Kitchener’s Stormwater Utility

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City of Kitchener

Urban-Basement Flood Symposium & RAIN Presentation
September 19, 2013
Presentation Agenda

1. Introduction
2. Stormwater Funding Review
3. Stormwater Rate
4. Stormwater Credits: Residential and Non Residential Programs
5. Lessons Learned
6. Recognition
Kitchener, Ontario

- 1 hour west of Toronto
- Population – 229,400
- Local municipal council within the two tier Region of Waterloo
- Grand River Watershed
Typical Challenges for Stormwater Management

- Growth and development
- Flooding and erosion
- Property damage and Increased liability
- Water quality degradation
- Source water protection
- Historic urban areas
- Inadequate inspection & maintenance
- Heightened regulatory requirements
- Climate Change
- 137 square kilometres
- 100 km open watercourses
- 700 km of sewers
- 10000 catchbasins
- 100 SWM ponds

$265M of SWM Assets (2011)
Service Level Study (2005 - 2009)

Current Service Level = $8.9M

Sustainable Service Level = $13.0M

$4.1M INCREASE
STORMWATER FUNDING REVIEW
• Stormwater has historically been funded through property taxes.

• Inequality as the amount property owners pay through property taxes may not = the amount of service they use.

• Residential property taxpayers subsidize tax exempt properties and large commercial/industrial properties

• Inconsistent funding source – competition for stormwater infrastructure funding.
## Funding Mechanism Comparison

<table>
<thead>
<tr>
<th>Funding Method</th>
<th>Dedicated Funding Source</th>
<th>Fair &amp; Equitable Allocation</th>
<th>Tax Exempt Property Contributions</th>
<th>Incentives for On-Site Stormwater Management</th>
<th>Effort to Administrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Stormwater Rate</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>High</td>
</tr>
<tr>
<td>2. Dedicated Tax Levy</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Low/Medium</td>
</tr>
<tr>
<td>3. Stormwater Flat Fee</td>
<td>Yes</td>
<td>Partly - if tiered</td>
<td>Yes</td>
<td>Possibly</td>
<td>Medium</td>
</tr>
<tr>
<td>4. Status Quo</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Low</td>
</tr>
</tbody>
</table>
Council Approval (June 2010)

• Reduce property tax base budgets and shift costs to the stormwater utility

• Stormwater Rate schedule effective January 1, 2011

• $4M increase to the annual capital and operating budget

• Addresses fairness - rate structure based on impervious area measurements

• Develop a stormwater credit policy for properties that manage stormwater on-site
STORMWATER RATE
Billing System Implementation

1. Update GIS impervious area mapping for each property

2. Assign SWM rate codes to each property.

3. Link GIS rate codes to City billing accounts

4. Update the City’s corporate tax and utility billing software (CIS).

5. First SWM utility bills issued in February 2011.
Stormwater rate based on measured impervious area:

- Driveways & parking areas (but not public right-of-way)
- Building footprint (rooftop area)
- Other hard surfaces (patios, sidewalks, private roads, etc.)

Total Impervious Area = 1,872 m²
## Residential Billing Chart

<table>
<thead>
<tr>
<th>Type Code</th>
<th>Description</th>
<th>Basis for Charge</th>
<th>Monthly Charge per Property</th>
<th>Annual Charge per Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Residential Single Detached Small</td>
<td>Detached homes with building footprint size of 105 m² or less</td>
<td>$5.92</td>
<td>$71.04</td>
</tr>
<tr>
<td>2</td>
<td>Residential Single Detached Medium</td>
<td>Detached homes with building footprint size between 106-236 m²</td>
<td>$9.87</td>
<td>$118.44</td>
</tr>
<tr>
<td>3</td>
<td>Residential Single Detached Large</td>
<td>Detached homes with building footprint size of 237 m² or more</td>
<td>$12.98</td>
<td>$155.76</td>
</tr>
<tr>
<td>4</td>
<td>Residential Townhouse / Semi-Detached</td>
<td>Per dwelling unit</td>
<td>$7.05</td>
<td>$84.60</td>
</tr>
<tr>
<td>5</td>
<td>Residential Condominium</td>
<td>Per dwelling unit</td>
<td>$3.94</td>
<td>$47.28</td>
</tr>
<tr>
<td>6</td>
<td>Multi-Residential (2-5 Units)</td>
<td>Per building</td>
<td>$7.91</td>
<td>$94.92</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$11.86</td>
<td>$142.32</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$15.80</td>
<td>$189.60</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$19.76</td>
<td>$237.12</td>
</tr>
<tr>
<td>7</td>
<td>Multi-Residential (&gt;5 Units)</td>
<td>Per property (according to number of dwelling units)</td>
<td>Charge = (# units) × ($1.98/month) See Note 2</td>
<td>Charge = (# units) × ($23.76/year) See Note 2</td>
</tr>
</tbody>
</table>
Single Detached Medium

