



# Dingman Creek ECA Pilot Project: A subwatershed-based approach

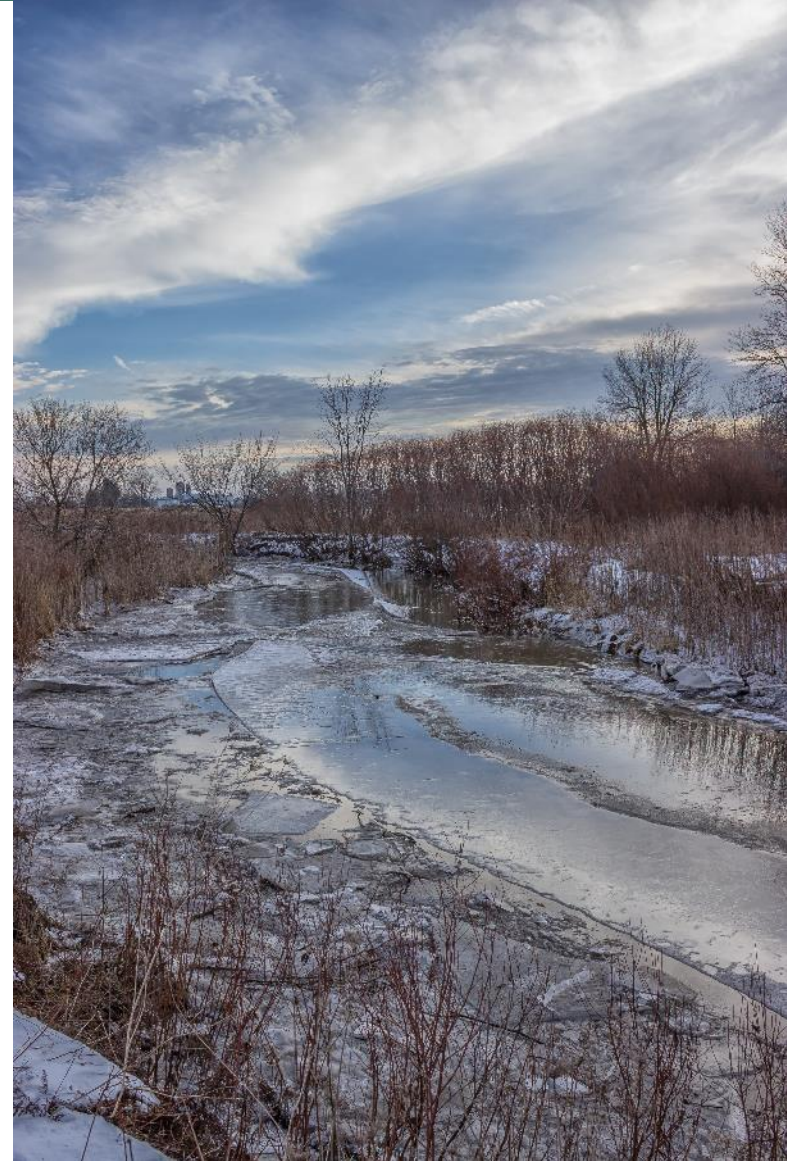


Latornell Conservation Symposium  
Municipal and Environmental Relationships  
November 20, 2019

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# Outline

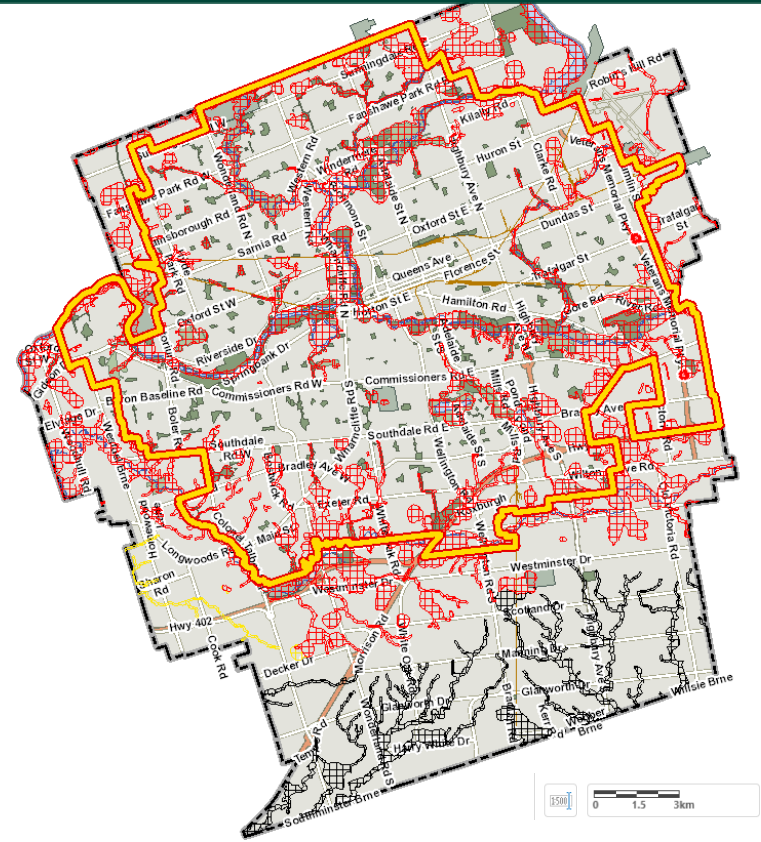
- The London Context
- Master Plan EA
- ECA Pilot Project
- Burden Reduction
- Next Steps
- Conclusions



