Water and Wastewater Master Plan for the Lake-Based Systems

REGION OF PEEL

Public Information Centre #2

November 25, 26 and 27, 2013
4:00 to 7:00 p.m.
Why are we here?

- As our communities grow, additional **water** and **wastewater** infrastructure will be required to meet the servicing needs.

- Therefore, the Region of Peel is updating the 2007 Water and Wastewater Master Plan.

- This study focuses on the Region’s **lake-based** systems to support growth to 2031 and to consider longer term servicing needs beyond 2031, as identified by Amendment 2 (2013) of the Places to Grow Growth Plan for the Greater Golden Horseshoe, 2006.

- This Public Information Centre (PIC) describes the master planning process and presents the preferred water and wastewater servicing strategies for **2031** as well as servicing considerations for post-2031 growth.
History and Context of the Region of Peel’s Master Plan

1999
- First Master Plan completed by the Region for the water and wastewater systems
- Identified servicing strategies for the lake-based water and wastewater systems to 2031

2002
- Master Plan Addendum
- Revision of the water servicing strategy to accommodate York Region’s water demand requirements to 2031.

2007
- First full update of the Master Plan.
- Places to Grow legislation was in effect.
- Water and wastewater servicing strategies were reviewed and updated to support growth based on Places to Grow.

2013
- Population and employment forecasts have been updated in the Region’s OPA.
- This Master Plan will update the lake-based servicing strategies to support growth to 2031.
- Areas of potential intensification growth and areas of potential greenfield growth post-2031 will be considered.
- The plan will build on previous Master Plans and related studies, considering the latest planning estimates and legislative changes.
- The Region is taking a more rigorous approach to the Master Plan process

The Region aims to formally update its water and wastewater servicing strategies every five years

Project Timeline

- **1999**
  - PIC No. 1 presented existing system conditions and identified constraints, opportunities and environmental conditions
  - The methodology used to evaluate the alternative water and wastewater servicing options was presented
  - Since PIC No. 1, the project team developed and evaluated servicing concepts and strategies based on the planning forecasts

- **2002**
  - Project Commencement
  - Identify and describe problem
  - Existing system constraints and opportunities
  - PIC No. 1

- **2007**
  - Identify alternative servicing concepts
  - Evaluate servicing concepts

- **2013**
  - Identify alternative servicing strategies
  - Evaluate servicing strategies
  - Identify preliminary preferred servicing strategy
  - Evaluate alignment options
  - PIC No. 2

- **Jan 2014**
  - File Master Plan Document
  - Project completion
The study will complete Phases 1 and 2 of the MEA Municipal Class EA process. A Master Plan Report will be prepared at the completion of the process.

The Master Plan will be filed under Approach #2 of the MEA Class EA Approach for Master Planning.

The Master Plan will fulfill the planning requirements for Schedule A, A+ and select Schedule B projects, and provide the basis for future investigations of identified Schedule B and C projects.

Projects are categorized according to their environmental significance and the effects on the surrounding environment:

- **Schedule A and A+** projects have little to no impact on the environment.
- **Schedule B** projects have the potential for greater impact on the environment.
- **Schedule C** projects have the potential for significant impacts on the environment. They are required to undergo the full Class EA process.

The study will complete Phases 1 and 2 of the MEA Municipal Class EA process. A Master Plan Report will be prepared at the completion of the process. The Master Plan will be filed under Approach #2 of the MEA Class EA Approach for Master Planning. The Master Plan will fulfill the planning requirements for Schedule A, A+ and select Schedule B projects, and provide the basis for future investigations of identified Schedule B and C projects.
What is Driving the Master Plan Strategy Updates?

- Meeting the servicing needs of identified growth in the Region of Peel to 2031
- Protecting the public and the environment from the impacts of potentially high wet weather flows
- Level of Service and Design Basis Review
- Optimization of Existing and Future Water Storage
- Recognition of growth beyond Places to Grow
- Potential intensification impacts

Water and Wastewater Master Plan for the Lake-Based Systems
POPULATION FORECASTS

<table>
<thead>
<tr>
<th>Municipality</th>
<th>2011</th>
<th>2021</th>
<th>2031</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brampton</td>
<td>510,000</td>
<td>651,000</td>
<td>750,000</td>
</tr>
<tr>
<td>Caledon</td>
<td>70,000</td>
<td>92,000</td>
<td>114,000</td>
</tr>
<tr>
<td>Mississauga</td>
<td>738,000</td>
<td>776,000</td>
<td>829,000</td>
</tr>
<tr>
<td>Region of Peel</td>
<td>1,318,000</td>
<td>1,519,000</td>
<td>1,693,000</td>
</tr>
</tbody>
</table>

