The below table shows the definition of each project schedule and provides some examples of the projects included in the City of Barrie master plans.

Project Schedule Definition	Example
<p><u>Schedule A</u> Projects are limited in scale, have minimal adverse environmental effects and include a number of municipal maintenance and operational activities. These projects are pre-approved and may proceed to implementation without following the full Class EA planning process. Schedule A projects generally include normal or emergency operational and maintenance activities.</p>	<ul style="list-style-type: none"> • Culvert replacement within the City’s property. • Extend water distribution system or wastewater collection system where extension is required to service a development under the Planning Act. • Expand/ refurbish/ upgrade sewage treatment plant up to existing rated capacity.
<p><u>Schedule A+</u> As part of the 2007 amendments, Schedule A+ was introduced, where Schedule A+ projects are pre-approved, however, the public is to be advised prior to project implementation.</p>	<ul style="list-style-type: none"> • Modify a stormwater pond within existing City property for the purpose of water quality. • Construction of bike lanes, sidewalks or multi-use trails.
<p><u>Schedule B</u> Projects have the potential for some adverse environmental effects. Schedule B projects generally include improvements and minor expansions to existing facilities.</p>	<ul style="list-style-type: none"> • Install or expand a stormwater pond where property is required. • Culvert replacement where property outside of the City’s property is required. • Works undertaken in a watercourse for the purposes of flood control or erosion control. • Construction of new or widening roads (value less than \$2.4 million). • Construction of a new pump station.

<p>Schedule C Projects have the potential for significant environmental effects and must proceed under the full planning and documentation procedures specified in the Class EA document. Schedule C projects generally include the construction of new facilities and major expansions to existing facilities.</p>	<ul style="list-style-type: none">• Construction of new or widening roads (value greater than \$2.4 million).• Expand a sewage treatment plant beyond its existing rated capacity.
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11. By following Approach #2 of the master planning process, the Master Plans, once completed, will fulfill all the environmental assessment requirements for Schedules A, A+, and B projects. This approach will result in significant time and cost savings because the City will not need to undertake separate EAs for Schedule B projects after completion of the Master Plans. The Schedule C projects will require completion of phases 3 and 4 of the Municipal Class EA process prior to implementation. Each master plan document includes a list of Schedule A, A+, B and C projects.

Public Consultation

12. The City has undertaken public consultation in accordance with the requirements for the Municipal Class EA process in order to ensure that the City's obligations for the Master Plan stage have been met.
13. The points of public contact as required under the Municipal Class EA process have been as follows:
- a) Notice of Commencement – Drainage Master Plan – June 1, 2017
 - b) Notice of Commencement – Water-Wastewater Master Plan – August 10, 2017
 - c) Notice of Commencement – Transportation Master Plan – August 29, 2017
 - d) Drainage Master Plan - PIC #1, - November 2, 2017
 - e) Drainage Master Plan - PIC #2, - April 17, 2018
 - f) Water & Wastewater Master Plan - PIC #1, - November 1, 2018
 - g) Transportation Master Plan PIC #1, - November 13, 2018
14. Once the Master Plans are approved by Council, the City will be issuing a Notice of Completion for the Master Plans. The associated Schedule A, A+, B and C projects have been recommended as part of the preferred alternative solutions to accommodate the projected growth and are documented in the Infrastructure Master Plans. With Schedule A and A+ projects being pre-approved, this Notice of Completion only pertains to the Schedule B projects. Schedule C projects will have further public consultation components in the future associated with subsequent phases under the Municipal Class Environmental process.
15. If a person or party has concerns that are not resolved by the City of Barrie's recommendations, or response to comments, that person or party may request that the Ministry of Environment, Conservation and Parks (MECP) make an Order for the project to comply with Part II of the Environmental Assessment Act (referred to as a Part II Order). Part II Orders cannot be submitted in respect of the Master Plans themselves, but must be made in respect to individual Schedule B projects listed in association with this notice. More information on the process can be found here: <https://www.ontario.ca/page/class-environmental-assessments-part-ii-order>

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16. The Minister of Environment, Conservation and Parks will evaluate Part II Order requests and has 4 options for a decision:
- a) refer the matter to mediation before making a decision
 - b) deny the request and inform the proponent and requester
 - c) deny the request but impose conditions
 - d) require the proponent to comply with the Part II Order and prepare a terms of reference for an individual environmental assessment
17. After a minimum of 30 days, if no Part II Order is received, the City can proceed with implementation of the Schedule B projects.

