

CITY OF VAUGHAN

EXTRACT FROM COUNCIL MEETING MINUTES OF APRIL 8, 2014

Item 2, Report No. 5, of the Finance, Administration and Audit Committee, which was adopted without amendment by the Council of the City of Vaughan on April 8, 2014.

2 STORMWATER INFRASTRUCTURE FUNDING STUDY - CITY-WIDE

The Finance, Administration and Audit Committee recommends:

- 1) That the recommendation contained in the following report of the Commissioner of Engineering and Public Works, dated March 31, 2014, be approved; and
- 2) That the presentation by the Manager of Special Projects, Office of the Commissioner of Engineering and Public Works, and C1, presentation material, entitled "*Stormwater Infrastructure Funding Study*", dated March 31, 2014, be received.

Recommendation

The Commissioner of Engineering and Public Works, in consultation with the Commissioner of Finance and City Treasurer recommends:

1. That this report be received for information.

Contribution to Sustainability

This project will directly support Green Directions Vaughan Goal 1: To significantly reduce our use of natural resources and the amount of waste we generate. Furthermore it directly adds resolution to the following objective:

- Objective 1.3: To support enhanced standards of stormwater management at the City and work with others to care for Vaughan's watersheds.

Economic Impact

There are no immediate economic impacts resulting from the adoption of this report. Funding is planned and available from the Year End Expenditure Reserve. Funding approval for subsequent studies may be required as part of future Capital Budget deliberations.

Communications Plan

An important part of this project is to develop and distribute a communication plan for citizens, businesses and stakeholders to raise awareness of the potential impacts of stormwater on properties, rivers and streams, along with the need for a sustainable funding framework to address the associated infrastructure needs. The project will include a comprehensive public engagement with the development of a Stormwater Advisory Committee, membership to be extended to the residents, both small and large businesses, associations, Toronto and the Region Conservation Authority, York Region and other property owners.

Purpose

The purpose of this report is to inform Council of staff's intended work plan to develop a sustainable funding framework for stormwater infrastructure.

Background - Analysis and Options

Stormwater management supports flood protection, maintains water quality and helps in climate change mitigation if infrastructure is well maintained

"The ultimate goal of stormwater management is to maintain the health of streams, lakes and aquatic life as well as provide opportunities for human uses of water by mitigating the effects of

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urban development. To achieve this goal stormwater management strives to maintain the natural hydrologic cycle, prevent an increased risk to flooding, prevent undesirable stream erosion, and protect water quality." An introduction to stormwater management planning and design (MOE, 2003)

Engineers Canada, in a recent presentation, Adapting Municipal Infrastructure to Climate Change, emphasized that operations and maintenance activities, such as pond cleaning and sediment removal, storm pipe cleaning, street sweeping, catch basin cleaning and woody debris management, has proven most effective to mitigating the impacts of climate change. The presentation also emphasized that capital projects are not always the answer and a comprehensive maintenance plan can help meet the objectives of stormwater management.

The evolution of stormwater management in Vaughan responds to intense storm events and adoption of best practices

Past storms, in August 2005, June and July 2008, August 2011 and July 2013 caused flooding in a number of areas of Vaughan. Staff recommended and implemented a number of studies, capital works projects, as well as, increased operations and maintenance activities in the flooded areas to better understand why the areas were flooded and what could be done to help protect properties in these areas. Some of the activities included:

- Frequent inspection of problem areas
- Storm inlet grates replaced with ones which allow water to flow more freely
- Trees cleared and ditches reshaped
- Water tight manhole lids installed in low lying areas
- Catch basin cleaning program was expanded

The City also established programs for residents in flooded areas to enable them to do work on their property which would help remove water from their property and into the storm system.

- Downspout Disconnection Program
- Backwater Valve Program
- Stormwater Education program

A number of stormwater studies have been completed which list capital projects and other activities to improve stormwater management in the City. The City has initiated its first Stormwater Master Plan which has been completed. It is expected that the Notice of Completion will be filed in late Spring 2014. The Stormwater Master Plan outlines infrastructure needed to 2031 to support growth and studies needed in certain localized areas.