EMPLOYMENT FORECASTS

<table>
<thead>
<tr>
<th>Municipality</th>
<th>2011</th>
<th>2021</th>
<th>2031</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brampton</td>
<td>182,000</td>
<td>274,000</td>
<td>321,000</td>
</tr>
<tr>
<td>Caledon</td>
<td>30,000</td>
<td>46,000</td>
<td>52,000</td>
</tr>
<tr>
<td>Mississauga</td>
<td>454,000</td>
<td>508,000</td>
<td>550,000</td>
</tr>
<tr>
<td>Region of Peel</td>
<td>666,000</td>
<td>828,000</td>
<td>923,000</td>
</tr>
</tbody>
</table>

Places to Grow is the Government of Ontario’s framework for implementing growth in the Greater Golden Horseshoe Region to 2031 and eventually to 2041. The Plan outlines the Region of Peel’s population and employment growth forecasts to 2031. Amendment 2 (2013) of the Plan will extend the forecasts to 2041.

The Region developed projections based on Places to Grow as part of a growth conformity exercise, used for the Regional Official Plan Amendment (ROPA 24) and adopted by Council, providing a 2031 population of approximately 1.64 million. Forecasts at a Small Geographic Unit (SGU) level are based on data received from each municipality for ROPA 24 background studies. For the purposes of this Master Plan, the SGU data (Scenario B) was used for the baseline scenario and has been slightly revised throughout the process.

Municipal input forecasts are described in ROPA 24 discussion paper “Places to Prosper – Managing Growth in Peel Region”.

Master Plan forecasts reflect the Census undercount.

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The Region developed projections based on Places to Grow as part of a growth conformity exercise, used for the Regional Official Plan Amendment (ROPA 24) and adopted by Council, providing a 2031 population of approximately 1.64 million. Forecasts at a Small Geographic Unit (SGU) level are based on data received from each municipality for ROPA 24 background studies. For the purposes of this Master Plan, the SGU data (Scenario B) was used for the baseline scenario and has been slightly revised throughout the process.

Municipal input forecasts are described in ROPA 24 discussion paper “Places to Prosper – Managing Growth in Peel Region”.

Master Plan forecasts reflect the Census undercount.
Inter-Regional Servicing Agreements

- York Region water requirements are defined in Schedule C of the York-Peel water servicing agreement. They are a key input to the long-term water servicing strategies of the Region of Peel.

- The Master Plan is planning for York Region’s 2031 water requirement as per Schedule C in the York-Peel agreement at a rate of 388 million litres per day (ML/d).

- The Master Plan is planning for York Region’s 2031 wastewater flows as per the York-Peel agreement at a rate of 53.2 million litres per day (ML/d).

- The Region of Peel sends a small quantity of wastewater flows to the City of Toronto and receives a slightly larger quantity in return.
Planning and Decision Making Process

Policy Planning Framework and Drivers

Alternative Servicing Concepts

Alternative Servicing Strategies

Preferred Servicing Strategy

Alternative Alignments and Sites

Servicing concepts to address existing and future servicing issues are first considered at a high level, weighing the advantages and disadvantages of each concept.

Concepts are refined to form detailed strategies. Each strategy is subject to a five-point evaluation, including environmental, technical, socio-cultural, financial, and legal/jurisdictional impacts.

The preferred strategy is then dissected into component parts, such as sewers and force mains, pumping stations, storage facilities etc. Individual alignments and alternative facility sites are identified and, where appropriate under the Class EA process, subjected to a siting and alignment evaluation process.

Evaluation

Preferred Concept

Preferred Concept

Preferred Concept

Strategy 1

Strategy 2

Strategy 3

Strategy 4

Strategy 5

Strategy 6

C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
Concept 1
Concept 2
Combination of Concept Components form Alternative Concepts

C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14

C2
C6
C9
C10
C14
C15

C4
C11
C12

C7
C14

C13
C16

Servicing strategy evaluation process.
The framework for evaluating alternative water and wastewater servicing strategies was based on the Five Point Evaluation Criteria.