# London, Ontario



- Population: ~ 385,000 people
- Single tier municipality
- Forks of the Thames River
- Storm Rate initiated in late 1990s





# London Context

- Subwatershed studies completed in the mid-1990s; multiple followup EAs completed
- Transfer of Review for variety of SWM infrastructure
- Lead construction of capital SWM works (ponds) for new growth; funded by Development Charges
- Oversee development applications, public flooding issues, and capital works
- Stormwater Engineering Division = 12 staff members

# Dingman Creek Subwatershed Stormwater Servicing EA



Dingman Creek – Spring 2016



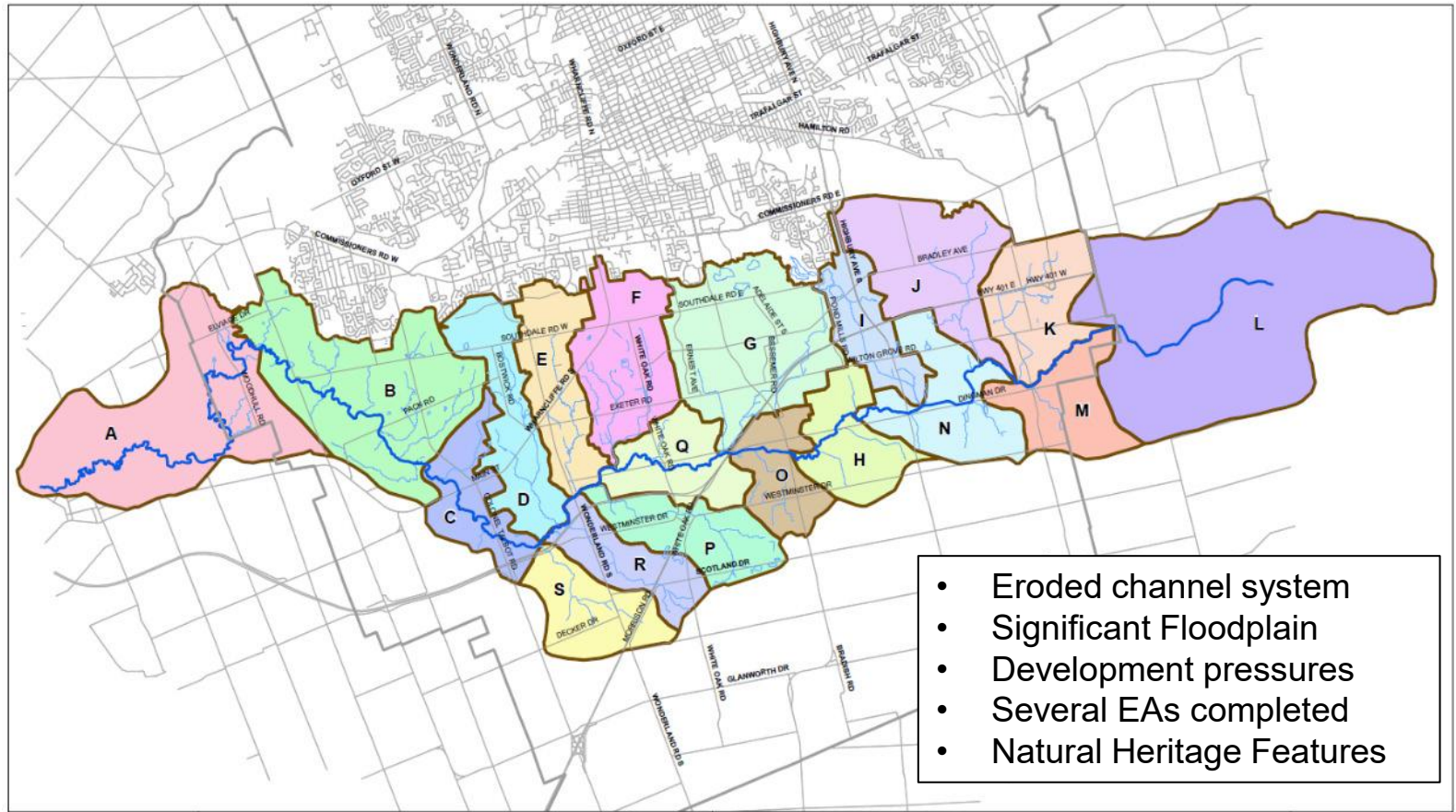
# By the numbers...



## Dingman Creek Subwatershed:

- 17,000 ha, 75% of subwatershed within City of London
- 19 tributaries flow into Dingman Creek, to Thames River, and ultimately Lake Erie
- Significant development pressures
- Surrounded by agricultural lands to the east, south, and west
- Predominately flat topography with clay soils and limited pockets of sand/gravels
- Wet ponds proposed under the current SWM strategy for new development

