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TRIECA 2018

SELECTING SITE AND CONTEXT APPROPRIATE LOW IMPACT DEVELOPMENT (LID) OPTIONS

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OVERVIEW

An understanding of site characteristics and context is essential to:

- **Expedite the Selection of appropriate LID options**

- **Optimize the performance of selected LID options**

BACKGROUND

City of Toronto

Green Streets Technical Guidelines

Project Goal:

To develop a technical guideline document that would direct the integration of green infrastructure into Toronto's streets addressing for planning, design, construction and O&M purposes.

City of Toronto

Green Streets Technical Guidelines

Key Objectives:

- Integrate LID options into a diverse and complex portfolio of streets

- Optimize efficiency of inter-departmental decision-making process

- Improve success of LID installation in streets

Premise

Process for selecting appropriate LID options must:

- **Be efficient and practical**

- **Simplify the complexity caused by the diversity of street types and situations**

- **Utilize readily available data and information**

- **Ensure replication in outcomes**

Research + Invention Process
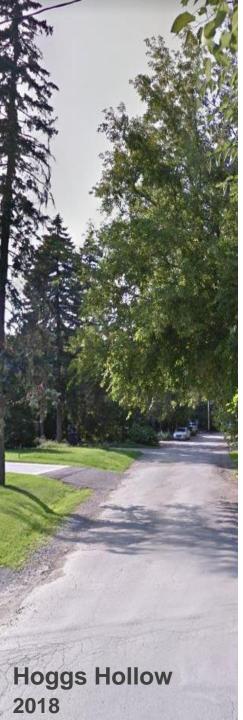
- **Precedent Review** | **Municipalities throughout America**

- **World-Wide Research** | **100+ LID Options**

- **Interdepartmental Interviews** | **27**

- **Policy Review** | **Foundational Documents**

  - **Toronto Green Standard (TGS)**

  - **CVC / TRCA LID Guidelines**

  - **City of Toronto Official Plan + OPA 262**

  - **Toronto Complete Streets Guidelines**

  - **Precedent Manuals – Reports (29)**

Lessons Learned

- **Site conditions influence efficiency of LID options**

- **Streets are complex -** Infrastructure, urban context & typology are key determinants

- **LID option selection methodology is necessary to optimize efficiency and performance**

An understanding of the characteristics of the street and its context are essential.

Site + Context

What do we need to know?

Not everything … Only the things that have an influence on LID option selection, integration and performance.

Hoggs Hollow 2018

Elmhurst Dr. Rexdale, Etobicoke c. 1960

Downtown Toronto 2017
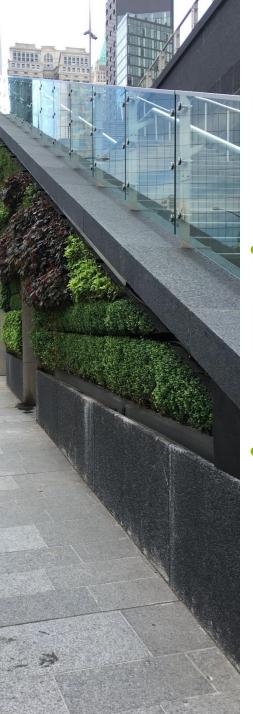
Eglinton Ave. & Yonge St. 2017

Key Selection Parameters

1 | **Street Typology –** Toronto 'Complete Streets' Document

2 | **Applications**

3 | **Physiography**

4 | **Open Space Context**

5 | **Storm Sewer Infrastructure**

6 | **Transit Infrastructure**

7 | **Utility Infrastructure**

8 | **Known Flooding**

9 | **Urban Forest**

10 | **Watershed Context**

11 | **Operations and Maintenance**

Toronto Green Streets Technical Guidelines Green Infrastructure (GI) Selection Tools

- **GI Selection Tool**

  - Utilizes the eleven parameters to determine optimal GI options from a list of 32 possibilities

