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Presented by:

Toronto and Region Conservation Authority

In association with:

Lake Simcoe Region conservation authority

Credit Valley Conservation – inspired by nature

Complete Corridors:
Moving Water, Wildlife, and People

Source to Stream Conference
Brampton, ON
March 22, 2023

City of London
Environment and Infrastructure
Shawna Chambers, P.Eng., DPA
Division Manager, Stormwater Engineering

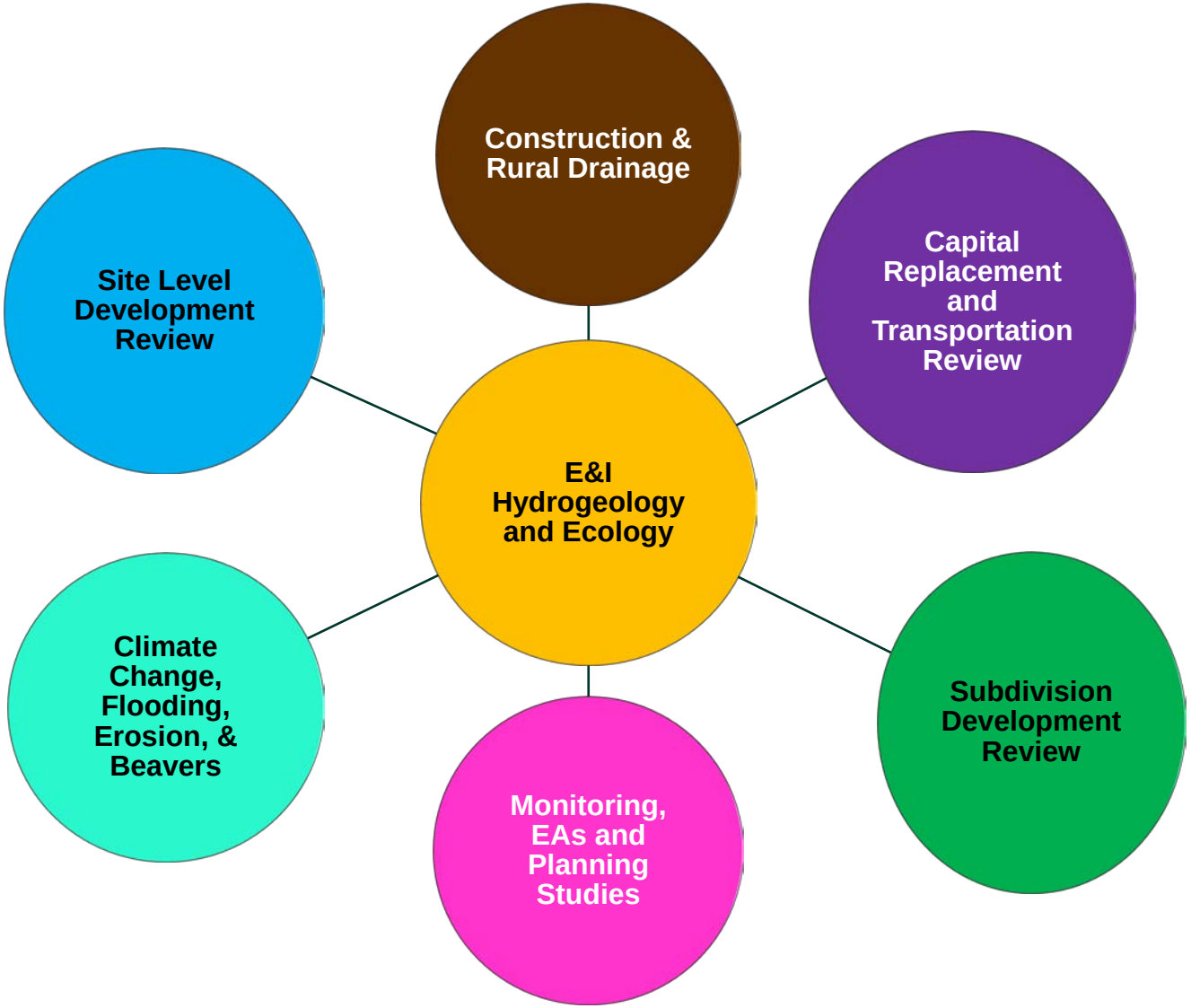
Outline

- Background
- Traditional SWM and paths
- Setting the Stage
- Complete Corridors
- Impacts to Planning Process
- Lessons learned
- Next Steps

London's Stormwater Engineering Division

- 13-person team of Engineers, Technologists, Hydrogeologist and Ecologist
- Provide input related to all SWM matters in City
- Funded by Storm Rates established in 1996
- 2019 design standard update includes LIDs
- Encourage innovation and practical approach to SWM

London's Stormwater Division: Services

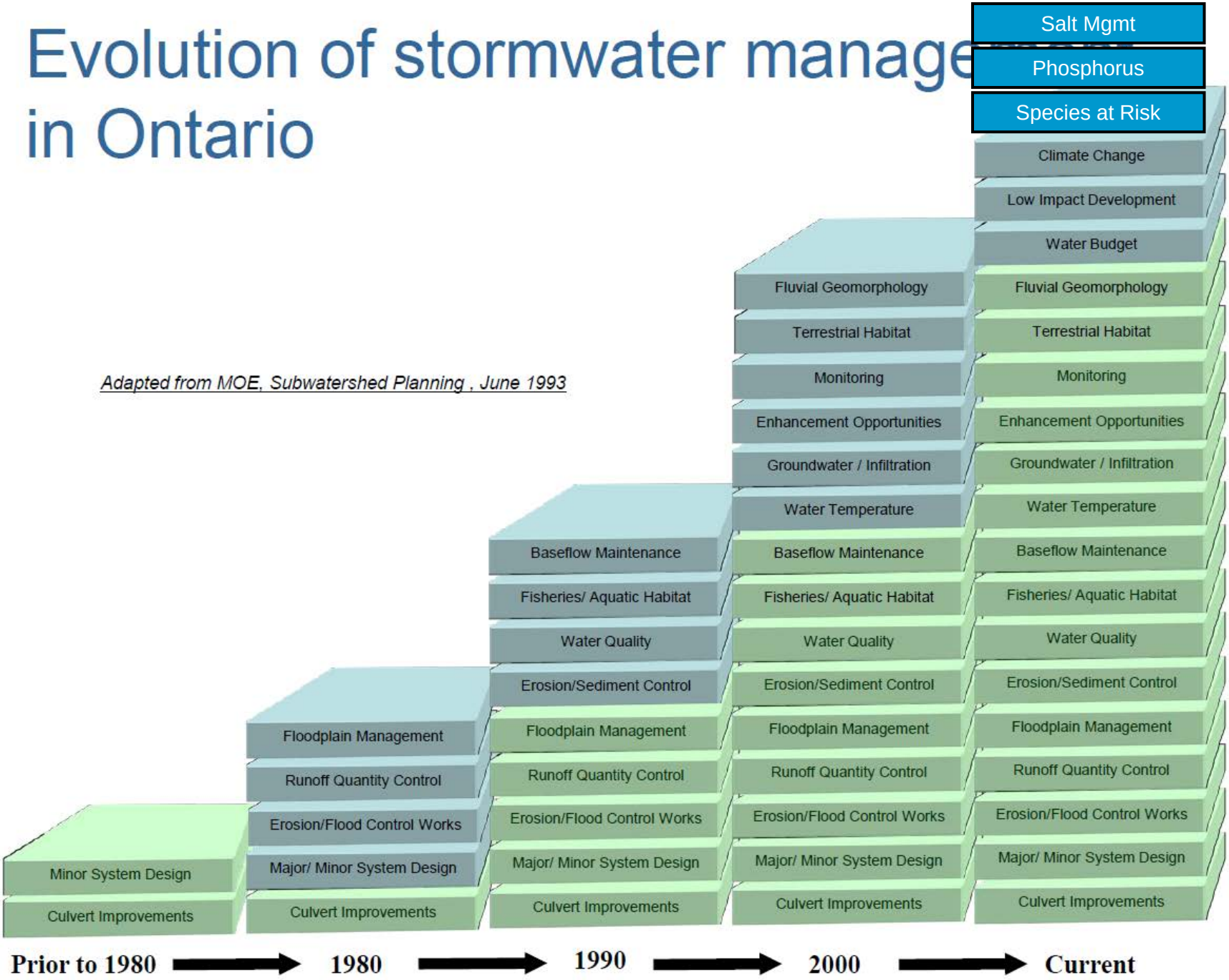


Traditional SWM – End of Pipe Facilities

Post-2002 practices:

- Stormwater wet ponds
- Can be isolated from ecological systems
- Loosely integrated with pathways
- Costly to remove sediment

Evolution of stormwater management in Ontario



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

Opportunity for LIDs

- MECP Bulletin, Expectations for Stormwater Management (*February 2015*)
- Have regard for subwatershed conditions and maintain natural hydrologic cycle
- Provincial LID Guidance Manual (Jan 2022 Draft)
- Consolidated Linear Infrastructure-Environmental Compliance Approval

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.

Filter Phil – Raingarden Mascot (2018); Waterloo St Rain Gardens (2017)

Increasing Biodiversity

- **New nesting site: Blue-Wing Teal Duck** discovered by Environment Canada Biologist summer 2019
- Media release Feb 20, 2020: Blackburn, Global, CTV and CBC
- https://www.cbc.ca/news/canada/london/dingman-creek-wetland-1.5475134

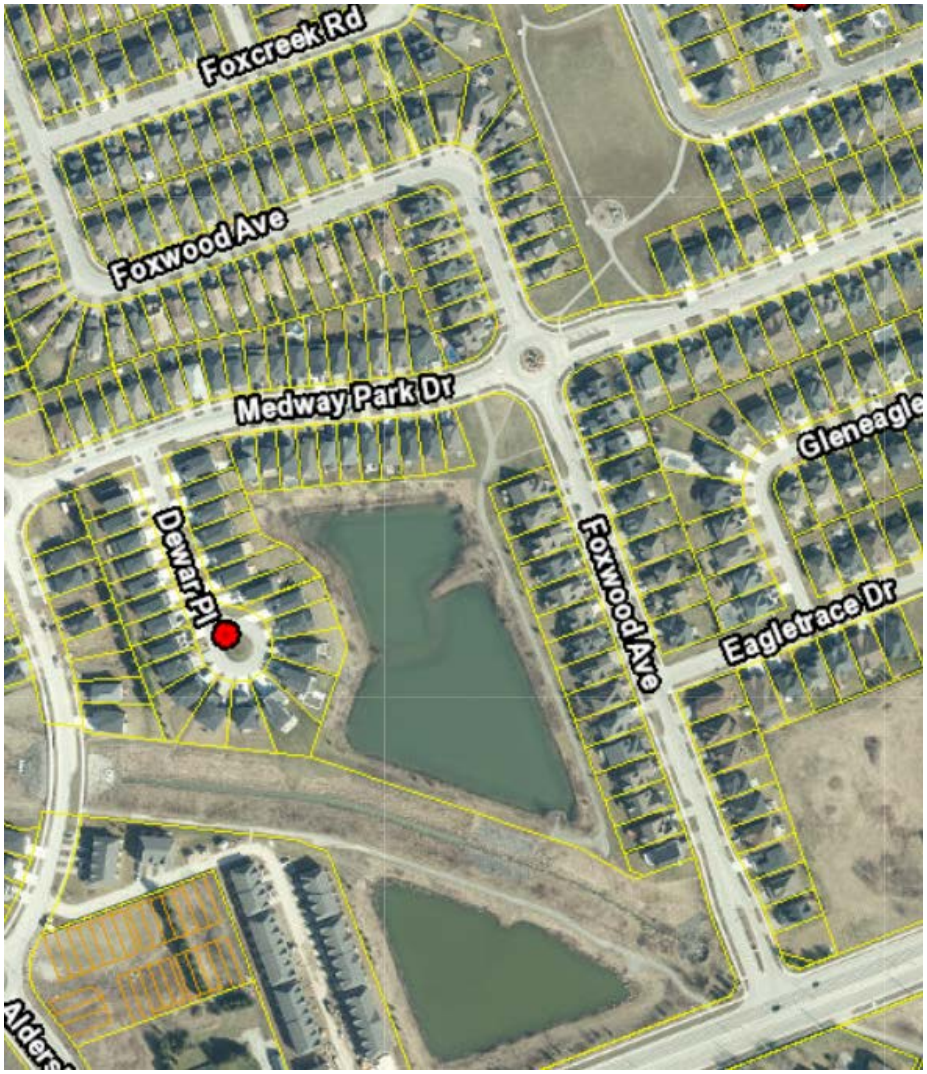
401/402 Rest stop for migratory birds

"Breeding [of the Blue-Wing Teal Duck] in Ontario is on the decline, and the fact that a successful brood was raised at the Dingman site, speaks to the quality of the habitat in there."
- Denby Sadler, Environment Canada Wildlife Biologist

