

Clause 9 in Report No. 6 of Committee of the Whole was adopted, without amendment, by the Council of The Regional Municipality of York at its meeting held on April 21, 2016.

9

Water and Wastewater Master Plan Update

Committee of the Whole recommends:

1. Receipt of the presentation by Stephen Fung, Director, Infrastructure Asset Management, Environmental Services.
2. Adoption of the following recommendation contained in the report dated March 10, 2016 from the Commissioner of Environmental Services:
 1. Council receive this report for information.

Report dated March 10, 2016 from the Commissioner of Environmental Services now follows:

1. Recommendation

It is recommended that Council receive this report for information.

2. Purpose

This report provides a progress update on the Water and Wastewater Master Plan Update, including consultation activities and identification of the preferred servicing alternative to support growth to 2041.

3. Background

Water and Wastewater Master Plan Update commenced in 2013

The last Master Plan Update was completed in 2009 and endorsed by Council on November 19, 2009. In 2013, York Region commenced an update to the 2009 Master Plan. This Master Plan Update is carried out in conjunction with the Municipal Comprehensive Review and Transportation Master Plan Update, and

Water and Wastewater Master Plan Update

will identify servicing solutions to support growth in York Region. Residential population in York Region is projected to grow to almost 1.8 million and employment is projected to grow to 900,000 by 2041 as set out in Amendment 2 to the Provincial Growth Plan for the Greater Golden Horseshoe.

A status update on the current Master Plan Update and the planned deliverables from March 2015 to June 2016 was provided to Council on March 26, 2015. Since then, the following planned work has been completed:

- Identification of preferred servicing strategy
- Consultation with public and stakeholders including two additional rounds of Public Open Houses
- Identification of required water and wastewater infrastructure and associated cost in support of the preparation of Water Rate Study and preferred 2041 Growth Scenario

Additional details on work completed to March 2016 are discussed in the following sections of this report.

4. Analysis and Options

Master Plan to develop a cost-efficient and resilient infrastructure plan and long term servicing strategy

In alignment with the 2015 – 2019 Strategic Plan, the goal of the Water and Wastewater Master Plan is to develop a long term servicing strategy that is environmentally sustainable and provides cost effective and reliable service to the public. To achieve this goal, two key objectives were identified through the Master Plan Update process:

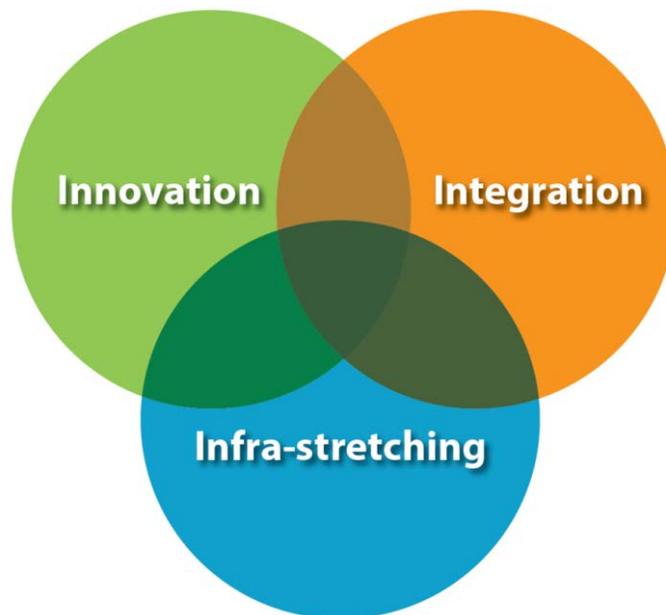
- Develop a cost effective and resilient water and wastewater infrastructure plan to serve growth to 2041
- Develop a long term strategy to provide sustainable water and wastewater services

Furthermore, three guiding principles were adopted to guide the decision making process of the Master Plan and the development of strategies to achieve the

above objectives. The three principles are Integration, Infra-stretching and Innovation (Figure 1). A description of these principles is listed below:

- **Integration** – Integrate master plan with sustainability and asset management initiatives to create synergy and increase efficiency
- **Infra-stretching** – Maximize useful capacity and useful life of built infrastructure with the benefit of minimizing and/or deferring capital investment
- **Innovation** – Practice and explore innovative new concepts and ideas through the development of the Master Plan and transpire the same throughout capital planning and delivery processes to promote cost efficiency and environmental sustainability

Figure 1
Master Plan Guiding Principles



Water and Wastewater Master Plan Update

Lake Simcoe and Lake Ontario are the two servicing alternatives considered in the Master Plan

To achieve the first objective, infrastructure improvements required to support growth to 2041 have to be identified. Building on previous master plan work and environmental assessment studies for water and wastewater projects, two servicing alternatives were identified and evaluated (Attachment 1):

- *Lake Simcoe Servicing Strategy*
- *Lake Ontario Servicing Strategy*

The primary difference between the two servicing alternatives is the source of water supply to support growth in Newmarket and parts of East Gwillimbury (Holland Landing, Queensville and Sharon). The *Lake Simcoe Servicing Strategy* recommends both Lake Simcoe and Lake Ontario based water supply to service additional growth in these communities, while the *Lake Ontario Servicing Strategy* recommends only Lake Ontario based water supply.

Wastewater servicing for both alternatives remains unchanged and incorporates use of Duffin Creek Plant and future water reclamation centre.

Both alternatives recommend that growth in the southern municipalities (Aurora, Markham, Richmond Hill, Vaughan and part of Whitchurch-Stouffville) continue to be serviced by water supply from Lake Ontario, with treated water returned to Lake Ontario after treatment at the Duffin Creek Water Pollution Control Plant (WPCP) and the Peel Region wastewater system.

Both alternatives also recommend that wastewater service for East Gwillimbury to be provided through the water reclamation centre proposed by the Upper York Sewage Solutions Individual Environmental Assessment completed in 2014. Growth beyond the currently proposed capacity of the water reclamation centre (40 MLD) will be accommodated by further expansion of the water reclamation centre.

The Long Term Water Conservation Strategy Update, Inflow and Infiltration Reduction Strategy Update and Asset Management Plan are integral to both servicing alternatives, and form part of the servicing solutions to meet the 2041 demand through implementing sound demand management and asset management programs.

Water and Wastewater Master Plan Update

Upper York Sewage Solutions Individual Environmental Assessment approval anticipated for Q3 2016

The Individual Environmental Assessment report for the Upper York Sewage Solutions project was submitted to the Minister of the Environment and Climate Change for approval July 25, 2014. With submission of the final report, the Ministry is conducting its own internal review and public consultation process in accordance with regulatory guidelines.

Since July 2014, Region staff have been addressing comments and additional information requests from the Ministry in a timely manner. Based on the current stage of the Minister's review and the Region's previous experience in similar undertakings, formal approval of the Upper York Sewage Solutions project is anticipated by Q3 2016.

2009 Master Plan Update recommended growth in Newmarket and parts of East Gwillimbury to be entirely serviced by Lake Ontario based water supply

Newmarket and parts of East Gwillimbury (Holland Landing, Queensville and Sharon) were originally serviced entirely by wells drawing from the Yonge Street Aquifer. By 2008, water draw from the Yonge Street Aquifer had approached capacity and a feedermain to convey Lake Ontario water to these communities was completed to supplement the groundwater supply. Since 2008, all additional water demand has been met through the Lake Ontario based supply.

The 2009 Master Plan Update envisioned that Newmarket and East Gwillimbury would continue to rely entirely on Lake Ontario based water supply to support future growth. Wastewater from these communities was envisioned to be conveyed through a new trunk sewer to the Duffin Creek WPCP. Servicing Newmarket and East Gwillimbury with Lake Simcoe water supply was studied under the 2009 Master Plan Update, however not adopted at the time partly because it would result in an increase in intra-basin transfer of Lake Simcoe water to Lake Ontario.

Subsequent to the 2009 Master Plan Update, the Region completed the Upper York Sewage Solutions Individual Environmental Assessment which recommends a water reclamation centre located in East Gwillimbury, a departure from the 2009 Master Plan Update proposal to convey wastewater flow to the Duffin Creek WPCP. This Master Plan Update reviewed the previous and ongoing studies, which resulted in the identification of two servicing alternatives (*Lake Simcoe Servicing* and *Lake Ontario Servicing*) for evaluation.