- **GI Vegetation Selection Tool**

  - Recommends appropriate plant material species for each GI option
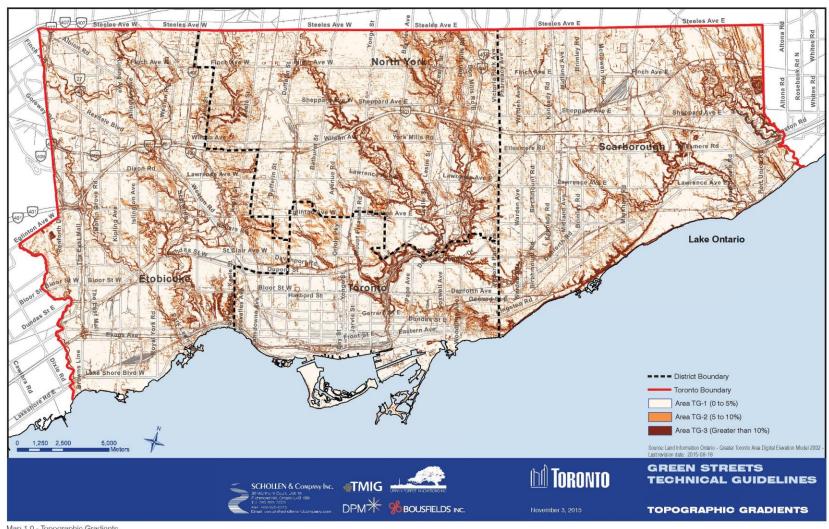
Selection Parameters

City-wide reference maps that address:

- **Topographic Gradients**
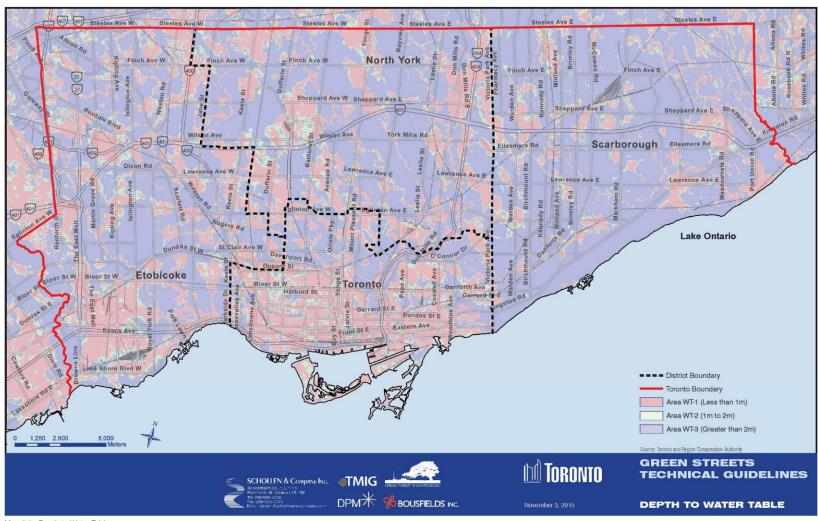
- **Depth of Water Table**

- **Depth of Bedrock**

- **Soil Permeability**

- **Natural Heritage System**

- **Known Areas of Soil Contamination**

- **Subway, Streetcar and LRT Lines**

- **Major Utility Corridors**

- **Combined and Separated Sewers**

- **Proximity to Flooding Areas**

- **Stream Restoration**

- **Flood Risk Areas**

TOPOGRAPHIC GRADIENTS

Map 1.0 - Topographic Gradients
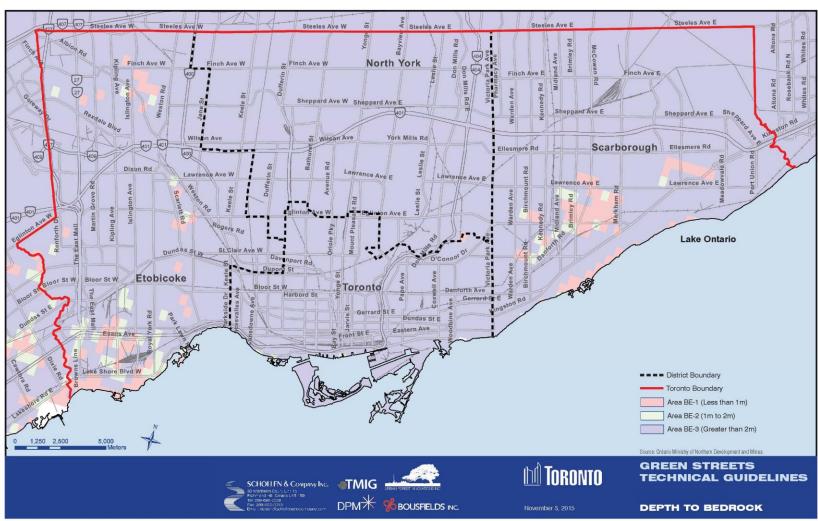
DEPTH OF WATER TABLE