Implementation and Next Steps

18. Once the Master Plans are completed, the recommendations are used as input for a number of other studies:
- a) **Development Changes Background Study and By-Law** - This is a mechanism that allows municipalities to collect funds from developers, to use towards provision of services to support growth. The goal is to ensure that growth pays for growth to the greatest extent possible, and that any benefit to existing population is also appropriately funded.
 - b) **Official Plan (OP) Update** - One very direct connection to the OP relates to the right-of-way widths identified in the Transportation Master Plan recommendations. Through the OP, the City has the authority to acquire additional land for road widening through dedication at the time of development or redevelopment, rather than having to purchase the property.
 - c) **Asset Management Plans (AMPs)** – The capital costs associated with infrastructure to service growth are a key component of the City's investment needs. These growth related costs combined with the costs to operate, maintain, rehabilitate and eventually replace existing assets, make up the total cost required to deliver the City's services. AMPs report on total costs required to deliver City services, against the City's available funding/willingness to pay. Where there are funding shortfalls, an AMP will identify the risks associated with those shortfalls and facilitate fully informed, transparent decision making.
 - d) **Financial planning** – Aligned with asset management plans, long range financial plans consider the details of how to pay for City services, impacts on rates, taxation levels, and overall financial condition.
19. In addition the studies noted above, the Master Plans provide a first step in implementation of infrastructure projects through the City's capital planning process. The infrastructure will be implemented through a combination of City-led projects and developer-led projects with City oversight.
20. City-led projects are implemented through the City's business plan (capital plan). The general project steps for implementation of growth infrastructure are:
- a) **Master Plan:** Project is identified in the Master Plan.
 - b) **Additional Study:** Further study or additional environmental assessment (not needed for all projects).
 - c) **Capital Plan:** Project is added to the capital plan using the information from the master plan to determine appropriate scope, cost and schedule. Prioritization in the capital plan follows a risk based process that considers all needs across the City, affordability and desired levels of service.

- d) **Pre-Design/ Design:** Design work is undertaken either internally by Barrie's Engineering Department or by a consultant hired by the City. Depending on the nature and complexity of the project this typically takes one or two years and may also include a pre-design phase.
 - e) **Property acquisition:** Projects that require the City to acquire additional property to be purchased secure the property through negotiation or, if necessary, expropriation. This typically takes at least one year.
 - f) **Utility Relocation:** Third party utilities (e.g. gas, electrical, communication) that need to be relocated are moved by the third party in coordination with the City's design. Depending on the nature of the utility work this typically takes one year.
 - g) **Construction:** Construction of the project is undertaken, the duration is determined by the size and complexity of the project.
 - h) **Operations and Maintenance:** once the project is completed, it is added to the inventory of assets which must be operated and maintained by the City.
21. The Master Plans consider the infrastructure needs to service new subdivisions and other developments, however the local infrastructure projects within subdivisions are not identified through the Master Plans. This local infrastructure will be built by developers through subdivision agreements (for example, local roads and associated water mains, wastewater sewers, parks) with City review, inspection and sign-off prior to assumption.

ENVIRONMENTAL MATTERS

22. The Infrastructure Master Plans have been completed under the Municipal Class EA process which considers environmental as well as social and financial criteria. The environmental commitments made through completion of the master plans will be carried through to the design and construction phases of the process.
23. The recommendations of Drainage Master Plan and Wastewater Treatment Master Plan were determined through a combination of meeting provincial regulatory requirements, City of Barrie guidelines, working with conservation authorities and applying industry best practice. The recommendations will help to protect the City's creeks and Lake Simcoe from the potential impacts of urban development and human activity.
24. The Transportation Master Plan contains recommendation to improve the long term sustainability of the City by improving transportation options for residents to provide more incentives for people to make sustainable and healthy choices.

ALTERNATIVES

25. The following alternatives are available for consideration by General Committee:

Alternative #1 General Committee could decide not to approve the Infrastructure Master Plans. This alternative is not recommended as these documents identify the infrastructure required to support growth to 2041 and beyond. The implementation of the recommended projects would be delayed.

Alternative #2 General Committee could endorse the Infrastructure Master Plans but direct staff to complete additional study on one or more aspects of the Master Plans prior to implementation of the related project(s).

