CITY OF VAUGHAN

EXTRACT FROM COUNCIL MEETING MINUTES OF APRIL 8, 2014

Item 2, Report No. 1, of the Priorities and Key Initiatives Committee, which was adopted without amendment by the Council of the City of Vaughan on April 8, 2014.

2 CITY-WIDE WATER / WASTEWATER SERVICING STRATEGY CLASS ENVIRONMENTAL ASSESSMENT STUDY NOTICE OF STUDY COMPLETION CITY-WIDE

The Priorities and Key Initiatives Committee recommends:

1) That the recommendation contained in the following report of the Commissioner of Engineering and Public Works and the Director of Development/Transportation Engineering, dated March 17, 2014, be approved; and

2) That the presentation by the Manager of Engineering Planning & Studies and Mr. Kevin Brown, Senior Municipal Project Engineer, The Municipal Infrastructure Group Ltd., Dufferin Street, Vaughan, and Communication C2, presentation material, be received.

Recommendation

The Commissioner of Engineering and Public Works and the Director of Development/Transportation Engineering in consultation with the Director of Finance and the Director of Development Finance and Investments recommend:

1. THAT staff issue a Notice of Study Completion for the City-Wide Water/Wastewater Master Plan Class Environmental Assessment Study.

Contribution to Sustainability

The City-Wide Water/Wastewater Master Plan has established a framework for the provision of sustainable water and wastewater infrastructure needs throughout existing and proposed communities. This will be achieved by optimizing the efficiency of existing systems; expanding systems where necessary; and by ensuring safe and well-managed systems. The foundation of the study involves the integration of economic, environmental and community issues to facilitate decisions about growth management.

Economic Impact

The Water/Wastewater Master Plan (Master Plan) includes a comprehensive City-Wide evaluation of the local water and wastewater infrastructure needed to efficiently accommodate the population and employment growth projections resulting from implementation of the City's Official Plan to a planning horizon of 2031. The total estimated capital cost to implement the recommendations of the Master Plan is approximately $138 million ($68 million for water and $70 million for wastewater). Funding for this growth related infrastructure has been included in the City's current Development Charges Background Study and City Wide By-Law (water) or will be collected through future Area Specific Development Charge By-Laws (wastewater).

The estimated increase in operating and maintenance costs associated with the growth related (Development Charge funded infrastructure projects) will be approximately $2 million (based on 2013 dollars). This will be realized at full build out by 2031.

In addition to physical infrastructure improvements, system monitoring/optimization programs are necessary to ensure system capacities are maximized throughout the existing network of pipes to accommodate growth. The estimated yearly operating cost associated with these programs is approximately $1.5 million. Potential funding sources may include development charges, water/sewer rates, and water/sewer reserves.

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Communications Plan

A comprehensive public consultation program to obtain input from all affected stakeholders was completed throughout the duration of the study in accordance with the requirements of the Municipal Class Environmental Assessment process. A final Notice of Study Completion will be issued upon endorsement by Council.

Purpose

The purpose of this report is to highlight the conclusions and recommendations of the Water/Wastewater Master Plan Study so the Notice of Study Completion can be issued in accordance with the Municipal Class Environmental Assessment process.

Background - Analysis and Options

The City is responsible for the local network of watermains necessary to distribution water directly to the end users, residents and businesses. This local distribution system is supplied in bulk by York Region through a network of larger diameter transmission mains, pumping stations, elevated tanks and reservoirs. Wastewater collection is also divided between the City, responsible for local wastewater collection and local pumping and York Region, responsible for major pumping stations, major trunk sewers and treatment facilities. Accordingly, the supply of water and collection of wastewater is provided through closely integrated systems comprised of both Regional and City components.

The City's Master Plan recognizes the importance of coordination with Regional initiatives and supports the goal of working towards seamless integration with York Region's Master Planning. York Region's Water/Wastewater Master Plan is fundamental in that it identifies a number of water and wastewater projects intended to support growth in Vaughan. As the Region supplies water to the City and collects and treats the City's wastewater, the recommendations of the City's Master Plan are considerate of, and complementary to those of the Region's Master Plan.

Much of the City's local network of pipes is constructed by Developers and ultimately assumed by the City. Local development infrastructure requirements are typically designed, funded and constructed by Development in conjunction with the servicing of individual development applications.

City plans for and prepares to assume new water and wastewater infrastructure necessary to accommodate the next 17 years of growth

Provincial and Regional forecasts recognize Vaughan reaching a population of approximately 416,600 people and 266,100 jobs by 2031. The new City-Wide Official Plan has established a local framework for growth and development to the year 2031. Accordingly, the need to plan for long term water and wastewater infrastructure is vital to accommodate the City's estimated growth demands.

The City-Wide Water/Wastewater Master Plan provides guidance on where new development can locate, how to strengthen existing and future communities, what municipal services will be provided, and ensures continued level of service to residents and businesses are sustained.

The area of study encompasses the full limits of the entire City including areas outside the current urban boundary as premised upon the Official Plan and associated Secondary Plans. Future needs to 2051 were also examined to ensure recommended actions would align with eventual infrastructure and land use development requirements, thus assuring long term sustainability of Vaughan's water and wastewater systems. Various area specific master plans previously completed are carried forward and integrated with this Master Plan. These specific strategies

have been endorsed by Council and/or finalized over the last few years. They include the following:

- Vaughan Metropolitan Centre Municipal Servicing Class EA Master Plan
- Kleinburg-Nashville Water and Wastewater Servicing Strategy Master Plan
- Steeles West Municipal Servicing Master Plan Class EA

Additional detailed servicing strategies may be completed to facilitate approval of future Secondary Plans / Primary Centres as necessary. The City-Wide Master Plan has established the higher order framework / servicing requirements such that the overall infrastructure needs for future Secondary Plans and intensification corridors are protected.

City to evolve its existing systems to service intensification areas and increase overall system efficiency

The Master Plan identifies the efficiency of the City's current infrastructure and where and how additional capacity may be provided to address the needs of new development areas, as well as redevelopment and intensification within the built boundary. Implementing the recommendations of this study will advance water conservation and efficiency initiatives including mitigation of inflow and infiltration within the wastewater collection system in order to maintain levels of service for new and existing communities. The physical infrastructure improvements and programs recommended by the study (further detailed below) ensure these efficiencies are maximized throughout the existing network of pipes and provide for expansion to facilitate growth as envisioned by the Official Plan. The individual components / recommendations of the Master Plan are summarized below.

Physical Infrastructure Improvements

The proposed water and wastewater servicing consists of a set of new projects aimed at supporting the on-going use of the existing distribution and collection system as well as its expansion into areas currently undeveloped but within the urban boundary as identified in the City's Official Plan. The solution needed to plan for long term water and wastewater infrastructure and accommodate the City's estimated growth demands will involve the construction of 26 individual water and wastewater capital projects. These projects are summarized in Attachments No. 1 and 3; and geographically identified in Attachments No. 2 and 4.

Water Conservation Program

Among the recommendations made by the Master Plan, is the development of a water conservation/leak detection program. This is a widely recognized optimum approach to monitoring and controlling water distribution system performance including the reduction of water loss through leakage as infrastructure ages. The leak detection program will greatly assist with long-term water conservation and allow the City to more effectively manage the flows of water within its network and define more accurately future rehabilitation requirements in order to maximize the efficiency of new and existing systems. Immediate identification and elimination of leaks in the system will assist in water conservation.

This program will serve to maintain service levels and decrease potential interruption to residents or businesses caused by watermain breaks, leaks or low pressure. This local initiative will also complement York Region's current "Water for Tomorrow" Program.

Inflow and Infiltration Reduction Program

The implementation of continuous inflow and infiltration (I/I) reduction measures within the wastewater collection system are necessary to maximize use of existing system capacity and meet the City's legislative obligations. The program will;

- identify where high I/I flows (extraneous flows entering the sanitary sewer system) could limit the ability of existing sewers to service growth areas; and
- minimize the risk of potential surcharging, basement flooding and capacity constraint issues

Further, the program will allow the City to dedicate necessary resources to effectively manage I/I sources and maximize system efficiency. It would also complement York Region's I/I reduction initiatives and the City's current operation and maintenance procedures.

Flow Monitoring Program

A sewage flow monitoring program (including both short-term and permanent monitoring requirements) was developed. A sewer modelling exercise identified areas that may be subject to surcharging, based on theoretical data used to build the model. Accordingly, further analysis to review actual existing conditions in these sewers is recommended prior to implementing upgrades thereby allowing maximum system efficiency as additional demands are introduced. This program is critical in achieving the desired redevelopment and intensification along primary corridors.

It is intended the Master Plan be reviewed and updated every five years in conjunction with City-Wide Official Plan reviews/updates. The above noted programs would be implemented over five years of progressive development and reviewed/re-assessed in conjunction with regular Master Plan updates and available funding.

City to secure capital funding requirements for new infrastructure and future operating and maintenance costs

The total estimated capital cost to carry out the recommendations of the Master Plan is approximately $138 million ($68 million for water and $70 million for wastewater). Implementation of the new physical infrastructure improvements to accommodate growth will be development driven. This growth related infrastructure will be constructed by development and has been included in the City's current Development Charges Background Study and City Wide By-Law (water) or will be collected through future Area Specific Development Charge By-Laws (wastewater).

