Municipal Low Impact Development Strategy and Implementation

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Outline

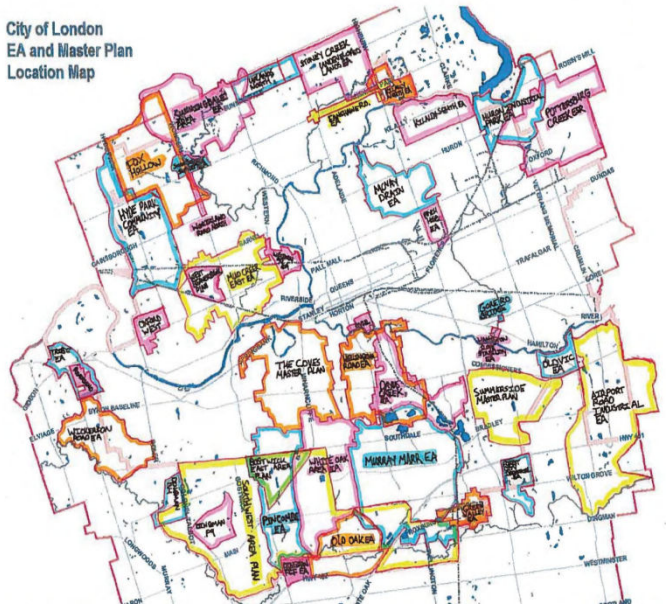
- City of London - Stormwater Management
- Triggers for Stormwater Low Impact Development (LID)
- LID Strategy Plan
- LID Implementation
  - Roadway Reconstruction Projects
  - Dingman Environmental Assessment (EA) and Pilot Environmental Compliance Approval (ECA)

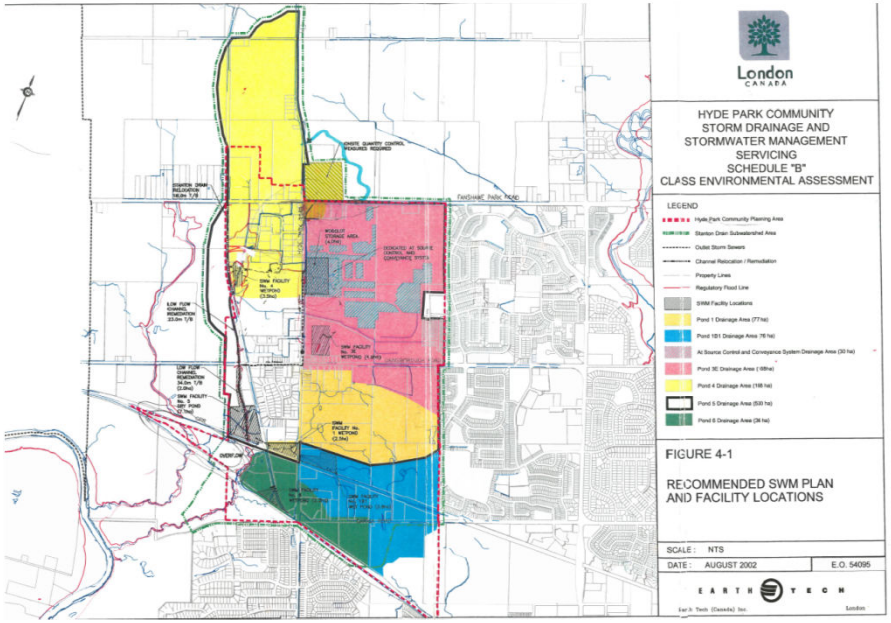
Slide 2

A1 Author, 9/19/2017

Where We've Come From - Traditional Stormwater Management (SWM)