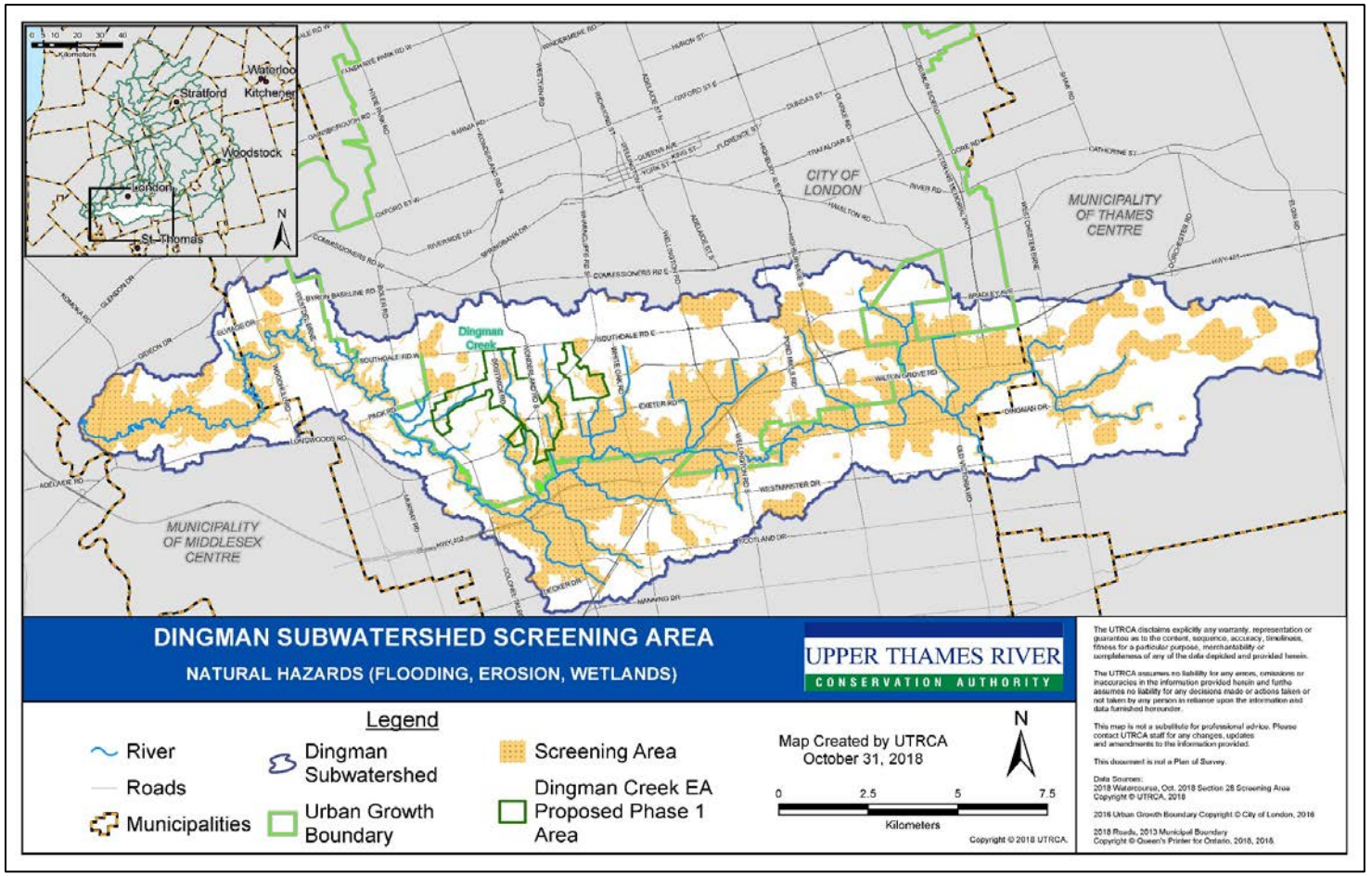

Dingman Creek Video Zone A
October 2015

SWM with Parks and Pathways

- London has over 500 parks and +240km of trails; >40km of Thames Valley Parkway
- Pathways often located around stormwater management ponds
- Parks as separated spaces within neighbourhoods.



Regulatory Floodplain Updates



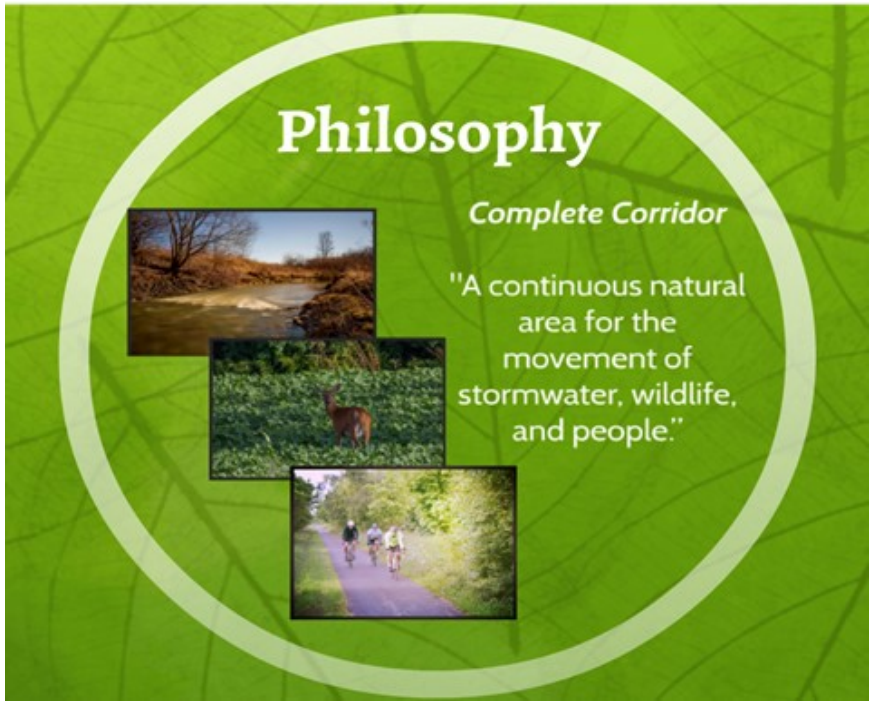
- Province-wide floodplain updates led by Conservation Authorities
- Regional 250-year floodplain limits and developable lands changing

The stage was set…

Grand Theatre, London, ON

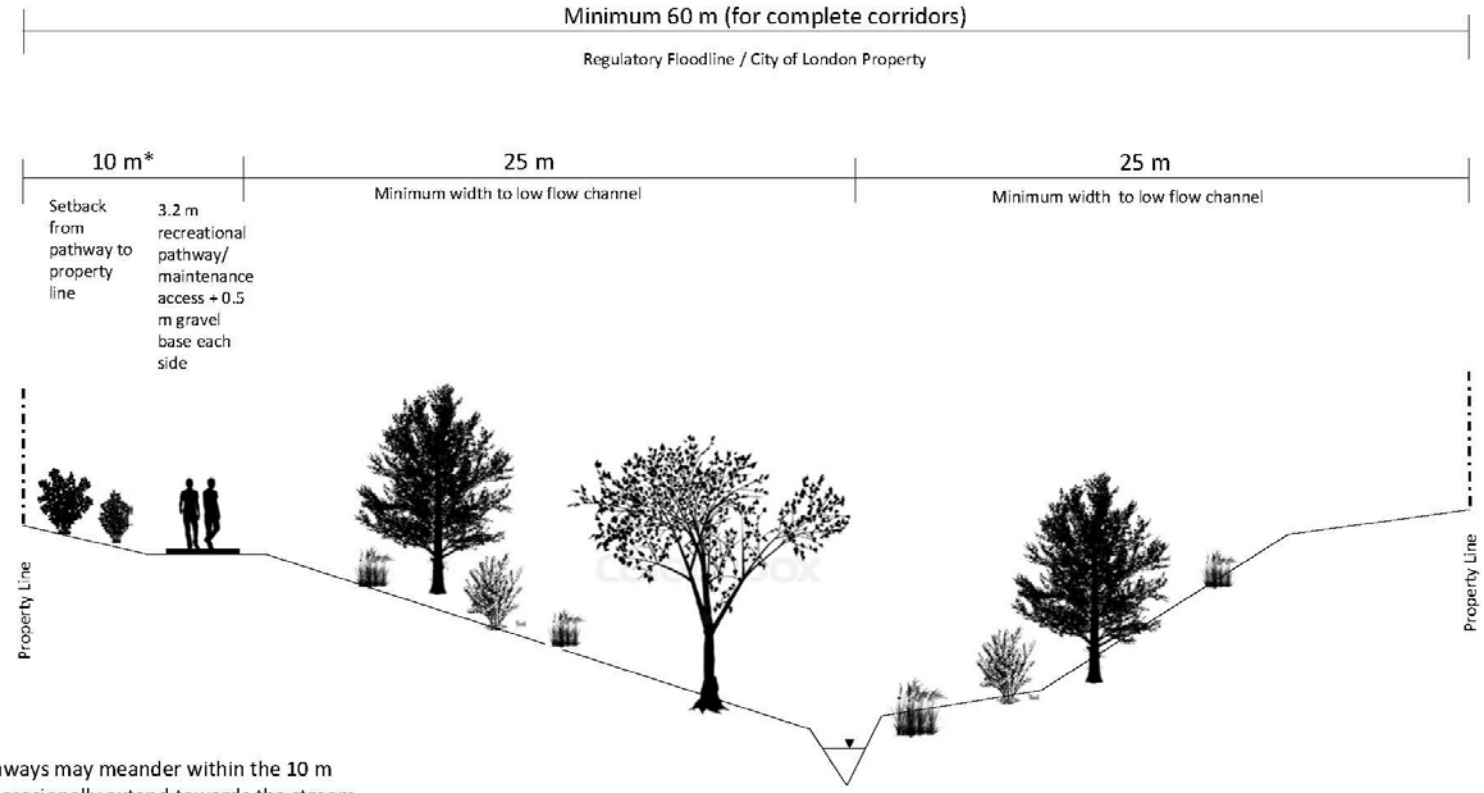
Complete Corridor Approach

- Integrate natural heritage, open space, recreational, and SWM
- Continuous corridor to protect, maintain, rehabilitate, and restore ecological functions
- Central focus for neighbourhood planning



