Water & Wastewater Master Plan Update

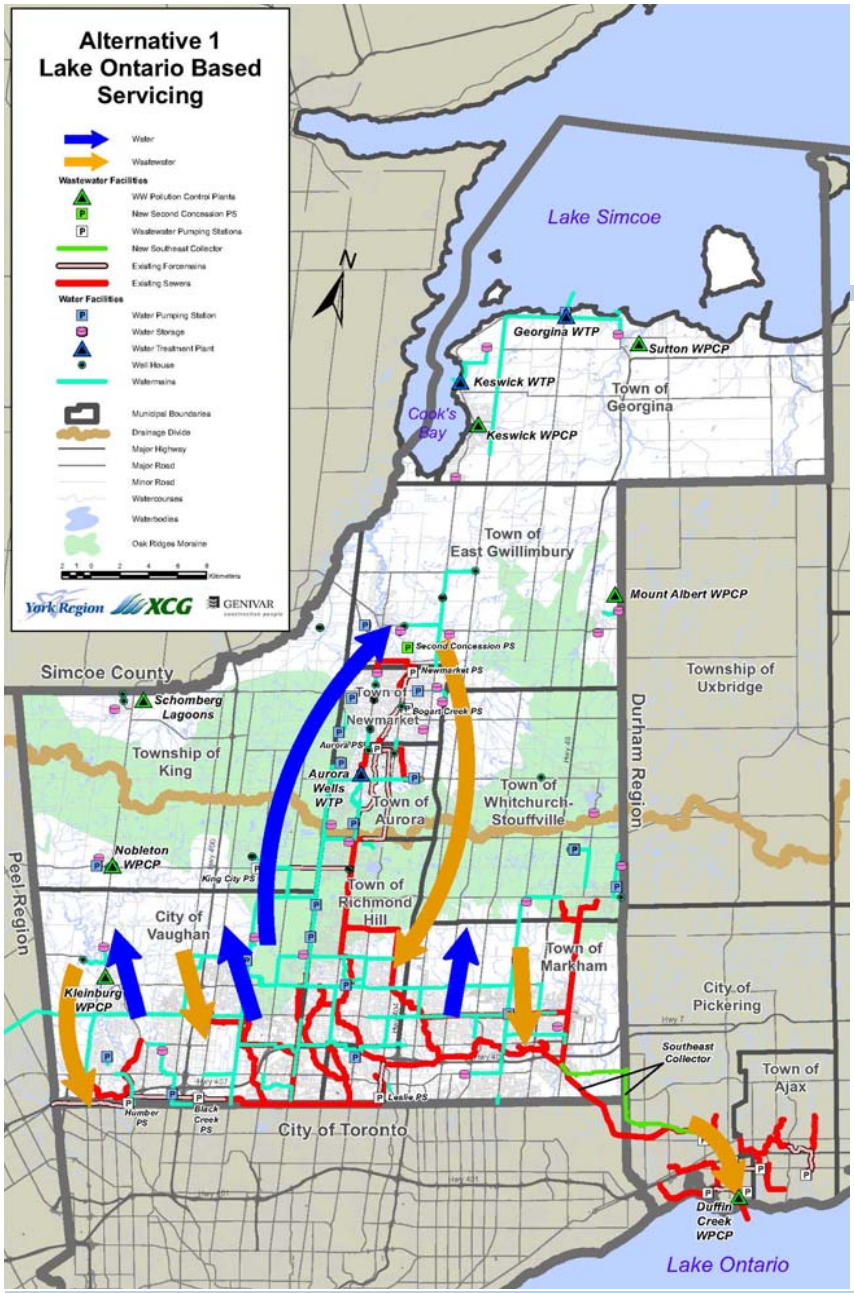
Presentation to
Town of Markham
Development Services Committee