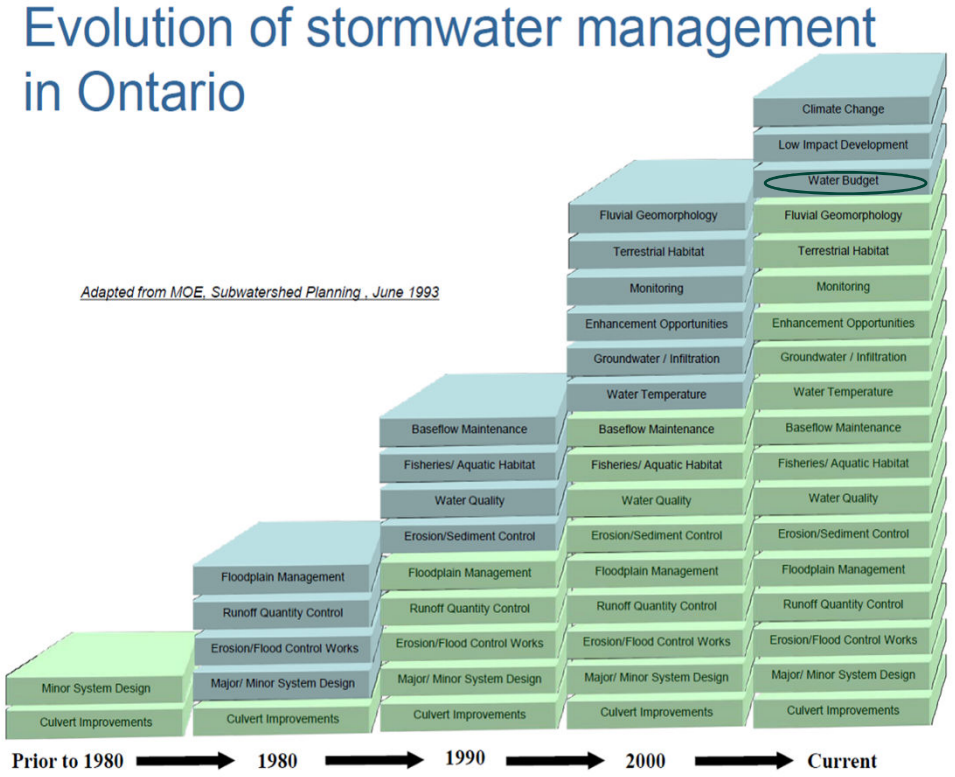
- Subwatershed studies establish SWM targets
- Master Planning Environmental Assessments (EAs) to establish SWM Facility locations
- City built SWM Facilities to service large catchments
- Oil-grit separators as part of road reconstruction works





Where We've Come From – Traditional Stormwater Management

- SWM Facilities (typically wet ponds) to provide water quality, quantity and erosion control
- MOECC 2003 Design Guidelines



Source: http://www.ceriu.qc.ca/sites/default/files/c1_1_glen_macmillan.pdf

Triggers for Stormwater LID

- MOECC Bulletin (*Interpretation Bulletin Ontario Ministry of Environment and Climate Change Expectations Re: Stormwater Management, February 2015*)
- Improved SWM control (i.e. water balance, volume control)
- Opportunity to apply the right stormwater control to the right project

Going forward, the Ministry expects that stormwater management plans will reflect the findings of watershed, sub-watershed, and environmental management plans, and will employ LID in order to maintain the natural hydrologic cycle to the greatest extent possible.

Low impact development stormwater management is relevant to all forms of development, including urban intensification and retrofit.

LID Opportunities

- Improved Stormwater Control:
  - At source control
  - Water balance
  - Runoff volume reduction

- Implementation will consider sustainability for the municipality from environmental, economic, and social perspectives.
  - Roadway Reconstruction Projects (i.e. Municipal ROW)
  - Future Development Areas within the City of London (i.e. New Subdivisions, Dingman)
  - Retrofits to previous developed areas

