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ENVIRONMENTAL SERVICES 2011 STATE OF INFRASTRUCTURE UPDATE REPORT

The Environmental Services Committee recommends:

- 1. Receipt of the presentation by Lucas Cugalj, Director, Strategy and Business Planning, Environmental Services; and**
- 2. Adoption of the recommendation contained in the following report dated January 27, 2012, from the Commissioner of Environmental Services.**

1. RECOMMENDATION

It is recommended that:

1. The Regional Clerk forward a copy of the Environmental Services Department 2011 State of Infrastructure Update Report to the Clerks of the local municipalities.

2. PURPOSE

This report provides an update on the State of Infrastructure for Environmental Services through an overview of the 2011 State of Infrastructure Update Report.

3. BACKGROUND

York Region owns and operates over \$3 billion worth of water, wastewater and waste management infrastructure assets

Water, wastewater, and waste management services are essential to the excellent quality of life enjoyed by the residents of York Region. Well maintained infrastructure is critical to ensure that these services are delivered in a safe, reliable and efficient manner, while sustaining a growing community.

As part of the Region's commitment to proactively and transparently manage and communicate issues associated with delivery of environmental services, the first State of Infrastructure Report was completed in 2009 and reported to Council in April 2010. The report established a baseline for infrastructure assets in Environmental Services. This work included a detailed review of industry trends and best practices, as well as developed comprehensive criteria and methodology to derive infrastructure grades. It also

outlined the financial demands and commitments to maintain infrastructure in good and reliable condition.

In order to provide current information as a sound basis for sustainable asset management, it was decided to report on the State of Infrastructure on a bi-annual basis. An external engineering consultant was retained to produce the 2011 State of Infrastructure Update Report, which is an objective assessment of the current condition and performance of Environmental Services infrastructure assets. This will continue to assist in sustainable asset management through proactive analysis, prioritization and program planning for infrastructure rehabilitation upgrades. The detailed report is appended as *Attachment 1*.

4. ANALYSIS AND OPTIONS

Framework used for Environmental Services State of Infrastructure is built on three key Dimensions: Reliability, Capacity and Soundness

The same assessment methodology was used for the 2009 State of Infrastructure Report and the 2011 update. The focus of the reliability dimension is the overall reliability and quality of service of an asset. Reliability grading provides an assessment of the ability to meet quality and regulatory standards and uninterrupted service.

Capacity to meet demand measures the ability to ensure availability of supply is consistent with current and future demands. Knowing the capacity performance of assets can provide an early indication of negative impacts on services for customers and potential impacts on the sustainability of the community. For example, a lower grade in capacity would indicate that further infrastructure work is required to meet current and future demands.

Soundness is a measure of the physical condition of the infrastructure, its age and maintenance performance. This provides knowledge related to maintaining and enhancing asset condition and the efficiency and effectiveness of rehabilitation initiatives. Soundness provides an understanding of the remaining service life and functionality of the asset.

Dimension grades are determined based on the infrastructure ability to meet current and anticipated expectations

Dimension grades are determined based on the infrastructure and how fit it is for its current and anticipated purpose in terms of condition, regulatory requirements and capacity processes. Grades have an associated numeric score range which is based on the criteria used to assess the indicators and measures. Approximately 20 indicators and measures are analyzed for each dimension, graded and then rolled up to determine simple

alphabetic grades. Table 1 indicates the grade, associated numeric score range and description.

Table 1
Description of Dimension Grades

Grade	Numeric Score Range	Description
A	0 to 1.5	Excellent – like new
B	1.6 to 2.5	Good – functions as designed
C	2.6 to 3.5	Adequate – most areas meet the standard expected
D	3.6 to 4.5	Poor – performance is at a level of high risk
F	4.6 to 5	Very Poor – fails the lowest standard of condition

Since the overall grades are derived from the average of the numeric score associated with each individual alphabetic grade (not the simple average of alphabetic grade), actual scores can result in two A's and one B having an overall B grade. This is demonstrated in Table 2 where the average of the numeric score for reliability, capacity and soundness results in an overall numeric score of 1.6 which is a B.

Table 2
Example of Overall Grade Determination

	Reliability	Capacity	Soundness	Overall
Grade	B	A	A	B
Numeric Score	2.0	1.5	1.2	1.6

Methodology used for state of infrastructure grading is in line with industry best practices

A comprehensive review of industry best practices for state of infrastructure reporting was completed as part of the initial report in 2009. The Region's grading was developed based on methodologies from the American Society of Civil Engineers, the Cities of Hamilton and Ottawa and the Region of Durham. Specific grading of infrastructure in York Region has been modified to reflect the differing types of service delivery.

Trend analysis provides short term outlook to 2013

The trend analysis focuses on how an indicator or measure is likely to develop over the next two years. It considers a range of factors including new and planned projects and programs and how the outcomes of these initiatives are likely to impact infrastructure condition in the next two years. Trend analysis provides important knowledge on

effectiveness of future initiatives to enhance infrastructure conditions. Trends are identified as positive, neutral and negative as depicted in Table 3.

Table 3
Short Term (2-Year) Trend Analysis

Trend to 2013	Description
↑	Positive
→	Neutral
↓	Negative

York Region's water, wastewater and waste management infrastructure assets are in a good state

Many of York Region's water and wastewater assets were constructed in the 1970s and 80s with a significant amount being upgraded and expanded in the last ten years in response to approved growth in York Region. Some of the water and wastewater linear assets date back to the 1950s having been transferred from local municipalities when the Region was incorporated. The majority of the waste management assets were built to serve the needs of the Region in the last decade.

Grades for wastewater and waste management remain stable compared to 2009, while significant improvement is achieved for Duffin Creek WPCP and water infrastructure

Overall, the state of Region assets is adequate to good and each service area scored relatively well. Grades for service areas remain stable compared to 2009, with improvements realized for Duffin Creek Water Pollution Control Plant (WPCP) and water infrastructure. Trends remain positive in all service areas as a result of current and near term initiatives. Some notable examples of service enhancements include:

- Kennedy Road Watermain – Ensures reliable water supply in Markham from the expanded Milliken pumping station
- Southeast Collector Trunk Sewer – Ensures adequate wastewater conveyance capacity for growth across the Region to 2036 and beyond
- Durham York Energy Centre – Aimed to generate energy from waste in partnership with Durham Region to sustain Region's waste treatment needs

- Duffin Creek WPCP (Stage 3 Solids Phase) – Expands the wastewater treatment capacity to meet future growth across the Region

Duffin Creek WPCP is graded separately from other York Region wastewater assets because over 80 per cent of the Region's wastewater is treated at Duffin Creek, which is co-owned with Durham Region. This represents nearly half the total value of the Department's infrastructure.

All trends are positive for water, wastewater and waste management infrastructure to 2013 as a result of effective infrastructure rehabilitation and a rigorous planning process

Table 4 provides the overall current state of infrastructure for water, wastewater, waste management and Duffin Creek WPCP, including trends over the next two years.

Table 4
Comparison of State of Infrastructure Overall Service Grades
from 2009 to 2011 and Forecasted Trends to 2013

Service Area	2009	2011	Trend to 2013
Water	B	A	↑
Wastewater	B	B	↑
Waste Management	B	B	↑
Duffin Creek	C	A	↑
OVERALL	B	B	↑

These grades reflect the younger age of the newer asset base, rehabilitation efforts made through regulatory requirements, and the rigorous planning processes in place that support continued growth in York Region.

Water infrastructure capacity has improved and projects currently underway provide a positive trend

The Region's ability to maintain water infrastructure in good and reliable condition while meeting regulatory requirements, internal operating and compliance standards, and provision of uninterrupted service are key strengths in this service area. Contributing factors for improvement of the capacity grade include construction of new supply infrastructure, expansion to existing facilities and strategic programs, including the Long Term Water Conservation Strategy.

Opportunities for improvement in this area centre on continued efforts to gather infrastructure knowledge to further strengthen the ability for rehabilitation and

replacement planning. This will be achieved through the Infrastructure Management Program where regular condition and performance assessments are completed and prioritized for implementation as part the commitment to sustainable asset management.

All trends are positive for water infrastructure to 2013 as a result of capital projects underway to meet future demand and an effective servicing strategy

Trends for water infrastructure are positive to 2013 as water capital projects currently underway will provide additional capacity, and cost-shared servicing partnerships with Toronto and Peel Region will support the Region's long-term servicing strategy. Projects underway include the Richmond Hill (Pugsley) Pumping Station Upgrade, expansion of the Georgina water supply system and the Glenway Reservoir expansion. Table 5 provides the overall service grades for reliability, capacity and soundness respectively for water. The combination of strong A and B grades result in an overall A grade for water infrastructure.

Table 5
Comparison of Grades for Water Infrastructure
from 2009 to 2011 and Forecasted Trends to 2013

Dimension	2009	2011	Trend to 2013
Reliability	B	B	↑
Capacity	B	A	↑
Soundness	B	B	↑
OVERALL	B	A	↑

Note: Each alphabetic grade has an associated numeric range.
Actual scores resulted in an overall 'A' for 2011.

Wastewater capital program has successfully increased system capacity to meet the Region's current and future growth needs

The Region's ability to maintain wastewater infrastructure in good and reliable condition with effective operations and maintenance, proactive capital planning and rehabilitation, and relatively young asset base are key strengths in wastewater services. Council has approved key wastewater capital initiatives over the last several years, such as the Inflow and Infiltration Reduction Strategy, that provide secure wastewater infrastructure and capacity to achieve sustainable environmental priorities and meet the Region's current and future growth needs. Other projects underway include upgrades to the Leslie Street Pumping Station and the Keswick Water Pollution Control Plant expansion.

Opportunities in this area are centred on continued efforts to proactively manage the wastewater system through condition assessment and the Inflow and Infiltration (I&I) Reduction Program.

All trends are positive for wastewater infrastructure to 2013 as a result of the Region's continued efforts to enhance and upgrade existing facilities

The outlook for wastewater infrastructure is positive considering planned improvements to existing facilities, such as the rehabilitation of the Black Creek and Newmarket Pumping Stations, and enhancements to the Infrastructure Management and Renewals Programs. Table 6 provides overall service grades for reliability, capacity and soundness respectively for Wastewater.

Table 6
Comparison of Grades for Wastewater Infrastructure
from 2009 to 2011 and Forecasted Trends to 2013

Dimensions	2009	2011	Trend to 2013
Reliability	B	B	↑
Capacity	B	A	↑
Soundness	A	A	↑
OVERALL	B	B	↑

Note: Each alphabetic grade has an associated numeric range.
Actual scores resulted in an overall 'B' for 2011

Opening of Community Environmental Centres & upgrades to the Material Recovery Facility provide capacity for waste management

The Region's ability to provide waste management services with adequate capacity for current and future demand and the current condition of the assets are key strengths in this service area. Capacity improvement is the result of the successful opening of McCleary Court and Elgin Mills Community Environmental Centres and upgrades to the Material Recovery Facility.

Improved data for waste management facilities provided the ability to more accurately assess reliability in 2011 compared to 2009. This results in a change in the reliability grade based on limited availability of standby power at waste management facilities. This change in grade reflects a change in data quality, rather than a change in the state of infrastructure. Opportunities in waste management are centred on continued development of long term service agreements and relationships with external partners to enhance reliability and assurance in waste management services. This will be guided by the Integrated Waste Management Master Plan which is scheduled for completion in 2012.

All trends are positive for waste management infrastructure to 2013 as a result of the Region's efforts to implement sustainable waste management practices and solutions

The outlook for waste management is positive as the Region continues to develop environmentally, socially and financially sustainable waste management solutions, including the partnership with Durham Region on the Energy from Waste facility and class leading waste diversion programs. Table 7 provides overall service grades for reliability, capacity and soundness respectively for waste management.

Table 7
Comparison of Grades for Waste Management Infrastructure
from 2009 to 2011 and Forecasted Trends to 2013

Dimensions	2009	2011	Trend to 2013
Reliability	A	B	↑
Capacity	B	A	↑
Soundness	B	B	↑
OVERALL	B	B	↑

Positive outlook at Duffin Creek with impending construction impacts being managed

The Region's commitment to the expansion of the Duffin Creek WPCP and achievement in maintaining service during significant construction activities and growth within both Durham and York Regions are key strengths in this service area. Significant improvement is achieved for Duffin Creek WPCP as a result of the Stage 3 expansion.

Opportunities for improvement are centred on specific individual processes and equipment to meet future capacity, and are currently being addressed. Specifically, the Region has already planned and initiated Stage 1 & 2 upgrades, which are expected to be completed in 2017. Staging of upgrades are being managed to ensure sufficient treatment capacity at all times.

All trends are positive for Duffin Creek WPCP infrastructure to 2013 as a result of on-going initiatives to expand and enhance the facility

Trends for Duffin Creek WPCP are positive based on on-going capital initiatives, which total \$180 million over the next two years. These initiatives include Stage 3 process

expansion projects, such as an influent pumping station and two incinerators, as well as the rehabilitation and refurbishment of Stages 1 and 2 infrastructure. Table 8 provides the overall service grades for reliability, capacity and soundness respectively for Duffin Creek WPCP.

Table 8

Comparison of Grades for Duffin Creek WPCP Infrastructure
from 2009 to 2011 and Forecasted Trends to 2013

Dimensions	2009	2011	Trend to 2013
Reliability	B	A	↑
Capacity	D	A	↑
Soundness	B	B	↑
OVERALL	C	A	↑

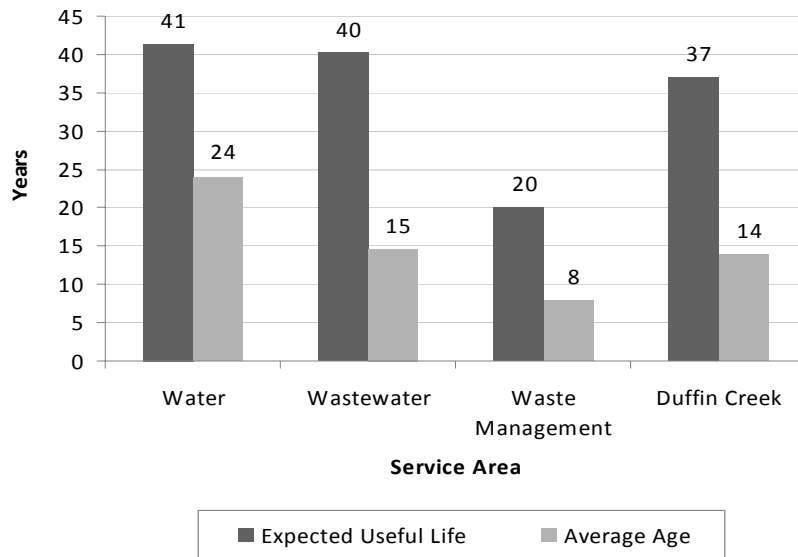
As Environmental Services continues to optimize the Department's performance by developing strategic asset management methods, one focus will be ensuring that these grades are sustainable in the long term by continuing to define and recommend the appropriate funding and resource commitment.

More than half the value of infrastructure assets has reached the midway point of the expected useful life

The expected useful life of these assets varies considerably from several years to several decades and reflects the varied nature of the assets themselves. The useful life is highly dependent on the lifecycle asset category. For example, instrumentation and control assets are expected to last in the 15 year range, process mechanical assets in the 30 year range, and structural assets in the 60 year range.

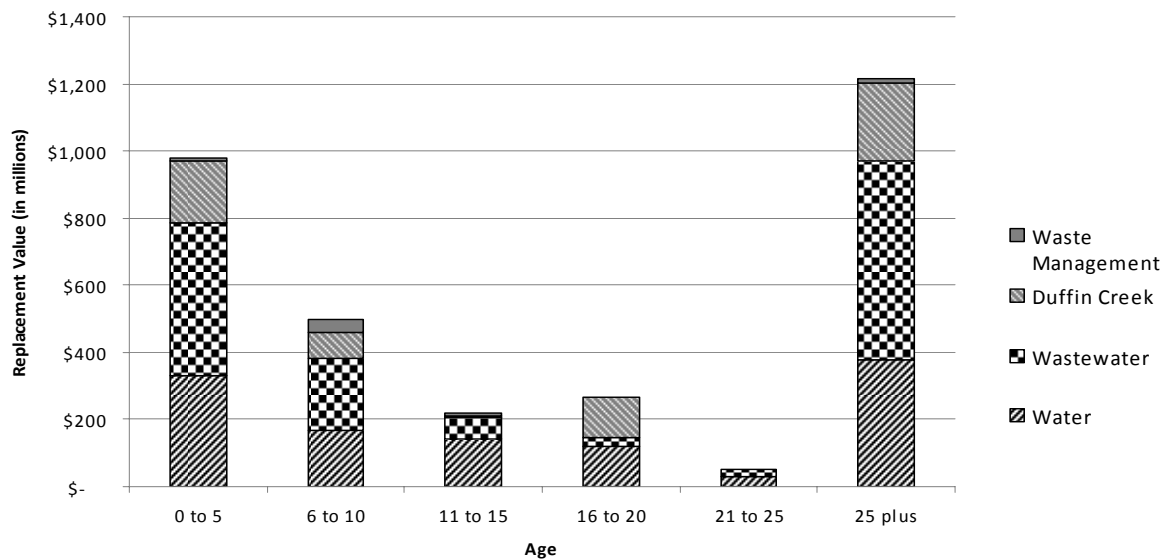
Figure 1 compares the average age with the average expected useful life of the Environmental Services infrastructure assets. The average age essentially represents how old assets are and the expected life represents how long they are expected to last notwithstanding any unforeseen issues. As can be seen in Figure 1, the average age of the assets is substantially less than the expected useful life for all asset categories.

Figure 1
Effective Service Life versus Average Age



As infrastructure ages, there are increasing financial demands to maintain the same level of reliable service. This presents challenges for provision of continued reliable service and represents a financial demand to maintain and replace assets. Figure 2 presents the current replacement value of infrastructure and the respective age.

Figure 2
Asset Value by Age Group



York Region has been developing a more focused approach to asset management since 2007 to strategically manage infrastructure

To ensure that future capital investments for rehabilitation and replacement are made most effectively, a strategic 10-year Infrastructure Improvement Plan has been developed by Environmental Services. The plan was developed to identify deficiencies, prioritize infrastructure projects, and determine appropriate resource levels. By developing these plans, rate models have been established with future requirements and reserves can continue to be built to match forecasted needs. The Infrastructure Improvement Plan is part of a broader Infrastructure Management Program within Environmental Services. The Infrastructure Management Program continues to develop and implement service levels required of infrastructure assets to meet customer expectations, as well as monitor asset performance to support infrastructure planning.

Link to Key Council-approved Plans

The State of Infrastructure Update Report aligns with the 2011-2015 Strategic Plan goals:

- Continue to deliver and sustain critical infrastructure – through proactive protection of our infrastructure and assets
- Manage the Region's finances prudently – working to optimize decision making to ensure funds are spent where and when they need to be in order to most efficiently use infrastructure and assets
- Strengthen organizational capacity – through implementation of best practices, continuous improvement, and efficient use of existing resources

5. FINANCIAL IMPLICATIONS

Lower financial grade for the current state of infrastructure reflects the need for continued financial commitments

The financial dimension measures the ability to meet the financial needs of rehabilitation and replacement over both short and long term periods. This information provides York Region with the underlying facts to understand whether reserves are sufficient to maintain current levels of service. The financial grade can be used to help establish predictable rates consistent with community expectations and values, while recognizing economic risks.

Current grades of the Region's Environmental Services infrastructure reflect the younger age of the asset base, rehabilitation efforts made through requirements of the *Safe Drinking Water Act*, and the rigorous planning processes in place that support the approved growth and infrastructure expansion in York Region. Table 9 shows the 2009

and 2011 Financial Dimension grades including trends for Environmental Services. The financial grade remains stable over the last two years. Trends for water, wastewater and waste management remain neutral while the trend for Duffin Creek is positive. The positive trend for Duffin Creek and the commitment to fund reserves moves the overall financial management trend from neutral to positive.

With responsible, prudent fiscal policies, sustainable financial strategies and proactive financial planning processes, York Region strives to ensure that programs and services are delivered to the community in an effective manner at reasonable cost. York Region's financial policies and practices ensure that ongoing operating requirements, as well as growth and development needs are financed in a fiscally responsible manner to meet the current and future needs.

