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LONG TERM WATER CONSERVATION STRATEGY

The Environmental Services Committee recommends the adoption of the recommendations contained in the following report dated January 26, 2011, from the Commissioner of Environmental Services.

1. RECOMMENDATIONS

It is recommended that:

1. Regional Council endorse the Long Term Water Conservation Strategy, subject to minor adjustments to the final drafts arising out of the pre-submission consultation with the Ministry of the Environment.
2. The Regional Clerk circulate this report to the Clerks of the local municipalities.
3. The Regional Clerk forward a copy of this report to the Ministry of the Environment, Central Region Office.

2. PURPOSE

This report provides information on the Long Term Water Conservation Strategy. The Draft Long Term Water Conservation Strategy Executive Summary is attached for reference (*Council Attachment 2*). Completion of the Strategy and submission to the Ministry of the Environment on March 31, 2011 is required to fulfill conditions of approval for both the Southeast Collector Trunk Sewer Individual Environmental Assessment and the Intra-basin Transfer initiative.

3. BACKGROUND

York Region has embraced water conservation and efficiency since 1998 as a very effective component of the long term drinking water supply strategy. The *Water for Tomorrow* program continues to incorporate leading edge technology and innovative programs since its inception as demonstrated in *Council Attachment 1*.

Since 2008 the *Water for Tomorrow* program has provided:

- 31,000 toilet and 11,500 subsidized rain barrel rebates to residents
- 480 installed pre-rinse spray valves to commercial kitchens

Water saved from the programs initiated since 2008 is approximately 2.1 million litres per day, which is enough water to service a community of 8,300 people.

Since 1998 *Water for Tomorrow* has provided:

- 60 water audits to businesses
- 124 water efficient landscape Seminars
- 10,700 individual garden visits
- 106,000 low-flow showerheads, installed
- Leakage monitoring and reduction on local municipal water systems

Water saved from all programs initiated since 1998 is approximately 22.4 million litres per day, which is enough water to service a community of 88,000 people.

Completion and submission of the Long Term Water Conservation Strategy fulfills stringent conditions placed on York Region by the Ministry of the Environment

A previous report (May 12, 2010, Report No. 5 Clause 4 of the Environmental Services Committee) outlined the conditions of approval for water conservation and efficiency for the Southeast Collector Trunk Sewer. Subsequently the Ministry of the Environment extended the same conditions of approval to York Region's proposal for an increase in Intra-Basin Transfer.

The Long Term Water Conservation Strategy has been developed based upon the following Ministry of the Environment directions:

- A review of best-in-class water conservation and efficiency measures
- Development of performance targets and timelines in conjunction with the Region and its local Municipalities
- Thorough consultation with stakeholders from throughout the Region, the Ministry of Environment's Central Region office, and Canadian water efficiency and conservation experts
- Independent peer review by members of the Alliance for Water Efficiency
- Presentation to the Southeast Collector advisory committee.

Annual reporting to Ministry of the Environment requires new processes to be developed and implemented

Additional conditions of approval from the Ministry of the Environment specify that York Region must carry out the Water Conservation Strategy, report annually on targets and performance measures and update the strategy every five years. A detailed monitoring and reporting process must be developed to account for water conservation and efficiency initiatives from many new program components. This process will be developed in coordination with local municipal staff to ensure that residential and

industrial/commercial water use is accurately recorded based on a standardized framework.

York Region is the first Canadian municipality required to comply with this type of detailed monitoring and reporting structure. There are currently no industry standards to adopt. York Region will be creating a reporting mechanism that is unique and in doing so will continue to demonstrate leadership in the water industry.

The Long Term Water Conservation Strategy identifies new and innovative approaches to water efficiency and conservation. It is critical for the Region, in partnership with the nine local municipalities, to determine accurate water consumption data by user type (ie residential, industrial, commercial) in order to accurately report the amount of water saved while ensuring programs are cost effective and achieving expected results. In addition, detailed monitoring and analysis processes must be developed and implemented on all programs and initiatives to ensure water savings are realized. These initiatives together will allow programs to adapt as necessary to ensure York Region meets annual targets set out in the Long Term Water Conservation Strategy.

4. ANALYSIS AND OPTIONS

Water conservation and efficiency is supported by a Regional strategic plan hierarchy and policy framework based on sustainability

Vision 2026 is comprised of a vision statement, eight goals and action areas that describe what the public and Regional Council envisioned for the Region to 2026. Vision 2026 guides all Council decisions and is a key component of York Region's strategic planning and business planning processes. Fundamental to this vision is a commitment to forging a legacy of sustainability. Vision 2026 is scheduled to be updated using a 40 year time horizon to 2051 that will build upon existing goals and further integrate the Region's Sustainability Strategy. It is anticipated that the next generation of the Vision document will identify the availability, access and safety of water resources as an emerging trend that will impact services required by future York Region residents.

In 2007, Regional Council approved the York Region Sustainability Strategy, "*Towards a Sustainable Region*". The strategy provides a long term framework for making more effective decisions about all municipal responsibilities that better integrate the economy, environment and community.

Implementation of the Long Term Water Conservation Strategy fulfills several action areas of the Sustainability Strategy including becoming a leader on the water conservation front in Canada, further integration between land-use planning and urban design, and the investigation and adoption of green building principles to ensure more liveable and efficient communities.

Both Vision 2026 and the Sustainability Strategy have informed the Region's growth management strategy and the update to the Regional Official Plan approved in September, 2010 by the Ministry of Municipal Affairs and Housing. As a result, the Regional Official Plan is a comprehensive plan focused on city building, maintaining a dynamic economy, providing integrated and responsive human services and protecting and enhancing the natural environment. Specifically, the Regional Official Plan establishes a policy framework for creating healthy sustainable communities including development of a long term water conservation strategy.

Best in Class program components are basis of Long Term Water Conservation Strategy

A detailed best-in-class review of water efficiency and conservation practices worldwide was undertaken as the first step in developing the Strategy. Literature and case study examples were reviewed from academic, municipal and upper level government, non-government organizations and the private sectors. Insight and experience was gathered from those involved with the development of the best-in-class projects.

The strategy has been created by reviewing best-in-class programs and tactics and adopting those that are technically, environmentally and economically feasible for implementation in York Region. All of the new components and tactics were identified in the best-in-class review and build upon the success of the current *Water for Tomorrow* program.

Governance and Administration

- Multi-stakeholder advisory group
- Measurement and reporting framework to meet annual requirements
- Detailed implementation plans with full cost benefits and return on investment assessments
- Integration with Infrastructure Master Planning
- Partnerships for pilot and demonstration projects

Policies and Bylaws

- Evaluate against the best in class review: summer water conservation bylaw, new development incentive programs, plumbing retrofits on resale homes
- Advocacy to encourage water efficiency and reuse in Provincial Permit to Take Water and Building Code changes

Rebates and Other Financial Instruments

- Continuation of rebates and programs offered to residents and businesses through *Water for Tomorrow* (toilets, humidifiers, rain barrels, audits)
- Subsidized landscape design service, coupon discounts for water efficient plants
- Incentives for low income housing
- Full-cost recovery conservation oriented pricing

New Development

- Evaluate Sustainable Home Incentive and LEED Programs to increase participation
- Water conservation guideline for industrial, commercial and institutional sectors
- Water efficient fixtures and landscaping and irrigation requirements for new developments
- Detailed monitoring program to evaluate water savings

Infrastructure

- Leakage monitoring and repair
- Opportunities to reduce water waste through comprehensive evaluation and maintenance programs

Regional Municipal Systems

- Develop and implement monitoring program to evaluate water consumption by sector (residential, industrial, commercial and institutional)
- Water conservation guidelines for retrofits of municipally owned buildings

Marketing, Outreach and Education

- Continuation of educational components offered through *Water for Tomorrow*
- Development of a ten-year education and outreach plan
- Public outreach through community groups, to new Canadians and subsidized housing
- Youth/community project that addresses local climate change issues
- Multi-cultural "Praise Water Week"

Pilot Projects

- Expedited development approvals for Green Building
- Rainwater harvesting and grey water projects
- Outdoor water use reduction targeting high water users and irrigation systems
- Implement water conservation guideline for industrial, commercial and institutional sectors
- Water efficient demonstration landscapes
- Retrofit and showcase municipal facilities, document water/energy savings outcomes
- Quantify volume of water used in watermain flushing
- Dual plumbing in new public building
- Innovative ways to deal with water use in sports fields, splash pads

Detailed implementation plans including cost/benefit analysis will be completed within the first five years of the strategy implementation to determine suitability, timing, resource requirements and cost of each component.

