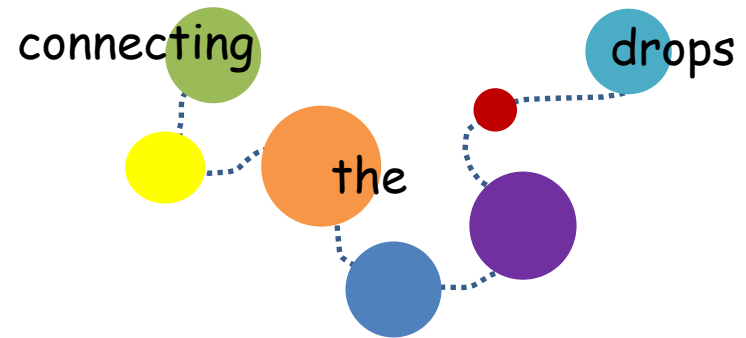


# Stormwater Management



## Ten Steps to Implementing ROW LID

UTRCA Symposium

Low Impact Development: Opportunities for Municipalities

### Implementing LID on a Watershed Basis and Making a Difference: A 10 Step Process

March 24, 2016

Presented by Kyle Vander Linden CVC

For John Nemeth, CET

Infrastructure Programming and Studies

Transportation Division, Public Works

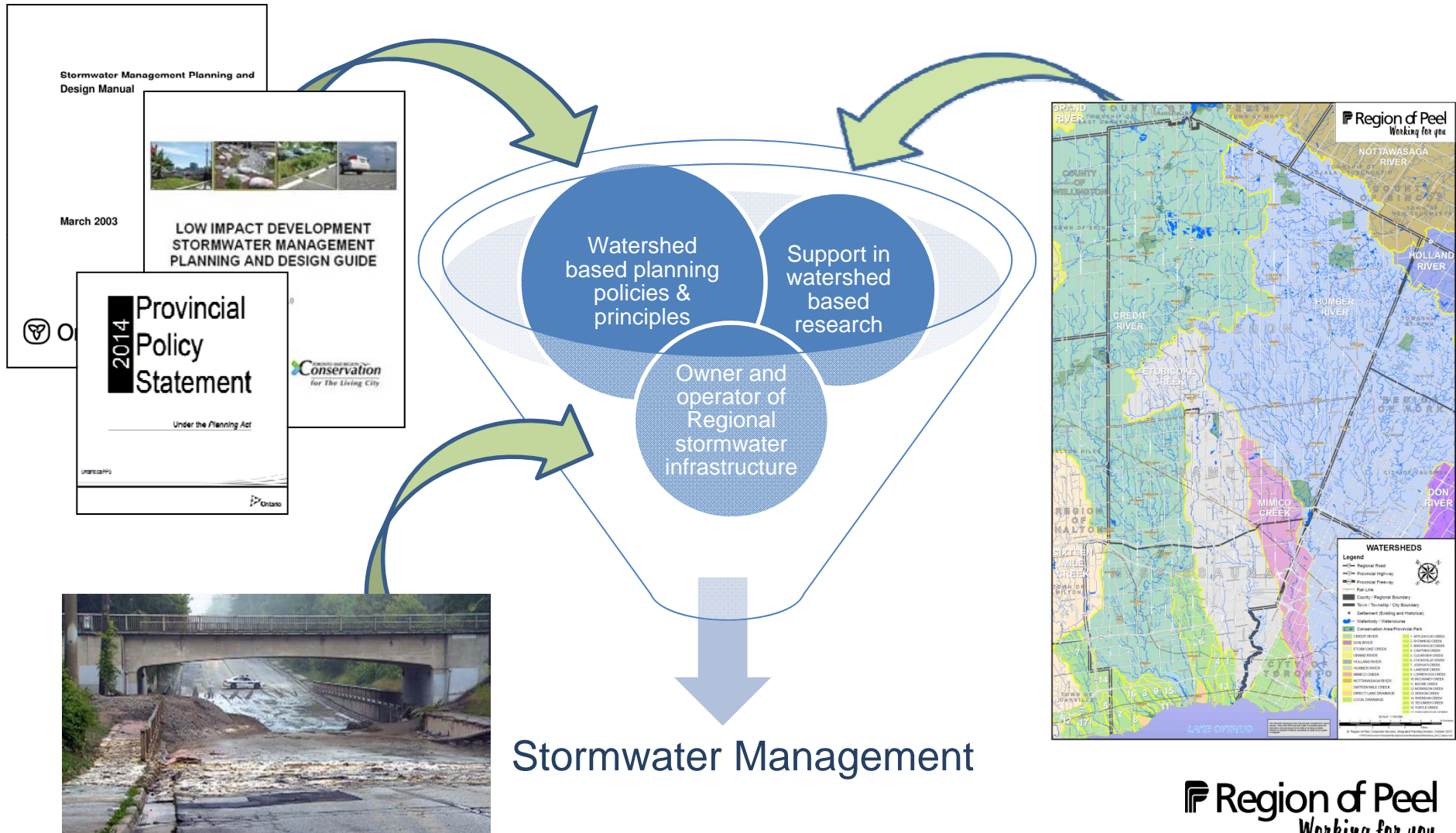
# Green Infrastructure

## Green infrastructure:

means natural and human-made elements that provide ecological and hydrological functions and processes. *Green infrastructure* can include components such as natural heritage features and systems, parklands, stormwater management systems, street trees, urban forests, natural channels, permeable surfaces, and green roofs.