The estimated increase in operating and maintenance costs associated with the growth related (Development Charge funded infrastructure projects) will be approximately $2 million (based on 2013 dollars). This will be realized at full build out by 2031.

In addition to new infrastructure improvement costs, further investment will be required to implement effective system monitoring/optimization programs recommended by the study (as described above). The estimated yearly operating cost associated with these programs is approximately $1.5 million ($0.5 million per program). Potential funding sources for these programs include development charges, water/sewer rates, and water/sewer reserves.

Staff will ensure infrastructure requirements are financially secured and constructed as part of the development review and approvals process.

A future rate study will be required to ensure financial sustainability and to assist in achieving full cost recovery.

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The recommendations of the City's Master Plan will accommodate existing and future communities

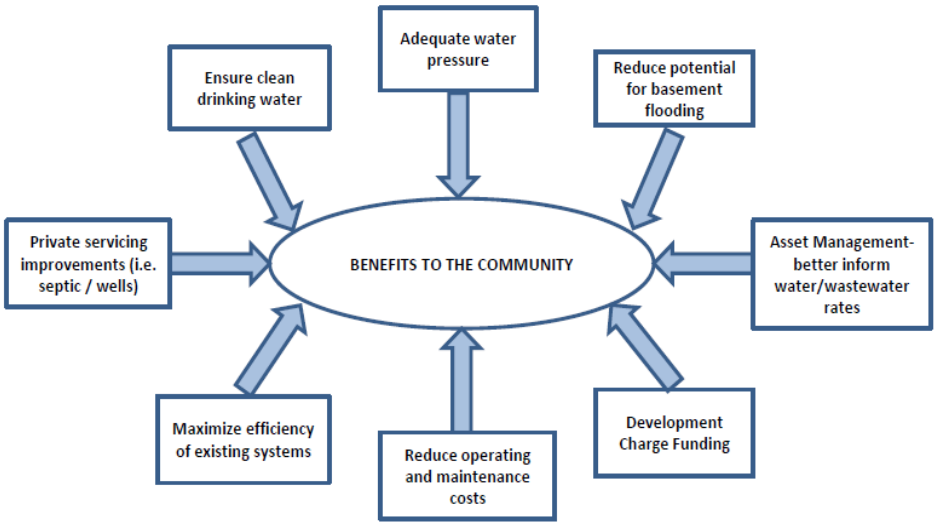
The recommendations of the Master Plan will allow for enhancement and expansion of the City's existing water and wastewater systems, and provide the most appropriate solution to effectively accommodate the City's long term plan to optimize services.

The benefits associated with implementation of the plan focus on ensuring the following:

- Projecting future water demands, comparing these to current capabilities and evaluating how to meet inadequacies in the system;
- Assuring the provision of adequate fire flow capacity; acceptable pressures and water quality;
- Minimizing water losses;
- Mitigating sources of potential inflow and infiltration to reduce impacts on downstream flooding as a result of upstream development; minimizing risk of potential surcharging, basement flooding and capacity constraint issues within the wastewater system;
- Improving financial management by focusing on primary service areas and vital support activities necessary to optimize system efficiency and customer service;
- Assist in permitting the City to reach full cost recovery;
- Increasing community awareness through regular updates every five years in conjunction with Official Plan reviews and/or updates,
- Making provisions for existing residential communities currently on private wells or septic systems to connect to municipal systems in the future through Local Improvements under the Municipal Act,

The overall resulting benefits to existing and future communities are summarized in Figure 1 below.

FIGURE 1



Relationship to Vaughan Vision 2020 / Strategic Plan

In consideration of the strategic priorities related to Vaughan Vision 2020, the recommendation of this report will assist in:

- The pursuit of excellence in service delivery
- Leadership initiatives and promotion of environmental sustainability
- Effective governance
- Planning and managing growth, and economic vitality

The recommendations of this report will assist in advancing the City's Strategic Plan initiative to establish "city-wide master phasing and servicing allocation plans". This report is therefore consistent with the priorities previously set by Council.

Regional Implications

Regional staff has been involved throughout the duration of the study and are supportive of the study findings and recommendations. Regional comments have been received on the draft document and will be addressed prior to finalizing the study report.

The Master Plan was coordinated with York Region's recently completed West Vaughan Servicing study (Sanitary). The Master Plan will also inform the on-going Regional North East Vaughan Water and Sanitary Sewer Class EA, Regional West Vaughan Water Servicing Class EA and the Regional Master Plan Update.

Conclusion

The City-Wide Water/Wastewater Master Plan Class EA study has been completed. It recommends a network of new watermains and sanitary sewers required to service planned growth and existing residential areas City-Wide to 2031. Preliminary cost estimates to implement the physical infrastructure improvement recommendations amount to approximately $138 million. Capital funding for these improvements will be from City Wide (Water) and Area Specific (Wastewater) Development Charges. The resulting increase in annual operating and maintenance costs will be funded from water and wastewater rates.

Additional operating budget investment is required to implement effective programs recommended by the study. The estimated yearly operating cost associated with these programs is approximately $1.5 million ($0.5 million per program). Funding sources for these programs may include development charges, water/sewer rates, and water/sewer reserves.

Implementation of the City-Wide Water/Wastewater Master Plan Class EA will ensure infrastructure is comprehensively planned and delivered in a timely manner to support the City's growth projections. Accordingly, it is recommended that staff issue a Notice of Study Completion for the City-Wide Water / Wastewater Master Plan study.

It is intended the Master Plan be reviewed and updated every five years in conjunction with City-Wide Official Plan reviews/updates.

Attachments

1. List of Proposed Water Servicing Projects
2. Plan of Proposed Water Servicing Projects
3. List of Proposed Wastewater Servicing Projects
4. Plan of Proposed Wastewater Servicing Projects

CITY OF VAUGHAN

EXTRACT FROM COUNCIL MEETING MINUTES OF APRIL 8, 2014

Item 2, Priorities Report No. 1 – Page 7

Report prepared by:

Jennifer Cappola-Logullo, Water/Wastewater Engineer, Ext. 8433
Michael Frieri, Manager of Engineering Planning & Studies, Ext. 8729

(A copy of the attachments referred to in the foregoing have been forwarded to each Member of Council and a copy thereof is also on file in the office of the City Clerk.)

C 2 - COMMUNICATION
PKI - MARCH 17, 2014
ITEM 2

PRIORITIES AND KEY INITIATIVES COMMITTEE
March 17, 2014

CITY-WIDE WATER / WASTEWATER MASTER PLAN

CLASS ENVIRONMENTAL ASSESSMENT STUDY
NOTICE OF STUDY COMPLETION

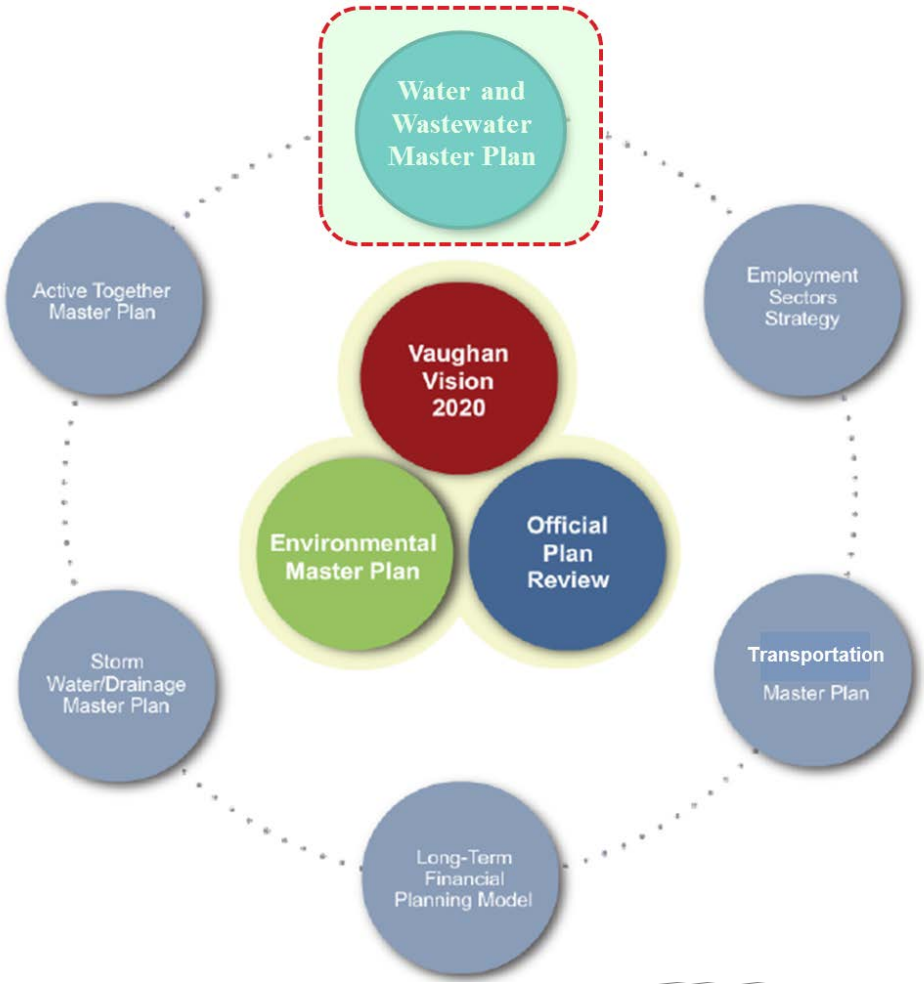
PRESENTATION OVERVIEW

1. Background
2. Water Infrastructure
3. Wastewater Infrastructure
4. Optimization Programs
5. Conclusions/Recommendations