The 2011 residential consumption rate is approximately 252 L/person per day based on projections from the 2009 Water and Wastewater Infrastructure Master Plan.

Table 1 provides a breakdown of the water savings targets and timelines based on continuation of current *Water for Tomorrow* programs and implementation of new programs and tactics.

Table 1
Water Savings Targets and Timelines
York Region Jurisdiction and Initiative Programs

	Year			
	2016	2021	2026	2031
Residential Water Use Targets (litres per person per day)	241	235	232	230
Expected Water Savings (million litres per day)	13.4	16.6	11.0	15.7

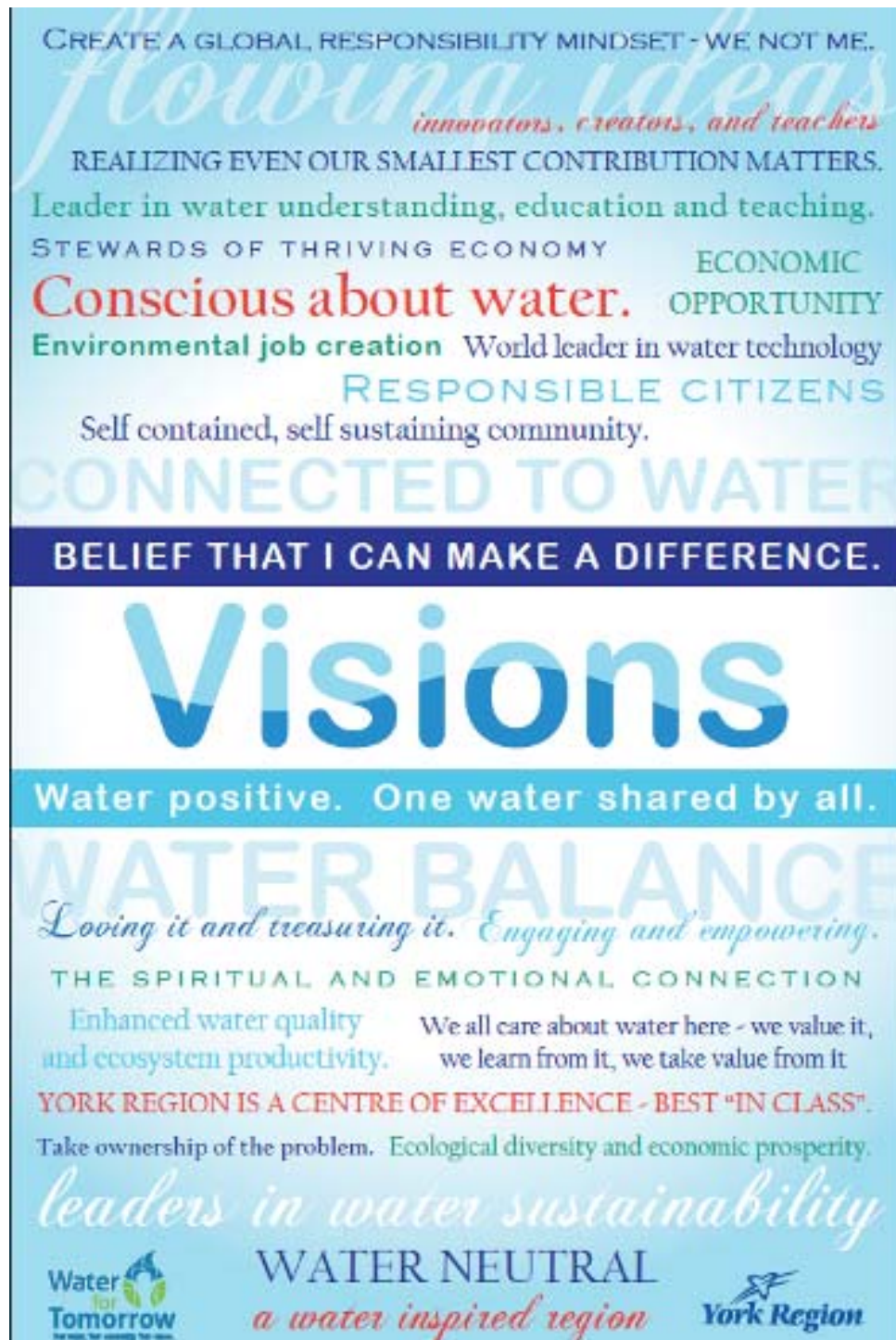
A copy of the Draft Long Term Water Conservation Strategy Report Executive Summary is included in *Council Attachment 2*.

Extensive public consultation and engagement has resulted in a public vision for the future

During September and October 2010, six public consultation sessions were held to engage a wide variety of stakeholders throughout York Region. The full list of all organizations that participated in consultation sessions is included in *Council Attachment 3*.

