Kitchener's Stormwater Utility

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City of Kitchener

TRIECA Conference
March 26, 2012

Presentation Agenda

1. Stormwater Funding Review
2. Stormwater Rate
3. Stormwater Credit Policy
4. Lessons Learned
5. Recognition

What is SWM?

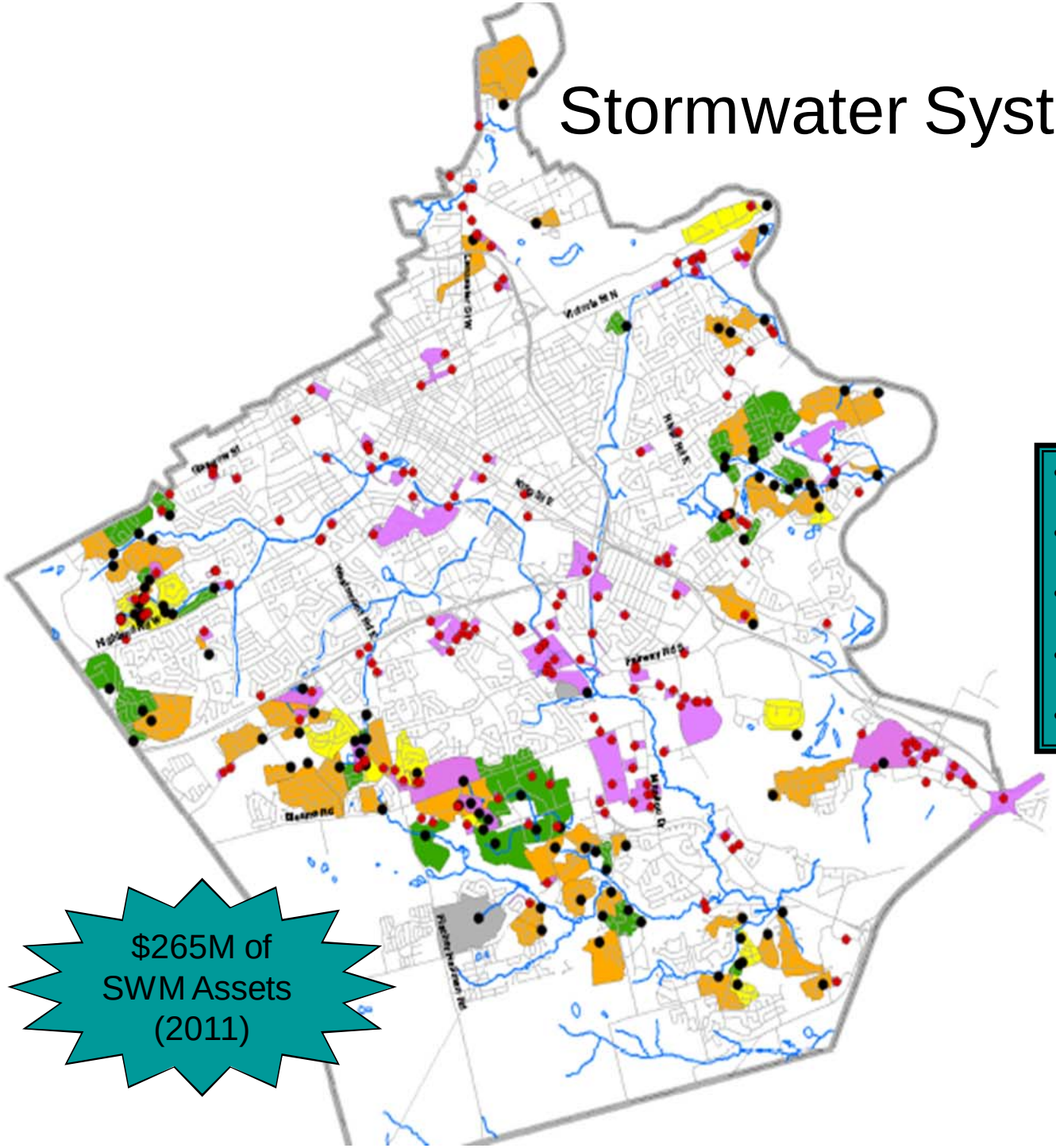
KITCHENER

- Flood control structures ensure public safety.
- Effective drainage conveys overland flows to prevent property damage.
- Water quality facilities protect aquatic and terrestrial habitat.
- Infiltration facilities protect source water ensuring a safe drinking water supply.
- Erosion protection to stabilize slopes, affecting public and private property.

Kitchener Ontario

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

Stormwater System



- 137 square kilometres
- 100 km open watercourses
- 700 km of sewers
- 10000 catchbasins
- 100 SWM ponds

$265M of SWM Assets (2011)

2010 Kitchener SWM Audit

Existing Pond & OGS Locations

Datum: NAD 83, Zone 17 Source: City of Kitchener	Figure 2.1
1:65,000	
January 2011	

KITCHENER

AECOM

Current and Typical Challenges

- Growth and development pressures
- Inadequate inspection & maintenance
- Inadequate drainage systems
- Flooding and erosion hazards
- Pavement damage
- Heightened regulatory requirements
- Noticeable change in pattern of storm events
- Increased liability
- Frequent backyard and basement flooding claims






STORMWATER FUNDING REVIEW

Review Process

- Kitchener and Waterloo worked collaboratively, as part of a shared services initiative.
- AECOM partnered with CDM to assist Waterloo and Kitchener.
- Stormwater Management Feasibility Study was started in 2004.
  - Part 1 - Service Level Study - investigated current and future anticipated stormwater expenditures.
  - Part 2 - Funding Mechanism Review - an equitable, self-supporting, and dedicated funding mechanism
- Study recommendations adopted by Council in October 2009.

Service Level Study

Sustainable Service Level = $ 13.0M

$4.1M INCREASE

Current Service Level = $ 8.9M

Funding Mechanism Review

- Stormwater has historically been taxpayer funded.
- Inconsistent funding source – competition for funding.
- Inequality = amount property owners pay through property taxes vs. amount of service they use.
- Residential property taxpayers subsidize tax exempt properties and large commercial/industrial properties.
- As stormwater management budget requirements continue to grow so does this inequity.
- Four funding options were reviewed which identified strengths, weaknesses and potential costs to ratepayers.

Funding Methodology Comparison

Funding Method	Dedicated Funding Source	Fair & Equitable Allocation	Tax Exempt Property Contrib-utions	Incentives for On-Site Stormwater Management	Effort to Administrate
1. Stormwater Rate	Yes	Yes	Yes	Yes	High
2. Dedicated Tax Levy	Yes	No	No	No	Low/ Medium
3. Stormwater Flat Fee	Yes	Partly - if tiered	Yes	Possibly	Medium
4. Status Quo	No	No	No	No	Low

Council Approval (June 2010)

- Reduce tax-supported base budgets implemented in fiscal 2011 … shift costs to the stormwater utility
- $4M increase to the annual capital and operating budget
- Rate schedule effective January 1, 2011
- Develop a stormwater credit policy, including residential credits
- Addresses inequity - 18% cost shift from residential sector to non-residential sector
- Addresses fairness - rate structure based on impervious area measurements

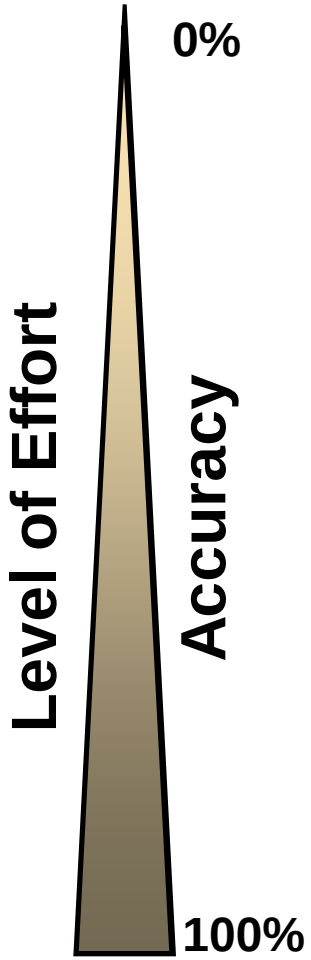
Rate Structure Benefits

- Dedicated funding source that allows for sustainability, flexibility and adaptability to respond to issues such as climate change
- Based on the user's amount of runoff contribution as opposed to property value
- Includes all contributors to the stormwater system
- Potential incentive to reduce stormwater runoff and pollutant discharge (i.e. installation of green roofs, rain barrels, etc.)
- Creates awareness of stormwater and importance of managing stormwater