Building Footprint: 226 m²
Monthly Charge: $9.73
Annual Charge: $116.76
Rate Code 2
<table>
<thead>
<tr>
<th>Type Code</th>
<th>Description</th>
<th>Basis for Charge</th>
<th>Monthly Charge per Property</th>
<th>Annual Charge per Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Non-Residential Smallest</td>
<td>26-1,057 m² of impervious area</td>
<td>$18.90</td>
<td>$226.80</td>
</tr>
<tr>
<td>9</td>
<td>Non-Residential Small</td>
<td>1,052 m – 1,640 m² of impervious area</td>
<td>$50.52</td>
<td>$606.24</td>
</tr>
<tr>
<td>10</td>
<td>Non-Residential Medium-Low</td>
<td>1,641-7,676 m² of impervious area</td>
<td>$132.38</td>
<td>$1,588.56</td>
</tr>
<tr>
<td>11</td>
<td>Non-Residential Medium-high</td>
<td>7,677 – 16,324 m² of impervious area</td>
<td>$386.43</td>
<td>$4,637.16</td>
</tr>
<tr>
<td>12</td>
<td>Non-Residential Large</td>
<td>16,325 – 39,034 m² of impervious area</td>
<td>$936.58</td>
<td>$11,238.96</td>
</tr>
<tr>
<td>13</td>
<td>Non-Residential Largest</td>
<td>39,035 m² or greater of impervious area</td>
<td>$2,010.62</td>
<td>$24,127.44</td>
</tr>
</tbody>
</table>
Impervious Area: 74,336 m²
Monthly Charge: $1,980.91
Annual Charge: $23,770.92
Rate Code 13
Revenue Distribution

Current Tax Levy
25.9% Non-Residential
74.1% Residential

Proposed Rate (18% shift)
43.8% Non-Residential
56.2% Residential
STORMWATER CREDITS INTRODUCTION AND, POLICY DEVELOPMENT
What Are SW Credits?

Encouragement to Manage Stormwater

Implementation of Best Management Practices

Receive Financial Rebates and Environmental Benefits
SWM Credit Policy Development

- Review and collect background information
- Develop credit policy alternatives
- Present policy alternatives to public (September 2011)
- Evaluate policy alternatives
- Present preferred alternative to public (November 2011)
- Seek Council approval of proposed policy (January 2012)
Credit Policy Alternatives

There were 5 alternatives under consideration:
1. Do Nothing (no credit program)
2. Multi-res and Non-res Credits
3. Residential Credits
4. Residential Rebates
5a. Combination (Options 2 & 3)
5b. Combination (Options 2 & 4)

Preferred alternative: Credits for both non residential and residential property owners
COMMUNICATIONS AND COMMUNITY OUTREACH
New stormwater user rate coming in 2011!

The City of Kitchener is transferring stormwater management funding from property taxes to a user fee program, effective Jan. 1, 2011. This new stormwater user fee will appear on your monthly utility bill beginning in February 2011. The average single dwelling homeowner will be charged approximately $16.50 per month for stormwater management.

All properties including non-residential properties will see the new user fee on their utility bill based on the rate category their property is in. This approach is the most fair and equitable way to fund stormwater management since the properties that use the system more also pay more.

* Stormwater is water that flows across the land and is routed into drainage systems and then on to our natural areas.

