



Lake Simcoe Region
conservation authority

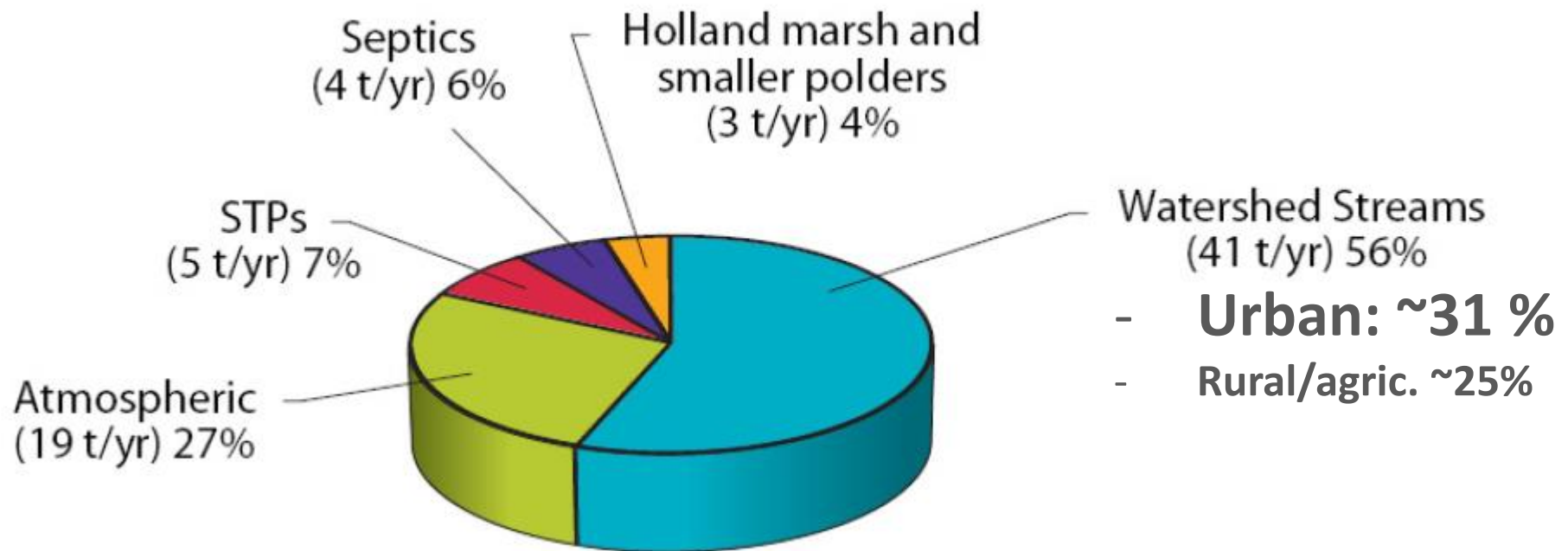
A Watershed for Life

Implementing Low Impact Development (LID) in the Lake Simcoe Watershed: *Progress, lessons learned and applicability to Muskoka watershed*

Ben Longstaff

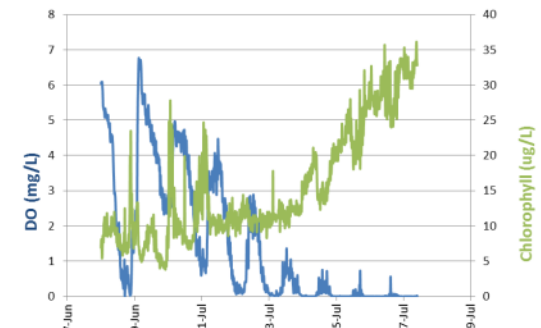
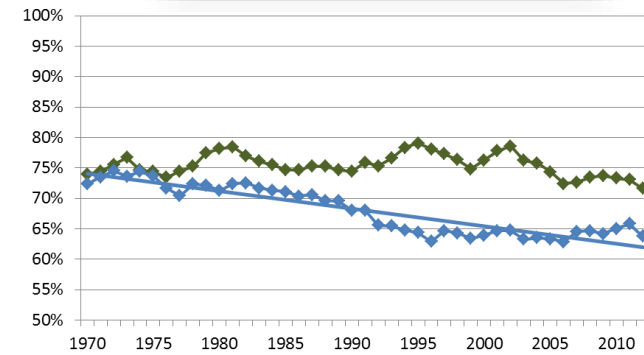
GM, Integrated Watershed Management
September 15, 2017