Water and Wastewater Master Plan Update

Comprehensive criteria used to assess two servicing alternatives

These two Servicing Alternatives were evaluated in accordance with the Municipal Class Environmental Assessment Process using the following five criteria:

1. **Technical** - Refers to the ability to maximize system capacity, add system security, and provide resilience to climate change while minimizing water age, pumping and operational complexity.
2. **Financial** - Compares the financial viability of alternatives by considering both capital and lifecycle costs of infrastructure required for their implementation and renewal.
3. **Social/Cultural** - Considers the potential impact to communities through evaluation of short and long term socio-cultural impacts as well archeological and heritage implications.
4. **Environmental** - Assesses the ability to minimize impacts to the natural environment while protecting groundwater resources, aquatic and terrestrial habitat and maintaining water balance.
5. **Jurisdictional/Regulatory** - Evaluates alignment with regulations and the ability to adapt to regulatory changes, to minimize land requirements and to maximize access to regional resources.

Lake Simcoe Servicing Strategy is the preferred alternative under this Master Plan Update

Results of the evaluation recommend the *Lake Simcoe Servicing Strategy* as the preferred servicing alternative. Infrastructure requirements to implement this servicing alternative include:

- Construction of a pumping station near Ravenshoe Road and Leslie Street in Georgina; and
- Extension of a 6 km watermain southerly from the proposed pumping station to a Regional watermain located at Queensville Sideroad and Leslie Street in East Gwillimbury.

Water and Wastewater Master Plan Update

Preferred water supply option from Lake Simcoe provides environment, technical and cost benefits

The preferred Lake Simcoe solution provides increased system resiliency and significant environmental benefits while in alignment with the three Master Plan principles: Infra-stretching, Integration and Innovation.

Key benefits of the *Lake Simcoe Servicing Strategy* include:

- **Improved water balance** - Future wastewater servicing in East Gwillimbury will have wastewater returned to the Lake Simcoe watershed after treatment at the water reclamation center, as recommended in the Upper York Sewage Solutions Individual Environmental Assessment. This Master Plan Update recommends a further expansion of the water reclamation center after 2031, subject to final timing of planned growth identified through the Municipal Comprehensive Review. As such, all future treated wastewater in Holland Landing, Queensville and Sharon will return to the Lake Simcoe watershed. Servicing Holland Landing, Queensville and Sharon with more Lake Simcoe based water over the long term will minimize intra-basin transfer and improve water balance.
- **Reduced water source to tap distance** - Lake Simcoe is significantly closer to Newmarket and East Gwillimbury communities than Lake Ontario. As such, this servicing alternative minimizes pumping costs and water age. Reduced pumping will result in reduced energy consumption and greenhouse gas emissions over the longer term.
- **Increased water system resiliency and redundancy** – This strategy will provide East Gwillimbury with an alternate water supply in a situation where supply from Lake Ontario is disrupted. Similarly, Georgina will also benefit from the interconnection that could provide an alternative supply in the event supply from Lake Simcoe is disrupted.

Lake Simcoe Servicing Strategy is consistent with current regulatory requirements and servicing agreements with Toronto and Peel

The Lake Simcoe Servicing Strategy aligns with regulatory direction through minimizing intra-basin transfer. It can be implemented without additional water supply beyond the current limits stipulated in the Toronto and Peel Water Servicing Agreements. Water supply from Lake Ontario will increase from 686 ML/d to 840 ML/d between 2016 and 2041, and will continue to be the prime

Water and Wastewater Master Plan Update

source of supply to service York Region. York Region's water supply distribution in 2016 and 2041 for the Lake Simcoe Servicing Strategy can be seen in Attachment 2.

Water supply from the Georgina water system (Lake Simcoe based) will increase from 42 ML/d to 62ML/d between 2016 and 2041 through a proposed upgrade of the Georgina water treatment plant. This upgrade will be within the current Permit to Take Water of the Georgina water treatment plant. As shown in Attachment 2, a Lake Simcoe based water supply will also service East Gwillimbury and Newmarket in 2041, in addition to Georgina.

Groundwater use to 2041 will continue at sustainable levels

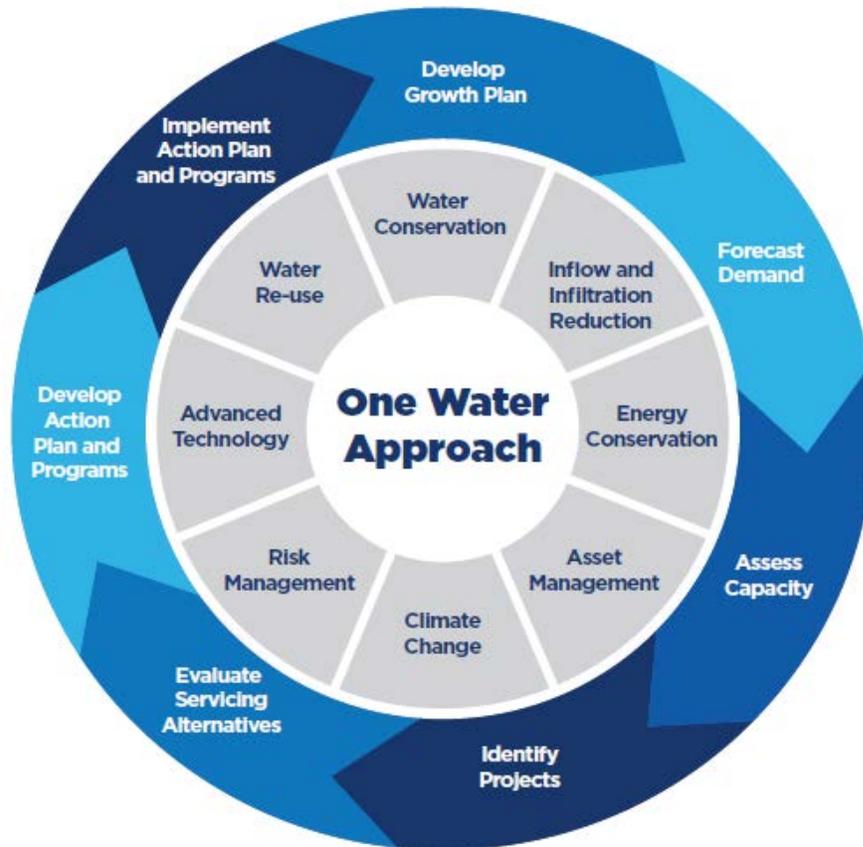
Water supply from Yonge Street Aquifer (groundwater based) will remain at current capacity in 2041. It will continue to play a key role in servicing Aurora, Newmarket and East Gwillimbury and minimizing intra-basin transfer of Lake Ontario based water to these communities.

Master Plan Update recommends a long term servicing strategy using a One Water approach

The second objective of this Master Plan Update is to develop a long term strategy to provide sustainable water service. Municipalities are facing increasingly complex challenges in delivering water and wastewater services to growing communities due to limited natural and financial resources. Ensuring the long term sustainability of services requires an innovative approach that minimizes capital investment and operating cost while protecting the natural environment.

Building on this concept, this Master Plan Update embraces a One Water approach that unlocks the value of more integrated thinking and decision making on water management and the water cycle (Figure 2). For example, this approach recognizes the value of wastewater as a resource instead of looking at it as waste, and promotes water reuse and energy recovery from wastewater systems.

Figure 2
One Water Approach



York Region has been practicing the One Water approach for many years through the Long Term Water Conservation and the Inflow and Infiltration Reduction Strategies (both updated in March 2016). These two initiatives create servicing capacity by managing demands and optimizing built infrastructure, with minimal impact to the environment.

The One Water approach has been developed through a consolidation of ideas from the public and stakeholders

Development of the One Water approach has been an integral part of this Master Plan Update. A visioning workshop was held in October 2015 with local municipal staff to identify opportunities for collaboration on One Water. Public input captured at the Master Plan Update public open houses and stakeholder input from the recent Long Term Water Conservation Strategy and Inflow and

Water and Wastewater Master Plan Update

Infiltration Reduction Strategy updates also help to support the development of ideas under One Water.

Lessons learned from these engagements concluded that an action plan needs to be developed and implemented to further this concept, with emphasis on the following:

- Incorporating a One Water approach into York Region decision making process in the delivery of water and wastewater services
- Investing in new technology to promote water and energy efficiencies including water reuse and energy recovery initiatives
- Integrating Long Term Water Conservation and the Inflow and Infiltration Reduction strategies with other initiatives created under the One Water action plan
- Strengthening partnerships with local municipalities and other government agencies to promote collaboration and innovation, and identify measures for climate change adaptation
- Integration of long term infrastructure planning with asset management

Public, municipal and community stakeholders were consulted on evaluating and selecting the preferred alternative and One Water objectives

The last Master Plan status update to Council in March 2015 reported the first round of public Open Houses held in November 2014. Subsequently, the second and third rounds of Public Open Houses were held in June 2015 and January 2016.