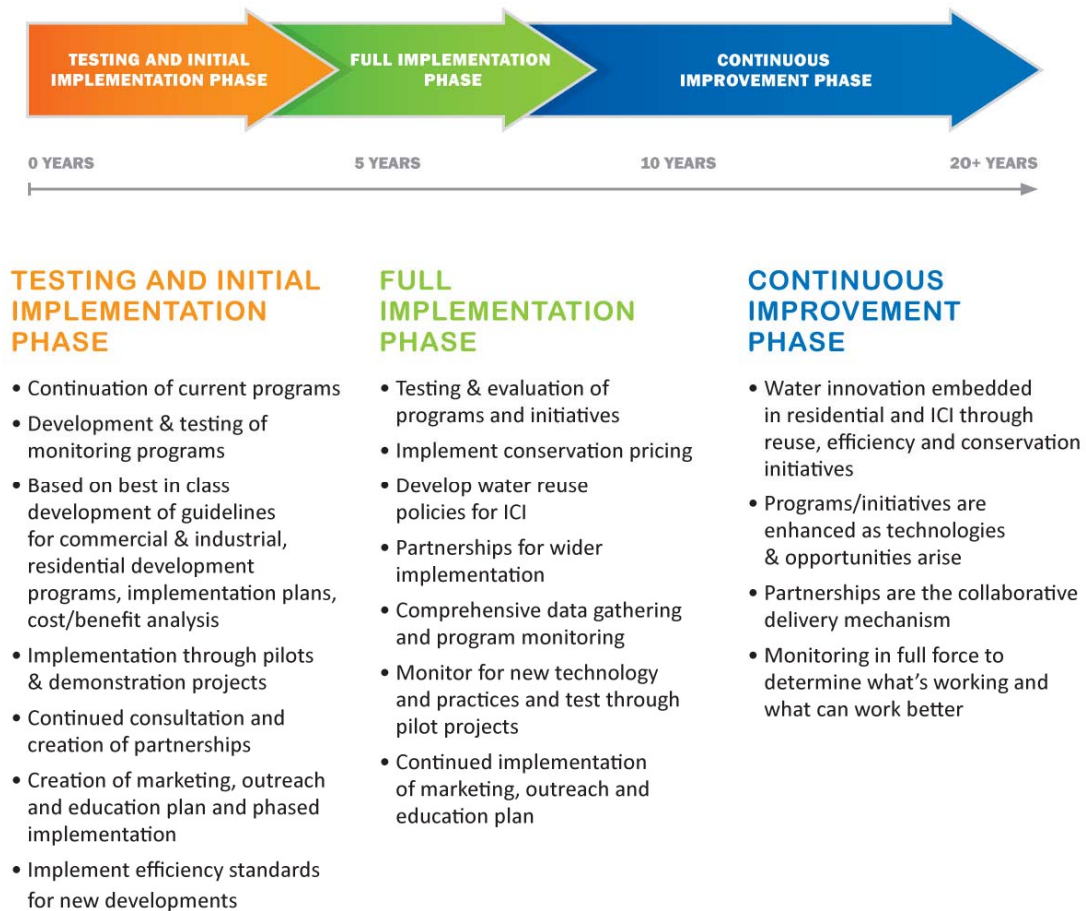
The six consultation working sessions brought people from an attitude of wondering why water conservation is important, to an understanding of the full realm of water efficiency and conservation program components and belief that they can make a difference. Through the public's involvement, participants created a public vision for water efficiency and conservation programming in York Region. A summary of the vision can be found in Figure 1.

Figure 1
Public Vision



The public vision has been embedded into all technical components and has been developed into an action strategy, shown in Figure 2.

Figure 2
Action Strategy



5. FINANCIAL IMPLICATIONS

\$43 million is available in the proposed 2011 update of the 10-year capital budget for continuation of the successful *Water for Tomorrow* programs and for the initial development of new components. Funding for these programs is provided 98.44% from development charges and 1.56% from user rates.

A breakdown of the 10-year capital budget for water conservation and efficiency is provided in Table 2.

Table 2
2011 Proposed Ten-Year Capital Budget

Program	Ten Year Budget
Rebates and Incentives	\$27,000,000
Education, Outreach and Customer Service	\$6,500,000
Leak Reduction	\$6,000,000
Pilot Projects and Implementation Planning	\$3,500,000
Total	\$43,000,000

Implementation plans will be created for each year from 2011 to 2016 for all priority programs required over the next ten years. Detailed cost benefit analysis will determine resourcing and full funding requirements to implement Regional and local municipal water conservation work.

There is an opportunity for the Province of Ontario to demonstrate leadership in the area of water efficiency by allowing the sale of only high efficiency toilets (i.e. 4.8 or 3 L/flush) throughout the province. In addition, changes to the building code to mandate the use of high efficiency toilets will ensure that all new homes use much less water.

These changes at the provincial level would allow York Region to save approximately \$18 million over ten years in funding of toilet rebates. This money could be reallocated and used to implement other new program components identified in the Long Term Water Conservation Strategy.

6. LOCAL MUNICIPAL IMPACT

Local municipal endorsement of the Long Term Water Conservation Strategy required to fulfill conditions of approval

Local municipal staff have been involved in developing of the Long Term Water Conservation Strategy through participation in the Water and Wastewater Steering Committee and through attendance at public consultation sessions. Municipal staff have committed to bring reports to local Councils to seek endorsement of the Long Term Water Conservation Strategy by March 31, 2011 to fulfill conditions of approval for both the Southeast Collector Trunk Sewer Individual Environmental Assessment and the Intra-basin Transfer initiative.

The continued commitment of local municipalities in working with the Region to develop and implement water conservation and efficiency programs is essential for providing servicing allocation for sustainable growth in York Region and for compliance with the full intentions of the Southeast Collector and Intra-basin Transfer initiative conditions of approval.

Development of implementation plans, pilot and demonstration projects with local municipal staff will identify the full long term funding and resource requirements at both the Regional and local municipal level.

Examples of pilot projects include:

- Expedited development approvals process for green buildings
- Development and testing of water efficiency, water reuse and irrigation guidelines in industrial, commercial and institutional facilities
- Retrofit and showcase of municipally owned facilities and document water-energy outcomes of facility-level water/energy efficiency retrofits
- Quantify the use of water for mains flushing and disinfecting and identify procedures to reduce water use
- Residential water efficiency landscaping

7. CONCLUSION

Completion and submission of the Long Term Water Conservation Strategy to the Ministry of the Environment fulfills conditions of approval for both the Southeast Collector Trunk Sewer Individual Environmental Assessment and the Intrabasin Transfer proposal.

Water conservation and efficiency are key components of a sustainable future for York Region. Reducing the amount of treated water used by the public and businesses of the Region will reduce future capital investments extend the life of infrastructure already built, reduce energy consumption and ensure that adequate water supply is available for the future.

The Long Term Water Conservation Strategy identifies new and innovative approaches to water efficiency and conservation. Testing and implementing these initiatives in York Region will demonstrate even greater municipal leadership and help ensure that *Water for Tomorrow* continues to be an award winning program.

For more information on this report, please contact Laura McDowell, Director Environmental Promotion and Protection at (905) 830-4444 Ext. 5077.

The Senior Management Group has reviewed this report.

(The three attachments referred to in this clause are attached to this report.)

Water Conservation and Efficiency Initiatives in York Region Timeline





DRAFT: LONG TERM WATER CONSERVATION STRATEGY

EXECUTIVE SUMMARY

York Region has more than a decade of conservation and efficiency programming, which to date saves more than 22-million litres of water each day.

Through the *Water Efficiency Master Plan Update (2007)*, York Region developed a plan for water conservation to 2016. The Long Term Water Conservation Strategy (LTWCS) builds on the results and success of previous plans by providing overarching guidance for Regional water conservation and efficiency programming for the next 40 years.

York Region submitted proposals to the MOE for both the expansion of sewage flow capacity in the Southeast Collector Trunk Sewer Individual Environmental Assessment and for an Intra-basin Transfer of drinking water from Lake Ontario to the communities of Aurora, Newmarket and East Gwillimbury. One of the conditions of approval for these undertakings is

the development of a 40-year Long Term Water Conservation Strategy. The completion and submission of this strategy to the Ministry of the Environment on March 31, 2011 builds on York Region's commitment to sustainable development and long term water conservation and efficiency programs and practices.



1. INTRODUCTION

York Region is centrally located in the Greater Toronto Area (GTA), directly north of the City of Toronto, in Ontario, Canada. York Region covers 1,756 square kilometres (678 square miles) and is comprised of nine local municipalities. It is the only Region in the GTA without direct access to Lake Ontario. Currently, the Region's drinking water supply comes from multiple sources: Lake Simcoe located in the northern portion of the Region, ground water sources, and Lake Ontario via water supply agreements with both the City of Toronto and the Region of Peel to offset demand on groundwater and to meet the needs of water customers in the southern municipalities.