STORMWATER RATE

Common Billing Unit Methods

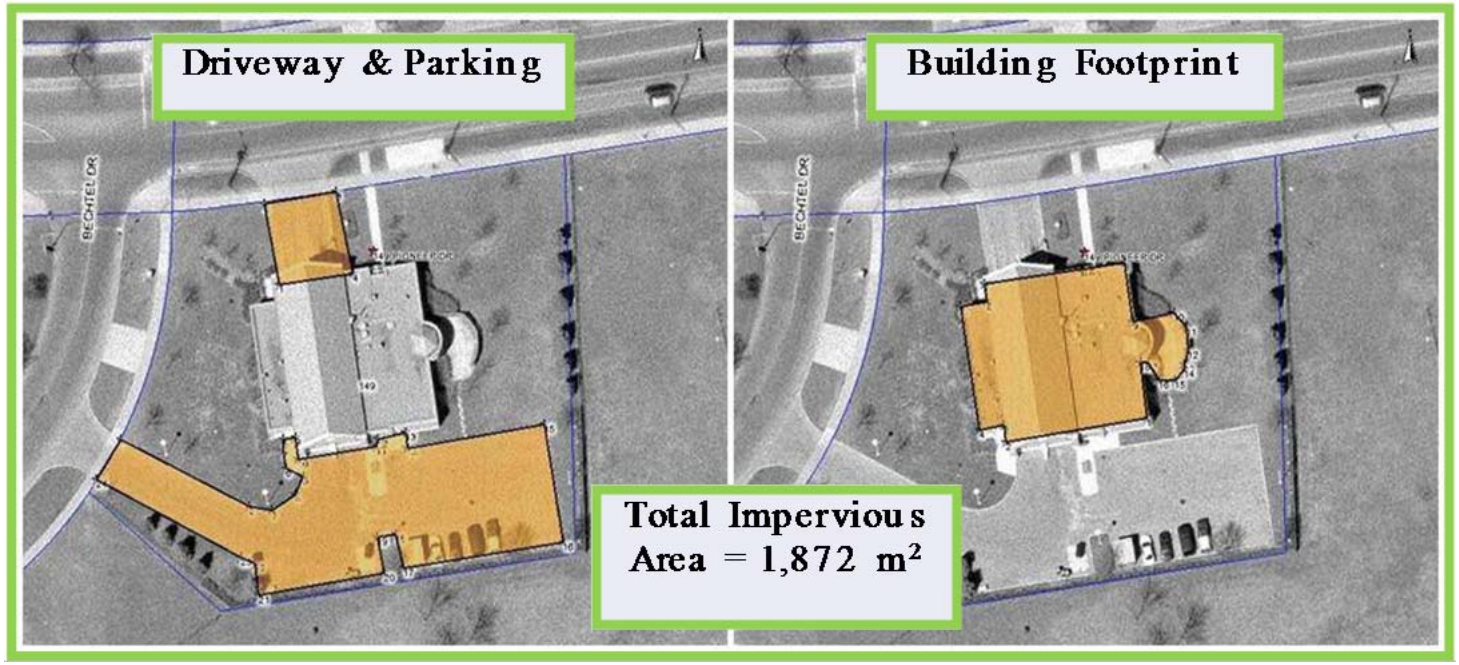
- Flat Fee
- Runoff Coefficient
- Intensity of Development Factor
- Residential Flat Rate
  - Equivalent Residential Unit (ERU)
  - Single Family Unit (SFU)
- Tiered Residential Rate
- Level-of-Service / Geography Base
- Impervious Area Measurements (all properties, each year)



Calculation Methodology

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.)



Single Family Unit (SFU) Methodology

- Single Unit Res.
- Multi-Unit Res.
- Condominiums
- Townhouses

→ 1 billing unit per single detached home

- Governmental
- Commercial
- Institutional
- Industrial

→ fractional billing units per non-single residential dwelling units

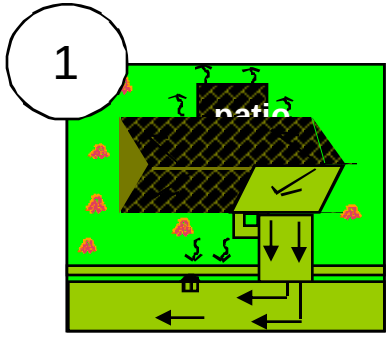
→ $\frac{\text{Parcel Impervious Area}}{\text{SFU Base Area*}} = \text{Units}$

** SFU = Single Family Unit*

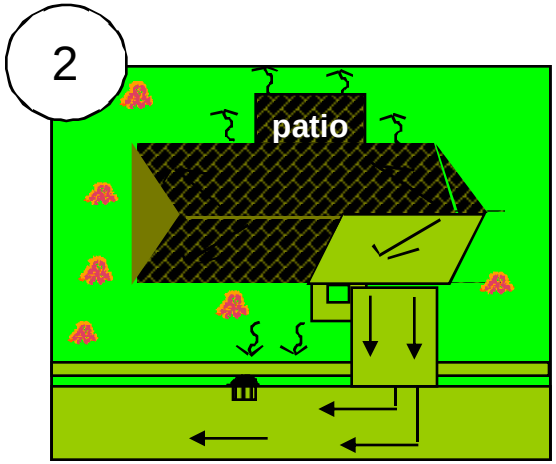
** 2010 Kitchener SFU Base Area: 259 m^2 (2,900 ft^2)*

Single Family Unit (SFU) Methodology

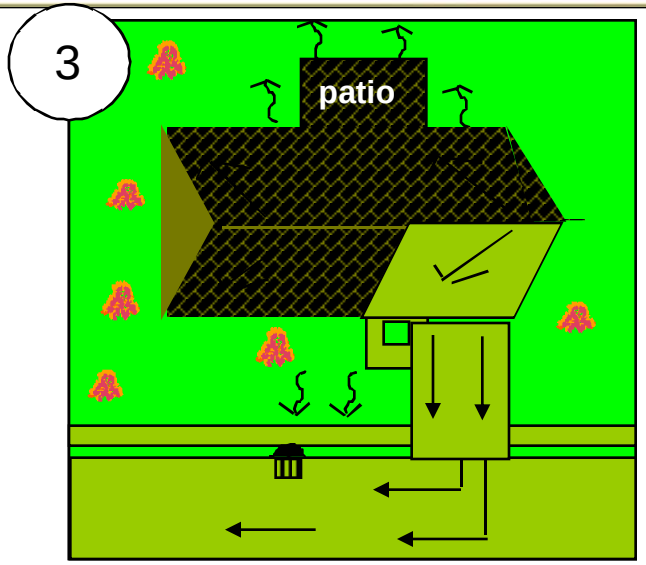
SFU = Single Family Unit



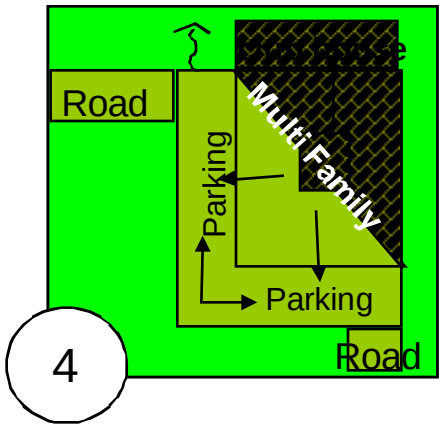
***Small** Single Detached*
168 m² = 0.6 SFU