Table 9
Grades for Financial Management

Service Area	2009	2011	Trend to 2013
Water	C	C	→
Wastewater	C	C	→
Waste Management	C	C	→
Duffin Creek	D	C	↑
OVERALL	C	C	↑

Regulations under the *Safe Drinking Water Act* encourage full cost recovery as a first step in developing a financially sustainable system

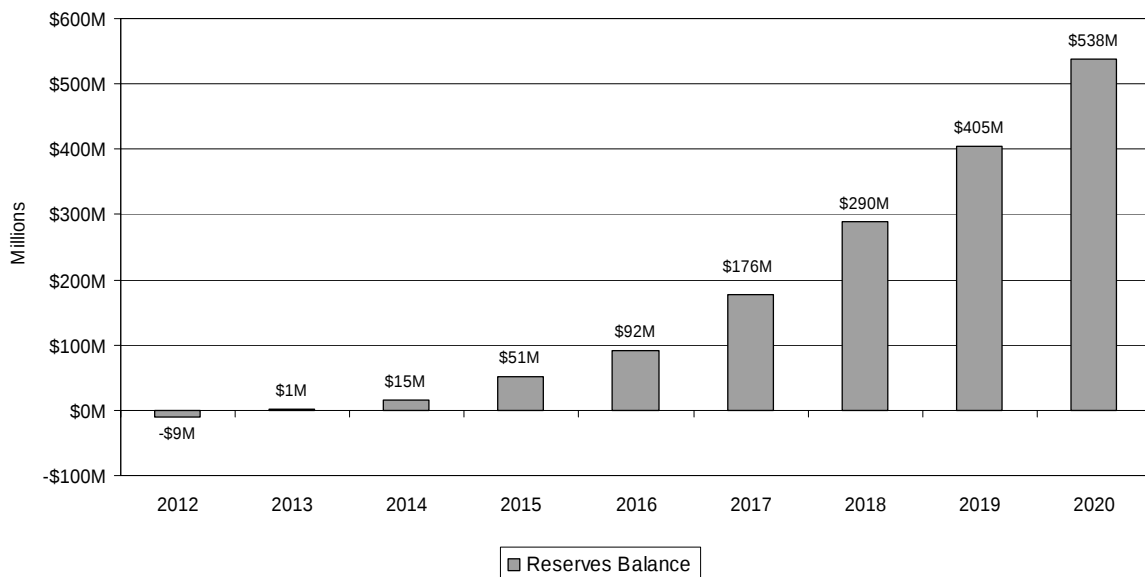
In 2010, Watson & Associates Economists Ltd. was engaged by the Region to prepare a study of future water and wastewater rates as part of the *Safe Drinking Water Act's* requirement for a Council approved Drinking Water Financial Plan. The study provided a long range projection of the Region's capital and operating budget, along with a preliminary review of the infrastructure replacement needs.

The study included a detailed inventory of all water and wastewater assets and contributions required to replace these assets at the end of their useful life. This study indicates that annual lifecycle replacement contributions of approximately \$14 million for water and \$19 million for wastewater are required to fund replacement needs. The 2012 budget includes reserve contributions of approximately \$7 million for water and \$15 million for wastewater. Forecasted reserve contributions remain close to these amounts until 2016, when reserve contributions will be increased to make up the current contribution shortfall.

Multi-year Council approved Water and Wastewater rate increase is key to building reserves in the long term

The May 2011 Council approval of an annual blended rate increase of 10% for water and wastewater user rates for the four-year period from April 1, 2012 to March 31, 2016 supports ongoing infrastructure requirements. The approved rate increases will ensure full cost recovery of the system and improve financial strength through increased reserve contributions. Based on this commitment from Council, reserves are projected to reach and maintain a sustainable level in 2020 and beyond as per Figure 3.

Figure 3
Total Water & Wastewater Reserves Forecast



Current target for water and wastewater reserve balances equal 20% of the replacement value of current infrastructure

In determining capital funding sufficiency, consideration is made for the timing of the capital needs, the annual amount being provided and the maintenance of a reserve. The 2011 water and wastewater rate review targeted reserve balances equal to 20% of the current replacement value of Environmental Services water and wastewater infrastructure.

The 20% target for reserves is based on the relatively young age of the asset base and the overall associated good condition of these assets. Replacement value of the Region's infrastructure is increasing due to the continued commitment to meeting growth requirements by constructing new assets. Since the 2009 State of Infrastructure Report,

capital expenditures have amounted to over \$1 billion. In addition, infrastructure projects scheduled for completion in the next ten years are expected to add about \$3 billion worth of assets to the Region's portfolio. Reserve balances will be continually monitored and the target balance will be re-evaluated during the next rate review as the asset base continues to grow and age.

The existing rate strategy is designed to ensure the necessary funding is in place to meet operating costs and long-term rehabilitation and replacement needs. The strategy also includes a phase-in approach to rate increases. As a result of phasing rate increases, the system is currently using all available revenue, including reserves to meet operating and capital obligations. The situation will improve as the rates reach their full value and proportionately more of the rate is focused on contribution to reserves.

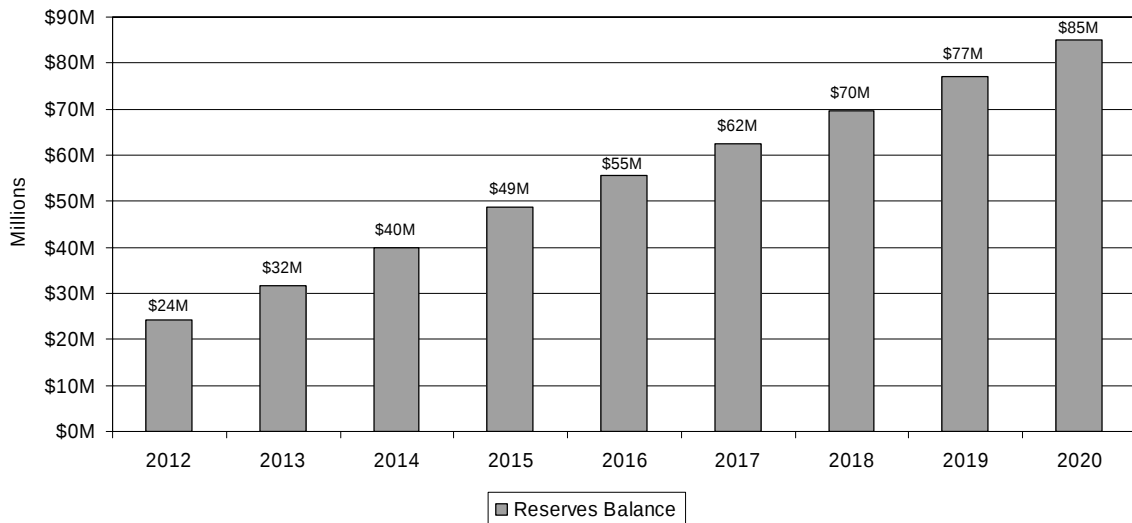
Waste Management reserve forecasted to increase over the coming years based on continued funding from WDO and market revenues

In addition to the building components, waste management facilities have mechanical equipment with moving parts that wear out over time and will need to be replaced at regular intervals over the life of the operation.

Revenue sources contributed to reserves include funding from Waste Diversion Ontario (WDO) and market revenues from the sale of recovered material. Since the establishment of the WDO, the Region has been allocating its share of Blue Box funding received (50% split with local municipalities) to the waste management reserve, which is now at approximately \$19 million.

The reserve fund is forecasted to increase over the coming years based on estimates for continued funding from WDO and market revenues as indicated in Figure 4. It is expected that major repairs, replacements and upgrades will be financed from reserves. Planned capital expenditures that will draw from the waste management reserve include the Durham York Energy Centre, the redesign of the Georgina Transfer Station to a community environmental centre like facility and a small portion designated for the potential Source Separated Organics Facility.

Figure 4
Total Waste Management Reserves Forecast
(assuming continued WDO funding past 2011)



Annual budget program is effective and reserves require continued funding

The annual budget program and the integration with identified rehabilitation needs in the water and wastewater service areas are key strengths. Increasing annual investment into financial reserves is a key area for improvement along with improving the knowledge of future rehabilitation and replacement funding requirements.

York Region has long-term sustainable financial management practices which have aided the Region in obtaining an AAA credit rating from both Moody's Investors Service and Standard & Poor's for the past 10 years. This continues to benefit the Region with favourable borrowing rates for financing major capital infrastructure projects.

In June 2010 Council approved the Water Financial Plan as required by the *Safe Drinking Water Act*. The Province released nine principles of financial sustainability for Water and Wastewater Services to assist municipalities with the development of financial plans. During the preparation of York's Water Financial Plan, York business processes were already in place to meet each of the nine principles of sustainability outlined by the Province.

York Region's long-term planning process and approved financial plans have the Region well positioned to enhance long-term financial reserves and to meet financial commitments.

6. LOCAL MUNICIPAL IMPACT

As the Region provides water, wastewater and waste management services to the local municipalities, they will benefit from the Region's proactive management of infrastructure assets.

York Region staff will continue to work with the local municipalities to support sustainable asset management practices through programs, such as Water for Tomorrow and the Inflow and Infiltration Reduction Program. With continued coordination and the development of business processes, best practices, technology and business resources, York Region and the local municipalities will continue to ensure sustainable environmental services.

7. CONCLUSION

The 2011 State of Infrastructure Update Report is a useful resource for focusing improvement efforts and fostering increased understanding of infrastructure issues among stakeholders.

York Region has been actively adopting sustainable asset management practices for the Region's water, wastewater, and waste management services. York Region has the opportunity to continue developing asset management programs at a time when the infrastructure is still relatively young. This is required to continue to provide high quality municipal infrastructure to ensure the community's growth, economic development, safety and quality of life.

Overall the reliability, capacity and soundness of the water, wastewater and waste management infrastructure are in a good state with assets and systems functioning as designed. The 10-year budget planning adequately supports the required commitment for asset management and Council's commitment to fund reserves ensures that, in the long term, services can continue to be delivered in a safe, reliable and efficient manner.

For more information on this report, please contact Lucas Cugalj, Director of Strategy and Business Planning at (905) 830-4444 Ext. 5041.

(The Council attachment referred to in this clause was included in the agenda for the February 8, 2012, Environmental Services Committee meeting.)

ENVIRONMENTAL SERVICES 2011 STATE OF INFRASTRUCTURE UPDATE REPORT

Presentation to
Environmental Services Committee

Lucas Cugalj
February 8, 2012



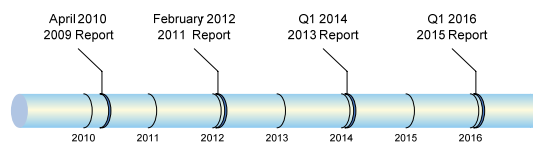
Agenda

- ❑ Background
- ❑ Overview of Infrastructure Assets
- ❑ Framework
- ❑ 2011 State of Infrastructure
- ❑ Recommendation



Background

- ❑ 2009 State of Infrastructure Report established a baseline grade for infrastructure supporting Environmental Services
- ❑ 2011 State of Infrastructure Update Report is based on current information and provides a sound basis for sustainable asset management
- ❑ Similar methodology used in Ottawa, Hamilton and Durham Region
- ❑ Report produced on a bi-annual basis



**Supports the 2011 to 2015 Strategic Priority Area:
Continue to Deliver and Sustain Critical Infrastructure**



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Slide 3

Overview of Infrastructure Assets

- ❑ York Region owns and operates over \$3 billion of water, wastewater and waste management infrastructure assets
- ❑ 10 year capital plan adds another \$3 billion in infrastructure assets



**Over \$6 billion in built water, wastewater and
waste management assets by 2020**



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Slide 4

Sustainable Asset Management



- ❑ Manage risk
- ❑ Make effective decisions
- ❑ Optimize process
- ❑ Prioritize capital projects and maintenance
- ❑ Minimize life cycle cost
- ❑ Sustainable funding

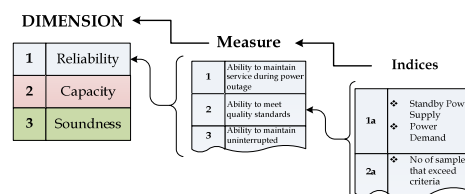
Council support of sustainable asset management practices ensures good return on investment for Regional infrastructure

Framework: Grades

Dimension Grades

A	EXCELLENT Like new
B	GOOD - Assets and systems function as designed
C	ADEQUATE Most areas meet the standard expected
D	POOR Performance is at a level of high risk
F	VERY POOR - Falls the lowest standard of condition

Grading System



Compare 2009 to 2011



Financial grading treated separately

Framework: Example of Grades



Grade: A



Grade: B



Grade: C



Grade: D



Grade: F (not a York Region asset)

Framework: Trends

Trend to 2013	Description
↑	Positive
→	Neutral
↓	Negative



- ❑ How an indicator or measure is likely to change in the future
- ❑ Considers a range of performance issues

Trends provide analysis on the short term outlook to 2013

State of Infrastructure: Overall Grades

Service Area	2009	2011
Water	B	A
Wastewater	B	B
Waste Management	B	B
Duffin Creek	C	A
OVERALL	B	B

Positive Results

- ❑ Effective, safe and secure operations
- ❑ Improved capacity to meet demand
- ❑ Ability to provide service

Opportunity for Improvement

- ❑ Continued development of condition assessment program as infrastructure ages



Grades improved since 2009, while significant improvement is achieved for drinking water assets and Duffin Creek



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Slide 9

State of Infrastructure: Overall Trends

Service Area	Trend to 2013
Water	↑
Wastewater	↑
Waste Management	↑
Duffin Creek	↑
OVERALL	↑

Trend

- ❑ Durham York Energy Centre and capacity increase at Duffin Creek have contributed to positive results



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Slide 10

State of Infrastructure: Water Grades

Dimension	2009	2011
Reliability	B	B
Capacity	B	A
Soundness	B	B
OVERALL	B	A



Action Since 2009

- ❑ Long Term Water Conservation Strategy
- ❑ Expansion of Georgina WTP (Phase 1)
- ❑ Stouffville Water Supply System

Opportunity for Improvement

- ❑ Continued development of condition assessment program as infrastructure ages

Water infrastructure capacity has improved and capital projects currently underway provide a positive trend



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Slide 11

State of Infrastructure: Water Trends

Dimension	Trend to 2013
Reliability	↑
Capacity	↑
Soundness	↑
OVERALL	↑

Trend

- ❑ Positive as a result of projects such as the Kennedy Road Watermain and the Glenway Reservoir Expansion



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Slide 12

State of Infrastructure: Wastewater Grades

Dimension	2009	2011
Reliability	B	B
Capacity	B	A
Soundness	A	A
OVERALL	B	B



Action Since 2009

- ❑ Inflow and Infiltration Reduction Strategy
- ❑ Nobleton & Schomberg WPCP
- ❑ Expansion of Kleinburg WPCP

Opportunity for Improvement

- ❑ Continued development of condition assessment program as infrastructure ages

Wastewater capital program has successfully increased system capacity to meet the Region's current and future growth needs



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Slide 13

State of Infrastructure: Wastewater Trends

Dimension	Trend to 2013
Reliability	↑
Capacity	↑
Soundness	↑
OVERALL	↑

Trend

- ❑ Positive as a result of projects such as the Southeast Collector and the Queensville Holland Landing Sharon – YDSS Connection



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Slide 14

State of Infrastructure: Waste Management Grades

Dimension	2009	2011
Reliability	A	B
Capacity	B	A
Soundness	B	B
OVERALL	B	B



Action Since 2009

- ❑ Opened two new Community Environmental Centres
- ❑ Upgrades to the Material Recovery Facility
- ❑ Integrated Waste Management Master Plan

Opportunity for Improvement

- ❑ Continued development of service agreements and delivery of capital infrastructure to accommodate growth and increased diversion

Opening of Community Environmental Centres & upgrades to the Material Recovery Facility provide capacity for waste management



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Slide 15

State of Infrastructure: Waste Management Trends

Dimension	Trend to 2013
Reliability	↑
Capacity	↑
Soundness	↑
OVERALL	↑

Trend

- ❑ Positive as a result of projects such as Durham York Energy Centre



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Slide 16

State of Infrastructure: Duffin Creek WPCP Grades

Dimension	2009	2011
Reliability	B	A
Capacity	D	A
Soundness	B	B
OVERALL	C	A



Action Since 2009

- ❑ Stage 3 liquids process expansion
- ❑ Project ranked in top 100 Infrastructure projects in 2010

Opportunity for Improvement

- ❑ Process Optimization
- ❑ Address outfall capacity limitations

Stage 3 expansion has significantly improved Duffin Creek WPCP



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Slide 17

State of Infrastructure: Duffin Creek WPCP Trends

Dimension	Trend to 2013
Reliability	↑
Capacity	↑
Soundness	↑
OVERALL	↑



Trend

- ❑ Positive as a result of projects such as the Stage 3 Process Expansion and Stage 1 & 2 liquids upgrades and refurbishment



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Slide 18

State of Infrastructure: Financial Management

Service Area	2009	2011	Trend to 2013
Water	C	C	→
Wastewater	C	C	→
Waste Management	C	C	→
Duffin Creek	D	C	↑
OVERALL	C	C	↑

Action Since 2009

- ❑ Council approved multi-year 10% blended rate increase to build reserves
- ❑ AAA credit rating
- ❑ Water Financial Plan Submitted

Opportunity for Improvement

- ❑ Reserve funding (to begin in 2014)

Trend

- ❑ Positive due to rehabilitation and replacement commitment to Duffin Creek and long-term commitment to building capital reserves

Well positioned to enhance long-term financial reserves



Environmental Services Committee / February 8, 2012

Slide 19

Report Card

	2009	2011	Trend to 2013
ENVIRONMENTAL SERVICES DEPARTMENT	B	B	↑ Grades remain stable compared to 2009, while significant improvement is achieved for drinking water assets and Duffin Creek
WATER	B	A	↑ Water infrastructure capacity has improved and capital projects currently underway provide a positive trend
WASTEWATER	B	B	↑ Wastewater capital program has successfully increased system capacity to meet the Region's current and future growth needs
WASTE MANAGEMENT	B	B	↑ Opening of Community Environmental Centres & upgrades to the Material Recovery Facility provide capacity for waste management
DUFFIN CREEK WPCP	C	A	↑ Stage 3 expansion has significantly improved Duffin Creek WPCP
FINANCIAL	C	C	↑ Well positioned to enhance long-term financial reserves

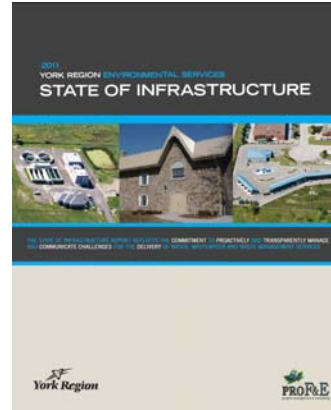


Environmental Services Committee / February 8, 2012

Slide 20

Recommendation

- ❑ The Regional Clerk forward a copy of the Environmental Services Department 2011 State of Infrastructure Update Report to the Clerks of the nine local municipalities.



The State of Infrastructure Report reflects the commitment to proactively and transparently manage service delivery

2011

YORK REGION ENVIRONMENTAL SERVICES

STATE OF INFRASTRUCTURE



THE STATE OF INFRASTRUCTURE REPORT REFLECTS THE COMMITMENT TO PROACTIVELY AND TRANSPARENTLY MANAGE AND COMMUNICATE CHALLENGES FOR THE DELIVERY OF WATER, WASTEWATER AND WASTE MANAGEMENT SERVICES.