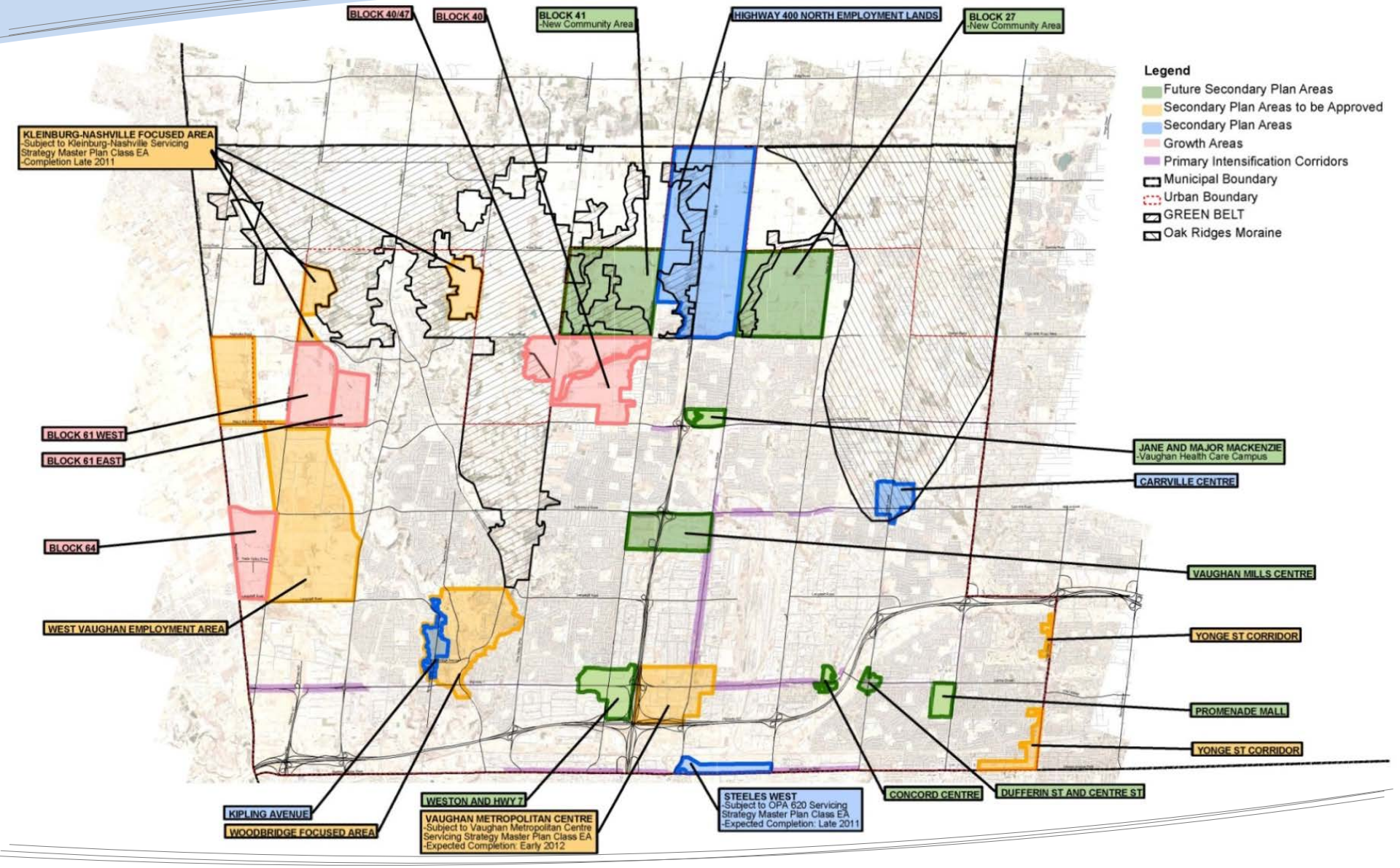
Relationship to Vaughan Tomorrow

Vaughan Tomorrow is the City's growth management program. It consists of:

- The *Vaughan Vision 2020*, outlining the City's mission, vision, goals and objectives
- The Environmental Master Plan, ensuring sustainability throughout all of the City's activities
- The Official Plan, creating a new official plan and secondary plans to guide development in Vaughan to 2031
- A series of individual master plans to support these growth management initiatives - including the Water/Wastewater Master Plan



Major Growth Areas – Official Plan 2010



MASTER PLAN IDENTIFIES NEED FOR NEW INFRASTRUCTURE AND OPTIMIZATION PROGRAMS TO MEET CITY'S PLANNED GROWTH

Recommendations of the Master Plan:

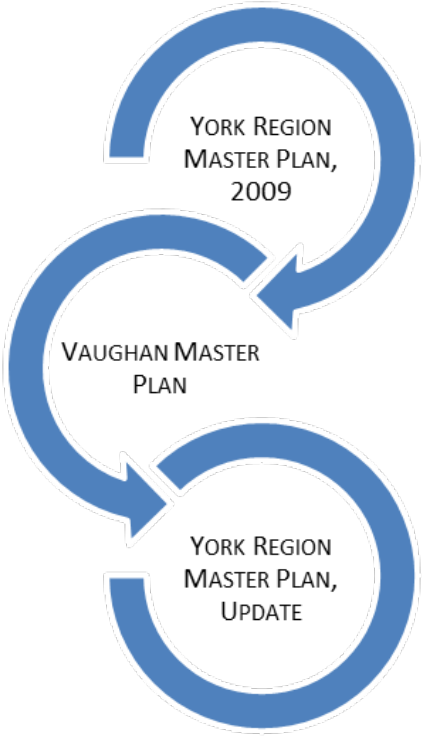
- Need to construct a network of new watermains and sanitary sewers to service planned growth
- Expand system optimization programs to ensure maximum efficiency of existing infrastructure to provide for growth in intensification and expansion areas
- Invest over $140 million in new servicing infrastructure and system monitoring/optimization programs

THE SUPPLY OF WATER & WASTEWATER COLLECTION IS PROVIDED THROUGH CLOSELY INTEGRATED SYSTEMS COMPRISED OF YORK REGION & CITY COMPONENTS

- Two-tier system approach composed of Regional trunk and City local servicing systems

- Well communicated and coordinated system for infrastructure improvements / programs and data sharing

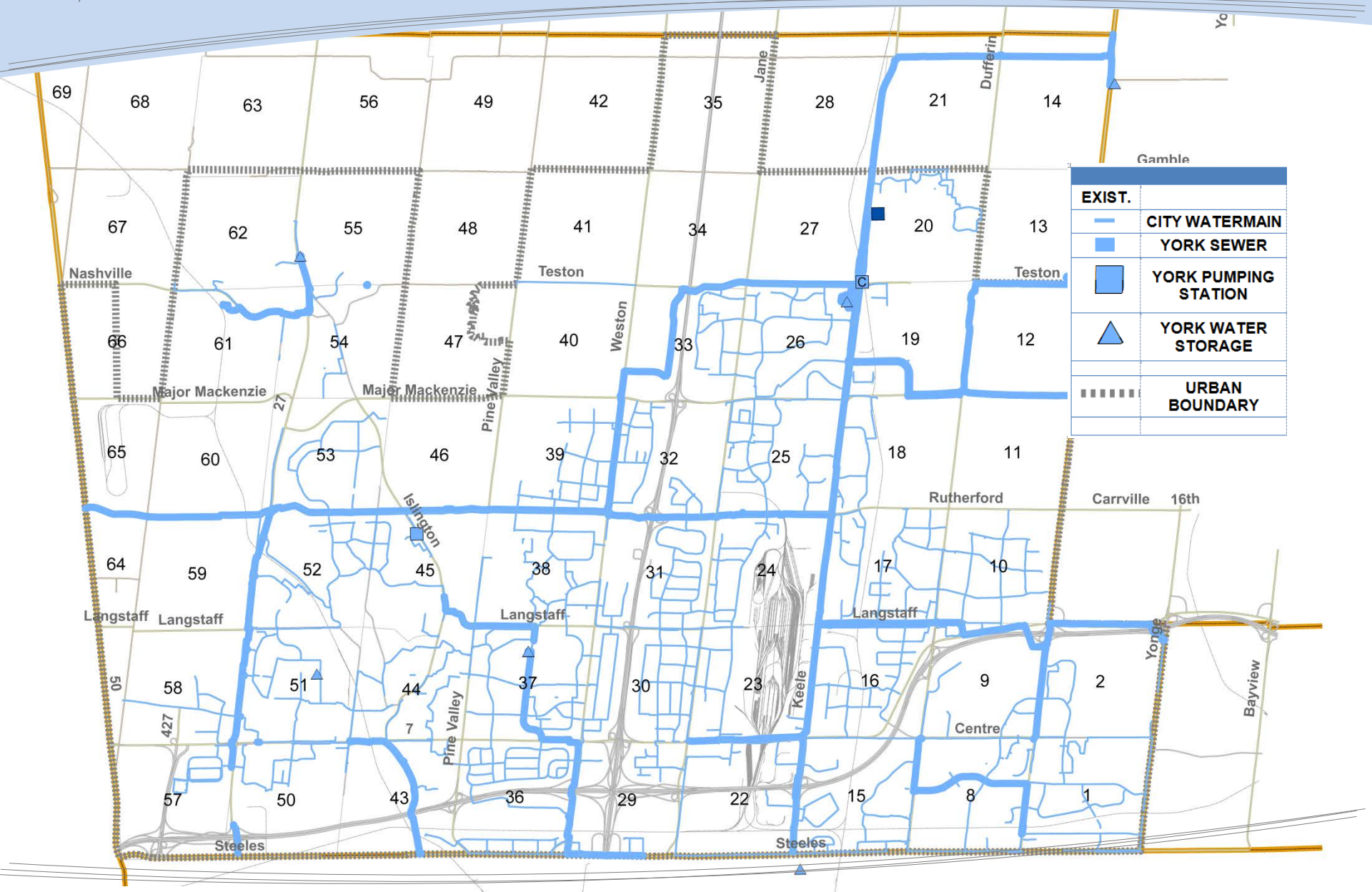
- On-going initiatives to improve City/Region collaboration include:
  - Adoption of common system modeling software;
  - Continued participation in Regional initiatives: All Pipes Model data sharing; Inflow/Infiltration Reduction;
  - Active participation in Liaison Meetings