Water Efficiency Planning and Programming

York Region is one of the fastest growing Regions in Canada with a current population of over 1 million. The population is projected to increase by approximately 500,000 by 2031 and by approximately 800,000 by 2051. Without concerted efforts in water conservation programming, demand on water supply and wastewater treatment systems is expected to increase in accordance with population growth. In 1997 York Region embarked on a Long Term Water Supply Master Plan and since its implementation in 1998, water conservation and efficiency has been an integral part of York Region's long-term drinking water supply strategy. *Through **Water for Tomorrow**, York Region has saved an estimated 22.4 million litres of drinking water per day, which translates to a total water savings sufficient to supply a community of about 88,000 people.*



The *Water Efficiency Master Plan Update* was completed in 2007 and set the stage for a 10-year conservation and efficiency plan for York Region. (A copy of the Plan is included in Appendix 1). The Plan established the strategic direction for water efficiency and also supports York Region's Sustainability Strategy. In developing the Master Plan Update, an extensive list of water conservation and efficiency measures, based on local and North American programs, were evaluated and a short list of recommended measures were identified and have been implemented since that time through *Water for Tomorrow*, the Region's successful water efficiency and conservation program.

The measures fall into four main categories as follows:

1. Residential programs – initiatives targeting single and multi-family dwellings and addressing indoor water use with fixture and appliance incentive programs and water audits; and addressing outdoor water use, through landscape audits and water efficient lawn and garden care information and guidance.

2. Industrial, Commercial and Institutional (ICI) programs – initiatives aimed at ICI building owner/managers, proprietors of laundromats and commercial kitchens and large volume industrial clients. The Region provides rebates for water efficient fixtures, equipment and in the case of industrial clients, water audits including a capacity buy-back incentive to replace inefficient processes with water efficient ones.

3. Distribution Leakage Detection – an International Water Association water audit and water balance of the municipal and regional distribution system was undertaken and a pro-active leak detection and repair program was initiated.

4. Education Program – water conservation and efficiency outreach and education initiatives including workshops, web site, displays, DVDs, informational resources, partnerships with garden centre retailers and marketing incentives for water efficient plant material targeting residents. Curriculum resources including an interactive web site, York Children's Water Festival and a calendar contest have been developed to help educate and engage students.



1.1 Project Purpose

Development, completion and submission of the LTWCS to the Ministry of the Environment on March 31, 2011 is required to fulfill Conditions of Approval for both the Southeast Collector Trunk Sewer for additional sewer flow capacity and the Intra-basin Transfer initiative to supply drinking water from Lake Ontario to the communities of Aurora, Newmarket and East Gwillimbury.

The LTWCS includes the following:

- Preparation, review and analysis of best-in-class water conservation and efficiency programs, initiatives, strategies and tactics adopted by other jurisdictions throughout the world.



- Consultation with lower-tier municipalities, the Southeast Collector Advisory Committee, the public, relevant government agencies and the Central Regional Office of the MOE.
- Completion of peer review of the strategy compared to the best-in-class tactics and strategies used by other jurisdictions
- Implementation of the water conservation and efficiency strategy.
- Submission of monitoring and reports annually on progress in implementing the strategy.
- Undertake a review and update of the strategy at a minimum once every 5 years until the MOE Central Region Director indicates that it is no longer required.

The provincial requirements for the strategy and other conditions of approval are consistent with the Region's water conservation goals and expand on the *Water Efficiency Master Plan Update* and York Region's Sustainability Strategy.

The Long Term Water Conservation Strategy enhances and extends to 2051 the Region's commitment to innovative water conservation and efficiency programming, water resource protection, energy conservation and greenhouse gas reduction.

2. VISION AND OBJECTIVES

With consideration to the conditions of approval set out by the MOE, a new approach that moves beyond traditional water management planning for the development of the LTWCS is being taken. Typically, increasing supply and Demand-side Management (DSM) – freeing up existing supply through the use of water efficient technologies at the consumer or demand-end of the supply system – are employed to accommodate growth.

The strategic decision to take a new approach led to the use of “Soft Path” to establish a long term vision for water conservation and efficiency in the Region. The Soft Path approach involved engaging stakeholders throughout the Region to develop a vision for a water future. The collective vision of “No New Water” evolved from public engagement and consultations. The definition of no new water reflects the aspirational goal for 2051. Even with water conservation, the demand for water will continue to increase over the decades due to approved increases in population and employment. By 2021 it is anticipated that the threshold of increasing demand may be reached and the continued implementation of progressive water conservation and efficiency programming coupled with new water saving technologies, regulations, practices and processes will result in a continuous reduction in per capita water use.

To achieve the vision of “No New Water”, the LTWCS will require:

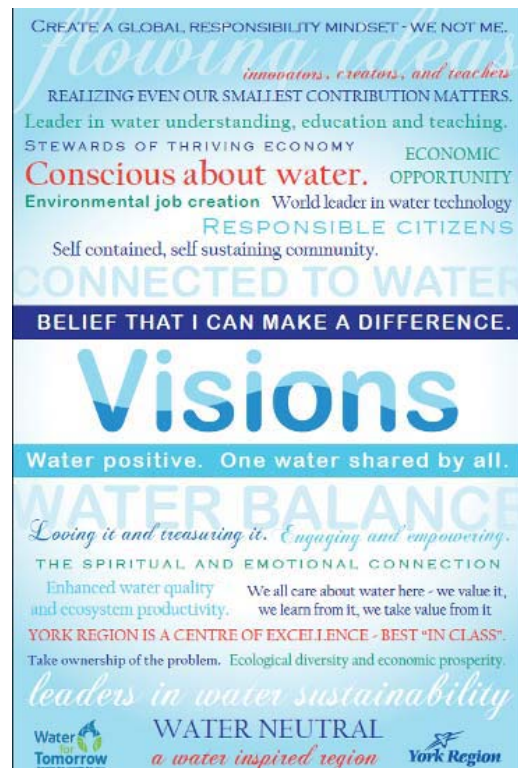
- Implementation of Regional incentive programs
- Provincial support through Ontario Building Code and/or legislative changes to allow the use of high efficiency fixtures in all new developments
- Adoption of reused water (i.e. rainwater, stormwater, grey water) as a water source for all outdoor and other non-potable uses beginning in 2021.

Numerically speaking, per capita water could decline to 150 litres per day from its current level of 252 litres per day. There are many aspects of the aspirational goal of “No New Water” that are currently beyond Regional jurisdiction. Achieving this vision will involve all sectors and facets of Regional life, from how individual residents use water at home and at work to building new water efficient communities and ICI developments.

The ambitious vision of the LTWCS is consistent with the sustainability and water conservation objectives of York Region, which are set out in the Region's *Water Efficiency Master Plan Update (2007)*, *Sustainability Strategy (2007)*, and *Regional Official Plan (2009)*, and those articulated by stakeholders throughout the consultation process.

The objectives for the LTWCS are summarized as follows:

- Be a municipal leader in water conservation and efficiency.
- Maximize sustainability of the water supply through the application of best-in-class technology and practices.
- Minimize energy consumption and reduce York Region's carbon footprint.
- Maximize the use of energy efficient technologies, processes and practices.
- Minimize the financial costs to York Region water customers
- Maximize partnerships with local municipalities and utilities for the cost-effective delivery of York Region's water conservation and efficiency programs
- Maximize the reliability of the water supply system
- Minimize the risk of water service disruptions
- Maximize system flexibility to respond to change
- Ensure York Region's drinking water supply meets all existing and future regional, provincial and federal public health and drinking water quality standards
- The Regional non-potable water supply meets future standards and is of acceptable quality for intended non-potable uses.
- Align York Region's strategic goals as set out in the Regional Master Plan and York Region's Sustainability Strategy
- Actively engage with public, youth and other regional stakeholders to find effective means of conserving and protecting the water supply.
- Deliver effective focused water conservation education programs for youth, residents and ICI sector.
- Develop marketing and outreach resources and initiatives to engage the diverse cultures living and working within York Region.