The second round of consultation was a joint open house for the Regional Official Plan Review, Water and Wastewater Master Plan Update and Transportation Master Plan Update. It was held in four locations as shown in Table 1. At the Open Houses, public input on evaluation criteria for servicing alternatives was collected. This formed the basis and the weightings of criteria used to evaluate the two servicing alternatives as discussed above.

Table 1
Second Public Open House Locations

Location	Municipality	Date
Milliken Mills Community Centre	Markham	June 9, 2015
Elgin West Community Centre	Vaughan	June 11, 2015
Aurora Cultural Centre	Aurora	June 16, 2015
The Recreational Outdoor Campus (ROC)	Georgina	June 25, 2015

The third and final round of Public Open Houses was held in the two locations shown in Table 2. In this final consultation round, the recommended *Lake Simcoe Servicing Strategy* was presented, as well as the One Water objectives to achieve the long term sustainability of water and wastewater services.

Table 2
Third Public Open House Locations

Location	Municipality	Date
South Services Centre	Richmond Hill	January 20, 2016
York Region Administrative Centre	Newmarket	January 26, 2016

Public engagement revealed support for One Water approach and the recommended servicing strategy

Attendance at the open houses included a broad representation of residents, landowners, developer groups, consultants and other stakeholders. The general response from collected from participants of these sessions was positive:

- The Open House content was presented in a format that was easy to understand, providing participants with a good understanding of the One Water objectives and servicing strategies.
- Participants support the One Water objectives and servicing strategies

Water and Wastewater Master Plan Update

Public expressed interest in using innovative approaches and ensuring source water quality among other factors

In addition to general feedback, members of the public expressed interest in ensuring the Region takes several factors into consideration in developing the Water and Wastewater Master Plan. Some of these considerations include:

- Using innovative approaches to water and wastewater treatment
- Ensuring the quality and quantity of our water sources are protected
- Ensuring future population growth does not compromise services
- Ensuring environmental sustainability is considered in the evaluation of potential servicing strategies
- Ensuring Regional and local municipal staff are accountable both from a technical and from a financial standpoint

In addition to public open houses, consultation sessions with a variety of stakeholders have been carried out. These included meetings with representatives from local municipalities, First Nations, Ministry of the Environment and Climate Change, Toronto Region Conservation Authority, Lake Simcoe Region Conservation Authority, and Building Industry and Land Development Association. All feedback received is being considered for incorporation into the Master Plan Update recommendations and final report.

Master Plan Update process supports the Water Rate Study and Growth Scenario Analysis

As part of the Master Plan process, new infrastructure and associated capital and lifecycle costs required to support growth to 2041 and beyond were identified. Preliminary infrastructure costs have been completed to support the preparation of:

- Water and Wastewater Financial Sustainability Plan which formed the basis of the new water rates approved by Council in October 2015
- Ongoing 2041 Growth Scenario analysis which was presented to Council in November 2015

These infrastructure cost estimates are being used for this Master Plan Update.

Water and Wastewater Master Plan Update

Cost of regional water and wastewater infrastructure to support growth to 2041 is in the range of \$3.0 to \$3.5 billion

Subject to final adjustment based on engineering analysis to be completed over the next few months, the total cost of projects required to support growth to 2041 identified under this Master Plan is in the range of \$3.0 to \$3.5 billion. The capital cost of the water and wastewater infrastructure identified in the Master Plan for the first ten years is in full alignment with the 2016 ten year capital plan. Work is currently underway to prepare more detailed cost estimates for the recommended servicing alternative, and will be used for the Development Charge Bylaw Background Study Update.

Master Plan Report will be brought to Council for endorsement in 2016

This Master Plan Update is scheduled for completion in Q3/Q4 2016 with the next progress report presented to Council in June. Key activities in the next six months include:

- Review public input and finalize master plan report
- Make presentations to Local Municipal Councils on findings of the Master Plan Update
- Progress report to Council in June on the Master Plan Update
- Carry out a financial impact analysis on the Water and Wastewater Master Plan Update in conjunction with the Municipal Comprehensive Review and the Transportation Master Plan Update
- Report to Council in Q3/Q4 2016 for endorsement of the Master Plan Update
- Submit Master Plan Update Report to Ministry of Environment and Climate Change
- Support activities leading to the Regional Official Plan Amendment including the update of Official Plan policies
- Support activities leading to the Development Charge Bylaw Update including the preparation of the Development Charge Bylaw Amendment Background Study

Water and Wastewater Master Plan Update

Link to key Council-approved plans

The 2015 Master Plan Update aligns with Vision 2051:

- **Livable cities and complete communities** - develop a cost effective and resilient infrastructure plan to serve York Region communities to 2041
- **Living sustainably** - develop a long-term strategy to provide sustainable water services under a one-water approach

The 2015 Master Plan Update aligns with the 2015-2019 Strategic Plan Priority Areas:

- Manage Environmentally Sustainable Growth
- Provide Responsible and Efficient Public Service

5. Financial Implications

Evaluation of servicing strategies considers both capital and full lifecycle costs

As part of the Master Plan Update, both capital and lifecycle costs will be estimated for recommended infrastructure. Preliminary costs have been completed to support the evaluation of servicing strategy options. Work is currently underway to prepare a more accurate and detailed cost estimate for the preferred servicing alternative and associated infrastructure. This information will provide input to the Development Charge Bylaw Update process.

6. Local Municipal Impact

The Master Plan is being completed in consultation with local municipal staff. Two workshops were held with all nine local municipalities participating. In addition, two one-on-one meetings were held with each of the local municipalities. Presentations to local municipal councils are currently underway and will be completed by May 2016. All feedback received from local municipalities will be taken into consideration in the development of Master Plan Update Report.

Water and Wastewater Master Plan Update

Regional infrastructure projects identified through the Master Plan process will form the basis for local municipalities to review and update local infrastructure plans. Active participation of local municipalities in the ongoing long term water conservation and infiltration and inflow reduction initiatives continues to be essential to ensure the provision of reliable, sustainable and cost-effective water and wastewater services over the long term.

7. Conclusion

This Master Plan Update supports the Region's Municipal Comprehensive Review process to update the Region's Official Plan in alignment with the new provincial growth target for York Region. It also provides input to the planned Development Charge Bylaw Update in 2017. The Master Plan Update has identified *Lake Simcoe Servicing* as the recommended servicing solution required to support growth to 2041. Completion of the Water and Wastewater Master Plan Update is expected in Q3/Q4 2016, with the next progress report presented to Council in June.

For more information on this report, please contact Stephen Fung, Director, Infrastructure Asset Management at ext. 73025.