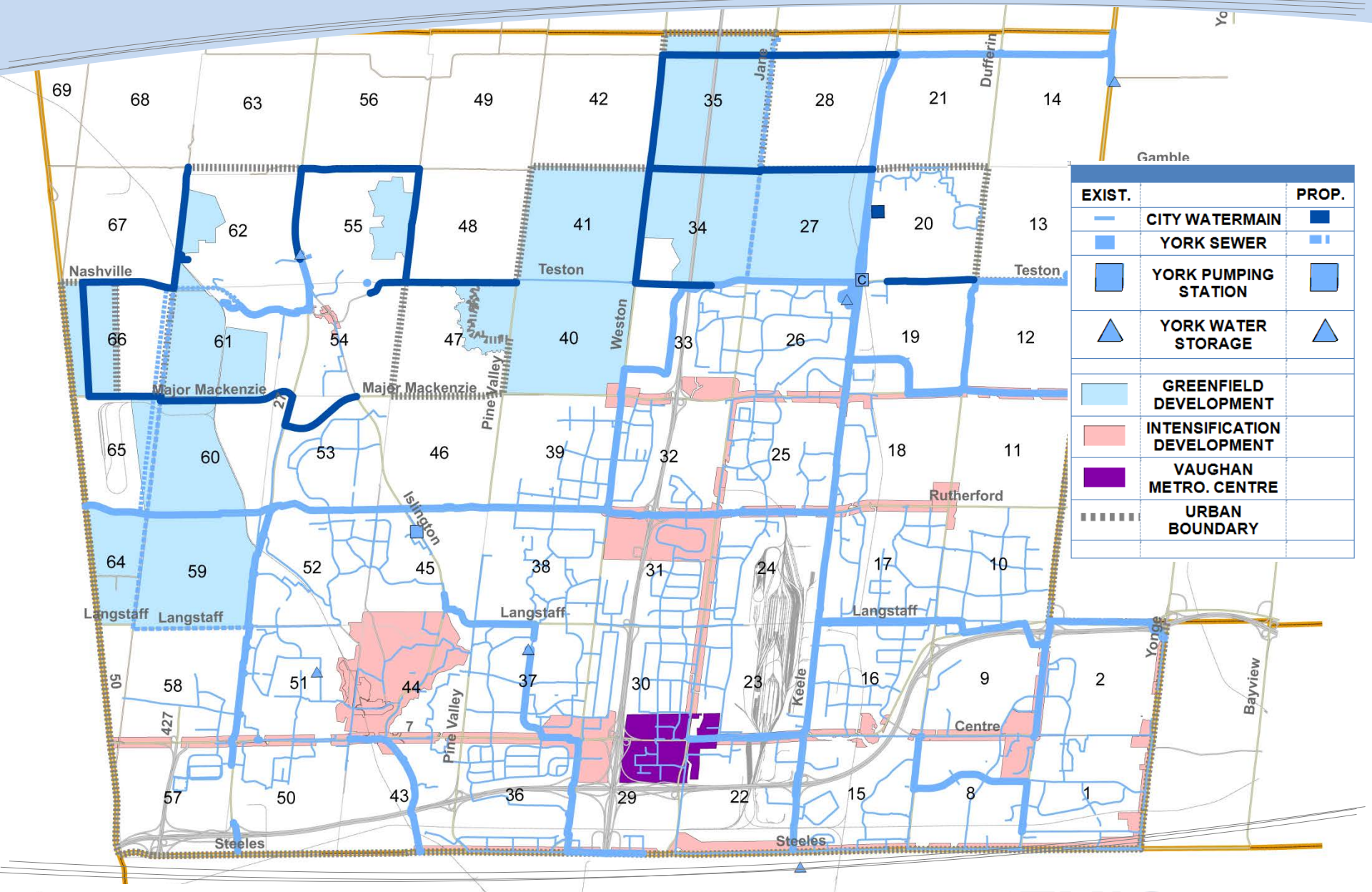
NEW WATER & WASTEWATER IMPROVEMENTS NEEDED TO ACCOMMODATE GROWTH

- Master Plan prepared following Class Environmental Assessment Process
- Master Plan provides a comprehensive, coordinated and efficient framework for the expansion of the City-wide water and wastewater systems
- Plan identifies need for 26 new water & wastewater (major trunk) infrastructure projects to service growth areas
- Local servicing will be provided through development in the usual manner

Existing Water Distribution Network



Planned Water Distribution Network



VAUGHAN green directions VAUGHAN Vaughan Tomorrow

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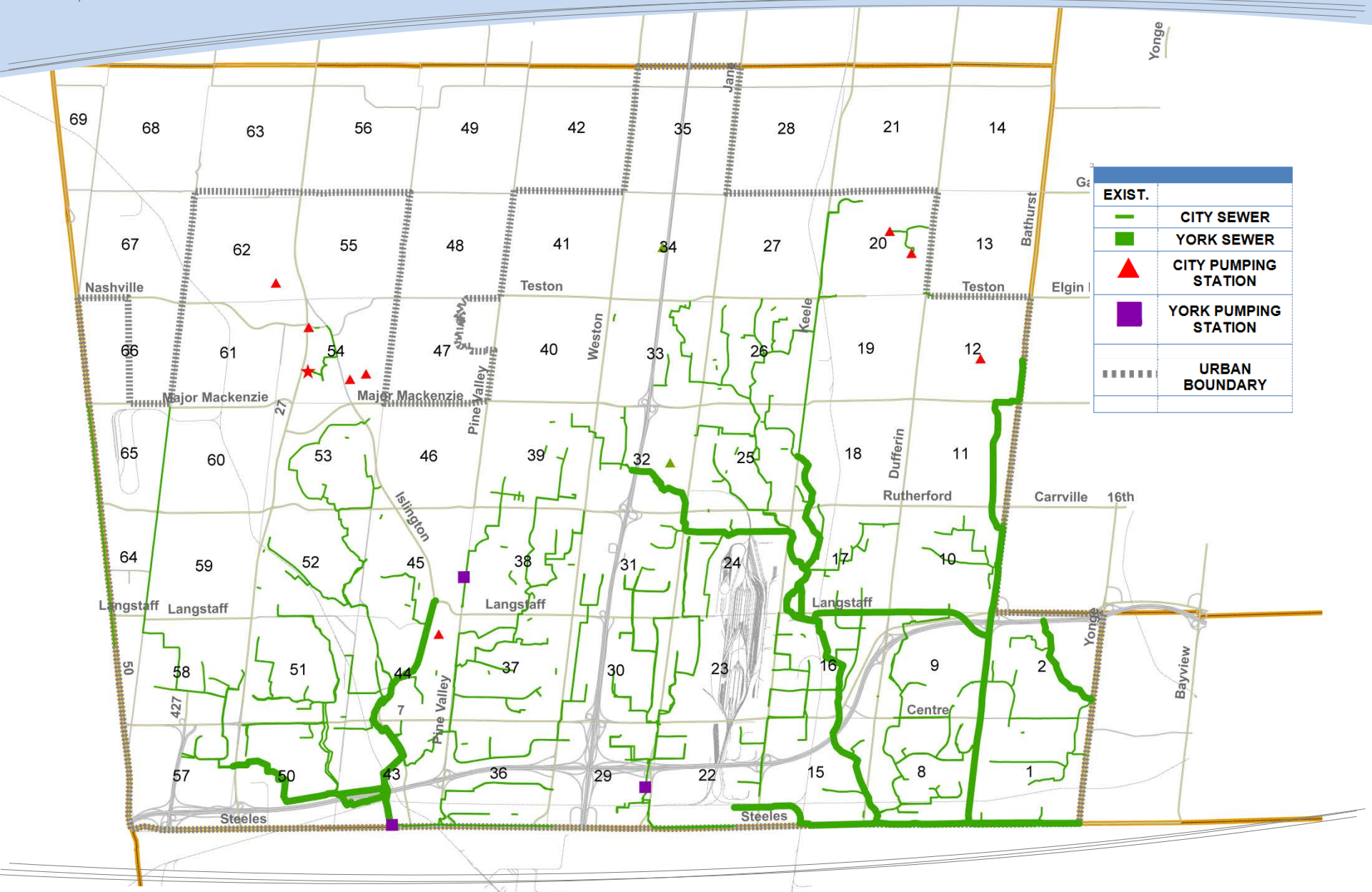
Physical Infrastructure Improvements – Water Servicing