2011 STATE OF INFRASTRUCTURE	1
WATER	2
WASTEWATER	2
WASTE MANAGEMENT	2
DUFFIN CREEK WPCP	3
FINANCIAL	3
1 BACKGROUND	4
1.1 ENVIRONMENTAL SERVICES PROGRAMS & INITIATIVES	5
1.1.1 FROM VISION TO RESULTS: 2011 TO 2015 STRATEGIC PLAN.....	5
1.1.2 INTEGRATED WASTE MANAGEMENT MASTER PLAN.....	5
1.1.3 WATER CONSERVATION AND EFFICIENCY.....	6
1.1.4 SUSTAINABILITY.....	7
1.1.5 WATER & WASTEWATER MASTER PLAN UPDATE.....	7
1.1.6 CAPITAL CONSTRUCTION PROGRAM	8
1.1.7 INFLOW AND INFILTRATION REDUCTION PROGRAM	8
2 MEASURING THE STATE OF INFRASTRUCTURE	10
2.1 GRADING DIMENSIONS	10
2.1.1 RELIABILITY	10
2.1.2 CAPACITY	10
2.1.3 SOUNDNESS.....	11
2.1.4 FINANCIAL	11
2.2 GRADING SYSTEM	11
2.3 DATA.....	12
2.4 TREND TO 2013	12
2.5 FACILITY TYPE	13
3 OVERVIEW OF 2011 RESULTS	14
3.1 RELIABILITY	15
3.2 CAPACITY	17
3.3 SOUNDNESS.....	18
3.4 FINANCIAL	20
4 WATER	23
4.1 RELIABILITY	24
4.2 CAPACITY	25
4.3 SOUNDNESS.....	26

5	WASTEWATER	29
5.1	RELIABILITY	30
5.2	CAPACITY	31
5.3	SOUNDNESS.....	33
6	WASTE MANAGEMENT	35
6.1	RELIABILITY	36
6.2	CAPACITY	37
6.3	SOUNDNESS.....	39
7	DUFFIN CREEK	40
7.1	RELIABILITY	41
7.2	CAPACITY	41
7.3	SOUNDNESS.....	43
8	FINANCIAL	45
8.1	REHABILITATION & REPLACEMENT BUDGET.....	45
8.2	RESERVE.....	46
8.2.1	WATER & WASTEWATER RESERVE.....	47
8.2.2	WASTE MANAGEMENT RESERVE	48
9	DATA MANAGEMENT	49

APPENDIX A: INFRASTRUCTURE MAPS 51

APPENDIX B: DEPARTMENT SERVICES FLOWCHARTS..... 54

List of Figures

Figure 2-1: Dimension Grades 10

Figure 2-2: Grading System 11

Figure 2-3: Trend Analysis 12

Figure 3-1: Asset Replacement Value by Age Group..... 21

Figure 3-2: 10 Year Business Plan Budget & Infrastructure Replacement Value 22

Figure 6-1: Organics Collection & Processing..... 37

Figure 6-2: Annual Quantity of Solid Waste Managed 2005-2014 38

Figure 7-1: Duffin Creek WPCP Projected Flows and Capacity to 2018 42

Figure 9-1: Data Confidence 49

List of Tables

Table 3-1: Department State of Infrastructure Service Grades 14

Table 3-2: Reliability Grades..... 16

Table 3-3: Capacity Grades..... 17

Table 3-4: Soundness Grades 19

Table 3-5: Financial Grades 20

Table 4-1: Water Service Grade 23

Table 4-2: Water Reliability Grade 24

Table 4-3: Water Capacity Grade 25

Table 4-4: Water Soundness Grade..... 26

Table 5-1: Wastewater Service Grade 29

Table 5-2: Wastewater Reliability Grade..... 30

Table 5-3: Wastewater Capacity Grade..... 32

Table 5-4: Wastewater Soundness Grade 33

Table 6-1: Waste Management Services Grade 35

Table 6-2: Waste Management Reliability Grade 36

Table 6-3: Waste Management Capacity Grade 38

Table 6-4: Waste Management Soundness Grade..... 39

Table 7-1: Duffin Creek Service Grade 40

Table 7-2: Duffin Creek Reliability Grade 41

Table 7-3: Duffin Creek Capacity Grade 42

Table 7-4: Duffin Creek Soundness Grade..... 43

Table 8-1: Financial Grades 45

2011 State of Infrastructure

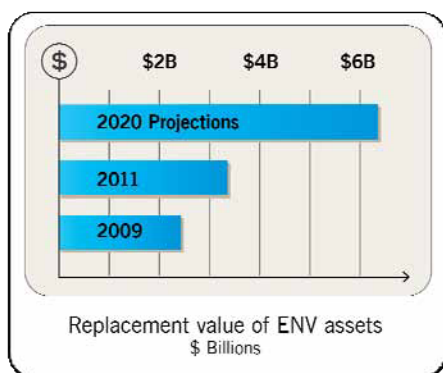
	2009	2011	Trend to 2013
ENVIRONMENTAL SERVICES DEPARTMENT	B	B	⬆
Water	B	A	⬆
Wastewater	B	B	⬆
Waste Management	B	B	⬆
Duffin Creek WPCP	C	A	⬆
FINANCIAL	C	C	⬆

In 2009 the Environmental Services Department of York Region developed a rigorous, repeatable assessment process for the state of water, wastewater and waste management infrastructure to raise the awareness of the public, Council and other stakeholders about current infrastructure issues. In addition to highlighting strengths and opportunities for infrastructure management, this process also provided an objective basis to confirm infrastructure investment decisions.

Updating the State of Infrastructure Report (SOIR) in 2011 reflects the commitment to proactively and transparently manage and communicate challenges for the delivery of water, wastewater and waste management services. A trend comparison and future outlook is possible by comparing the grades between 2011 and 2009 and considering the direction and intentions of the Department in managing assets and delivering the service.

Current grades for the Region's environmental services infrastructure reflect both the relatively young age of the assets and the proactive programs in place for the management and operations of them.

Overall the **B** grade is stable from the 2009 State of Infrastructure Report with a positive outlook or trend for the future. Challenges remain to complete condition assessment and life cycle analysis of the infrastructure and to complete rehabilitation and replacement in the face of competition for project resources including staffing and funding.



WATER

The overall State of Infrastructure grade for Water is an **A**, which demonstrates the Region's continued commitment to provide customers with reliable service with the Region remaining among the highest ranked municipal water suppliers in the Province. York Region attained the Ministry's water quality standards 99.99% of the time with a facility compliance rate of 99.8%. This is a direct result of the commitment to operational excellence and capital improvements to water infrastructure.

Provision of water services through partnerships with Toronto and Peel Region is a key component of the Region's long-term servicing strategy. A number of projects in Toronto and Peel Region are currently underway to provide capacity to service growth in the Region.

In light of the increasing and pressing need to efficiently manage scarce water resources and ensure long term water supply to a growing Region, there has been renewed focus on preserving water through conservation efforts. To enhance York Region's commitment to a sustainable environment and services, a Long Term Water Conservation Strategy for a 20 year planning horizon has been developed.

WASTEWATER

Overall the Region provides a highly reliable service and achieves a grade of **B**. The sewer and wastewater treatment systems in York Region are generally well-run and comply with regulatory requirements. Consistent and comprehensive advocacy on emerging legislation has kept the Region in the forefront of meeting and exceeding regulatory quality requirements.

A number of factors contribute to variability in the condition and performance of wastewater infrastructure (sewers, pumping stations and treatment plants) such as age of systems, operating conditions, and rainfall-related flows. Environmental Services has a proactive Infrastructure Management Program to monitor performance of the Region's water and wastewater infrastructure through comprehensive inventory, inspection, condition assessment and maintenance initiatives. Ongoing investment in infrastructure management and renewal resulted in an improvement in the Soundness dimension.

Another major improvement in the 2011 Wastewater grades is in the Capacity dimension, where the service area achieved an A grade based on an increased ability to service the Region's current demands and growth needs.

WASTE MANAGEMENT

The overall grade for Waste Management is **B** with a positive trend for the future years. The current program is well managed and planned with sufficient capacity for the foreseeable future. Services to regional residents and businesses are provided by the Region through a robust program of Regional owned and operated infrastructure, purchased services from public and private enterprises, Region owned and privately operated infrastructure, and local municipal services.

Recently several of the Region's waste management facilities (Household Hazardous Waste Facilities and Community Environmental Centres) obtained compliance with Environmental Management quality systems and achieved ISO 14001 registration. ISO 14001 is a tool that can be used to meet internal objectives or standards as well as provide assurance to management that it is in control of the organizational processes and activities having an impact on the environment.

In 2010, waste diversion accounted for an approximately 52% reduction in solid waste delivered to landfills and this number continues to grow as more waste diversion is achieved. Electronic waste collection and household hazardous waste drop-off centres have greatly expanded on the capabilities of the Region to divert and process waste material generated within the Region.

DUFFIN CREEK WPCP

The overall grade for Duffin Creek is an **A** reflecting the recent effort and work to upgrade and expand the facility. The grade for Reliability has improved to an A as the strain from operating near or at capacity has been reduced with the completion of new and expanded facilities. With the investment in new facilities, the capacity grade is also now an A with sufficient capacity to support growth over the coming 10-15 years. A heightened sense of awareness of the need for more action on capital rehabilitation and replacement has been gained through the intensive planning undertaken to support expansion plans. This has translated into better data for capital plans that are reflected in the Region's current 10 year business plan.

FINANCIAL

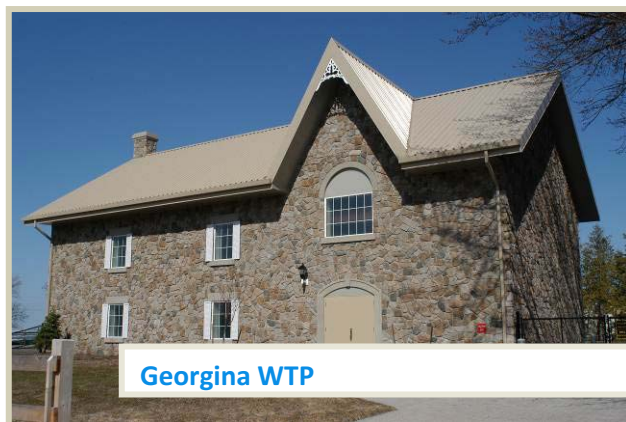
Managing municipal services in a sustainable manner to ensure system reliability requires funding to be in place and for dollars to be spent on the required infrastructure improvements at the right time and for the right reason. This requires a combination of long range planning for future replacement needs with short and near term planning for rehabilitation and improvements. Requirements to finance infrastructure for identified ongoing rehabilitation, expansions to accommodate growth and build a long term reserve to stabilize annual budgets remain the biggest challenge for the Region. The

C grade for Financial reflects the Region's strong financial policies and practices, as well as the challenge of building and maintaining financial reserves. In addition to long-term planning for capital and operating budgets and a history of meeting fiscal targets, York Region adheres to conservative debt and investment management policies. Thus while challenged, the outlook for the Region's financial state of infrastructure is positive.

1 BACKGROUND

The Environmental Services Department is responsible for delivering water, wastewater and waste management services to 1.1 million residents. To provide these services York Region owns and operates over \$3 billion of infrastructure. This is an increase of almost \$1 billion since the 2009 State of Infrastructure Report.

The Environmental Services Department delivers wholesale supply of drinking water to York Region's nine local municipalities. The Department is also responsible for the collection and treatment of wastewater. Water and wastewater functions include the operation and maintenance of transmission watermains and major sanitary sewers, pumping stations, water storage facilities, production wells and treatment plants. Water and wastewater service is provided through a combination of Region infrastructure and partnerships with the City of Toronto, and Peel and Durham Regions.



Georgina WTP

The Department's waste management responsibilities include the planning, operations, financing and delivery of environmentally sound solid waste diversion and disposal services that ensures public health and safety. This includes source separated organics and blue box processing, management of public drop-offs, and transportation and disposal of municipally-collected waste.



Nobleton WPCP

The Department manages performance of York Region's Water, Wastewater and Waste Management assets with a proactive program of Infrastructure Management utilizing the principles of asset management.

The State of Infrastructure Report establishes a quantifiable baseline from which to measure progress. It is a useful resource providing the ability to focus improvement efforts as well as foster understanding regarding the state of infrastructure.



Vaughan Community Environmental Centre

1.1 ENVIRONMENTAL SERVICES PROGRAMS & INITIATIVES

York Region continues to adopt sustainable business management practices for the Region's water, wastewater, and waste management services. A description of current Department initiatives provides an understanding and context to the state of infrastructure.

1.1.1 From Vision to Results: 2011 to 2015 Strategic Plan

From Vision to Results: 2011 to 2015 Strategic Plan serves to officially align Regional departments with Council's goals by establishing a hierarchy of planning processes that direct department plans and budgets, as well as individual performance plans. The plan is intended to set the specific course of action for this term of Council to ensure the Region meets its long-range Vision.

The plan houses seven strategic priority areas of focus. These priority areas are supported by clearly stated objectives that translate into concrete measures of progress. The plan will be tracked, measured and reported to Council throughout the term of Council to ensure the objectives are met in the timeframe required.



The Environmental Services Department has integrated and aligned plans and activities for water, wastewater and waste management services with the Corporate Strategic Plan. Samplings of the current Department initiatives are highlighted below.

1.1.2 Integrated Waste Management Master Plan



Success of York Region's waste management programs, including ranking number one in Waste Diversion Ontario's Large Urban grouping in 2009 and 2010, is a direct result of collaboration with the local municipalities and a highly engaged public. The SM4RT

LIVING project focuses on reducing the amount of waste created and maximizing the amount of waste diverted to beneficial re-use. Through SM4RT LIVING, opportunities to achieve a more sustainable and environmentally responsible future are being investigated.

An Integrated Waste Management Master Plan (IWMMP) presents a blueprint for reducing solid waste and managing solid waste that is generated, reduced, reused, recycled, or disposed by York Region residents and businesses. It establishes a broad policy framework for solid waste management in York Region over the next 25 years.

1.1.3 Water Conservation and Efficiency

The Region has more than a decade of successful conservation and efficiency programming. Through *Water for Tomorrow* York Region is saving an estimated 23.7 million litres of drinking water each day.



The Long Term Water Conservation Strategy recommends a suite of enhanced conservation program components to provide York Region with the framework to reduce potable water demand as the population grows. Recommended programs were developed based on results of a best in class review of water conservation and efficiency programs world-wide and on input from members of the Alliance for Water Efficiency peer reviewers. Program components include:

- Governance and Administration
- Policies and Bylaws
- Rebates and Other Financial Instruments
- New Development
- Full Cost Recovery Conservation-Oriented Pricing
- Marketing, Outreach and Education
- Municipal Infrastructure

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.

Promoting water conservation increases the population the Region can service with the existing water infrastructure. These efforts reduce current demand and decrease the probability of operating assets at or above capacity levels effectively extending the remaining life and capacity of the built infrastructure. Total water savings is currently 23.7 million litres of water per day which is enough water to service a community of approximately 90,000 people.

1.1.4 Sustainability



York Region and its nine local municipalities are part of a broader economic region where over 6 million people live, work and play. Sustainability is the lens through which York Region formulates, enhances and implements policy. The award-winning *York Region Sustainability Strategy: Towards a Sustainable Region*

provides a long term framework for making smarter decisions about all municipal responsibilities that fully evaluates economic, environmental and community considerations.

York Region is committed to a sustainable approach to growth. A key element of this approach includes achieving high standards in new construction. While Provincial policy supports sustainable community development and green buildings, the Ontario Building Code does not yet include some of the advanced energy efficiency/sustainability measures, including green building design and materials, water and energy use endorsed in the Region official plan.

Environmental Services Department sustainability measures include:

- Moving forward with results from energy audits at several wastewater facilities
- Developing a sustainable procurement strategy for operations, maintenance and monitoring of water and wastewater services
- Exploring opportunities for improving facility energy management and improving vehicle fuel efficiency



Passive Solar Heating Wall on Mount Albert WPCP

1.1.5 Water & Wastewater Master Plan Update

In November of 2009, York Regional Council endorsed the Water and Wastewater Master Plan (Master Plan) Update. The Master Plan provides the Region's water and wastewater servicing plan to the year 2031 and provides an outlook for sustainable servicing to the year 2051.

The Master Plan Update makes more than 50 policy and program recommendations supporting sustainable water and wastewater servicing. The total gross cost for water and wastewater capital projects and supporting programs is approximately \$6.6 billion to the year 2051.

The Master Plan Update included a five-year action plan, to 2016, focused on plans and programs needed to successfully deliver services in a way that would protect and enhance its natural environment, ensure healthy communities, and promote on-going economic vitality. Ongoing work on this five-year action plan includes:

- Implementation of water and wastewater capital projects such as West Richmond Hill Pumping Station, South East Collector Truck Sewer, and Upper York Sewage Solutions (UYSS) Individual Environmental Assessment
- Regional Official Plan Amendments
- Programs for ensuring safe and clean drinking water such as Source Water Protection and Drinking Water Quality Management System (DWQMS)
- Implementation of Inflow and Infiltration (I&I) Reduction Strategy with local municipalities
- Implementation of Long Term Water Conservation Strategy
- Development of Climate Change Strategy

1.1.6 Capital Construction Program

This program corresponds directly with the Corporate Strategic goal to Continue to Deliver and Sustain Critical Infrastructure. Through the capital construction program, the Regional Municipality of York demonstrates its commitment to ensuring the health of the natural environment, meeting the essential infrastructure needs of its residents and communities while maintaining its economic vitality as outlined by the triple bottom line objectives in the Official Plan.



In 2011 the Capital Planning and Delivery Branch created an environmental support program to ensure that environmental legislation and related policies and procedures are adhered to during the delivery and implementation of water and wastewater infrastructure projects, with the goal of maintaining the quality of the systems used while minimizing harmful impacts on the surrounding environment. The Capital Planning and Delivery Branch also has members of the construction team trained as Certified Inspectors of Sediment and Erosion Control.

1.1.7 Inflow and Infiltration Reduction Program

The Regional Municipality of York and its nine local municipalities have taken a leadership role within the province of Ontario by developing and committing to the implementation of a 20 year strategy to address sustainable growth through a comprehensive Inflow and Infiltration Reduction Program. This ongoing innovative initiative, the largest of its kind in Canada, has identified industry best practices and cost effective methods to reduce inflow and infiltration. Increasing system capacity by constructing new infrastructure is necessary to accommodate increasing demand and alleviate pressure from wet weather flows, but is not always a proactive or sustainable approach to growth. The Inflow and Infiltration Reduction Program helps optimize operational efficiency and lifecycle of both existing and future sewage infrastructure, better positioning York Region to maintain sustainable service for the long term.



Completion of detailed studies will provide a full suite of inflow and infiltration reduction measures that are available for all local municipalities and the Region to use in ongoing asset management programs.

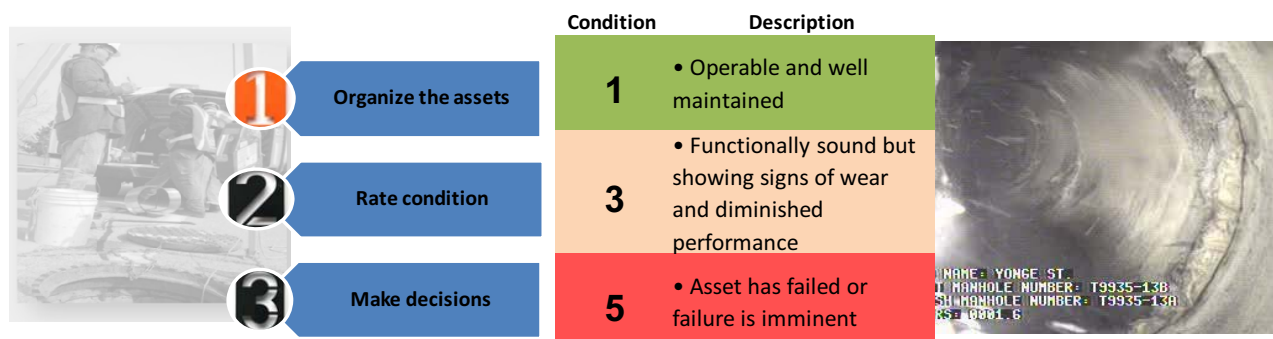
Coordination of effort between York Region and local municipal staff is the key to success of the Inflow & Infiltration Reduction program. Studies completed or ongoing include:

- A joint contract for inflow and infiltration identification in Aurora, East Gwillimbury, Georgina, Newmarket, Richmond Hill and Whitchurch-Stouffville including eight catchment areas
- Independent inflow and infiltration contracts in Richmond Hill and Vaughan to complete work on seven catchment areas
- Development of a Region-wide uniform Sanitary Sewer Commissioning Guideline

Ongoing inspections of Regional wastewater collection infrastructure include:

- CCTV re-inspections of 20 kilometers of gravity sewers (approximately 10% of total Regional system) are completed annually
- Stream bank inspection has identified 500 sites where there is potential for erosion and undermining of water or sewer mains with approximately 60 high priority sites inspected per year
- Assessment of all 1300 sewer maintenance holes
- Routine York-Durham Sewage System inspection walk to visually inspect, observe and assess the physical condition of the sewer easement and maintenance holes of critical sewers

The Region's knowledge of its asset base including condition, remaining life, reliability and risk enhances the ability to prioritize projects. Although the Region's trunk sewer system is quite young relative to other regional municipalities, approximately \$370 Million worth (replacement value) is 25 years or older. This makes rigorous monitoring, inspection, condition assessment and capital planning programs key to ensure the future sustainability of wastewater services.



2 MEASURING THE STATE OF INFRASTRUCTURE

State of infrastructure includes not only physical condition, but also capacity, performance and economic conditions. Combined, these factors are important facets of the asset's current state. The following section briefly describes how the state of infrastructure is graded and the reporting methodology.

2.1 GRADING DIMENSIONS

The framework used for the Environmental Services State of Infrastructure is defined by three dimensions; Reliability, Capacity and Soundness. Additionally the Financial State of Infrastructure consists of one dimension measuring financial capacity. The dimension grades are based on a scoring system from 1 to 5, with 1 representing the highest score and 5 being the lowest. These scores translate to an alphabetic grading format ranging from A-D, and F. Dimensions are defined as follows.

