



Regional Municipality of York



Alternative Solutions Water and Wastewater Master Plan Update

March 2008



GENIVAR





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March 31, 2008

Dr. H. Hatami, Ph.D, P.Eng, PMP
Project Manager
The Regional Municipality of York
17250 Yonge Street
Newmarket, ON L3Y 6Z1

Re: Water and Wastewater Master Plan - Alternative Planning Scenarios

Dear Dr. Hatami:

We are pleased to submit this working paper on Alternative Planning Scenarios Analysis for the Water and Wastewater Master Plan Update.

Please review the report and we can arrange to discuss your comments.

Yours truly,

GENIVAR Ontario Inc.

A handwritten signature in blue ink, appearing to read "Stan C. Holden".

Stan C. Holden, P.Eng.
Project Manager

/cl

cc: Mr. George Zukovs, XCG Consultants Ltd.

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- Small Urban Systems
- York Water System

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1. Introduction

York Region has prepared four different planning scenarios to be evaluated for selection of the preferred planning scenario. The scenarios varied by the amount of intensification to be considered in the existing urban boundaries to the horizon year 2031. For the 30%, 40% and 50% intensification scenarios, the respective percentages of growth were within the urban boundary with the remaining increased population to settle in the potential development lands while in the No Growth scenario all future populations were considered to be within the existing boundary. The evaluation of the planning scenarios will consider the impact on the water supply and wastewater collection systems. This report presents the analysis that has been conducted on the planning scenarios and the projected cost.

2. Planning Data and System Demands

The planning data for the four scenarios was provided by traffic zone in 5 year increments for 2011 to 2031. The data was broken down by service area/pressure district using GIS for the water supply system and by drainage area for the wastewater system. The serviced population and employment data were combined with the unit demand rates, to calculate the demand/flows for each water service area. Similarly wastewater demands were generated for the major drainage areas of the existing systems.

3. Cost Basis

The cost information presented in this assessment has been based on previous Master Plans, Class EAs or Region estimates and considered to reflect January 2008.

4. Water Systems Evaluation and Cost

The water system demands were developed for the Smaller Urban Systems (SUS) separately from the larger York Water System. For the SUS, the demands were compared to the existing system capacity and/or the planned system expansion. The infrastructure was evaluated and additional infrastructure identified as necessary. In many cases, the systems currently planned in the 2004 MP or recent Class EAs were sufficient to service the needs to the 2031 horizon.

For the York Water System (YWS) the system was planned to 2036 in the 2004 MP and this was considered the base for this evaluation. The demands were determined by pressure district and compared to the demands in the 2004 MP update. The infrastructure proposed in the previous master plan was reviewed and all completed or soon to be constructed works were removed from the previous cost estimate. The system was considered to include the communities of Kleinburg, King City and Stouffville which are proposed to be connected to the YWS. The remaining projects were updated to reflect changes in sizes based on the new estimated demands and costs increased to reflect current pricing information. The cost information was based on recent costing studies or the estimates from recent EAs.

The costs for each scenario were calculated. Timing for the infrastructure was based on the demand projections and considered in 5 year intervals. The costs and timing are shown in Table 4.1.

The cost summary indicates that for the SUS there is no real difference in cost or phasing of the infrastructure for the planning scenarios. The No Growth scenario in the YWS would be the preferred based on the lower overall capital cost and marginally lower costs to phase. While no evaluation of operating costs has been done, the cost for the No Growth scenario would be slightly less than the other scenarios.