# Region of Peel Responsibilities



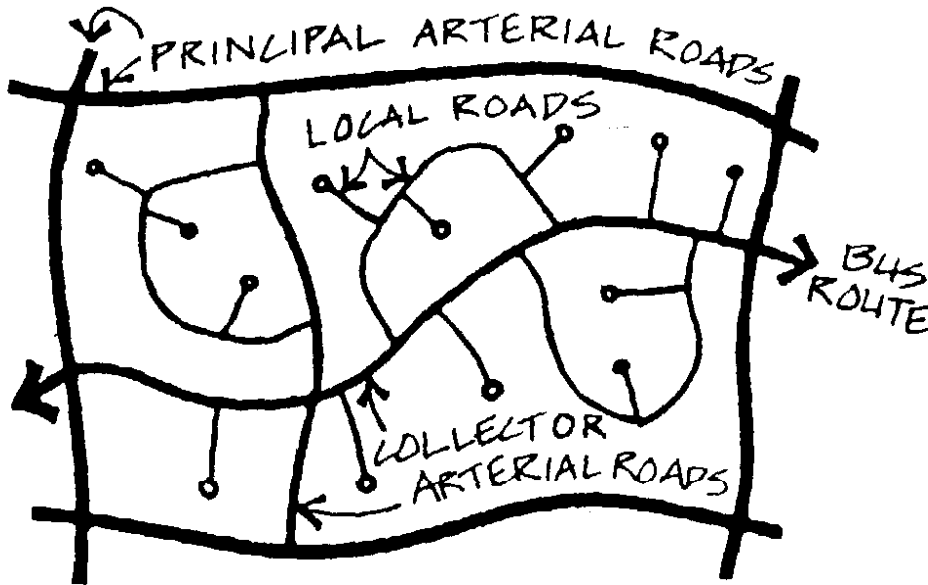
# SWM Advocacy

advocacy. : the act or process of supporting a cause or proposal

*An ongoing dialogue with partners and champions*

- Best Practices e.g. Low Impact Development
- Partnerships for Projects e.g. Mississauga Road LID
- Research and Development e.g. SWM Design Standards
- Knowledge Transfer e.g. TRIECA
- Peel Internal Support e.g. Climate Change and I&I
- Peel Internal Process e.g. 10 Step LID Practice

# New Directions



**The watershed** includes all roads within a system.

## Green Infrastructure

- Design Criteria project (RFP)
- Pilot Projects
- Education and Training
- Permits and Approvals
- Conferences/Seminars
- National Benchmarking
- Water Resources Paper (Official Plan)

# Municipal Interest : Common Issues

Stormwater is considered within 4 distinct areas of municipal interest.....