FINANCIAL

26. The following table summarizes the capital cost estimates to implement the Master Plans:

Master Plan	Component	Capital Costs Estimate
Water Supply	Groundwater Supply	\$2,400,000
	Surface Water Supply	\$6,800,000
	Total:	\$9,200,000
Water Storage and Distribution	Watermains	\$76,800,000
	Pump Stations and Reservoirs	\$33,400,000
	Total:	\$110,200,000
Wastewater Collection	Trunk Sewers	\$88,700,000
	Pump Stations	\$36,400,000
	Total:	\$125,100,000
Wastewater Treatment	Advance Nutrient Removal	\$189,000,000
	Solid Stream Modifications	\$99,400,000
	Hydraulic Expansion	\$90,000,000
	Total:	\$378,400,000
Transportation	Roads ¹	\$1,659,100,000
	Active Transportation	\$172,400,000
	Transit	\$248,500,000
	Total:	\$2,080,000,000
Drainage ²	Culvert Improvements ¹	\$52,200,000
	Stormwater Ponds	\$68,500,000
	Trunk Sewers	\$63,800,000
	Watercourse Improvements	\$58,000,000
	Total:	\$242,500,000
All Master Plans		\$2,945,400,000

Notes:

1. The cost for some culverts determined in the Drainage MP are included as part of the cost for road widening.
2. Drainage Master Plan costs do not include upsizing of local sewers what were recommended for implementation at the time of renewal.

27. The capital cost estimates were prepared to capture the total costs of implementing projects, including actual construction costs, engineering and other soft costs and contingencies. Base construction costs were based on industry expectations, and where possible, cross referenced with previous City of Barrie experience on similar projects. Property costs were estimated using actual data from land purchases in the City of Barrie over the last 6 years. Percentages for engineering design, project management, utility relocation, and contract administration and inspection. Finally, contingencies were added, to reflect the high level of uncertainty associated with planning level estimates. This approach is standard within the engineering and construction industry, and application of appropriate contingencies at the early planning stages is considered best practice.

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28. Master plans primarily identify growth related projects and do not generally account for renewal or changes to existing infrastructure that doesn't have a growth driver. Renewal projects are investigated as part of the City's asset management work.
 29. The Master Plans provide critical input to the 2019 Development Charges (DC) Background Study. The capital costs and timing of infrastructure projects required to service the City's growth to 2041, form the basis for the DC rates that the City will collect under the future DC By-Law. The DC rates that are collected will then be used to help fund the necessary infrastructure improvements as the City grows.
 30. The portions of Water and Wastewater Master Plan projects which are non-growth related will be funded by water/ wastewater rates, and the non-growth shares of the transportation and drainage projects will be tax rate funded (through the Tax Capital Reserve).
 31. While the Master Plans provide capital cost estimates, they do not identify the operating costs associated with projects. During the phase of the studies where alternative solutions were evaluated, high level consideration of future lifecycle costs led to the recommendations of some preferred alternatives. Total cost of ownership is an important concept for the City to consider as the projects within the Master Plans are considered for implementation through future capital plans.
 32. By endorsing the Master Plans, Council will not commit to any spending. Implementation of all master plans is accomplished through the City's annual business plan and budget process. The budget process considers all needs across the City, and prioritizes in keeping with the City's Financial Policy Framework and related targets. In addition to the financial targets, prioritization considers desired service levels, ability to deliver projects, and risk.
 33. In the future, the costs will be further assessed in Asset Management / Financial plans that consider sustainability. The projects in the Master Plans will advance subject to the City's ability to maintain its financial sustainability.

LINKAGE TO 2018-2022 STRATEGIC PLAN

34. The recommendation(s) included in this Staff Report support the following goals identified in the 2018-2022 Strategic Plan:
 - Growing the City's economy
 - Fostering a safe and healthy city
 - Building strong neighbourhoods
 - Offering innovative and citizen-driven services
 - Improving the ability to get around Barrie
35. As the foundational documents that identify infrastructure needs to service growth in the City to 2041, the Master Plans are directly linked to all 5 goals in Council's Strategic Plan. Major infrastructure projects will facilitate the development of new neighbourhoods, and in particular, transportation network improvements will improve the ability of new and existing citizens to get around the City. Water, wastewater and drainage improvements will provide for safe and healthy homes, businesses and protect the environment. The provision of reliable infrastructure will enable economic development.



LIST OF APPENDICES:

- A.** Master Plan Summary
- B.** Draft Notice of Completion

APPENDIX “A”

Master Plan Summary

The purpose of the Master Plans is to outline the strategies for creating complete, connected communities where residents will continue to enjoy delivery of safe, clean drinking water to their homes and businesses, collection and treatment of wastewater and stormwater for protection of the environment, and a transportation network that provides choices for people to walk, cycle and take transit as they move around the City. Existing and new residents will also continue to benefit from a range of services provided by the City such as waste management, parks and recreation, transit, fire, police and library.

Water Supply Master Plan

The purpose of the Water Supply Master Plan is to identify the preferred water supply and treatment solution for providing safe, clean drinking water to the residents and businesses of the City of Barrie. The Master Plan (MP) covers the period to the year 2041, with consideration and flexibility for further growth beyond 2041.

The existing water supply system includes twelve groundwater wells and one surface water plant treating water from Lake Simcoe.