Why is the new rate important?
The new user rate will allow the city to improve its stormwater service levels by:

- Keeping pollutants out of our stormwater system - leading to better protection of our source water.
- Preventing local flooding and pollution from reaching our creeks and streams - preserving their health and vitality.
- Accelerating needed improvements to the local stormwater management system, including Victoria Park Lake.

Where do I get more information?

For more information on the city’s new stormwater rate, please:

- Visit www.kitchener.ca/stormwater
- E-mail: revenue.customerservice@kitchener.ca
- Call 519-741-2450

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Public Communication

... investment in source water
... protecting the environment
... consistency in our billing rules

Victoria Park Lake

The Lowdown on the Clean-up
Welcome to the Victoria Park Lake improvements project email update!

Next steps
Construction will focus on site preparation during the initial phase. Please keep your distance from the work area for your own safety.

http://www.kitchener.ca/stormwater
Community Outreach

- RAIN is a joint program of Green communities Canada and its members, including REEP green solutions.
- The RAIN program provides information and resources to property owners for on-site stormwater management.
- Made possible through funding from MOE Showcasing Water Innovation Fund.
RESIDENTIAL STORMWATER CREDIT PROGRAM
Approved Best Management Practices (BMPs)
Rain Garden During Rainfall
Infiltration galleries are stone-filled (golf ball size) excavations where stormwater runoff collects and then infiltrates into the ground.
Infiltration Gallery vs. Rain Barrel

Example of Infiltration Gallery

Amount of rain water stored in an average infiltration gallery = 21 rain barrels
Infiltration Galleries
Infiltration Trench
Permeable Pavers

Traditional Interlocking Pavers
Permeable vs. Impermeable

Permeable pavers use an Open Graded Base

Traditional Pavers use a Dense Graded Base

Sand & Gravel Mix
Permeable pavers are installed over a high void ration base to store runoff and promote long term infiltration.
# Credit Structure

## Residential BMP Credit Values

<table>
<thead>
<tr>
<th>Credit Type</th>
<th>Volume Captured</th>
<th>Examples</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Residential Credit</td>
<td>200 - 800 L</td>
<td>1-4 rain barrels small cistern</td>
<td>20%</td>
</tr>
<tr>
<td>Normal Residential Credit</td>
<td>801 - 3200 L</td>
<td>Small Rain garden Medium sized cistern</td>
<td>30%</td>
</tr>
<tr>
<td>Enhanced Residential Credit</td>
<td>3201 L or more</td>
<td>large cistern infiltration gallery</td>
<td>45%</td>
</tr>
<tr>
<td><strong>Residential Hardcopy Stormwater Credit Application</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[Form content and details provided in the image]
Residential Stormwater Credit Application Form

Rain Barrels

What are they?
A rain barrel is used to collect and temporarily store rainwater for re-use in the garden. Rain barrels typically hold 200 litres of rainwater yet can range from 150-300 litres in size.

How do they work?
Rain barrels are connected to your roof’s downspout(s) and collect the rainwater that lands on your roof. Generally, the only maintenance that’s required is to empty rain barrels between rainfalls and to flip them upside down during freezing temperatures to avoid damaging the hose connections.

What are the benefits?
Rain barrels capture rain that can be used to water your plants, while saving on water bills. They are cost effective and easy to maintain. Rain barrels help to reduce your impact on the city’s stormwater management system and help protect our rivers and creeks. The more rain barrels you have, the greater the benefits.

Do you have one or more Rain Barrels?

- Yes
- No

[Back] [Continue]
Residential Online Application

Residential Stormwater Credit Application Form

Permeable Pavers

What are they?
Permeable pavers are an alternative to traditional pavement or interlocking brick and are becoming more common for use in residential driveways and patios.

How do they work?
Permeable pavers are designed in a way that allows rainwater to drain between the paver stones into an under-layer of gravel. The difference between traditional paving stones and permeable pavers is a slightly larger spacing between stones and rather than a fine sand mix between the stones, a looser gravel mix is used that allows water to be absorbed rather than running off the hard surface. Once in the gravel base, rainwater then slowly absorbs into the ground and gradually makes its way down to the water table where it is known as groundwater.