3. PROJECT APPROACH

A multi-disciplinary and integrated approach was employed to develop the LTWCS. Project management was the responsibility of Regional staff with guidance and support provided by local municipal staff. A project Advisory Panel of conservation and efficiency experts was established to guide the development of the LTWCS and provide input and feedback throughout the process (See Section 4.1.1 of the main report for a detailed description of the Advisory Panel). Additional guidance and feedback were provided by MOE staff and the Southeast Collector Advisory Committee. External consultant specialists provided research and support to Regional project staff (see Section 4.1.2 of the main report for a description of the LTWCS Project Team).



3.1 Soft Path

The Soft Path approach informed the strategy development process. Four guiding principles of the Soft Path approach include:

1. All water is considered a service provider and therefore other means of providing those services (i.e., transportation of waste, irrigation, heating and cooling), should be considered
2. Match water quality with quality of need, such as non-potable water for irrigation.
3. Ecological integrity of water sources and their ecosystems incorporated up front in the planning process
4. Identify a long-term vision for a water future and back-cast to determine the programs and processes needed to attain the vision

The soft path approach is founded on the assumption of ecological limits. It is designed to recognize the limits of water resources. In other words, withdrawing increasingly more and more water to meet growing demand presents risks to the community water supply and to local ecosystems. By tapping into the wasted water within the existing system and matching the water supply source with the quality of water required to perform the service, the soft path approach ensures the sustainability of the water supply system.

The application of Soft Path is unprecedented in a large, two-tier municipality with nine autonomous municipalities such as York Region.

4. PROJECT METHODOLOGY

A four-phased process was employed to develop the LTWCS: Phase 1, Project Design and Organization; Phase 2, Review and Research; Phase 3, Public Engagement and Consultation; and Phase 4, Analysis and Strategy Development. Phase 2 and 3 ran concurrently with the findings from each phase informing the other (A detailed discussion of the project methodology is provided in Section 4.2 of the main report).

4.1 Best in Class

A review of best-in-class water conservation and efficiency programs and practices from jurisdictions around the world was undertaken in Phase 2. A preliminary scan of external water conservation reports and programs, contact with sector experts and a review of internal Regional studies and reports was undertaken to identify leading jurisdictions for the best-in-class review. [Over 175 leading water conservation programs, policies and initiatives covering hard infrastructure through pricing, and outreach and education were reviewed for the best-in-class research.](#) A detailed discussion of the findings from the best-in-class review is provided in Section 5.0 and a copy of the Best-in-class Report is included in Appendix 5.

4.2 Public Engagement and Consultation

Concurrently with the Review and Research phase was engagement and consultation with a wide range of stakeholders throughout the Region. Stakeholder engagement was critical in developing a vision for the LTWCS. Findings from the best-in-class review were shared with stakeholders, providing an opportunity to collectively explore innovative ways and means of achieving the vision. Stakeholders identified

key themes for the duration of the LTWCS and identified “time zones” for their development and implementation. The key themes for each identified time zone to emerge from the public engagement and consultation process is summarized below.

[All aspects of the LTWCS, from the vision for a water future for York Region through the assessment and vetting of program components, were informed by findings from the public engagement and consultation process](#) (A complete discussion of the process is included in Section 4.3 of the main report).

4.3 Scenarios

Once the long term vision of “No New Water” and aspirational water saving targets were identified through public consultation and engagement, scenarios – an exploration of ways and means to realize the vision – were developed. In developing the scenarios an analysis of water consumption by municipalities and an assessment of potential water savings achievable across all sectors was undertaken. [Three scenarios summarized below considered conservation program uptake rates and potential reductions in indoor and outdoor water use as a result of new regulations, new technology, pricing and other drivers both regionally and provincially. Through this soft path process, the scenarios explore possible water savings from regionally developed incentive programs to more complex regulatory and infrastructure related initiatives.](#)

The aspirational target scenario of no new water by 2051 used a back-casting methodology by assuming total water used across all sectors in 2051 is equivalent to that used in 2011. Any potential scenario, including no new water, cannot be a straight line from 2011 to 2051. Programs and practices take time to develop and reach potential, particularly where policy,

regulations, and infrastructure are concerned; therefore, there will be an increase in actual total consumption before a decrease back to 2011 levels

The three scenarios developed are summarized as follows and are presented in Table 1 – Water Use Scenarios.

York Region Jurisdiction – Incentive Programs:

This scenario assumes 10% uptake of new development incentive-based programs from the Region achieving 150 litres per capita per day (lpcd), indoor use. Total residential outdoor water use is reduced by 2.5% every 5 years through incentive and education programs and other financial drivers such as conservation-oriented pricing.

Provincial Programs and Support – Incentive Programs + Legislative Changes: All of the above incentive and education programs plus provincial updates to the building code and/or plumbing code to include water efficient fixtures to bring indoor water use to 175 lpcd beginning in 2016 and 150 lpcd beginning in 2021 and/or legislation giving municipalities the authority to enforce building standards above and beyond the Ontario Building and Plumbing Code.

No new Water – Incentive Programs +

Legislative Changes + Water Re-use: Includes all of the programs and initiatives identified in the previous scenarios with the addition of significant water reuse and/or alternative sources for use in fixtures and processes that do not require potable water such as outdoor irrigation, industrial process water, toilet flushing, etc. commencing in 2021. This scenario aspires to achieve 150 lpcd unit rate average for all residents, new and existing development and includes indoor and outdoor potable water use. In conjunction, ICI total water consumption would be reduced from the Water and Wastewater Master Plan anticipated 216.6 million litres per day (MLD) to 131.8 MLD by matching water quality with quality of need.

The scenarios and their potential impact on water use over the 40 year timeframe of the LTWCS are discussed in detail in Section 4.4.6.

Table 1 - Water Use Scenarios

	Residential water use (litres per person)			
	2011	2021	2031	2051
York Region Jurisdiction • Incentive Programs	252	235	230	224
Plus Provincial Programs and Support • Incentive programs and legislative changes		233	227	219
“No New Water” • Incentive programs, legislative changes and adopting water re-use or alternative sources for all outdoor and other non-potable uses		233	206	150

5. RESEARCH FINDINGS & ASSESSMENT

The findings from the best-in-class review are the basis for the program components that comprise the LTWCS. The best-in-class programs and practices from leading jurisdictions were assessed for their relevance and applicability to York Region prior to inclusion in this strategy.

The program components from the best-in-class review were organized into the following categories:

Governance & Administration – research showed that leading jurisdictions in water conservation and efficiency utilize multi-stakeholder, multi-disciplinary committees to provide advice, guidance and feedback on programs from concept and design through implementation and monitoring.

Representation on such committees often include local residents, academic experts from colleges and universities, builders/developers, ICI facility managers and operators, landscape irrigation specialist and landscape designers/contractors, plumbers, water auditors, process engineers, and water and water industry professionals.

Another management tool employed by leading water conservation jurisdictions is program tracking and reporting. Many best-in-class jurisdictions use an annual scorecard approach to track and assess water savings and the return on investment (ROI). Water saving targets and key performance indicators are developed and used to track the success of any given conservation and efficiency initiative.