Climate change has a direct impact on stormwater infrastructure and water courses

Climate change has brought brief, intense storms which can easily overwhelm existing storm infrastructure. The quickly moving water enters streams and rivers, impacting the eco-system and affecting water quality. The storms also cause flash flooding of streams and rivers which cause water to rise dangerously fast within parks and along trails.

Stormwater can also enter people's homes through basement wall cracks, window wells, and through the sanitary floor drain if the rain water enters the sanitary sewer system. Residents can protect themselves through disconnecting downspouts, installing sump pumps, and lot grading angled away from the home. In some instances, back flow preventers can also be useful to stop water from entering the home through the sanitary sewer pipe.

Municipalities build stormwater systems which are designed to remove water quickly from City streets, into ponds and then receiving water courses. If this infrastructure is not maintained in a state of good repair, the stormwater system has difficulty performing as designed.

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Stormwater infrastructure can become a liability

The Insurance Board of Canada reported in 2005 that claims from water damage had exceeded claims from fire for the first time and it has remained this way ever since. Residents who have been flooded multiple times or who live in flood prone areas within the City are refused basement insurance. In some cases, the residents are offered a limited insurance claim in dollar amount against water damage, sewer backup, etc.

As a result of multiple flooding incidents, residents, in a number of municipalities, are participating in class action law suits to sue municipalities and conservation authorities to recover damage to their homes.

The cost to replace Vaughan's stormwater assets is estimated at \$1 billion

The City of Vaughan owns \$780 million (estimated historical costs) of stormwater assets. Through a recent consultant's study, the cost to replace these assets is estimated at \$ 1 billion. These storm assets represent the largest dollar figure of any of the City's asset classes. Stormwater infrastructure in the City is not currently funded from a dedicated source, and as result, Vaughan does not currently have a programmed capital repair and replacement program for stormwater assets. Capital works are completed as a response to studies of past flooded areas and only when funding is available.

The City's current operations and maintenance program has historically been inspection and cleaning of infrastructure and water courses in historically flooded areas and other known problem areas. Other maintenance activities are mostly programmed in response to capital works needs (road works) or development assumption needs. Maintenance of stormwater ponds (dredging and removal of sediment) is completed only when there is funding available, and as such this activity is based on available funds, not necessarily needs. The operations and maintenance program is funded from the wastewater consumption rates and therefore programmed maintenance activities are limited.

The City's Stormwater Program will ultimately require sustainable funding for repair, retrofit, replacement and operations and maintenance

The following table lists major stormwater funding needs, as recently identified in City studies:

Study	Capital Work	Further Studies
SWM Retrofit Study (2008)	\$50 million*	
SWM Master Plan	\$2.12 million (not DC funded)	\$1.25 million
Phase 2 Drainage Study	\$1.5 million	
Total	\$53.62 million	\$1.25 million

* Adjusted for inflation 3% per year

Note: Black Creek Storm Water rehabilitation was not included because it is specialized and subject to DC charges

The Stormwater Master Plan identified new infrastructure needed for growth to 2031. Although the developers will pay to install the pipes and the ponds, the City will need to operate and maintain this infrastructure once assumed.

Currently the stormwater program is funded from the Wastewater Reserve, Gas Tax, Infrastructure Grants and the Road Infrastructure Reserve. These funds are not adequate to meet the needs of the capital projects detailed in the stormwater studies and future operation and maintenance costs which will be needed to operate and maintain future infrastructure detailed in the Stormwater Master Plan. The stormwater operations and maintenance annual budget is \$1.6 million. These activities are currently funded from wastewater consumption rates.

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Numerous other municipalities have implemented or will be implementing dedicated stormwater funding frameworks to ensure sustainable funding for the future

Vaughan is not unique in its challenge to find funding to manage stormwater assets. Many municipalities have either implemented or will be implementing stormwater funding models in the future.