1

## Planning and Land Development

- master environmental servicing plans
- Plans of Subdivision and Site Plans

2

## Environmental Assessments

- stormwater drainage report provides direction in detailed design

3

## Capital Programs

- delivery of municipal engineering projects, e.g. roads, erosion, facility design, etc.

4

## Operations and Maintenance

- operating procedures and monitoring
- repair and replacement

# Who is setting the “Bar” for “LID”

- ***Land Use Planning***
  - Policy and Legislation
    - Planning Act Places to Grow, Clean Water Act
  - Growth and Intensification
- ***Development Processes***
  - Engineering
  - Subdivision Agreements and Site Plans
  - Severances
- ***External Approvals***
  - Conservation Authorities (e.g. TRCA, CVC, Halton, CLOCA, Lake Simcoe, etc)
  - Provincial Ministries (e.g. MOE, MNR)
  - Federal Departments (e.g. DFO)



# The Watershed Approach – Why use it?



Decrease in regional operation and maintenance costs



Decrease in flood risk and flood damage



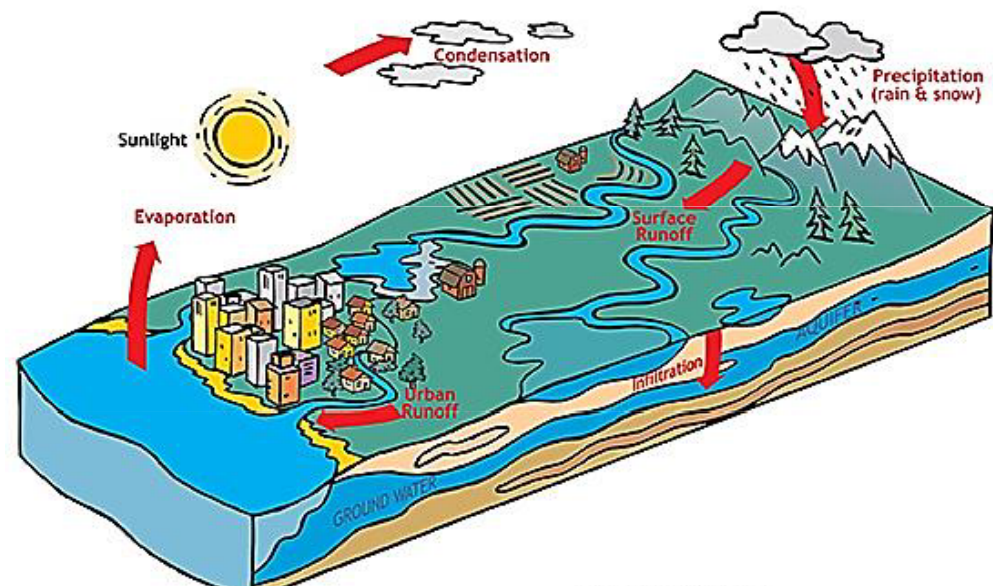
Increased coordination of SWM programs across the region



Supports the Peel Climate Change Strategy

*“Planning authorities shall protect, improve or restore the quality and quantity of water by using the watershed as the ecologically meaningful scale for integrated and long-term planning, which can be a foundation for considering cumulative impacts of development”*