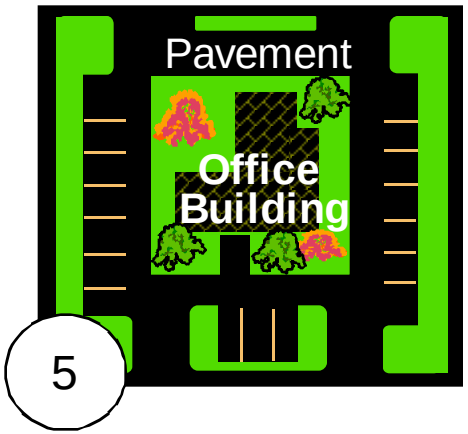
***Average** Single Detached*
259 m² = 1.0 SFU



***Large** Single Detached*
344 m² = 1.3 SFU



Multi-Unit Residential
1 Dwelling Unit =
0.2 - 1.0 SFU

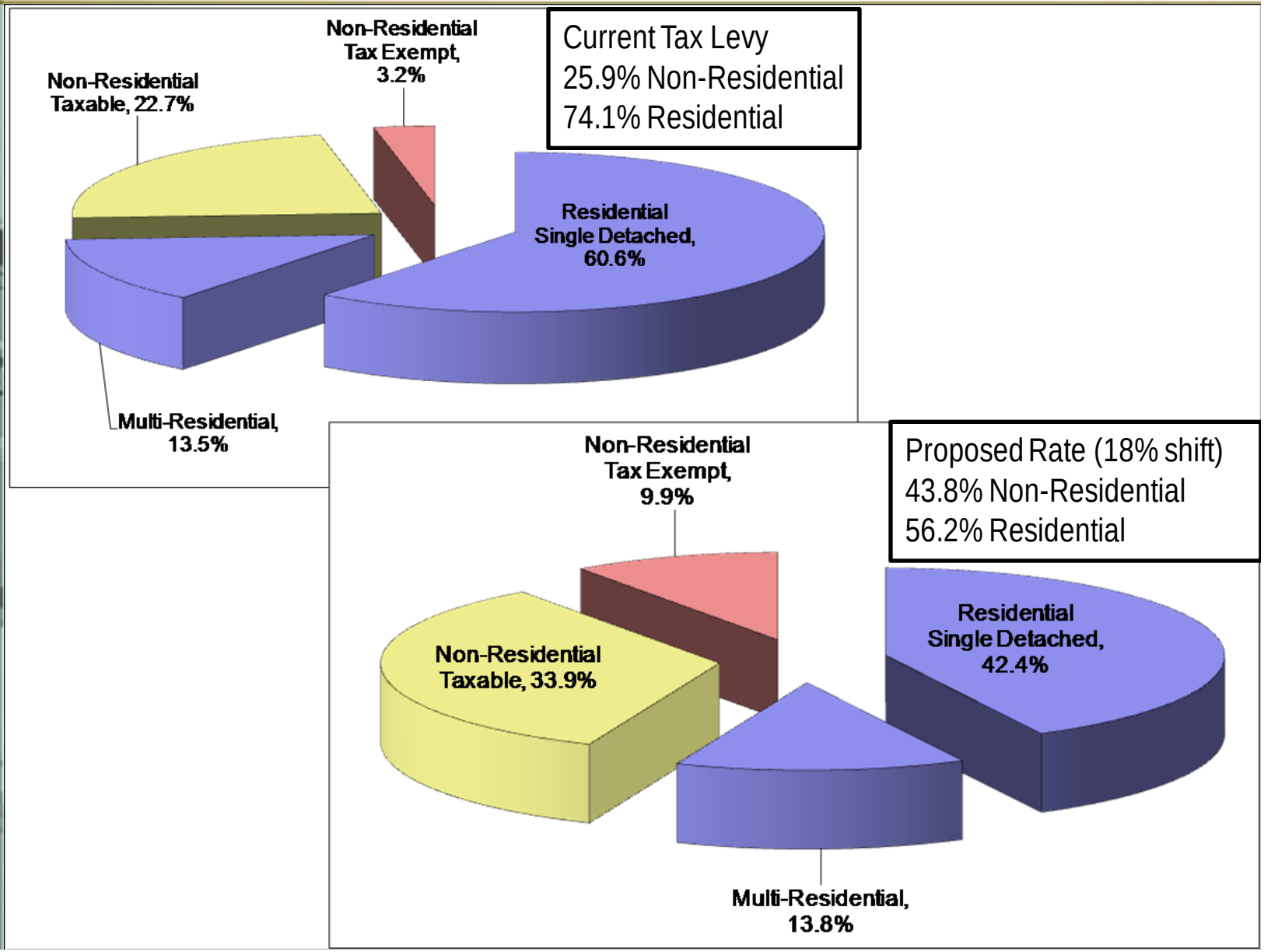


$$\text{Units} = \frac{\text{Non-Residential Impervious Area}}{\text{SFU Area}}$$

Rate Table (March 2012)

Type Code	Description	Basis for Charge	Number of Dwelling Units	Monthly Charge per Property[1]	Annual Charge per Property[1]
1	Residential Single Detached Small	Detached homes with building footprint size of 105 m^2 or less	1	$5.84	$70.08
2	Residential Single Detached Medium	Detached homes with building footprint size between 106-236 m^2	1	$9.73	$116.76
3	Residential Single Detached Large	Detached homes with building footprint size of 237 m^2 or more	1	$12.79	$153.48
4	Residential Townhouse / Semi-Detached	Per dwelling unit	1	$6.95	$83.40
5	Residential Condominium	Per dwelling unit	1	$3.89	$46.68
6	Multi-Residential (2-5 Units)	Per building	Duplex	$7.79	$93.48
			Triplex	$11.68	$140.16
			Four-plex	$15.57	$186.84
			Five-plex	$19.47	$233.64
7	Multi-Residential (>5 Units)	Per property (according to number of dwelling units)	varies	Charge = (# units) × ($1.95/month) ***See Note 2***	Charge = (# units) × ($23.40/year) ***See Note 2***
8	Non-Residential Smallest	26 -1,051 m^2 of impervious area	n/a	$18.63	$223.56
9	Non-Residential Small	1,052 -1,640 m^2 of impervious area		$49.78	$597.36
10	Non-Residential Medium-Low	1,641 -7,676 m^2 of impervious area		$130.43	$1,565.16
11	Non-Residential Medium-High	7,677 -16,324 m^2 of impervious area		$380.72	$4,568.64
12	Non-Residential Large	16,325 -39,034 m^2 of impervious area		$922.74	$11,072.88
13	Non-Residential Largest	39,035 m^2 or greater of impervious area		$1,980.91	$23,770.92

Revenue Distribution



Single Detached Medium

Building Footprint:	226 m^2
Monthly Charge:	$9.73
Annual Charge:	$116.76

Rate Code 2

Multi-Residential (>5 units)

No. of Dwelling Units:	6
Unit Charge:	$1.95
Monthly Charge:	$11.70
Annual Charge:	$140.40

Rate Code 7

Non-Res Medium Low

Impervious Area:	2,452 m^2
Monthly Charge:	$130.43
Annual Charge:	$1565.16

Rate Code 10

Non-Res Largest

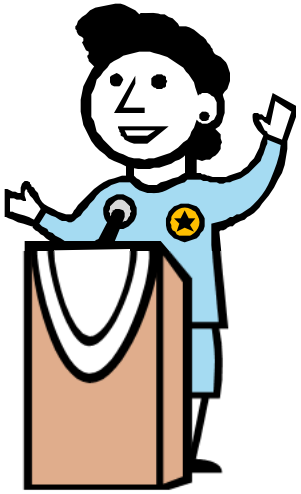
Impervious Area:	74,336 m^2
Monthly Charge:	$1,980.91
Annual Charge:	$23,770.92