Each municipality followed the process of determining its infrastructure and funding needs and choosing funding models appropriate to their own municipality. Some of the funding models were tax funded, but most have moved or are moving to a property use reflected dedicated rate structure.

Vaughan's Stormwater Infrastructure Funding Study will be completed in two phases

Staff propose to issue an RFP in April 2014, with a June 2014 award, to engage a consultant or an integrated consultant team to examine the relationship of the engineering (capital and future operations and maintenance) needs to the financial (funding model and options) needs and opportunities.

The project will be broken into two phases: the first phase allowing for the engineering analysis and funding model options analysis to be examined and reviewed with our citizens, businesses and stakeholders. The second phase will focus on development of a recommended funding model or framework, along with public consultation and policy and by-law development.

Phase 1

The first phase of the project will include a quantification and assessment of our current and future stormwater assets. This information will establish the life cycle costs of the infrastructure, as well as, timing on future repair and replacement needs. The operations and maintenance needs will be established once the level of service review is complete. The level of service review will be defined by best practices and financial impact.

Phase 1 will also include a review of funding options and models. This review will consider different funding models and their complexity. For instance, the funding model review will include an analysis of a tax model vs. a rate model, a tiered system or a flat rate system, a system based on permeable area on the property, etc.

A consultation program with citizens, businesses and stakeholders is key during this time to engage the public in stormwater issues.

Staff expect to report back to Council in early 2015.

Phase 2

The second phase of the project will involve public consultation and engagement to help refine the stormwater funding model. This consultation is key to the implementation of the funding model.

The second phase will also include policy development and the development of a stormwater by-law in preparation for implementation of the rate.

Staff expect to report back to Council in late Spring 2015.

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Relationship to Vaughan Vision 2020/Strategic Plan

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

- Lead and Promote Environmental Sustainability
- Demonstrate Excellence in Service Delivery

Regional Implications

York Region has been identified as a stakeholder and will be invited to take part in the Stakeholder Advisory Committee.

Conclusion

The stormwater infrastructure funding study will determine an appropriate funding framework to meet the objectives of stormwater management:

- Maintain the natural hydrologic cycle
- Prevent an increased risk to flooding
- Prevent undesirable stream erosion
- Protect water quality

Attachments

None

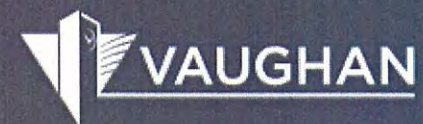
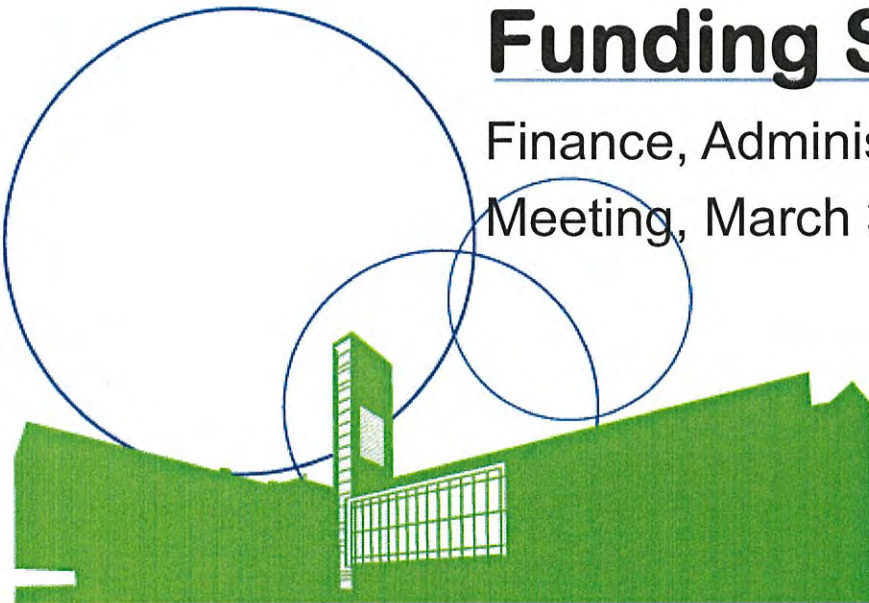
Report prepared by:

Jennifer Rose, Manager, Special Projects, ext. 8745

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Stormwater Infrastructure Funding Study

Finance, Administration and Audit Committee
Meeting, March 31, 2014



The Objectives of the Stormwater Infrastructure Funding Study

- Understand our stormwater asset needs
- Develop a comprehensive stormwater program
- Develop a funding framework for the stormwater program



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Background for the Study

- Council direction at CW (WS) Rpt. No. 1, Item 3, February 2009
 - *“That staff examine funding models for the implementation of the Storm Water Management Retrofit Program and report back to a future Committee of the Whole Meeting”*
- Since 2009, studies, new activities and capital projects have been completed or programmed into the capital budget
- 2014-2017 Budget Guideline and Instructions
 - New User Fees and Service Charges: Departments are encouraged to explore and submit new user fee and service charge opportunities for existing non-revenue generating services.



Objectives of Stormwater Management

- Maintain the natural hydrologic cycle
- Prevent an increased risk to flooding
- Prevent undesirable stream erosion
- Protect water quality

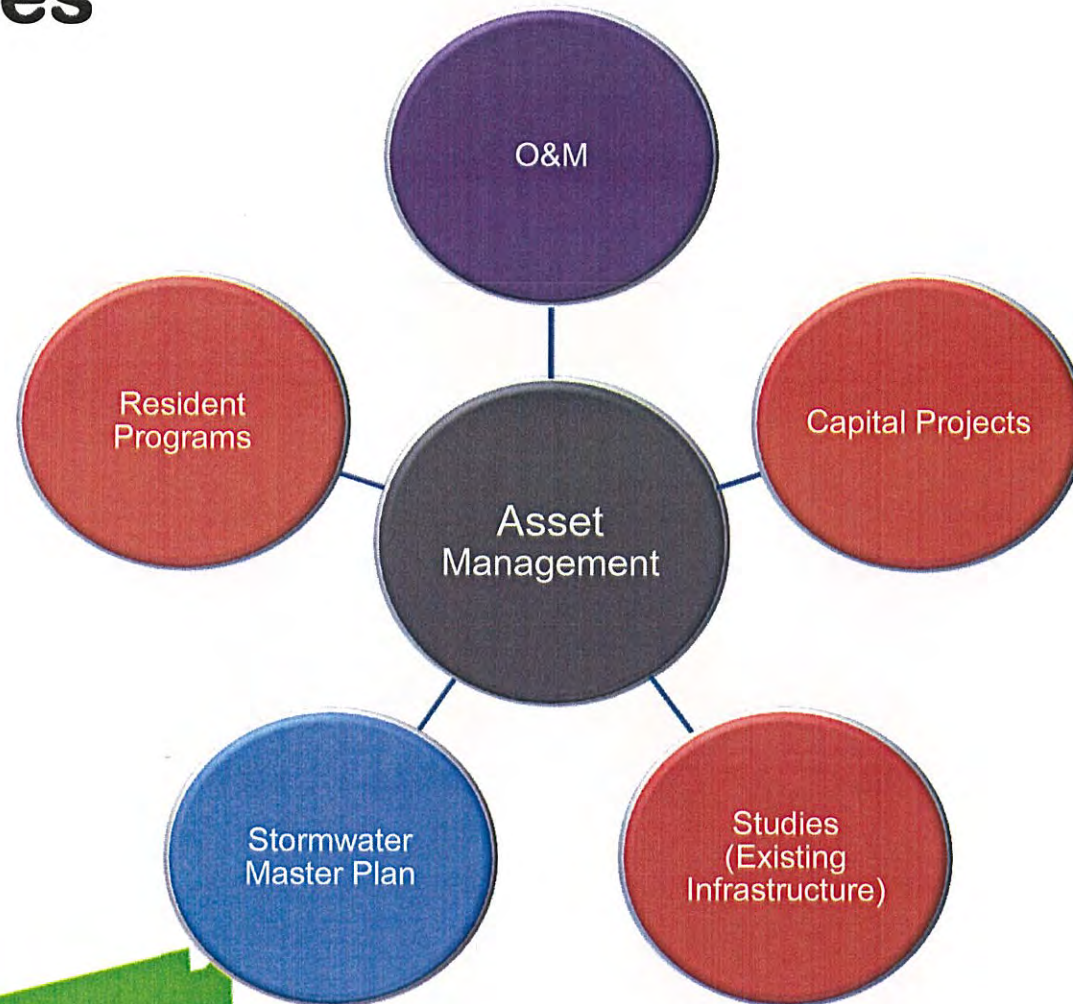
An Introduction to Stormwater Management Planning and Design (MOE, 2003)