Jonathan P'ng

November 10, 2009

Objectives of this Water & Wastewater Master Plan (WWMP) Update

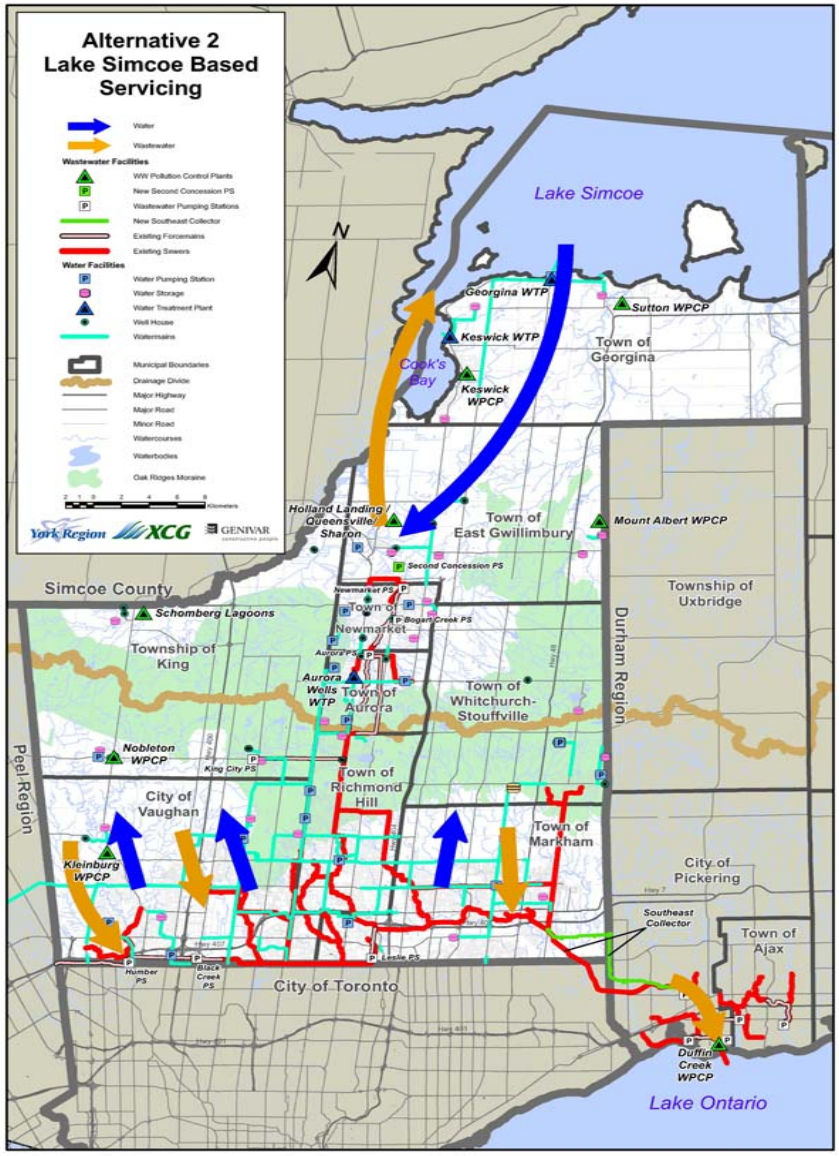
- Estimate York Region's water and wastewater needs for the next 40 to 50 years for all 9 municipalities
- Master Plan process address Phases 1 and 2 of project Class EAs
- Confirm or modify projects of existing Master Plan
- Estimate the cost of the infrastructure needed to accommodate forecasted growth
- Address the Region's servicing demands while providing solutions that protect the natural environment
- Establish a high level Implementation Plan for the Capital Works Program



Alternative 1
Lake Ontario Based Servicing

- Current groundwater well supply will be maintained
- All additional water supply will come from Lake Ontario by way of the York Water System to service the communities of Aurora, Newmarket, East Gwillimbury, Kleinburg and King City
- Lake Simcoe will supply water and receive wastewater for Georgina
- Small Urban communities remain on local systems
- The York Durham Sewage System (YDSS) will be extended to East Gwillimbury
- Enhanced water efficiency and inflow/infiltration reduction/prevention

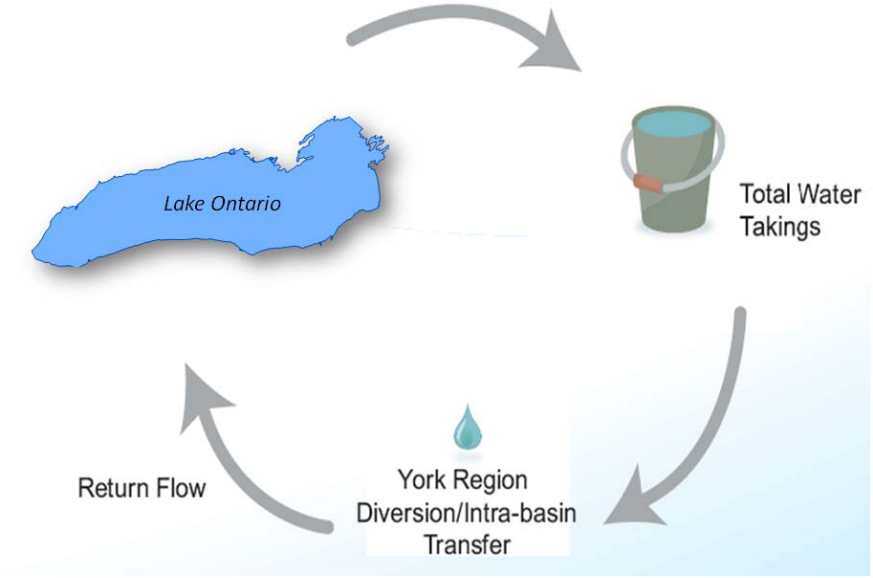
Alternative 2
Lake Simcoe Based Servicing



- **Current groundwater well supply will be maintained**
- **Additional water supply will come from Lake Ontario by way of the York Water System to service the communities of Aurora, Newmarket, Kleinburg and King City**
- **Lake Simcoe will supply water and receive wastewater for Georgina**
- **Small Urban communities remain on local systems**
- **Enhanced water efficiency and inflow/infiltration reduction/prevention**
- **Additional water supply for northern York Region will be from Lake Simcoe**
- **Northern York Region wastewater will be directed to Lake Simcoe by way of discharging treated effluent by extending an outfall into Lake Simcoe**

Major Findings and Recommendations

- Lake Ontario based servicing (Alternative 1) most sustainable long term solution
  - Supports the Great Lakes water balance by returning flow to Lake Ontario; and,
  - Protects Lake Simcoe in accordance with Lake Simcoe Protection Act