ID	Description	Trigger/Timing	Anticipated Class EA Schedule	Estimated Cost (2013 dollars)
W1(A)	Option A: Teston Road PD8 Watermain	Subject to ongoing monitoring of pressures and construction of Teston Road connection	B	$2.8 M
W1(B)	*Option B:* *PD8 East Improvements*	*Connections to Region infrastructure. Subject to further study.*	*A+*	*$1.4 M* *(not carried in total)*
W3	Teston Road PD7 Watermain Twinning	Block 40/41747/55 Development. Subject to further study.	B	$5.6 M
W4	Block 35 PD8 Watermain	Block 34E/35 Development	A+	$23.9 M
W5	Weston Road PD7 Watermain	Block 34W/41 Development	A+	$2.8 M
W6	Forest Fountain Drive PD6 Watermain Connection	Subject to ongoing monitoring of pressures	A+	$0.4M
W7	Block 55 PD-KN Watermains	Block 55 Development	B	$10.1 M
W8	Major Mackenzie Drive PD6 Watermain	Block 60/61 Development	B	$7.2 M
W9	Huntington Road Watermain	Block 62W Development	A+	$3.2 M
W10	PD5-East Improvements	Subject to further study and ongoing monitoring of pressures	TBD	$1.7 M
W11	*Water Conservation Program -Water Loss Monitoring & Control System*	*Progressive development 2013-2017*	*TBD*	*$2.5M (not carried in total)*
W12	Realignment of PD4/PD5 Zone Boundary on Kipling Avenue	Subject to ongoing monitoring of pressures	A	$0.1M
W13	Block 66W PD6 Watermain	Development of the industrial lands	A+	$6.5 M
W14	PD9 Pumping Station	Subject to condition assessment of existing City pumping station	B	$3.4 M
	TOTAL WATER PROJECTS			❖ $68 M

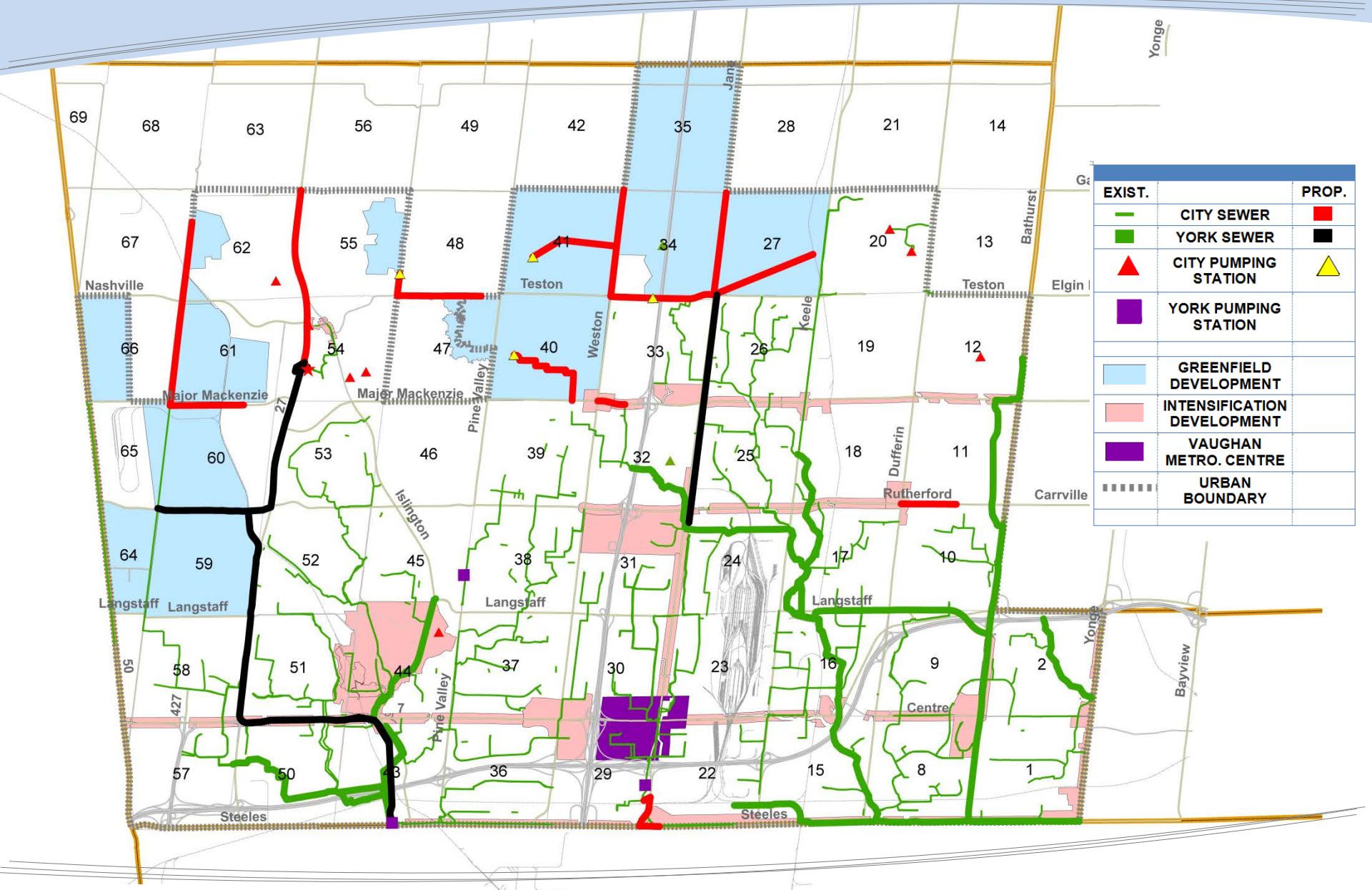
- ❖ Estimated capital cost for water infrastructure at full build out
- ❖ Growth related infrastructure constructed by development
- ❖ Funding included in the City's current Development Charge Background Study and City Wide By-Law
- ❖ Estimated increase in operating & maintenance costs - $2M (water & wastewater)

Existing Wastewater System



Priority & Key Initiatives Committee
March 17, 2014

Planned Wastewater System



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Physical Infrastructure Improvements – Wastewater Servicing

ID	Description	Trigger/Timing	Anticipated Class EA Schedule	Estimated Cost (2013 dollars)
WW1	Jane Street Sub-Trunk Sanitary Sewer	Block 35E Development. Subject to completion of York Region EA.	A+	$3.3 M
WW2	Block 27 Sub-Trunk Sanitary Sewer	Block 27 Development	A+	$1.7 M
WW3	Teston Road Sub-Trunk Sanitary Sewer and SPS	Block 34/35W/41 Development	B	$10 M
WW4	Weston Sub-Trunk Sanitary Sewer	Block 34W/35W/41 Development	A+	$2.6 M
WW5	Block 55 SPS/Forcemain	Block 55 Development	B	$5.4 M
WW6	Huntington Road Sub-Trunk Sanitary Sewer	Block 62W Development	A+	$2.1 M
WW7	Major Mackenzie Drive Sub-Trunk Sanitary Sewer	Block 61 Development	B	$2.6 M
WW8	Carrville Centre Sewer (Rutherford Road)	Carrville Centre Development	A+	$1.5 M
WW9	Vellore Centre Sewer (Major Mackenzie Drive)	Vellore Centre Development	A+	$700K
WW10	South Jane Street Sanitary Sewer Upgrades	Steeles West Development	A+	$2.2 M
WW11	Pine Valley North SPS/Forcemain	Block 40/41W/47/55 Development	B	$28.6 M
WW12	Highway 27 (Kleinburg) Sanitary Sewer	Further Development in North Kleinburg	A+	$3.6 M
WW13	Block 41 SPS, Forcemain and Sanitary Sewer	Block 41 Development	B	$5.3 M
WW14	*Flow Monitoring and Sewer Capacity Analysis Studies (3 studies)*	*2014*	*TBD*	*($2.5 M) (not carried in total)*
WW15	*City-Wide Infiltration/Inflow (I/I) Monitoring and Reduction (50 flow monitors)*	*Progressive development during 2013-2017*	*TBD*	*($2.5 M) (not carried in total)*
	TOTAL WASTEWATER PROJECTS			$70 M*

- Estimated capital cost for wastewater infrastructure at full build out
- Growth related infrastructure constructed by development
- Funding will be collected through future Area Specific Development Charge By-Laws
- Estimated increase in operating & maintenance costs - $2M (water & wastewater)

CITY TO OPTIMIZE EXISTING SYSTEMS TO SERVICE INTENSIFICATION AREAS

Key programs and recommendations of the Master Plan:

1. Water Conservation / Leak Detection
2. Inflow/Infiltration Reduction
3. Flow Monitoring

Implementation/expansion of these programs will assist to:

- ✓ Maximize efficiencies within existing network of pipes and facilitate new growth
- ✓ Maintain levels of service for existing communities and new development
- ✓ Meet City's legislative obligations - MOE and Regional mandates for Inflow/Infiltration Reduction and Water Conservation