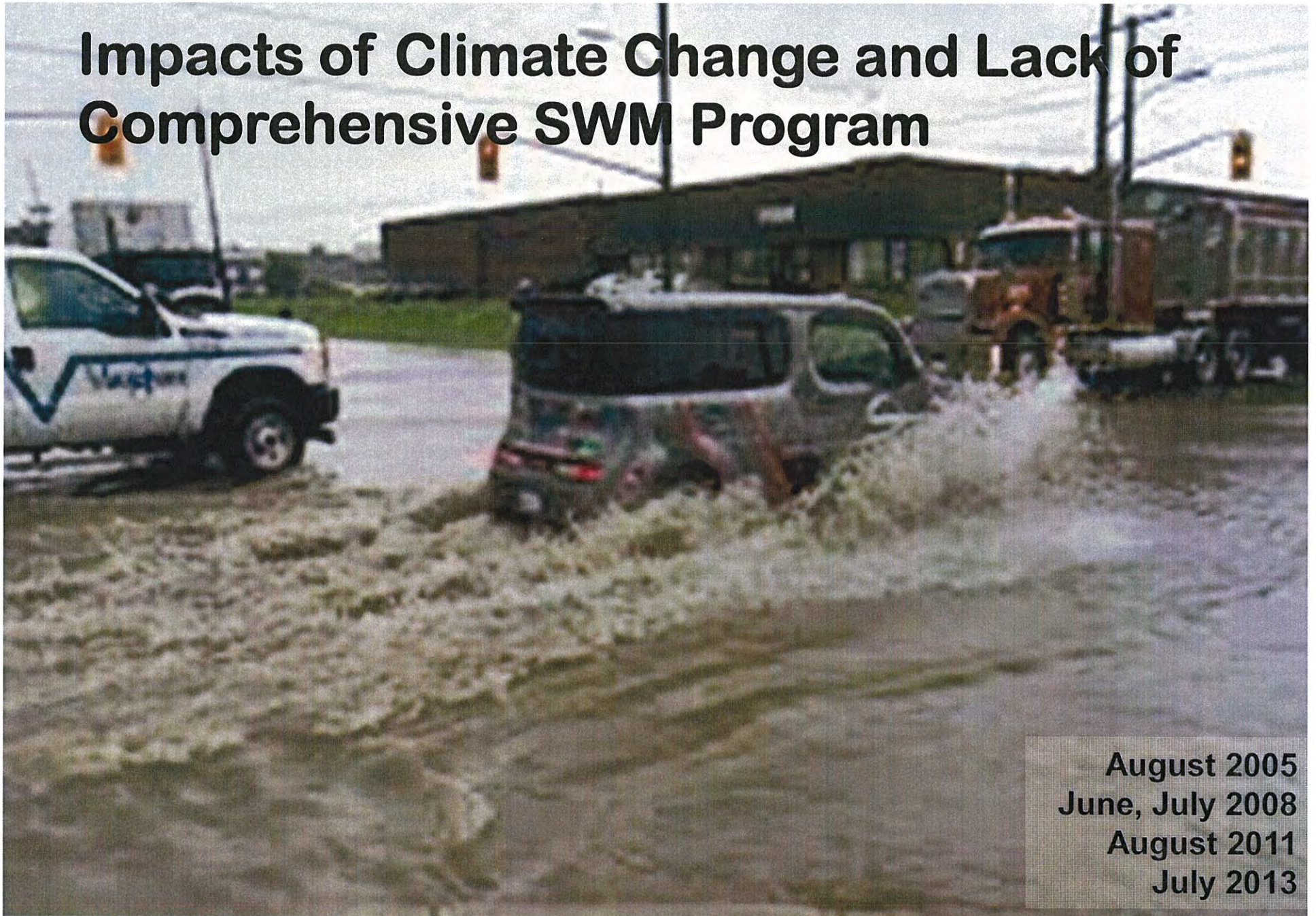
Stormwater Management in Vaughan



Vaughan's Stormwater Management Activities



Impacts of Climate Change and Lack of Comprehensive SWM Program



August 2005
June, July 2008
August 2011
July 2013



Risks Associated with Short, Intense Storms and Lack of Comprehensive SW Program

Quickly rising water in rivers and streams

Can be dangerous to the public

**Overland flow routes, pipes and ponds must be
maintained to allow water to reach destination**

Keep water out of people's basements

**Woody and other debris must be managed within water
courses to avoid blockages at culverts, outfalls,
bridges, etc**

Protect properties adjacent to water courses

Municipal Liability

- *\$9M lawsuit over flooding served against Amherstburg* (Nov 2013) CBC News
- *Thunder Bay \$375M flood lawsuit moves ahead* (Sep 2013) CBC News
- *Lisgar Flooding (in Mississauga) leads to \$200 million lawsuit* (June 2012) YorkRegion.com
- *City of Stratford Agrees to Settle Class Action Suit Related to 2002 Flood* (March 2010) Press Release City of Statford