Conceptual Design

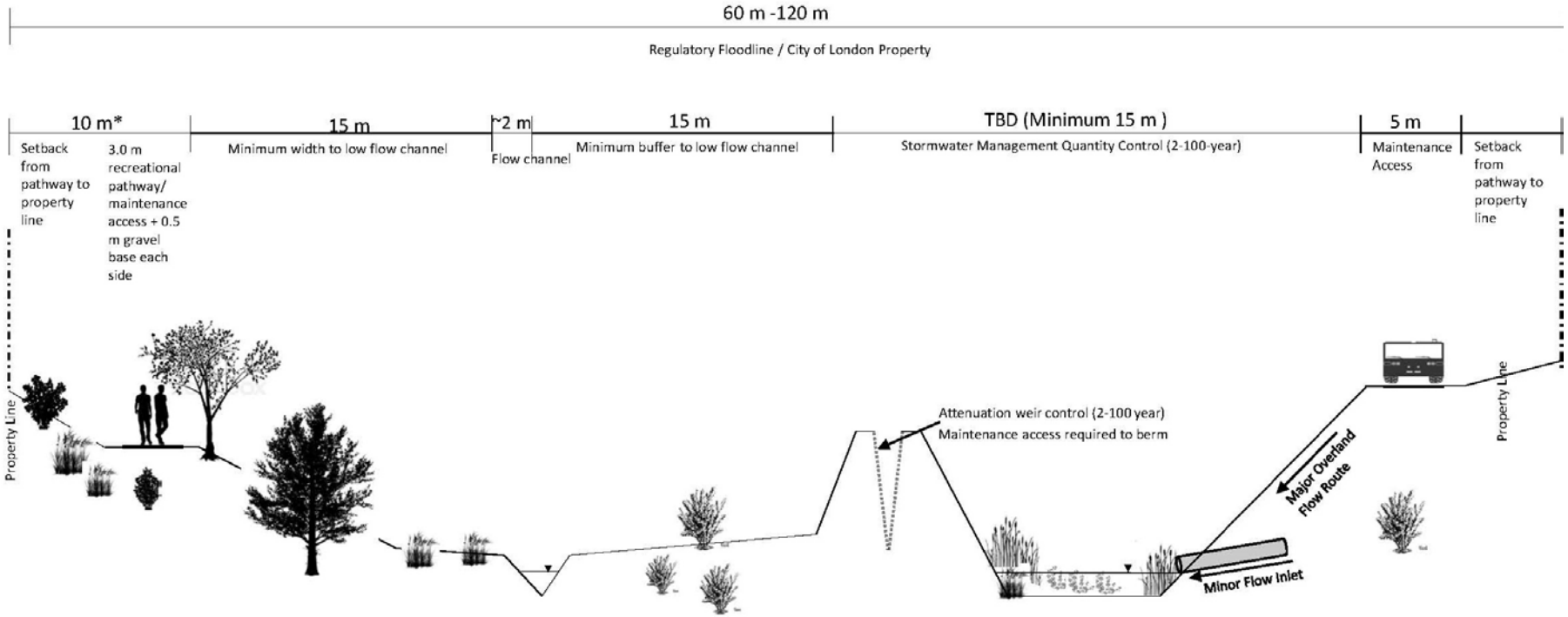
Example 1 – Minimum Corridor Requirements



*Pathways may meander within the 10 m and occasionally extend towards the stream or other feature where appropriate.

Conceptual Design

Example 2 – Corridor with Stormwater Management (Quantity Control), Maintenance access on both sides of corridor



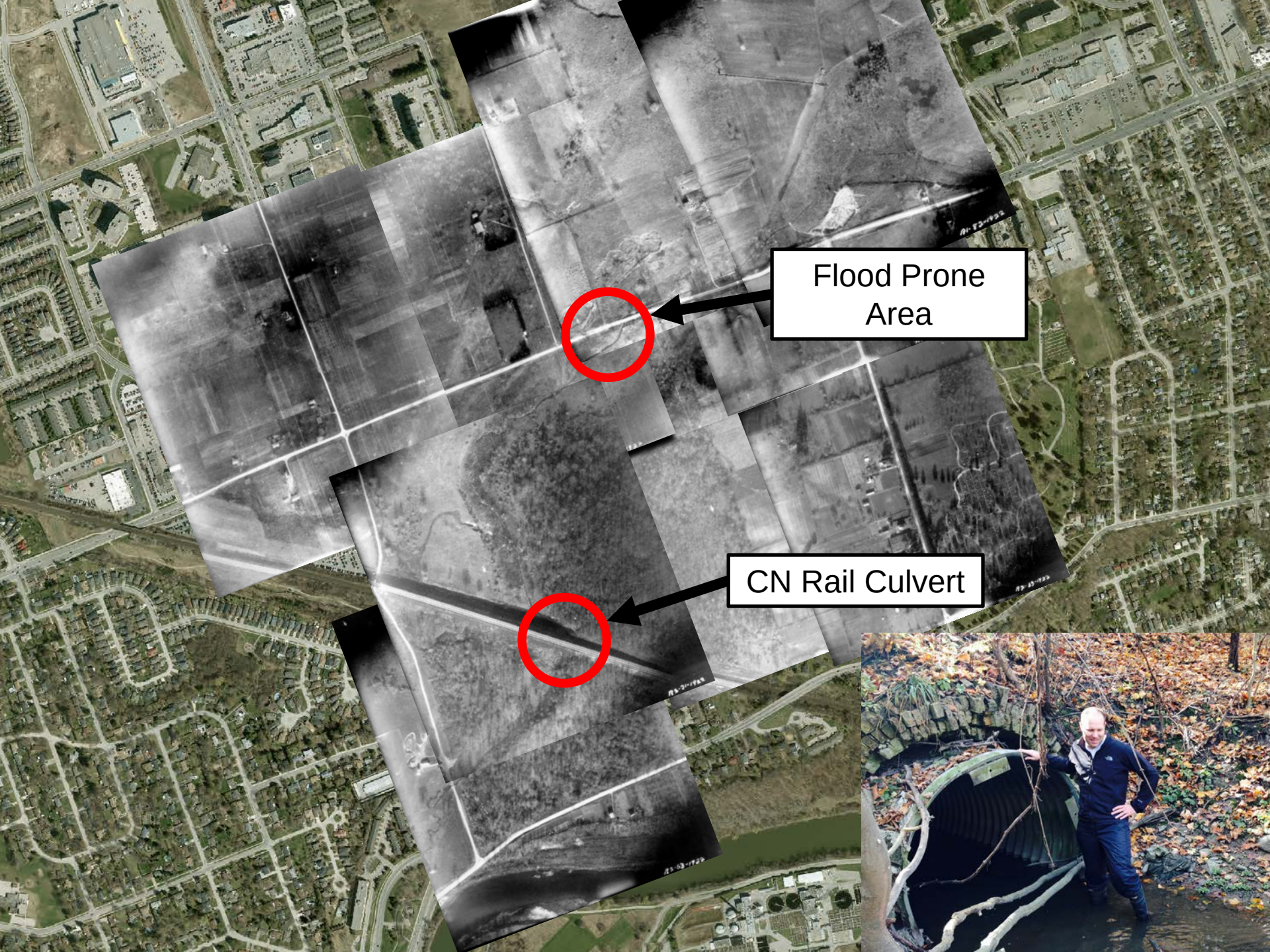
*Pathways may meander within the 10 m and occasionally extend towards the stream or other feature where appropriate.