Major Findings and Recommendations

- Projects in existing Master Plan
  - Majority of planned projects confirmed
  - Some projects altered or expanded to meet Growth Plan targets

- Major new infrastructure
  - To meet Growth Plan and forecasts to 2051
  - New infrastructure to support development in the future urban areas of north Markham, north Vaughan, and northern York Region
  - Primary Trunk Second Pipe (new outlet sewer for the YDSS)

Major Findings and Recommendations

Implementation of the following:

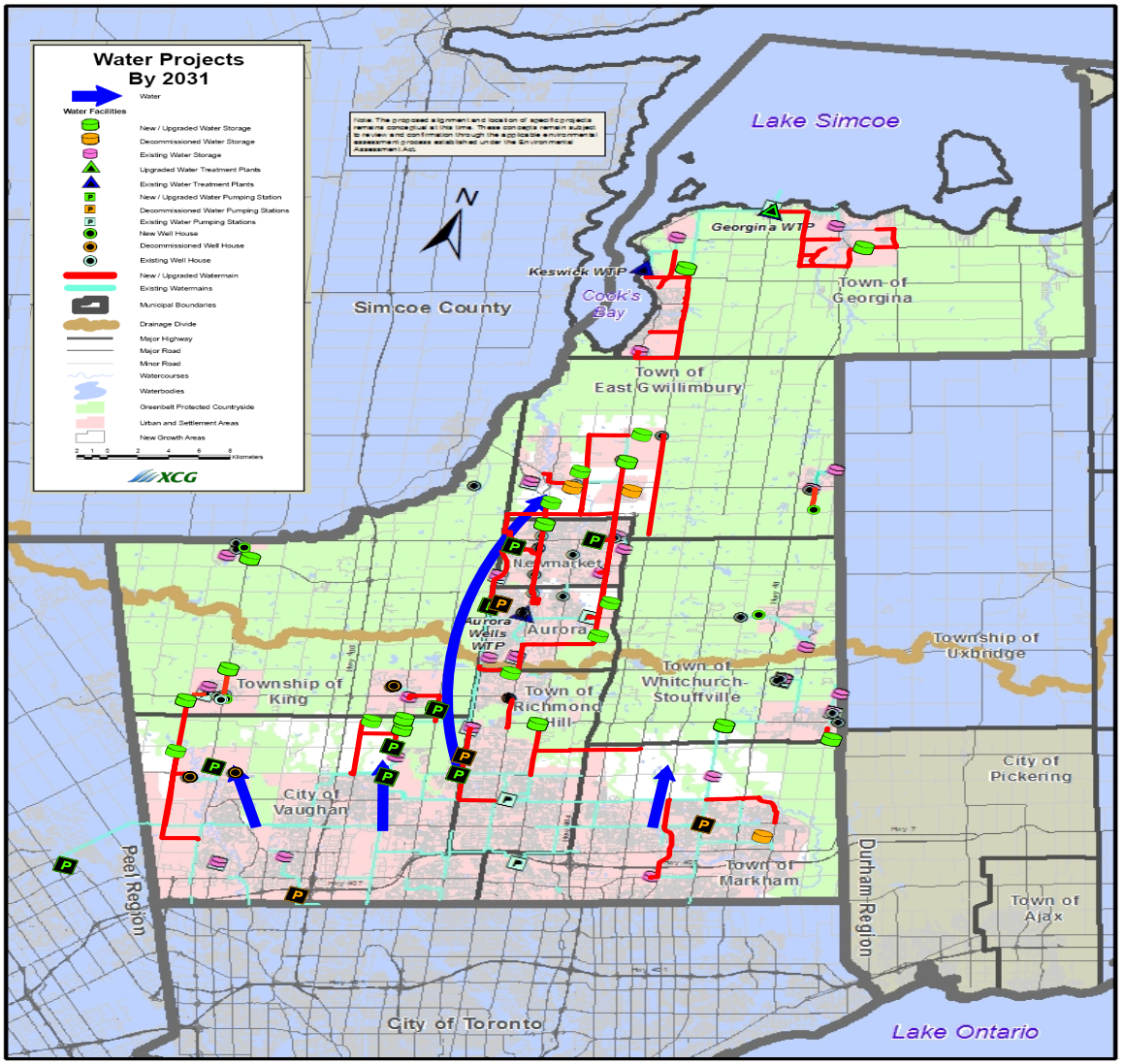
- 160 km of trunk watermains
- 12 water pumping stations and 22 water storage facilities
- 50 km of trunk sewers and forcemains
- 4 wastewater pumping stations, 1 wastewater treatment plant
- Expansion and/or upgrade of 8 wastewater treatment facilities
- Twin the Primary Trunk
- Cost shared water infrastructure in Peel and Toronto including expansion of 2 water treatment plants

Major Findings and Recommendations

51 recommendations for Policies and Programs for Sustainable Water & Wastewater Servicing