**Water Servicing Considerations**
- Evaluate Average Day, Maximum Day and Peak Hour demands and supply
- Consider system security of supply
- Maintain adequate levels of service (pressure/flow for domestic use and firefighting)
- Ensure operating considerations are addressed
- Continue to meet all MOE requirements
- Use the hydraulic model to assess impact of new growth demands (based on SGU projections) on system – infrastructure (Capacity, Pressure, Fire flow)
- Analyze pressure zone boundaries

**Wastewater Servicing Considerations**
- Continue to meet all MOE requirements including effluent quality standards
- Evaluate growth and inflow and infiltration
- Consider system security
- Ensure that operating considerations are addressed
- Use the hydraulic model to assess impact of new growth flows (based on SGU projections) on system infrastructure (Capacity, d/D)
- Analyze wastewater drainage areas

**Five Point Evaluation Criteria**
- Technical
- Environmental
- Social
- Legal
- Financial

**Water and Wastewater Master Plan for the Lake-Based Systems**

**Region of Peel**
Working for you

**BluePlan** AECOM
Water Servicing

- Lake Ontario based water supply for the City of Mississauga, the City of Brampton, and parts of the Town of Caledon
- Groundwater-based systems in the Town of Caledon are not covered under the Lake-Based Water and Wastewater Master Plan
- Existing Pressure Zones 1 through 7 service the study area
- The trunk water system comprises:
  - Two water treatment plants (WTP): Lakeview WTP in the central system and Lorne Park WTP in the west system
  - Trunk transmission mains (east-central-west or E-C-W)
  - Pumping stations and storage facilities
- The lake-based water system currently supplies a population of over 1.3 million
- In 2012, the Lakeview WTP and Lorne Park WTP produced over 225 billion litres of water
- A portion of this water is supplied to York Region

Constraints and Opportunities

- Optimize east-west transfers with distribution and pumping for improved service level and security
- Reservoirs and pumping stations may require expansion for additional capacity
- Additional storage capacity may be required to service the upper zones
- Intensification areas (e.g., Mississauga City Centre, Hurontario Corridor, Downtown Brampton) may require additional infrastructure capacity
- There is a potential for additional post-2031 growth. The Master Plan will determine the potential impact of this growth on infrastructure.
Impact of Growth on Water Servicing

<table>
<thead>
<tr>
<th>Maximum day demand (million litres per day)</th>
<th>2011</th>
<th>2016</th>
<th>2021</th>
<th>2026</th>
<th>2031</th>
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<tbody>
<tr>
<td>West Transmission System TOTAL</td>
<td>301.55</td>
<td>340.31</td>
<td>368.66</td>
<td>396.03</td>
<td>420.96</td>
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<tr>
<td>Central Transmission System TOTAL</td>
<td>439.95</td>
<td>475.93</td>
<td>507.26</td>
<td>533.87</td>
<td>561.41</td>
</tr>
<tr>
<td>East Transmission System TOTAL</td>
<td>61.60</td>
<td>76.62</td>
<td>91.28</td>
<td>100.04</td>
<td>106.77</td>
</tr>
<tr>
<td>Bolton System TOTAL</td>
<td>18.17</td>
<td>19.50</td>
<td>20.84</td>
<td>21.04</td>
<td>21.25</td>
</tr>
<tr>
<td>Region of Peel TOTAL</td>
<td>821.27</td>
<td>912.36</td>
<td>988.04</td>
<td>1,050.98</td>
<td>1,110.39</td>
</tr>
<tr>
<td>York Region TOTAL (Agreement)</td>
<td>133.90</td>
<td>210.50</td>
<td>271.96</td>
<td>324.62</td>
<td>388.32</td>
</tr>
<tr>
<td>Region of Peel and York Region TOTAL</td>
<td>955.17</td>
<td>1,122.87</td>
<td>1,260.00</td>
<td>1,375.59</td>
<td>1,498.71</td>
</tr>
</tbody>
</table>

Technical Analysis

- Computerized hydraulic modelling was performed to assess the system and identify constraints.
- The system was evaluated under various modelling scenarios (maximum day, minimum day, average day and peak hour demands).
- Fire flow analysis was completed.
- Pumping and storage analysis (system head curves) undertaken to determine project infrastructure needs.
- Separate detailed modelling analysis undertaken for intensification scenarios.
- Water system schematics were developed to help identify future demand requirements and project timing.
Concepts Evaluation – Water

**Concept 1: Do Nothing**
- Do nothing
- No upgrades or expansion to existing system

**Concept 2: Limit Growth**
- Build off planned 2031 infrastructure as per the 2007 Master Plan while shifting planned E-C-W servicing boundary to match system hydraulics
- Expand transmission, storage, and pumping as outlined in 2007 Master Plan
- Allow zone boundaries to be delineated by hydraulics within the system and adjust planning boundary
- Continue to implement water conservation programs

**Concept 3: 2007 Master Plan**
- Build off planned 2031 infrastructure as per the 2007 Master Plan
- Expand transmission, storage, and pumping as outlined in 2007 Master Plan
- Allow servicing of existing zones to be dictated by existing hydraulics within the system