Capital Projects

Metamora Slope Rehabilitation (2022)

Project 1:
Mud Creek Channel Reconstruction

Flooding – 2014/2022


Flood Prone Area
CN Rail Culvert

Mud Creek Naturalization

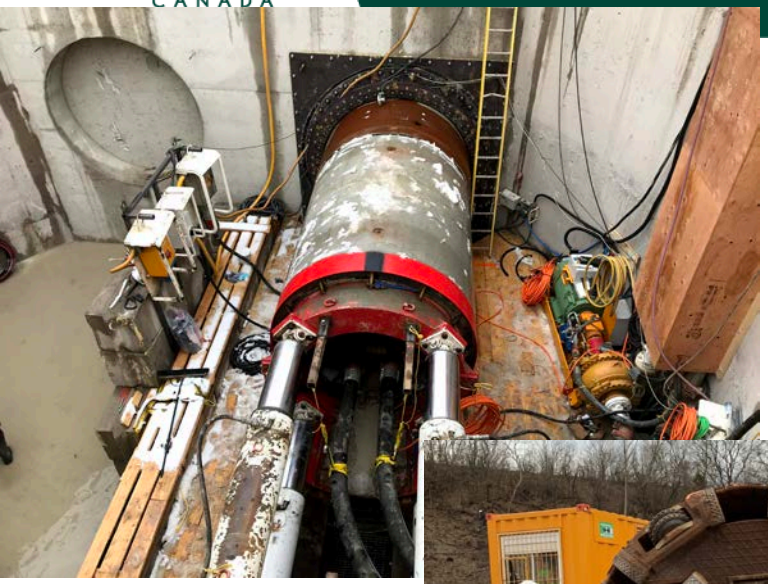
Mud Creek EA completed in 2017:

- Recommended upsizing CN culvert and channel reconstruction.
- Goal to improve flood conveyance at Oxford and reduce flood risk to property.

Developments hinging on SWM project:

- 54 ha of infill development proposed

CN Culvert Upgrade



Tunnel Boring Machine (TBM) installation Twin 2.2m dia. Culvert

JACOBS WARD & BURKE

Channel Reconstruction

March 25, 2020

June 30, 2022

Mud Creek Channel Restoration
Contractor: *J-AAR Excavating*
Consultant: *Jacobs/Matrix Solutions*

Channel Reconstruction

Mud Creek Natural Channel Reconstruction

Matrix Solutions Inc. ENVIRONMENT & ENGINEERING

JACOBS

J-AAR EXCAVATING

Drone Footage

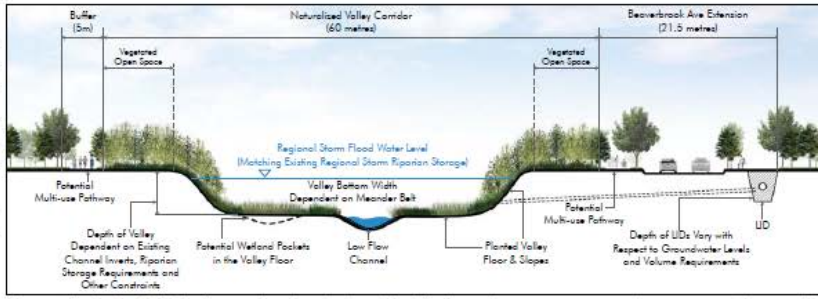
Future Infill Subdivision

The Municipal Infrastructure Group Ltd. (TMIG) was retained in 2016 by Sam Katz Holdings Limited to provide a solution for the uncontrolled flooding that occurs on the subject lands, at 323 Oxford Street West, with the intention that the proposed solution would be appended to the final Mud Creek Subwatershed Class Environmental Assessment. TMIG has been coordinating their modelling, calculations and proposed solution with City staff and their consultant team throughout the duration of this exercise.

TMIG Memorandum "Conceptual Design Of Mud Creek Re-Alignment On The ESAM Lands For Informing The Mud Creek Subwatershed Class Environmental Assessment"

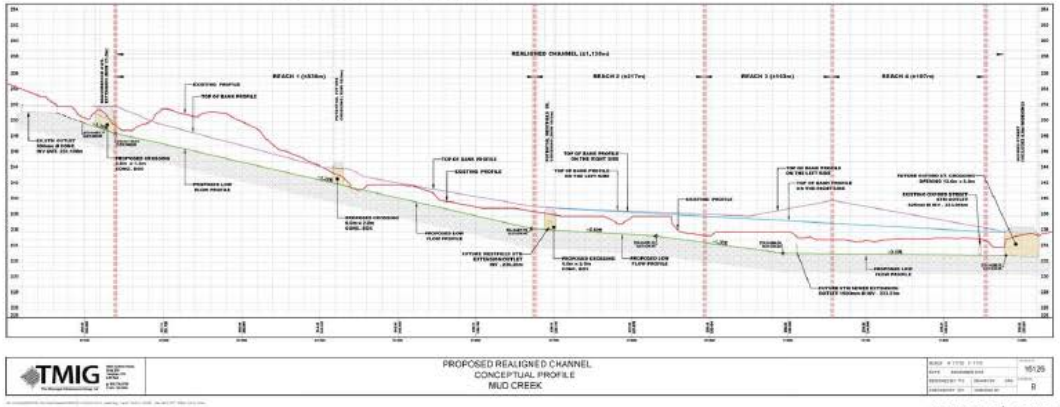
The memorandum prepared by TMIG addresses design considerations such as the Beaverbrook Avenue Extension, potential local roadway crossings, the preferred alternative of the Mud Creek Subwatershed Class Environmental Assessment, existing culverts and storm sewers, storm event peak flows, meander belt width, and riparian storage. The proposed corridor provides opportunities for an enhanced creek and vegetation system, and comprises the following areas:

Features of the Defined Valley & Creek Corridor	Area (ha)
Low Flow Channel	0.58
Valley Floor	2.21
Embankment (max 3:1 side slope)	1.57
Vegetated Open Space	1.66
Total Creek Corridor	**6.02**
5 Metre Buffer with Multi-Use Path (located outside of the valley corridor)	0.42
Total Creek Corridor + Buffer	**6.44**

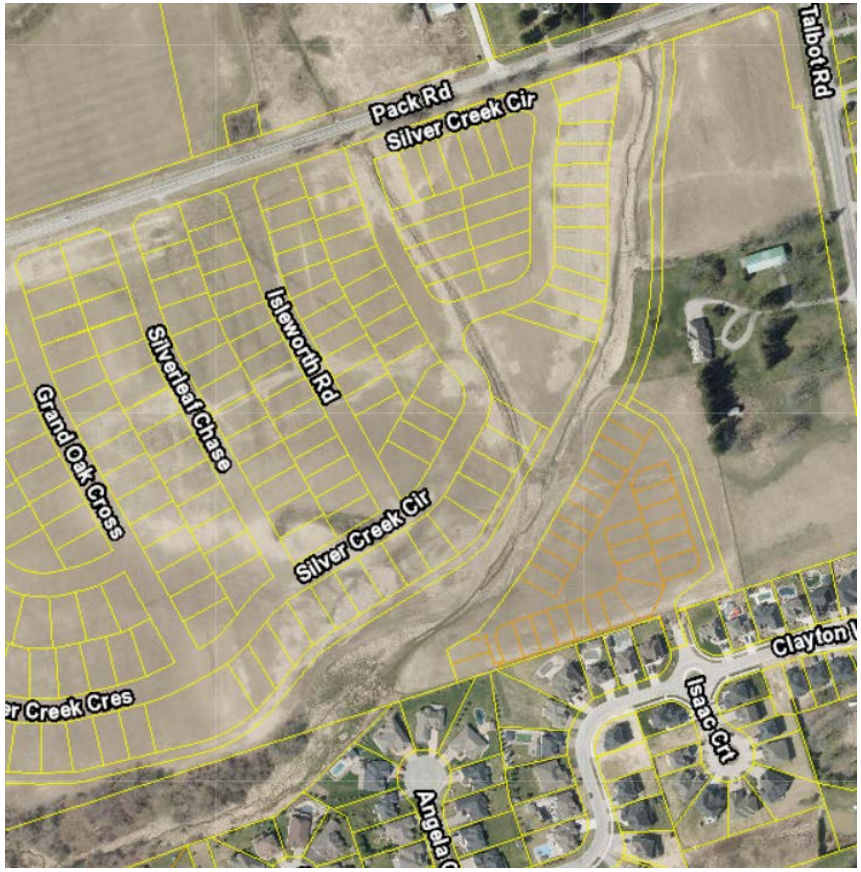


Where possible, Site Plans for blocks adjacent to the Mud Creek valley corridor shall orient outdoor amenity space adjacent to the valley corridor.