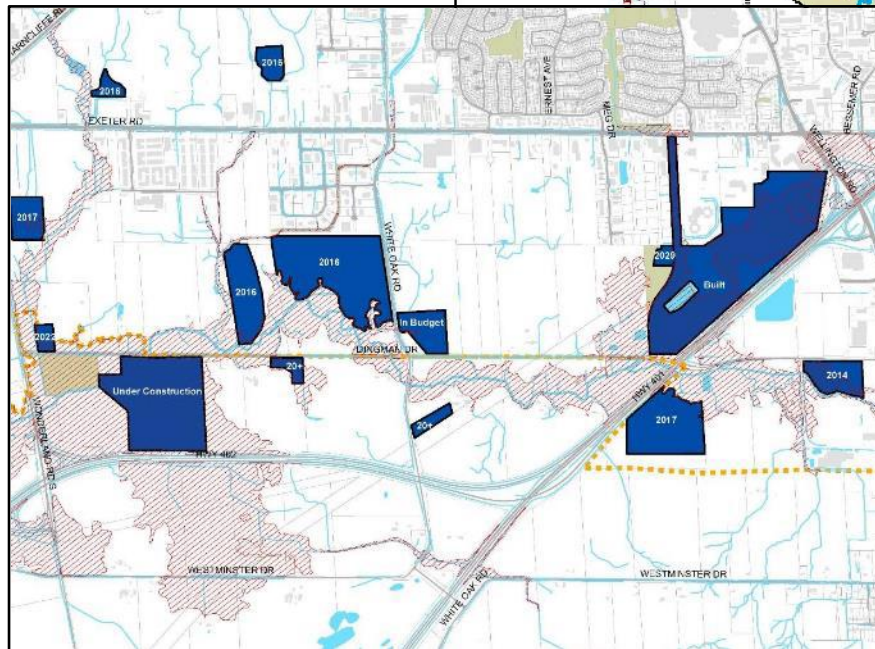
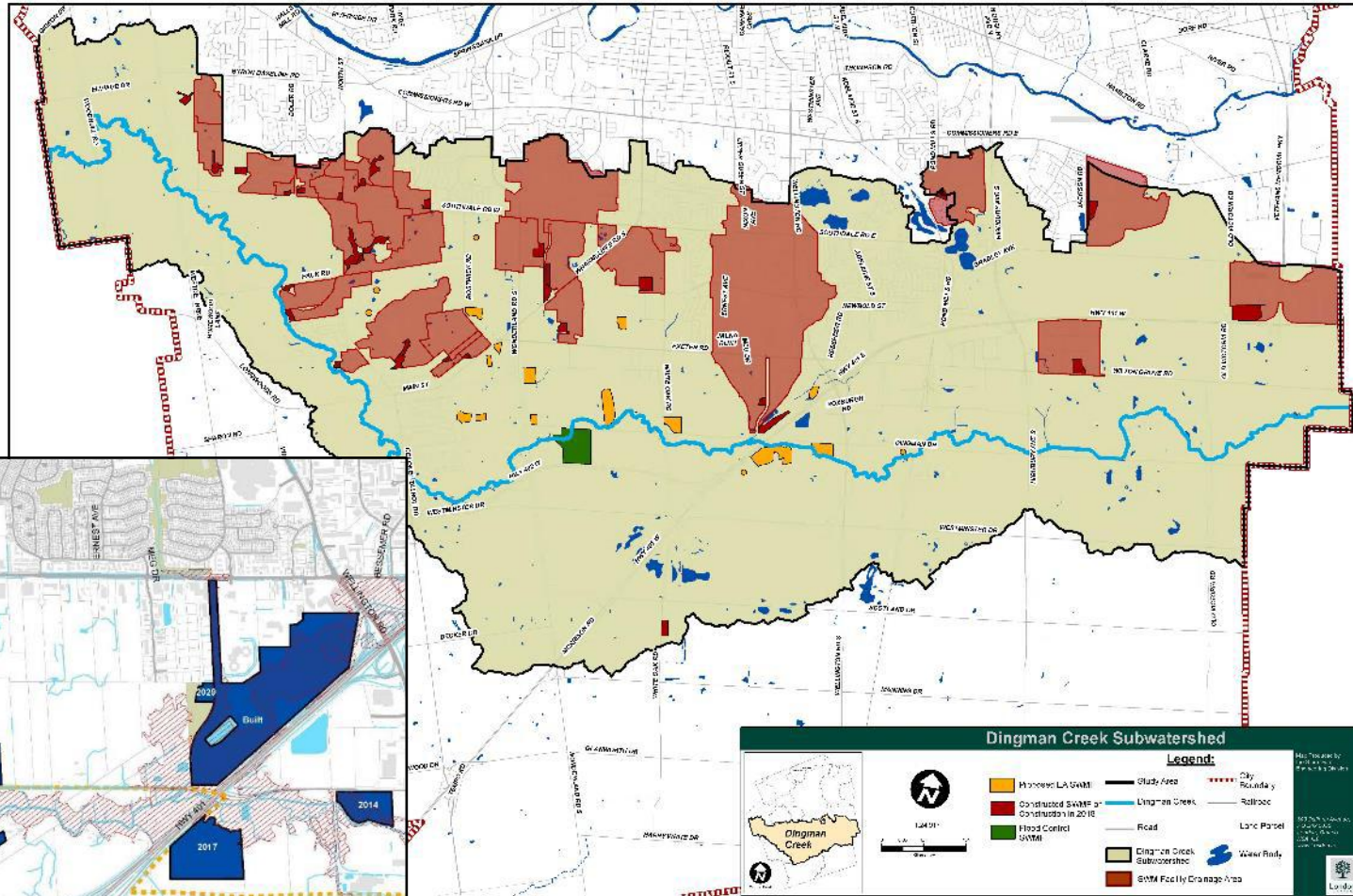
# Dingman Creek Subwatershed SWM Servicing EA



**Purpose:** To develop an innovative stormwater servicing strategy with consideration for current and potential flooding, erosion concerns, as well as wildlife/aquatic habitat and natural corridor enhancement.