The preferred solution is to maintain the existing water supply system, which has a total available capacity to meet demand projections to 2041 with some improvements to the connection between groundwater and surface water zones.

Water demand will continue to be monitored and the timing of the next expansion of the surface water treatment plant or additional wells will be evaluated through subsequent updates of the Water Supply Master Plan.

Cost Summary:

Year	MP Costs
2014	\$10,250,000
2019	\$9,200,000

Comments:

The 2019 Water Supply MP outlines a few projects related to increasing security and redundancy in the supply by increasing the options to supply between zones in order to best meet demands to 2041. The reason for this approach is the low water use trends and the selection of mixing of surface water and groundwater to meet maximum day demands in the future.

Less infrastructure is required to achieve this approach than outlined in the 2014 Master Plan but the costs are similar because of revisions to unit pricing and the application of new contingency and soft costs (design, inspection, project management, etc.) considered appropriate at this stage in the infrastructure planning process.

Water Storage and Distribution Master Plan

The purpose of the Water Storage and Distribution Master Plan is to identify the preferred solution for delivering potable water to homes and businesses as well as for storing water to meet fluctuating demands throughout the day and to protect the City for fire and emergency purposes. The Master Plan covers the period to the year 2041.

The existing water storage and distribution system consists of 6 booster pumping stations, 3 water towers, 3 in-ground storage reservoirs and over 600 km of water distribution pipes. The system is divided into water pressures zones according to ground elevation.

Watermains of size 400 mm and greater are considered trunk (sometimes referred to as transmission) watermains. New trunk watermains will be paid through development charges; watermains smaller than size 400 mm are considered local watermains and will be built and paid for by developers through subdivision or site-plan agreements as required to accommodate their growth.

The preferred solution for water storage and distribution includes the following components:
Secondary Plan Areas (SPA)

- Extension of trunk watermains into the secondary plan areas.
- New 20 ML in-ground storage reservoir and booster pump station on Salem Road between Veteran's Drive and Highway 400. The implementation date for this project has been pushed out from what was identified in previous studies from 2026 to 2031. This is due to the delay in the growth coming online and the existing low water demands.

Existing Built Boundary

- New booster pumping station from the Anne Street Reservoir to reinforce pressure Zone 3N. This project was the subject of specific study within the Master Plan to look at the options for the pump station location on the City's reservoir property.
- Watermain improvements south of the existing built boundary to service the secondary plan areas.
- New trunk watermain on Sunnidale Road to connect the Sunnidale and Anne Street Reservoirs to the water distribution system south of Highway 400.
- Additional area specific improvements throughout Barrie.

Cost Summary:

	Costs of MP Recommendations
2014 MP	\$ 11,782,000 (existing Barrie) \$ 39,946,000 (SPA) \$ 51,728,000 (total)
2019 MP	\$ 20,320,000 (existing Barrie) \$ 89,850,000 (SPA) \$110,170,000 (total)

Comments:

There are very few changes in the projects proposed between the 2014 MP and the 2019 MP. The majority of the cost difference is because of revisions to unit pricing and the application of appropriate contingency and soft costs (design, inspection, project management, etc.).

Wastewater Collection Master Plan

The purpose of the Wastewater Collection Master Plan is to identify the preferred solution requirements for collecting and conveying wastewater from homes and businesses to the wastewater treatment facility. The Master Plan covers the period to the year 2041, with consideration and flexibility for further growth beyond 2041.

Wastewater sewers of size 450 mm and greater are considered trunk mains. New trunk sewers will be funded through development charges; wastewater mains smaller than 450 mm are considered local mains and will be paid and built by developers through subdivision or site-plan agreements as required to accommodate their growth.

The preferred solution for wastewater collection is based on limiting the number of sewage pumping stations and servicing by gravity where practical, and includes the following major components:

Secondary Plan Areas

- Extension of the existing Hewitt's Creek wastewater sewer to south of Mapleview Drive East.
- Extension of the existing Lovers trunk wastewater sewer on Huronia Road at Lockhart Road south to McKay Road East then west on McKay Road to Veteran's Drive.
- New Salem wastewater pumping station and forcemain south of McKay Road West and west of Veteran's Drive.

- New Hewitt's wastewater pumping station and forcemain in the vicinity of Mapleview Drive East and the 20th Sideroad.