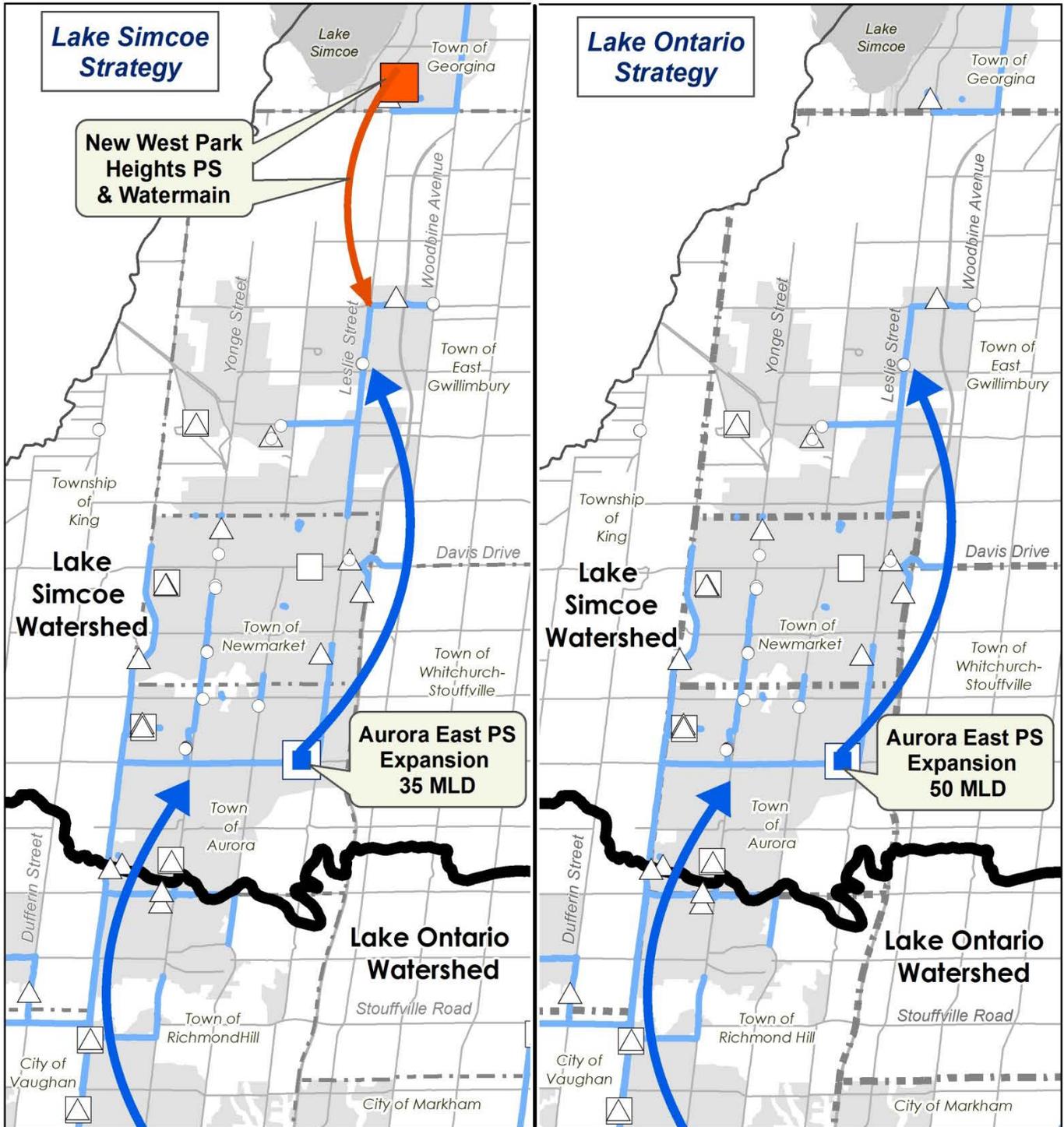
The Senior Management Group has reviewed this report.

March 10, 2016

Attachments (2)

#6690648

Accessible formats or communication supports are available upon request

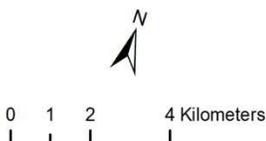


Lake Ontario and Lake Simcoe Drinking Water Strategies

Water and Wastewater Master Plan Update
April 7, 2016

Produced by:
The Regional Municipality of York
Infrastructure Asset Management Branch,
Environmental Services Department
February, 2016

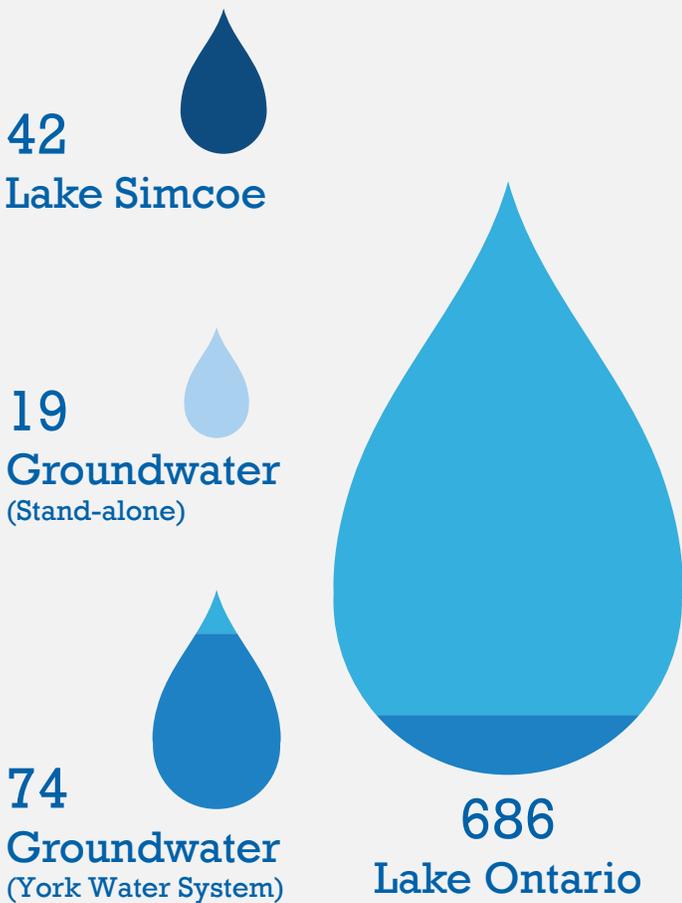
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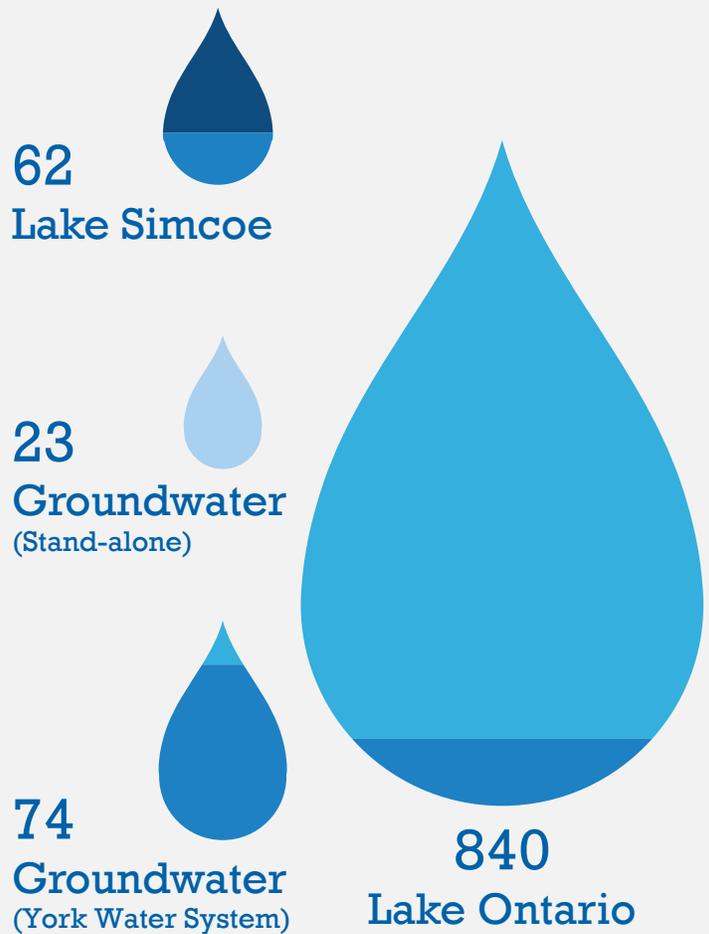
- | | |
|--|--|
| Aurora East Pumping Station -Expansion/Upgrade | Existing Infrastructure
Pumping Station |
| Water Supply from Lake Ontario | Storage |
| <i>Lake Simcoe Strategy Only</i> | Water Treatment Plant |
| Pumping Station - New | Well |
| Water Supply from Lake Simcoe | Existing Water Main |
| | Watershed Boundary |

Sources of York Region Drinking Water

2016 Capacity (ML/d)



2041 Capacity (ML/d)



- Aurora, Newmarket, East Gwillimbury
- Markham, Richmond Hill, Vaughan, Whitchurch–Stouffville, King
- Georgina
- Stand-alone