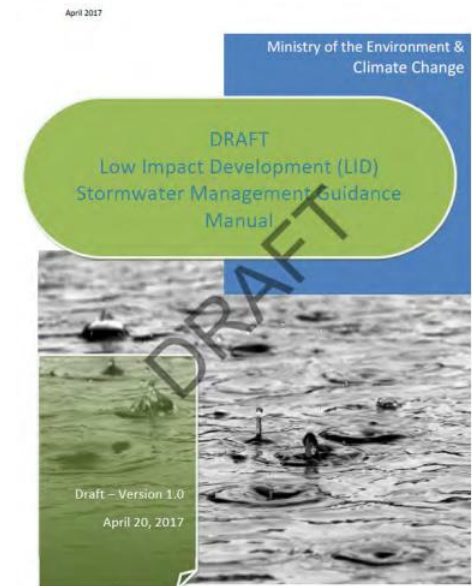
# 2015 Proposed SWMFs “Land of Lakes”



# Opportunity for LIDs

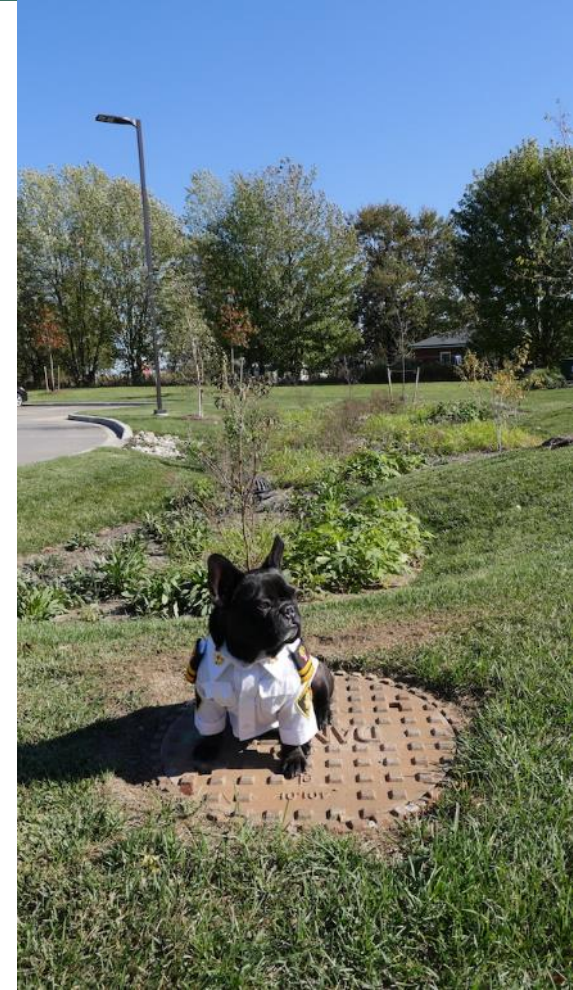
- Ontario Ministry of Environment, Conservation and Parks (MECP) Bulletin, Expectations Re: Stormwater Management (*February 2015*)
- Regard for subwatershed conditions and maintain natural hydrologic cycle to the greatest extent possible
- Finalized provincial LID Guidance Manual outstanding

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.



# Integrated Planning - LIDs

- Dingman Creek Master Plan EA establishes SWM targets for new development for consideration in *Draft Plan* development
- SWM infiltration targets for water quality and water balance
- General strategy for LIDs (90<sup>th</sup> percentile) and dry ponds for flood control

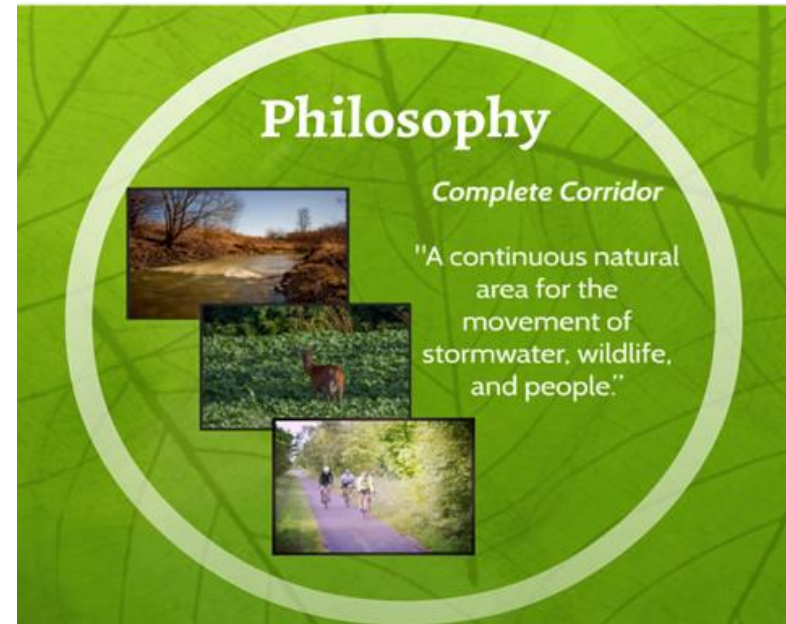


*“Archie” with Rain Garden  
at Firehall 11*



# Integrated Planning – Complete Corridors

- Convey stormwater, people, and wildlife
- Natural channel, wetland/storage pockets, multiuse path and terrestrial/aquatic species connector
- To enhance existing watercourses or ditches = increased riparian vegetation / habitat
- Benefit to community as amenity trail and creates premium lots for developers