Map 2.0 - Depth to Water Table
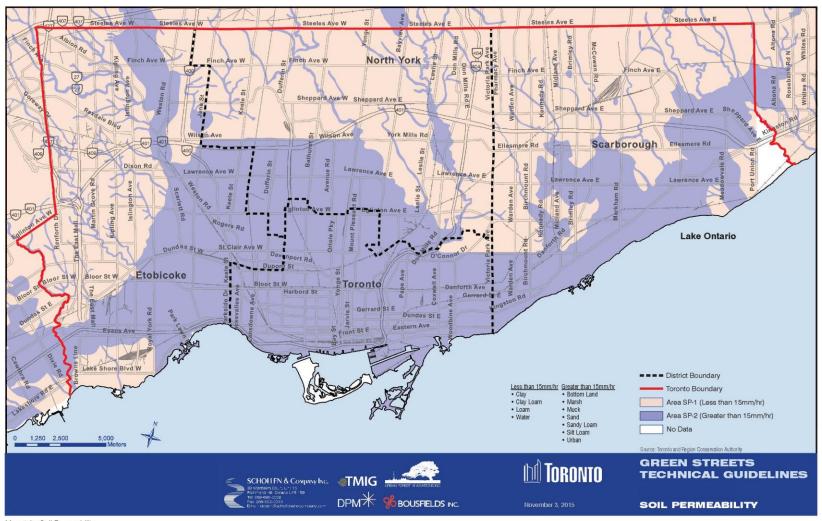
DEPTH OF BEDROCK

Map 3.0 - Depth to Bedrock
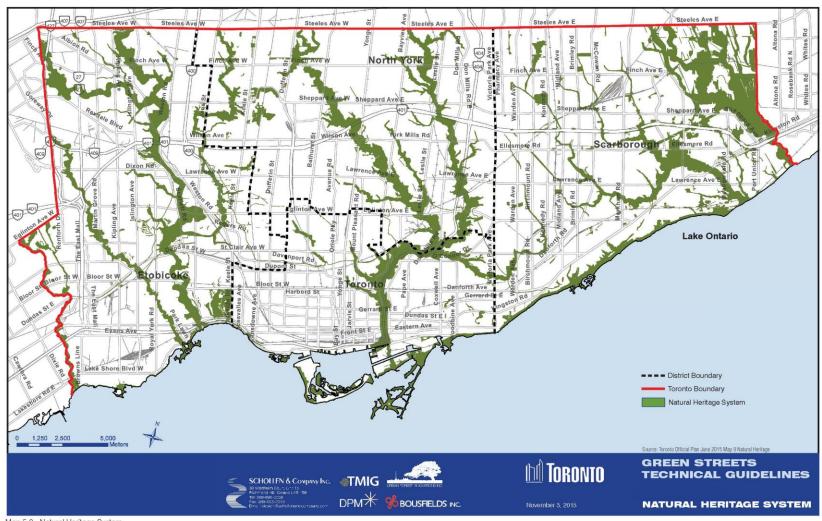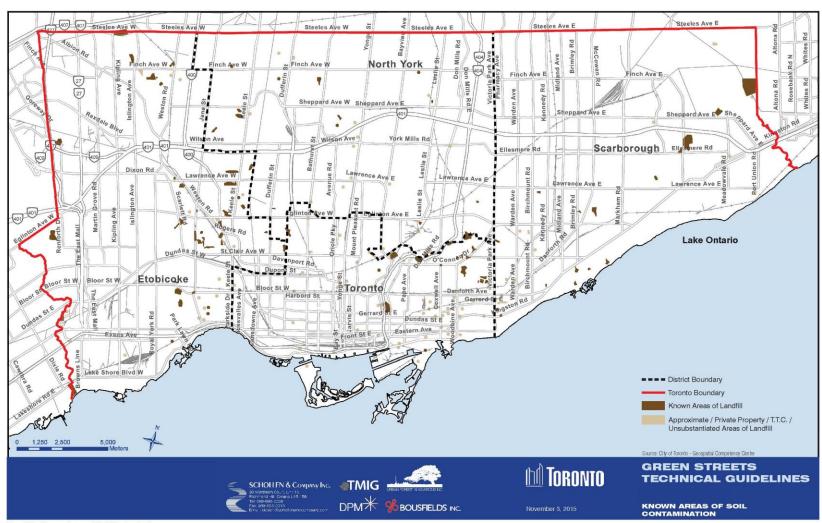
SOIL PERMEABILITY