Existing Built Boundary

- Upgrading or twinning of the wastewater sewer on Bishop Drive between Ferndale Drive and Patterson Road
- Upgrading or twinning of the wastewater sewer on Tiffin east of Hwy 400 to WwTF (this project is shown beyond 2031 and would be re-evaluated as growth occurs)
- Upgrading or twinning of the wastewater sewer on Lakeshore/Hurst from the WwTF to Little Avenue (this project is shown beyond 2031 and would be re-evaluated as growth occurs)

Cost Summary:

	Costs of MP Recommendations
2014 MP	\$52,880,000
2019 MP	\$125,100,000

Comments:

A portion of the change is due to new sewer projects identified in existing Barrie for capacity increases due to growth and intensification. These mains were known in past studies to be close to requiring additional capacity and expanding the analysis to 2041 triggered the requirement for an upgrade. Updated unit pricing, and the application of appropriate contingency and soft costs (design, inspection, project management, etc.) also plays a role in the cost increases.

Wastewater Treatment Master Plan

The purpose of the Wastewater Treatment Master Plan is to identify the requirements for treating wastewater collected from homes and businesses before it is discharged to the environment. The Master Plan covers the period to 2041.

The existing wastewater treatment facility has a rated capacity of 76 mega litres per day (MLD) and discharges to Lake Simcoe at the western end of Kempenfelt Bay.

The preferred solution is to expand the plant with a hydraulic upgrade to meet the flow to 2041 as well as reducing inflow and infiltration (I & I). I & I are surface water or groundwater that makes its way into the sanitary sewer. Reducing I & I lessens the amount of wastewater to be conveyed and treated by the Wastewater Treatment Facility.

The strategy also recognizes the requirements of the Lake Simcoe Protection Plan – Phosphorus Reduction Strategy and identifies that the City must implement additional phosphorus removal technology (Membrane Bio-Reactor (MBR)) at the WwTF.

Key projects recommended include:

- MBR upgrades to allow the plant to treat to provincial standards and still accept flows from growth. Pre-design for this project is underway.
- Increasing the treatment capacity of the WwTF:
 - Raw sewage pumping station
 - Aerated grit tanks
 - Horizontal screw conveyor
 - Primary clarifiers (2)
 - New operations and maintenance facility due to expansion of the plant
- Installing a peak attenuation system

- Solids stream capacity improvements:
 - Increasing digestion capacity for sludge stabilization (2 digesters)
 - Biosolids thickening system

Cost Summary:

	Costs of MP Recommendations
2014 MP	\$189,000,000
2019 MP	\$378,400,000

Comments:

There have been many changes in the approach since the last Master Plan including:

- Additional capacity required to go beyond 2031.
- Additional solids stream capacity improvements.
- Increases to cost estimates for the MBR to account for increased capacity and project definition.
- New peak flow attenuation system.
- Appropriate contingency and soft costs (design, inspection, city project management, etc.).

Transportation Master Plan

The purpose of the Transportation Master Plan is to provide a roadmap for accommodating the City's transportation needs to the year 2041, considering all components of the existing transportation system including roads, sidewalks, transit, cycling facilities and walking trails.

The recommended approach is a multi-modal active transportation system with a modal split of 12% active transportation, 7% transit and the remaining 81% auto trips. This means that one in every five trips will occur using alternative transportation (transit, cycling, walking) rather than through individual motorized vehicles. The Master Plan outlines additional sidewalks on local roads, on-roadway cycling on arterial and collector roads, and off-roadway active transportation pathways designed for more intensive use.

The 2019 Transportation Master Plan includes the City's first Trails Master Plan. The Trails Master Plan developed the framework to guide implementation of a full trail system both in the secondary plan areas and the built boundary.

The Active Transportation section of the Master Plan has been enhanced to include more recommendations on helping the City meet the future modal share targets. This includes recommendations on transportation demand management, and prioritizes implementation of projects to complete a spine network of active transportation. It also includes recommendations on active transportation at Highway 400 interchanges and crossings. It is recommended that all interchanges and crossings have dedicated active transportation infrastructure with the exception of Essa Road and Dunlop Street. There are significant constraints at both Essa Road and Dunlop Street, safety is a concern; both locations have two alternative crossings within reasonable proximity. The ultimate active transportation crossing at Bayfield Street is proposed as a dedicated active transportation bridge on the alignment of Toronto Street / Coulter Street.

The partial Harvie Road-Big Bay Point /Highway 400 interchange is no longer being proposed. The additional access and crossing capacity of Highway 400 at other locations removed the need for this interchange. The implementation of the improvement at Mapleview Drive, including the diverging diamond is part of the improvements that need to be implemented to achieve a functioning system without this interchange.

The 2014 Transportation Master Plan had recommended that Burton Avenue between Bayview Drive and Essa Road remain a two lane road. Because of traffic volumes, the fact it is an arterial road in the Urban Growth Centre and part of an intensification corridor, this Transportation Master Plan is recommending it become 3 lanes in the future. This recommendation would allow the City to acquire additional right of way (ROW) as part of redevelopment to allow for three lanes to be constructed in the future.