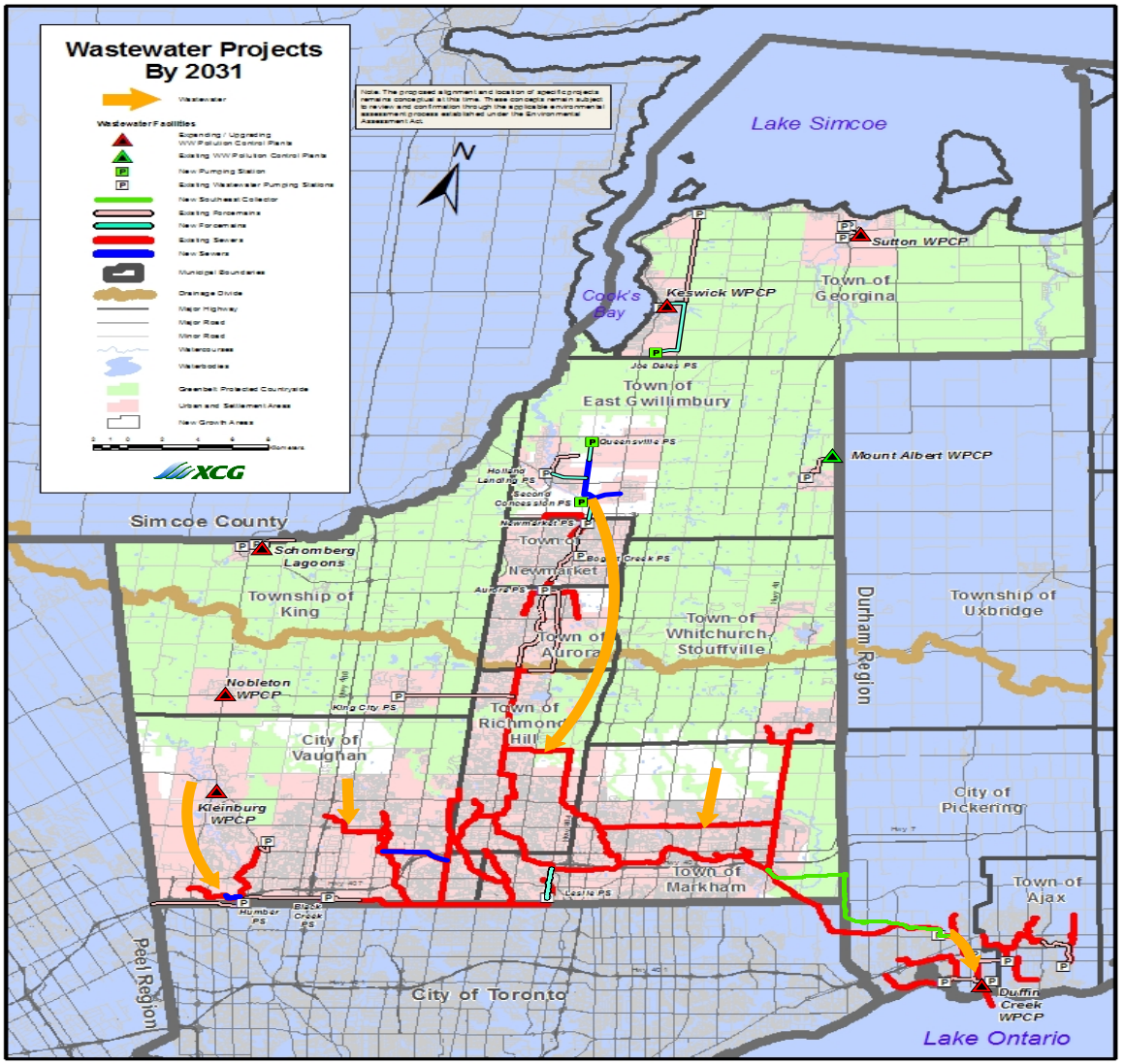
- Regional Official Plan Policies
- Safe and Clean Drinking Water
- Wise Use of Water for today and the future
- Reliable W & WW servicing for Community Well-being and Economic Vitality
- Communications, Consultation and Engagement
- Healthy Watersheds
- Respect for Natural and Cultural Heritage
- Climate Change and Energy Efficiency
- Full and Equitable Funding and Value-for-Money
- Timely and Integrated Service Delivery
- Monitoring Performance and Adaptive Management