Rate Code 13

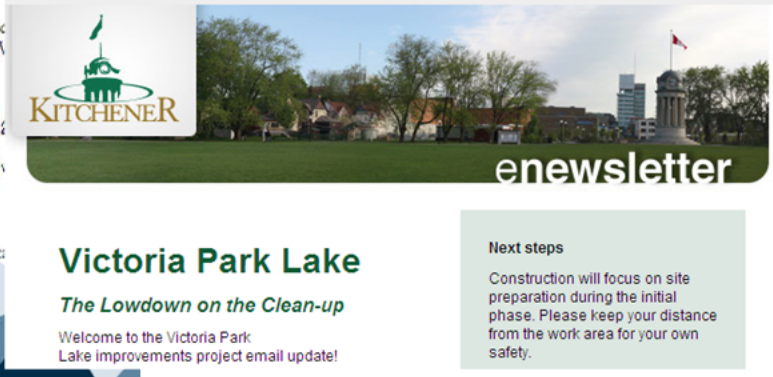
Billing System Implementation

1. Update GIS impervious area mapping and estimates.
2. Assign SWM rate type codes from approved rate schedule to properties.
3. Link GIS data to City billing records to assign a rate code and monthly billing amount.
4. Finalize master stormwater billing file data.
5. Incorporate into the City's corporate tax and utility billing system (CIS).
6. Prepare procedures manual to maintain the master billing data file.
7. Develop comprehensive communications strategy.
8. First SWM utility bills issued in February 2011.

Public Communication



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



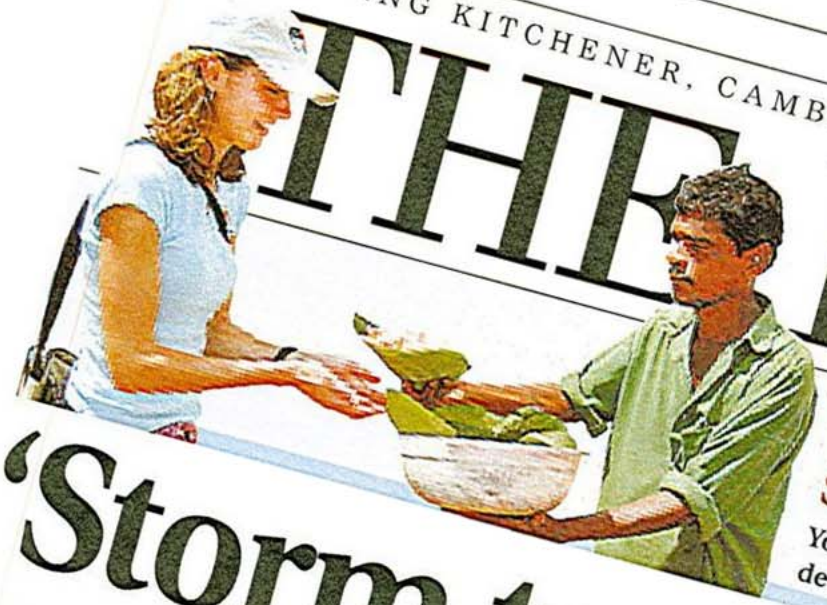
http://www.kitchener.ca/stormwater

AY, APRIL 6, 2006

SERVING KITCHENER, CAMBRIDGE, WATERLOO AND THE REGION

THE RECORD

$1.00 INCLUDES GST — OUTSIDE WATERL



World-class students

Young local volunteers help developing nations. NIGHTLIFE

Tougher Masters

Augusta bares its teeth. SPORTS C1

'Storm tax' on the horizon

Another reason to hate rainy days

cities propose stormwater fee

RIAN CALDWELL
RD STAFF

RLOO REGION

hener and Waterloo are
sidering a new user fee

— kind of a tax on rain
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they'll take the biggest hit in what they say amounts to a sneaky money grab.

"It is a way of raising taxes without being seen to raise taxes," said Todd Letts, president of the Greater Kitchener Waterloo Chamber of Commerce.

"I can't believe the politicians are instructing their staff this in an election year."

The money to handle stormwater — including flood controls and water quality — now comes out of property taxes, competing for priority with all the other services provided by the two cities.

Expenditures in Kitchener total about $4.6 million a year; with about $2.8 million spent annually in Waterloo.

This summer, the cities agreed to split the cost of a $90,000 study into stormwater spending increases and new ways to get the money.

Included was the possible creation of a stormwater utility, similar to utilities that directly bill customers for water, gas and electricity use.

SEE RAIN: PAGE A2

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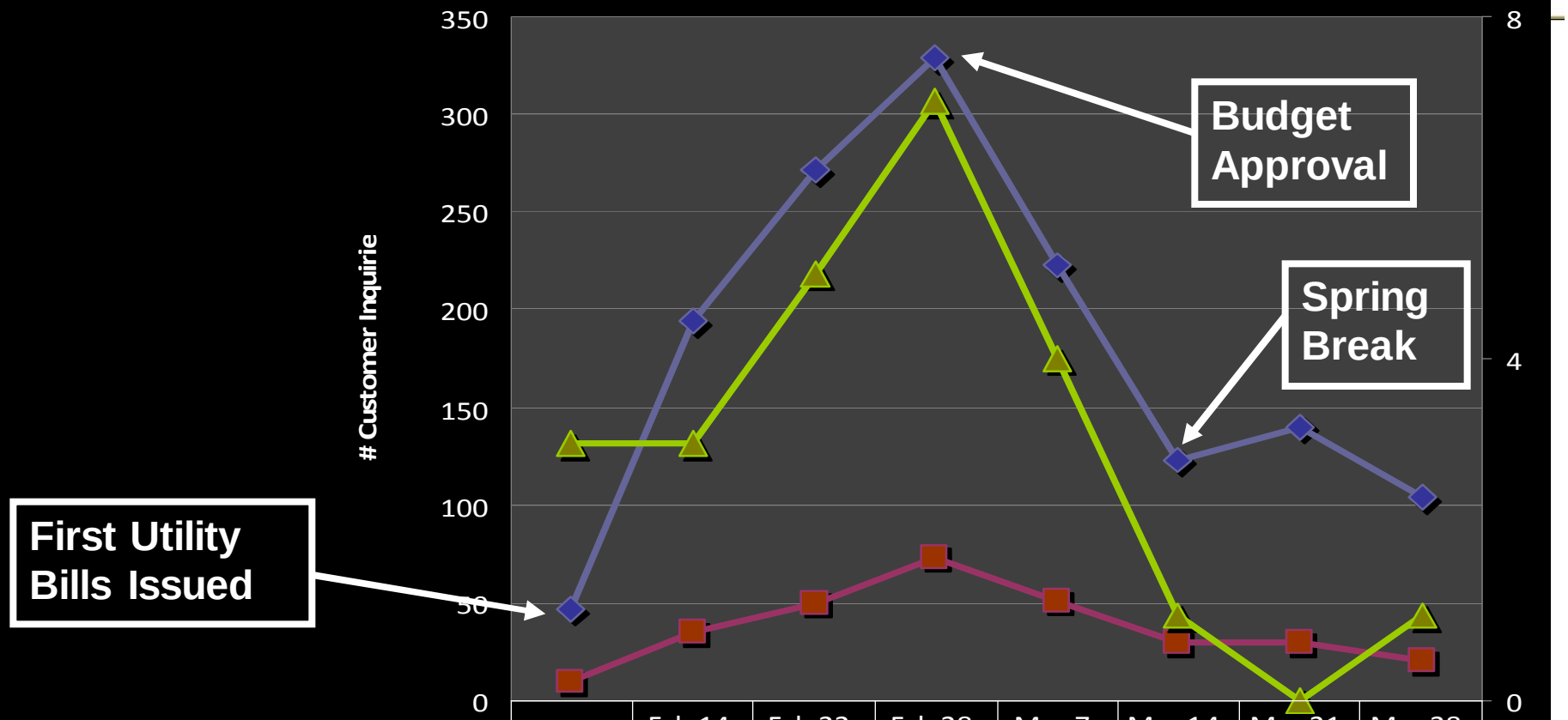
Storm fee 'a blatant tax grab'