31% of Lake Simcoe Phosphorus loads from Stormwater

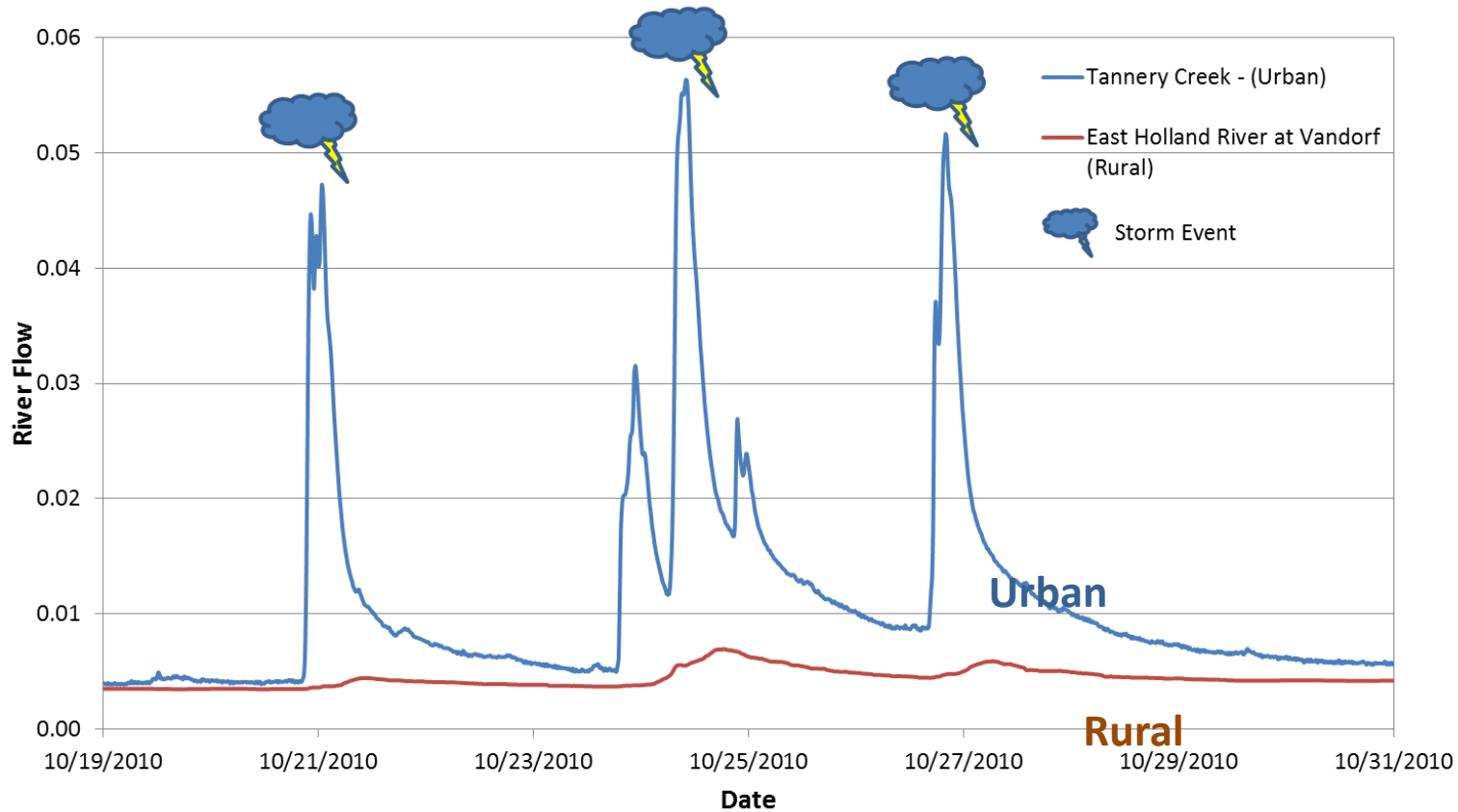


The trouble with SWM ponds

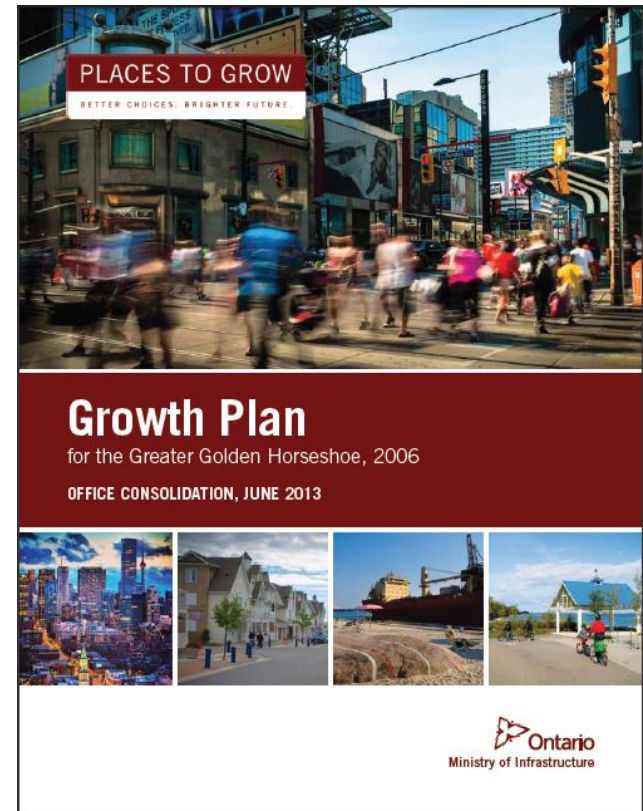
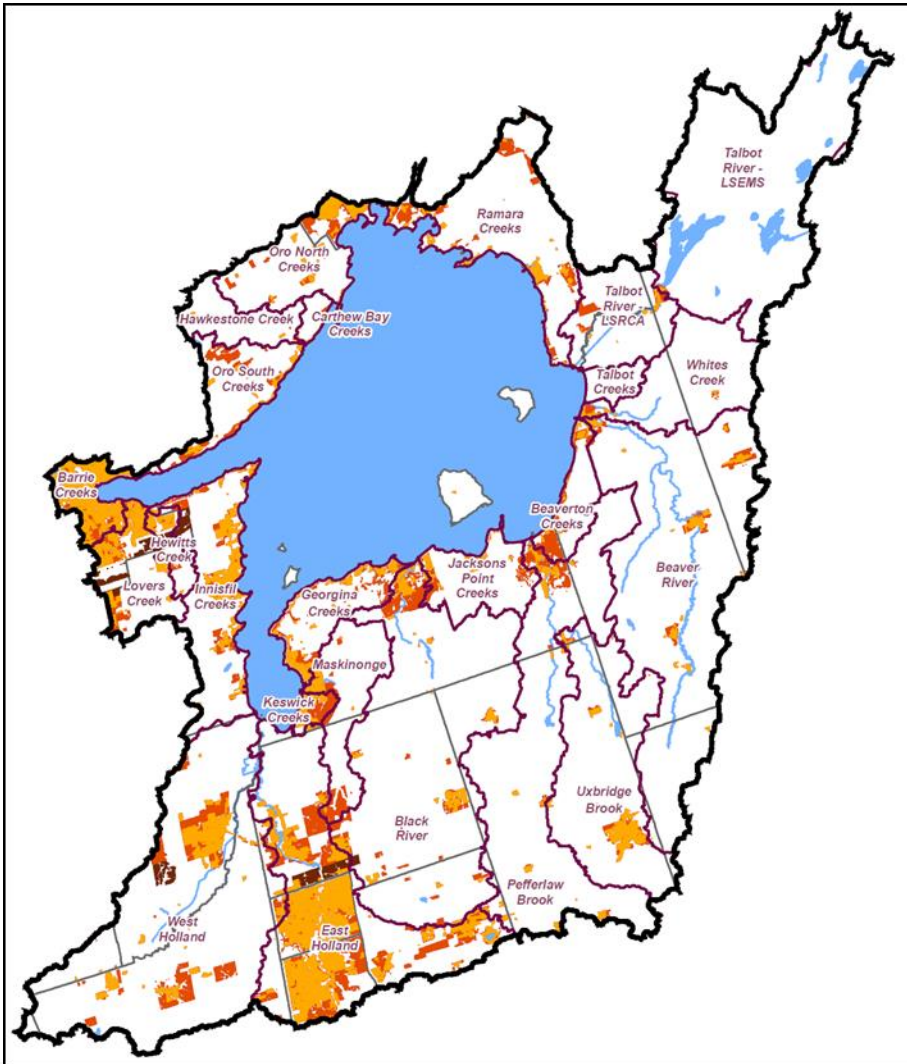
- Costly to maintain, therefore not being maintained
 - Estimated cost to bring 56 ponds back to design level: **\$18.5 million**
- Diverting stormwater to ponds is reducing critical cold water habitat
 - Change from ground to surface flow
- Stormwater ponds can become a source of phosphorus:
 - Low dissolved oxygen causing dissolved P to be released from sediment