Provincial Policy Statement, 2014





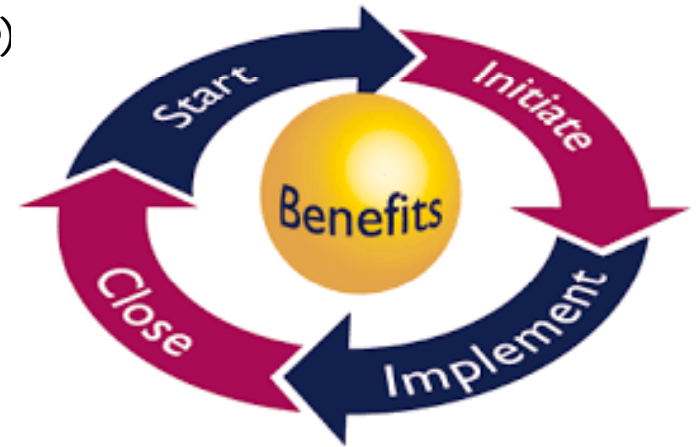
# Climate Change & SWM



Low Impact  
Development  
&  
Green  
Infrastructure

# Region of Peel Approach

- **Environmental Assessment Process**
- SWM study *done up front*
- Permits and Approvals (*approval in principle*)
- Complete the process
- **Detailed Design**
- LID Design Process for Regional Roads
- Monitoring programs
- **New Initiatives**
- Environmental Assessment Reform
- New SWM Design Criteria, Standards and Specifications
- Ecosystem Compensation Protocols
- Permits and Approvals Strategy
- Operations and Maintenance Protocols
- Partnership Development



# LID : Ten Step Approach

The ten (10) step process has been developed for the ROP with the intent to serve as template process for future Region of Peel (ROP) right-of-way (ROW) projects which include LID with the goals of:

- Overall improvements to the health of the Credit River Watershed
- Compliance with the Peel Climate Change Strategy Background Report (June 2011), specifically

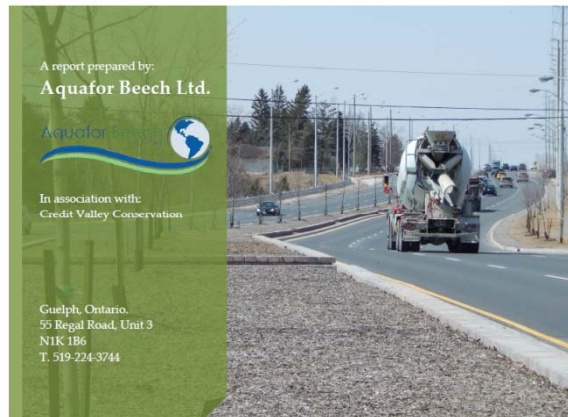
Section 3.4 which calls for the redesign and retrofit water collection and conveyance infrastructure and systems to reduce vulnerabilities due to climate change, as well as implement

- runoff reduction practices such as source and conveyance controls.
- This report and ten (10) step process as presented, are not intend to be a 'static' but rather it is
- anticipated that the process outlined with this report will be refined by the ROP staff as subsequent LID
- projects are implemented and as internal efficiencies are identified

# LID Process Report

Version 1.0  
September 16<sup>th</sup>, 2014

LID IMPLEMENTATION PROCESS FOR  
REGIONAL ROAD RIGHT-OF-WAYS



- STEP 1. Building the Project Team**
- STEP 2. Site Evaluation and Field Reconnaissance**
- STEP 3. Screening the LID options**
- STEP 4. Preliminary Design**
- STEP 5. Detailed Design**
- STEP 6. Approvals**
- STEP 7. Tender and Contract**
- STEP 8. Construction Supervision and Administration**
- STEP 9. Assumption and Verification**
- STEP 10. Lifecycle Activities**

# Step 1- Building the Project Team

- Identify **core and support project team** members and at which project phases their expertise will be required.
- Define the **project goals and objectives**, develop a Request for Proposal (RFP)
- Retain an **experienced consultant** and determine the need and extent of any public consultation requirements.



## Step 2 – Site Evaluation and Field Reconnaissance

- Review all **relevant background documents** from agencies, municipality etc.
- Conduct **field reconnaissance** to verify site conditions and identify constraints and data gaps.
- A suggested reporting table template is provided.