**Concept 4: New stream-based or groundwater-based WTP**
- Build off modified version of the planned 2031 infrastructure as per the 2007 Master Plan
- Construct a new stream-based or groundwater-based WTP

**Concept 5: New lake-based WTP**
- Build off planned 2031 infrastructure as per the 2007 Master Plan
- Construct a new lake-based WTP at Lake Ontario or within the Region of Peel

**Concept 6: Efficiency**
- Water conservation
- Water efficiency
- Water reuse
- Water/rainwater harvesting
- Water restrictions and public awareness

**Strategy 1:** Planned East-Central-West service boundaries

**Strategy 2:** Hydraulic East-Central-West boundaries

**Strategy 3:** Planned/Hydraulic East-Central-West boundaries

**Strategy 4:** New stream-based Water Treatment Plant near shoreline

**Strategy 5:** New groundwater-based Water Treatment Plant

**Strategy 6:** New lake-based Water Treatment Plant near shoreline

**Strategy 7:** New lake-based Water Treatment Plant within Peel
## Strategies Evaluation – Water

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Planned East-Central-West (E-C-W) Boundary</td>
<td>Build off planned 2031 infrastructure as per the 2007 Master Plan and maintain planned E-C-W servicing boundary</td>
<td>Build off planned 2031 infrastructure as per the 2007 Master Plan while shifting planned E-C-W boundary to match system hydraulics</td>
<td>Build off planned 2031 infrastructure as per the 2007 Master Plan while shifting planned E-C-W boundary in selected pressure zones</td>
<td>Build off a modified version of the planned 2031 infrastructure as per the 2007 Master Plan and construct a new stream-based WTP to service growth in the upper pressure zones</td>
<td>Build off modified version of the planned 2031 infrastructure as per the 2007 Master Plan and construct a new groundwater-based WTP to service growth in the upper pressure zones</td>
<td>Build off modified version of the planned 2031 infrastructure as per the 2007 Master Plan and construct a new Lake-based WTP within Peel</td>
</tr>
<tr>
<td>Hydraulic East-Central-West (E-C-W) Boundary</td>
<td>Expand transmission, storage and pumping as outlined in the 2007 Master Plan</td>
<td>Construct additional pumping and transmission to match the planned E-C-W boundary</td>
<td>Expand transmission, storage and pumping as outlined in the 2007 Master Plan</td>
<td>Provide supply to northeast pressure zones from a new water treatment plant</td>
<td>Additional supply to the transmission and distribution system from a new lake-based water treatment plant</td>
<td>Build off modified version of the planned 2031 infrastructure as per the 2007 Master Plan</td>
</tr>
<tr>
<td>Planned Hydraulic East-Central-West (E-C-W) Boundary</td>
<td>Allow zone boundaries to be delineated by hydraulics within the system and adjust the planning boundaries accordingly</td>
<td>Construct additional pumping and transmission in selected zones to shift the E-C-W boundary to closely match the planned boundary and maximize capacity of existing infrastructure (e.g., pumping stations, WTPs, etc.)</td>
<td>Construct additional pumping and transmission in the west system as per 2007 Master Plan</td>
<td>Expand transmission, storage and pumping in the west system as per 2007 Master Plan</td>
<td>Expand transmission, storage and pumping as outlined in the 2007 Master Plan</td>
<td>New Lake-Based WTP Near Shoreline</td>
</tr>
<tr>
<td>Planned East-Central-West (E-C-W) Boundary</td>
<td>Continue to implement water conservation programs</td>
<td>Continue to implement water conservation programs</td>
<td>Potential opportunity to defer or reduce central transmission upgrades</td>
<td>Transient pressure zones from a new water treatment plant</td>
<td>Potential opportunity to defer or reduce central transmission upgrades</td>
<td>New Lake-Based WTP within Peel</td>
</tr>
<tr>
<td>Least Preferred</td>
<td>Medium</td>
<td>Least Preferred</td>
<td>Medium</td>
<td>Least Preferred</td>
<td>Least Preferred</td>
<td>Least Preferred</td>
</tr>
</tbody>
</table>

### Water and Wastewater Master Plan for the Lake-Based Systems

- **Strategy 1**: Build off planned 2031 infrastructure as per the 2007 Master Plan and maintain planned E-C-W servicing boundary.
- **Strategy 2**: Expand transmission, storage and pumping as outlined in the 2007 Master Plan.
- **Strategy 3**: Allow zone boundaries to be delineated by hydraulics within the system.
- **Strategy 4**: Expand transmission, storage and pumping as outlined in the 2007 Master Plan.
- **Strategy 5**: Construct additional pumping and transmission in selected zones to shift the E-C-W boundary.
- **Strategy 6**: Construct additional pumping and transmission in the west system.
- **Strategy 7**: New Lake-Based WTP Near Shoreline.