Water Projects by 2031



Capital Works: $1.4 B

Wastewater Projects by 2031



Capital Works: $2.2 B

Water Projects in Markham by 2031

New Storage Projects

- North Markham Reservoir PD 6 (2017-2021)
  Estimated Cost: $14.7 M

Storage Decommissioning

- Wooten Way ET (2009-2011)
  Estimated Cost: $0.3 M

Pumping Station Decommissioning

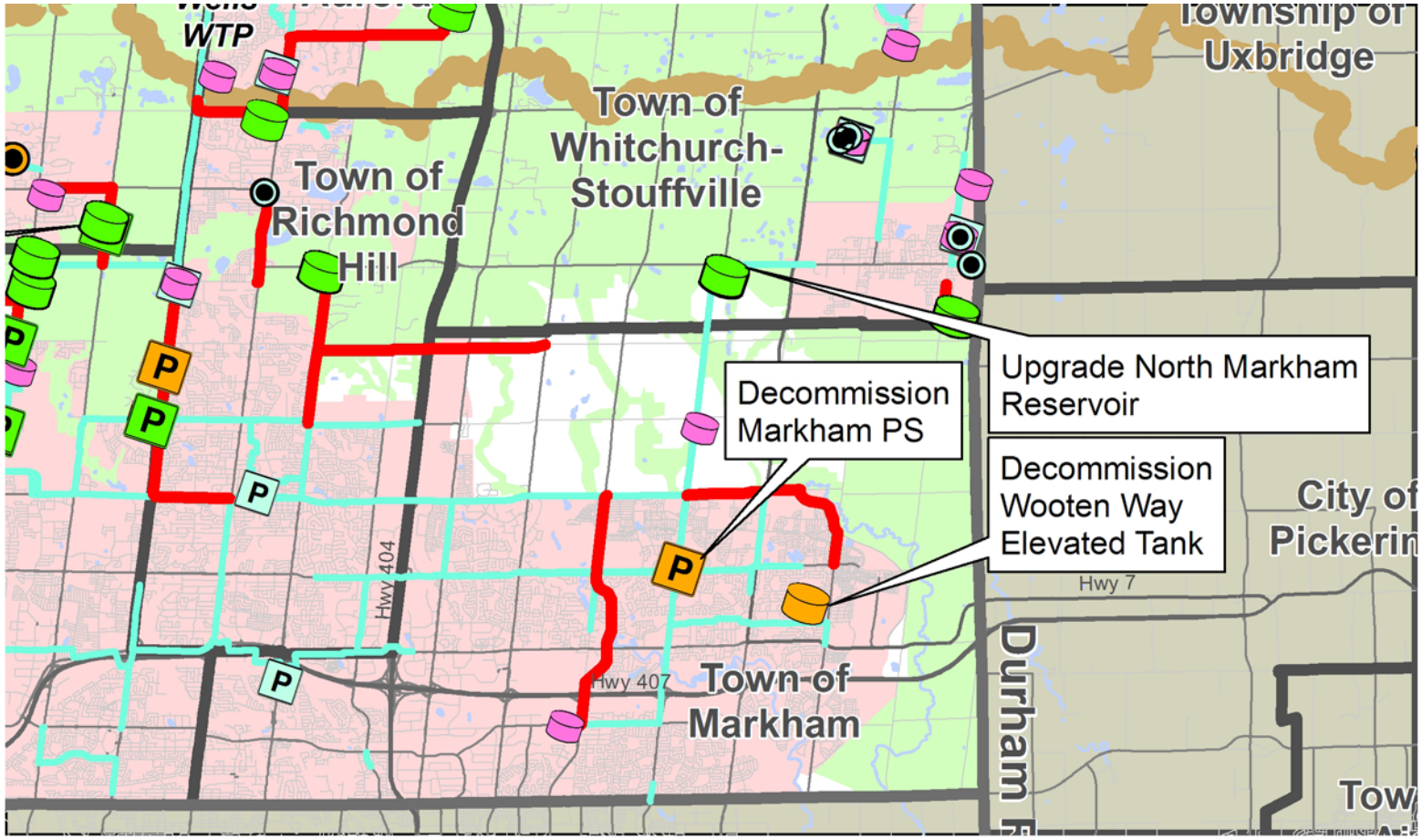
- Markham PS (2016-2021)

Water Projects in Markham by 2031

Watermain Projects

- Kennedy Road Watermain (Under Construction)
  Estimated Cost: $23 M
- Markham By-pass, completion by December 2011
  (Major Mac, Don Cousen's Pkwy, 9th Line)
  Estimated Cost: $9.3 M
- PD7 Watermains on Warden and 19th Avenue (2021-2026)
  Estimated Cost: $14 M