Our urban creeks have flashy high flows and periodic flooding

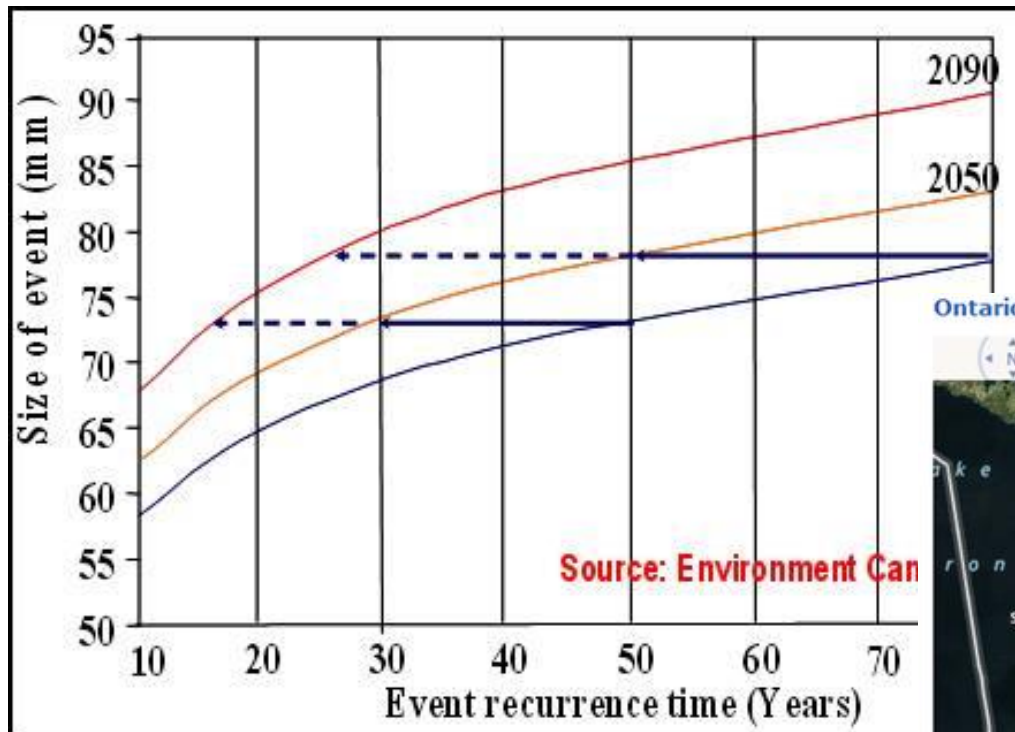


Only going to get worse unless we change the way we do business...Meeting Growth Plan targets



2010 urban = 22,793 ha
Future at 2031 = 35,028 ha
Increase From 2014 = 9,990 ha

Only going to get worse unless we change the way we do business...Climate Change



Rain Scaping

*A market transformation
program to promote
Low Impact Development (LID)
and more sustainable building
practices.*



Low Impact Development (LID)

Definition

An integrated ecological, planning, and aesthetic strategy for stormwater management to maintain natural hydrology by managing runoff as close to the source as possible.



Source of Photos: L - City of Maplewood, MN via CVC/TRCA; C - City of Seattle ; R - Unilock

Rain Scaping

Protection

New Development

Developers, Builders and
Municipalities



Restoration

Retrofit Existing
Urban Areas

Public Lands
(Municipalities)

Private Lands
(Residential, Institutional,
Commercial, Industrial)



Strategies to effective change



Building municipal support: *Council and senior staff*

What was needed

- Council and senior staff understanding and supporting a change towards LID

What have we done

- Workshops & council delegation: Showcase successes in other jurisdictions (Minnesota)
- Tour: showcasing LID Pilot projects
- Media events: ground breaking and ribbon cutting



Collaboration: *Stormwater Management Working Group*

Aim

Provide a forum to drive collaboration, consistency and knowledge sharing between all stakeholders

What has been done

- Regularly bringing together municipal, Provincial, development, consultant & Conservation Authority
- Progressed a number of key initiatives. e.g.
 - development of model by-law & guidelines
 - SWM Utility Fees / Credit Program; Grant programs,



New Development: Regulatory approach

Aim: Capture and control 90th percentile (25mm) rainfall event in all new development using principles of better site design & LID

How: In collaboration with stakeholders;

- Prepared template by-laws for municipalities to adopt
- Updated LSRCA Stormwater Management Guidelines
- Province updating their SWM guidelines, likely similar requirements

DRAFT

Lake Simcoe Watershed
Model By-Law for Municipalities

April 9, 2015

LSRCA Technical Guidelines
for
Stormwater Management
Submissions

Approval Date: June 24, 2016
Effective Date: September 1, 2016



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Getting developers on board: *Design Charrettes*

Aim

Promote the early integration of LID into site plan design

What's being done

- Offering design charrettes for new development
 - Defined opportunities & constraints for LID implementation
 - Reducing the number of submissions to reach Final Draft Plan Approval
- Modelling tool to support early design



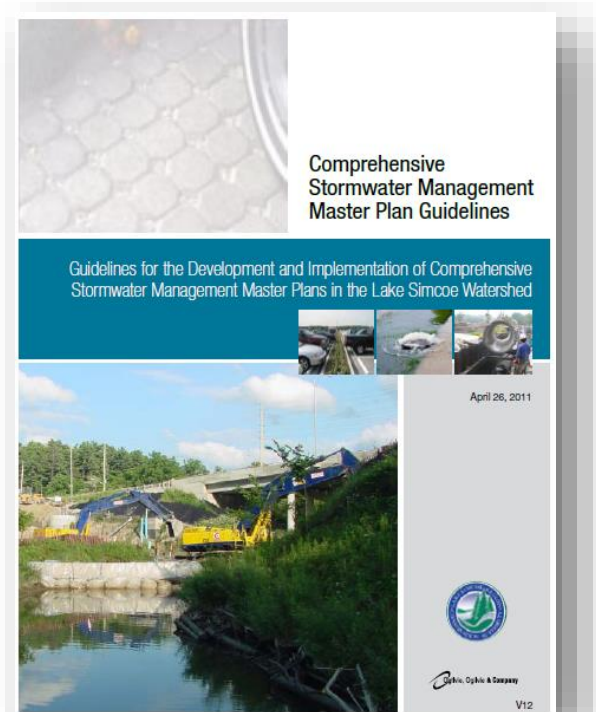
Providing technical & implementation support