# Step 3- Screening the Options

- Describes the process for **screening the preliminary LID options** based on the type of ROW construction, the type of Regional ROW cross section, project cost and site specific criteria.
- A two (2) stage screening process is outlined, which includes a **feasibility screening** and **detailed screening** that incorporates a performance assessment and cost/benefit analysis in order to select the preferred solution.



## Step 4 – Pre Design

- Describes the requirements for the preliminary design phase including the collection of field measurements which builds upon information gathered during the field reconnaissance and background document review.
- Site testing requirements, including those identified as data gaps in Step 2 include utility locates, geotechnical assessments (i.e.: in-situ infiltration testing, boreholes etc.), tree inventories and topographic survey requirements.

# Step 5 – Detailed Design

Summarizes the **multi-step approach** that utilizes the information gained through the previous steps and guides the development of a detailed design.

The multi-steps include

- 1) review of design guidelines and requirements
- 2) catchment area development
- 3) hydrologic and hydraulic assessments
- 4) design optimization
- 5) landscape design requirements,
- 6) approaches for infrastructure and utility avoidance,
- 7) design drawing standards and reporting/ brief development and
- 8) the inclusion of post construction monitoring infrastructure and plan development.

## Step 6 – Approvals

Provides general guidance with respect to reviewing municipal, government and agency policies to ensure compliance and identify the application process for obtaining approvals.



# Permits and Approvals

MOECC – Environmental Compliance  
 MNRF – Endangered Species  
 CA – Interference Wetlands  
 DFO – Fisheries



## Guide for the Application for an overall benefit permit under clause 17(2)(c) of the Endangered Species Act

### Legal Context

The purposes of the *Endangered Species Act, 2007* ("ESA" or "the Act") are:

- to identify species at risk based on the best available scientific information, including information obtained from community knowledge and Aboriginal traditional knowledge;
- to protect species that are at risk and their habitats, and to promote the recovery of species that are at risk; and
- to promote stewardship activities to assist in the protection and recovery of species that are at risk.

Under section 17 of the ESA, the Minister of Natural Resources ("Minister") may issue a permit to a person, with respect to one or more species at risk<sup>1</sup>, authorizing the person to engage in an activity<sup>2</sup> that would otherwise be prohibited by subsection 9(1) or 10(1) of the Act.

This application form is specific to overall benefit permits issued under clause 17(2)(c) of the Act. An overall benefit permit may be issued by the Minister where the following legislated requirements are satisfied:

The Minister is of the opinion that the main purpose of the activity authorized by the permit is not to assist in the protection or recovery of the species specified in the permit, but,

- the Minister is of the opinion that an overall benefit to the species will be achieved within a reasonable time through requirements imposed by conditions of the permit,
- the Minister is of the opinion that reasonable alternatives have been considered, including alternatives that would not adversely affect the species, and the best alternative has been adopted, and
- the Minister is of the opinion that reasonable steps to minimize adverse effects on individual members of the species are required by conditions of the permit.

In addition to the above, subsection 17(3) of the ESA requires the Minister to consider any Government Response Statement (GRS) that has been published under subsection 11(8) of the Act with respect to the species specified in the permit before an overall benefit permit may be issued.

The Minister is not obligated to issue an overall benefit permit. As noted above, an overall benefit permit can only be issued where it is the opinion of the Minister that the legislated requirements under clause 17(2)(c) of the ESA are likely to be met through requirements imposed by the conditions of the permit.



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 Tel: (905) 670-1615 or 1-800-468-2587, Fax: (905) 670-2210  
 www.creditvalleyconservation.ca e-mail: glenn@creditvalleyconservation.ca

For office use only:

File # \_\_\_\_\_  
 Fee Received \_\_\_\_\_

### APPLICATION FOR DEVELOPMENT, INTERFERENCE WITH WETLANDS AND ALTERATIONS TO SHORELINES AND WATERCOURSES (Pursuant to Ontario Regulation 160/06)