Policies and By-laws – In leading jurisdictions, particularly those where water shortages are a reality, policy and regulatory initiatives to drive conservation actions down the water supply chain are commonplace. National, provincial/state and local level policies and regulations identified through the best-in-class research addressed all facets of water conservation and efficiency from pricing and economic instruments to building and technology performance standards. Regulations are used in combination with incentive and education based initiatives providing a mix of carrots and sticks.

Rebates and Other Financial Instruments – Financial incentives, such as tax credits and rebates for water conservation fixtures, equipment and devices and/or penalties for excessive water use or wastage are utilized by best-in-class jurisdictions. It should be noted that such financial instruments are not stand-alone drivers for conservation but rather are part of a larger suite of initiatives used by municipalities or water utilities.

New Development – As research showed, the greatest opportunity for water conservation and efficiency resides with new development. Practices such as dual plumbing for grey water recycling, installations of cisterns and rain water harvesting systems, landscape design for zero or minimal irrigation, etc., are more viable for new development. It is important to note however, that responsibility for planning and development approval for new construction resides with the nine local municipalities, not with the Region.

Conservation-Oriented Pricing – Best-in-class jurisdictions employ some form of conservation-oriented pricing which is attaching an economic value to a unit of potable water at a level that encourages water conservation on the part of the consumer. There are three forms of conservation-oriented pricing:

- **fixed rate** where the value is set at a point to encourage conservation (some form of discount to low income customers is often provided)
- **seasonal tiered block rate** where a seasonal rate or surcharge is applied during the warm weather months to discourage excessive water use for irrigation and other outdoor purposes. The goal is to reduce summer peak demand which can result in greater than 50% increase in water use and strain on the water supply system.
- **tiered block rate** involves the application of a tiered or increasing block rate concurrent with a customer's water use. Those customers who use the least amount of water pay the lowest unit rate while those using the most pay a premium or the highest per unit cost for the water.

Pilot and Demonstration Projects – Pilot and demonstration projects are standard business practice for all potentially large scale undertakings. Leading jurisdictions used pilot projects to test new technology, rebates and other financial incentives, policies and by-laws, pricing models, etc. In addition, demonstration projects aimed at residents and ICI clients were used by many municipalities to showcase the benefits of a given water conservation practice or technology.

Regional-Municipal System – The best-in-class review examined the practices in three main stages of a system life cycle; planning, design and construction, and operation. Leading jurisdictions harmonize water quality objectives with water conservation and they do so by:

- closely scheduling infrastructure construction with the service demand to avoid oversized mains with underserved population;
- having a robust water quality program including co-ordinated sampling and conservation-based automated flushing program;
- employing pressure control and flow monitoring such as district metered areas within a leak detection program; and,
- assessing the condition and implementing an asset management program for water main replacement to prioritize repair and replacement of leak- or break-prone mains.

5.1 Screening and Evaluation

Best-in-class potential program components were identified for each of the categories identified above. In order to identify those program components to be included in the LTWCS, screening and evaluation criteria specific to York Region were developed to qualitatively analyse options. Screening or “knock-out” criteria culled the list of potential program components. Those components which passed the screening process were then assessed and ranked based on evaluation criteria (A detailed discussion of the screening and evaluation criteria and approach is included in Section 5.8).



6. PROGRAM COMPONENTS

The screening and evaluation of potential LTWCS program components resulted in a go-forward list of projects, practices and initiatives to be evaluated and/or implemented between 2011 and 2021. It is considered impractical at this stage to suggest potential program components beyond the 10-year horizon since beyond this timeframe it is reasonable to assume that there will be policy and legislative changes, new technology and process and/or climate and other related ecological and water resource changes that will impact the LTWCS and the program components to be considered for implementation.

The strategy includes a qualitative analysis of program components that pass requirements pertaining to health, climate suitability,

Regional strategic alignment and are within the control of the Region or are achievable through strategic partnerships with lower tier municipalities or other stakeholders. Full qualitative and quantitative vetting of program components, including cost-benefit analyses, return on investment (ROI) assessments, technology evaluations, market surveys and analyses, and pricing options/models assessments will be initiated in 2011 and 2012.

A summary of the LTWCS program components to be implemented over the next decade is summarized in Table 2 below. To reiterate, these components were drawn from the best-in-class global review and from existing York Region water conservation and efficiency initiatives and are consistent with the findings from the consultation process.



Table 2: Summary of Program Components by Category

Program Category	Program Component
GOVERNANCE & ADMINISTRATION	Measurement and reporting framework
	Regional-municipal Advisory Group
	Implementation Plans
	Multi-stakeholder Advisory Group
	Incorporate LTWCS into infrastructure Master Plan
POLICIES & BY-LAWS	Conservation and low impact development for new development by-law
	Conservation plans for facilities/complexes
	Plumbing retrofit on resale by-law
	Drought response by-law
	Process water reuse by-law
	Update summer conservation by-law
	Water efficiency fixtures and appliances for new development and renovation by-law
	Irrigation system sensor by-law
	Individual unit water metering for multi unit complexes
REBATES & OTHER FINANCIAL INSTRUMENTS	Free water audits and capacity buy-back for businesses
	Incentive for hot water recirculation systems in homes
	Subsidized residential landscape design service
	Front-loading clothes washer installations in Laundromats
	Multi-unit metering subsidy
	Coupon discounts for xeriscape plants
	HET Toilet rebate
	Develop new rebates and incentives and/or modify existing ones
	Subsidized WaterSense toilet installations in multi-family dwellings
	Water efficient fixture rebate
	Water efficient residential furnace humidifier
	Low income incentive program
	Pre-rinse spray valve for commercial kitchens
	Subsidized rain barrels

Table 2: Summary of Program Components by Category

Program Category	Program Component
NEW DEVELOPMENT	Implementation of East Gwillimbury program
	Integrate WaterSense when updating SHIP
	Develop conservation and reuse guidelines
	Integrate WaterSense into LEED programs
	Modify LEED for high rise to increase uptake
	Detailed monitoring for new development
	Modify SHIP to increase uptake and monitor
	Expedited approvals process for green building with local municipalities
	Study to quantify water use for main flushing and disinfecting
	Water reuse projects
	Water efficient landscapes
	Aquifer recharge through community-level water reuse
PRICING	Full cost conservation-oriented pricing
MARKETING OUTREACH & EDUCATION	Community-level great 'unlawning' challenge
	Regional marketing, outreach and education strategy
	Water efficient landscape workshops
	Free individual landscape assessments
	Water efficiency outreach program for new Canadians
	Children's Water Festival
	Sector specific water efficiency seminars and workshops
	Water efficiency outreach program for low income housing
	Grade 7 water efficiency curriculum for schools
	Develop curriculum unit on "embedded water"
	Region water efficiency calendar contest for Grade 7 students

Table 2: Summary of Program Components by Category

Program Category	Program Component
PILOT PROJECTS	Expedited approvals for green building in partnership with local municipalities
	Capture and demonstrate results from upgrades at public facilities
	Water reuse projects
	Water efficient landscapes
	Water efficient irrigation
	Dual plumbing in new public buildings
	Quantifying water use for main flushing and disinfecting
	Aquifer recharge through community-level water reuse
REGIONAL-MUNICIPAL SYSTEM	District meter areas
	Flow and pressure control
	Leak detection program
	Design and construction methods – water efficiency and water quality
	Design leakage rates
	Flushing and disinfection
	Disinfection design practices
	Water system and storage flow (circulation) design
	System flushing and swabbing
	Process control at water treatment plants



7. IMPLEMENTATION SCHEDULE

The implementation of the LTWCS program components is based on a 10-year timeline in recognition that beyond this timeline unforeseeable changes to federal and provincial policy and regulations, climatic conditions (and resulting alterations in weather patterns, water resources, water availability), area watersheds and ecosystems, and residential and ICI development and technology will occur. The implementation of the LTWCS is divided into three primary phases (see Table 3 below).