Aim

- Provide technical support for LID design and implementation, as requested for Municipal and Private projects

What have we done

- Ensure municipalities are aware LSRCA staff available to assist / answer technical questions and issues
- Updating LID Guidelines
- Improving ESC inspection process



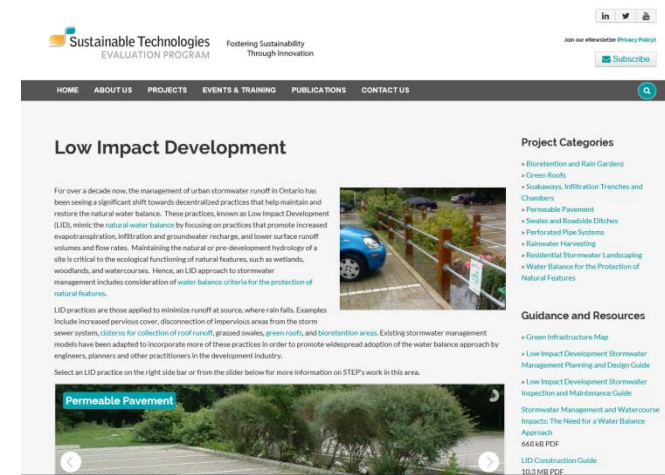
Building knowledge: *Training, Education, Outreach*

Aim

- Provide LID and related training courses for Municipalities and industry.

What have we done

- Regularly providing subsidized training opportunities related to design, construction and maintenance
- Updating STEP website: Ontario water resource hub



Taking action: *Funding the fixes*

Aim

- Immediate and long term funding.

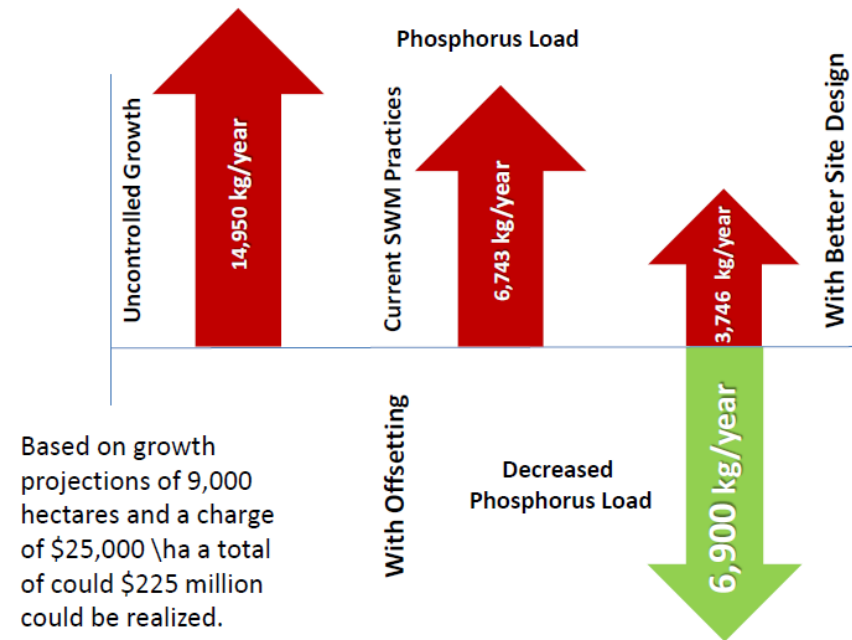
What have we done

- Immediate funds:
 - grant applications and partnership (e.g. LSGBCUF)
 - Reallocating LSRCA funds towards urban restoration
- Long term:
 - Supporting municipalities in establishing SWM Utility Fees and Credit Programs.
 - phosphorus off-setting program



New revenue sources – Phosphorus Offset

- Provincial enabling legislation passed. Pending LSRCA BOD approval
- New & re-development required to ensure zero P exported from site
- If cannot achieve requirement, payment at set price to support offsite P reduction
- Revenue used for urban retrofit (e.g. LID)
- Open and transparent reporting



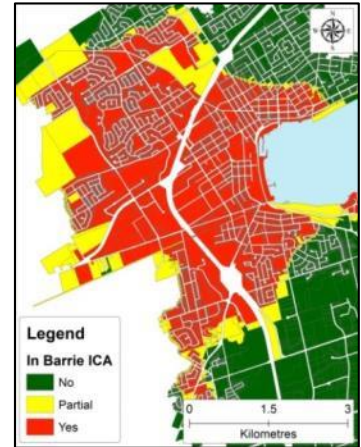
Taking action: *RainScaping Restoration*

What is needed

- Revitalized urban restoration program.