Note:
Inspections will be conducted to confirm your permeable pavers meet the necessary criteria. Traditional interlocking stone is not the same as permeable pavers. Interlocking stone driveways that use sand in the joints, lack the spacing between the stones and do not have at least 0.3 metres (1 foot) of loose stone beneath them to store stormwater, are not eligible for stormwater credits.

What are the benefits?
Permeable pavers provide an attractive alternative to traditional driveways and patios while also increasing the amount of water that gets absorbed into the ground rather than running off your driveway into storm sewers. In the Region of Waterloo, 66% of our drinking water is supplied from groundwater and permeable pavers help to replenish our groundwater resources. Permeable pavers also help to reduce your impact on the city’s stormwater management system and help protect our rivers and streams.

Do you have Permeable Pavers?

- Yes
- No

Back  Continue
Residential Stormwater Credit Application Form

Permeable Pavers

You told us you have permeable pavers. Please tell us the dimensions of your permeable paver area.

<table>
<thead>
<tr>
<th>Dimensions of Your Permeable Paver Area</th>
<th>Example Illustration of Dimensions to Be Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length: (from 1.5 to 20 metres)</td>
<td></td>
</tr>
<tr>
<td>Width: (from 1.5 to 20 metres)</td>
<td></td>
</tr>
</tbody>
</table>

- Depth of Gravel Base: (from 0.3 to 0.6 metres)
- Depth of Subbase: (from 0 to 0.5 metres, if there is no subbase at all)

Note:
- In order to qualify for the stormwater credit, your permeable pavers must have small gaps between the pavers that are filled with stone and a gravel drainage layer beneath. The spaces between the pavers allow water to drain through to the gravel base (and subbase) where stormwater is retained on your property and is absorbed into the ground. Pits, stone slivers or other surface features that block these components do not qualify for the stormwater credits. If you are unsure about your system, please contact the city to discuss or arrange a site visit.
- If you do not know the depth of the gravel base or subbase for your permeable pavement system, enter 0.3m for depth of the base, and 0 for the depth of the subbase.
Residential Credit Policy Uptake

4,157 applications received in first 6 months

- Cumulative Applications Received
- Cumulative Applications Approved

Number of Applications Received

Date Application Received:
- Oct-12
- Nov-12
- Dec-12
- Jan-13
- Feb-13
- Mar-13
Pass Rate

- 662 inspections completed from May 15, 2013 - August 16, 2013
- 17% of all residential participants received an inspection
Local Examples (Inspections)
Local Examples (Inspections)
Local Examples (Inspections)
Local Examples (Inspections)
Local Examples (Inspections)
Local Examples (Inspections)
Local Examples (Inspections)
Local Examples (Inspections)
Residential Credit Program: Lessons Learned

• As much an education opportunity as it is about providing incentives to retrofit

• A good communications strategy and community outreach work are necessary to make the program successful

• An online application that links directly to city billing software is highly recommended to cut down staff time
Residential Credit Program: Lessons Learned

• Inspections necessary to keep program honest

• Promotes awareness of potential solutions to drainage problems and alternative landscaping techniques.

• Green minded people, doityourself, seniors and gardeners are early adopters

• BMP’s direct water away from the home foundation and reduce sw directed to pipes by promoting groundwater recharge.
NON-RESIDENTIAL STORMWATER CREDIT PROGRAM
Approved Best Management Practices (BMPs)

- Quantity
- Quality
- Education
Quantity (Flood Reduction)

- Quantity Control Pond
- Parking Lot Storage
- Rooftop Storage
- Infiltration Gallery
- Underground Storage
Quality (Pollutant Reduction)

- Quality Control Pond
- Oil/Grit Separator
- Filter Strip
- Paved Sweeping Plan
- Salt Management
## BMPs & Credit Values