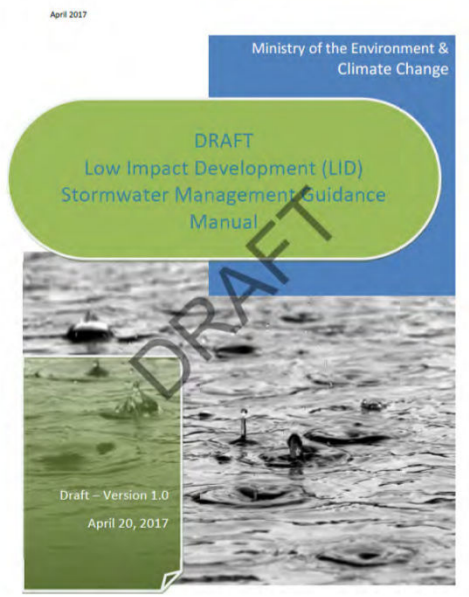
- *Identification of need for strategy to move forward*

LID Implementation -Strategy

1. Discuss ✓
2. Implementation and Construction ← We are here
3. Finalize and Endorse

Strategy

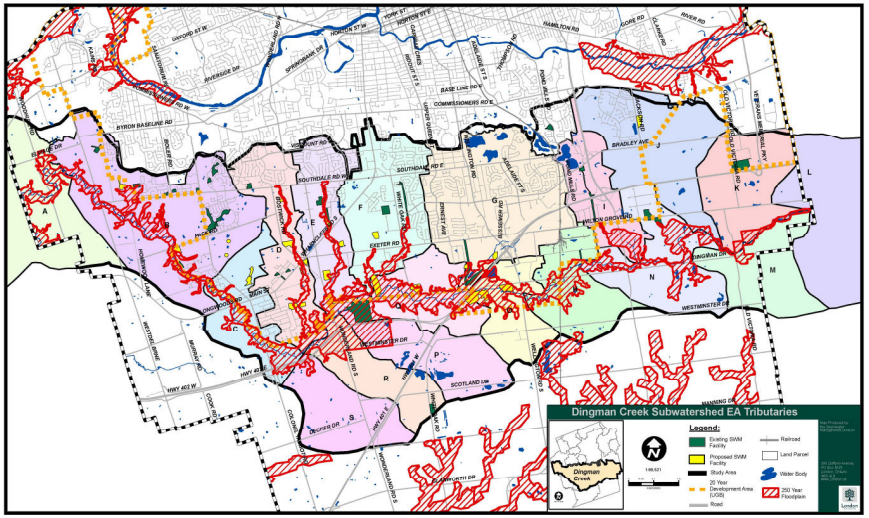
- Step 1: Discussion ✓
  - Internal review of municipal LID practices within Canada and United States
  - Participate in MOECC manual review through MEA
  - City stakeholder buy-in (Operations, Transportation, Parks, Urban Design)
  - Identify City LID Champions
  - Education and discussion sessions with local stakeholders (utilities, consultants, developers)



Strategy

- Step 2: Construction and Implementation ← We are here

  - Build it (pilot projects, industry partners)
  - EA's (Dingman Creek Subwatershed Study EA and Hyde Park EA Addendum)



Strategy

- Step 3: Finalize and Endorse
  - Operation and maintenance review
  - Updates to City standards and policy (Private Permanent Servicing, design standards, development charges, by-law, stormwater infrastructure charge)
  - Council endorsement
  - Address design data gaps (hydrogeology, soils)

Current Approach

- City of London would like to be a ‘practical partner’ with development industry to move towards LID in conformance with the pending MOECC direction
- Identify LID approach by landuse
- Municipal roadway right-of-way (bioswales, infiltration galleries, 3rd pipe system, soakaways)
- Lot level controls (soil amendments, PPS)
- Opportunity to apply the right stormwater control to the right project