Figure 2-1: Dimension Grades

A	EXCELLENT - Like new
B	GOOD - Assets and systems function as designed
C	ADEQUATE - Most areas meet the standard expected
D	POOR - Performance is at a level of high risk
F	VERY POOR - Fails the lowest standard of condition

2.1.1 Reliability

The focus of this dimension is the overall reliability and quality of service of an asset. Reliability grading provides an assessment of the ability to meet quality and regulatory standards and uninterrupted service.

2.1.2 Capacity

Capacity to meet demand measures the ability to ensure availability of services provided by the Department is consistent with current and future demands. Knowing the capacity performance of

assets provides an early indication of negative impacts on services for customers and potential impacts on the sustainability of the community. Capacity performance provides insight into future impacts of growth including how to prepare for what will be required of infrastructure in the future.

2.1.3 Soundness

Soundness is a measure of the physical condition of the infrastructure, its age and the maintenance performance. A grade for Soundness provides knowledge related to maintaining and enhancing asset condition and the efficiency and effectiveness of rehabilitation initiatives. Soundness provides an understanding of the remaining service life and functionality of the asset.

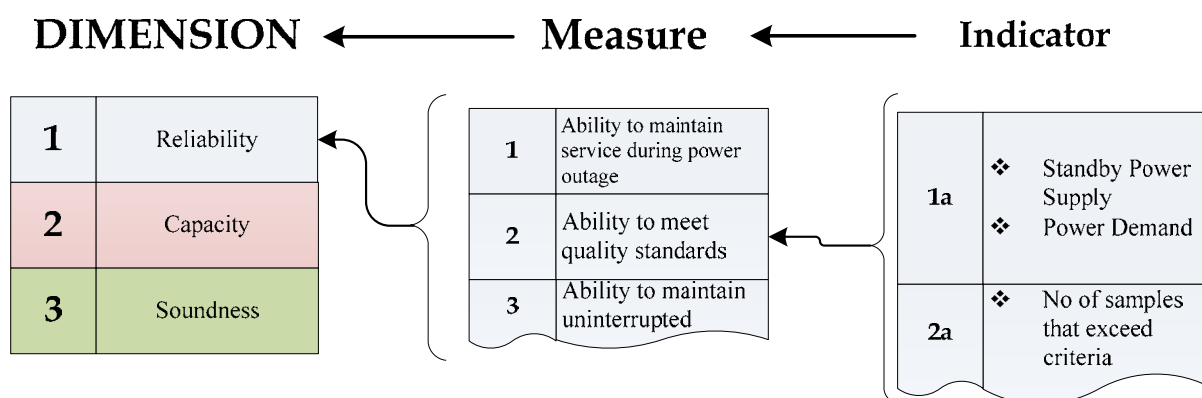
2.1.4 Financial

Financial management of the State of the Infrastructure is defined by one dimension focused on budget funding and reserves. This provides a measure of the ability to finance rehabilitation and replacement over both short and long term periods helping to understand whether budgets and reserves are sufficient to maintain current levels of service. The financial grade can be used to help establish predictable water and wastewater rates, and waste management tax levies consistent with community expectations and values while recognizing economic risks.

2.2 GRADING SYSTEM

Each dimension grade is made up of the scores from a number of measures that reflect the dimension. The mark for each measure is made up of a score from each indicator. Indicators are made up from data from single or multiple data points.

Figure 2-2: Grading System



Dimension grades are determined based on the infrastructure and how fit it is for current and anticipated purposes in terms of condition, regulatory regime, capacity processes and committed investment.

This format adopted by the Environmental Services Department follows a traditional practice focused on the perspective of the owner on the condition, reliability and operational and economic performance of the infrastructure and service.

2.3 DATA

While ideally the score for each indicator is derived from actual infrastructure data, some workaround solutions are necessary where data needed to generate a result is unavailable. Indicators are assigned a colour representing the level of data confidence associated with the particular indicator.

Scoring criteria for water, wastewater, waste management and Duffin Creek vary based on the service area. This is necessary in order to appropriately assess the different infrastructure types in each service area. Analysis of data confidence is provided in Section 9.

2.4 TREND TO 2013

The trend analysis focuses on how an indicator or measure has developed over time and how it is likely to develop in the future. It considers a range of performance issues related to the indicator or measure in question and considers the time period to the next State of Infrastructure Report (typically 2 years). A short time frame for the trend analysis is useful for planning purposes because of the association of the activity with the outcomes of the State of Infrastructure Report grades. Over a longer term, the expectation is that the outlook will be positive since the Region is striving to continually improve.

Figure 2-3: Trend Analysis

Service or Indicator Dimension	Analysis of Programs	Trend to 2013 Legend: Expectation for Grades in short term (2-years)	
Example:			
Water	Reviews what the change in grade over the next reporting period will be. Example: Installation of backup generators is underway at several water facilities and expected to be completed by 2013. The Trend to 2013 for the ability to maintain service during power outage is positive	↑	Positive
Reliability		→	Neutral
Ability to maintain service during power outage		↓	Negative

2.5 FACILITY TYPE

The State of Infrastructure indicator data is grouped by facilities or facility types for each service area. There are five Water, six Wastewater and seven Waste Management facility types operated in York Region. The breakdown to facility type for Water and Wastewater service areas is based on the existing asset hierarchy developed by the Environmental Services Department.

Facility types within Water include:

- Linear Water (Transmission Main)
- Surface Water Treatment
- Water Storage
- Ground Water (Production) Wells
- Water Pumping Station

Facility types for Wastewater include:

- Gravity Sewer
- Wastewater Equalization Tank
- Sewage Treatment – Water Pollution Control Plant
- Sewage Pumping Station
- Sewage Pumping Station Forcemain
- Odour Control

Waste Management facility types include:

- Transfer Stations (Georgina)
- Waste Management Centre (Garfield Wright)
- Household Hazardous Waste Facility
- Community Environmental Centre
- Asian Longhorned Beetle Processing Facility
- Recycling Depot
- Public Yard Waste Drop-Off Facility



3 OVERVIEW OF 2011 RESULTS

Grades reflect both the relatively young age of the assets and proactive programs in place for managing and operating the assets. Overall the B grade is stable from the 2009 State of Infrastructure Report with a positive outlook or trend for the future. Challenges remain to complete condition assessment and life cycle analysis of the infrastructure and to complete rehabilitation and replacement in the face of competition for project resources including staffing and funding.

The budget for repairing, replacing and updating York Region's water, wastewater and waste management infrastructure is approximately \$750 million over the next 10 years, based on the 2012 10-year Capital Plan. This includes an increase of almost \$320 million as identified in the 2009 State of Infrastructure Report, an increase largely attributable to the Stage 1 and 2 upgrades imposed by the Ministry of Environment as part of the Stage 3 expansion Conditions of Approval at the Duffin Creek WPCP.

The requirement to finance infrastructure for identified ongoing rehabilitation, expansions to accommodate growth and build a long term reserve to stabilize annual budgets remain the biggest challenge for the Region. The C grade for Financial reflects both the Region's strong financial policies and practices for ongoing operating requirements as well as the issue with the current state of reserves. The outlook for the Region's financial state of infrastructure is positive; the Region has a solid strategy to build the reserve based on financial projections and the commitment to maintain the strategy. To further support service delivery, Council has approved an annual blended rate increase for water and wastewater user rates for a four-year period commencing in 2012.

Table 3-1: Department State of Infrastructure Service Grades

Environmental Services Department State of Infrastructure			
Service Grades			Trend to 2013
	2009	2011	
Water	B	A	↑
Wastewater	B	B	↑
Waste Management	B	B	↑
Duffin Creek	C	A*	↑
OVERALL	B	B	↑

*Construction of mandatory upgrades to the Duffin Creek WPCP over a 5-6 year period will reduce available treatment capacity by approximately 25% during this period. While presenting operational challenges to meet performance requirements especially during peak demand wet weather events, the two Regions are working with the Ministry of Environment to address and mitigate impacts during this time period.

The Region continues to support growth through priority projects that are crucial to providing timely servicing capacity to municipalities serviced by the York-Durham Sewage System, the York Water System and local community systems. The capacity provided through these projects meets growth expectations while maintaining a desirable level of environmental and public health protection.



The Region has demonstrated its leadership position for sustainable services and environmental protection through groundbreaking programs and strategies for water conservation, waste management and energy conservation. As a member of the Partners for Climate Protection, the Region has adopted a framework to reduce its greenhouse gas emissions. The most significant opportunity for abatement of greenhouse gas emissions for Environmental Services is to continue to improve energy efficiency by reducing

electricity use at all facilities. The ongoing Environmental Services Energy Management Program will ensure that energy is being used in the most efficient manner possible towards achieving greenhouse gas emission reductions. Conservation programs not only contribute to an enhanced environment but also make business sense in that they reduce the requirements for new infrastructure.

Physical assets are managed through the Infrastructure Management program that has a mandate to proactively manage the performance of York Region's Water, Wastewater and Waste Management infrastructure assets. The Infrastructure Management group performs extensive reviews related to the asset lifecycle to characterize the asset base to identify risk, costs and benefits of the various options to maintain the physical condition of the assets. Risk evaluation is used to prioritize the annual program of assessment, analysis, rehabilitation and replacement programming and make adjustments to the 10 year business plan. Renewal and rehabilitation work is scheduled for completion through the Infrastructure Renewals program.

3.1 RELIABILITY

The focus of this dimension is the overall reliability and quality of service. Reliability grading provides an assessment of the ability to meet quality and regulatory standards and uninterrupted service. Clean and safe drinking water and treated wastewater is critical for human health, ecological health and maintaining local and provincial economies.

Overall the Region provides a highly reliable service and achieves a grade of B. Consistent and comprehensive advocacy on emerging legislation has kept the Region in the forefront of meeting and exceeding regulatory quality requirements.

The outlook for Reliability is positive as the Region continues to invest in system improvements with several major projects underway to improve redundancy, efforts to increase operational effectiveness and the integration of quality programs across all services.

Table 3-2: Reliability Grades

Environmental Services Department State of Infrastructure			
Reliability Grade			Trend to 2013
	2009	2011	
Water	B	B	↑
Wastewater	B	B	↑
Waste Management	A	B	↑
Duffin Creek	B	A	↑
OVERALL	B	B	↑

In 2010 the Region's Waste Management facilities joined the Water and Wastewater systems in registration with the ISO management systems by successfully attaining ISO 14001 registration. Both ISO 9001 (Water) and ISO 14001 (Wastewater and Waste Management), along with the Drinking Water Quality Management Standard emphasize the importance of management reviews to ensure continuing adequacy, suitability and effectiveness of systems.

The Ministry of Environment inspection rating process measures the operational performance of municipal residential drinking water systems. The ministry's inspections are guided by a Drinking Water Inspections Protocol, which includes a total of 130 possible regulatory questions, grouped into 14 modules. From these inspections, Environmental Services received a facility compliance rate of 99.8%.



In response to the social resistance to out-of-jurisdiction waste disposal, the Region and local municipalities have developed environmentally, socially and financially acceptable and sustainable waste management solutions including partnership with Durham Region on the Energy from Waste facility, and class leading waste diversion programs.

The Canadian Council of Ministers of the Environment (CCME) has outlined a proposed strategy for National Performance

Standards for wastewater effluent discharges. These standards will represent the minimum performance requirement for municipal wastewater discharges to surface water. It is expected that the Region's wastewater treatment plants should perform well within the standard since the effluent requirements and performance are amongst the most stringent in the Province. When requirements are finalized and rolled out, the Region will evaluate the impacts to the plant designs and determine the need to complete any required upgrades to be fully compliant.

3.2 CAPACITY

The Region has made significant advances in the Capacity dimension achieving an A for each service sector. Capacity to meet demand ensures availability of services to accommodate current and future needs. The Region's service strategies and commitment to capital expansions provide a positive outlook for future Capacity grades.

Services to regional residents and businesses are provided by the Region through a robust program of Regional owned and operated infrastructure, purchased services from public and private enterprises, Region owned and privately operated infrastructure, and local municipal services. Provision of water and wastewater services through partnerships with Toronto and Peel Region is a key component of the Region's long-term servicing strategy. A number of projects in Toronto and Peel Region are currently underway to provide capacity to service growth in the Region. Joint ownership with Durham Region of the Duffin Creek WPCP, and the Energy From Waste facility sustain the Region's wastewater treatment needs and support management of waste through diversion.

Table 3-3: Capacity Grades

Environmental Services Department State of Infrastructure			
	Capacity Grade		Trend to 2013
	2009	2011	
Water	B	A	↑
Wastewater	C	A	↑
Waste Management	B	A	↑
Duffin Creek	D	A*	↑
OVERALL	C	A	↑

* Construction of mandatory upgrades to the Duffin Creek WPCP over a 5-6 year period will reduce available treatment capacity by approximately 25% during this period. While presenting operational challenges to meet performance requirements especially during peak demand wet weather events, the two Regions are working with the Ministry of Environment to address and mitigate impacts during this time period.

Constraints to servicing have been managed over the last several years with assignments made to local municipalities subject to completion of certain infrastructure projects and certain programs such as the Inflow and Infiltration Reduction Program. With growth in the Region being slower than projected in 2009 and 2010, local municipalities will have an ability to maintain their forecast growth rates beyond 2013 into 2014. This is in line with the current targeted commissioning date for the new Southeast Collector Trunk Sewer which commenced construction in 2011.

The Southeast Collector is a critical infrastructure component in ensuring adequate wastewater conveyance capacity for growth across York Region. This infrastructure when completed will support forecast growth within the Region to 2036 and beyond.



growth to 2031.

On the wastewater treatment side, York Region and Durham Region have jointly initiated a Schedule C Class Environmental Assessment study of the existing outfall and diffuser system at the Duffin Creek Water Pollution Control Plant. The present flow capacity limit is 520 megalitres per day (MLD), capable of accommodating growth to 2017 whereas the preferred solution will permit the Plant to operate at a capacity of at least 630 MLD to meet

The proposed 1500 mm diameter watermain along Kennedy Road from the Milliken Pumping Station is part of the Toronto East Water Supply project. This is required to provide additional water from Toronto to Markham Pressure District 6 to meet long-term growth demands.

In addition to major works pertaining to the York-Durham Sewage System service area, most communities outside the York-Durham Sewage System service area are either in the process of completing or have completed major water and wastewater system upgrades.

York Region has processing capacity for waste material of all types for both current and projected demand. The future outlook is positive because of the proactive waste management strategy, public engagement and education, and ongoing projects to expand processing capacity. To help achieve and maintain York Region's top rankings for diversion in the Province, Council supported and approved the Durham-York Energy from Waste facility that has commenced construction in 2011.

3.3 SOUNDNESS

Soundness is a measure of the physical condition of the infrastructure, its age and maintenance performance. The Region's overall B grade represents their efforts to maintain and enhance asset condition and the efficiency and effectiveness of rehabilitation initiatives.

In many municipalities, the approach toward infrastructure management is reactive. Systems are built and operated with minimal maintenance until they wear out. The Environmental Services Department has built and applied a proactive management program for the water and wastewater assets. More recently this program has been expanded to consider the waste management assets so that the future Soundness grades improve.

Table 3-4: Soundness Grades

Environmental Services Department State of Infrastructure			
	Soundness Grade		Trend to 2013
	2009	2011	
Water	B	B	↑
Wastewater	B	A	↑
Waste Management	B	B	↑
Duffin Creek	B	B	↑
OVERALL	B	B	↑

Condition assessment methodologies are based on utility requirements, the purpose that the assessment is to serve, the value of the asset to the organization's goals, and the risk tolerance level. The Environmental Services Department has developed an Infrastructure Management Roadmap to effectively manage the portfolio of assets belonging to the Department. The Roadmap is a 10 year plan that provides a guide to manage infrastructure centered on service levels, condition and remaining service life, risk and finances. Utilizing the Roadmap, the Region has completed priority assessments on a number of water and wastewater assets. The program serves as another step in the evolution of the asset management process and enhances the Region's status as a leader in infrastructure asset management.



A condition assessment is a preventive management inspection, and as such should drive decision making and action. In the model employed by the Environmental Services Department, the condition rating provides an indication of the need for maintenance (repair, renewal or replacement) and supports an estimation of the remaining useful life of the asset.

Management of waste in York Region is completed through a combination of local municipal and regional responsibilities with Region owned facilities and private operations, facilities and infrastructure. Waste Management extends beyond collection, processing and disposal of solid waste to include a variety of diversion programs to recover recyclables, hazardous waste, generate energy from waste, and facilitate reuse. Waste Management facilities in York Region are designed to service the blue box program, source separated organics, yard waste composting, household hazardous waste, electronics, collection of tires, scrap metal, textiles and specialty programs such as processing of wood waste for Asian Longhorned Beetle control.

Recent upgrades to the Garfield Wright Material Recovery Facility combined with recent construction of McCleary Court and Elgin Mills Community Environmental Centres have improved the overall physical condition of waste management infrastructure.

3.4 FINANCIAL

Solid financial strategies have been identified based on approved new rate structure and conducting an in-depth financial study of the Department operations and assets. Regional Council approved 10% combined annual rate increases for water and wastewater for 2012 through 2015. Implementing and building the reserves will require the Region to maintain a disciplined approach and strong financial management to monitor and manage the projections used to develop the concepts for the reserve.

Although the Region has approved a rate structure with a positive long-term outlook, the Region's financial grade remains a C because reserve balances for water and wastewater will not begin to build until 2014 and beyond. The Region's overall financial outlook will remain positive for the foreseeable future while the reserves are built up.

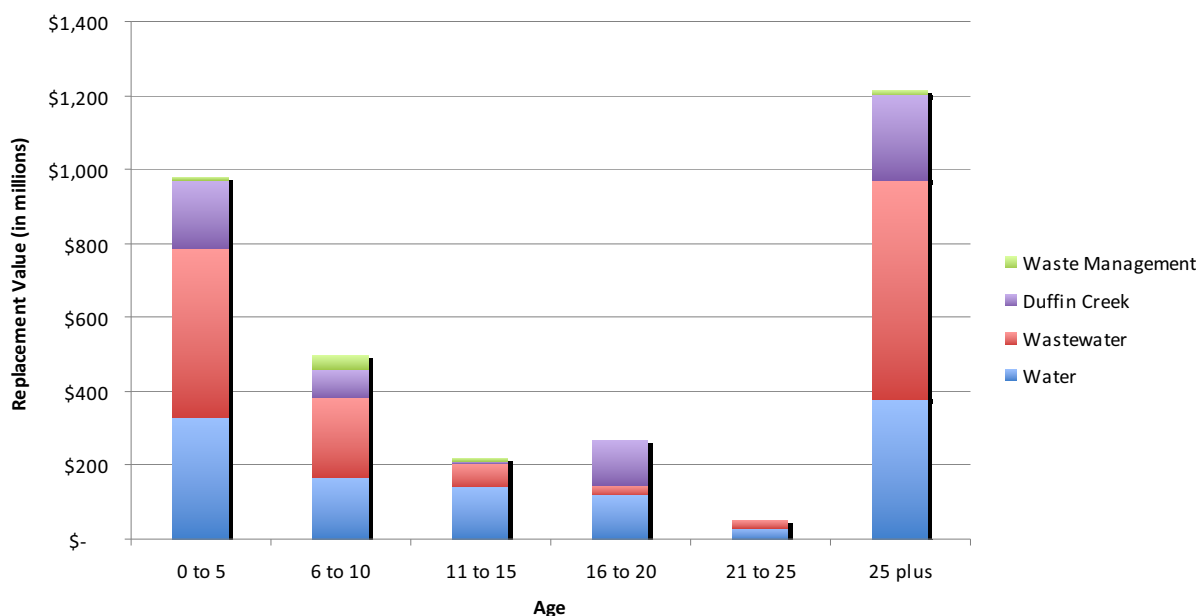
Table 3-5: Financial Grades

Environmental Services Department State of Infrastructure			
	Financial Grade		Trend to 2013
	2009	2011	
Water	C	C	→
Wastewater	C	C	→
Waste Management	C	C	→
Duffin Creek	D	C	↑
OVERALL	C	C	↑

Business planning over the 10 year planning cycle remains a strong suit of the Environmental Services Department with good results obtained from identifying and matching rehabilitation and replacement needs with forecast expenditures over the 10 year planning cycle. York Region's financial policies and practices ensure that ongoing operating requirements as well as growth and development needs are financed in a fiscally responsible manner to meet current and future needs.