Water and Wastewater Master Plan

Presentation to
Committee of the Whole

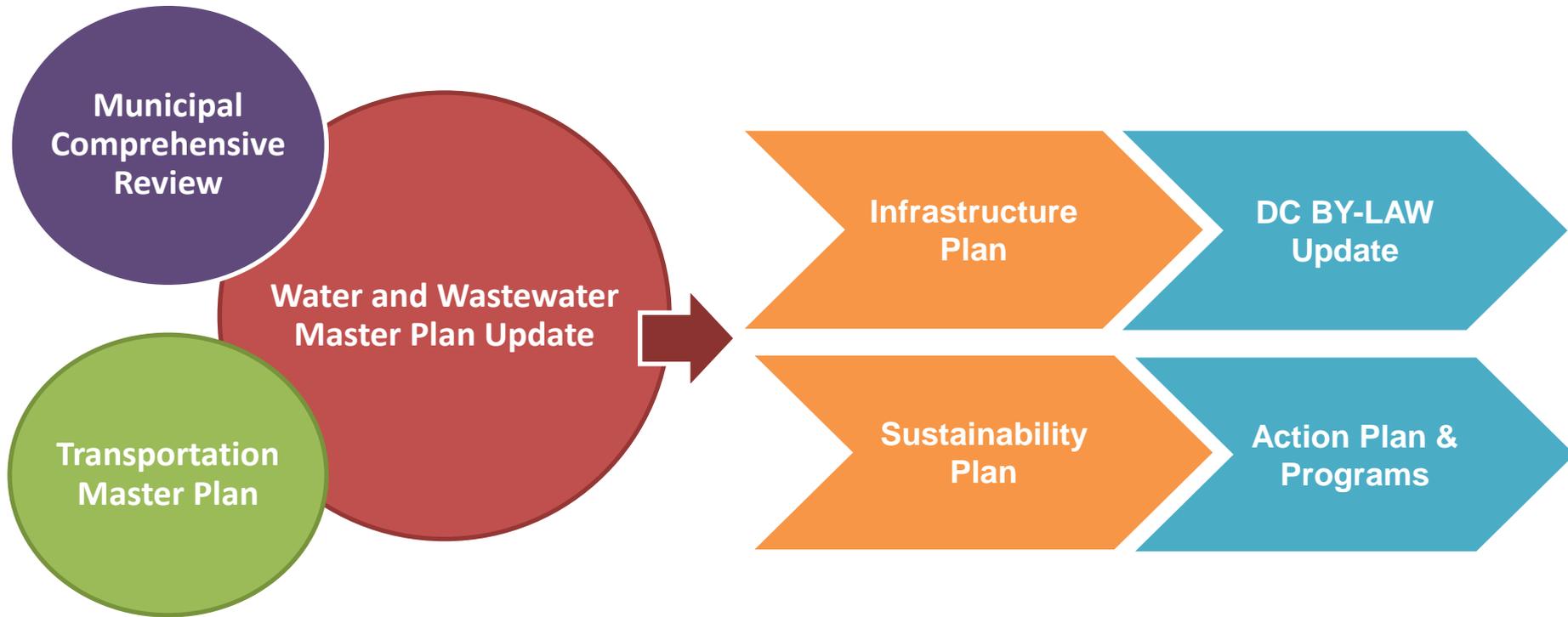
Stephen Fung

Director, Infrastructure Asset Management

April 7, 2016



Purpose of the Master Plan Update



Last Water and Wastewater Master Plan Update completed in 2009

Key Objectives of Master Plan Update

Two Key Objectives:

Infrastructure Plan

1. *Develop a cost effective water and wastewater infrastructure plan to accommodate growth to 2041 and beyond*

Sustainability Plan

2. *Develop a long-term strategy to provide sustainable water and wastewater services*



Key Objectives of Master Plan Update

Objective 1:

Infrastructure
Plan

Develop a cost effective water and wastewater infrastructure plan to accommodate growth to 2041 and beyond



*What options
do we have?*



Knowing our Opportunities and Constraints is key to a sound Infrastructure Plan

Key Factors Influencing the Options

❑ Built and committed infrastructure

- Service Agreements (Toronto, Peel, Durham)
- York Region projects and studies
 - *Upper York Sewage Solutions Individual Environmental Assessment*
 - *Duffin Creek Plant, Stage 3 expansion*

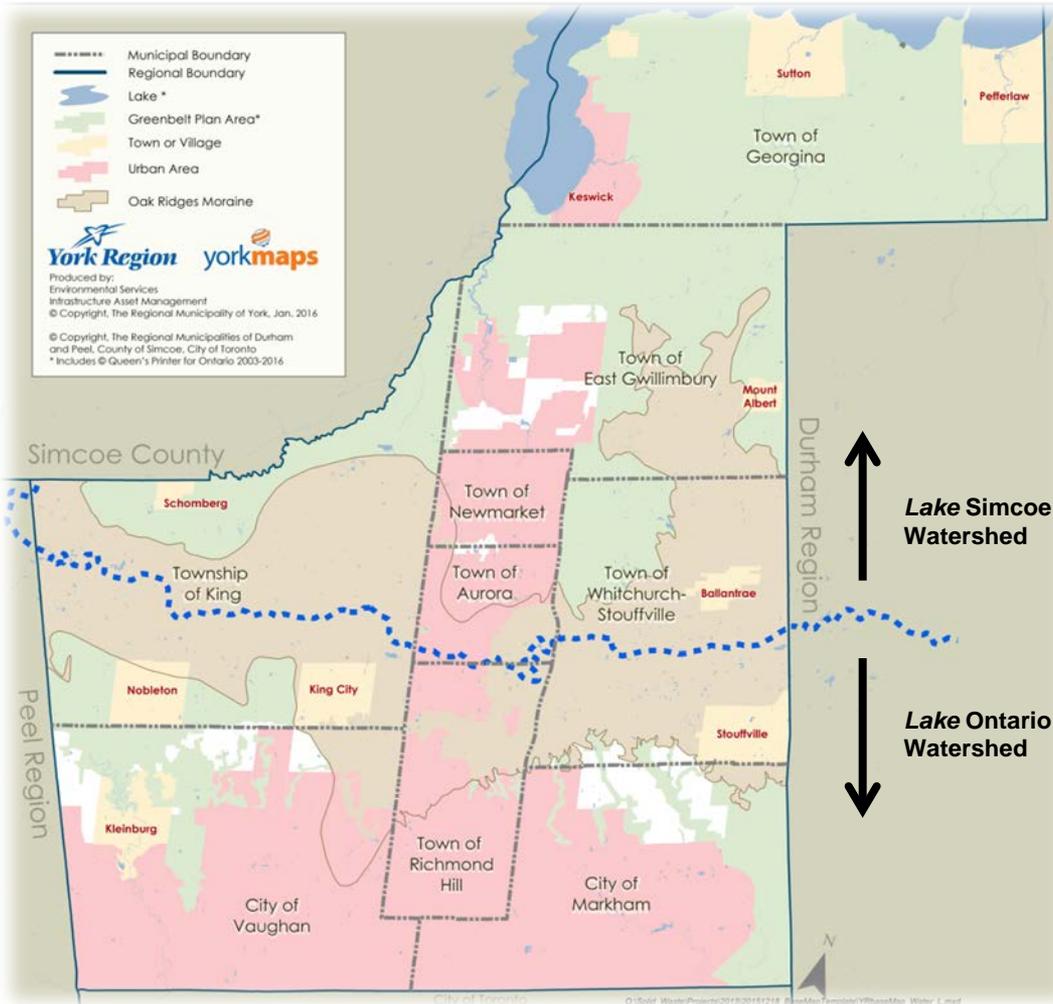
❑ Natural Environment and Regulation

- Straddled between two watersheds: Lake Ontario and Lake Simcoe
- Oak Ridges Moraine
- Green Belt



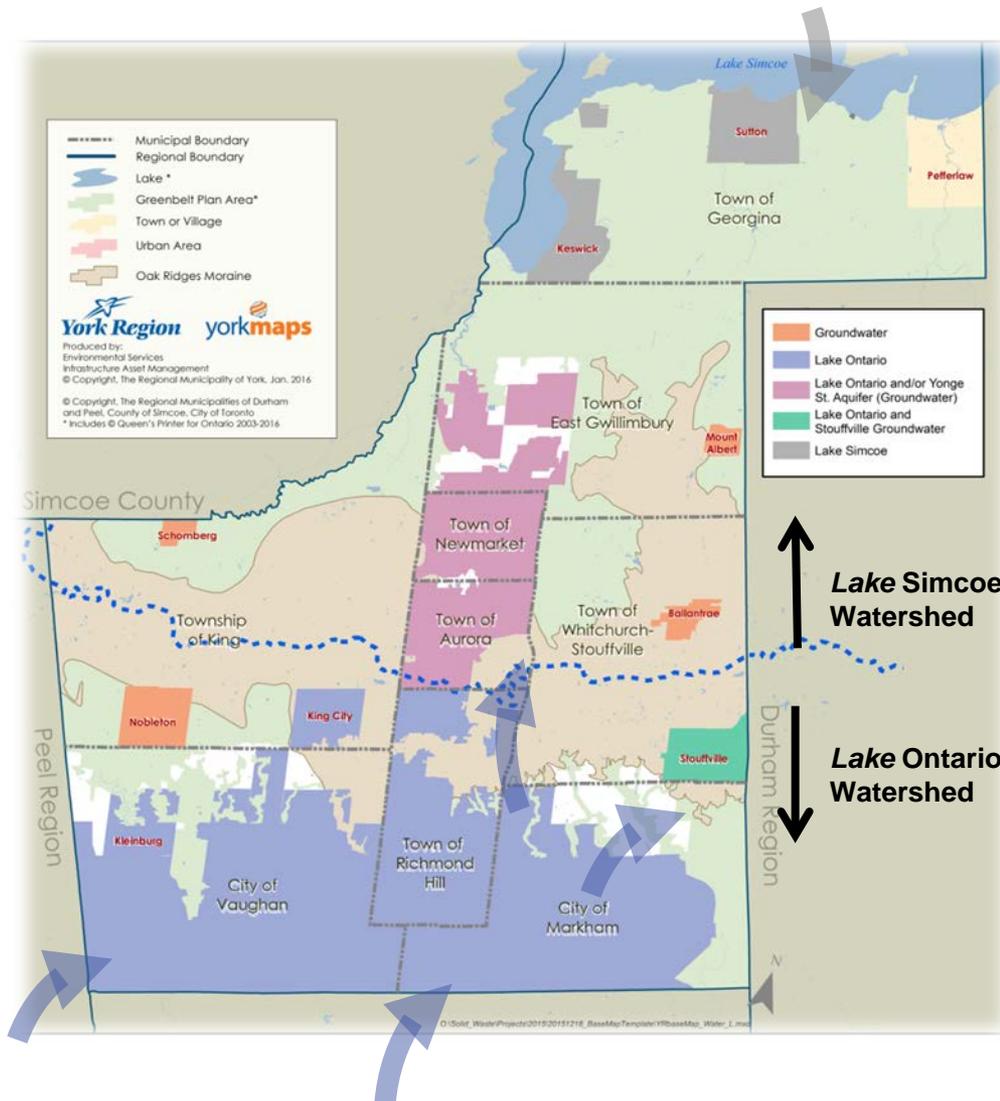
Upper York Sewage Solutions Individual Environmental Assessment sets the future wastewater servicing strategy for East Gwillimbury

