

LID: The Upper Thames River Conservation Authority Experience - Lessons Learned

Design, Maintenance & Monitoring

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UPPER THAMES RIVER
CONSERVATION AUTHORITY





Outline

- Role of SWM LID;
- Barriers to SWM LID;
- LID Design Issues;
- Construction Issues;
- Sediment and Erosion Issues;
- Operation and Maintenance Issue; and
- Monitoring Issues.



Role of SWM LID

- Provincial Policy Statement 2014, Section 1.6.6.7 Subsection(a-e):
 - *Minimize changes in water balance*
 - *Maximize the extent and function of vegetative and pervious surfaces*
 - *Shall promote stormwater management best practices, including stormwater attenuation and re-use, and low impact development*
- MOECC: New SWM guidelines document (2017 release expected)



UTRCA Survey: Barriers to SWM LIDs

2014 UTRCA survey of municipalities, consultants and developers to assess familiarity with LID identified barriers:

- **Technical barriers;**
- **Institutional barriers; and**
- **Physical barriers.**





Technical Barriers

- **Technical experience**
 - Conventional approach vs. the new approach
 - LID are not a replacement for conventional approaches
- **Technical tools available for LID design**
 - Software required for the design
- **Design concept of SWM LID based on:**
 - Water balance,
 - Post to pre volumes, or
 - 25 mm rainfall
- **Training and experience for LID design**



Technical Barriers

- Absence of LID guidelines
 - CVC guidelines
 - Understanding/misunderstanding the guidelines
- Lack of data on LID
 - Design examples
 - Pilot projects
- Proper landscape plan and type of plants required
- Understanding site soil properties
- Understanding site topography:
 - Maintain runoff pattern
 - Minimize grading





Institutional Barriers

- No incentives for developers and landowners
 - Why consider LID?
 - Convincing developers that SWM LID is a viable option
 - The developer could see the benefit in:
 - Additional units
 - Reduced size of the pond
 - Reduced size of the sewers
 - Minimizing costs
 - Convincing Municipalities that LIDs are acceptable means to address SWM
 - Fear of unknown
- Absence of supportive policies at municipal level
 - Integration into policy and planning
 - Integration into official plan
 - Consideration into subwatershed studies



Institutional Barriers

- Lack of awareness and knowledge
- Public education
- Staff skepticism (engineers, planners, developers and residents) related to how and if LID techniques will work
 - Ready to accept the change?
 - Uncertainty?
 - Design, construction and maintenance of LID?
 - How will LID techniques function within our changing climate?



Physical Barriers

- High groundwater table
- Soil not suitable
- Interference with utilities
- No room for LID in the road ROW
- Steep slope
- Cold climate





LID Design Issues

- Design concepts and experience of SWM LID
 - Infiltration vs. Filtration
 - Design according to the site soil properties
 - Proper grading
 - Inflow and outlet design
 - Overflow system
- Availability of tools for SWM LID design
 - Software
 - Required experience





Construction Issues

- Lack of construction / contractor experience:
 - Contractor education
 - Importance of LID feature
 - Construction is critical to long-term LID performance
- The contractor needs to understand the design intent of LID practices:
 - Water quality and water quantity goals
 - Base flow requirements
 - Concept of infiltration / filtration
- Construction sequences and proper equipment are essential.





Sediment & Erosion Control Issues

- Sediment and erosion control for conventional SWM vs. LID
- Phasing and sequence of construction activities
- Details and notes on the drawings





Operation & Maintenance Issues

- Cold weather
 - University of New Hampshire study 2007
 - http://www.unh.edu/erg/cstev/2007_stormwater_annual_report.pdf
- Maintenance includes items such as:
 - Sediment removal
 - Erosion repair, vegetation pruning
 - One common concern - who will maintain the rain gardens and how





Operation Maintenance Issues

- LID techniques do not typically require specialized maintenance equipment and may be able to be maintained as part of typical landscaping activities





Monitoring Issues

- Funding issue
- Staff and training
- Property owner
- Municipal staff





Thank you!

- Questions & Discussion