Cost Summary:

	Costs of MP Recommendations
2014 MP	Total: \$969,000,000
2019 MP	Roads: \$1,659,100,000 Transit: \$248,500,000 AT and Trails: \$172,400,000 Total: \$2,080,000,000

Comments:

While the change in the total cost of the Transportation Master Plan is extensive, overall the projects remain similar. The unit costs for the road projects were generally unaltered (except for inflation). The additional costs have a number of factors influence them:

- The last Master Plan did not include any allowance for Low Impact Development (LID) in the roadway. Because of the Lake Simcoe Protection Plan and the pending release of Ministry of Environment, Conservation and Parks guidelines, this is becoming a requirement and is expensive to deliver.
- To update the property costs from 2014, the City analyzed the cost of property purchase for City projects over the past 5 years. Property values in Barrie have grown a lot since the last master plan. The property acquisitions costs associated with road widenings are higher than previously known.
- Appropriate contingency and soft cost (design, inspection, city project management, etc.).

Drainage Master Plan

The purpose of the Drainage Master Plan is to outline drainage improvements required for existing areas and future development. It addresses the needs for improvements to 2041.

As part of this Drainage Master Plan, the recently prepared city wide drainage system models were updated and used to evaluate the drainage systems city wide and identify the existing drainage system deficiencies. The Drainage Master Plan did not include the Sophia Creek watershed and the secondary plan areas as they were addressed in separate study.

Currently, portions of the City experience flooding during both minor and major storm events. Frequent flooding of private and municipal property during minor and major storm events has been documented throughout the City along most of the watercourses due to insufficient culvert and channel capacities. In addition to the flooding causing damage, it causes concern for public safety and contributes to significant erosion along a number of the channel reaches in the City. Erosion in turn, threatens property and poses public safety concerns.

The following general recommendations were developed from the preferred approach and are recommended as part of the preferred solution for each watershed and drainage area across the City:

- Upgrade the minor storm sewer system at time of renewal or redevelopment. Where storm sewers are not present new sewers should be constructed at time of renewal of other infrastructure/ROWs.
- Solutions to address the identified major overland deficiencies be evaluated as part of future road reconstruction projects where feasible through oversizing the storm sewer and/or adjusting the road profile/cross-section.
- Implement lot level LID measures on private property across the City should be promoted.
- Implement linear LID measures as part of local road reconstruction projects and intensification in the City of Barrie where feasible.

The Drainage Master Plan also identified 122 projects to address major issues. These projects are related to:

- Culverts
- Watercourse improvements (either conveyance or erosion)
- Trunk sewer systems
- Stormwater management ponds
- Centralized LIDs

There are some drainage projects that impact private property. The proposed impact on private property was subject to careful consideration by the City and the study engineering consultant, as impacting people's private property with a municipal infrastructure project is a last resort. The study included a detailed evaluation of options and weighed those options using criteria that considered the potential impact on people and their property. The decision to recommend full or partial property acquisition was made when it was felt that concerns about flooding risk, public safety, cost and the environment outweighed the impacts on private property.

Cost Summary:

	Costs of MP Recommendations
2014 MP	Not applicable
2019 MP	\$242,500,000

Note: Some costs for project determined in the Drainage Master Plan were used in the Transportation Master Plan where the projects were linked.

Comments:

There is no previous Drainage Master Plan with which to compare costs. The 2014 DC included drainage related costs of \$134,000,000. Of that total, \$55,000,000 was assigned to growth while in this study \$150,000,000 has been assigned to growth. This Master Plan has identified most of the drainage projects that were included in the past DC and updated the cost with new unit pricing and changes in contingency and soft costs (design, inspection, project management, etc.). The Drainage Master Plan also identified new projects due to the inclusion of a large study area, identifying new stormwater pond retrofit opportunities and identifying more problem erosion areas.

APPENDIX "B"

Draft Notices of Completion



**DRAINAGE MASTER PLAN
MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
NOTICE OF COMPLETION**

The Corporation of the City of Barrie has completed a Drainage Master Plan under the Municipal Class Environmental Assessment Master Planning Process (Phases 1 & 2) to identify the existing drainage deficiencies and develop drainage solutions to address the deficiencies, reduce flooding, resolve public safety concerns and improve maintenance opportunities throughout the City. In accordance with Approach #2 of the Master Planning Process, the investigation, consultation and documentation completed for this Master Plan are consistent with the requirements for Schedule B projects. Schedule A, A+ and B projects have been recommended as part of the preferred solution. With Schedule A and A+ projects being pre-approved, this Notice of Completion pertains to the Schedule B projects.