A timeline for the implementation of detailed implementation plans, cost benefit and return on investment is summarized in Table 4.

Table 3 – Summary of Key Actions by Phase

* The Region has and continues to implement Water Efficiency Master Plan Update water conservation and efficiency initiatives.

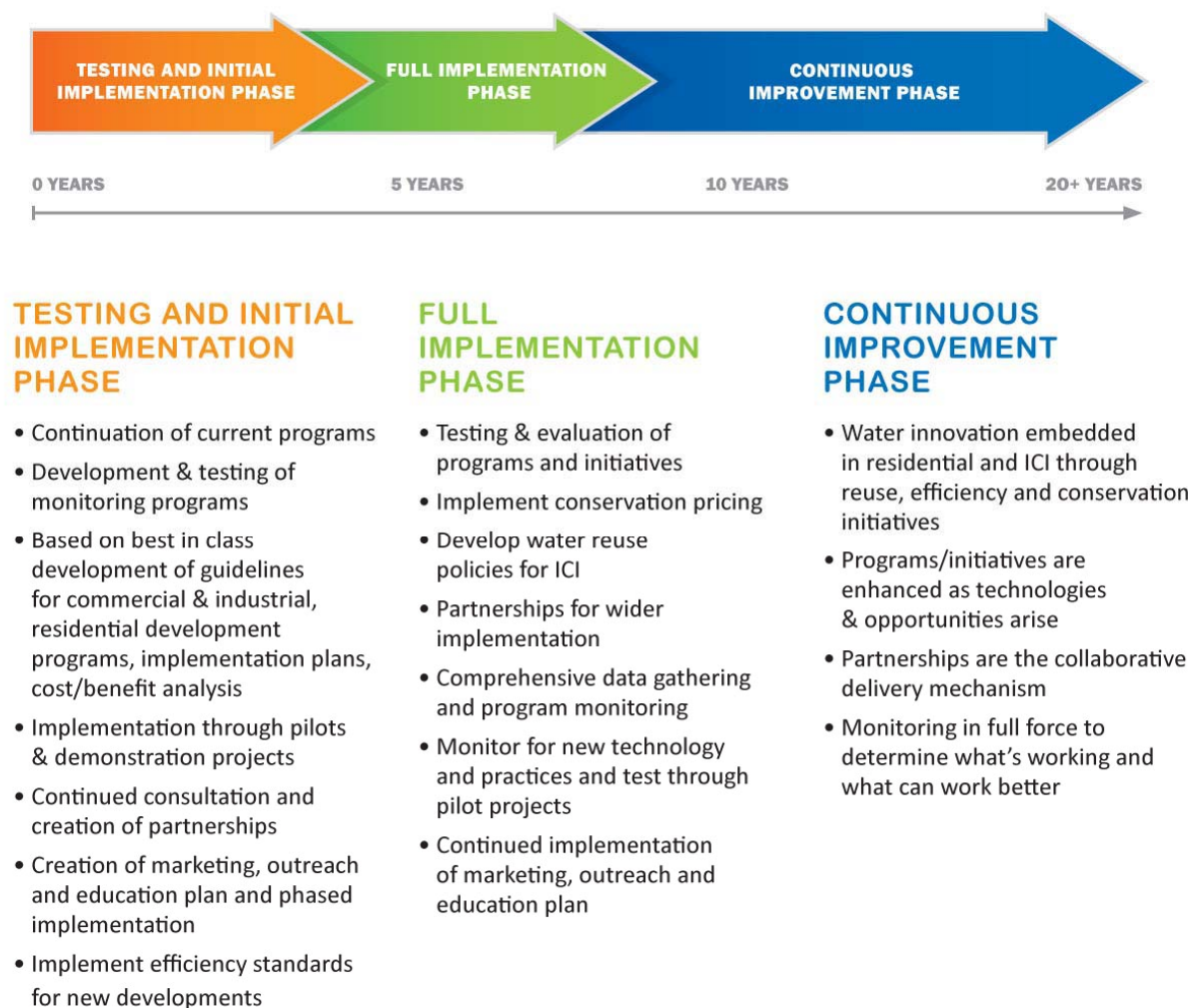


Table 4
Timeline of Detailed Implementation Planning

Program Components	New Programs	2011	2012	2013	2014	2015
New Developments	Develop plan to increase uptake of SHIP and LEED programs	start				
	Develop detailed monitoring program	start				
	Implement detailed monitoring					
	Create commercial industrial conservation and efficiency guideline	start				
	Pilot and demonstration projects					
Governance, Policies and Administration	Multi Stakeholder Advisory Group					
	Evaluate conservation based Pricing				start	
	Evaluate plumbing retrofits on resale homes			start		
	Develop annual measurement and reporting framework	start				
	Provincial Advocacy to encourage water efficiency					
	Incorporate results of LTWCS into infrastructure master plans			start		
Regional-Municipal System	Leak reduction					
	Develop process and implement monitoring and evaluation of water consumption	start				
	Guideline for retrofits of municipally owned buildings	start				
	Pilot and demonstration projects					
Financial Incentives	Capacity buy-back for industrial commercial institutional	start				
	Clothes washer installations for industrial commercial institutional	start				
	Evaluate low income incentive program				start	
	Evaluate multi unit meter subsidy			start		
Outdoor Water Use	Evaluate water efficient landscape design and assessment programs		start			
	Evaluate water conservation bylaw		start			
	Pilot Projects					

8. OPPORTUNITIES AND CONSTRAINTS

In the review of best-in-class jurisdictions in water conservation and efficiency, opportunities and constraints for York Region's LTWCS were identified and may be summarized as follows:

8.1 Opportunities

Many of the leading jurisdictions in water conservation and efficiency are located in areas where water availability for most of the year, and year in and year out, is a reality. As a result, there are national and/or provincial/state policies, programs and regulations in place which support water conservation programming.

- **Established Water Conservation and Efficiency Programming** – York Region's 10-plus year record of water conservation and efficiency is consistent with other leading jurisdictions which have an established pattern of conservation-oriented water management.

Consequently, the LTWCS is not a starting point, but rather, effectively builds on the success of existing Regional programs and processes.

- **Wholesaler Influence** – As a result of its wholesaler status, the Region can to a degree use policies and pricing to influence or motivate conservation and efficiency programming and practices at the local municipal level. In leading jurisdictions where there is a wholesale supplier and municipal/utility provider structure, pricing and contractual arrangements are used to drive conservation down to the consumer.
- **Partnerships** – Best-in-class jurisdictions, without exception, use partnerships and joint ventures with their municipal/utility clients and with other stakeholders to develop and deliver more impactful and cost-efficient water conservation and efficiency programs. **York Region is well positioned to utilize existing partnership to deliver programs and to foster new partnerships.** Strong connections with key stakeholders were made through the LTWCS public engagement and consultation process and there is a significant opportunity for the Region to cultivate these relationships into productive partnerships.

8.2 Constraints

The best-in-class review also highlighted possible barriers or constraints to achieving targeted water savings through the LTWCS. In some instances, the Region has the authority or the capacity to overcome or mitigate the constraint, in other instances; it is beyond the control and/or influence of the Region itself.