As existing infrastructure reaches its end of life and growth slows, the financial commitment of the Region will shift from constructing new assets to maintaining existing ones. More than half the value of the Department infrastructure has reached the midway point of the expected useful life which demonstrates the significance of future expenditures needed for asset replacement. Maintaining a reserve of 20% of the replacement cost of Environmental Services infrastructure takes significant and increasing financial investment to account for withdrawals from the reserve fund and an increasing cost to rehabilitate and replace infrastructure.

Figure 3-1: Asset Replacement Value by Age Group

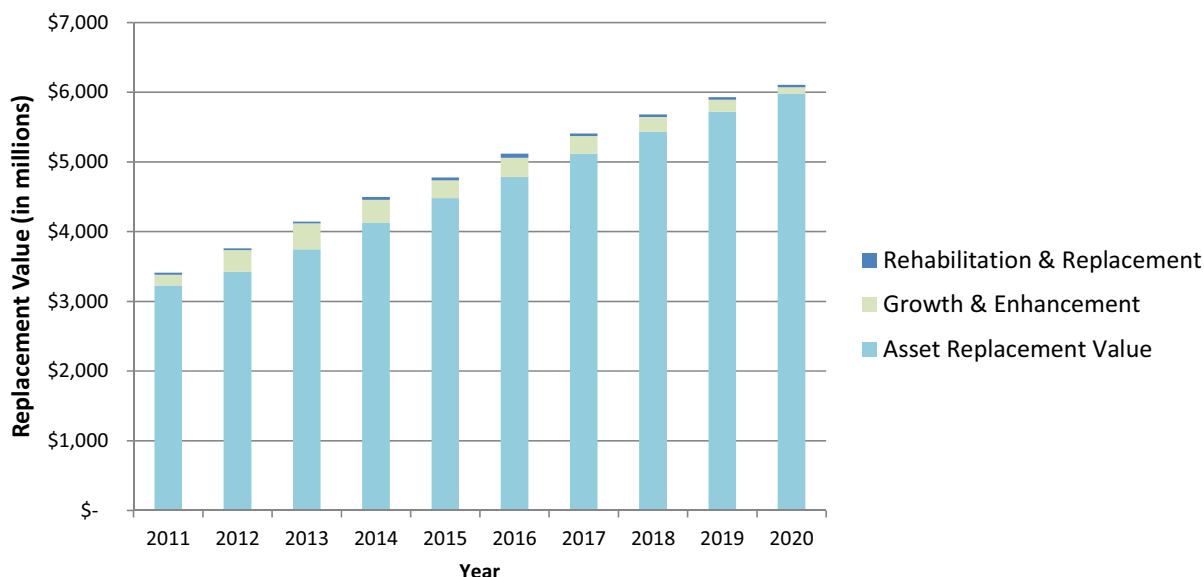


This concept stresses the importance of committing funds to the reserve balance in order to adequately prepare for the future. To prepare for the financial commitment associated with infrastructure rehabilitation and replacement costs, the Region has established a reserve target of 20% of the total replacement value of the infrastructure.

The Region has implemented significant changes to meet this target, including developing a new rate structure and conducting an in-depth financial study. Maintaining a target reserve of 20% of replacement value will be challenging since the replacement value will rise with inflation, technology advancements, more stringent regulatory operating requirements and new infrastructure adding to the replacement value.

Replacement value of the Region's infrastructure is increasing due to construction of new assets from the continued commitment for growth. Since the 2009 State of Infrastructure Report, capital expenditures have amounted to over \$1 billion. In addition the costs of priority infrastructure projects scheduled for completion in the next several years in the York-Durham Sewage System service area are \$2.4 billion, and over \$250 million of infrastructure projects in communities outside the York-Durham Sewage System service area. This is in addition to the current approximate replacement value of Environmental Services assets of over \$3 billion.

Figure 3-2: 10 Year Business Plan Budget & Infrastructure Replacement Value



York Region has been developing principles of asset management since 2007 to strategically manage the Environmental Services Department infrastructure.

To ensure that future capital investments are made most effectively, a strategic 10-year Infrastructure Improvement Plan (IIP) has been developed by York Region. The plan was developed to identify deficiencies, prioritize projects, and determine appropriate resource levels.

York Region has also been developing a Levels of Service Framework and Strategy, a key component to successfully develop an asset management program. The Levels of Service Framework strategically outlines objectives of the Department, measures service delivery success, and acts as a process management tool focused on continuous improvement.

Overall, the state of York Region's Environmental Services assets is good. These marks are a reflection of the relatively young age of the asset base, rehabilitation efforts made through the regulatory requirements, and the rigorous planning processes in place to support continued growth in York Region.

Each service area infrastructure type within the Environmental Services Department scored relatively well, with shortfalls being addressed through current or projected initiatives which are discussed in the following sections.

As York Region continues to focus on optimizing the Department's performance by developing strategic asset management methods, these grades will be sustainable in the long term if matched with a continued commitment to funding infrastructure improvements and building reserves.

4 WATER

The overall State of Infrastructure grade for Water is a B, which demonstrates the Region's continued commitment to provide customers with reliable service. The significant improvement to the Capacity dimension represents York Region's efforts to plan and build new infrastructure; more specifically the ability to identify the future needs of residents and business, develop a plan of action and execute accordingly.

Each Dimension grade for Water infrastructure is as good as or better than it was in the 2009 State of Infrastructure Report. The outlook for the future is very positive based on the prioritized infrastructure capital plans for both new and existing infrastructure.

Table 4-1: Water Service Grade

Environmental Services Department State of Infrastructure			
Water Service Grades			Trend to 2013
	2009	2011	
Reliability	B	B	↑
Capacity	B	A	↑
Soundness	B	B	↑
OVERALL	B	A	↑

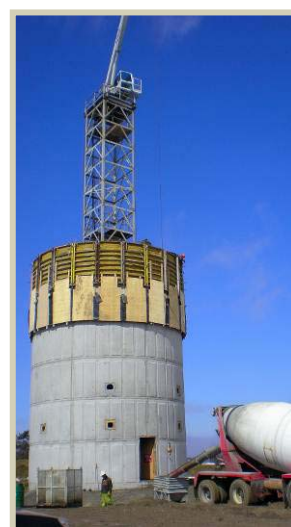
As a two-tier municipal governance structure, water servicing in York Region is a multi-jurisdictional undertaking made more complex by the Region's limited access to large surface water sources. Sources of York Region's drinking water include surface water from Lake Ontario supplied by Peel Region and Toronto, Lake Simcoe, and groundwater from aquifers. Approximately 85% of York's drinking water is sourced from Lake Ontario, 3% from Lake Simcoe, and 12% from groundwater.

York Region's water system is divided into two distinct service areas:

- 1) the York Water System, which serves the larger urban communities in the Region; and
- 2) individual systems serving smaller communities located mainly in the northern and central areas of the Region.

The York Water System services approximately 77% of the Region's population with the remainder being serviced by individual systems. As of June 2011 York Region operates and maintains:

- 309 km of Transmission Mains
- 39 Groundwater (Production) Wells
- 2 Surface Water Treatment Plants
- 18 Pumping Stations
- 40 Storage Facilities



Through long-term partnership agreements with the City of Toronto and Peel Region, water is supplied to York Region. Both Toronto and Peel provide potable water from their treatment plants using Lake Ontario as the source. York Region, in turn supplies drinking water to the Towns of Markham and Richmond Hill, the City of Vaughan, and parts of the Towns of Aurora, Newmarket and East Gwillimbury. The Town of Stouffville was added in 2009 to lake-based drinking water supply and King City was added in 2011.

Provision of water services through partnerships with Toronto and Peel Region is a key component of the Region's long-term servicing strategy. A number of projects in Toronto and Peel Region are currently underway to provide capacity to service growth in the Region.

4.1 RELIABILITY

The outlook for Reliability is positive due to the Region's ability to provide secure, uninterrupted service to residents and businesses while meeting quality standards at a rate that ranks among Ontario's best. The outlook for the future represents the expectation that the Region will continue to provide high quality and reliable service.

Table 4-2: Water Reliability Grade

Environmental Services Department State of Infrastructure			
Reliability Measures			Trend to 2013
	2009	2011	
Ability to maintain service during power outage	C	B	↑
Ability to meet quality standards	B	B	→
Ability to maintain uninterrupted service	B	B	→
Ability to maintain secure operations	A	A	→
OVERALL	B	B	↑

To better assure the Region's ability to provide uninterrupted service, the Environmental Services Department developed a Business Continuity Plan for water and wastewater operations. The Plan identifies essential activities and contingencies to maintain service in the event of a disruption to normal operations. It is an operational plan based on the principal service areas, the critical activities and the tools required to sustain service and the fundamental management responsibility necessary to meet regulatory requirements. The plan helps ensure reliable service delivery to York Region's residents and businesses during times when resources are scarce due to a natural disaster, prolonged power outage, or any other business disruption event.

Construction is underway at the Maple Water Pumping Station to better ensure reliable water service. The project upgrade includes two back up power generators to enhance reliability of supply during power outages and one additional pump to support capacity to service Pressure District 7.

The Region remains among the highest ranked municipal water suppliers in the Province. York Region attained the Ministry's water quality standards 99.99% of the time with a facility compliance rate of 99.8%. This is a direct result of the commitment to operational excellence and capital improvements to water infrastructure.

As water and wastewater facilities represent the single largest user of electricity within all the services provided by York Region, it is an important component of the regional energy management program. Ensuring that energy is being used efficiently contributes to service benefits by lowering costs, reducing power demand during power interruptions and reducing the Region's carbon footprint. The Environmental Services Department Energy Management Program has been expanded from reducing energy in buildings to include a focus on optimizing operations and energy related processes.

To increase the availability of supply, or uptime of operations, the Region has reviewed and identified a priority sequence to install standby power supply at the water pumping stations and groundwater wells.

4.2 CAPACITY

In 2009, Water Capacity dimension was rated B and has improved to an A in 2011. The contributing factors for the improvement include construction of new supply infrastructure, expansions to existing facilities and strategic program development including advanced water conservation.

Table 4-3: Water Capacity Grade

Environmental Services Department State of Infrastructure			
Capacity Measures			Trend to 2013
	2009	2011	
Ability to meet current demand	B	A	↑
Ability to meet future demand	n/a	A	↑
OVERALL	B	A	↑

The ability to provide increased capacity for both the short and long term will be enhanced through the delivery of critical infrastructure projects such as:

- Aurora Newmarket Water Supply Connection to Peel
- PD6 Major MacKenzie Watermain in Richmond Hill and Markham
- Schomberg Water Treatment Plant
- Stouffville Water Supply System (Connection to York Water System)
- Yonge Street Aquifer Groundwater Wells
- Georgina WTP expansion



Increasing the Region's ability to provide treated surface water to some of the Region's northern municipalities alleviates the pressure on groundwater aquifers to meet the demand of growing communities.

In light of the increasing and pressing need to efficiently manage scarce water resources and ensure long term water supply to a growing Region, there has been renewed focus on preserving water through conservation efforts. To enhance York Region's commitment to a sustainable environment and services, a Long Term Water Conservation Strategy for a 20 year planning horizon has been developed. In addition to traditional conservation measures, the Strategy examined innovative measures and practices in the planning, design, and operations and maintenance of water infrastructure to determine opportunities to achieve water savings.

4.3 SOUNDNESS

Water infrastructure received a Soundness grade of B, the same grade as received in 2009. The consistent grades represent the Region's efforts to increase asset knowledge and proactively maintain assets to maximize effective useful lives.

Table 4-4: Water Soundness Grade

Environmental Services Department State of Infrastructure			
Soundness Measures			Trend to 2013
	2009	2011	
Condition	B	B	→
Ability to maintain assets	A	A	↑
OVERALL	B	B	↑

The Region has developed an Infrastructure Management Roadmap to effectively manage the portfolio of assets belonging to the Department. The Roadmap is a 10 year plan that provides a guide to manage infrastructure centered on service levels, condition and remaining service life, risk and finances. Utilizing the Roadmap, the Region has completed priority assessments on a number of water

assets including linear water systems and storage facilities. This serves as another step in the evolution of the asset management process and enhances the Region's status as a leader in infrastructure asset management.

Although ductile iron watermain comprises only 13% of the Region's transmission mains, ductile iron watermain breaks are the primary cause of water service interruptions in the last few years. A condition assessment and field investigation for ductile iron watermain is underway and expected to be completed in 2012. A rigorous analysis to identify risk reduction concepts continues on this project with the output assisting with the preparation of an appropriate solution considering financial, social and performance impacts.

Currently the Region has approximately 1,000 water chambers on the transmission mains. These chambers house air valves, isolation valves, and flow meters that are critical to maintaining water service to the Region's residents. Integrating preventive maintenance activities into an infrastructure management framework represents a best in class practice for asset management. The Operations, Maintenance and Monitoring (OMM) Branch has developed and instituted a valve exercising and chamber inspection program as an important component of drinking water and wastewater asset management. Regular valve exercising increases valve reliability, facilitates the collection of equipment and condition data, and provides an opportunity for operators to gain advanced system knowledge to address routine and emergency operational issues. Since 2009, the OMM branch has completed inspections on over 700 of these chambers. A similar program is in place for the routine inspection and maintenance of gravity sewer maintenance holes and forcemain chambers. The existing database of condition and attribute data for chambers and maintenance holes was expanded in 2010 to help staff plan, schedule and conduct the routine maintenance activities and the rehabilitation upgrades for these assets.

Condition assessment methodologies should be tailored to specific needs of the utility based on their requirements and risk tolerance level. A condition assessment is a preventive management inspection that should employ a standard approach and methodology to allow comparison across asset types.

In 2011, condition assessment templates were developed and applied for 21 of the Elevated Storage Tanks. The templates are designed to capture critical condition data at detailed levels of the asset hierarchy. Results from the assessments have been incorporated into the 2012 10-Year Capital Plan.



Through the Infrastructure Management Program, a plan is now in place to develop templates and assessments for each of the remaining water, wastewater and waste management facility types in the coming years. This plan was included in the 2012 budget as a new program for the development of an

overall management program for water assets including identification of strategies, system optimization, asset inspection, condition assessment and data collection, risk assessment, asset performance evaluation, deterioration and lifecycle modelling. This information will assist in the long range capital planning of asset rehabilitation or replacement.

5 WASTEWATER

The 2011 State of Infrastructure grade for Wastewater is a B, the same grade received by the Service Area in 2009. A major improvement in the 2011 Wastewater grades is in the Capacity dimension, where the service area achieved an A grade based on an increased ability to service the Region's current demands and growth needs. The outlook for wastewater infrastructure in the future is positive considering the planned improvements to existing facilities and the enhancements to the Infrastructure Management and Infrastructure Renewal Programs. Due to its significant cost and criticality as well as its unique ownership scenario the Duffin Creek WPCP is graded as a separate entity and is not included as part of the wastewater grades.

Table 5-1: Wastewater Service Grade

Environmental Services Department State of Infrastructure			
Wastewater Service Grades			Trend to 2013
	2009	2011	
Reliability	B	B	↑
Capacity	B	A	↑
Soundness	A	A	↑
OVERALL	B	B	↑

Over the 10 year business plan cycle, the Environmental Services Department has planned the development of an overall management program for wastewater assets, which include delineation of asset management strategies, odour and corrosion control programs, system optimization, asset inspection, condition assessment and data collection, risk assessment, assets performance evaluation, deterioration and lifecycle modelling.



York Region is responsible for the collection of sewage through the York-Durham Sewage System where it is treated at the Duffin Creek Water Pollution Control Plant in Pickering before it is discharged into Lake Ontario. This collection system serves the communities of Newmarket, Aurora, Richmond Hill, Whitchurch-Stouffville, King City, Vaughan and Markham. More than 85% of flows from the Region are treated at the Duffin Creek WPCP and 10% of flows are diverted to Peel Region, with the remainder treated at separate treatment plants serving the communities of Mount Albert, Holland Landing, Schomberg, Kleinburg, Keswick, Sutton and Nobleton. These facilities discharge into tributaries leading to either Lake Ontario or Lake Simcoe.

As of June 2011 York Region is responsible for the following wastewater assets:

- 185 km of Gravity Sewers
- 93 km of Force mains
- 2 Wastewater Storage (Equalization) Tanks
- 19 Pumping Stations
- 7 Wastewater Treatment Plants
- 3 Odour Control Facilities
- 1 Co-owned Wastewater Treatment Plant (Duffin Creek WPCP)

Due to its significant cost and criticality as well as its unique ownership scenario the Duffin Creek WPCP is graded as a separate entity and is not included as part of the wastewater grades.

5.1 RELIABILITY

The Wastewater Reliability grade for 2011 remained a B as it was in the 2009 State of Infrastructure Report. The grade is expected to be sustained in the future as the Region continues to enhance existing management programs that contribute to consistent levels of service reliability even while regulatory requirements and environmental issues increase.

Table 5-2: Wastewater Reliability Grade

Environmental Services Department State of Infrastructure			
Reliability Measures			Trend to 2013
	2009	2011	
Ability to maintain service during power outage	B	A	↑
Ability to meet quality standards	C	C	→
Ability to maintain uninterrupted service	B	C	→
Ability to maintain secure operations	A	A	→
OVERALL	B	B	↑

A number of wastewater pumping stations have upgraded the standby power capacity with plans for others as part of the Infrastructure Management and Renewals programs. The primary reason for the reduced grade for uninterrupted service was due to reportable bypass events. Since 2009, there were two bypass events related to capacity and ten bypass events related to operational challenges that were minor in nature. A primary cause of bypass events at pump stations is high flows during peak wet weather events. Pumping station capacity has been assessed through condition assessments and the Inflow and Infiltration Reduction Program will address the contribution to sewer flow during wet weather events over a long term period with an expected 10% reduction by 2031. The outlook for this measure is positive as the Region continues to enhance its programs and strategies to provide uninterrupted services.

The Canadian Council of Ministers of the Environment (CCME) is comprised of the environmental ministers from the federal, provincial and territorial governments who seek to achieve positive environmental results, focusing on issues that are national in scope and that require collective attention by a number of governments. The CCME has outlined a proposed strategy for National Performance Standards for Carbonaceous Biochemical Oxygen Demand, Total Suspended Solids, and Total Residual Chlorine.

These standards will represent the minimum performance requirement for municipal wastewater discharges to surface water. Implementation of the National Performance Standards will be based on risk criteria and financial sustainability of communities. New and upgraded facilities will be required to meet or exceed these standards when they are commissioned. Consequently the new Nobleton plant and upgraded Keswick WPCP will be subject to these standards. For existing facilities that do not meet the National Performance Standards, the provincial jurisdiction will determine the risk level and the corresponding timeline required to implement these standards. At this time, all York Region WPCPs are well within the proposed National Performance Standards with the exception of the Keswick WPCP for chlorine residual. The Keswick WPCP is currently undergoing facility upgrades to eliminate final effluent chlorination through the use of UV disinfection, which will be completed prior to the new standards coming into effect.

Considering the Lake Simcoe Protection Plan, and its efforts to reduce the discharge of phosphorus to the Lake, it is likely that WPCPs within the Lake Simcoe watershed will be required to conduct a watershed approach to the environmental risk assessment.

When the requirements of these regulatory and environmental initiatives are finalized and rolled out, the Region will evaluate the impacts to the plant designs and assess the need to make any required upgrades to be fully compliant.

5.2 CAPACITY

The 2011 Wastewater capacity grade is an A which is an improvement from the 2009 rating of B. Committee and Council have approved key wastewater capital initiatives over the last several years that provide secure wastewater infrastructure and capacity to achieve sustainable environmental priorities and meet York Region's current and future growth needs.

OMM Mechanical Skills Enhancement Program

A significant component of W&WW operations staff duties is to perform routine maintenance to clean, lubricate, adjust and complete minor repairs on assets and equipment. This program provides operations staff with the opportunity to enhance their mechanical knowledge and skills through in-class and practical hands-on training.

It was developed through collaborative efforts with Region staff and George Brown College and officially launched in 2009.

This enhances the Region's ability to maintain high levels of asset soundness and service reliability.

Table 5-3: Wastewater Capacity Grade

Environmental Services Department State of Infrastructure			
Capacity Measures			Trend to 2013
	2009	2011	
Ability to meet current demand	B	A	↑
Ability to meet future demand	n/a	B	↑
OVERALL	B	A	↑

The Region has commenced numerous projects to address capacity issues and ensure demand can be met. These projects provide much needed redundancy and capacity within the system. Some notable examples include:

- Duffin Creek Water Pollution Control Plant – Stage 3 Expansion (discussed in a separate section)
- York-Durham Sewage System Interceptor
- Nobleton Water Pollution Control Plant
- Keswick Water Pollution Control Plant Expansion
- Completion of the Southeast Collector Trunk Sewer Individual Environmental Assessment
- Completion of the Upper York Serving Solutions Individual Environmental Assessment
- Terms of Reference to determine future serving options

The capacity requirements for specific facilities have been forecasted by the Region through the Master Plan. The Leslie SPS will be required to pump 7500 litres per second by 2051 to meet approved growth in the areas of Woodbridge, Maple, Thornhill and parts of Markham and Vaughan. The station has a current capacity of 3800 litres per second, and is undergoing an upgrade and expansion project to help meet demand needs.