Map 4.0 - Soil Permeability
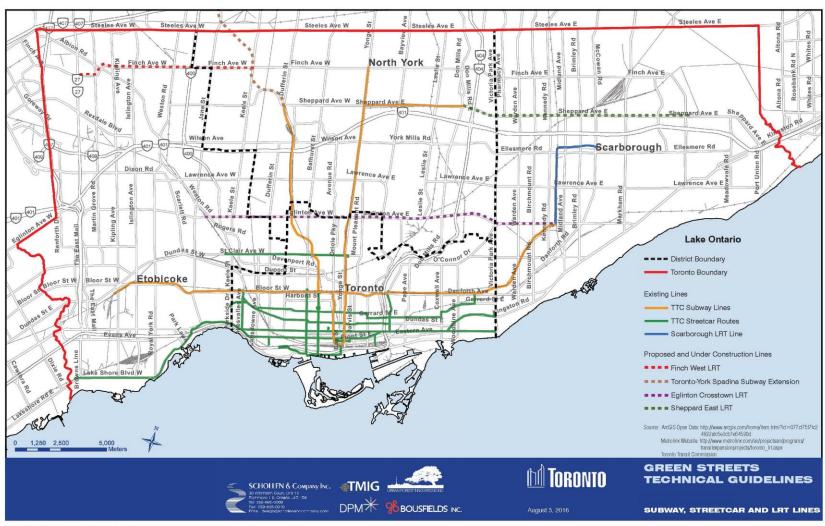
NATURAL HERITAGE SYSTEM

Map 5.0 - Natural Heritage System
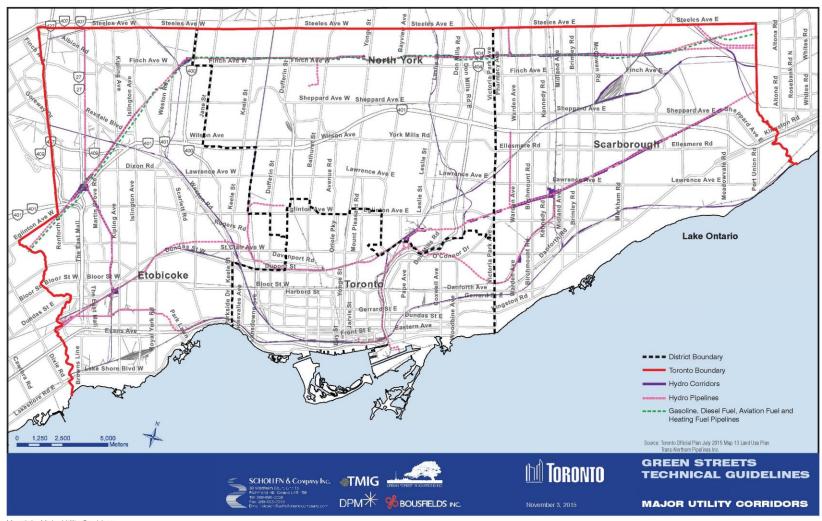
KNOWN AREAS OF SOIL CONTAMINATION