- Supporting Provincial Legislation and Regulations** – All best-in-class programs and practices by leading jurisdictions were backed by supporting state/provincial and/or national policies, programs and regulations. Leading countries in water conservation such as Australia, Spain, America, Germany and England have state and/or national requirements for water conservation and in some jurisdictions, such as California, actual reduction targets are set for all regions. This approach ensures a level playing field, creates a favourable market for water conservation products and services, and provides municipalities or water utilities with the tools they need to make water efficiency and conservation a reality.
- Ontario Plumbing and Building Code** – Of particular reference as a major obstacle to enforcing water efficient building standards is provincial Plumbing and Building Code. Section 35 of the Act stipulates that the Act and the code supersede all municipal by-laws and in the event that the “...Act or the building code and a municipal by-law (includes upper-tier municipalities) treat the same subject-matter in different ways with respect to standards... [the] Act or the building code prevails and the by-law is inoperative to the extent that it differs from [the] Act or the building code for the use of a building.”
- Climate** – Many leading jurisdictions in water conservation and efficiency are located in areas with arid or semi arid climates where water availability issues are a reality throughout the year and winter freezing is not a consideration. Certain initiatives, such as centralized grey water systems for irrigation, are not necessarily viable in York Region. Such systems are used in areas where there is year-round irrigation. In York Region, the season is about 3 to 4 months with high outdoor water demand for only about 2 of those months. This reality limits the ROI of such systems for York Region.
- Regional-Municipal Structure** – As an upper tier municipality comprised of nine local municipalities, the Region has limited authority in many areas pertaining to water conservation and efficiency. The local municipalities or their utility representatives are responsible for direct communications with customers and water billing; collection of customer water use data, planning and development approvals and the municipal portion of the water distribution system.

- **Soft Path** – Although it was chosen because of its innovative engagement process and holistic approach to water management, Soft Path is untested in a large upper tier Region with nine independent, local municipalities. In addition, there are two potential constraints associated with Soft Path. Firstly, scientific knowledge of water ecosystem needs is a new and evolving science and the scope of water sources to be taken into consideration is vast. Secondly, full cost accounting does not currently take into consideration the value of conserved water in terms of wastewater treatment, water source protection, etc., therefore there is an inherent bias toward conventional solutions.
- **Access to Water Use Data** – the local municipalities or their water utility providers are responsible for the collection of customer water use data. From a Regional perspective, two significant constraints exist. Firstly, it is often very difficult to secure the needed water use data and secondly, there is limited consistency in the data that is collected and supplied to the Region making analysis and comparisons difficult at best.
- **Planning and Development Approvals** – Local municipalities have primary responsibility for the review and approval of new construction. Best-in-class jurisdictions use incentives, such as expedited approvals and increased density allocations and disincentives such as increased development fees or surcharges to drive green building and the use of water conservation products and practices. In order to implement such leading initiatives, the Region will require the active participation of the local municipalities.
- **Water System** – Currently there is a lack of quantifiable data on water usage for construction and operation purposes and a lack of detailed condition and performance data on water mains. In conjunction, there is a significant cost associated with maintaining existing high risk water mains and there are competing demands to maintain water quality in the face of diminished water demand.

9. RECOMMENDATIONS

The recommendations in the Long Term Water Conservation Strategy came out of the best-in-class review and the assessment of the opportunities and constraints for water conservation and efficiency in York Region.

- **Provincial Legislation and Regulations** – For the province and its regional and local municipalities to truly be leaders in water conservation and efficiency it is imperative that the legislative and regulatory framework to support such programming be in place.
 - The Ontario Building and Plumbing Code should be modified to require water efficient appliances and fixtures
 - The sale of 13-litre toilets should be banned
 - Standardized water use data collection, reporting and billing should be a requirement for all municipalities and utility providers
 - Public reporting of water use and water savings data should be required.
- **Regional-Municipal Co-operation** – In order to address the complexities associated with a two-tier municipal structure it is recommended that the:
 - Region seek the endorsement of the LTWCS by the local municipal councils;
 - Water and Wastewater Steering Committee comprised of Regional and local municipal staff help direct and facilitate co-ordination and co-operation between relevant regional and municipal departments for the delivery of the strategy; and,
 - MOE provides a clear statement to local municipalities and their utility providers to furnish water use data in a format to be specified by the Region.

Soft Path – In order to address the potential constraints associated with the Soft Path approach it is recommended that implementation planning for the LTWCS program components employ Soft Path accounting practices and that there is on-going monitoring and updating of the methodology as required.

Water System – To address the constraints associated with the Regional-Municipal water supply system, it is recommended that the Region utilize the Regional-Municipal Water and Wastewater Steering Committee to facilitate co-ordination of planning, leakage detection, asset management, flushing programs and other system related matters.

9.1 Annual Monitoring and Reporting

York Region has established monitoring and reporting protocols and has undertaken on-going monitoring of its Water for Tomorrow conservation initiatives. Under the LTWCS, the Region will build on the existing monitoring program and employ additional metering, measuring and reporting mechanisms. Annual progress reports will be submitted to the MOE for their review and public reporting of water use savings and associated activities will also be carried out on an annual basis.

9.2 Updating the Long Term Water Conservation Strategy

The LTWCS will be implemented over a 40-year timeframe, therefore regular updating of the strategy will undertaken every five years to ensure it remains current and reflects any changes in provincial policies, programs and regulations; water using technologies and processes; climate; water resources and ecosystem health; building practices; and water pricing and associated accounting practices.

10. CONCLUSION

York Region has a proven record of water conservation and efficiency programs spanning more than a decade. This strategy expands on existing Regional plans, strategies and programs and sets the stage for innovative and jurisdiction-leading water conservation and efficiency programming for the next 40 years.

A peer review of the LTWCS by water conservation experts and program managers from leading jurisdictions across Canada and the United States has been undertaken. The comments and feedback received from the peer reviewers has been incorporated. The final, peer reviewed strategy will be submitted to the Ministry of the Environment for review and approval.

Roll out of the strategy will begin with the development of detailed implementation plans, including full cost-benefit analysis, ROI assessments, technology evaluations and resource assessments for the identified program components.

Long Term Water Conservation Strategy
Public Engagement - September - October 2010

List of Attendees

Chippewas of Georgina Island

Members of the Public

- Residents of Georgina
- Residents of Newmarket
- Residents of Richmond Hill
- Residents of Markham
- Residents of Thornhill
- Residents of East Gwillimbury
- Public School Students, Newmarket
- High School Students, Newmarket

Non-Government Organizations

Alliance for a Better Georgina
Ducks Unlimited
Eek Farms
Holland Marsh Grower's Association
Ladies of the Lake Conservation Association
North East Sutton Ratepayers Association
ReWilding Keswick Creeks Project
Save the Maskinonge
Social Service Network
The Moraine for Life
Transition York
Windfall Ecology Centre
Women's Centre of York Region
York Region Environmental Alliance
York Region Federation of Agriculture
York Simcoe Naturalists

Development Community

IBI Group

Metrus Development

Schaeffers Consulting Engineers

Educational Institutions

Seneca College

York Catholic District School Board

Other Associations/Organizations

Lake Simcoe Region Conservation Authority

Toronto Region Conservation Authority

CTC Source Water Protection Committee

PRO F&E Ltd

Lallibrook Consulting

Local Government

- City of Vaughan
- Regional Municipality of York
- Town of East Gwillimbury
- Town of Georgina
- Township of King
- Town of Markham