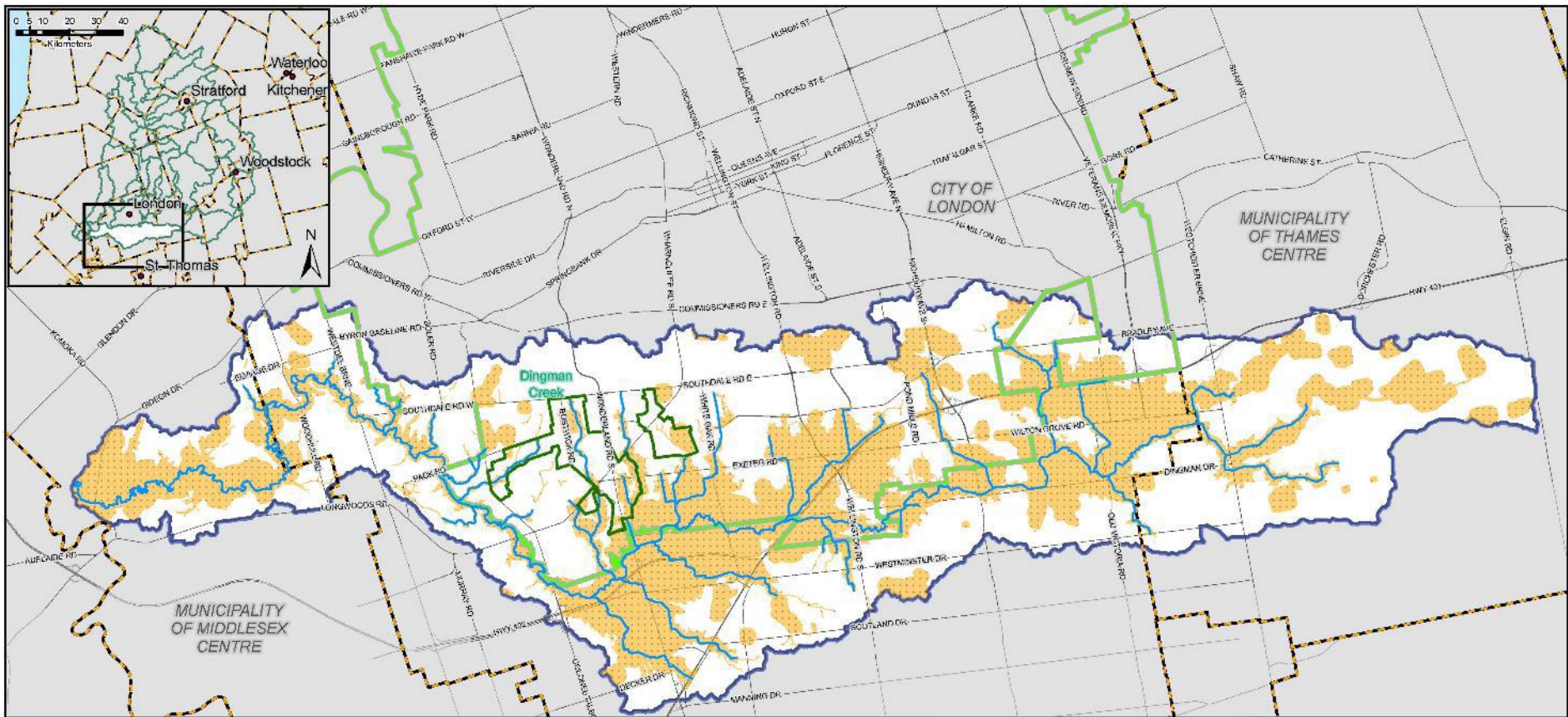




# Integrated Planning - Climate Change Resiliency

## *Regulatory Floodplain Update*

- Upper Thames River Conservation Authority (UTRCA) conducting Regional Floodplain Update in parallel with EA.
- Preliminary floodplain “screening area” presented to Planning Committee on November 12, 2018.
- Significant floodplain expansion along certain lengths of Dingman Creek and select tributaries.



# DINGMAN SUBWATERSHED SCREENING AREA

NATURAL HAZARDS (FLOODING, EROSION, WETLANDS)



Legend

- River
- Roads
- Municipalities
- Dingman Subwatershed
- Urban Growth Boundary
- Screening Area
- Dingman Creek EA
- Proposed Phase 1 Area

Map Created by UTRCA  
October 31, 2018

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This document is not a Plan of Survey.