LID Pilot Projects

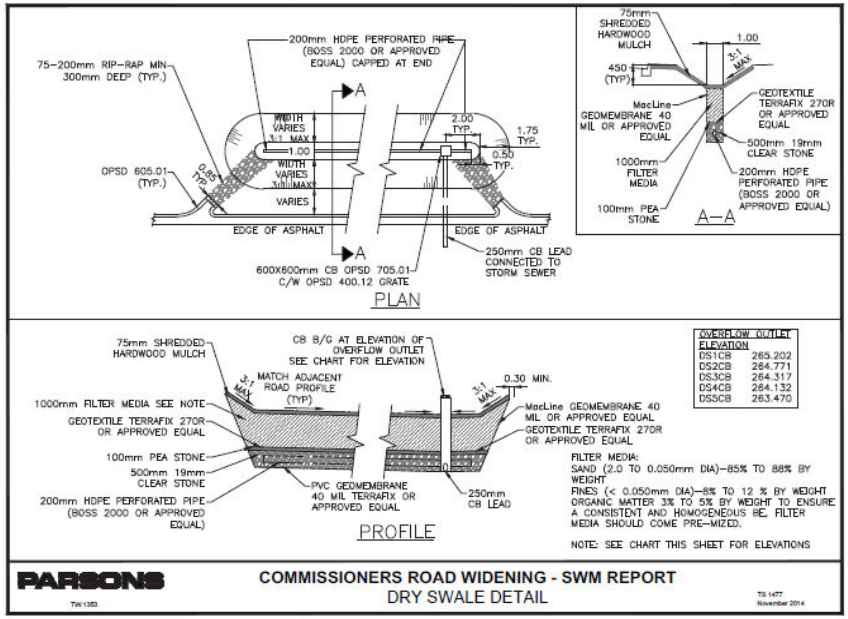
- Bioswale and infiltration galleries within ROW as part of road widening, infrastructure renewal, and community infrastructure projects
  - Commissioners Road
  - Sarnia Road
  - Oakridge
  - Waterloo Street
  - Southwest Community Centre
  - Firehall 11

Pilot Projects: Arterial Roads

Commissioners Road Phase 2

- 5 dry swales with bioretention media in boulevard
- Redundant to “grey infrastructure” (i.e. storm sewers)
- Provide stormwater attenuation and water quality benefits

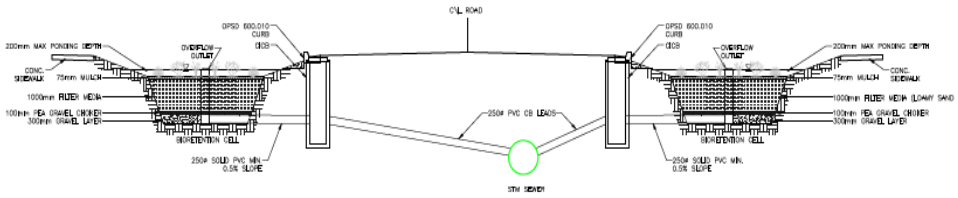
Consultant: Parsons, Contractor: Burnam Construction



Pilot Projects: Arterial Roads

Sarnia Road:

- 16 bioswales with curb-cut inlets upstream of each catchbasin
- Project relies solely on LIDs to satisfy MOECC water quality/quantity.
- Studies to be done by Western University