Dam that crazy stormwater tax

or years, the taxpayers' most paranoid fear was that some day,
where, a government would actually tax the air we
os of Kitchener and Waterloo aren't quite ready
g something nearly as bad: taxing the

the cities are jointly
charge resi-
tor

Public Awareness of Stormwater Utility Bills



	Feb 7-11	Feb 14-18	Feb 22-25	Feb 28-Mar 4	Mar 7-11	Mar 14-18	Mar 21-25	Mar 28-Apr 1
Customer inquiries to customer service centre	47	194	272	329	223	123	140	104
Customer inquiries escalated to engineering division	10	35	50	73	51	30	30	20
Newspaper articles about city budget deliberations	3	3	5	7	4	1	0	1

STORMWATER CREDIT POLICY

Development Process

- Joint initiative between City of Kitchener & Waterloo
- Environmental Assessment Framework (MEA)
- Public Consultation is a key component of approach
  - Community survey performed by the UW Survey Research Centre
  - Public Feedback Sessions/Openhouses
  - Website Information & Feedback
  - Detailed Analysis of Existing BMPs and Future Trends (LID)

SWM Credits Purpose

- Customers/Residents Perspective
  - Incentives to implement on-site controls
  - Financial benefit to properties with reduced impact = fairness & equity in rate model
- Municipal Perspective
  - Reduced contributions of runoff and pollutant loading
  - Supports the City's stormwater management policies and water quality initiatives
  - Provides potential future cost savings & benefits
- Natural Environment Perspective
  - Improved water quality and runoff management = less erosion & better aquatic habitat
  - Greater resiliency to adjust to climate change impacts

SWM Credit Policy Development

- Review and collect background information
- Develop policy alternatives
- Present policy alternatives to public (September 2011)
- Conduct impact analysis of alternatives
- Evaluate policy alternatives
- Present preferred alternative to public (November 2011)
- Seek Council approval of proposed policy (January 2012)

Policy Alternatives

There were 5 alternatives under consideration:

1. Do Nothing
2. Multi-res and Non-res Credits
3. Residential Credits
4. Residential Rebates

5a. Combination (Options 2 & 3)

5b. Combination (Options 2 & 4)

Credit: a monthly credit applied to the stormwater portion of the utility bill

Rebate: a one time lump sum payment and no monthly credit to the utility bill

Evaluation Matrix

Alternatives

Criteria	Do nothing	Non-residential Credits	Residential Credits	Residential Rebates	Non-res Credits & Residential Credits Combination	Non-res Credits & Residential Rebates Combination
Technical Ease of Implementation Erosion control Flood protection Administrative process and resource requirements						
Natural Ability to meet local goals Aquatic habitat Sediment loading Tree canopy Groundwater resources						
Economic Municipal capital costs Operations and maintenance costs Effect on property owner Effect on rate setting						
Social Public education opportunity Public participation opportunity Public recognition opportunity Fairness and equity Visual aesthetics						

Least Preferred → **Most Preferred**



Preferred Alternative – Credits For Everyone

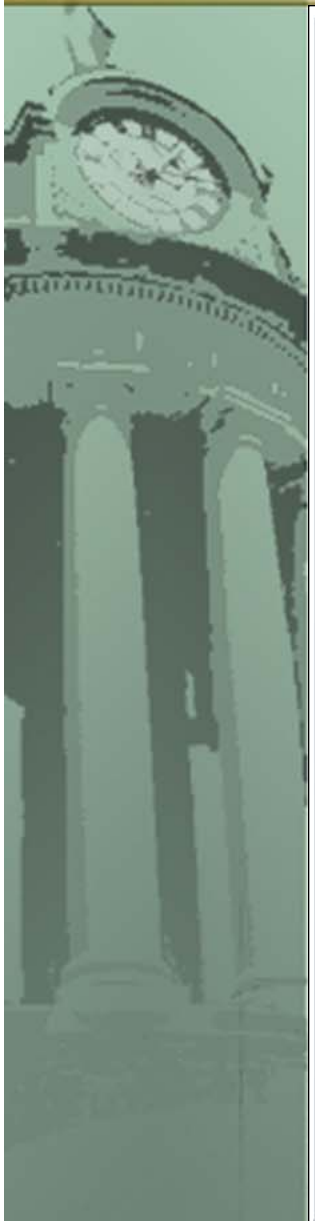
- The credit for each multi-residential/non-residential property will be evaluated based on approved flood prevention (quantity) and pollution reduction (quality) controls.
- The credit for each residential property will be evaluated based on the amount of runoff diverted from the municipal stormwater management system.
- The maximum amount of credit per property would be 45% of the stormwater portion of the regular utility bill. This amount is based on an assessment of the stormwater program costs that could be influenced by the actions of property owners on the privately owned impervious areas.

Credit Structure

- Non-Residential & Multi-Residential credits
  - Credit based on:
    - Flood Prevention – 25%
    - Pollution Reduction – 15%
    - Education – 5%
- Residential credits
  - Credit based on volume of water captured:
    - Enhanced – 45%
    - Normal – 30%
    - Basic – 20%

Maximum credit value = 45%

Residential Credit Application



Residential Form (Step 3 of 3)

Step 3 of 3

Contact Info
Phone: 519-741-3400 ext 3355
Email: stormwater@kitchener.ca

Corporation of the City of Kitchener

Stormwater Credit Application Form - Residential

Credit Registration Information:

Check all the Stormwater Best Management Practices that you use to control runoff from your property
You must choose at least one option.

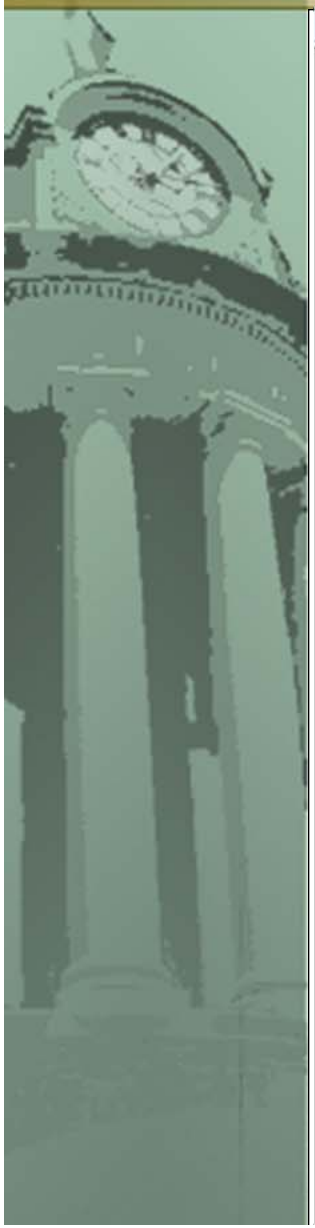
Typical Best Management Practices:

Type	Details
☐ Rain Barrels	○ Barrels (1-4) ○ Barrels (5 or more) What is the volume of water your Typical Best Management Practice designed to accommodate? Water Volume (minimum 200 Liters): How to Calculate Your Water Volume
☐ Cistern	What is the volume of water your Typical Best Management Practice designed to accommodate? Water Volume (minimum 200 Liters): How to Calculate Your Water Volume

Enhanced Best Management Practices:

Type	Details All fields are mandatory unless specified as "if applicable".
☐ Infiltration Gallery	○ Installed by Developer ○ Installed by Landowner Contractor Length (in meters): Width (in meters): Depth (in meters):

Residential Online Application



Stormwater Credit Application

Page

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Contact Information
Phone: 519-741-3400 ext 3355
Email: stormwater@kitchener.ca

Residential Stormwater Credit Application Form

Step 3

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.