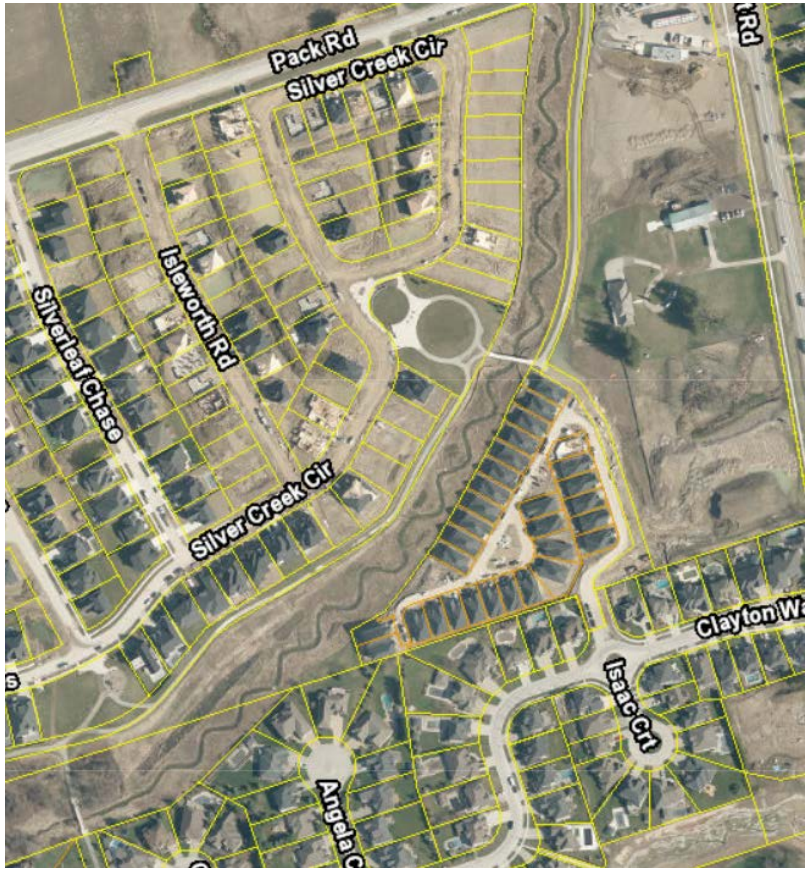
Conceptual Creek Alignment and Restoration Opportunities



Project 2: Silverleaf Subdivision (2017)