In 2008, York Region proactively initiated the Inflow and Infiltration Reduction Program to reduce extraneous flows to the collection system which plays an important role in reducing the need for capital expansion and providing additional system capacity or security. York Region relies on the commitment and collaboration of the local municipalities to provide adequate funding and resources to implement critical programs to reduce inflow and infiltration within existing local and private systems, and within new development areas by adopting a series of new Region-wide sewer design and commissioning standards that will be introduced in 2011. The Region's inflow and infiltration strategy will dovetail nicely with future national overflow standards as well as contributing to capacity for increased growth within the Region



and management of wet weather event flows that contribute to excessive flows within the wastewater system.

The Southeast Collector Trunk Sewer is a critical infrastructure component to ensure adequate wastewater capacity for growth across York Region. A major constraint to permit growth beyond 2014 is conveyance capacity limitations in this trunk sewer. This project when completed will support forecast growth within the Region to carry the projected flows to accommodate growth in York Region to 2036 and beyond.

5.3 SOUNDNESS

The 2011 Soundness grade for Wastewater infrastructure is an A, the same as it was in 2009. The condition of wastewater infrastructure improved to an A grade from a B in 2009 due to new asset construction and assessment and upgrade projects for existing facilities.

Table 5-4: Wastewater Soundness Grade

Environmental Services Department State of Infrastructure			
Soundness Measures			Trend to 2013
	2009	2011	
Condition	B	A	→
Ability to maintain assets	A	A	↑
OVERALL	A	A	↑

Environmental Services has a proactive Infrastructure Management Program to monitor performance of the Region's water and wastewater infrastructure through comprehensive inventory, inspection, condition assessment and maintenance initiatives. The focus of the program is to facilitate early identification of asset deficiencies to determine timely, optimized and cost-effective inspection, maintenance, renewal, rehabilitation, and replacement measures. Key assets that have been evaluated and proactive actions resulting from the analysis are described below.

In 2009, an assessment for the Aurora Sewage Pumping Station directed through the Infrastructure Management Program, identified the condition and remaining life expectancy of various equipment and components of the station. The report provided recommendations for upgrades and modifications to improve operation of the facility which are now underway. In addition to restoring capacity, the assessment report recommended replacement of various mechanical, electrical and process components such as pumps and motors, underground diesel storage tanks, pipe valves, electrical harmonic filter and transformers.

With the use of closed circuit television and sonar sewer inspections, the Region identifies deficiencies that may affect performance of the systems and affect flows from local municipal sewer systems. Sections of the Region's sanitary sewer system will be inspected over a three year period (2011 – 2013). This will include 77.6 kilometres of large diameter gravity sanitary sewers and siphons and 903 maintenance holes.

In November 2011, Regional Council approved the enactment of an updated Sewer Use Bylaw. The updated practices in sewer regulation, new requirements, modified administrative processes and enhanced enforcement tools will better regulate and protect Regional sewage infrastructure. In conjunction with these initiatives, the updated Sewer Use Bylaw lays the foundation for harmonization of sewer use bylaws across the Region thereby aligning with the Strategic Plan objective of partnering with local municipalities to facilitate the delivery of environmentally sustainable infrastructure. Several local municipalities are in the process of updating their own sewer use bylaws and it is anticipated that all local municipalities will harmonize their sewer use bylaws with the Region's Sewer Use Bylaw by 2014. This harmonization will assist with potential coordination of enforcement activities by the Region and local municipalities and will simplify sewer use requirements for industry.

Approximately 120,000 residents and businesses in York Region use their own septic or wastewater holding systems which require regular maintenance and wastewater haulage services. To assist in providing services to these residents and businesses, the Region has three wastewater facilities available to receive certain types of hauled wastewater. There is a level of risk exposure to staff and equipment at the facilities; for example heavy grit mixed with hauled wastewater discharges has been linked to premature wear of pump impellers at the Aurora Pumping Station. As a part of the Sewer Use By-Law compliance program, implementation of a new Hauled Waste policy and new procedures will help ensure protection of the Region's infrastructure, and mitigate risks of environmental pollution. Throughout the update process for both Sewer Use By-Law and the Hauled Waste Program, the Region consulted extensively with the stakeholder community including the local municipalities.

6 WASTE MANAGEMENT

Management of waste in York Region is completed through a combination of local municipality and regional responsibilities with region owned facilities and private operations, facilities and infrastructure. Waste Management extends beyond the collection, processing and disposal of solid waste to include a variety of diversion programs to recover recyclables, hazardous waste, generate energy from waste, and reuse. Waste Management facilities in York Region are designed to service the management of the blue box program, source separated organics, yard waste composting, household hazardous waste, electronics, collection of tires, scrap metal, textiles and specialty programs such as processing of yard waste generated under the Asian Longhorned Beetle quarantine area.

In assessing the State of Infrastructure of Waste Management, existing conditions, future conditions resulting from pending projects, and operational capacity from disposal management alternatives were considered. Waste Management infrastructure elements include storage containers, collection/transportation vehicles, transfer, processing and disposal facilities. Storage containers are supplied by the generator whether residential, commercial, institutional or an industrial facility. Sufficient collection and transportation vehicles are supplied by vendors engaged by the local municipalities. Currently end process facilities for disposal (landfills or incinerators) and plants where material is processed into new materials for further fabrication or into final products are publically or privately owned.

The overall grade for Waste Management is B with a positive trend for the future years. The current program is well managed and planned with sufficient capacity for the foreseeable future.

Table 6-1: Waste Management Services Grade

Environmental Services Department State of Infrastructure			
Waste Management Service Grades			Trend to 2013
	2009	2011	
Reliability	A	B	↑
Capacity	B	A	↑
Soundness	B	B	↑
OVERALL	B	B	↑

YORK REGION AND LOCAL MUNICIPALITIES:

*Working Together
Toward a Sustainable
Residential Waste
Management System*

York Region is developing an Integrated Waste Management Master Plan to provide the strategic direction necessary to maintain a leadership role in waste management in Ontario. This Master Plan will create a decision making framework that is adaptable to changing legislation, increasing Provincial targets, and will enable the accommodation of population growth.

Collection of solid waste, green bin and recyclable material is managed by the local municipalities through contracts with private collections companies. Processing and subsequent transportation of material is the responsibility of York Region. This is contracted out through various vendors dependent on a number of factors such as the type of material, how it is processed and the source location.

Facilities owned by the Region are operated by private sector vendors. Vendors engaged by York Region are responsible for their own infrastructure (e.g. trucks, yards). For Region owned facilities operated by vendors, the vendors are responsible for maintenance while the Region is responsible for capital rehabilitation and replacement.

Due to the distance to some of the third party facilities located outside of the Region, vendor capabilities and practices are monitored or checked on a periodic basis. In future State of Infrastructure Reports, consideration should be given to whether public or private entities that the Region relies on have sufficient management and funding capacity for transportation, facilities and systems maintenance as well as their contribution to compliance with regulatory requirements.

6.1 RELIABILITY

The outlook for the overall reliability of waste management service and infrastructure is positive for the next period despite the decrease in this grade from an A to a B. Improved data for waste management facilities provided the ability to more accurately assess reliability in 2011 compared to 2009. This resulted in a change in the reliability grade based on limited availability of standby power at waste management facilities. This change in grade reflects a change in data rather than a change in the state of the infrastructure.

Table 6-2: Waste Management Reliability Grade

Environmental Services Department State of Infrastructure			
Reliability Measures			Trend to 2013
	2009	2011	
Ability to maintain service during power outage	A	B	→
Ability to meet quality standards	B	A	↑
Ability to maintain uninterrupted service	B	B	→
Ability to maintain secure operations	A	B	→
OVERALL	A	B	↑

The outlook for Reliability is positive due to recent initiatives, an overall surplus of capacity that lends flexibility in maintaining service, and pro-active management practices.

Recently several of the Region's waste management facilities (Household Hazardous Waste Facilities and Community Environmental Centres) obtained ISO 14001 registration. ISO 14001 is a tool that can be used to meet internal objectives or standards as well as provide assurance to management that it is in control of the organizational processes and activities having an impact on the environment. The facilities are audited on a regular basis by the Department's Compliance group.

Waste management requires consistent and regular operational planning and logistics to deal with changes to operating conditions of vendors in the industry. For some material there are many options for disposal, recycling and handling as well as capacity within the industry to handle the volumes generated by York Region, while for other materials there are few options and capacity. An additional challenge is that one of York Region's diversion goals is to process and re-use material within Ontario. However, there are certain limitations that may require materials to be sent elsewhere.

In 2010, the two Ontario organic material processing facilities capable of processing the Region's material in Ontario were shut down by the Ministry of Environment. As a result York Region had to secure processing capacity in a Marlborough, Massachusetts facility. Any material that could not be processed was disposed of in Ontario landfills. The total amount of material landfilled in 2010 was 38,774 tonnes.

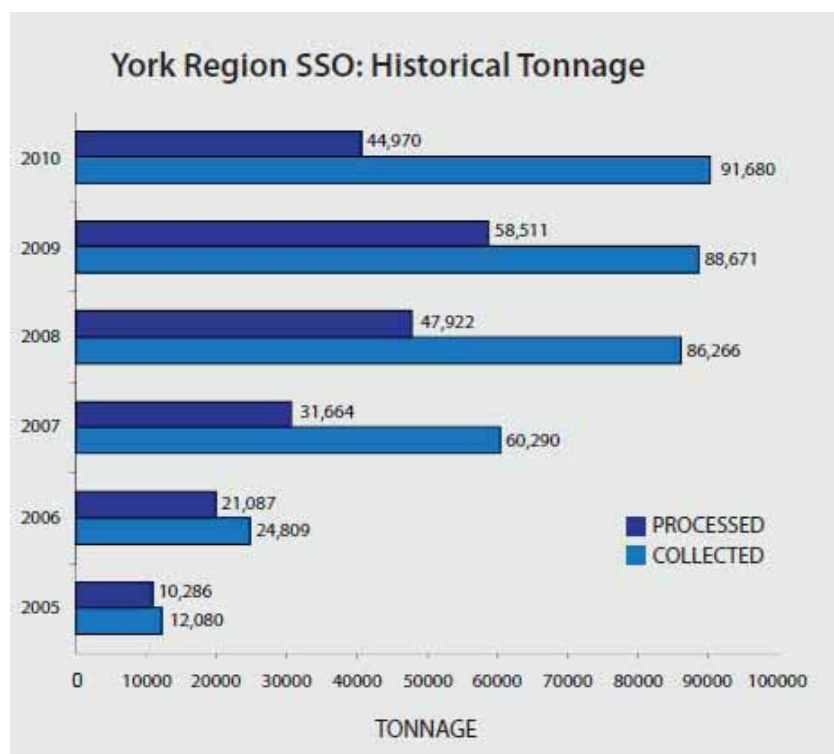
The discussion illustrates the need for diversified processing options to maintain effective service.

6.2 CAPACITY

York Region has ranked first in Ontario in Waste Diversion Ontario's large urban municipality category for waste diversion at 47% in 2007, 53% in 2008 and 57% in 2009. In 2010 York Region ranked second in Ontario in Waste Diversion Ontario's large urban municipal category with a slight drop in diversion from 57% in 2009 to 52% in 2010. This drop in diversion is a direct result of processing interruptions experienced at our Source Separated Organics (SSO) Processing facilities in the summer of 2010. All of the Region's SSO processors were fully operational in 2011, as a result forecasts estimate that York Region's diversion rate is on-track to achieve 59% diversion in 2011.

York Region has an abundance of processing capacity for waste material of all types for both current and projected demand resulting in a grade of A for this measure. The outlook is also positive because of the proactive waste management strategy, public engagement and ongoing projects. To help achieve and maintain top rankings for diversion in the Province, Council supported and approved the Durham-York Energy from Waste Facility that has commenced construction in 2011.

Figure 6-1: Organics Collection & Processing



* Processed material is the collected amount less unprocessed and

York Region will own 21% of the capacity of the Energy from Waste Facility that will be completed in the next 3 to 4 years with Durham owning the remaining capacity.

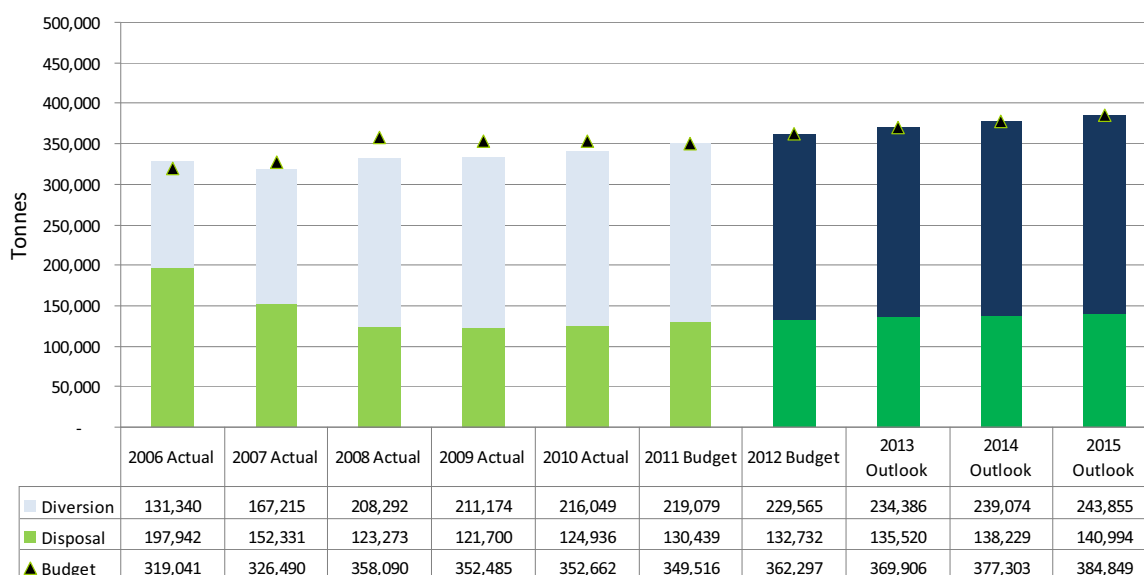
Table 6-3: Waste Management Capacity Grade

Environmental Services Department State of Infrastructure			
Capacity Measures			Trend to 2013
	2009	2011	
Ability to meet current demand	B	A	↑
Ability to meet future demand	B	A	↑
OVERALL	B	A	↑

The Garfield Wright Material Recovery Facility (MRF) currently processes approximately 90,000 tonnes per year of recyclables. Processing capacity at the MRF has been expanded to 140,000 tonnes to provide sufficient capacity for about 10 more years. In addition to increasing capacity, other key objectives for enhancements to the MRF include increasing efficiency, improving product quality and improving the capture of recyclable material.

Electronic waste is a rapidly growing component of the solid waste stream. Growth of the electronics industry has multiplied the quantities of electrical waste and electronic equipment that will only further increase. Many electronic products contain toxic materials such as lead, mercury and cadmium that may be hazardous when disposed of improperly. Capacity to capture this waste stream has been increased with the addition of the Community Environmental Centres.

Figure 6-2: Annual Quantity of Solid Waste Managed 2005-2014



Determining the required capacity for the various facilities and waste streams continues to be a challenge for York Region due in part to the two tier system that can lead to communication issues on new sources of material collected, the lack of good data material volumes by type and population, and the competition for valuable recyclable material. In addition to becoming part of social behaviour, the location and operation of recycling and disposal facilities such as Community Environmental Centres must be brought to the community's awareness especially for newer facilities. McCleary Court Community Environmental Centre was built to handle 9000 tonnes of material and in its first six months of operation received 1000 tonnes of material.

6.3 SOUNDNESS

The grade for soundness, the physical attributes of the waste management infrastructure, received an overall grade of B.

Table 6-4: Waste Management Soundness Grade

Environmental Services Department State of Infrastructure			
Soundness Measures			Trend to 2013
	2009	2011	
Condition	B	B	↑
Ability to maintain assets	B	C	→
OVERALL	B	B	↑

In general, physical maintenance at Regional infrastructure is maintained by Property Services on an as needed basis and by the operations vendor below a certain dollar threshold. Other than the basic inventory required under the Public Sector Accounting Board practice (PS 3150), there is no active management or tracking of either maintenance required or performed, or of condition, rehabilitation or replacement required.

A base inventory is a useful first step to manage infrastructure as well as generate replacement costs using expected life and age. Inventory data properly managed provides a basis to identify required improvements and costs and provides a sound basis to setting capital budgets. In 2012, the region infrastructure management portal software will be updated to incorporate waste management assets commencing with the Material Recovery Facility (MRF) by 2012, and all other facilities completed by 2013.

For facilities operated by third party vendors, it is planned that maintenance data and history will be collected, analyzed and integrated with the Region's Maximo work management system by 2013.

Consideration should be given to identifying critical equipment and condition, establishing a preventive maintenance program, and monitoring the output of the vendor's maintenance programs during this same time period. Additionally since the success of the Region's program is heavily influenced by the service and infrastructure owned by the private vendors, consideration should be given to including an analysis of this in future State of Infrastructure Reports.

7 DUFFIN CREEK

The Duffin Creek WPCP located in the Town of Pickering, accepts wastewater flows from both the Regions of York and Durham. Currently, approximately 80% of plant flows originate from York Region.

The overall grade for Duffin Creek is an A reflecting the recent effort and work to upgrade and expand the facility. While the overall condition is very good, significant upgrades to process buildings and equipment have been identified in the 10 year planning period including works needed to comply with approval conditions. Maintaining the current grades will require that these upgrades be completed as identified. Additionally, works required on the existing plant needed to comply with the approval process will result in temporarily reduced treatment capacity during the construction period.



The 2010 Top 100 Infrastructure Projects listed by ReNew Canada includes the expansion at Duffin Creek ranked 41st. The treatment capacity of the plant has steadily increased in its recent history from 182 MLD to an expanded capacity of 420 MLD, and under a Certificate of Approval issued in 2011 for the Stage 3 expansion, 630 MLD with a maximum operating capacity of 520 MLD until outfall capacity is addressed.

Table 7-1: Duffin Creek Service Grade

Environmental Services Department State of Infrastructure			
Duffin Creek Service Grades			Trend to 2013
	2009	2011	
Reliability	B	A	↑
Capacity	D	A	↑
Soundness	B	B	↑
OVERALL	C	A	↑

The Duffin Creek WPCP is co-owned by Durham and York Regions, and is operated by Durham Region. Flows to Duffin Creek Stage 1 & 2 are treated in four identical treatment trains. Each train consists of two primary clarifiers, two aeration tanks and four secondary clarifiers. In 2004, the aeration process was converted to fine bubble diffused air from the original mechanical aerators. Disinfection is by chlorination with subsequent de-chlorination to ensure a non-toxic wastewater treatment plant effluent. The recently completed Stage 3 expansion consists of six identical treatment trains consisting of a primary tank, secondary clarifier, with chlorine disinfection followed by dechlorination. The plant discharges into Lake Ontario through an approximately 1100 m long, 3.0 m diameter outfall pipe. The plant is equipped with four primary digestion tanks, two secondary digestion tanks and two sludge

blending tanks. Each primary tank has a liquid capacity of approximately eight million litres. The plant is equipped with two incinerators. Both units can be operated concurrently to reduce stored sludge quantities. The construction of two additional reactors is currently underway for added plant capacity and reliability. The reactors are expected to be commissioned in 2012 and will provide a firm solids treatment capacity of 270 dry tonnes per day.

7.1 RELIABILITY

The outlook for Reliability is positive due to current initiatives to install additional standby generator capacity, the redundant processes and equipment at the plant, and the effectiveness of plant operations. The grade for Reliability has improved to an A as the strain from operating near or at capacity has been reduced with the completion of new and expanded facilities.

Table 7-2: Duffin Creek Reliability Grade

Environmental Services Department State of Infrastructure			
Reliability Measures			Trend to 2013
	2009	2011	
Ability to maintain service during power outage	A	B	↑
Ability to meet quality standards	B	A	→
Ability to maintain uninterrupted service	B	A	↑
Ability to maintain secure operations	A	A	→
OVERALL	B	A	↑

For the 2011 State of Infrastructure Report, more quantitative data was obtained for power demand and supply that resulted in a more accurate grade being assigned. Standby generator capacity installed at the plant as of 2011 is 4.16 MW which can provide about 85% of the current average day power demand with an additional 1.75 MW generator planned for 2014.