Natural Environment and Regulatory Framework



- **Intra-basin Transfer**
 - Water transfer from Lake Ontario to Lake Simcoe watershed is restricted (105 million liters per day)
- **Oak Ridges Moraine Plan**
 - “Partial services” are prohibited
- **Green Belt Plan**
 - Extension of lake-based system prohibited

York Region Existing Water Supply Systems



- Georgina** serviced by Lake Simcoe Water

Lake Simcoe: 5.1%
- Aurora, Newmarket, and East Gwillimbury (Holland Landing, Queensville, Sharon)** serviced by Lake Ontario water and Yonge Street Aquifer wells

Yonge Aquifer: 7.6%
- Markham, Richmond Hill, Vaughan, and King City** serviced by Lake Ontario water

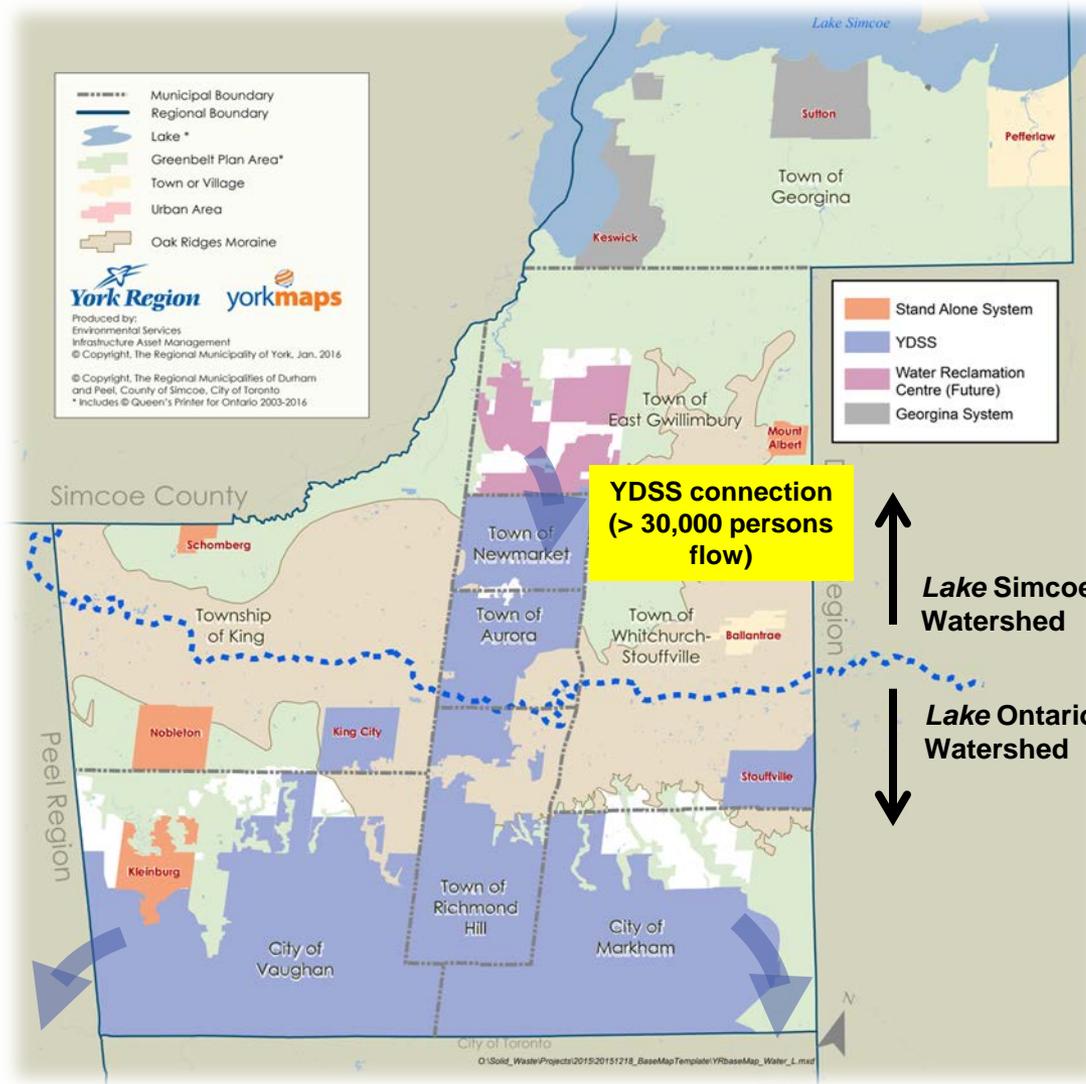
Lake Ontario: 83.4%
- Stouffville** serviced by Lake Ontario water and Stouffville wells

Stouffville Wells: 1.5%
- Stand-alone systems (Groundwater):
 - Ansnorveldt**
 - Ballantrae**
 - Mount Albert**
 - Nobleton**
 - Schomberg**

Stand-alone: 2.4%

York Region Existing Wastewater Systems

(pre Upper York Sewage Solutions)



- **Georgina** serviced by Keswick WRRF and Sutton WRRF (discharging to Lake Simcoe)

Georgina WRRFs: 4.5%

- **Aurora, Markham, Newmarket, Richmond Hill, Vaughan, King City, Stouffville, Holland Landing, Queensville, and Sharon** serviced by York Durham Sewage System (including Peel diversion)