(click image to enlarge)

Do you have one or more Rain Barrels?

○ Yes ◉ No

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If your browser is not supported, you may still be able to access the site, but may encounter some problems. Please use one of the browsers listed for best results.
• Windows XP and Windows 7: Internet Explorer 8, Firefox 14.01 and 15, Chrome 21 • Macintosh 10.7.3: Firefox 15.0.1, Safari 5.1.3

Residential Online Application

Stormwater Credit Application

Contact Information
Phone: 519-741-3400 ext 3355
Email: stormwater@kitchener.ca

Residential Stormwater Credit Application Form

Step 7

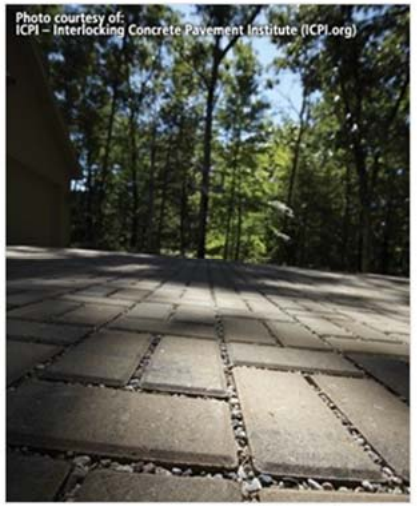
Permeable Pavers

What are they?
Permeable pavers are an alternative to traditional pavement or interlocking brick and are becoming more commin 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, 80% 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 creeks.



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Do you have Permeable Pavers?

Yes No

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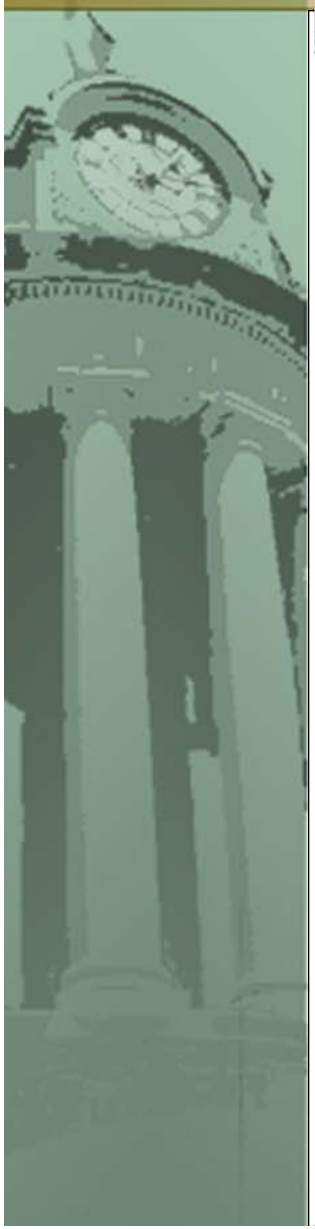
Residential Online Application



Stormwater Credit Application

Contact Information
Phone: 519-741-3400 ext 3355
Email: stormwater@kitchener.ca

Residential Stormwater Credit Application Form

Step 9, Part 1

Permeable Pavers

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

Dimensions of Your Permeable Paver Area

Length:
(from 1.3 to 20 metres)

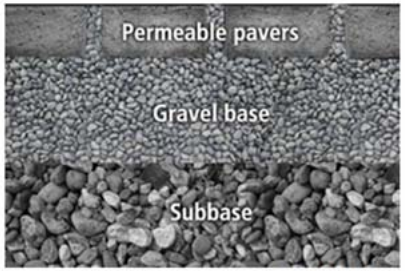
Width:
(from 1.3 to 20 metres)

Depth of Gravel Base:
(from 0.3 to 0.6 metres)

Depth of Subbase:
(from 0 to 0.3 metres, if there is no subbase enter 0)

Example Illustration of Dimensions to Be Measured

(click image to enlarge)



(click image to enlarge)

Note:

- In order to qualify for the stormwater credit your permeable driveway must have small gaps between the pavers that are filled with stone and a gravel storage 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. Patio stone driveways or other systems that lack 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.

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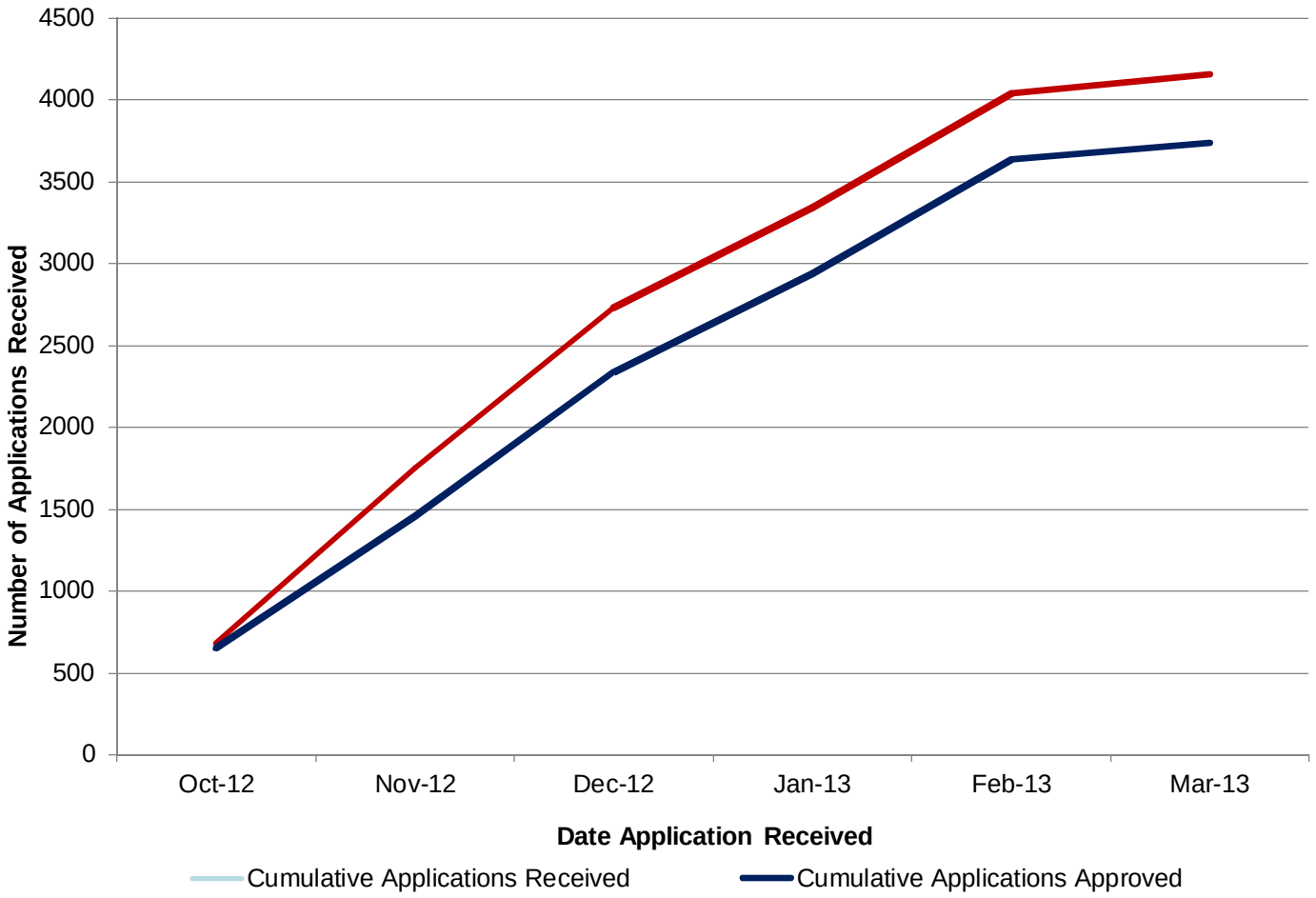
Credit Communications

- We have sent out utility bill inserts in October 2012 to inform all customers of the program
- Promoted program through Facebook, Twitter, Our Website, Newspaper Ads, REEP/RAIN promotional materials (banner, pamphlets etc.)
- Letters have been sent out to all homeowners with infiltration galleries that were installed when the home was constructed
- Letters have been sent out to non-residential properties that we have record of approved stormwater management plans through the development process

Residential Credit Policy Uptake

4,157 applications received in first 6 months



Residential Credit Program Update

- Over 4,000 residential applications were submitted within the first 4 months.
- Approximately 90% submitted using the online application and 10% submitted by hardcopy application
- Unfortunately the paper applications were more popular than anticipated requiring more processing time. Errors are common on the hardcopy application, required information is often missed.