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Vaughan's Stormwater Assets

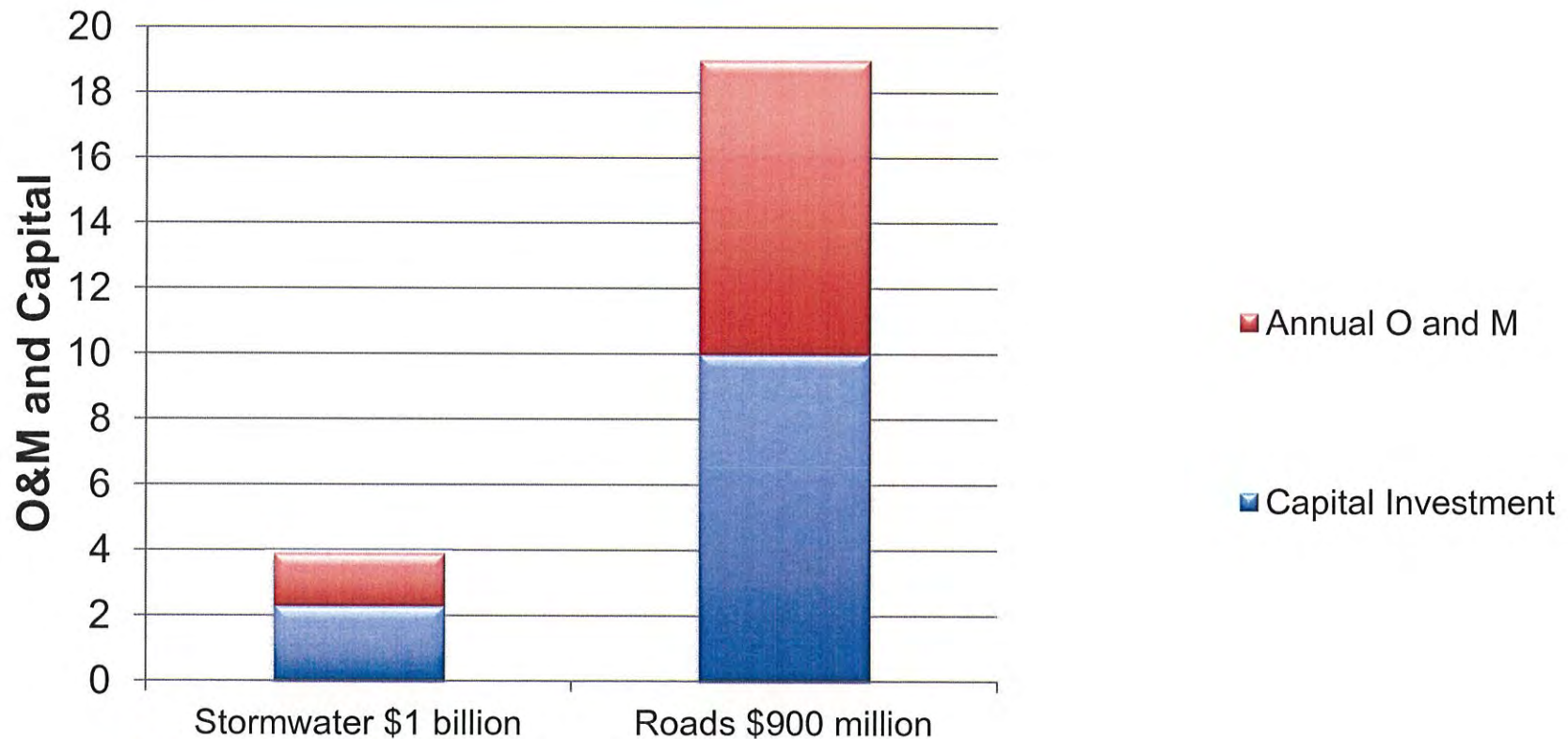


Vaughan's Current Stormwater Assets

Underground Infrastructure and Ponds	Waterways and Overland Flow Routes
<p>Approximately</p> <ul style="list-style-type: none">• 850 km pipes• 15,000 catch basins• 73,000 storm connections• 2400 culverts• 100 ponds	<ul style="list-style-type: none">• Rivers• Streams• Streets• Ditches• Grassed Swales



Capital and O&M Costs Comparison against Asset Value (in Millions)



Studies have identified capital works and further studies

Study	Capital Work Identified	Further Studies Identified	
SWM Retrofit Study (2009)	\$50 million*		Ponds
SWM Master Plan	\$2.12 million	\$1.25 million	Undesirable erosion in streams
Phase 2 Drainage Study	\$ 1.5 million		Focused studies on 7 areas (flood mitigation)
Total	\$ 53.62 million	\$1.25 million	

*adjusted for inflation 3% per year



Importance of O&M to Climate Change Risk Management

- *Engineers Canada, Adapting Infrastructure to a Changing Climate: Risk Assessment and Good Engineering Practices*

“Much can be accomplished within operations, maintenance and redevelopment policies, procedures and cycles”

“It’s not always about ‘building a bigger pipe’”



Current Operations and Maintenance

- Inspection activities mostly programmed for capital works needs
- Pond maintenance is limited and is based on available funds, not necessarily on needs
- Proactive inspection and cleaning of catch basins, channels and watercourses
- Programmed maintenance activities are limited due to:
 - staffing resources
 - O&M funded from wastewater consumption rates



Future O&M and Capital Funding Needs

- Stormwater Master Plan identified new infrastructure which will need to be maintained
 - Developers pay to build the infrastructure but future users (City) fund future repairs and ongoing operations and maintenance costs



Current Stormwater Funding

- Projects have traditionally been funded from Gas Tax, Infrastructure Grants and Road Infrastructure Reserve
- Over the last decade, the City of Vaughan, has collected for stormwater needs in combination with wastewater consumption rates
- Operations and maintenance is funded from wastewater consumption rates