<table>
<thead>
<tr>
<th>Credit Type</th>
<th>BMP Examples</th>
<th>Maximum Credit</th>
</tr>
</thead>
</table>
| **Quantity**      | • Quantity control pond  
                    • Parking lot storage  
                    • Rooftop storage  
                    • Underground Storage  
                    • Infiltration gallery | 25%            |
| *(Flood Prevention)* |                                                                             |                |
| **Quality**       | • Quality control pond  
                    • Oil/grit separator  
                    • Filter strip  
                    • Paved area sweeping program  
                    • Salt management program | 15% - Enhanced  
                        10% - Normal  
                        5% - Basic    |
| *(Pollution Reduction)* |                                                                     |                |
| **Education**     | • Employee  
                    • Customer | 5%             |
|                   | Total: 45%                                                                   |                |
## Credit Registration Information:

Check all boxes that apply for the stormwater best management practices (BMP) currently in use. To learn more about how the stormwater credits are calculated please see the Frequently Asked Questions section of this package.

### Quantity Control Credit:

<table>
<thead>
<tr>
<th>Credit Description</th>
<th>Box</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity Control Pond (can combine with quality)</td>
<td></td>
</tr>
<tr>
<td>Parking Lot Storage</td>
<td></td>
</tr>
<tr>
<td>Infiltration Gallery</td>
<td></td>
</tr>
<tr>
<td>Rooftop Storage</td>
<td></td>
</tr>
<tr>
<td>Underground Storage</td>
<td></td>
</tr>
<tr>
<td>Other (provide description)</td>
<td></td>
</tr>
</tbody>
</table>

How many square metres of impervious area drain to the control?:

### Quality Control Credits:

<table>
<thead>
<tr>
<th>Credit Description</th>
<th>Box</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Control Pond (can combine with quality)</td>
<td></td>
</tr>
<tr>
<td>Oil Grit Separator</td>
<td></td>
</tr>
<tr>
<td>Filter Strip</td>
<td></td>
</tr>
<tr>
<td>Paved Area Sweeping Program</td>
<td></td>
</tr>
<tr>
<td>Salt Management Plan</td>
<td></td>
</tr>
<tr>
<td>Other (provide description)</td>
<td></td>
</tr>
</tbody>
</table>

Choose the level of Quality Control achieved:

<table>
<thead>
<tr>
<th>Level</th>
<th>Box</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhanced</td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td></td>
</tr>
<tr>
<td>Basic</td>
<td></td>
</tr>
</tbody>
</table>

To review the requirements for the paved area sweeping program please see the attached insert.

To review the requirements for the salt management plan please see the attached insert.

How many square metres of impervious area drain to the quality control?:

### Education Credit:

<table>
<thead>
<tr>
<th>Credit Description</th>
<th>Box</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee Education Program</td>
<td></td>
</tr>
<tr>
<td>Customer Education Program</td>
<td></td>
</tr>
<tr>
<td>Student Education Program</td>
<td></td>
</tr>
</tbody>
</table>

To review the requirements for the employee, customer or student education program please see the attached insert.
Popularity of BMPs Among Non-Res Applicants
Credit Criteria

Creditable area is defined by the amount of impervious area draining to a BMP
550 Trillium Dr
550 Trillium Dr.

Total: 40% Credit
Savings = $1828/year
Ontario Die International
Ontario Die International
Non Residential Credit Program: Lessons Learned

• Ideal to promote the credit program during the municipal site development process – harder to implement sw controls once built

• Incentives to retrofit increase for properties with large amounts of impervious area (high rates)

• Essential to send targeted mail to properties with City approved BMP’s on site
Meeting site development requirements may not mean full stormwater credits:

- Building expansions
- Cash in lieu rather than on site controls
- Site drains to a downstream SW facility
- Etc.

In these cases stormwater credits received will be less than the maximum
Non Residential Credit Program: Lessons Learned

- A good communications strategy and community outreach work are necessary to make the program successful

- Considering to offer property owners the option to leverage sw fees in order to spread capital costs of new sw infrastructure
Recognition
August 2011 - Peter J. Marshall Municipal Innovation award from the Association of Municipalities of Ontario for the implementation of its stormwater utility

January 2012 - Kitchener, along with other project partners, was awarded Showcasing Water Innovations Grants totaling almost $2M

February 2012 - Ontario Good Roads Association Best Practices Award for the new Stormwater Utility Rate

March 2013 – Council of the Federation Excellence in Water Stewardship Award
The more you pave... the more you pay

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