Residential Credit Communications

- Many residents call in to explain their unique circumstances and how stormwater does not runoff their lot and onto the street

- Roughly 30 calls per day at height of SWM credit implementation

Residential Credit Communications

- Most do not know what an infiltration gallery, rain garden or permeable paver driveway is

Residential Credit Communications

- Updates were required to both the hard copy and online applications in order to improve the communication about what qualifies and what doesn't
- Particularly to help with differentiating between flower gardens and rain gardens and between interlocking brick and permeable paver driveways

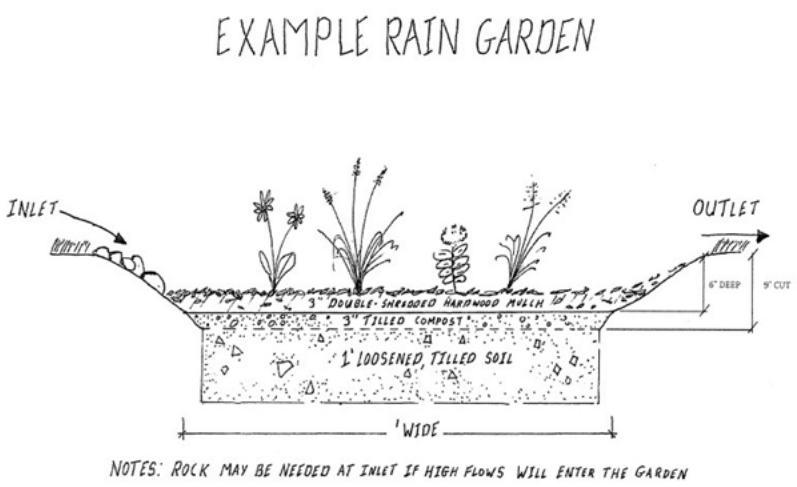
Rain Garden Communications

- Rain gardens differ from conventional gardens in that they primarily serve a drainage purpose
- There must be a direct connection or linkage between your downspout and the rain garden
- The garden must be designed to hold water back from the street using either a dug out lowered area, or a small hill (berm) to block the flow of water leaving the garden

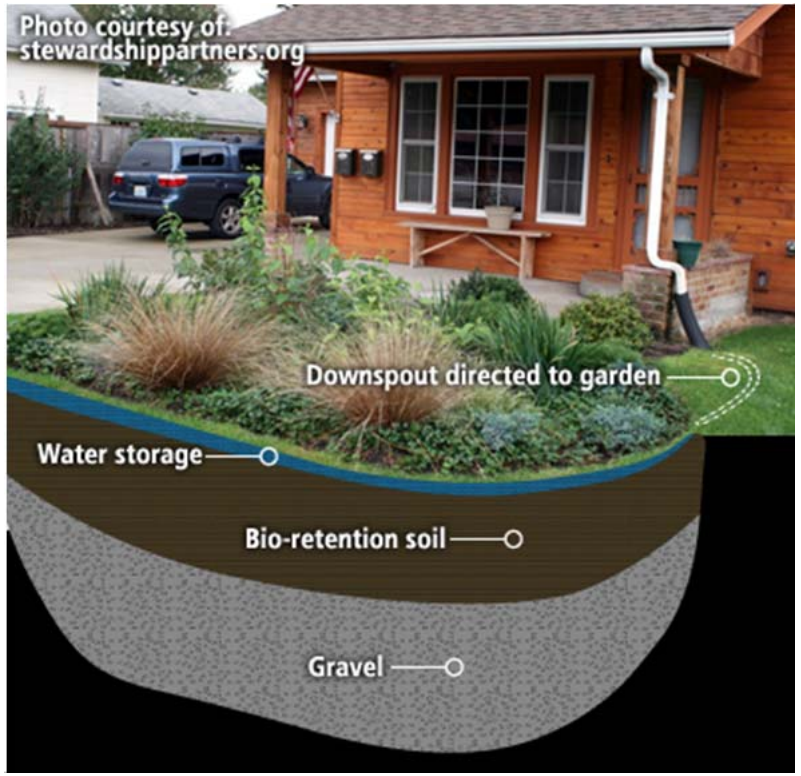
Rain Garden Under Construction

Different Rain Garden Designs

Illustrates depression and loosened tilled soils – Ideal for clay sites



Difficult to see depression but shows underlying bioretention media and gravel - Appropriate for sandy sites



Rain Garden Designs

Rain Garden During Rainfall

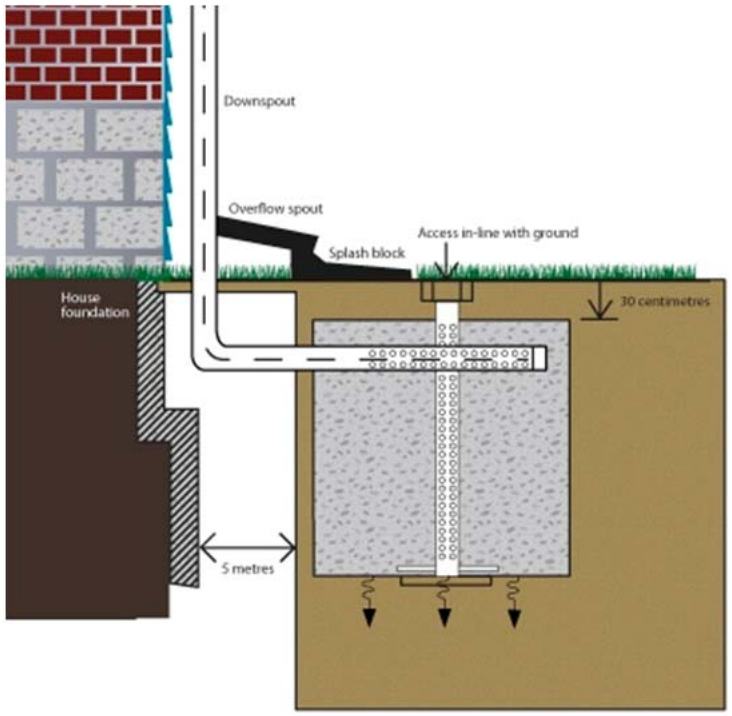
Municipal Rain Garden

Municipal SWM Planters

- Similar to City of Kitchener Municipal Planters along King St.

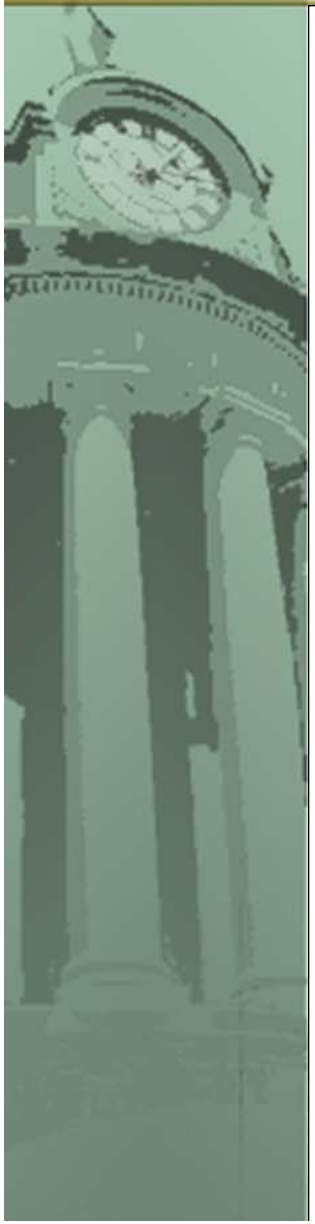
- These planters provide attenuation and water quality treatment for road drainage.