Predevelopment (2016):
Agricultural field with farm drain



Post-development (2017):
40m wide Complete Corridor

Silverleaf Subdivision

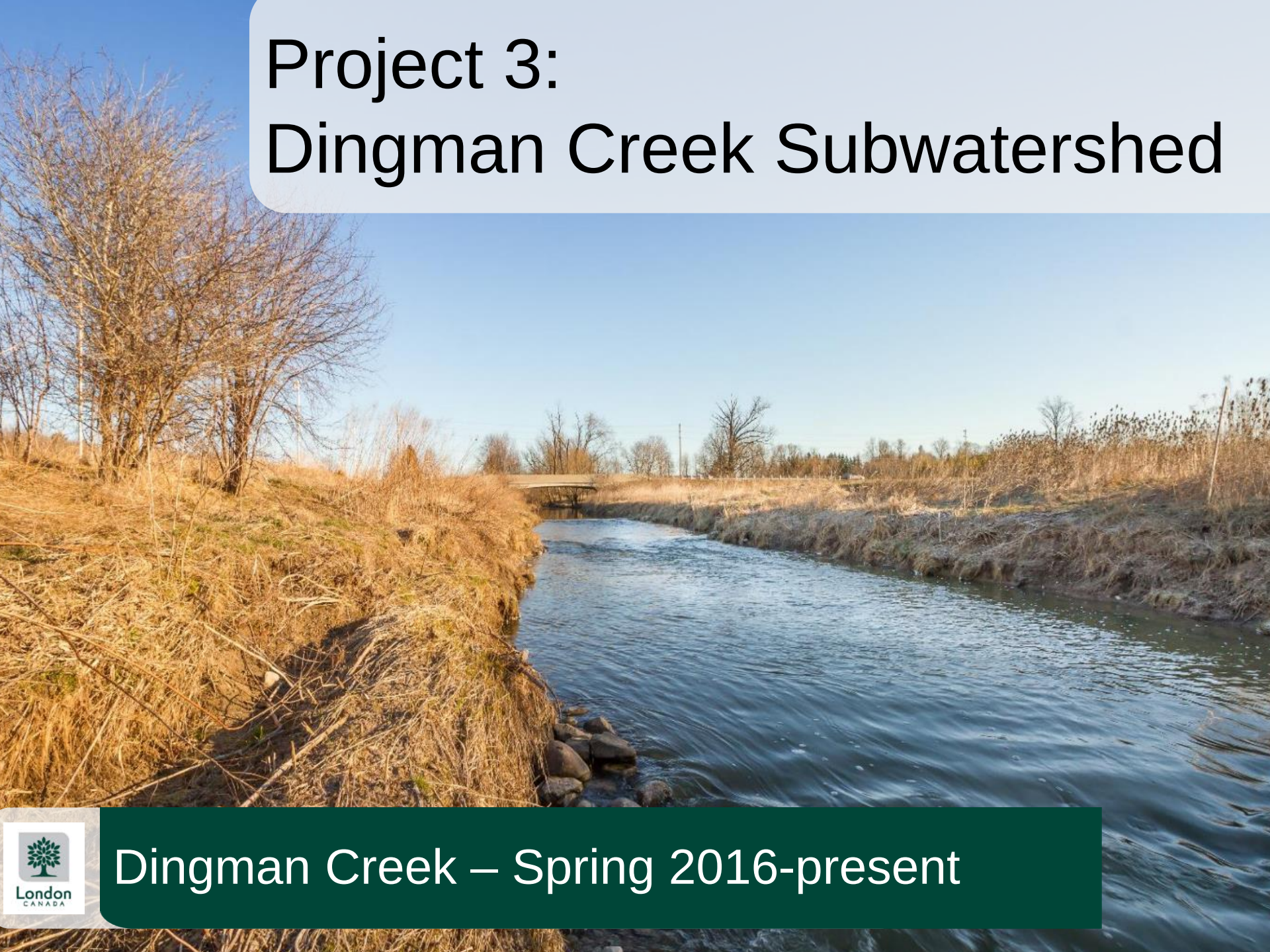
Silverleaf Natural Channel Design

Stantec

DEKAY CONSTRUCTION LTD. Since 1962

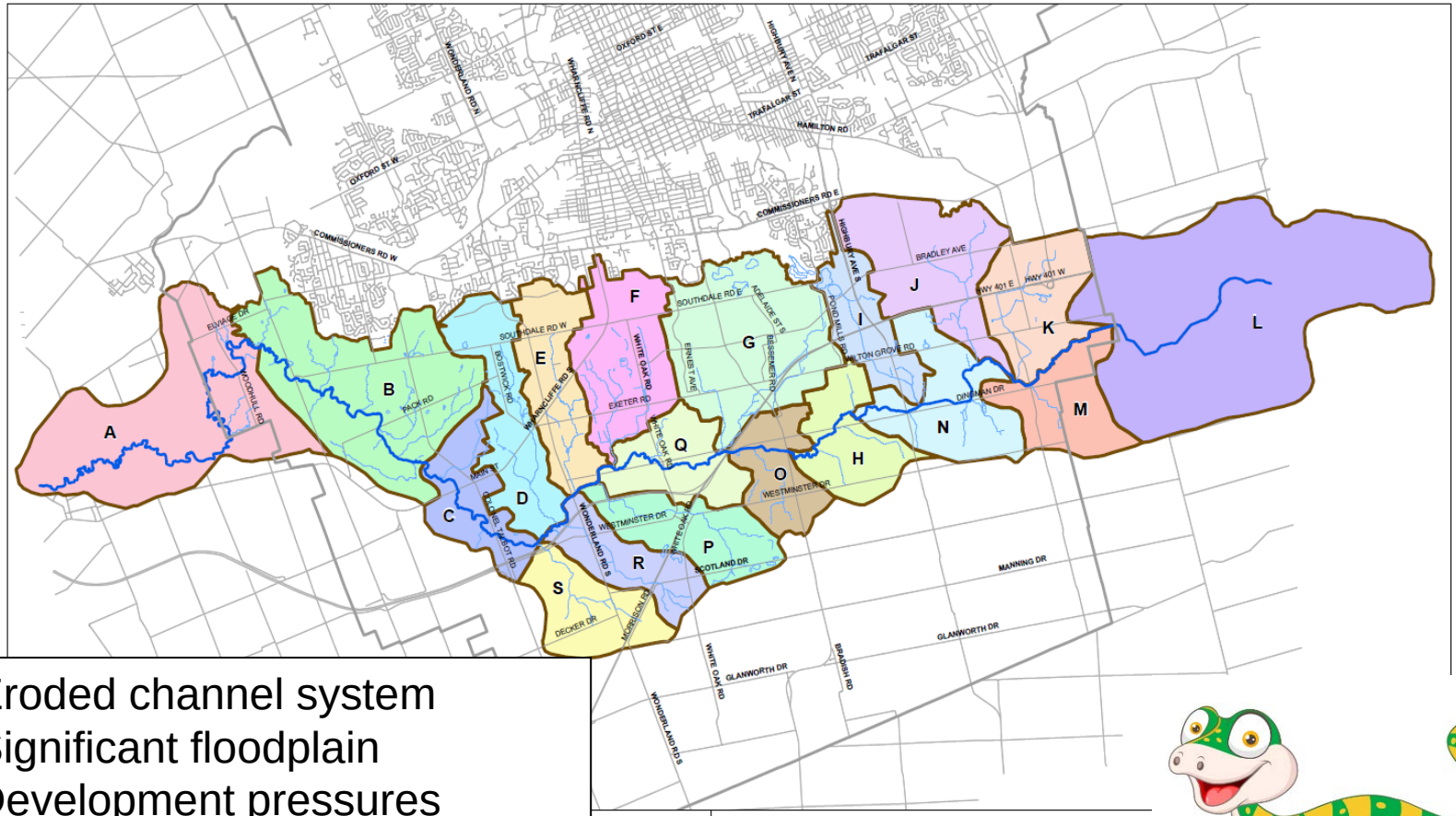
York DEVELOPMENTS

Project 3:
Dingman Creek Subwatershed

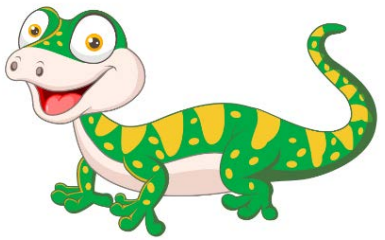


Dingman Creek – Spring 2016-present

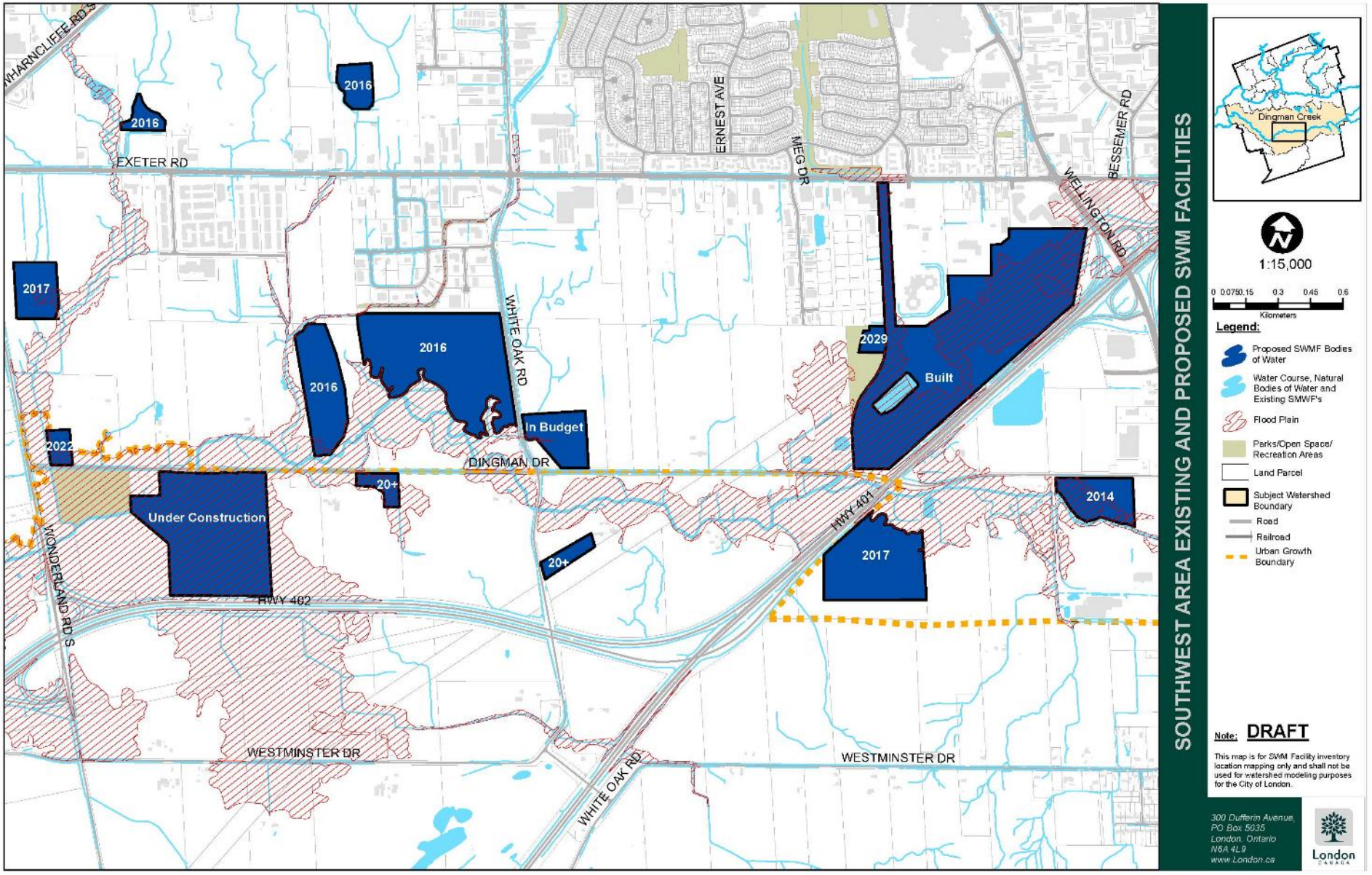
Dingman Creek Subwatershed



- Eroded channel system
- Significant floodplain
- Development pressures
- Several EAs completed
- Natural heritage features