Water Projects in Markham by 2031

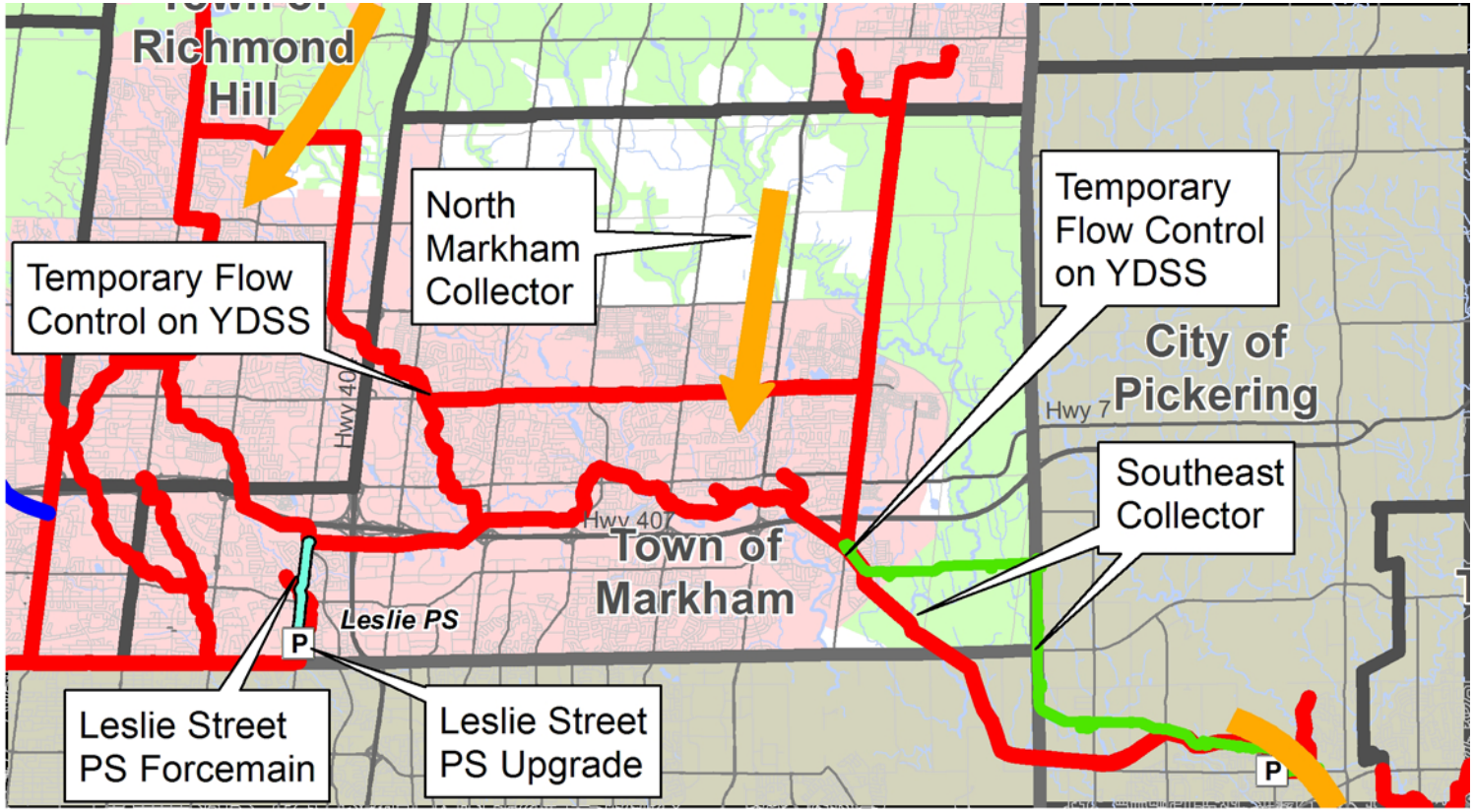


Wastewater Projects in Markham by 2031

New Sewer Projects

- Leslie St PS upgrade (Estimated Completion 2011)
  Estimated Cost: $3.5 M
- North Markham Collector (2016-2021)
  Estimated Cost: $78.6 M
- Leslie St PS Forcemain (2021-2026)
  Estimated Cost: $4.8 M

Wastewater Projects in Markham by 2031



5 Year Action Plan – Key Actions

- Apply for increase in intra-basin transfer under Great Lakes Charter
- Peel Region – Explore additional wastewater treatment
- Priority Wastewater Projects
  - Leslie Street Pumping Station Upgrade
  - Upper York Sewage Solutions (UYSS)
  - Bogart Creek PS new sewer to UYSS
  - Newmarket PS new forcemain to UYSS
  - Southeast Collector Sewer - Second Pipe
  - Duffin Creek WPCP Stage 3 Pumping Station
  - Primary Trunk Sewer, Second Pipe – Initiate Class EA study
- Priority Water Projects
  - Pumping Stations - West Richmond Hill, Orchard Heights
  - Watermains - Bathurst St, Yonge St, Wellington St/Leslie St
- Enhance Water Efficiency Program (Water for Tomorrow)
- Continue Infiltration/ Inflow Reduction/Prevention Program
- Develop an overall Climate Change Strategy

Estimated Cost of Water Capital Works

Facilities	2031 Cost	2051 Cost
Watermains	$ 313 M	$ 313 M
Pumping Stations	$ 48 M	$ 73 M
Storage	$ 271 M	$ 279 M
Supply & Treatment (includes External Works*)	$ 767 M	$ 787 M
Decommissioning	$ 9 M	$ 9 M
Programs & Initiatives	$ 108 M	$ 198 M
Assessment, Planning & Enhancement	$ 165 M	$ 309 M
Rehab & Replacement	$ 215 M	$ 433 M
TOTAL	**$1,896 M**	**$ 2,401 M**

* Agreement costs with Toronto/Peel to 2036

Estimated Cost of Wastewater Capital Works

Facilities	2031 Cost	2051 Cost
Sewers/Forcemains	$ 1,493 M	$ 1,493 M
Pumping Stations	$ 51 M	$ 51 M
Treatment	$ 501 M	$ 1,043 M
Outfalls	$ 73 M	$ 73 M
External Costs	$ 45 M	$ 45 M
Assessment, Planning & Enhancement	$ 193 M	$ 361 M
Rehab & Replacement	$ 509 M	$ 1,139 M
TOTAL	**$ 2,865 M**	**$ 4,205 M**

Region of York
Water and Wastewater Master Plan Update
Engineering Department Comments

Development Services Committee
November 10, 2009

Regional Assumption Utilized in Study

	Population		Employment	
	2006	2031	2006	2031
Region	929,900	1,507,400 [1]	462,300	780,300 [1]
Markham	272,500	423,500 [2]	144,800	240,600 [2]

1. Overall 40% intensification target within the Provincial Built Boundary for the Region by 2031.
2. Estimated 52% intensification target for Markham within the Built Boundary.
3. New community growth is also forecasted in the Region's analysis.