Infiltration Gallery

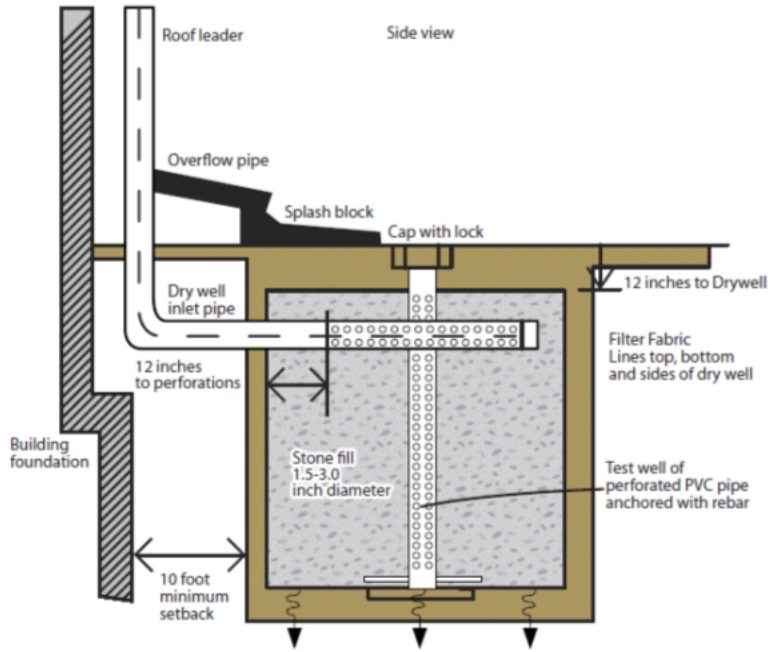


Soakaway pits and infiltration galleries are stone-filled (golf ball size) excavations where stormwater runoff collects and then infiltrates into the ground.

Infiltration Gallery vs. Rain Barrel



Example of Infiltration Gallery



Amount of rain water stored in an average infiltration gallery = 21 rain barrels

Infiltration Galleries - Differences

Infiltration Trench / French Drain

Dry River Bed

Infiltration Galleries - Differences

Aesthetically pleasing infiltration galleries however Ontario Building code requires that infiltration galleries be located at least 5m away from the foundation.

Permeable Pavers

- Permeable pavers differ from traditional interlocking brick in that small stones rather than sand is used around and below the pavers. The stones have no sand or other soils mixed in (clear washed stone)

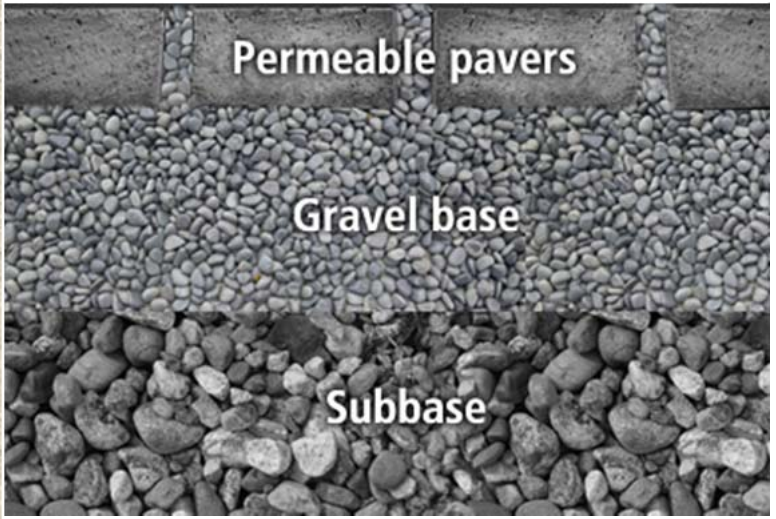
- Permeable pavers contain at least 0.3m (1 ft) of small stones beneath the pavers. This is where stormwater is stored during rainfall

Permeable vs. Impermeable

Permeable Pavers

Traditional Interlocking Pavers

Permeable Paver Runoff Storage



- Permeable pavers are installed over a high void ration base to store runoff and promote long term infiltration.

Permeable vs. Impermeable

Permeable pavers use an Open Graded Base

Traditional Pavers use a Dense Graded Base

LESSONS LEARNED

... or should we say ?

LESSONS LEARNING

Stress Reduction Kit

KITCHENER

Bang Head Here

Directions:

1. Place kit on FIRM surface.
2. Follow directions in circle of kit.
3. Repeat step 2 as necessary, or until unconscious.
4. If unconscious, cease stress reduction activity.

Lessons Learned in Kitchener …getting started…

- Define basic principles and assess the need to proceed
- Expect that this could take more than four (4) years to go from concept to implementation
- Ensure that there is support from senior management to "bully on"
- Expect to meet with council many, many times
- Work with a consultant with a good mix of engineering, financial and public relations experience

Lessons Learned in Kitchener …feasibility study…

- Define program service level with a dedicated funding source
- Allocate costs to property owners in a fair and equitable manner
- Review various funding options and couple this with a detailed credit policy
- Ensure a revenue neutral shift from tax to rate base
- Avoid a transition from the tax base to the rate base over a period of years

Lessons Learned in Kitchener …implementing…

- Work with partners to get your message across to Council and the public
  - Chamber of Commerce
  - Conservation Authority
  - Industry Associations, Environmental Associations
- Apply rate structure in a consistent manner and "protect" the utility rate base… avoid "special deals" unrelated to utility values
- Apply rate & credit policies to property owners not tenants… where there is the most ability to influence behaviours

Stormwater Utility Recognition

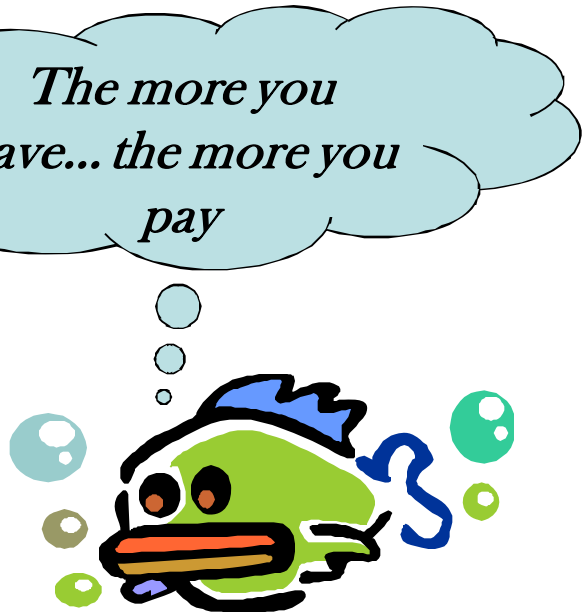
- August 2011 - Peter J. Marshall Municipal Innovation award from the Association of Municipalities of Ontario for the implementation of its stormwater utility
- January 2012 - Kitchener, along with other project partners, was awarded Showcasing Water Innovations Grants totaling almost $2M
- February 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

Community Outreach

- Complimentary program aimed to provide community outreach.
- Intended to link citizens with stormwater & landscape professionals.
- Modelled after other successful programs.
- Made possible through funding from MOE Showcasing Water Innovation Fund.

Thank You!

Contact Information



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