What have we done

- New department within LSRCA
- Stewardship Prioritization Opportunities Tool (SPOT) .
- Municipal: Pilot projects and incentives
- Residential: Implementing a residential Raingarden Grant Program, downspout redirection program
- ICI: establishing incentive program



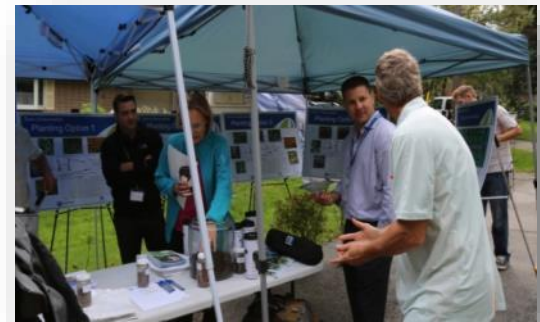
Taking action: *Municipal LID Demonstration Projects*

What was needed

- Demonstration projects to showcase LID, learn a few lessons, make a difference!

What have we done

- Over 10 projects completed and more underway
- Secured up to 2/3 federal funding to complete each project
- Seeking funds and/or assisting municipalities to implement additional LID projects.



Municipal Pilot Projects

Municipality	Feature treated	LID installed	Area treated (ha)	P reduction (kg/yr)
Bradford	Town parking Lot	Permeable Pavement/Bioswale	0.29	0.43
Newmarket	Residential Road (Woodland Crt)	Enhanced swale	0.02	0.015
Innisfil	Fire Station parking lot and roof	Infiltration Gallery & cistern	1.05	0.09
Newmarket	Residential Road (Forest Glenn)	Bioswale / biofilters / Raingardens	1.16	
Whitchurch Stouffville	Community Park & parking lot	Permeable asphalt/infiltration galleries/raingardens	0.11	0.012
East Gwillimbury	Municipal office sidewalk/entrance area	Permeable Pavement/Bioswale	1.11	1.21
Newmarket	Recreation Complex – roof & parking	Dry Swales / Permeable Pavement/Bioretetion		
Aurora	Recreation Complex – roof & parking	Permeable pavement, rain gardens	1.98	3.5
Uxbridge	Recreation Complex – parking	Bioswale	1.67	1.7
Barrie	Recreation Complex – parking	Bioswale - Design phase only	N/A	N/A
Barrie	School play area and parking	Permeable Pavement/Bioswale	TBC	TBC