Servicing Concept for Markham

- Sanitary Servicing for Markham is dependent on the Duffin Creek treatment plant and Southeast Collector.
- Water Servicing is based on supply from Toronto and Region of Peel.
- Overall Wastewater Infrastructure cost for the Region to 2031 = $ 2.2B
- Overall Water Infrastructure cost for the Region to 2031 = $ 1.4B

Region of York – Water & Wastewater Master Plan

- **Recommended Infrastructure upgrades within Markham**

  a) Leslie Street Pumping Station - Increase Capacity (2011)

  b) North Markham Collector Sewer (2016-2021)

  c) Leslie Street Pumping Station – additional forcemain (2021-2026)

  d) Decommission Markham Pumping Station (2016-2021) & Wooten Way Elevated Tank (2009-2011)

  e) Markham PD7 Pumping Station (2031-2036) (Major Mackenzie / Warden)

  f) Temporary Sanitary Flow Controls (Currently being implemented)

- **Recommended External Infrastructure improvements / upgrades for Markham future growth**

  a) Duffin Creek WPCP Stage 3 Pumping Station (2006-2011)

  b) Southeast Collector – Second pipe (2011-2016)

  c) Primary trunk Sewer – Second Pipe (2011)

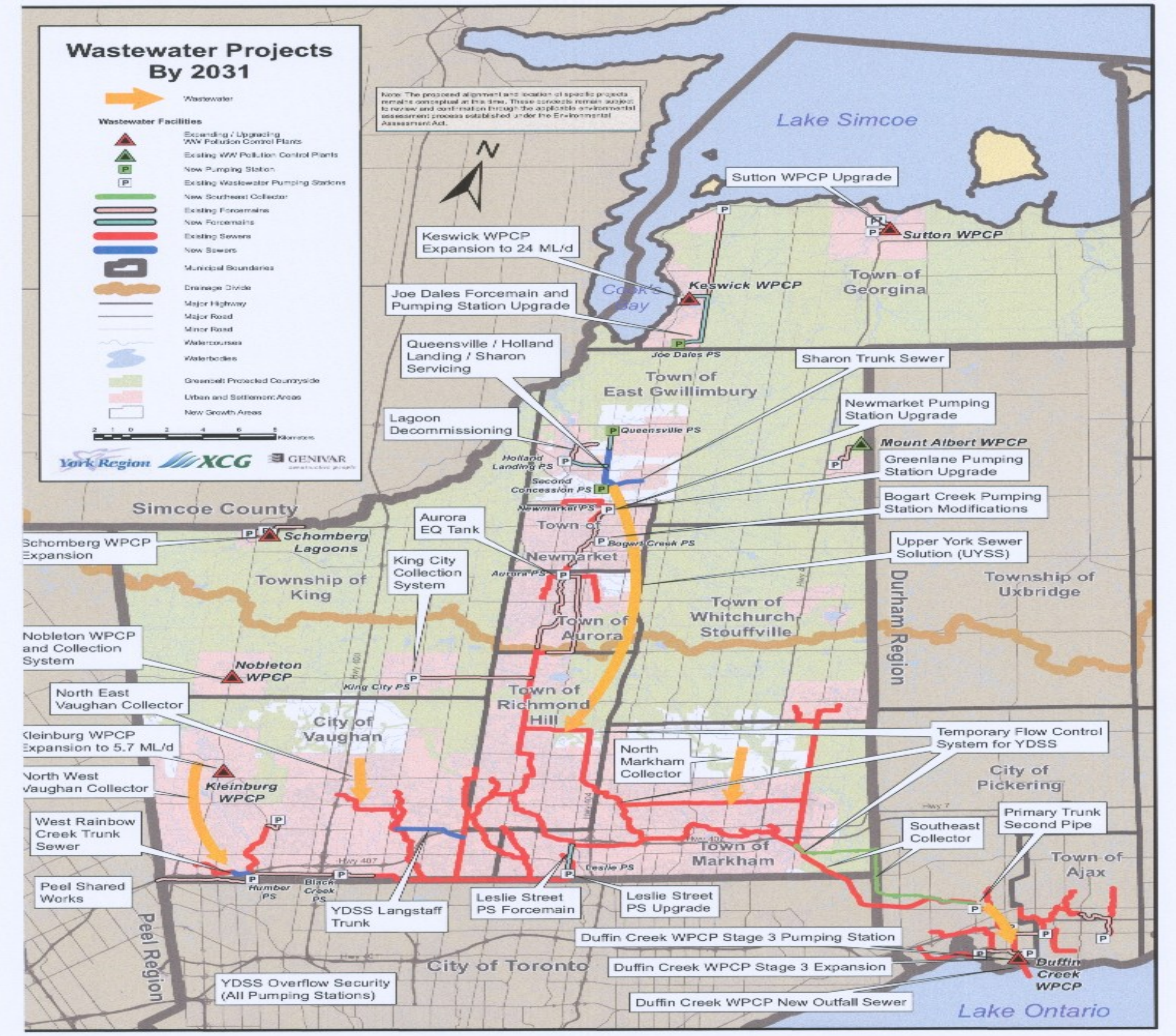
  d) Duffin Creek WPCP Stage 3 – new outfall sewers (2011-2016)

  e) Duffin Creek WPCP Stage 4 – Plant Expansion (2031-2036)