**Carried forward**

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*Image source: Region of Peel, Water and Wastewater Master Plan for the Lake-Based Systems*
Preliminary Preferred Strategy – Water

General Water Strategy

- No major capacity triggers prior to 2031
- Need to recognize the existing infrastructure implementation plan
- Opportunity to leverage the existing master plan strategy with optimization of system hydraulics
- Currently moving forward with refining preferred strategy of “2007 Master Plan Strategy – Hydraulic East-Central-West Boundary”
- East-Central-West servicing boundary revised based on locations of growth and future infrastructure
- High-lift supply and low-lift supply ratio to local distribution was revised based on optimized hydraulics

Mississauga Upgrade Requirements

- Transmission Main Upgrade Requirements:
  - Streetsville Transmission Main Twinning
- Pumping Upgrade Requirements:
  - Lakeview Zone 1 Pumping Station
  - Lakeview Zone 2 Pumping Station
  - Herridge Zone 2 Pumping Station
  - Streetsville Zone 3 Pumping Station
  - Streetsville Zone 4 Pumping Station
- Zone Storage Requirements:
  - Continued strategy of pumped vs floating
  - Optimize E-C-W storage utilization

Brampton Upgrade Requirements

- Transmission Main Upgrade Requirements:
  - Meadowvale North Transmission Main Twinning
  - East Brampton Transmission Main Twinning
- Pumping Upgrade Requirements:
  - West Brampton Zone 5 Pumping Station
  - North Brampton Zone 6 Pumping Station
  - North Brampton Zone 7 Pumping Station
  - Beckett Sproute Transfer Pumping Station
- Zone Storage Requirements:
  - Continued strategy of pumped vs floating
  - Optimize E-C-W storage utilization
  - Potentially two new Zone 6 reservoirs
  - Potentially one new Zone 5 reservoir

Caledon Upgrade Requirements

- Storage Requirements:
  - North Bolton Elevated Tank

Mississauga Upgrade Requirements

- Storage Requirements:
  - North Bolton Elevated Tank

General Water Strategy

- Current program at the Lakeview and Lorne Park Water Treatment Plants
- Feedermain upgrades currently planned (i.e., Hanlan) are required and will meet P2G (2031) needs
- The East Trunk System will supply a larger portion of the lower pressure zones and will be the primary source for the Hurontario Corridor and MCC intensification areas
- The currently planned facilities will meet the P2G (2031) needs – no new storage or pumping facilities required
- Distribution system upgrades are required to support water supply and distribution throughout the network

Current program at the Lakeview and Lorne Park Water Treatment Plants

- The East Trunk System will supply a larger portion of the lower pressure zones and will be the primary source for the Hurontario Corridor and MCC intensification areas
- The currently planned facilities will meet the P2G (2031) needs – no new storage or pumping facilities required
- Distribution system upgrades are required to support water supply and distribution throughout the network
Existing Wastewater System Constraints and Opportunities

Wastewater Servicing

- Wastewater flows from the City of Mississauga, the City of Brampton and parts of the Town of Caledon are conveyed by the municipal wastewater system to the wastewater treatment plants and eventual discharge to Lake Ontario.
- Septic systems and communal sewage systems are not included in the Water and Wastewater Master Plan for the Lake-Based Systems.
- Two major drainage areas service the study area.
- The trunk wastewater system comprises:
  - Two wastewater treatment facilities: G.E. Booth in the east and Clarkson in the west.
  - Sanitary trunk sewer systems (east and west).
  - Sewage pumping stations and force mains.
- The lake-based wastewater collection system supplies a population of over 1.3 million.
- In 2012, the G.E. Booth Wastewater Treatment Facility and Clarkson Wastewater Treatment Facility treated over 218 billion litres of wastewater.
- A portion of wastewater comes from the Region of York and the City of Toronto.
- Also wastewater from a small area of Peel flows to the City of Toronto.