Fire hall



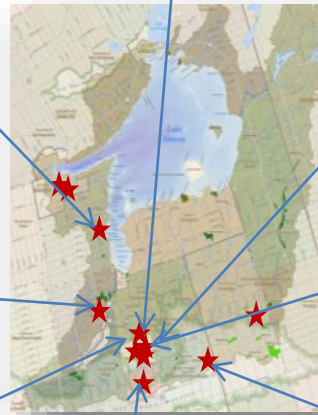
Recreation centre



Office parking lot



Town parking lot



Street



Street

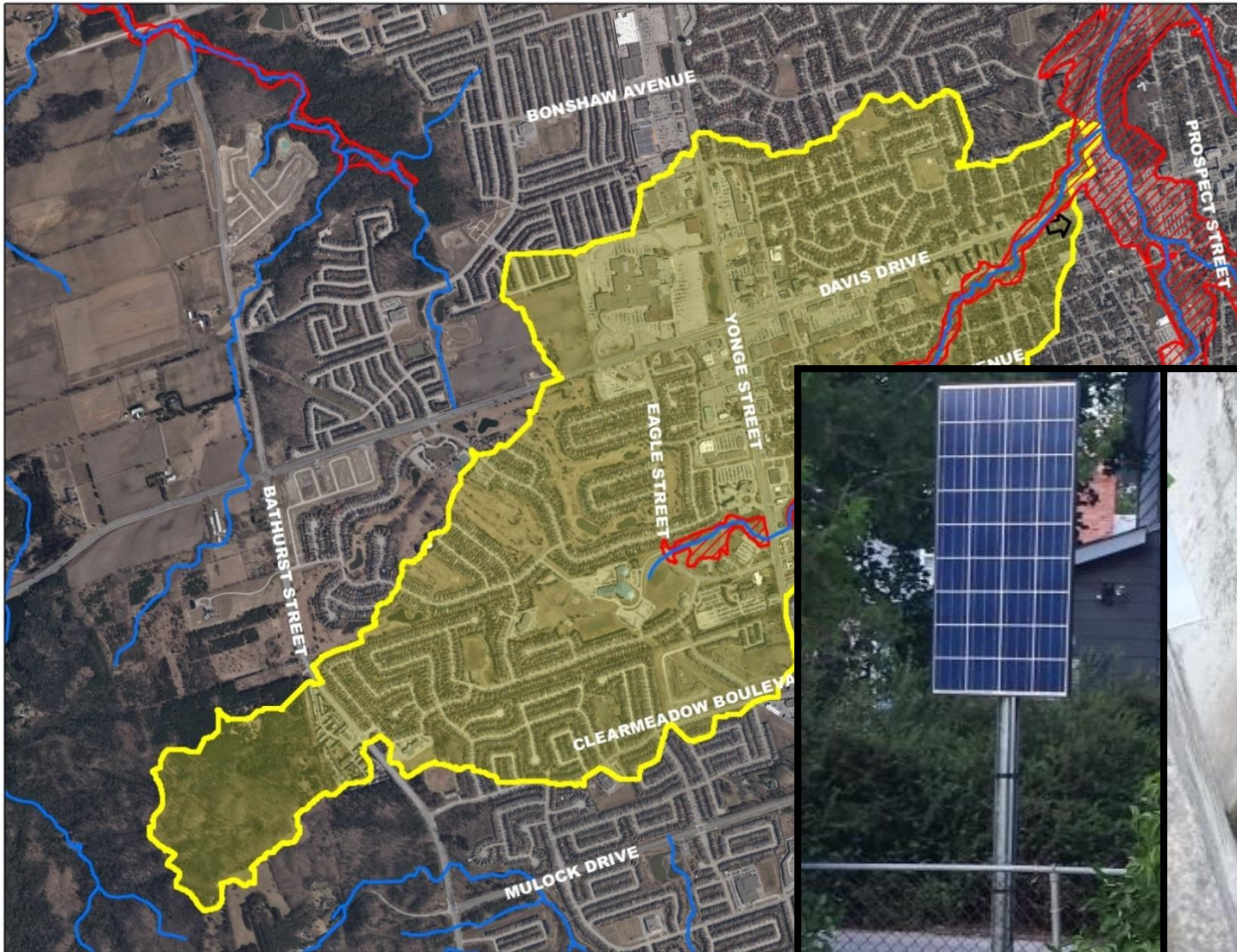


Community centre



Play park

Demonstrating progress: Focused catchments



New monitoring station



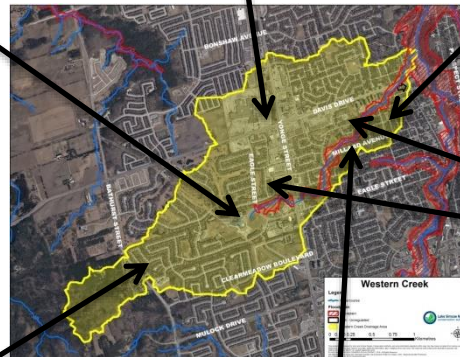
Demonstrating progress: Focused catchments



LID retrofit at recreation Centre (roof and parking lot)



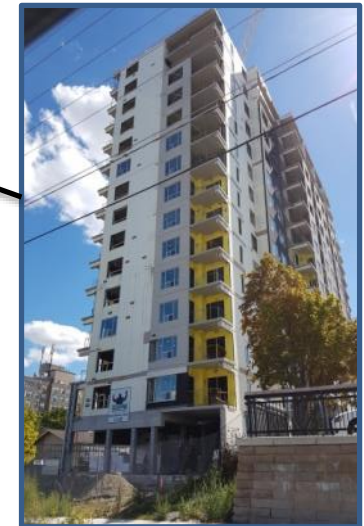
Street LID retrofit



School De-Pave



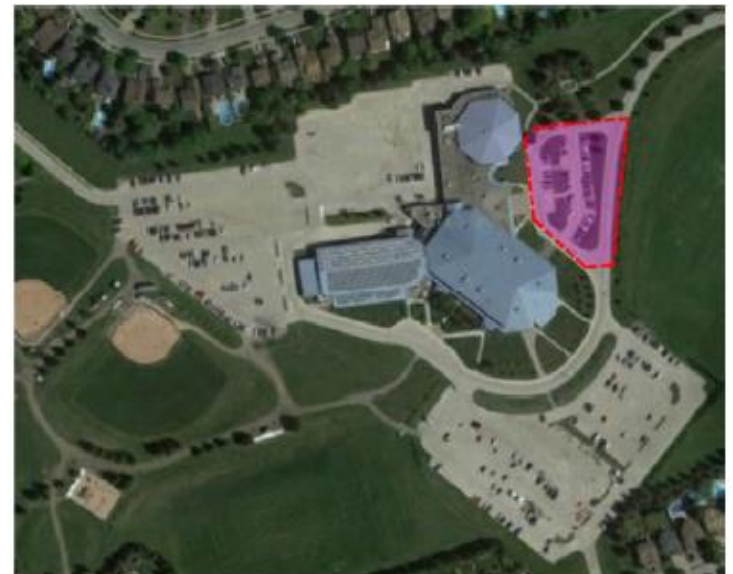
Residential Raingardens



SWM guidelines driving LID in re-development

Recreation Centre: Newmarket

- Opportunity and constraints assessment
- Partnership with Town
 - LSRCA: Funding through EC & technical support
 - Town: Funding and project management
- Treat: Roof (flat section), entrance drive and parking lot
- Permeable pavement and bioswale



Recreation Centre: Newmarket



Before

After



Street retrofit: Newmarket

- Major works (water, sewage, Stormwater) planned for street
- Western Creek prone to flooding (flooding challenges well know to elected officials)
- Partnership with Town
 - LSRCA: Funding & technical support
 - Town: Funding and project management
- Strong community focus
- Bioswales and rain gardens