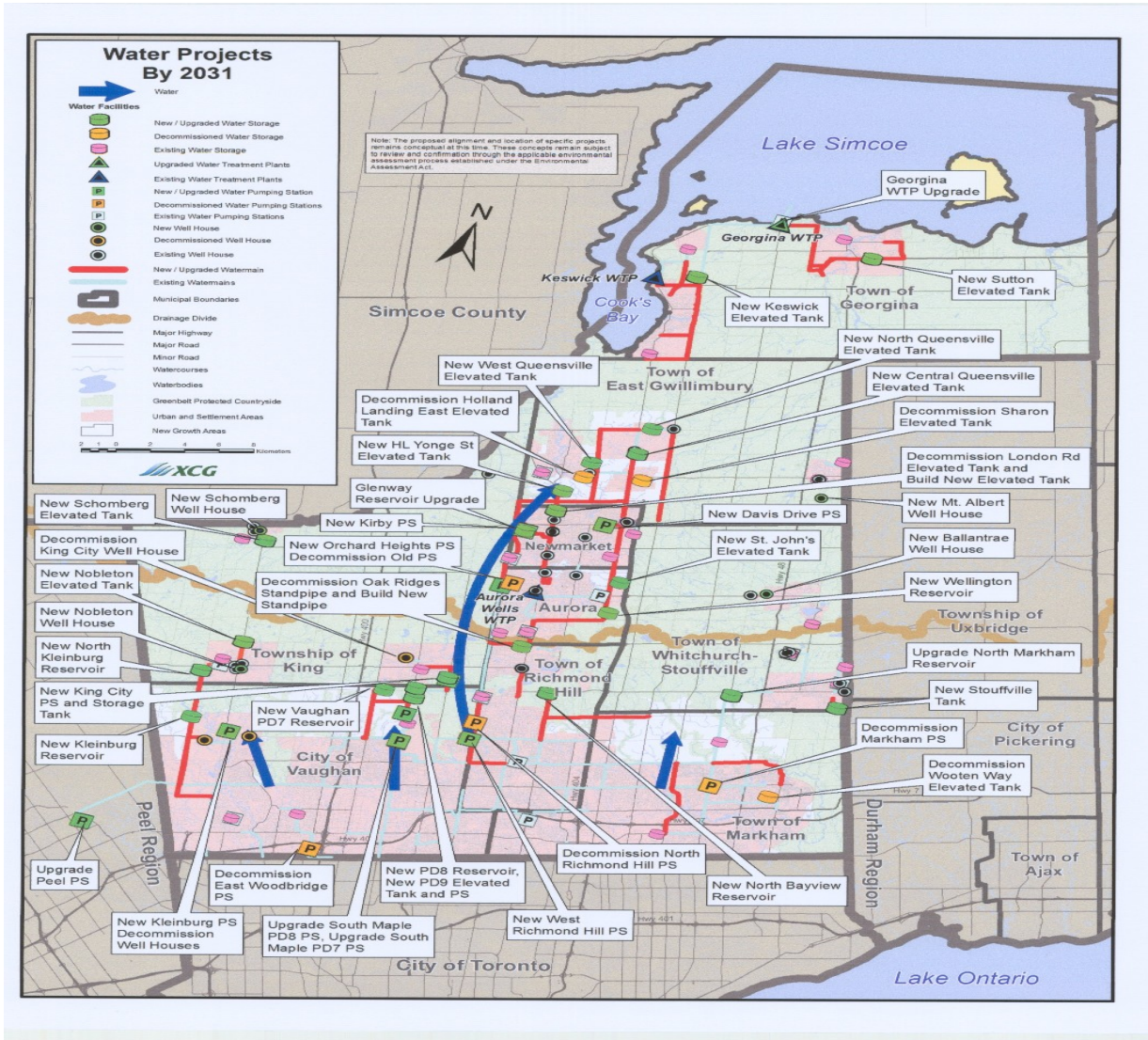
  f) North Markham Reservoir Expansion (2017-2021)

  g) Water Supply from Region of Peel

Region of York – Water & Wastewater Master Plan



Region of York – Water & Wastewater Master Plan



- **Sustainable Strategy Water and Wastewater**
  - Climate Change
    - Develop policies to take into consideration Climate Changes and its impact on the design and delivery of the servicing infrastructure. And incorporate climate change considerations into the design of wastewater infrastructure and treatment facilities
  - Promote water conservation and enhance water efficiency
  - Reduce / prevent inflow and infiltration into sanitary sewers
  - LEED initiatives
    - All new mid- and high-rise residential, mixed-use, major office, commercial and institutional development shall be built to a minimum
      - LEED Silver, prior to and including 2015
      - LEED Gold, 2016 up to and including 2021
      - LEED Platinum, post 2021
    - All ground related residential units be constructed to a minimum Energy Star standard or equivalent prior to 2012. Review policy to incorporate LEED standards post 2021.

Staff Comments

- Clarify the growth distribution and coordinate the Region's Water and Wastewater Master Plan with Markham's Growth Management Strategy.
- Review and adjust the requirements of the Region's infrastructure upgrades pending on the results of the Town's Master Servicing Study. (i.e. Langstaff)
- Review the timing of infrastructure delivery to ensure servicing will be available when required.
- Review the need for continued yearly servicing allocation requirement beyond 2013.
- Review and identify the impact of the servicing infrastructure requirements as result of the climate change, the enhancement of water conservation technologies, and the implementation of environmental sustainable technologies.