Table 4.1 Water System Costs

Scenario	To 2011	2012-2016	2017-2021	2022-2026	2027-2031	Total Capital Cost
Small Urban Systems						
Ballantrae						
30%	\$3,287,000					\$3,287,000
40%	\$3,287,000					\$3,287,000
50%	\$3,287,000					\$3,287,000
No Growth	\$3,287,000					\$3,287,000
Mount Albert						
30%	\$5,647,000					\$5,647,000
40%	\$5,647,000					\$5,647,000
50%	\$5,647,000					\$5,647,000
No Growth	\$5,647,000					\$5,647,000
Nobleton						
30%	\$6,871,000					\$6,871,000
40%	\$6,871,000					\$6,871,000
50%	\$6,871,000					\$6,871,000
No Growth	\$6,871,000					\$6,871,000
Schomberg						
30%	\$12,000,000					\$12,000,000
40%	\$12,000,000					\$12,000,000
50%	\$12,000,000					\$12,000,000
No Growth	\$12,000,000					\$12,000,000
Georgina						
30%	\$18,211,000	\$13,200,000		\$6,500,000		\$37,911,000
40%	\$18,211,000	\$13,200,000		\$6,500,000		\$37,911,000
50%	\$18,211,000	\$13,200,000		\$6,500,000		\$37,911,000
No Growth	\$18,211,000	\$13,200,000		\$6,500,000		\$37,911,000
York Water Systems						
30%						
Watermains	\$28,650,000	\$26,522,000	\$10,495,000	\$9,400,000	\$8,793,000	\$83,860,000
Pumping Stations	\$2,760,000	\$0	\$3,480,000	\$914,000	\$0	\$7,154,000
Storage Facilities	\$16,111,000	\$11,144,000	\$6,665,000	\$4,063,000	\$0	\$37,983,000
Supply and Treatment	\$1,200,000	\$8,657,000	\$6,797,000	\$0	\$0	\$16,654,000
Decommission	\$885,000	\$330,000	\$165,000	\$0	\$0	\$1,380,000
Total	\$49,606,000	\$46,653,000	\$27,602,000	\$14,377,000	\$8,793,000	\$147,031,000
40%						
Watermains	\$28,650,000	\$26,522,000	\$10,495,000	\$9,400,000	\$8,793,000	\$83,860,000
Pumping Stations	\$2,760,000	\$0	\$3,480,000	\$914,000	\$0	\$7,154,000
Storage Facilities	\$16,111,000	\$11,144,000	\$6,665,000	\$4,063,000	\$0	\$37,983,000
Supply and Treatment	\$1,200,000	\$8,657,000	\$6,797,000	\$0	\$0	\$16,654,000
Decommission	\$885,000	\$330,000	\$165,000	\$0	\$0	\$1,380,000
Total	\$49,606,000	\$46,653,000	\$27,602,000	\$14,377,000	\$8,793,000	\$147,031,000
50%						
Watermains	\$28,650,000	\$26,522,000	\$10,495,000	\$9,400,000	\$8,793,000	\$83,860,000
Pumping Stations	\$2,760,000	\$0	\$3,480,000	\$914,000	\$0	\$7,154,000
Storage Facilities	\$16,111,000	\$11,144,000	\$6,665,000	\$4,063,000	\$0	\$37,983,000
Supply and Treatment	\$1,200,000	\$8,657,000	\$6,797,000	\$0	\$0	\$16,654,000
Decommission	\$885,000	\$330,000	\$165,000	\$0	\$0	\$1,380,000
Total	\$49,606,000	\$46,653,000	\$27,602,000	\$14,377,000	\$8,793,000	\$147,031,000

Table 4.1 Water System Costs

Scenario	To 2011	2012-2016	2017-2021	2022-2026	2027-2031	Total Capital Cost
No Growth						
Watermains	\$28,650,000	\$26,522,000	\$8,644,000	\$9,400,000	\$8,793,000	\$82,009,000
Pumping Stations	\$2,760,000	\$0	\$0	\$2,706,000	\$0	\$5,466,000
Storage Facilities	\$14,422,000	\$9,456,000	\$6,665,000	\$2,456,000	\$0	\$32,999,000
Supply and Treatment	\$1,200,000	\$8,657,000	\$6,797,000	\$0	\$0	\$16,654,000
Decommission	\$885,000	\$330,000	\$165,000	\$0	\$0	\$1,380,000
Total	\$47,917,000	\$44,965,000	\$22,271,000	\$14,562,000	\$8,793,000	\$138,508,000
Regional Total Water						
30%	\$95,622,000	\$59,853,000	\$27,602,000	\$20,877,000	\$8,793,000	\$212,747,000
40%	\$95,622,000	\$59,853,000	\$27,602,000	\$20,877,000	\$8,793,000	\$212,747,000
50%	\$95,622,000	\$59,853,000	\$27,602,000	\$20,877,000	\$8,793,000	\$212,747,000
No Growth	\$93,933,000	\$58,165,000	\$22,271,000	\$21,062,000	\$8,793,000	\$204,224,000

5. Wastewater Systems Evaluation and Costs

The wastewater system demands were developed for the SUS facilities and for the larger York Durham Sewage System (YDSS). For the SUS facilities, the demands were compared to the existing system capacity and/or the planned system expansion. The infrastructure was evaluated and additional infrastructure identified as necessary. In many cases, the systems currently planned in recent Class EAs were sufficient to service the needs to the 2031 horizon.

For the YDSS, the system has been planned to the 2036 horizon in the 2003 YDSS Master Plan. Wastewater flow projection curves were developed for each planning scenario and for each major pumping station. These curves were then compared against current or planned capacities to identify system needs. Based on the analysis, already planned and new required projects were identified. For each planned project, cost estimates were developed from previous Class EA documents, 2007 York Region capital budget estimates or project cost information provided directly by Capital Planning. For new required projects, conceptual level cost estimates were developed based on recent York Region project costs for similar projects.