BIORETENTION CELL–CROSS SECTION

SCALE 1:75

Consultant: AECOM,
Contractor: Bre-Ex

Pilot Projects: Infrastructure Renewal

Residential Retrofits – Neighbourhood Beautification

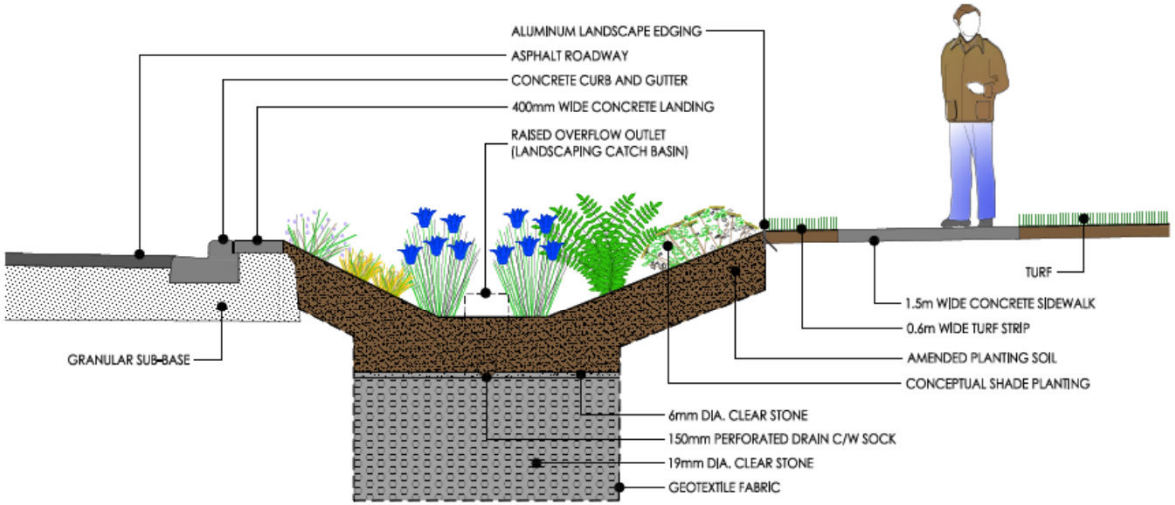
- Oakridge Acres:
  - Approx. 5 rain garden and 6 infiltration features throughout reconstruction project
  - Redundant storm sewers
  - Rain garden maintenance by homeowners
  - *Consultant: Development Engineering, Contractor: Elgin Construction*

Pilot Projects: Infrastructure Renewal

Residential Retrofits – Neighbourhood Beautification

Waterloo Street (SOHO): Horton to Simcoe

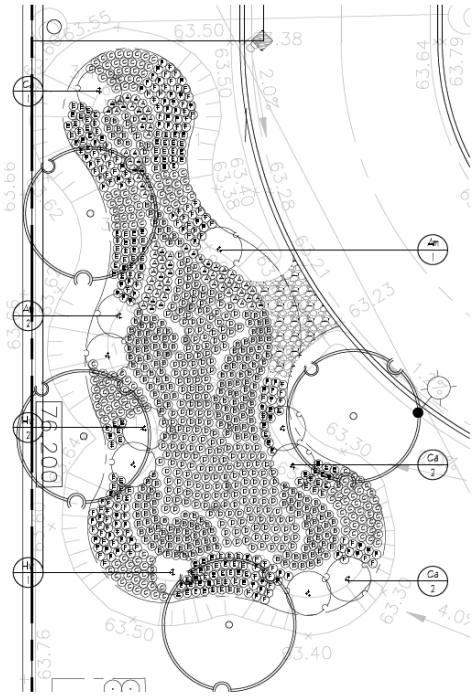
- Highly aesthetic urban rain gardens
- Maintenance by SOHO Neighbourhood Association
- *Consultant: Stantec, Contractor: L82*



CONCEPTUAL RAIN GARDEN SECTIONS

Pilot Projects: City Facilities

- Fire Hall 11:
  - Large rain garden/bioswale replacing requirement for OGS
- Southwest Community Centre (YMCA)
  - 26 bioswales approved for parking lot design as part of water quality treatment train
  - Assists with achieving LEED certification for water quality



RAIN GARDEN LANDSCAPE PLAN

Consultant: Development Engineering Ltd.