PLEASE SEE REVERSE SIDE FOR INSTRUCTIONS FOR SUBMITTING PLANS

#### Ownership Details

Owner's Name \_\_\_\_\_ Email \_\_\_\_\_

Organization \_\_\_\_\_ City/Town \_\_\_\_\_

Mailing Address \_\_\_\_\_ Postal Code \_\_\_\_\_ Phone # \_\_\_\_\_

Agent's Name \_\_\_\_\_ Email \_\_\_\_\_

Organization \_\_\_\_\_ City/Town \_\_\_\_\_

Mailing Address \_\_\_\_\_ Postal Code \_\_\_\_\_ Phone # \_\_\_\_\_

#### Property Location Details

Municipal Street Address \_\_\_\_\_

Lot \_\_\_\_\_ Concession/Range \_\_\_\_\_ City/Town \_\_\_\_\_

#### Description of Type of Development / Work Proposed

- Development (new structure, replacement structure, addition, site grading/fill placement, pool, deck)  
 Interference with a Wetland/Alteration of Watercourse

Proposed Start Date: \_\_\_\_\_ Anticipated Completion Date: \_\_\_\_\_

#### Terms and Conditions

- Any false or misleading statement made on this application will render null and void any permission granted.
- Authorized representatives of Credit Valley Conservation will be granted entry at any time onto lands which are the subject of this permit application in order to make such surveys, investigations, inspections or other arrangements which such representatives deem necessary.
- This permit does not absolve the applicant of the responsibility of obtaining necessary permission from applicable federal and provincial agencies or local municipalities.

I, \_\_\_\_\_ solemnly declare that to the best of my knowledge and belief, all of the above information to be true.

Signature of Owner: \_\_\_\_\_ Date: \_\_\_\_\_

Note: Signature or written authorization from the owner is mandatory.

Signature of Agent: \_\_\_\_\_ Date: \_\_\_\_\_

## Major Issue

Compensation for habitat impacts

# Step 7 – Tender and Contract

Describes the process for developing the tender packages. This step includes the review of detailed design and the development of specifications, detailed cost estimates, schedule of items, and contractual documents.





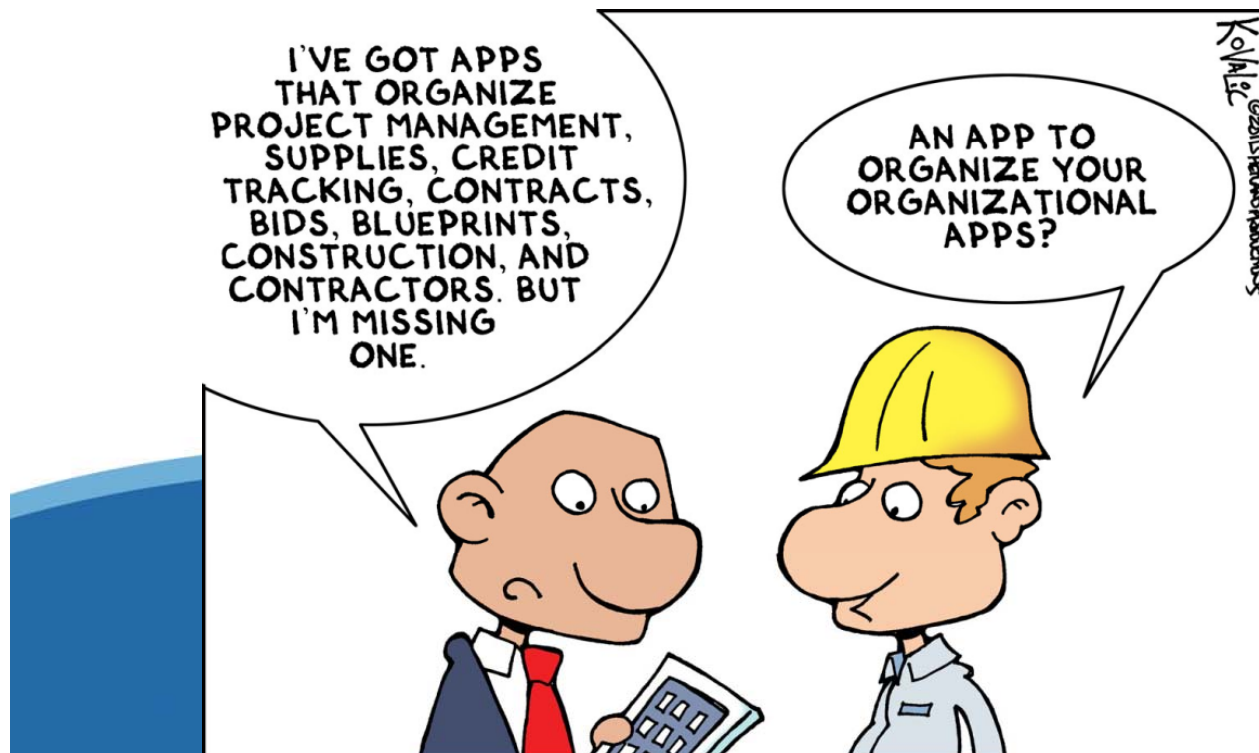
# Step 8 – Construction Supervision and Administration