Key programs and recommendations of the Master Plan

1. Water Conservation / Leak Detection:

- Assist in long-term water conservation
- Support growth by minimizing the amount of water lost through leakage as water infrastructure ages

2. Inflow/Infiltration Reduction:

- Minimize extraneous flows entering the sanitary sewer system
- Maximize use of existing wastewater system capacity
- Reduces capacity constraints within the existing system
- Decreases risk of potential surcharging and basement flooding

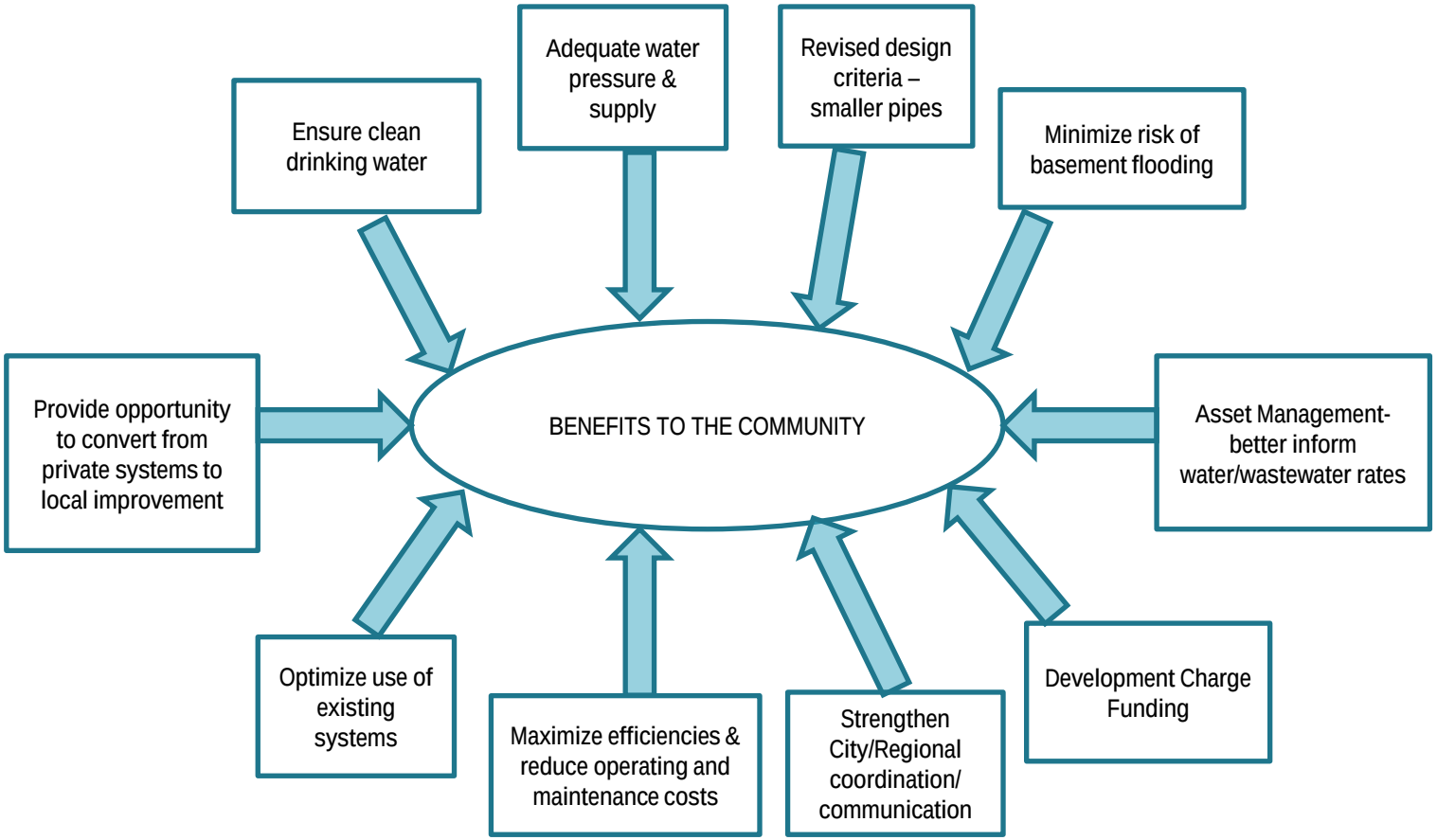
3. Flow Monitoring:

- Supports I/I Reduction program
- Intensification is serviced through the existing sanitary system
- Verify that the existing conditions are consistent with the design parameters in the hydraulic model
- Allows maximum system efficiency as additional demands are introduced

Total estimated operating/equipment cost $1.5 million/year

Funding source may include development charges, water/sewer rates & water/sewer reserves

Benefits of Implementing the Master Plan



To support planned growth demands, City needs to…

- ✓ Expand the existing water and wastewater systems through the construction of 26 major trunk infrastructure projects
- ✓ Expand system optimization programs to ensure maximum efficiency of existing infrastructure to provide for growth in intensification and expansion areas
- ✓ Invest over $140 million in new servicing infrastructure and system monitoring/optimization programs

Next Steps

- Finalize Master Plan document
- Issue Notice of Study Completion
- Place Master Plan on Public Record for 30-Day review period

QUESTIONS ?

PRIORITIES AND KEY INITIATIVES COMMITTEE – MARCH 17, 2014

CITY-WIDE WATER / WASTEWATER SERVICING STRATEGY
CLASS ENVIRONMENTAL ASSESSMENT STUDY
NOTICE OF STUDY COMPLETION
CITY-WIDE

Recommendation

The Commissioner of Engineering and Public Works and the Director of Development / Transportation Engineering in consultation with the Director of Finance and the Director of Development Finance and Investments recommend:

1. THAT staff issue a Notice of Study Completion for the City-Wide Water / Wastewater Master Plan Class Environmental Assessment Study.

Contribution to Sustainability

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- Kleinburg-Nashville Water and Wastewater Servicing Strategy Master Plan
- Steeles West Municipal Servicing Master Plan Class EA

Additional detailed servicing strategies may be completed to facilitate approval of future Secondary Plans / Primary Centres as necessary. The City-Wide Master Plan has established the higher order framework / servicing requirements such that the overall infrastructure needs for future Secondary Plans and intensification corridors are protected.

City to evolve its existing systems to service intensification areas and increase overall system efficiency

The Master Plan identifies the efficiency of the City's current infrastructure and where and how additional capacity may be provided to address the needs of new development areas, as well as redevelopment and intensification within the built boundary. Implementing the recommendations of this study will advance water conservation and efficiency initiatives including mitigation of inflow and infiltration within the wastewater collection system in order to maintain levels of service for new and existing communities. The physical infrastructure improvements and programs recommended by the study (further detailed below) ensure these efficiencies are maximized throughout the existing network of pipes and provide for expansion to facilitate growth as envisioned by the Official Plan. The individual components / recommendations of the Master Plan are summarized below.

Physical Infrastructure Improvements

The proposed water and wastewater servicing consists of a set of new projects aimed at supporting the on-going use of the existing distribution and collection system as well as its expansion into areas currently undeveloped but within the urban boundary as identified in the City's Official Plan. The solution needed to plan for long term water and wastewater infrastructure and accommodate the City's estimated growth demands will involve the construction of 26 individual water and wastewater capital projects. These projects are summarized in Attachments No. 1 and 3; and geographically identified in Attachments No. 2 and 4.

Water Conservation Program

Among the recommendations made by the Master Plan, is the development of a water conservation / leak detection program. This is a widely recognized optimum approach to monitoring and controlling water distribution system performance including the reduction of water loss through leakage as infrastructure ages. The leak detection program will greatly assist with long-term water conservation and allow the City to more effectively manage the flows of water within its network and define more accurately future rehabilitation requirements in order to maximize the efficiency of new and existing systems. Immediate identification and elimination of leaks in the system will assist in water conservation.

This program will serve to maintain service levels and decrease potential interruption to residents or businesses caused by watermain breaks, leaks or low pressure. This local initiative will also complement York Region's current "Water for Tomorrow" Program.

Inflow and Infiltration Reduction Program

The implementation of continuous inflow and infiltration (I/I) reduction measures within the wastewater collection system are necessary to maximize use of existing system capacity and meet the City's legislative obligations. The program will;

- identify where high I/I flows (extraneous flows entering the sanitary sewer system) could limit the ability of existing sewers to service growth areas; and
- minimize the risk of potential surcharging, basement flooding and capacity constraint issues

Further, the program will allow the City to dedicate necessary resources to effectively manage I/I sources and maximize system efficiency. It would also complement York Region's I/I reduction initiatives and the City's current operation and maintenance procedures.

Flow Monitoring Program

A sewage flow monitoring program (including both short-term and permanent monitoring requirements) was developed. A sewer modelling exercise identified areas that may be subject to surcharging, based on theoretical data used to build the model. Accordingly, further analysis to review actual existing conditions in these sewers is recommended prior to implementing upgrades thereby allowing maximum system efficiency as additional demands are introduced. This program is critical in achieving the desired redevelopment and intensification along primary corridors.

It is intended the Master Plan be reviewed and updated every five years in conjunction with City-Wide Official Plan reviews/updates. The above noted programs would be implemented over five years of progressive development and reviewed/re-assessed in conjunction with regular Master Plan updates and available funding.