Based on results of the National Water and Wastewater Benchmarking Initiative, in most areas, the Duffin Creek WPCP performance is above or comparable with facilities in the same category. In particular within the area of environmental compliance, the Duffin Creek WPCP stands out as having best in class performance. Continuous effort will be required to maintain best in class performance due to increasing environmental standards and regulatory requirements.

7.2 CAPACITY

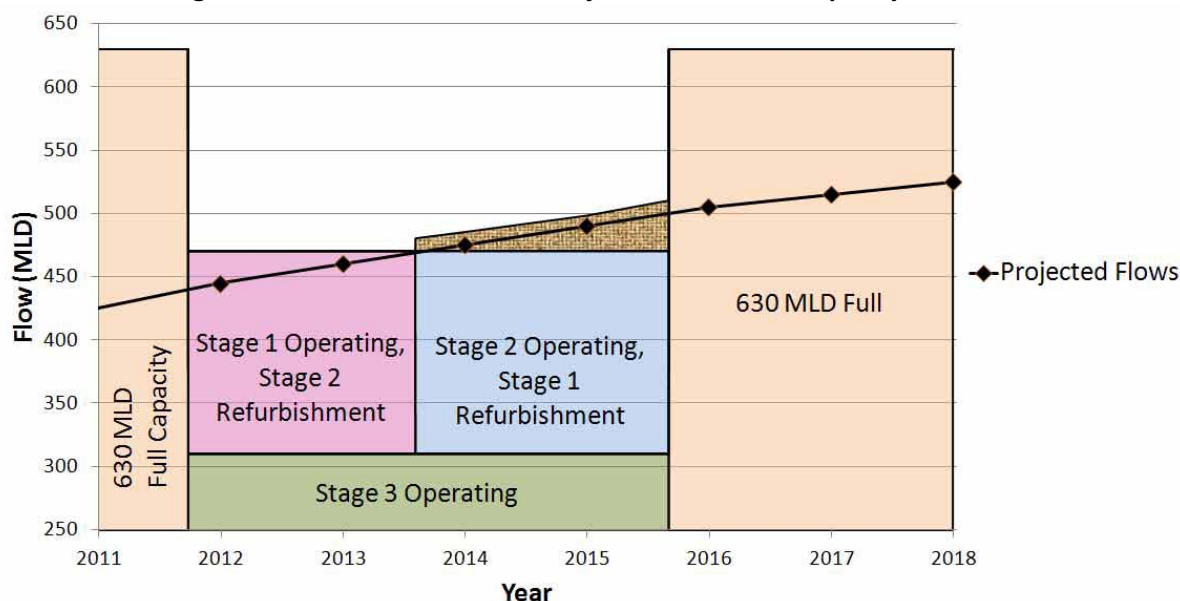
In 2009, Duffin Creek WPCP capacity was rated a D. This low grade was due primarily to the rapid growth the York Region was facing and the length of time required to bring new facilities on line at the plant. With the investment in new facilities, the capacity grade is now an A with sufficient capacity to support growth over the coming 10-15 years.

Table 7-3: Duffin Creek Capacity Grade

Environmental Services Department State of Infrastructure			
Capacity Measures			Trend to 2013
	2009	2011	
Ability to meet current demand	C	A	→
Ability to meet future demand	F	B	↑
OVERALL	D	A	↑

As part of the approval process for the current expansion, mandatory conditions resulted in a requirement for upgrades and refurbishment of the existing (Stage 1 & 2) plant to comply with an Odour Mitigation Plan for the WPCP. Implementation of the upgrades and refurbishment will require partial shutdown of the existing plant in stages reducing available treatment capacity during implementation by approximately 25%. This will present operational challenges to maintain the consistently high performance of the plant especially during peak demand wet weather events. While representing an operational challenge, as each stage is successively upgraded and returned to service, plant rated capacity gradually will be restored and overall reliability will be improved. Additionally the two Regions are working with the Ministry of Environment to address and mitigate impacts during this time period.

Figure 7-1: Duffin Creek WPCP Projected Flows and Capacity to 2018



Plant upgrades have included the installation of fine bubble diffusers, new aeration blowers, a de-chlorination system, headworks building for screening and grit removal, primary treatment modules,

secondary treatment modules, a new disinfection facility and improvements to the two incineration reactor systems.

York Region and Durham Region have jointly initiated a Schedule C Class Environmental Assessment study to identify the preferred solution for a capacity increase for the outfall and diffuser system at the Duffin Creek WPCP. The present approved flow capacity is 520 MLD, capable of accommodating growth to 2017. The preferred solution will permit the Duffin Creek WPCP to operate at a capacity of at least 630 MLD to meet growth to around 2031.

7.3 SOUNDNESS

Soundness, the physical attributes of the Duffin Creek infrastructure, received an overall grade of B. In the recent past there has been considerable concern over the condition of certain assets such as the incineration facility. The main focus of projects that have been completed in the last several years has been on expansion with nominal efforts to rehabilitate existing infrastructure where it was necessary to maintain or enhance capacity. A heightened sense of awareness of the need for more action on capital rehabilitation and replacement has been gained through the intensive planning undertaken to support expansion plans. This has translated into better data for capital plans that are reflected in the Region's current 10 year business plan. The challenge for the two Regions will be to transform these plans into executed projects at the risk of deteriorated asset condition and decreased maintenance effectiveness.

Table 7-4: Duffin Creek Soundness Grade

Environmental Services Department State of Infrastructure			
Soundness Measures			Trend to 2013
	2009	2011	
Condition	C	B	↑
Ability to maintain assets	B	A	↑
OVERALL	B	B	↑

According to a recent inventory assessment, the overall condition for the Duffin Creek WPCP assets is good or a B grade factoring in the age of the plant and equipment. While the majority of assets are in good operating condition, a fair number of these require minor maintenance including cleaning, refinishing, and adjustment as part of routine operator and central maintenance activities. There are also some assets assigned a D or F grade representing assets at end of expected life such as electrical and instrumentation assets, those operating in harsh environments or those with quality not as high as expected.



As an example, over the last ten years the majority of the plant roofing systems have been replaced, however with a 20 year life expectancy, of the 30 roofing systems throughout the plant ranging in age from new to nearly 30 years old, maintenance and replacement of these roofing systems will be an ongoing need. Much of the plant has been in service for 20 to 30

years, and many of the other building systems are in the age range where rehabilitation will be required including the aforementioned electrical systems. Combined with asset replacements, the expected infrastructure requirements over the 10 year planning have been estimated by York Region in the order of \$150 million.

Currently, the Region of Durham is utilizing Avantis Pro Enterprise, a computerized maintenance management system (CMMS), to manage maintenance activities at the Duffin Creek WPCP. The CMMS database contains information on approximately 4,000 mechanical and electrical assets and systems at the plant as well as approximately 1,000 HVAC, roofing and various building support assets and systems.



Since its implementation in 2004, maintenance programming with the Avantis system has evolved to include a

comprehensive asset inventory, asset condition assessments and rehabilitation/replacement costs and timing. The current work order ratios for planned and unplanned as well as completion ratios score favorably, however the total number of preventive maintenance work orders is low for a plant of this size and complexity. As equipment is installed under the Stage 3 expansion, preventive maintenance work orders are being developed and added to the Avantis system. This is a good way of expanding the CMMS and increasing the effectiveness of the maintenance management program.

8 FINANCIAL

Strength of the budgeting process reflects in the grades and trends of the Financial State of Infrastructure. As the Region begins to build reserves in 2014 and beyond the financial grades will begin to improve.

Table 8-1: Financial Grades

Environmental Services Department State of Infrastructure			
	Financial Grade		Trend to 2013
	2009	2011	
Water	C	C	→
Wastewater	C	C	→
Waste Management	C	C	→
Duffin Creek	D	C	↑
OVERALL	C	C	↑

The Region's funding for projects take advantage of contributing funds from Federal and/or Provincial funding wherever possible. Projects in all Environmental Services categories have qualified for funding.

The Region's existing rate strategy is designed to ensure the necessary funding is in place to meet operating costs and long-term rehabilitation and replacement needs. The strategy also includes a phased-in approach to rate increases over the long-term. As a result of phasing rate increases, the system is currently using all available revenue, including reserves to meet operating and capital obligations. The situation will improve as rates reach their full value and proportionately more of the rate is focused on contribution to reserves.

With responsible, prudent fiscal policies, sustainable financial strategies and proactive financial planning processes, York Region strives to ensure that programs and services are delivered to the community in an effective manner at reasonable cost. York Region's financial policies and practices ensure that ongoing operating requirements as well as growth and development needs are financed in a fiscally responsible manner to meet the current and future needs.

8.1 REHABILITATION & REPLACEMENT BUDGET

York Region has a robust budget process that requires each department to prepare a 10-Year Capital Plan which analyzes the various funding sources in their respective units to meet specific budget pressures. Each department is also required to produce a business plan which provides justification for current and forecasted expenditures and revenues within their business unit. A comprehensive review process is conducted after which, the proposed budget is adopted by Regional Council. The framework used outlines budget pressures according to three categories; Rehabilitation, Growth and Enhancement and clearly distinguishes between discretionary versus uncontrollable costs.

York Region has been actively adopting sustainable business management practices for the Region's water, wastewater, and waste management services. Within the budget process, the Infrastructure Management Program is primarily concerned with developing information for the category of rehabilitation and in few instances with the improvement of existing performance or optimization or enhancement.

The Infrastructure Management and Infrastructure Renewal Programs are the Region's key support programs to manage the on-going performance, quality, reliability and improvement of Department infrastructure. The system employed by the Environmental Services Department for rehabilitation capital planning and budgeting includes steps for inventory, needs identification, goals and standards, risk management, and decision making. Over the last several years the infrastructure knowledge base has improved significantly allowing funding requirements for Water and Wastewater, including Duffin Creek WPCP, to be more accurately predicted. Waste Management infrastructure needs have not been formally forecast as yet although a plan is in place to generate this information.

Although the budget has been matched with the estimated rehabilitation needs, the amount has increased substantially since the 2009 State of Infrastructure Report. It is reasonable to expect an adjustment to the 10 year budget when more and better asset information is acquired through continued infrastructure management processes such as condition assessments and lifecycle predictions. In particular over the last two years, the Region has improved water and wastewater asset knowledge in many areas, such as:

1. **Wastewater:** several critical wastewater pumping stations have been assessed and are currently under rehabilitation upgrades
2. **Gravity Sewer:** through the ongoing CCTV and chamber inspection, and the Inflow and Infiltration program, significant rehabilitation projects were identified and are underway
3. **Watermain:** Analysis of ductile iron watermain performance and condition has revealed the need to address the frequent breaks that occur compared to other types of watermains. A plan has been developed to gradually replace the ductile iron watermains over the next several years.

As part of the program to manage the inspection, condition assessment and capital planning of infrastructure, the Department plans to allocate approximately \$25 million over the next 10 years to assess, analyze, and plan infrastructure lifecycle rehabilitation and replacement requirements.

8.2 RESERVE

In 2010, Watson & Associates Economists Ltd. was engaged by the Region to prepare a study of future water and wastewater rates as part of the *Safe Drinking Water Act's* requirement for a Council approved Drinking Water Financial Plan. The study provided a long range projection of the Region's capital and operating budget along with a preliminary review of the infrastructure replacement needs. Regulations under the *Safe Drinking Water Act* encourage full cost recovery as a first step in

developing a financially sustainable system. Regional staff has updated the model based on 2011 budget information to arrive at the recommended water and wastewater user rates for 2012 to 2015.

The study included a detailed inventory of all water and wastewater assets and contributions required to replace these assets at the end of their useful life. This study indicates that annual lifecycle replacement contributions of approximately \$14 million for water and \$19 million for wastewater are required to fund replacement needs. In comparison, the 2011 budget includes replacement contributions of \$6.7 million for water and \$15.0 million for wastewater. However, the wastewater contribution is essentially offset by the 2011 budgeted operating shortfall of \$15 million, as operating shortfalls have been funded through the reserve.

The 2011 rate review targeted reserve balances equal to 20% of the replacement value of Environmental Services infrastructure. In the review, reserves are projected to reach and maintain a sustainable level in 2020 and beyond.

Replacement value of the Region's infrastructure is increasing due to the continued commitment to meeting growth requirements by constructing new assets. Since the 2009 State of Infrastructure Report, capital expenditures have amounted to over \$1 billion. The budget for repairing, replacing and updating York Region's water, wastewater and waste management infrastructure is approximately \$580 million over the next 10 years. This will add to the current infrastructure replacement value of Environmental Services assets of over \$3 billion.

More than half the value of the Department infrastructure has reached the midway point of the expected useful life which demonstrates the significance of future expenditures needed for asset replacement. Maintaining a reserve of 20% of the replacement cost of Environmental Services infrastructure takes significant and increasing financial investment to account for withdrawals from the reserve fund and the increasing cost to rehabilitate and replace infrastructure.

The single most valuable Regional asset is the Duffin Creek WPCP. This wastewater treatment plant is co-owned with Durham Region. Original construction was completed in 1980 for approximately \$70 million. Over the last 30 years the plant has undergone various additions and upgrades with a concentration of expansions more recently begun in 2005. In 2009 a valuation of the Duffin Creek WPCP was performed to establish the replacement value of the plant. Several evaluation methods were employed to establish the plant's replacement cost estimate of \$870 million. This value does not include expenditures from the recent expansions. Share of the original plant is based on equal ownership of the plant in terms of value although York Region utilizes a greater share of the capacity. For the expanded plant York Region has assumed a greater ownership share of the plant components. Thus the Region's financial obligations are more than 50% of the total value of the plant.

8.2.1 Water & Wastewater Reserve

York Region provides water supply and sanitary sewage servicing capacity to the nine local municipalities within the Region. The operating costs associated with the provision of these services are recovered through a uniform region-wide water and wastewater user rate, based on actual water flows. A fixed component of each user rate is contributed to a reserve which is used to fund the

replacement and rehabilitation of water and wastewater infrastructure. These reserves are also used to mitigate any large fluctuations in the water or wastewater user rates. The Region's uniform water and wastewater user rates provide for the following:

- Rehabilitation and replacement of existing assets
- Rehabilitation and replacement of assets built in the future
- The funding component of new infrastructure (i.e. upgrades) not related to growth
- The component of growth-related infrastructure not recovered from development charges due to reduced DC rates (discount)
- Costs associated with operating water and wastewater services

8.2.2 Waste Management Reserve

In addition to the building components, Waste Management facilities have high speed conveyors, sorting equipment, balers and compactors that wear out over time and will need to be replaced at regular intervals over the life of the operation. Even with a proper preventative maintenance system, the equipment and some building elements have an expected life of between ten and fifteen years.

The majority of these facilities were funded from the Solid Waste Management Reserve Fund financed from royalty payments from the City of Toronto from the Keele Valley Landfill Site. The Keele Valley funding source expired in 2011. Other revenue sources are funding from Waste Diversion Ontario (WDO) and market revenues from the sale of recovered material. Since the establishment of the WDO, the Region has been allocating its share of Blue Box funding received (50% split with local municipalities) to its Waste Management reserve which is now approximately \$19 million.

The reserve fund is forecast to increase over the coming years based on estimates for continued funding from WDO and market revenues. It is expected that major repairs, replacements and upgrades will be financed from reserves although there is no formal plan in place for the anticipated requirements for these needs.

9 DATA MANAGEMENT

Data is the foundation of information. A key challenge to generate insightful and meaningful information is that data resides in multiple systems and sources typically in a form not readily accessible for reporting purposes. Best practice for data is to maintain processes that provide clean, accessible, consistent, accurate and complete data.

- **Clean:** the data contains consistent spelling, is free of unnecessarily complex syntax and tables do not contain duplicate records
- **Accessible:** data can readily and easily be obtained in the format required for reporting
- **Complete:** all of the required fields in each record have been populated
- **Consistent & Accurate:** described in a standardized, structured manner and adheres to an agreed-upon naming convention, all of the required fields in each record have been populated correctly, data is current

Overall data confidence results for the 2011 State of Infrastructure Report are improved from the 2009 Report. This reflects an increase in the breadth and depth of completeness, greater accessibility, and better consistency of the data. By recognizing what data is required, where it is to be reported and the recording source at the asset level, York Region has enabled a robust data management and data transfer process for the 2011 State of Infrastructure Report.

Figure 9-1: Data Confidence

		Data Confidence		Trend to 2013
Measure & Indicator		2009	2011	
Reliability	Ability to maintain service during power outage	Medium	Medium	↑
	Ability to meet quality standards	Medium	High	↑
	Ability to maintain service during power outage	High	High	↑
	Ability to maintain secure operations	Medium	Medium	↑
Capacity	Ability to meet current demand capacity	Medium	Medium	↑
	Ability to meet future demand capacity	No Data	Medium	→
Soundness	Condition Rating	High	High	↑
	Ability to maintain assets	Medium	High	↑
Financial	Ability to fund identified Rehabilitation & Replacement needs (near term)	High	High	↑
	Ability to Fund Future Replacement Needs (long term)	Medium	High	↑

Confidence in the indicator data is indicated in the general illustration above with colour representing the ability to secure the needed data. As can be seen the majority of the indicator data is highlighted green. For indicator data represented by yellow confidence limits, information is available through surrogate or work-around methods such as the use of age for condition.

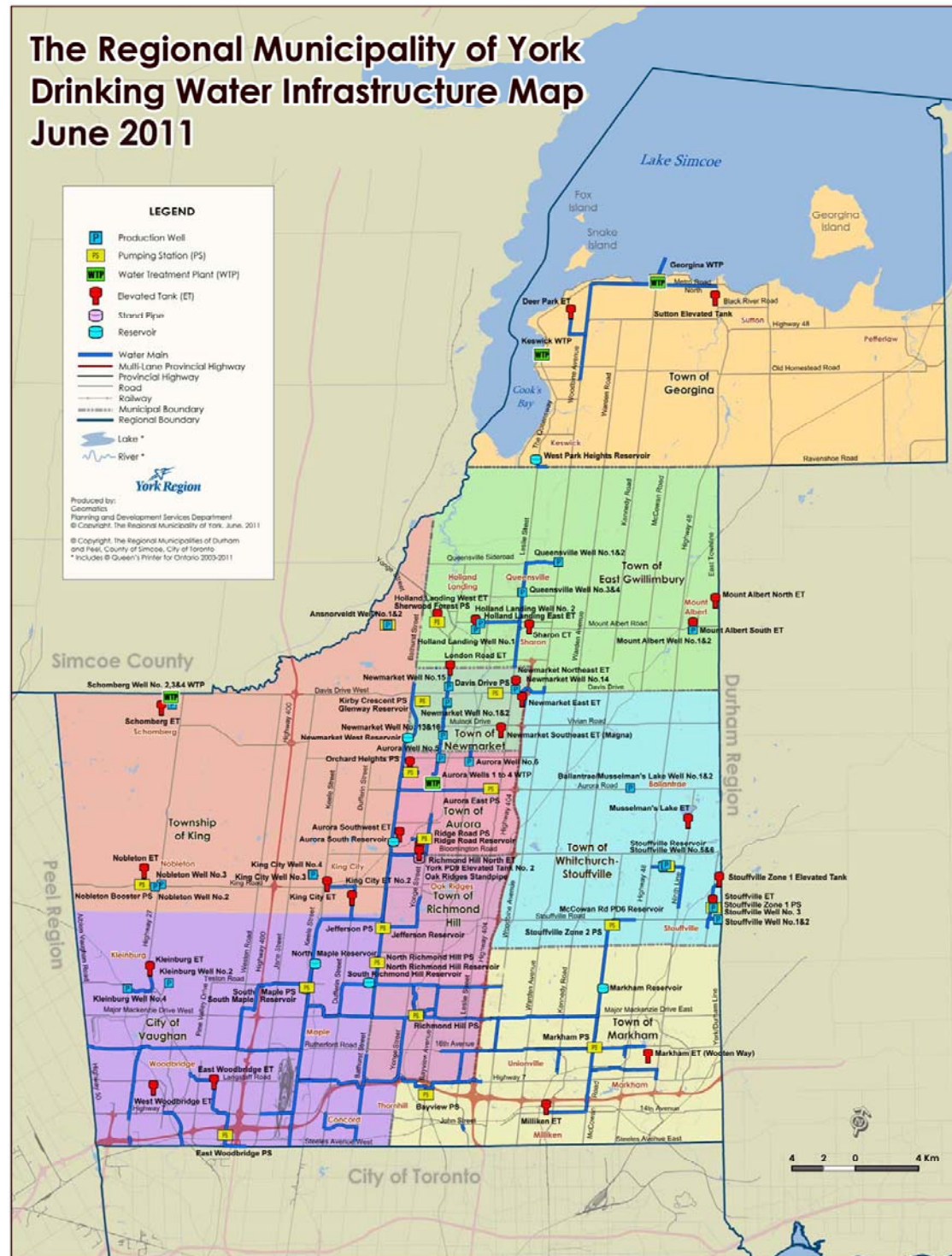
Data is the core of any business information system and is a key organizational resource. Data needs must be defined clearly and the accuracy and currency of data should match the business needs to support the decision-making processes of the organization. Data must be able to be gathered, verified, stored, retrieved and protected in an understandable and systematic manner.