Street retrofit - Town of Newmarket



Before

After



Forest Glen Video

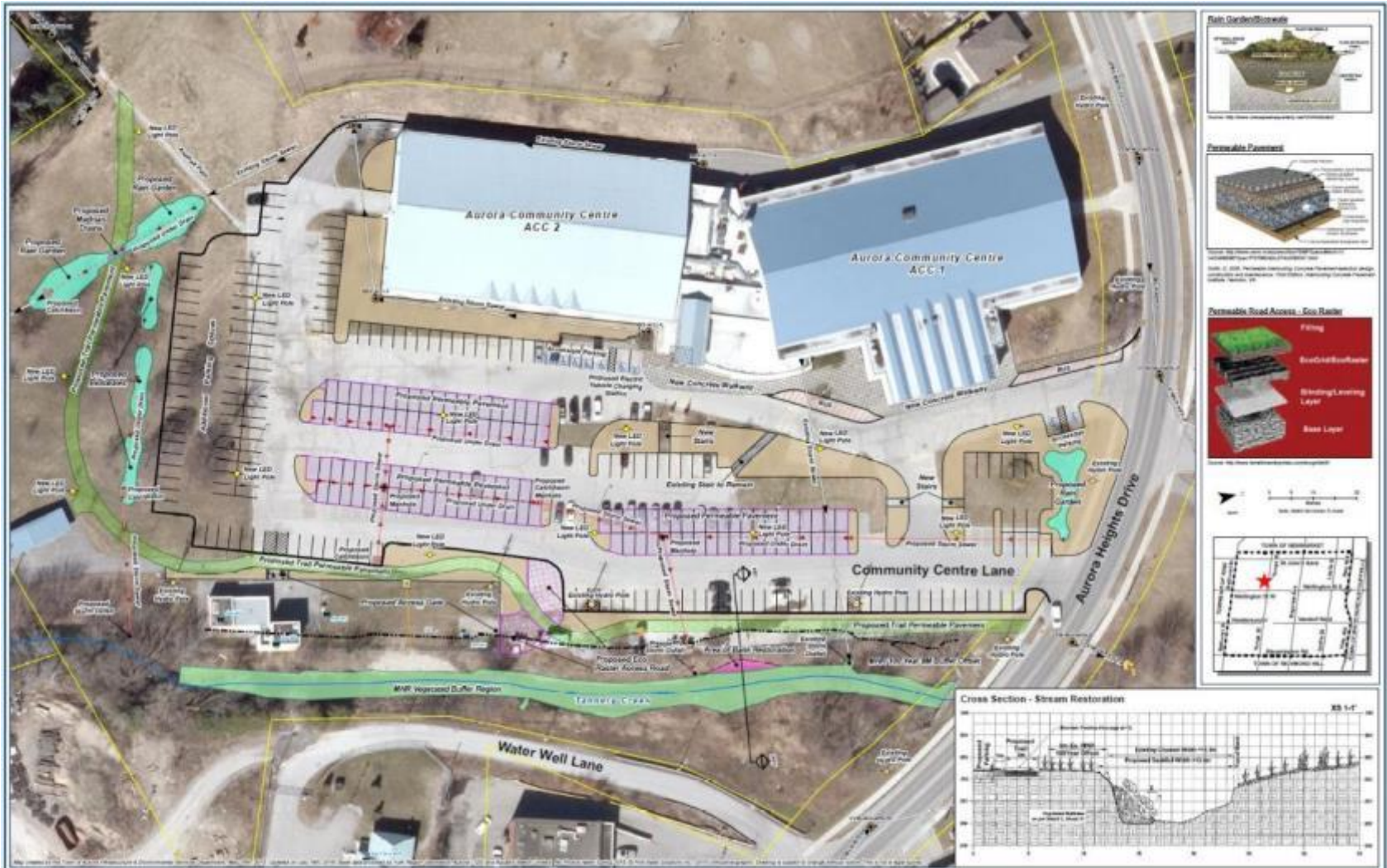
Town parking lot (Bradford)

- Town planning upgrade to Town Parking lot
- With LSRCA support able to include LID
- Permeable pavement and bioswale





Aurora Community Centre



Aurora Community Centre



Before



After

Pilot project: Lesson's learned

- Financial support needs to align with municipal budget cycles
- No set formula for funds needed to incentivize a project
- Important to be able to demonstrate multiple benefits of LID - especially financial return
- Keep projects relatively simple at first
- Contactor training essential
- Continuous construction monitoring essential

Moving forward

- We've made some great progress
- Learned some valuable lessons
- Recognize that need to keep adapting and learning if we're going to be successful in restoring urban environment!
- Success = move beyond 'pilot project' - widespread and rapid restoration of urban watershed
 - What will that take?



Moving beyond pilot projects...

- Significant sustained funding
- Economic justification for investment
- Catchment/watershed based decision support tools to guide: where, when, what types of GI/LID
- Demonstrate that we are making a difference



Thank you