The costs for each scenario were calculated. Timing for the infrastructure was based on the demand projections and considered in 5 year intervals. The costs and timing are shown in Table 5.1.

Table 5.1 Wastewater System Costs

Scenario	To 2011	2012-2016	2017-2021	2022-2026	2027-2031	Total Capital Cost
Satellite Systems						
Schomberg						
30%	\$9,291,000					\$9,291,000
40%	\$9,291,000					\$9,291,000
50%	\$9,291,000					\$9,291,000
No Growth	\$9,291,000					\$9,291,000
Keswick						
30%	\$32,400,000		\$32,400,000			\$64,800,000
40%	\$32,400,000		\$32,400,000			\$64,800,000
50%	\$32,400,000		\$32,400,000			\$64,800,000
No Growth	\$32,400,000		\$32,400,000			\$64,800,000
Sutton						
30%		\$29,500,000				\$29,500,000
40%		\$29,500,000				\$29,500,000
50%		\$29,500,000				\$29,500,000
No Growth		\$29,500,000				\$29,500,000

Table 5.1 Wastewater System Costs

Scenario	To 2011	2012-2016	2017-2021	2022-2026	2027-2031	Total Capital Cost
Nobleton						
30%	\$29,000,000					\$29,000,000
40%	\$29,000,000					\$29,000,000
50%	\$29,000,000					\$29,000,000
No Growth	\$29,000,000					\$29,000,000
Kleinburg						
30%	\$11,232,000					\$11,232,000
40%	\$11,232,000					\$11,232,000
50%	\$11,232,000					\$11,232,000
No Growth	\$11,232,000					\$11,232,000
Queensville/ Holland Landing/ Sharon						
30%		\$338,682,000				\$338,682,000
40%		\$338,682,000				\$338,682,000
50%		\$338,682,000				\$338,682,000
No Growth		\$338,682,000				\$338,682,000
YDSS						
30%						
Pumping Stations		\$8,217,000		\$2,224,000		\$10,441,000
Collector Sewers	\$0	\$513,832,000	\$66,560,000	\$40,650,000		\$621,042,000
Treatment		\$390,900,000				\$390,900,000
Total	\$0	\$912,949,000	\$66,560,000	\$42,874,000	\$0	\$1,022,383,000
40%						
Pumping Stations		\$8,217,000		\$1,200,000		\$9,417,000
Collector Sewers		\$513,832,000	\$66,560,000	\$40,650,000		\$621,042,000
Treatment		\$390,900,000				\$390,900,000
Total	\$0	\$912,949,000	\$66,560,000	\$41,850,000	\$0	\$1,021,359,000
50%						
Pumping Stations		\$8,217,000	\$	\$950,000		\$9,167,000
Collector Sewers		\$513,832,000	\$66,560,000	\$40,650,000		\$621,042,000
Treatment		\$390,900,000	\$			\$390,900,000
Total	\$0	\$912,949,000	\$66,560,000	\$41,600,000	\$0	\$1,021,109,000
No Growth						
Pumping Stations		\$8,217,000	\$	\$1,140,000		\$9,357,000
Collector Sewers		\$513,832,000	\$66,560,000			\$580,392,000
Treatment		\$390,900,000	\$			\$390,900,000
Total	\$0	\$912,949,000	\$66,560,000	\$1,140,000	\$0	\$980,649,000
Regional Total Wastewater						
30%	\$81,923,000	\$1,281,131,000	\$98,960,000	\$42,874,000	\$0	\$1,504,888,000
40%	\$81,923,000	\$1,281,131,000	\$98,690,000	\$41,850,000	\$0	\$1,503,864,000
50%	\$81,923,000	\$1,281,131,000	\$98,690,000	\$41,600,000	\$0	\$1,503,614,000
No Growth	\$81,923,000	\$1,281,131,000	\$98,690,000	\$1,140,000	\$0	\$1,463,154,000

The cost summary indicates that for the SUS there is no real difference in cost or phasing of the infrastructure for the planning scenarios. The No Growth scenario in the YDSS would be the preferred based on the lower overall capital cost and marginally lower costs to phase. While no evaluation of operating costs has been done, the cost for the No Growth scenario would be slightly less than the other scenarios.

6. Discussion

The planning scenarios that have been developed by the Planning Department are for the interim year of 2031 for the purpose of selecting a preferred planning scenario. When the planning forecast is extended to the 2051 horizon (as planned for the water and wastewater servicing) changes to the infrastructure requirements can be expected. While it is not known what the extended planning data would be for the scenarios considered here it could change the preferred planning scenario. Additionally, the analysis presented does not consider the area municipal costs for servicing infrastructure.