Reliable decision making on capital planning, rehabilitation and replacement planning largely depends on the quality of infrastructure data that the Region collects and maintains. One of the key objectives of the Report is the ability to replicate and substantiate the results of the State of Infrastructure Report. To do so, the Region should continue to develop its asset data systems and processes.

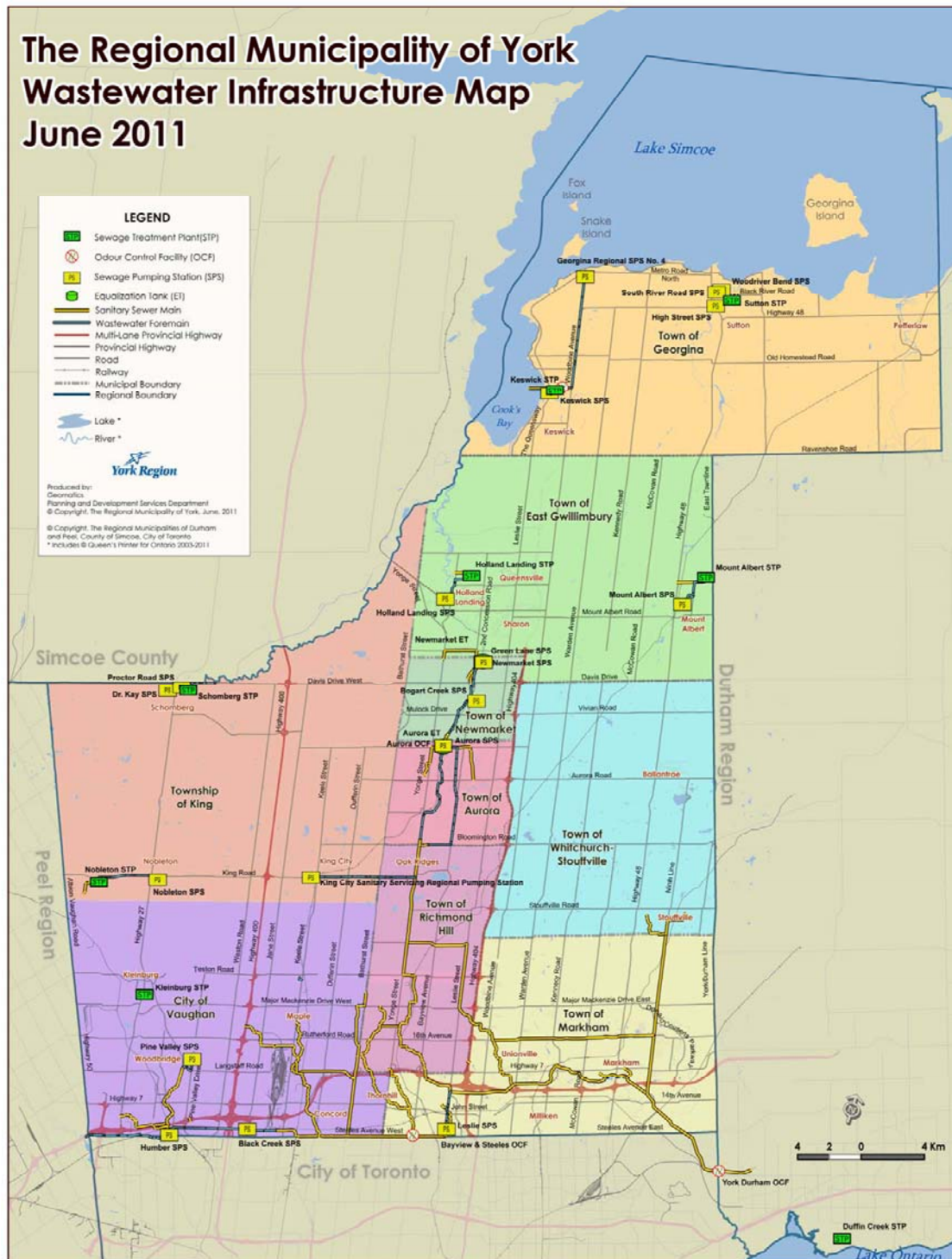
Further improvements can be realized by adopting recommendations from a review of the Infrastructure Management program and updating the Information System Master Plan including a Data Management Strategy. Specific improvements related to production of State of Infrastructure Reports include development of a data audit process to identify performance gaps, and the set-up of equipment and inventory databases to provide data in the format needed.

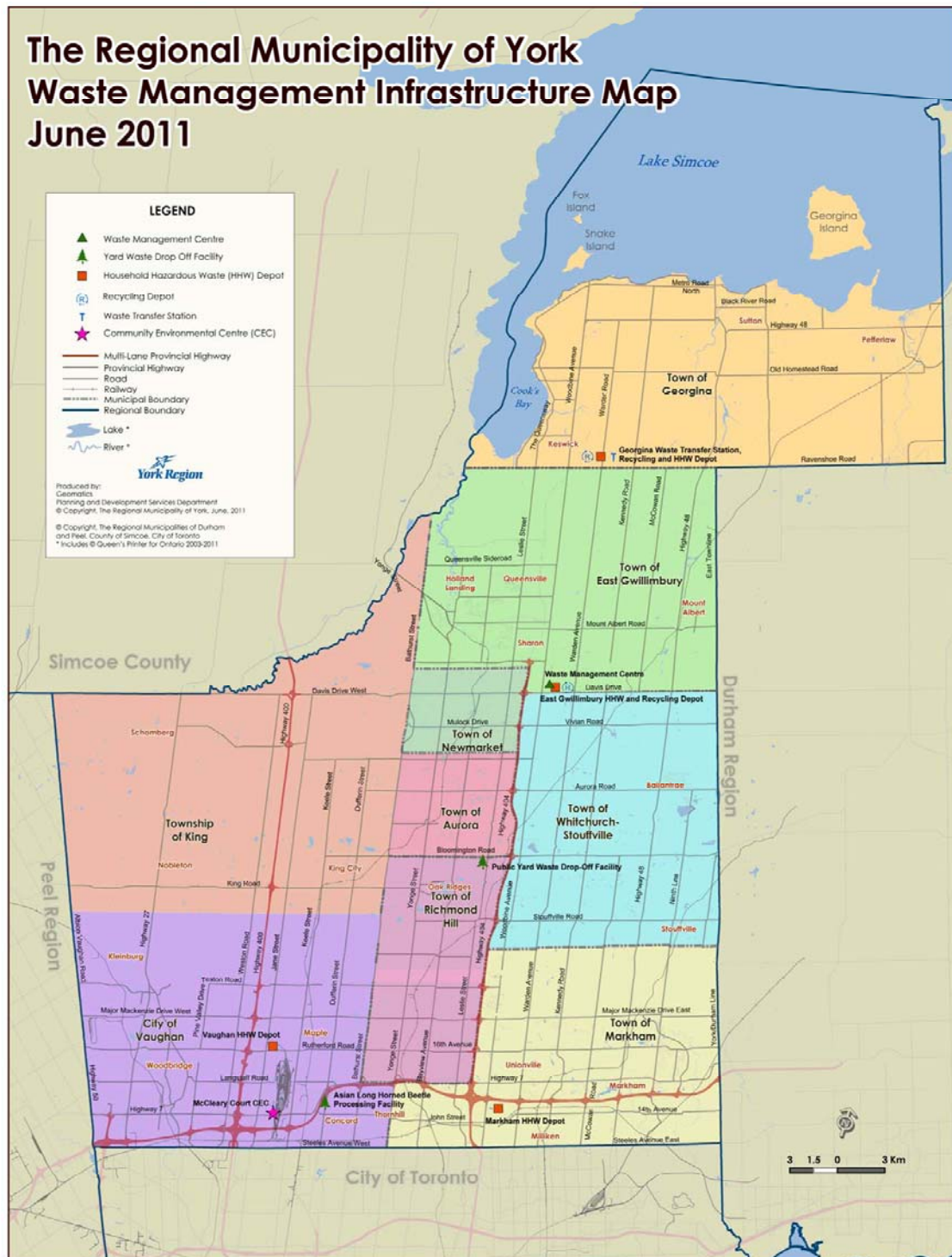
Data needs must be defined clearly and the accuracy and currency of data should match the business needs to support the decision-making processes of the organization. It must also be verified, stored, retrieved and protected in a systematic manner and hence be readily available for use by staff. Examples of specific data issues are that data for some indicators is available but not stored in any maintenance or infrastructure management system such as for standby power, installed power load, and condition data. Other data although accessible, must be analyzed or transformed prior to use in the State of Infrastructure Report. In cases where data was not available, staff knowledge was relied on to permit a qualitative analysis of the results.

APPENDIX A: INFRASTRUCTURE MAPS



The Regional Municipality of York Wastewater Infrastructure Map June 2011



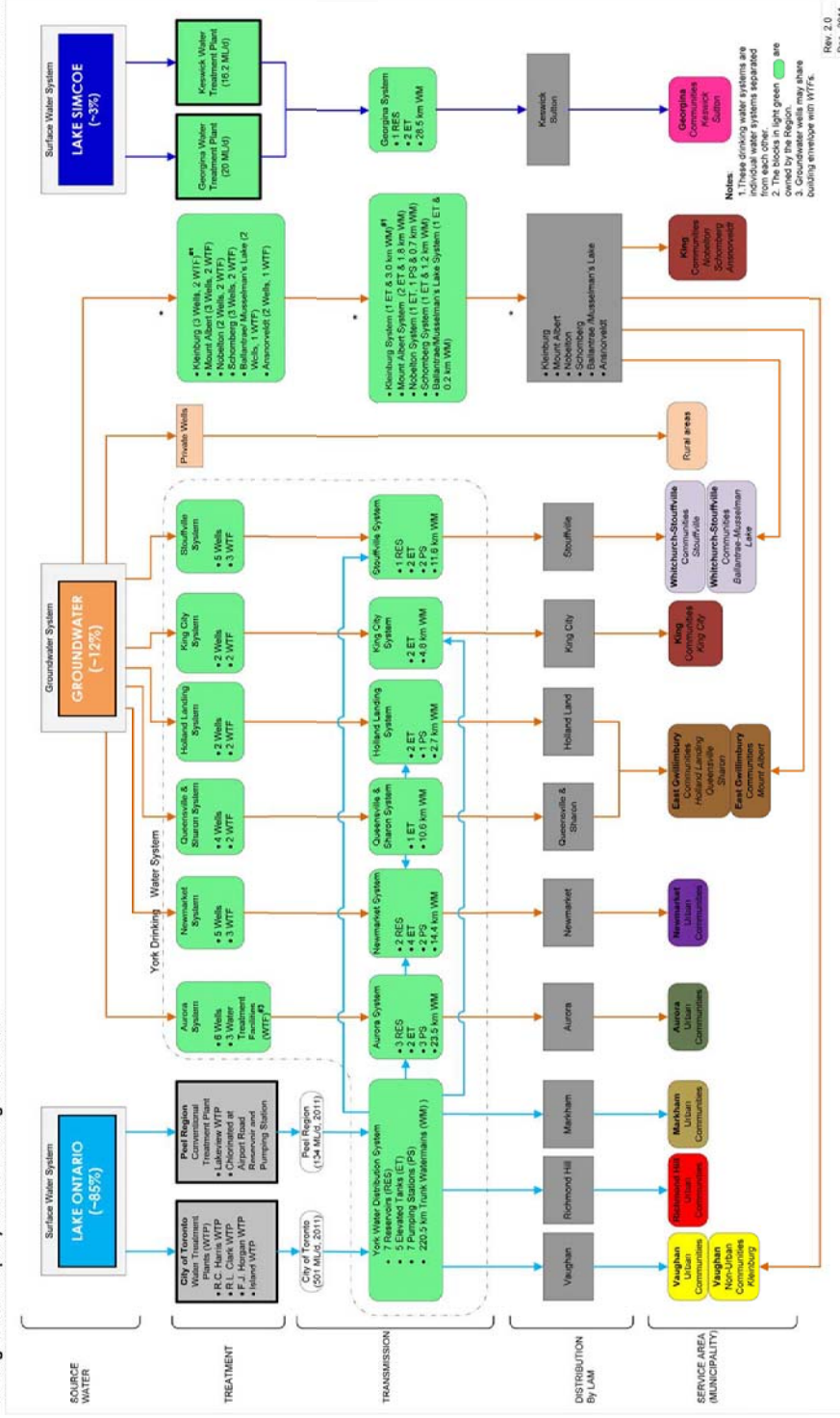


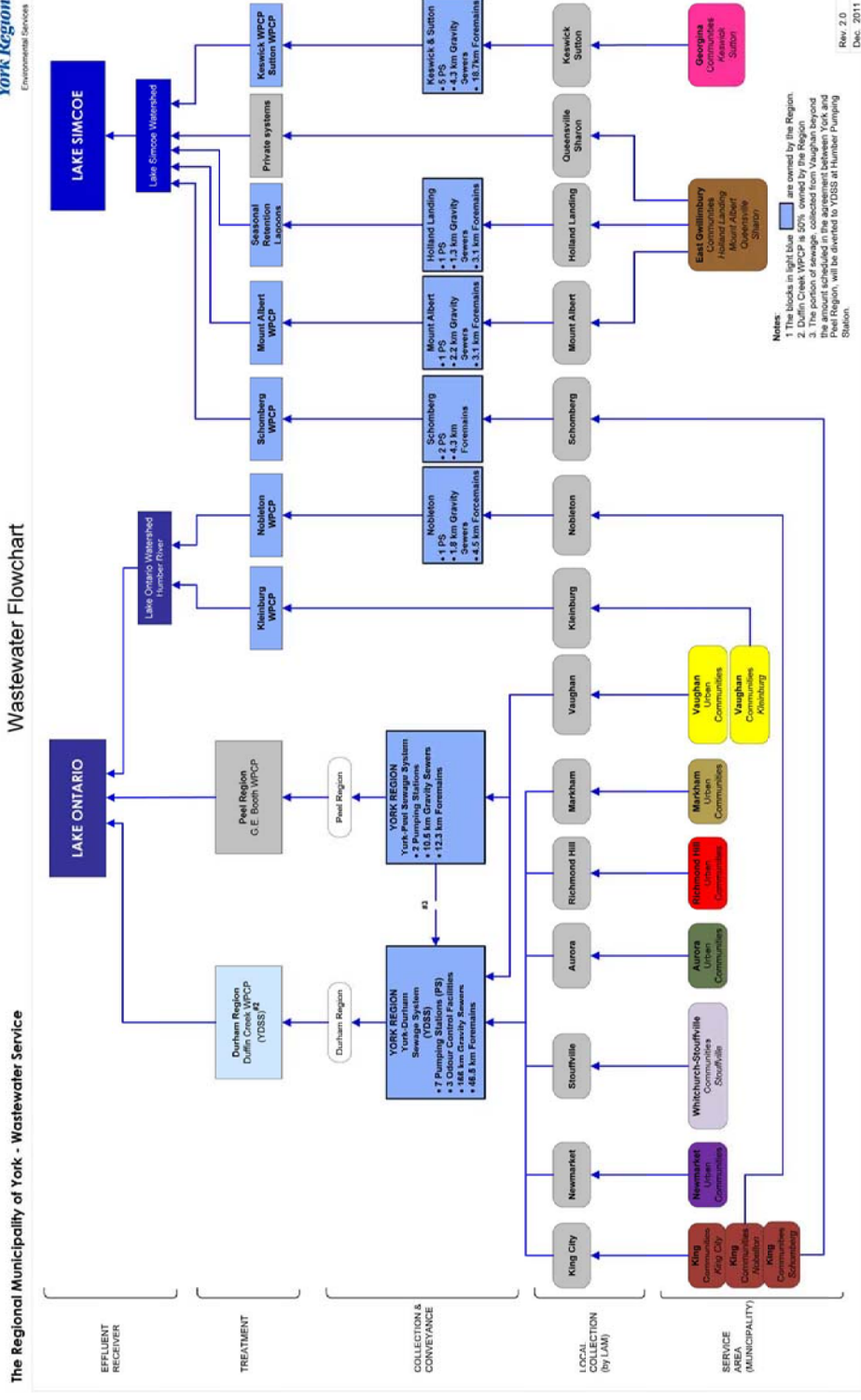
APPENDIX B: DEPARTMENT SERVICES FLOWCHARTS

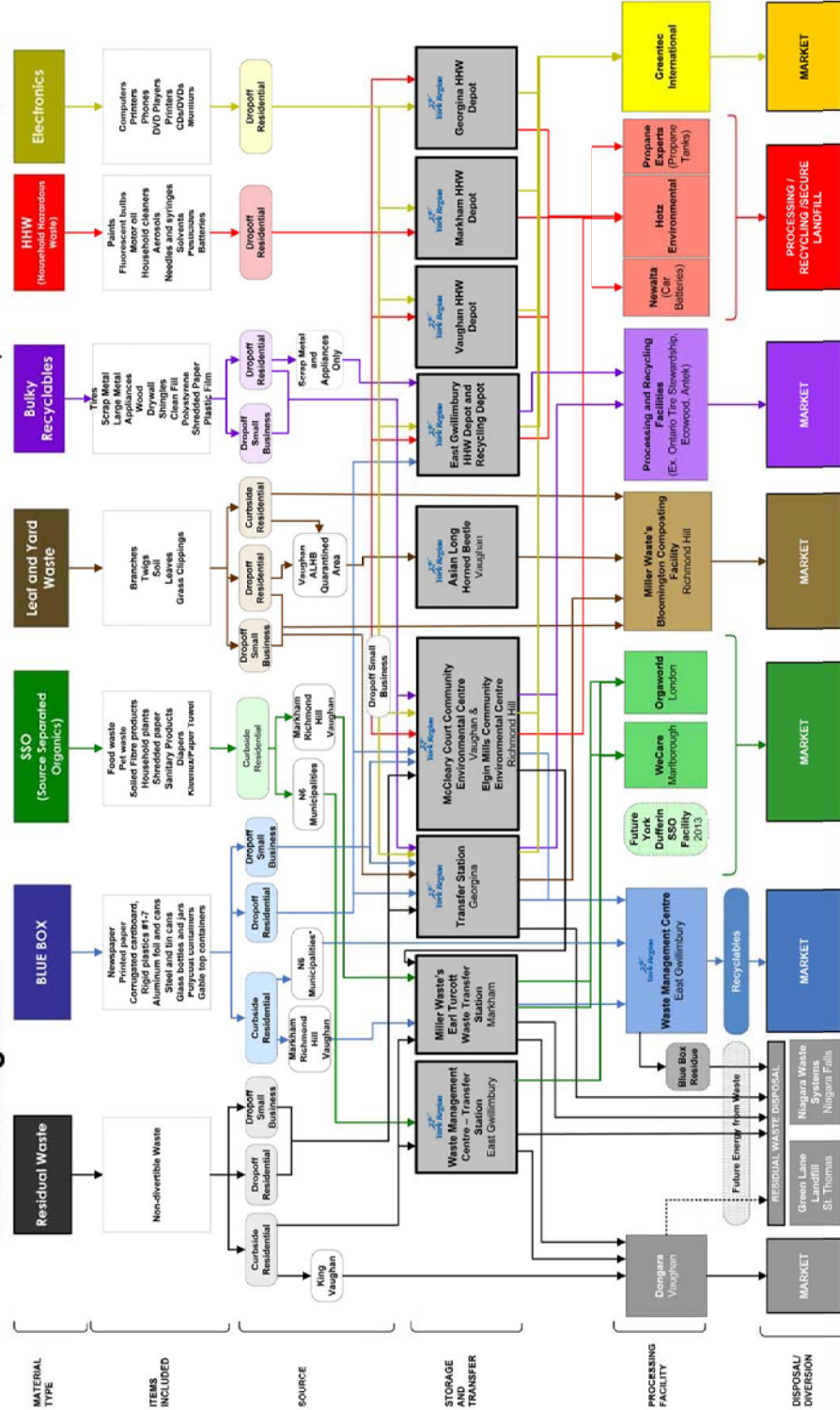


Water Flowchart

The Regional Municipality of York - Drinking Water Service







THE REGIONAL MUNICIPALITY OF YORK
ENVIRONMENTAL SERVICES

17250 Yonge Street
Newmarket, Ontario L3Y 6Z1

Telephone: 905-895-1207 Extension 3000

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