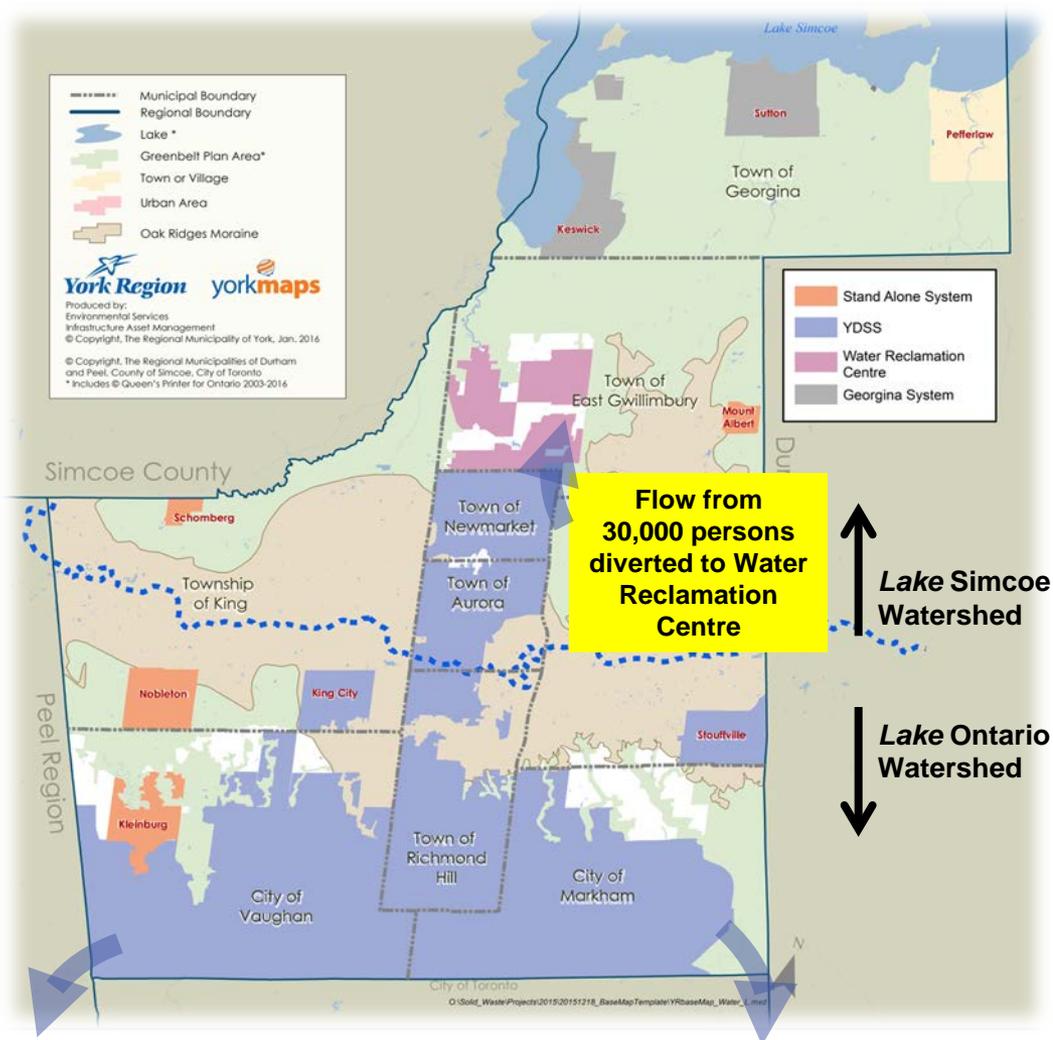
YDSS: 93.2%

- Stand-alone systems:
 - Kleinburg WRRF
 - Mount Albert WRRF
 - Nobleton WRRF
 - Schomberg WRRF
 - Holland Landing Lagoon

Stand-alone: 2.3%

York Region Wastewater Systems (2024)

(post Upper York Sewage Solutions - 2024)



- **Georgina** serviced by Keswick WRRF and Sutton WRRF

Georgina WRRFs: 3.5%

- **East Gwillimbury (Holland Landing, Queensville, and Sharon) and part of Newmarket** serviced by Water Reclamation Centre

WRC: 6.6%

- **Aurora, Markham, Newmarket, Richmond Hill, Vaughan, King City, and Stouffville** serviced by York Durham Sewage System* (including Peel diversion)

*Assume Duffin Creek Outfall constraint addressed

YDSS: 88.3%

Stand-alone systems :

- **Mount Albert WRRF**
- **Nobleton WRRF**
- **Schomberg WRRF**
- **Kleinburg WRRF***

Stand-alone: 1.6%

*Kleinburg WRRF to be decommissioned 2036-2041

Key Water Servicing Concepts

Concepts	Reasons
Continue supporting growth in Aurora, Newmarket, and East Gwillimbury with Lake Ontario based water	<ul style="list-style-type: none"> • Committed investment through servicing agreements with Toronto and Peel • Yonge Street Aquifer is at capacity
Continue using groundwater wells in Yonge Street Aquifer to service Aurora, Newmarket and East Gwillimbury	<ul style="list-style-type: none"> • Groundwater wells are valuable assets (\$200M to replace with surface water) • Transfer of Lake Ontario water is limited to 105 million liters per day. Can only support growth to 2026, without the wells
Continue implementing water conservation programs	<ul style="list-style-type: none"> • Less reliance on building new infrastructure • Environmental and financial sustainability
Continue servicing communities on stand-alone systems by maintaining and expanding (if required) existing systems	<ul style="list-style-type: none"> • Maximize use of built infrastructure • Regulatory requirements (such as Green Belt Plan)
Consider supporting growth in East Gwillimbury and Newmarket with Lake Simcoe water	<ul style="list-style-type: none"> • Key Alternative being evaluated in this Master Plan

Key Wastewater Servicing Concepts

Concepts	Reasons
Continue servicing Aurora, Markham, Newmarket, Richmond Hill, Vaughan, King City, and Stouffville by YDSS (including Peel diversion)	<ul style="list-style-type: none"> • Built infrastructure in York Durham Sewage System and committed investment through servicing agreement with Peel
Servicing growth in East Gwillimbury and parts of Newmarket through construction (and further expansion) of water reclamation center	<ul style="list-style-type: none"> • As per Upper York Sewage Solutions • Minimize intra basin transfer
Continue servicing communities on stand-alone systems by maintaining and expanding (if required) existing systems	<ul style="list-style-type: none"> • Built infrastructure • Regulatory limitations (such as Green Belt Plan)
Continue implementing inflow and infiltration reduction program	<ul style="list-style-type: none"> • Recover lost capacity • Less reliance on building new infrastructure • Environmental and financial sustainability

Two Servicing Alternatives for Water Supply

1. Lake Ontario Supply Servicing Alternative

- Incremental water demand in East Gwillimbury and Newmarket supplied **from Lake Ontario only**
- Existing water supplies from Lake Ontario and Groundwater maintained
- Water Conservation

2. Lake Simcoe Supply Servicing Alternative

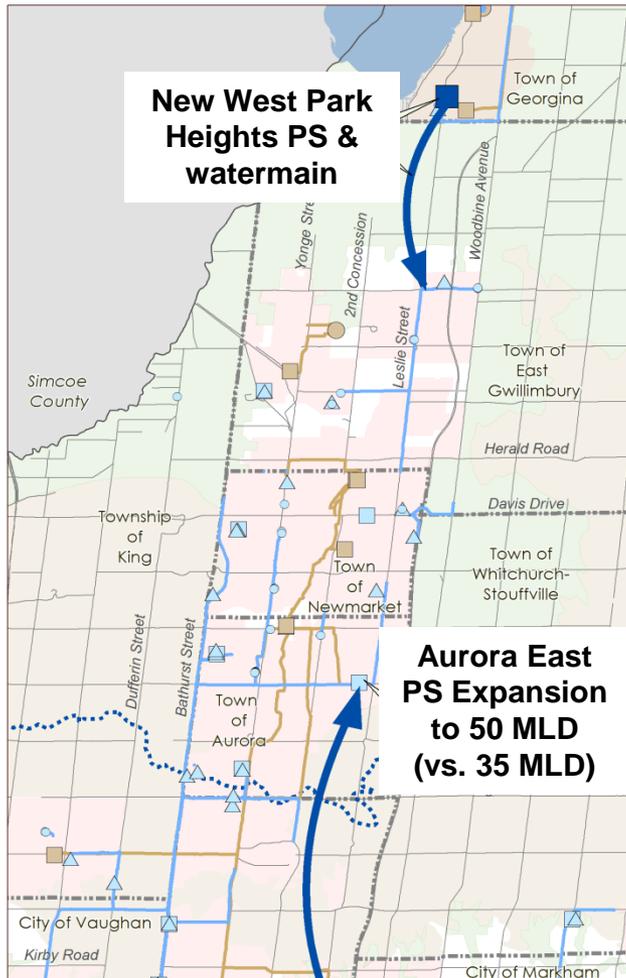
- Incremental water demand in East Gwillimbury and Newmarket supplied **both from Lake Simcoe and Lake Ontario**
- Existing water supplies from Lake Ontario and Groundwater maintained
- Water Conservation