Constraints and Opportunities

- Provide operational flexibility for diverting flow from east to west system.
- Sewage pumping stations may require expansion for additional capacity.
- Intensification areas (e.g., Mississauga City Centre, Hurontario Corridor, Downtown Brampton) may require additional infrastructure capacity.
- There is potential for additional growth to occur post-2031. The Master Plan will determine the potential impact of this growth on infrastructure.
Impact of Growth on Wastewater Servicing

### Water and Wastewater Master Plan for the Lake-Based Systems

<table>
<thead>
<tr>
<th>Pumping Station / Plant</th>
<th>Peak Dry Weather Flow (L/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Richard's Memorial</td>
<td>1</td>
</tr>
<tr>
<td>Jack Darling 1</td>
<td>2</td>
</tr>
<tr>
<td>Jack Darling 2</td>
<td>3</td>
</tr>
<tr>
<td>Pinetree Crescent</td>
<td>4</td>
</tr>
<tr>
<td>Elmwood Avenue</td>
<td>5</td>
</tr>
<tr>
<td>Harvestview</td>
<td>6</td>
</tr>
<tr>
<td>Bolton North Hill</td>
<td>7</td>
</tr>
<tr>
<td>Bolton</td>
<td>8</td>
</tr>
<tr>
<td>Albion-Vaughan</td>
<td>9</td>
</tr>
<tr>
<td>McVean Drive</td>
<td>10</td>
</tr>
<tr>
<td>Indian Road</td>
<td>11</td>
</tr>
<tr>
<td>Silverbirch Trail</td>
<td>12</td>
</tr>
<tr>
<td>Front Street</td>
<td>13</td>
</tr>
<tr>
<td>Beechw ood</td>
<td>14</td>
</tr>
</tbody>
</table>

#### Technical Analysis

- Detailed gravity and pumping conveyance analysis was undertaken to determine infrastructure needs.
- Computerized hydraulic modelling was performed to assess system performance and identify constraints.
- System was evaluated under various modelling scenarios (average day and peak wet weather flows).
- Separate detailed modelling analysis undertaken for intensification scenarios.
Concepts Evaluation – Wastewater

Concepts 1 & 2
- Do Nothing, or
- Limit Community Growth

Concepts 3 & 4
- New Wastewater Treatment Facility and Conveyance (Lakeshore or Inland location), or
- New Wastewater Treatment Facility and Conveyance (Inland location)

Concept 5
- Satellite Treatment

Concept 6 & 7
- Convey and Expand G.E. Booth Wastewater Treatment Facility, or
- Store and Expand Booth Wastewater Treatment Facility

Concept 8 & 10
- Convey, Store or Convert & Divert to Western System; Expand Clarkson Wastewater Treatment Facility, or
- Convey, Store or Convert & Divert to Western System; Expand Clarkson Wastewater Treatment Facility

Concept 9
- Divert to Eastern System: Expand G.E. Booth Wastewater Treatment Facility

Concepts 11 & 13
- Store and Divert to Eastern System; Expand Clarkson Wastewater Treatment Facility, or
- Central tunnel to lakeshore; Expand Clarkson Wastewater Treatment Facility

Concepts 14 & 15
- Storage, or Inflow and infiltration reduction
- Not a stand alone concept

Concept 16
- Localized vacuum systems for new development

Strategy 1
- North Wastewater Treatment Facility and I/I Reduction

Strategy 2
- Satellite Wastewater Treatment Facilities and I/I Reduction

Strategy 3
- Convey and Expand G.E. Booth Wastewater Treatment Facility and I/I Reduction

Strategy 4
- Store, Expand G.E. Booth Wastewater Treatment Facility and I/I Reduction

Strategy 5
- Convey, Store, Expand G.E. Booth Wastewater Treatment Facility, and I/I Reduction

Strategy 6
- Convey and Divert to West Trunk System, Expand Clarkson Wastewater Treatment Facility Post-2031 and I/I Reduction

Strategy 7
- Store and Divert to Western System, Expand Clarkson Wastewater Treatment Facility Post-2031, and I/I Reduction

Strategy 8
- Convey, Store and Divert to Western System, Expand Clarkson Wastewater Treatment Facility Post-2031, and I/I Reduction

Strategy 9
- Central Tunnel to Lakeshore, Expand Clarkson Wastewater Treatment Facility Post 2031, and I/I Reduction
A long list of wastewater strategies were evaluated to create a short list of wastewater strategies. The above strategies were short-listed for further evaluation. Strategies 2, 3, 4, and 7 were screened out during this process.
Preliminary Preferred Strategy – Wastewater

General Wastewater Strategy

- 2031 Program remains consistent with the 2007 Master Plan strategy
- Recent expansion of the Clarkson Wastewater Treatment Facility is sufficient to service growth to 2031
- East-to-west diversion is required to support the overall strategy and maintain projected flows to the Wastewater Treatment Facility within 90% of the rated capacity
- By reducing inflow and infiltration, the Region expects that the system will experience lower wet weather response and will inherently increase peak wet weather flow capacity
- By reducing inflow and infiltration, the Region expects that the system will experience lower wet weather response and will inherently increase peak wet weather flow capacity
- Continued intensification pressure, particularly in Mississauga