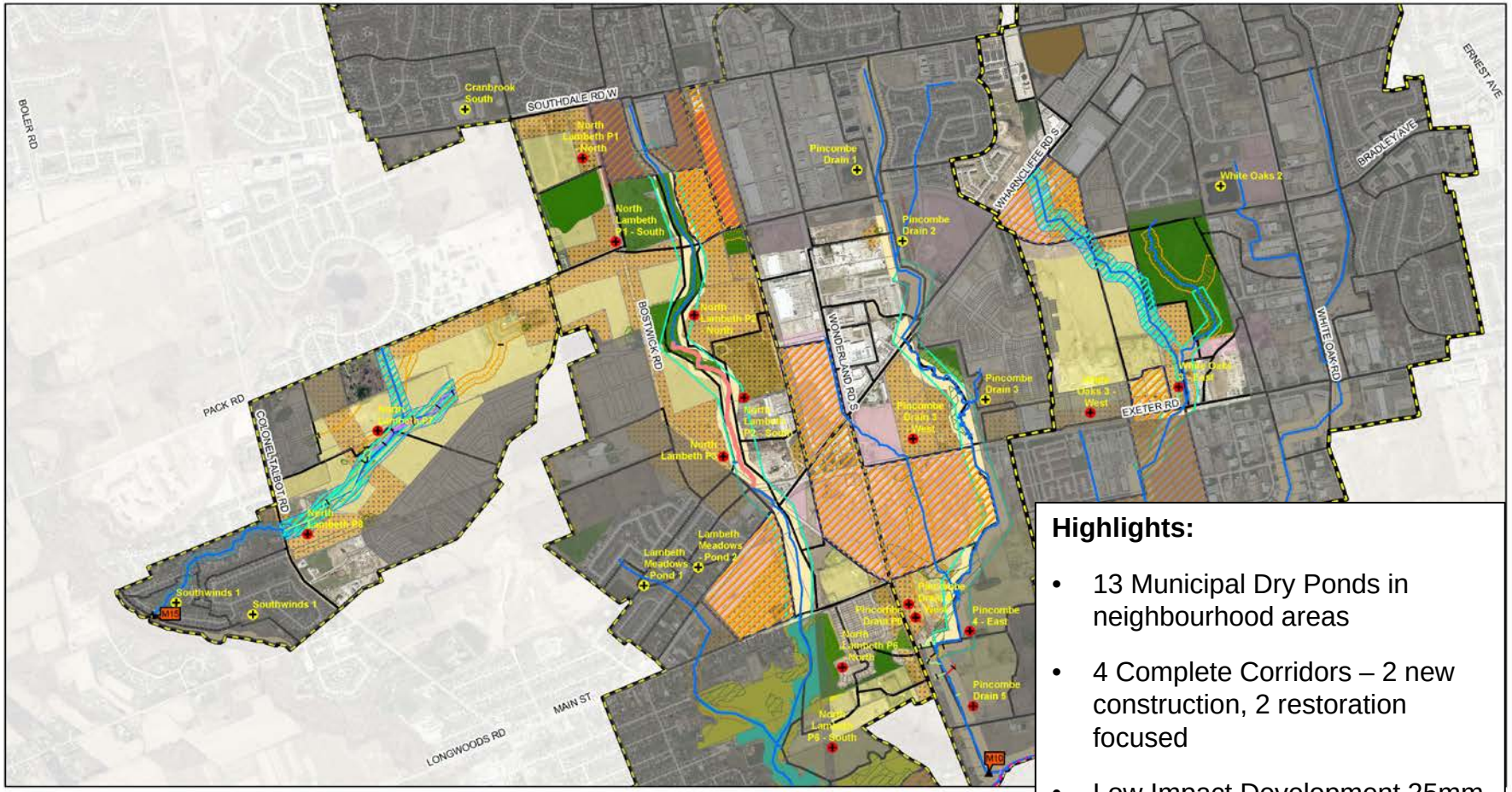


https://getinvolved.london.ca/DingmanCreek



Original Plan = Dingman SWM ponds a.k.a. “Land of Lakes”

Dingman Stage 1 Lands: 2021 Strategy



Highlights:

- 13 Municipal Dry Ponds in neighbourhood areas
- 4 Complete Corridors – 2 new construction, 2 restoration focused
- Low Impact Development 25mm capture for new development
- Permanent Private Systems on multifamily/commercial lands

Project 3A: Southwinds Channel

Flood Control Storage for North Lambeth P7 + P8 to be provided within a Complete Corridor. (See Section 7.1.3)

Reach 1 Fluvial Geomorphic Assessment and Erosion Hazard assessment to be completed prior to channel restoration.

Stream Resoration Including Channel Reconstructionand Riparian Revegetation (See Figure 7.6)

Reach 2 minimum generic meander belt of 30m applied based on protection status of Creek.

PACK RD

COLONEL TALBOT RD

North Lambeth P7

North Lambeth P8

Southwinds 1

Southwinds 1

M15

Planning Implementation

1. Corridor-First “Block Plans”

- Initial Proposal Review – Pre-Application Consultation;
- Environmental Impact Study, Stormwater Management Studies, and conceptual plans;
- Define Parks, Open Space, and Stormwater lands and developable limits.

2. Establish Lot Fabric for Draft Plan

- Develop Draft Plan of Subdivision built around the Block Plan

Changes to the Subdivision Approval Process

- Complete corridor is the foundation of subdivision planning.
- Adjustment to traditional approaches to land development that is environment and recreation focused.
- Additional time may need to be factored into the approvals process.

Benefits

Climate Change Adaptation

- Manages overland and stream flows
- Connected Ecological habitat

Public Benefit

- Contributes to park and pathway system
- Accessible natural space for outdoor recreation and active mobility
- Supports mental health of residents

Challenges

Timing and Land costs:

- EIS, SWM Study, and parkland needs to be accepted before Draft Approval to establish corridors
- Land acquisition

Unresolved policy updates:

- Regulatory floodplain updates
- MNRF Technical Guide update
  - Climate Change
  - Stormwater Management Facilities

It takes time!

Son: 15 months old in Fall 2015

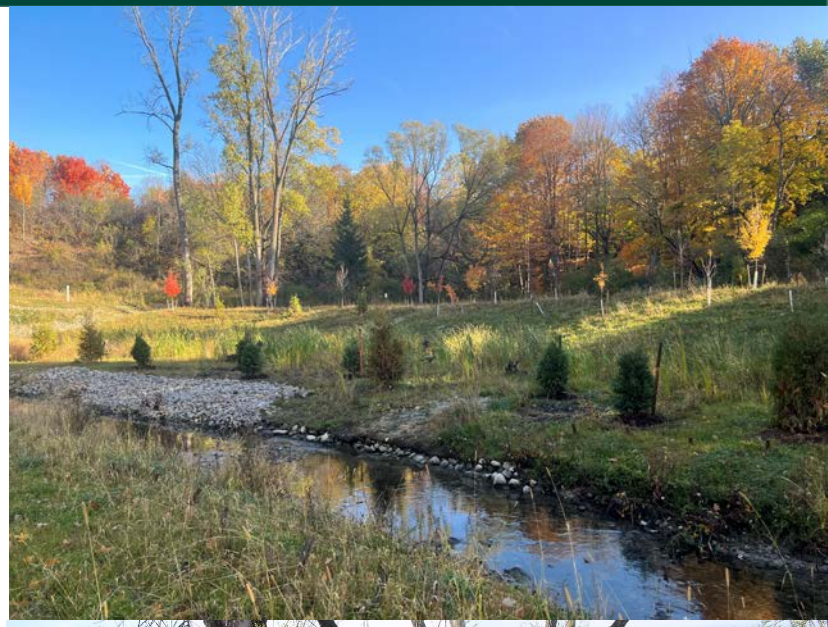
Daughter: Born 2017

- 5 and 8 years old

2022

Next Steps

- Implement Complete Corridor Strategies identified by two EAs
- Finalize larger corridor strategy for Dingman Creek
- Confirm floodplain updates
- Adopt implementation policy for complete corridors
- Construct works in accordance with timing of Development Charges study



Thank You!

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Dingman Creek Sunrise

Photo Credit: Paul Roedding Photography

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