City to secure capital funding requirements for new infrastructure and future operating and maintenance costs

The total estimated capital cost to carry out the recommendations of the Master Plan is approximately $138 million ($68 million for water and $70 million for wastewater). Implementation of the new physical infrastructure improvements to accommodate growth will be development driven. This growth related infrastructure will be constructed by development and has been included in the City's current Development Charges Background Study and City Wide By-Law (water) or will be collected through future Area Specific Development Charge By-Laws (wastewater).

The estimated increase in operating and maintenance costs associated with the growth related (Development Charge funded infrastructure projects) will be approximately $2 million (based on 2013 dollars). This will be realized at full build out by 2031.

In addition to new infrastructure improvement costs, further investment will be required to implement effective system monitoring/optimization programs recommended by the study (as described above). The estimated yearly operating cost associated with these programs is approximately $1.5 million ($0.5 million per program). Potential funding sources for these programs include development charges, water/sewer rates, and water/sewer reserves.

Staff will ensure infrastructure requirements are financially secured and constructed as part of the development review and approvals process.

A future rate study will be required to ensure financial sustainability and to assist in achieving full cost recovery.

The recommendations of the City's Master Plan will accommodate existing and future communities

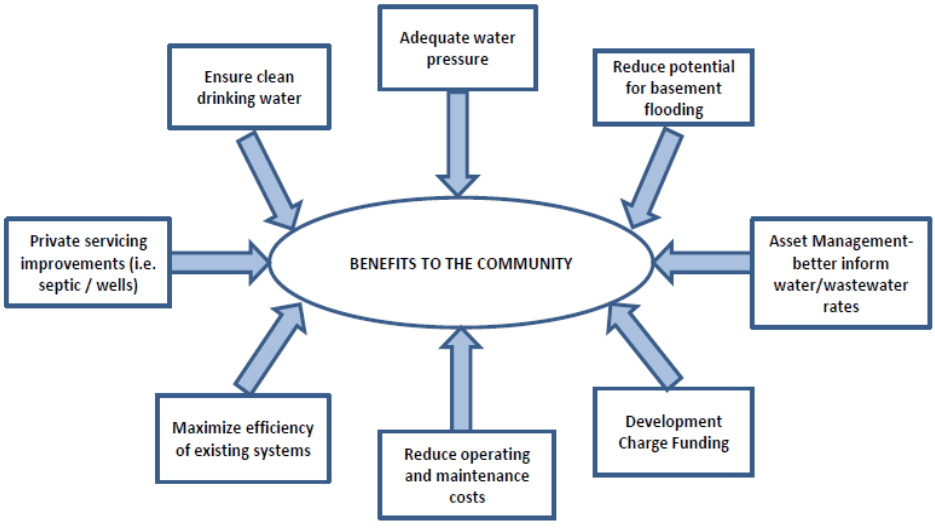
The recommendations of the Master Plan will allow for enhancement and expansion of the City's existing water and wastewater systems, and provide the most appropriate solution to effectively accommodate the City's long term plan to optimize services.

The benefits associated with implementation of the plan focus on ensuring the following:

- Projecting future water demands, comparing these to current capabilities and evaluating how to meet inadequacies in the system;
- Assuring the provision of adequate fire flow capacity; acceptable pressures and water quality;
- Minimizing water losses;
- Mitigating sources of potential inflow and infiltration to reduce impacts on downstream flooding as a result of upstream development; minimizing risk of potential surcharging, basement flooding and capacity constraint issues within the wastewater system;
- Improving financial management by focusing on primary service areas and vital support activities necessary to optimize system efficiency and customer service;
- Assist in permitting the City to reach full cost recovery;
- Increasing community awareness through regular updates every five years in conjunction with Official Plan reviews and/or updates;
- Making provisions for existing residential communities currently on private wells or septic systems to connect to municipal systems in the future through Local Improvements under the Municipal Act;

The overall resulting benefits to existing and future communities are summarized in Figure 1 below.

FIGURE 1



Relationship to Vaughan Vision 2020 / Strategic Plan

In consideration of the strategic priorities related to Vaughan Vision 2020, the recommendation of this report will assist in:

- The pursuit of excellence in service delivery
- Leadership initiatives and promotion of environmental sustainability
- Effective governance
- Planning and managing growth, and economic vitality

The recommendations of this report will assist in advancing the City's Strategic Plan initiative to establish "city-wide master phasing and servicing allocation plans". This report is therefore consistent with the priorities previously set by Council.

Regional Implications

Regional staff has been involved throughout the duration of the study and are supportive of the study findings and recommendations. Regional comments have been received on the draft document and will be addressed prior to finalizing the study report.

The Master Plan was coordinated with York Region's recently completed West Vaughan Servicing study (Sanitary). The Master Plan will also inform the on-going Regional North East Vaughan Water and Sanitary Sewer Class EA, Regional West Vaughan Water Servicing Class EA and the Regional Master Plan Update.

Conclusion

The City-Wide Water/Wastewater Master Plan Class EA study has been completed. It recommends a network of new watermains and sanitary sewers required to service planned growth and existing residential areas City-Wide to 2031. Preliminary cost estimates to implement the physical infrastructure improvement recommendations amount to approximately $138 million. Capital funding for these improvements will be from City Wide (Water) and Area Specific (Wastewater) Development Charges. The resulting increase in annual operating and maintenance costs will be funded from water and wastewater rates.

Additional operating budget investment is required to implement effective programs recommended by the study. The estimated yearly operating cost associated with these programs is approximately $1.5 million ($0.5 million per program). Funding sources for these programs may include development charges, water/sewer rates, and water/sewer reserves.

Implementation of the City-Wide Water/Wastewater Master Plan Class EA will ensure infrastructure is comprehensively planned and delivered in a timely manner to support the City's growth projections. Accordingly, it is recommended that staff issue a Notice of Study Completion for the City-Wide Water / Wastewater Master Plan study.

It is intended the Master Plan be reviewed and updated every five years in conjunction with City-Wide Official Plan reviews/updates.

Attachments

1. List of Proposed Water Servicing Projects
2. Plan of Proposed Water Servicing Projects
3. List of Proposed Wastewater Servicing Projects
4. Plan of Proposed Wastewater Servicing Projects

Report prepared by:

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Respectfully submitted,

Paul Jankowski, P. Eng.
Commissioner of Engineering
And Public Works

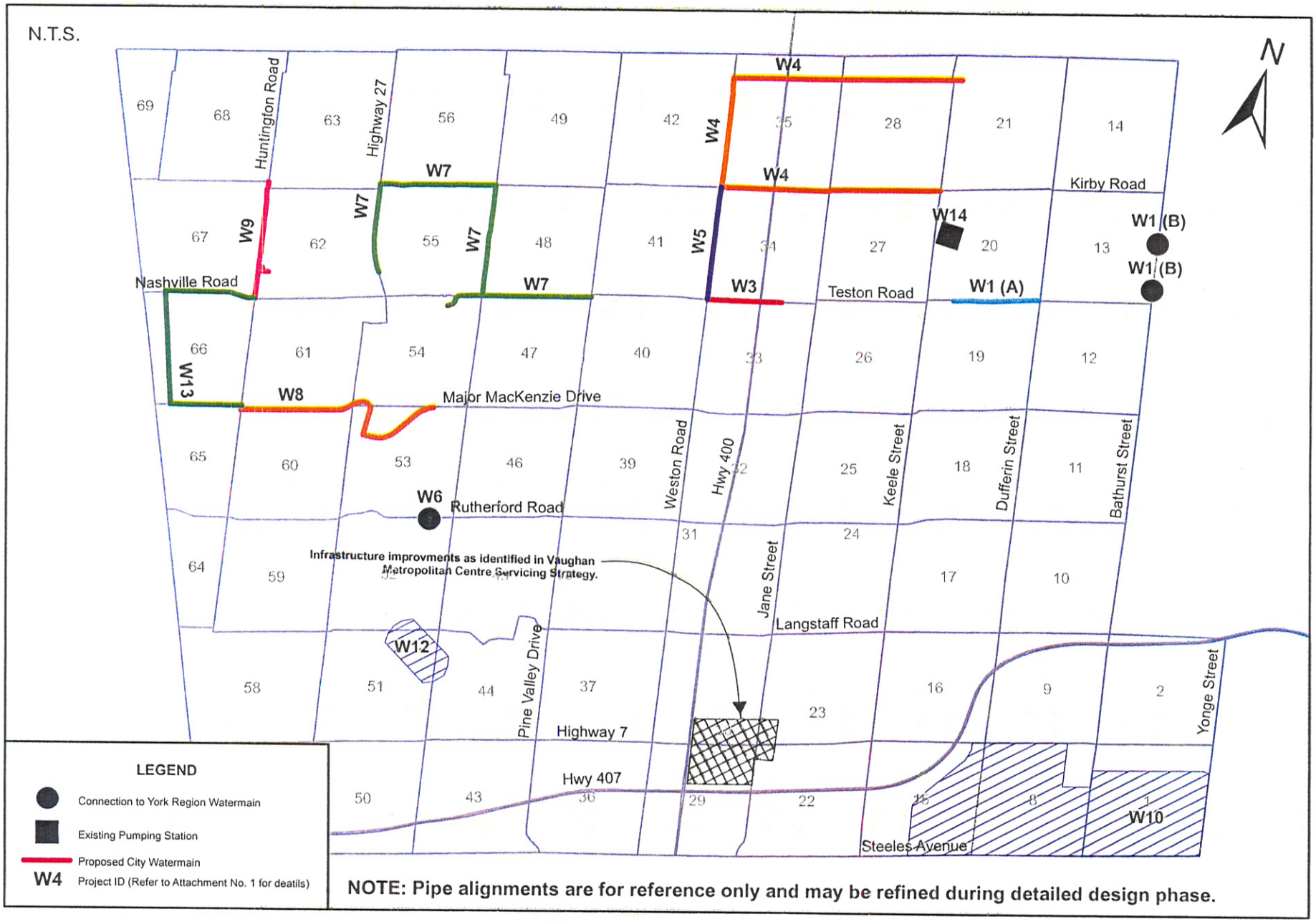
Andrew Pearce, C.E.T.
Director of Development/
Transportation Engineering