Data Sources:  
2015 Waterscourse, Ont. 2018 Section 28 Screening Area  
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2016 Urban Growth Boundary Copyright © City of London, 2016

2018 Roads, 2013 Municipal Boundary  
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## Dingman Creek “Screening Area” – Draft Hazard Lands



# Master Plan EA Alternatives

Subwatershed Management Strategies comprised of a suite of management options:

1. Do Nothing
2. Traditional Strategy (End-of-pipe only)
3. Low Impact Development (LID) Strategy
4. Combined Traditional & LID
5. Integrated Dingman Creek Corridor

# Bringing it all together

- Integrated planning with stormwater management:
  - Incorporate LID infiltration targets
  - Opportunity for enhanced stream corridors
- UTRCA Regulatory Floodplain Update
- MECP ECA Pilot Project
  - One ECA for existing and future preapproved works
  - Consolidated inventory to track, maintain and monitoring SWM system in accordance with asset management regulations

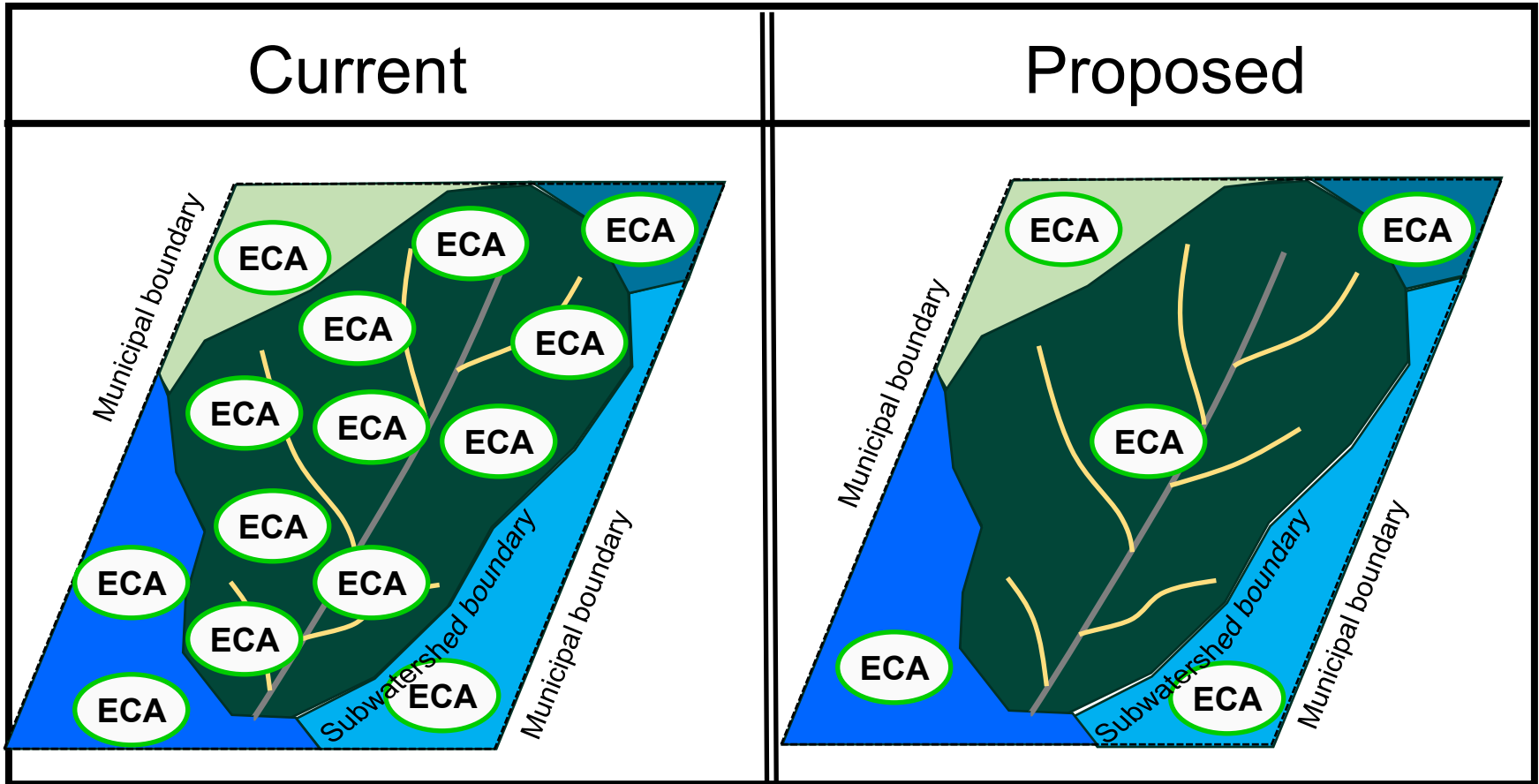


# ECA Pilot Project



Waterloo Street Bioretention Cell

# ECA Pilot Project





# ECA Mission Statement

- Use the existing regulatory framework to create a comprehensive Stormwater ECA to support a holistic watershed approach to managing municipal stormwater, provide tangible benefits to the environment, and lighten administrative burden.
- Should be reproducible for application in other mid-size to large municipalities. Pared down application for small municipalities, consistent with resource capabilities and growth status.



# ECA Pilot Project: Overview

- An ECA for municipal stormwater systems including new and existing works, maintenance requirements, monitoring, and adaptive management to enable long term performance and address subwatershed/local needs
  - Applies to municipally owned stormwater infrastructure only
  - Shift from site by site infrastructure focus to environmental performance of the system
  - Identify suitable receiver targets and metrics to evaluate how well a municipality is managing its stormwater
  - Leverage work already taking place and existing tools (e.g. municipal planning, subwatershed studies, monitoring programs, asset management)



# Benefits of Comprehensive *Watershed-Based ECAs*

- Promotes a comprehensive watershed-based monitoring strategy
- Provides a digestible and logical Study Area for consultants and municipalities
- Increased environmental stewardship and support for watershed health through Adaptive Management
- Burden Reduction through Preauthorized Works = Reduced applications for municipalities to prepare and fewer applications for MECP to review
- Supports Asset Management objectives by creating a comprehensive infrastructure inventory

# Components of the ECA



Trevithen Outfall



# Components of the ECA

## Main components of Subwatershed-Based ECA:

1. Infrastructure Inventory
2. Monitoring Program and Adaptive Management
3. Operations and Maintenance
4. Preauthorized Works
5. Reporting Requirements



# 1. Infrastructure Inventory

- Online “living” GIS inventory with most recent GIS data available
- Administered by City with access for MECP
- Includes all City owned/maintained SWM infrastructure (lot level, conveyance and end of pipe controls)
- Includes any City GIS information to support the understanding of the SWM system (catchments, sewers system, Source Water Protection Areas, property fabric, 1m contours, aerial imagery).