Wastewater Treatment Facility Upgrade Requirements:
- Expand G.E. Booth Wastewater Treatment Facility from 486 ML/d to 518 ML/d

Sewer Upgrade Requirements:
- Twin pipes downstream of diversion (Old Derry Road)
- Convert gravity sewer to a force main as part of the east-to-west diversion
- Twin East Brampton Trunk Sewer
- Extension of collection system in northwest Brampton to service new growth areas
- East to West diversion gravity trunk sewer

Pumping Station Requirements:
- Expand the McVean SPS to a firm capacity of 2100 L/s
- East-to-west sewage pumping station

Mississauga Upgrade Requirements

- GE Booth Wastewater Treatment Facility will need to be expanded from 486 to 518 ML/d – this is already planned and budgeted for
- Collection system upgrades are required to support conveyance to the plants
- Long term inflow/infiltration program is required to meet continued level of service and defer/eliminate additional infrastructure upgrades

Mississauga Upgrade Requirements

- Area to be serviced by Albion-Vaughan sewer
- Extension of collection system in Bolton
- Extension of collection system for servicing Mayfield West community phase II

Caledon Upgrade Requirements

- Twin pipes downstream of diversion (Old Derry Road)
- Convert gravity sewer to a force main as part of the east-to-west diversion
- Twin East Brampton Trunk Sewer
- Extension of collection system in northwest Brampton to service new growth areas
- East to West diversion gravity trunk sewer

Brampton Upgrade Requirements

- Recent expansion of Clarkson Wastewater Treatment Facility to 350 ML/d is sufficient to 2031
- East to west diversion is required to defer Booth expansion and maintain all plants within 90% of rated capacity
- Collection system upgrades are required to support conveyance to the plants
- Long term inflow/infiltration program is required to meet continued level of service and defer/eliminate additional infrastructure upgrades
Project will replace the existing 500 mm forcemain with a 900 mm forcemain, as additional forcemain capacity is required to be able to convey the upgraded firm capacity of the station.

Alternative routing alignment options are not applicable, as the project is based on a replacement to upgrade the existing forcemain.

Majority of the land to the west of McVean SPS is associated with the West Humber River Valley and TRCA Claireville Conservation Area.

No temporary easements are required for tie-ins to the SPS or Trunk Sewer at Goreway. For forcemain replacement, temporary easements are required from TRCA.

Proposed forcemain can be constructed with manageable impacts to the socioeconomic, cultural and natural environment based on use of trenchless technologies and typical best construction practices and mitigation methods.

McVean Forcemain
Queen Street E. between McVean Dr. and Goreway Dr.
Peak flow exceeding pipe capacity immediately upstream of the Clarkson Wastewater Treatment Facility triggers the need to this 1500 mm sewer to service future growth.

Trunk sewer routing options were identified and evaluated. Alternatives are based on transportation corridors, land use and possible connection to existing trunk sewer and the treatment facility.

Predominant land uses are industrial and open space, including some commercial and residential lands. Crossings include CVC regulation limit and Sheridan Creek.

Constructability and construction impacts will be evaluated. A cost/benefit analysis is currently being considered to help with the selection process.

Proposed trunk sewer can be constructed with manageable impacts to the socioeconomic, cultural and natural environment based on use of trenchless technologies and typical best construction practices and mitigation methods.
Schedule A+ Project No. 3 – Wastewater

Project is located in North West Brampton and is bounded by Wanless Drive to the north, Mississauga Road to the east, Bovaird Drive West to the south and Winston Churchill Boulevard to the west.

Alternative routing alignment options were evaluated and preferred alignment will follow Heritage Rd. and future Sandalwood extension to Mississauga Rd.

Proposed trunk sewer avoids crossing CNR Railway and Credit River tributary. Construction will occur in the existing and/or future right away.

Project will be approved as a Schedule A+. Does not require further approval under Master Plan. (This has been updated since the notice of PIC)

Northwest Brampton Sanitary Trunk Sewer
Heritage Road from Wanless Drive to Bovaird Drive
Post 2031 Servicing Vision and Impact

- The 2013 Master Plan provides perspective on the servicing impacts of post-2031 growth
- Intensification and hypothetical sensitivity scenarios including additional intensification and/or growth in the Caledon Agricultural and Rural Area were evaluated at a high level

As growth extends north, key servicing issues include:

- Growth may need to be located in new water pressure zones – new pumping and storage facilities would be required
- Northern limits of the existing systems may not have sufficient capacity to support connections
- Regardless of location, a minimum level of trunk capacity upgrades including treatment capacity expansion will be required