ATTACHMENT NO.1
RECOMMENDED PHYSICAL INFRASTRUCTURE IMPROVEMENTS - WATER SERVICING

ID	Description	Anticipated Trigger/Timing	Class EA Schedule	Estimated Capital Cost (in millions) (2013 dollars)
W1(A)	Option A: Teston Road PD8 Watermain	Subject to ongoing monitoring of pressures and construction of Teston Road connection	A+	$2.8
W1(B)	*Option B: PD8 East Improvements*	*Connections to Region infrastructure. Subject to further study.*	*B*	*($1.4) (not carried in total)*
W3	Teston Road PD7 Watermain Twinning	Block 40/41/47/55 Development. Subject to further study.	B	$5.6
W4	Block 35 PD8 Watermain	Block 34E/35 Development	A+	$23.9
W5	Weston Road PD7 Watermain	Block 34W/41 Development	A+	$2.8
W6	Forest Fountain Drive PD6 Watermain Connection	Subject to ongoing monitoring of pressures	A+	$0.4
W7	Block 55 PD-KN Watermains	Block 55 Development	B*	$10.1
W8	Major Mackenzie Drive PD6 Watermain	Block 60/61 Development	B*	$7.2
W9	Huntington Road Watermain	Block 62W Development	A+	$3.2
W10	PD5-East Improvements	Subject to further study and ongoing monitoring of pressures	TBD	$1.7
W11	*Water Conservation Program - Water Loss Monitoring & Control System*	*Progressive development during 2013-2017*	*TBD*	*($2.5) (not carried in total)*
W12	Realignment of PD4/PD5 Zone Boundary on Kipling Avenue	Subject to ongoing monitoring of pressures	A	$0.1
W13	Block 66W PD6 Watermain	Development of the industrial lands	A+	$6.5
W14	PD9 Pumping Station Improvements	Subject to condition assessment of existing City pumping station	B	$3.4
	TOTAL			**$68M**

*Class EA approval for these projects are secured through the Kleinburg-Nashville Water and Wastewater Servicing Strategy Master Plan dated November 2012

ATTACHMENT NO. 2



WATER SERVICING
PREFERED ALTERNATIVE

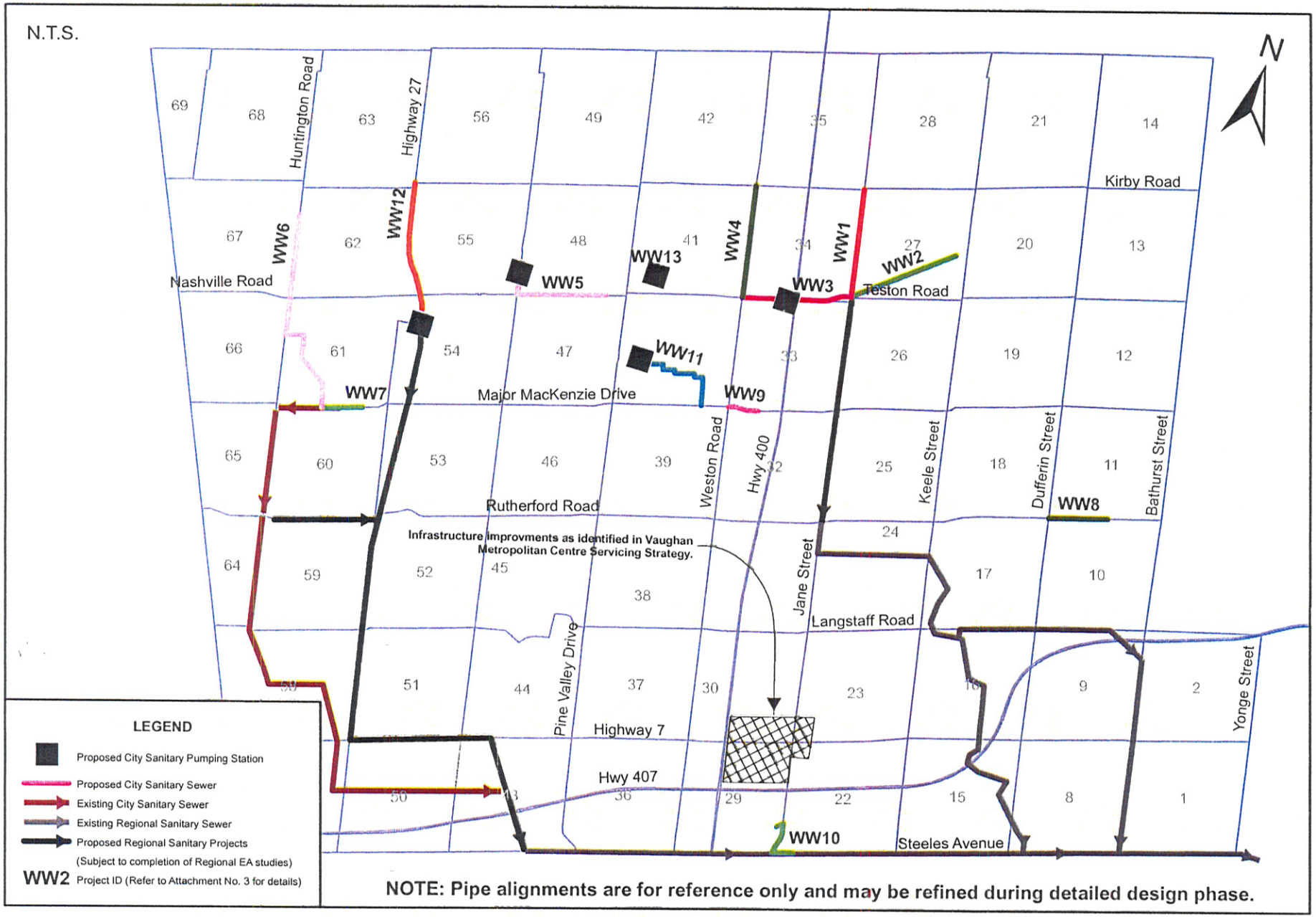
VAUGHAN
Development/Transportation Engineering

ATTACHMENT NO. 3
RECOMMENDED PHYSICAL INFRASTRUCTURE IMPROVEMENTS - WASTEWATER SERVICING

ID	Description	Anticipated Trigger/Timing	Class EA Schedule	Estimated Capital Cost (in millions) (2013 dollars)
WW1	Jane Street Sub-Trunk Sanitary Sewer	Block 35E Development Subject to completion of York Region EA	A+	$3.3
WW2	Block 27 Sub-Trunk Sanitary Sewer	Block 27 Development	A+	$1.7
WW3	Teston Road Sub-Trunk Sanitary Sewer and SPS	Block 34/35W/41 Development	B	$10
WW4	Weston Sub-Trunk Sanitary Sewer	Block 34W/41 Development	A+	$2.6
WW5	Block 55 SPS/Forcemain	Block 55 Development	B*	$5.4
WW6	Huntington Road Sub-Trunk Sanitary Sewer	Block 62W Development	A+	$2.1
WW7	Major Mackenzie Drive Sub-Trunk Sanitary Sewer	Block 61 Development	A+	$2.6
WW8	Carrville Centre Sewer (Rutherford Road)	Carrville Centre Development	A+	$1.5
WW9	Vellore Centre Sewer (Major Mackenzie Drive)	Vellore Centre Development	A+	$0.7
WW10	South Jane Street Sanitary Sewer Upgrades	Steeles West Development	A+	$2.2
WW11	Pine Valley North SPS/Forcemain	Block 40/41W/47/55 Development	B	$28.6
WW12	Highway 27 (Kleinburg) Sanitary Sewer	Further Development in North Kleinburg	A+	$3.6
WW13	Block 41 SPS, Forcemain and Sanitary Sewer	Block 41 Development	B	$5.3
WW14	*Flow Monitoring Program and Sewer Capacity Analysis Studies (3 studies)*	*Progressive development during 2013-2017*	*TBD*	*($2.5) (not carried in total)*
WW15	*Inflow/Infiltration Monitoring and Reduction Program*	*Progressive development during 2013-2017*	*TBD*	*($2.5) (not carried in total)*
	TOTAL			**$70M**

*Class EA approval for these projects are secured through the Kleinburg-Nashville Water and Wastewater Servicing Strategy Master Plan dated November 2012

ATTACHMENT NO. 4



SANITARY SERVICING
PREFERED ALTERNATIVE

VAUGHAN
Development/Transportation
Engineering