# 1. 'Living' Infrastructure Inventory

MECP Dingman Creek The Corporation of the City of London

Find address or place

Legend  
MECP Dingman Creek

- City Boundary
- STORM SEWERS
  - Outfalls
  - Pipes
- WellheadProtectionAreasWithZones
- Subwatersheds
- Railways
- SingleLineRoads
- Buildings
- SURFACE WATER FEATURES
  - CulvertsSmall
  - CulverHeadwalls
  - WaterEdges
  - Watercourses
  - Water
  - Waterbodies



Options Filter by map extent Zoom to Clear selection Refresh

Diameter	Length	Slope
375	23.00	1.26
300	47.30	0.50
525	75.70	0.36
450	38.50	10.44
300	34.50	2.30
450	70.00	2.19

24863 Features 0 selected

All rights reserved



# 1. 'Living' Infrastructure Inventory

MECP Dingman Creek The Corporation of the City of London

Legend  
MECP Dingman Creek  
City Boundary  
STORM SEWERS  
Outfalls  
Catchbasins  
Manholes  
Pipes  
WellheadProtectionAreasWithZones  
Subwatersheds  
Railways  
SingleLineRoads  
Buildings  
SURFACE WATER FEATURES  
CulvertsSmall  
CulvertHeadwalls  
WaterEdges  
Watercourses

Find address or place

36  
2635  
2636

OBJECTID GIS\_ID LastEditDate Asset\_ID Name Location PondType PondTypeDescriptor Status YearConstructed SWM\_Control Subwatershed Year\_rehabilitated

OBJECTID	GIS_ID	LastEditDate	Asset_ID	Name	Location	PondType	PondTypeDescriptor	Status	YearConstructed	SWM_Control	Subwatershed	Year_rehabilitated
36	39	January 17, 2019	S-060-POND	North Lambeth	7268 Clayton Walk	Wet	Pond	Permanent		QTY/QLY/ERO	Dingman Creek	
2635	268	April 5, 2018	S-253-POND	South Winds SWM Facility South - Phase 1	3901 West Graham Place	Dry	Pond	Permanent	1987	QTY/ERO	Dingman Creek	
2636	269	April 5, 2018	S-254-POND	South Winds SWM Facility North - Phase 2	3938 West Grehem Place	Dry	Pond	Permanent	1990	QTY/ERO	Dingman Creek	

3 Features 0 selected

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## 2. Monitoring Program

- Dingman Creek Master Plan EA identifies watershed Goals, Objectives, Indicators and Targets (GOITs)
- Goals and objectives relate to maintaining/enhancing water quality, quantity (water balance), public safety, and protection of property
- Indicators and Targets identify *stressors, exposures, responses* and administrative measures
- ECA requires GOITs to be monitored and reported

# Relationship between indicators

## Stressor Indicators:

- Stormwater works (e.g. uncontrolled outfalls, ponds)
- % of uncontrolled developed area
- % of stream length with no riparian buffer

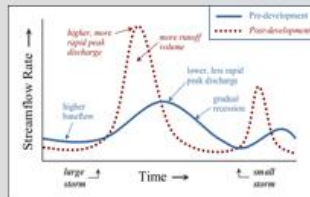


Activities or occurrences that have potential to impact the environment



## Exposure Indicators:

- River water chemistry
- Bank erosion
- Stream hydrograph



Receiver's response to stressors (e.g. stormwater discharges)



## Response Indicators:

- Aquatic biota (e.g. benthics)



Biological measures in the receiver of a cumulative response to exposure and stress



## 2. Monitoring Program and Adaptive Management

- Accountability for Municipalities as it relates to the water resources systems
- Focus on overall watershed health with less emphasis on performance of individual works; avoids monitoring each individual facility
- Rotational monitoring on tributaries and select infrastructure in areas under development
- Ability for municipality to target/resolve a problem area based on ongoing monitoring results = **Adaptive Management**



# 3. Operations and Maintenance

- City maintains record of all Operations and Maintenance activities
- Activities include inspections, pond sediment removals, outlet repairs, vegetation removal, and Adaptive Management activities
- Records retained by City and available upon request of MECP
- Future capability: Living GIS database to house all O&M activities (Spring 2020)



## 4. Preauthorized Works

- Any work that supports meeting the Goals, Objectives, Indicators and Targets and does not trigger a Duty to Consult
- Includes:
  - Retrofits to existing SWM facilities and systems to improve performance
  - SWM control retrofits to the built area for quality or quantity control (new LIDs, Oil Grit Separators, Storm Sewer Outlets)
  - New storm sewers, pipe lining and storm sewer replacement
  - EA recommended works
- Send Notice of Modification to the local MECP office and track in the Living GIS Inventory with all attributes.