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Other municipalities

- Many municipalities have implemented or are in the process of implementing a dedicated stormwater funding framework
 - Markham
 - Richmond Hill
 - Aurora
 - Kitchener
 - Waterloo
 - Mississauga



Stormwater Infrastructure Funding Study Goal

A balanced approach to a stormwater funding framework through level of service review and examining funding options



Stormwater Infrastructure Funding Study

LCC and LOS Review

- Calculate service life costs based on repair, retrofit and eventual replacement, operations and maintenance costs
- Determine level of service based on best practices

Funding Options and Models

- Tax vs. Rate
- Tiered vs. Straight Dollar Figure
- Calculated based on permeable area on property
- Other funding options

Policy and By-law Development

- Policy for application of funding framework
- Stormwater By-law

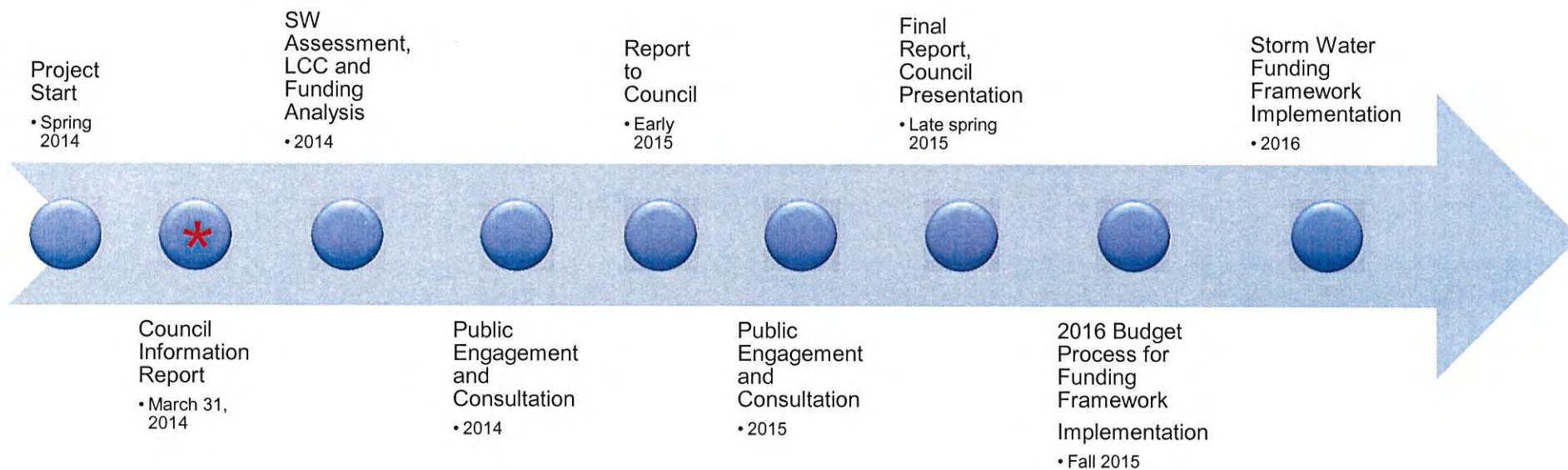


Public Consultation and Engagement Plan

- Communication campaign to promote and define stormwater management, the role of the resident and the role of the City
- Public Consultation and Education through Stakeholder Advisory Committee



Proposed Study Schedule



Questions?



FINANCE, ADMINISTRATION AND AUDIT COMMITTEE – MARCH 31, 2014

STORMWATER INFRASTRUCTURE FUNDING STUDY - CITY-WIDE

Recommendation

The Commissioner of Engineering and Public Works, in consultation with the Commissioner of Finance and City Treasurer recommends:

1. That this report be received for information.

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Attachments

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Report prepared by:

Jennifer Rose, Manager, Special Projects, ext. 8745

Respectfully submitted,

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