It is difficult to provide the details of the impacts on existing infrastructure at this time, but impacts are being considered and analyses are underway

Water

- Depending on the location of the intensification (even varying between corners of an intersection), the impact on the local distribution can vary greatly
- As the intensification hits a threshold additional plant capacity and intake will be triggered

Post P2G (2031) will trigger additional treatment capacity and trunk sewer / diversion needs

Wastewater

- Most intensification area flows to the GE Booth Wastewater Treatment Facility
## Preliminary Cost Estimates of Preferred 2031 Strategies

### WATER

<table>
<thead>
<tr>
<th>Category</th>
<th>Preliminary Cost Estimate (2013 $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – Transmission System</td>
<td>$975,000,000</td>
</tr>
<tr>
<td>2 – Distribution System</td>
<td>$254,000,000</td>
</tr>
<tr>
<td>3 – Intensification impacts</td>
<td>$214,000,000</td>
</tr>
<tr>
<td>4 – Supplemental infrastructure</td>
<td>$209,000,000</td>
</tr>
<tr>
<td><strong>Total Infrastructure Requirements</strong></td>
<td><strong>$1,652,000,000</strong></td>
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</tbody>
</table>

*Transmission: Cost related to upgrading larger watermains used to transfer water north through the major facilities*

*Distribution system: Cost related to upgrading watermains distributing water through the system*

*Intensification: Cost related to upgrades due to intensification*

*Supplemental: Other costs not included in the above categories*

### WASTEWATER

<table>
<thead>
<tr>
<th>Category</th>
<th>Preliminary Cost Estimate (2013 $)</th>
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<tbody>
<tr>
<td>1 – Trunk System</td>
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<tr>
<td>2 – Collection System</td>
<td>$142,000,000</td>
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<tr>
<td>3 – Intensification impacts</td>
<td>$14,000,000</td>
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<tr>
<td>4 – Supplemental infrastructure</td>
<td>$108,000,000</td>
</tr>
<tr>
<td><strong>Total Infrastructure Requirements</strong></td>
<td><strong>$672,000,000</strong></td>
</tr>
</tbody>
</table>

*Trunk: Cost related to upgrading larger trunk sewer used to convey wastewater through the major facilities*

*Collection: Cost related to upgrading sewer collecting flow from the local system to the trunk system*

*Intensification: Cost related to upgrades due to intensification*

*Supplemental: Other costs not included in the above categories*
Other Studies

- Twinning of the Etobicoke Creek Trunk Sewer (Brampton)
- Twinning of the Credit Valley Trunk Sewer
- Diversion sewage pumping station
- Mississauga Intensification Trunk Sewer
- Westcreek Twinning and Relief

- Water efficiency and conservation is promoted through Water Smart Peel
- Water Efficiency Plan (WEP) in place to clearly define measures needed to reduce water use, including system leaks and wastewater flows
- Ongoing program helps residents reduce their quantity of water use
- Recent per capita consumption rates have been declining, and this has been considered in the Master Plan

- Regional Inflow and Infiltration Rebate Program
- Inflow and Infiltration Reduction Strategy

- Proposed Transmission Main: 2100-mm Zone 2 extension from Herridge to Streetsville
  - East Brampton Transmission Main: 1500-mm Zone 4 water main from Beckett Sproule to East Brampton
  - 1200-mm Zone 3 water main from Streetsville PS to Meadowvale North PS
  - Queensway 900 mm Zone 2 Extension from Queensway/Cawthra towards the Silverthorn Pumping Station Discharge
  - Future distribution main: 900-mm Zone 5 water main along Williams Parkway
  - Proposed distribution main: 900-mm Zone 3 water main on Confederation Parkway from Burnhamthorpe Road to Eglinton Avenue
  - Streetsville Zone 4 Discharge: Erin Mills Parkway from Streetsville to Britannia Road

- Separate ongoing study being undertaken by the Region to consider servicing strategies for the rural non-lake based communities and settlement areas in North Peel

- Wastewater Servicing Strategy for the Non-Lake-Based Communities and Settlement Areas in North Peel

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What happens next?

Following this PIC the project team will:

- Compile information received from you and other stakeholders to finalize the servicing strategies
- Review your comments and respond to questions and comments
- Document the water and wastewater servicing strategy study and public consultation process
- File the documentation on public record for a 30-day review period

Following the completion of the Master Plan study:

- Schedule A, A+ and Schedule B projects not requiring further study will move forward to implementation based on the identified schedule
- Key follow-on studies would be undertaken as required; Schedule C Projects would move forward to complete Phases 3 and 4 under stand-alone studies based on the identified schedule

For water-related questions or comments:

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THANK YOU FOR ATTENDING