# 5. Reporting Requirements

- Annual reporting of additional infrastructure constructed within the watershed
- Every 5-years, a comprehensive review and data analysis of the monitoring parameters to evaluate long-term trends to be prepared for the MECP
- Incorporates performance metrics that are aligned with Climate Change Resiliency and Asset Management (i.e. % properties resilient to a 5 year and 100 year storm)
- Supplemented by administrative goals for pollution prevention and education and outreach

# Burden Reduction

## 1. Digitization and Shared Data

- Living GIS Inventory
- Three year monitoring contract (pilot project) with UTRCA
- Data sharing through WISKI software

## 2. Optimized Monitoring Program

- Built upon previous monitoring work
- Supports adaptive management

## 3. Preauthorization

- Enhanced transfer of review
- Notice of modification



*Stoney Creek Erosion Control Wetland*



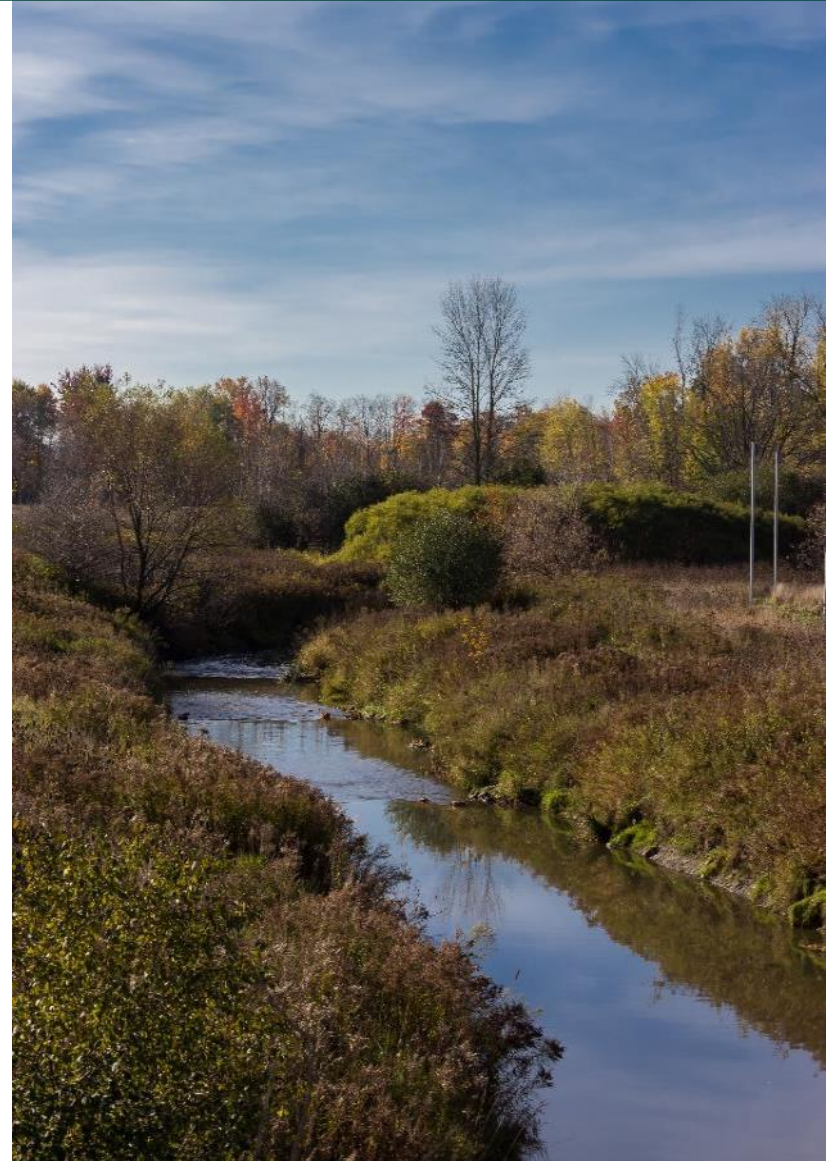
# Conclusions

- Proposed ECA recommends practical and achievable Goals, Objectives, Indicators and Targets to support ongoing watershed health.
- ECA supports integrated stormwater planning for Low Impact Development across the subwatershed.
- Living GIS inventory complements Asset Management efforts that are already underway in Ontario.
- Subwatershed-scale is appropriate to evaluate environmental impacts and improvements as it relates to SWM infrastructure.



# Next Steps

- City of London to complete Dingman Creek Master Plan as a Schedule B EA in winter 2019.
- Finalize draft ECA and obtain sign off as a Pilot Project.
- Integrate components of this ECA with MECP Stormwater Design and Permissions Working Group.





# Acknowledgements

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# Implementation

## Supporting the evolution of Stormwater:

- Updated Design Standards to incorporate LIDs
  - <http://www.london.ca/business/Resources/Consultant-Resources/Documents/2019-Specs-and-Reqs/06-StormwaterManagement.pdf>
- LID Subsidy new in 2019 Development Charges
  - Average of \$391/m for linear LIDs in the municipal ROW
- Multiple LID Pilot Projects
  - Including Groundwater monitoring program

To find out more, see presentation by Adrienne Sones:

***“London’s LID Strategy: From Pilot Projects to Design Standards”***

3:15pm-4:45pm “Green Technologies” Room 8 W4C

# Questions?



<https://getinvolved.london.ca/DingmanCreek>