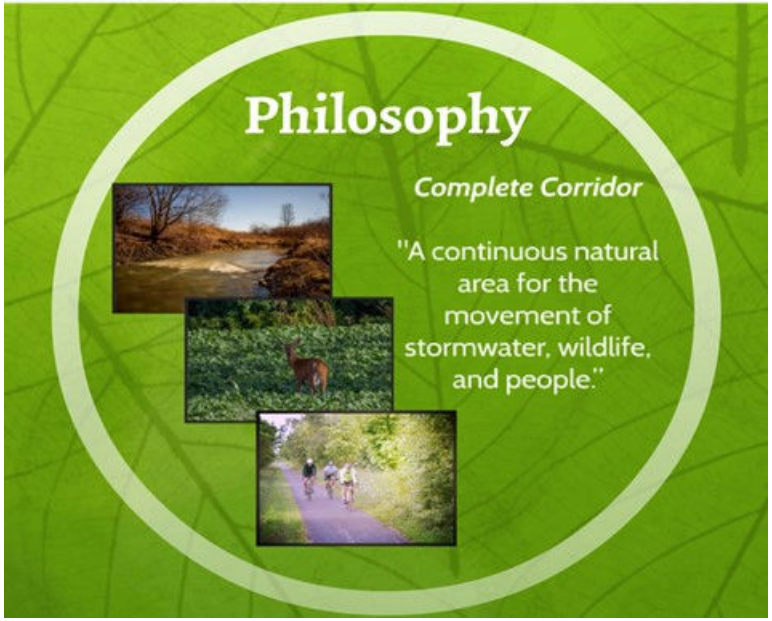
Contractor: Peeters Landscaping

Pilot Project Costs

Project	Feature Description	Tender Price (approx.)	Construction Cost per Feature (approx.)
Oakridge	5 rain gardens, 6 infiltration features	$ 70,000	$ 6,400
Waterloo Street	10 Bioretention cells	$ 143,000	$ 14,300
Sarnia Road	16 Bioretention cells	$ 266,000	$ 16,600
Commissioners Road	5 Bioretention cells	$ 135,000	$ 27,300
SW Community Centre	26 Bioretention cells	$ 160,000	$ 6,200
No. 11 Fire Station	1 Bioretention cell	$ 24,000	$ 24,000
	Average	*$ 133,000*	*$15,800*
	Minimum	*$ 24,000*	*$6,200*
	Maximum	*$ 266,000*	*$27,300*

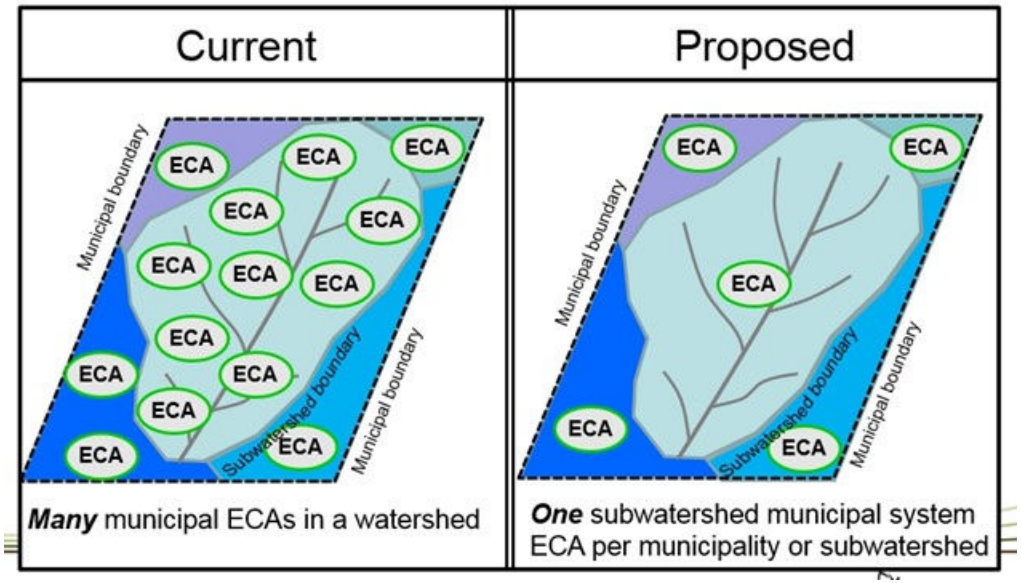
Dingman EA

- Develop subwatershed wide stormwater management approach.
- Emphasis on connecting the Natural Heritage System through developing a “complete corridor” to convey water, people, and wildlife.
- Establish goals, objectives, indicators and targets to improve water quality and connectivity of woodlands and wetlands.



Dingman Pilot ECA

- Infrastructure focus to environmental performance of the system
- Systems and cumulative impacts approach
- Enable long term performance of municipal stormwater systems to address subwatershed needs



Conclusions

- Pilot projects for construction of roadway LID features
- New development – maintaining water balance
- Incorporation of LIDs into EA's and stormwater implementation strategies
- Integration with City processes and procedures
- Development of complementary knowledge base