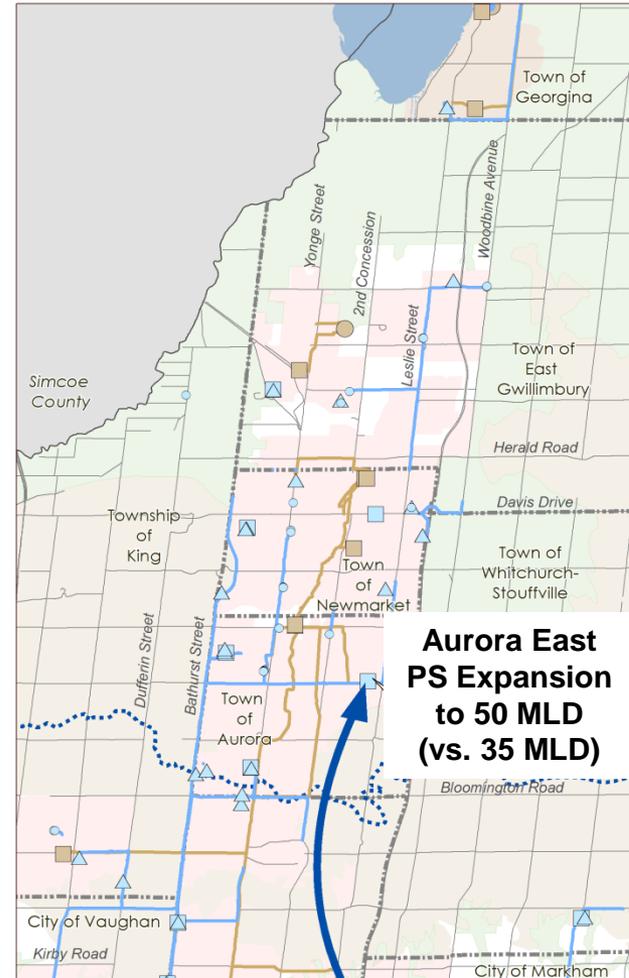
Wastewater servicing strategy is the same for both alternatives

Infrastructure differences between the Two Servicing Strategies

Lake Simcoe Strategy



Lake Ontario Strategy



Benefits of Lake Simcoe Servicing Strategy

Resilience of Supply

- Provide redundancy in event of disruption of supply

Water Balance

- Minimize intra-basin transfer between Lake Ontario and Lake Simcoe Watersheds

Water Quality

- Shorter Water Age

Climate Change & Energy Efficiency

- Minimize energy consumption on pumping
- Reduce Green House Gas emissions



Lake Simcoe Servicing is the Recommended Strategy

Key Objectives of Master Plan Update

Objective 2:

**Sustainability
Plan**

Develop a long-term strategy to provide sustainable water and wastewater services



*Think Outside
the Box*



Re-thinking the way to service the future

A New Way of Thinking for a Sustainable Future



- **re-think** how to convert waste to resource



- **re-think** what can be integrated to create efficiency

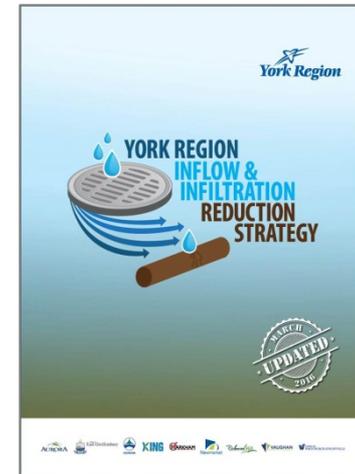
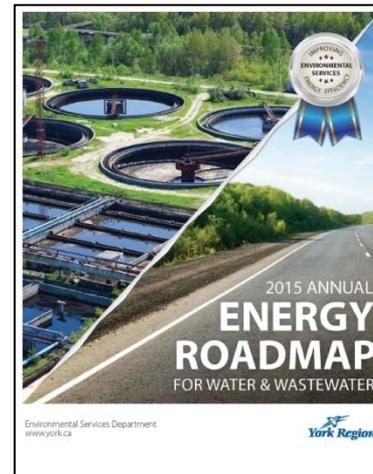
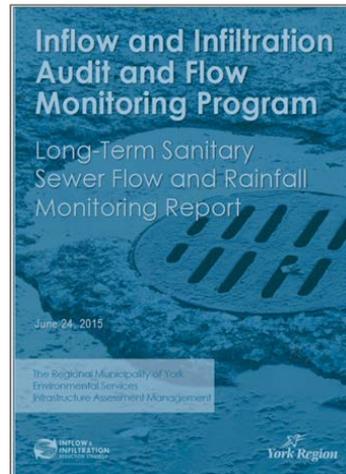
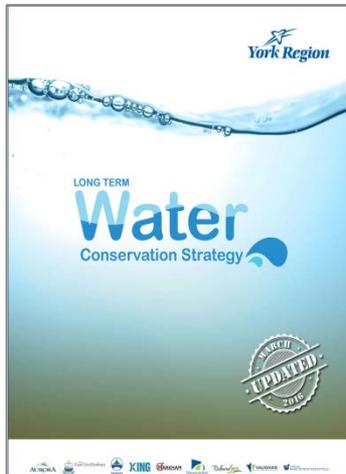


- **re-think** how to deliver servicing capacity innovatively

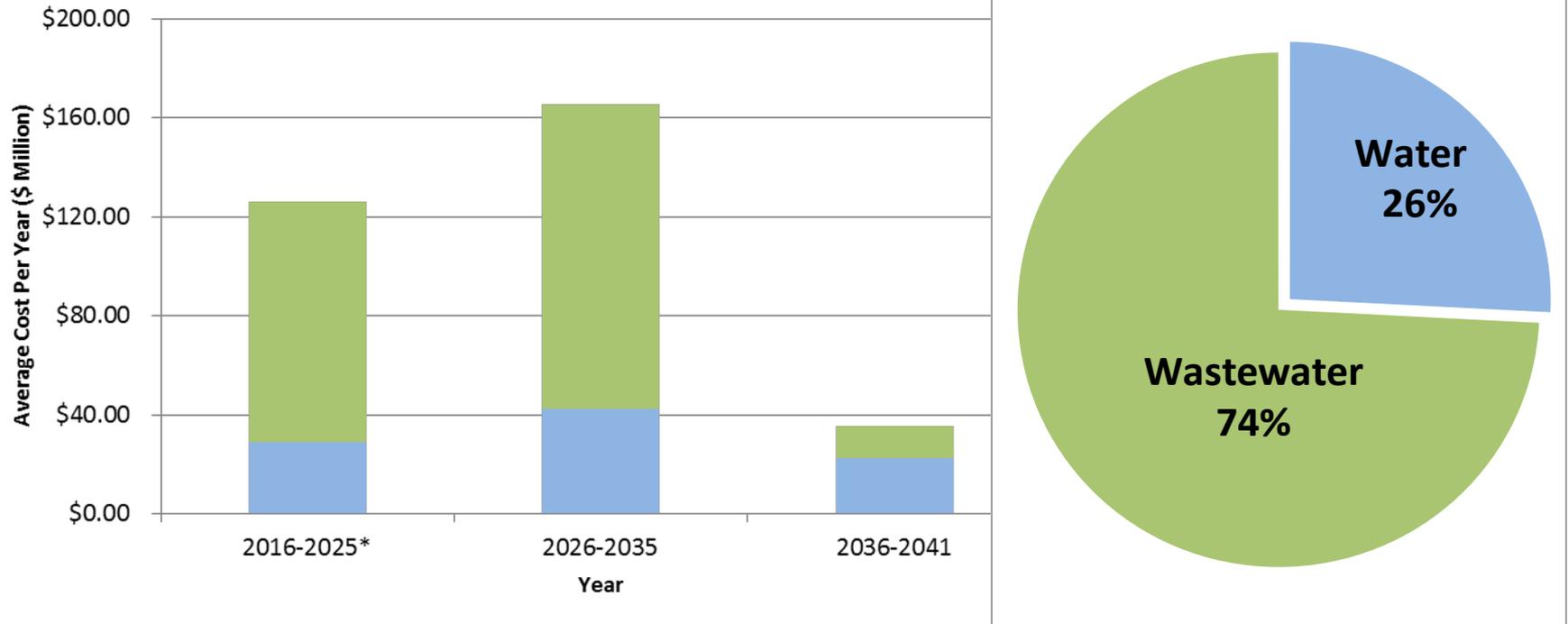


The One Water Approach Action Plan

- Incorporate One Water approach into decision making process
- Develop and implement a 5-year Sustainability Action Plan
 - Enhance integration of existing programs, promote innovation and maximize use of built infrastructure
 - Water Conservation and Water re-use
 - Inflow and Infiltration Reduction
 - Asset Management
 - Energy Management
 - Ensure financial sustainability
 - Adapt to climate change



Preliminary Cost Estimate for the Master Plan Projects



*Master Plan first ten year cost is in line with the 2016 10-year capital plan.

Cost of Master Plan Projects is approximately \$3.1B
\$1.3B is already included in the 2016 ten year capital plan

Key Milestones

PAST ACTIVITIES	2014				2015				2016			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Notice of Commencement			✓									
PCC (#1, 2, 3)				✓		✓			✓			
Update to Council					March							
FUTURE ACTIVITIES	We are here 											
Updates to Council										April & June		
Presentation to Local Councils												
30 Day public & agency review												
Council Endorsement												