Two (2) Public Information Centers (PICs) were held where the public and interested stakeholders could provide comment on the project details and the various physical, natural, social, cultural and economic impacts. Public and agency comments received have been considered as part of the selection of the preferred solutions. A Drainage Master Plan Environmental Study Report (ESR) has been prepared that documents the study process and presents the preferred solutions. By this notice, the Drainage Master Plan ESR is available for public review starting April 17, 2019 at the following location:

**City of Barrie
Engineering Department
6th Floor City Hall
70 Collier Street**

In addition, the Drainage Master Plan ESR is available on the City of Barrie website at: barrie.ca → City Hall → Planning & Development → Environmental Assessment Studies.

If you have questions or concerns related to the preferred solutions or identified projects recommended in the ESR, please contact Tom Reeve, P. Eng. at the address below within 30 calendar days from the date of this notice.

Tom Reeve, P. Eng.
Senior Infrastructure Planning Program Coordinator
Engineering Department
City of Barrie
70 Collier Street, P.O. Box 400
Barrie, ON L4M 4T5
Phone: (705) 739-4220 ext. 4465
Fax: (705) 739-4247
Email: Tom.Reeve@barrie.ca

If concerns arise which cannot be resolved with the City of Barrie, a person or party may request that the Minister of Environment, Conservation and Parks make an Order for the project to comply with Part II of the Environmental Assessment Act (referred to as a Part II Order), which addresses individual environmental assessments. Part II Orders cannot be submitted in respect of the Master Plan itself but must be made in respect to individual Schedule B projects associated with this notice. Requests must be received by the Minister within 30 calendar days of this notice being issued. Requests are to be submitted to:

Hon. Rod Phillips
Minister of Environment, Conservation and Parks
College Park 5th Floor
777 Bay St.
Toronto, ON M7A 2J3
minister.mecp@ontario.ca

A duplicate copy of the request must also be forwarded to Tom Reeve, P. Eng. of the City of Barrie at the address provided above. If no requests are received, the City of Barrie, upon receipt of the necessary approvals, plans to proceed to implementation of the Schedule A, A+ and B projects recommended in the Drainage Master Plan through a phased approach, dependent on future budget approvals.

This Notice issued May XX, 2019 and May XX, 2019

Information will be collected in accordance with the Freedom of Information and Protection of Privacy Act. With the exception of personal information, all comments will become part of the public record.

Wendy Cooke
City Clerk

Bala Araniyasundaran, P. Eng.
Director of Engineering



Transportation Master Plan

NOTICE OF COMPLETION

The City of Barrie has completed the Transportation Master Plan (TMP) under the Municipal Class Environmental Assessment Master Planning Process to assess the City of Barrie's future development of its roads, transit, active transportation and trail networks. The TMP follows the planning process outlined in the Municipal Engineers Association Municipal Class Environmental Assessment document (October 2000, amended in 2007, 2011 and 2015), with the study area encompassing the entire City, including the secondary plan areas. The TMP informs the City of recommendations aimed at expanding and improving its transportation networks to meet the demands of the City's future population and employment. This was achieved through a combination of review of existing conditions, traffic modeling, outreach, and collaboration to determine the long-term transportation needs and priorities of the City.

The associated Schedule A, A+, B and C projects have been recommended as part of the study to accommodate the projected growth and are documented in the TMP. With Schedule A and A+ projects being pre-approved, this Notice of Completion only pertains to the Schedule B projects. Schedule C projects will have further public consultation components in the future associated with subsequent phases under the Municipal Class Environmental Assessment process.

The TMP has been conducted under Approach #2 of the Municipal Class Environmental Assessment process. The project included one (1) public information centre where the public and stakeholders could provide comments on the project details and recommendations. Public and review agency comments received have been considered in the development of the recommended networks and infrastructure improvements. The Transportation Master Plan and a list of the Schedule A, A+, B and C projects have been placed in the public record for review and the documents are available during regular business hours at the following locations:

City of Barrie
Engineering Department
6th Floor City Hall
70 Collier Street

The documents are also available on the City of Barrie web page: barrie.ca → City Hall → Planning & Development → Environmental Assessment Studies.