Describes the **roles and responsibilities** of the construction inspector to supervise the work of the contractor and provide guidance as necessary and most importantly, how to **document site activities** and maintain client relations.



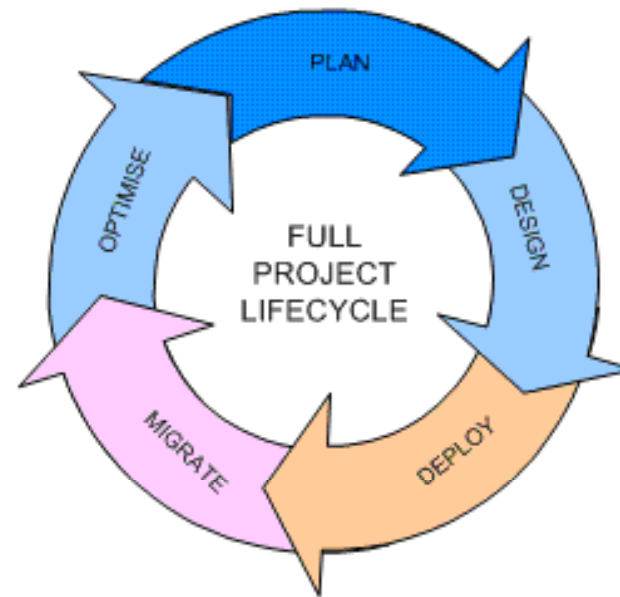
# Step 9 – Assumption & Verification

Summarizes how to verify accuracy of constructed elements and review any monitoring in order to evaluate performance including the development deficiencies lists to be rectified by the contractor prior to municipal assumption or issuance of final approval.



# Step 10 – Lifecycle Activities

Summary of the requirements for **operation and maintenance** to assist the region with guidelines for short and long term operation and maintenance strategies.



# Monitoring Program



## Mississauga Road Monitoring Plan



Draft November 2014

## ***Objectives of Interest:***

- ❖ Evaluate whether LID SWM systems are providing flood control, erosion control, water quality, recharge, and natural heritage protection as per the design standard.
- ❖ Evaluate long-term maintenance needs and maintenance programs, and the impact of maintenance on performance.
- ❖ Determine the life cycle costs for LID practices.
- ❖ Demonstrate the degree to which LID mitigates urban thermal impacts on receiving waters.
- ❖ Assess the ancillary benefits, or non-SWM benefits.
- ❖ Improve and refine the designs for individual LID practices.

# *Questions*



# Thank you !



*John Nemeth, C.E.T  
Infrastructure Programming & Studies  
Public Works – Transportation  
Region of Peel*

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john.nemeth@peelregion.ca*

Low Impact Development in Action

 **Region of Peel**  
*Working for you*