Map 6.0 - Known Areas of Soil Contamination

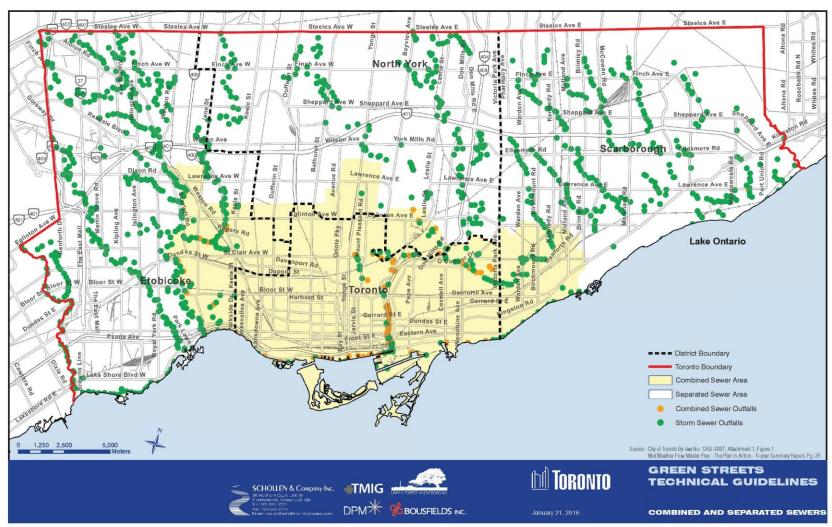# SUBWAY, STREETCAR AND LRT LINES

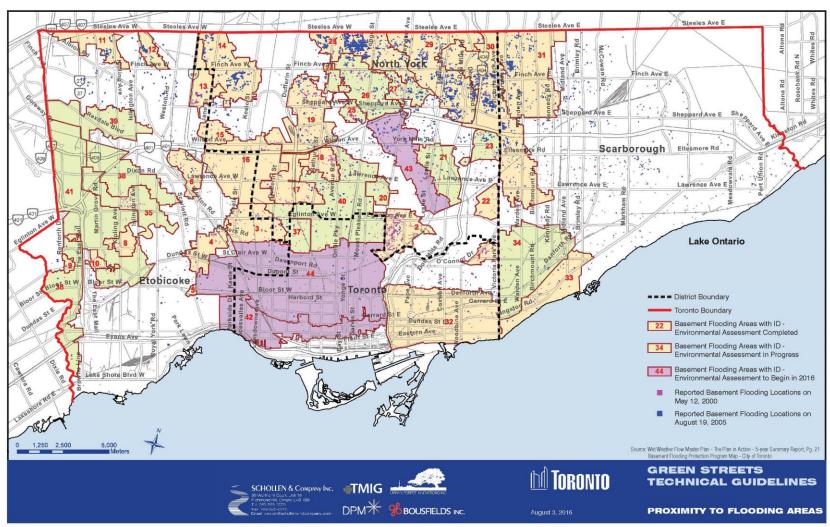Map 7.0 - Subways, Streetcars and LRT Lines

MAJOR UTILITY CORRIDORS

Map 8.0 - Major Utility Corridors
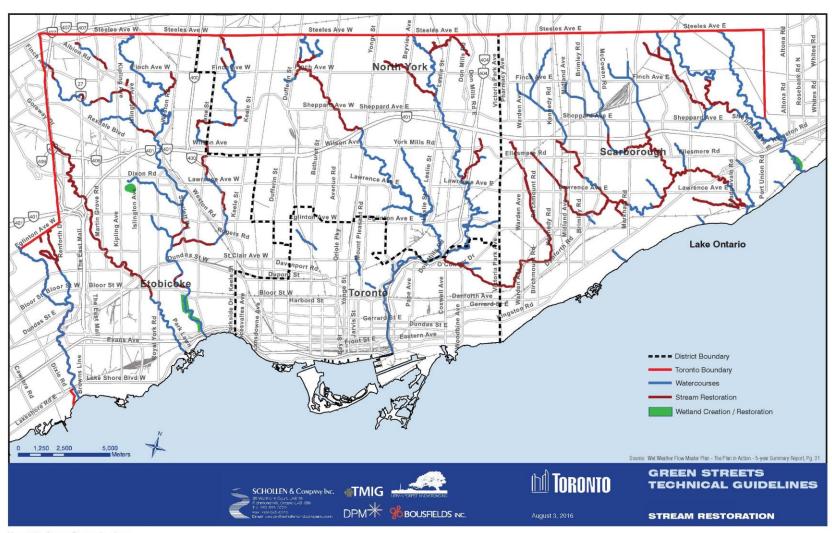
COMBINED AND SEPARATED SEWERS

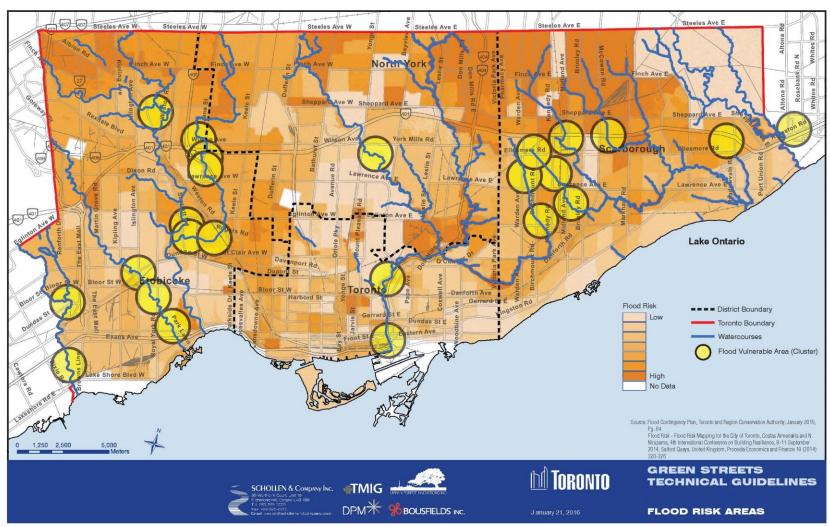Map 9.0 - Combined and Separated Sewers

PROXIMITY TO FLOODING

Map 10.0 - Proximity to Flooding Areas

STREAM RESTORATION

Map 11.0 - Stream Restoration Areas

FLOOD RISK AREAS

Map 12.0 - Flood Risk Areas

Selection Process

GI Selection Tool utilizes inputted data from the reference maps to determine optimal LID options based on site characteristics and context.

- Can be applied at macro and micro scales
- Recommends design variations to address specific parameters
- Unbiased, fact-based decisions-making
- Adaptable to other Municipalities

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