If persons have questions or concerns related to the above noted TMP or recommendations, within the thirty (30) calendar days from the date of this notice, please contact:

Tom Reeve, P. Eng.
Senior Infrastructure Planning Program Coordinator
City of Barrie
70 Collier Street, 6th Floor
Barrie, ON L4M 4T5
Tel: (705) 739-4220 Ext. 4465
Fax: (705) 739-4247
Email: Tom.Reeve@barrie.ca

If concerns arise that cannot be resolved with the City of Barrie, a person or party may request that the Minister of Environment, Conservation and Parks make an Order for the project to comply with Part II of the Environmental Assessment Act (referred to as a Part II Order), which addresses individual environmental assessments. Part II Orders cannot be submitted in respect of the Master Plan itself, but must be made in respect to individual Schedule B projects listed in association with this notice. Requests must be received by the Minister at the address provided below within thirty (30) calendar days of this notice being issued. A duplicate copy of the request must also be forwarded to Tom Reeve, City of Barrie. If no requests are received, the City of Barrie, upon receipt of necessary approvals from the provincial ministry, plans to proceed to the implementation of the recommended Schedule A, A+ and B projects identified in the TMP through a phased approach, dependent on future budget approvals.

Minister of the Environment Conservation and Parks
Environmental Approvals Access and Service Integration Branch
2 St Clair Avenue West, Floor 12A, Toronto, ON M4V 1L5

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Wendy Cooke
City Clerk

Bala Araniyasundaran, P. Eng.
Director of Engineering



Water and Wastewater Master Plan

NOTICE OF COMPLETION

The City of Barrie has updated four Water and Wastewater Master Plans under the Municipal Class Environmental Assessment Master Planning Process to assess the City of Barrie's future development of its water distribution, wastewater collection, water supply and wastewater treatment. The titles of the Master Plans are as follows:

- Water Storage and Distribution Master Plan Update
- Wastewater Collection Master Plan Update
- Water Supply Master Plan Update
- Wastewater Treatment Master Plan Update

All four Master Plan updates follow the planning process outlined in the Municipal Engineers Association Municipal Class Environmental Assessment document (October 2000, amended in 2007, 2011 and 2015), with the study area encompassing the entire City, including the secondary plan areas. The Water and Wastewater Master Plans include recommendations aimed at expanding and improving its water and wastewater infrastructure to meet the demands of the City's future population and employment. This was achieved through a combination of review of existing conditions, water and wastewater hydraulic modelling, outreach, and collaboration to determine the long-term water and wastewater needs and priorities of the City.

The associated Schedule A, A+, B and C projects have been recommended as part of the study to accommodate the projected growth and are documented in the Master Plans. With Schedule A and A+ projects being pre-approved, this Notice of Completion only pertains to some of the Schedule B projects identified in the Master Plan. Schedule C projects will have further public consultation components in the future associated with subsequent phases under the Municipal Class Environmental Assessment process.

All four Master Plan Updates have been conducted following Approach #2 of the Municipal Class Environmental Assessment process. The project included one (1) public information centre where the public and stakeholders could provide comments on the project details and recommendations. Public and review agency comments received have been considered in the development of the recommended networks and infrastructure improvements. All four Water and Wastewater Master Plans and a list of the Schedule A, A+, B and C projects have been placed in the public record for review and the documents are available during regular business hours at the following location:

**City of Barrie
Engineering Department**
6th Floor City Hall
70 Collier Street

The documents are also available on the City of Barrie web page: barrie.ca → City Hall → Planning & Development → Environmental Assessment Studies.

If persons have questions or concerns related to the above noted Water and Wastewater Master Plans or recommendations, within the thirty (30) calendar days from the date of this Notice, please contact:

Tom Reeve, P. Eng.
Senior Infrastructure Planning Program Coordinator
City of Barrie
70 Collier Street, 6th Floor
Barrie, ON L4M 4T5
Tel: (705) 739-4220 Ext. 4465
Fax: (705) 739-4247
Email: Tom.Reeve@barrie.ca

If concerns arise that cannot be resolved with the City of Barrie, a person or party may request that the Minister of Environment, Conservation and Parks make an Order for the project to comply with Part II of the Environmental Assessment Act (referred to as a Part II Order), which addresses individual environmental assessments. Part II Orders cannot be submitted in respect of the Master Plan itself, but must be made in respect to individual Schedule B projects listed in association with this notice. Requests must be received by the Minister at the address provided below within thirty (30) calendar days of this notice being issued. A duplicate copy of the request must also be forwarded to Tom Reeve, Senior Infrastructure Planning Program Coordinator, City of Barrie. If no requests are received, the City of Barrie, upon receipt of necessary approvals from the provincial ministry, plans to proceed to the implementation of the recommended Schedule A, A+ and B projects identified in the Master Plans through a phased approach, dependent on future budget approvals.

Minister of Environment, Conservation and Parks
Environmental Approvals Access and Service Integration Branch
2 St Clair Avenue West, Floor 12A
Toronto ON M4V 1L5

This Notice issued May XX, 2019, and May XX, 2019.

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Wendy Cooke
City Clerk

Bala Araniyasundaran, P. Eng.
Director of Engineering