



Toronto Green Streets: Building a Resilient City through Green Infrastructure



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City Planning*

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Toronto Water*

March 1, 2016



PLANNING A GREAT CITY, **TOGETHER**

'Next Generation Infrastructure'

Integrated City Building with Green Infrastructure /
Watershed / **Biodiversity** / **co-benefits...**





'Next Generation Infrastructure'

Integrated City Building with Green Infrastructure /
Watershed / **Biodiversity** / **co-benefits...**

ReNew September/October 2014

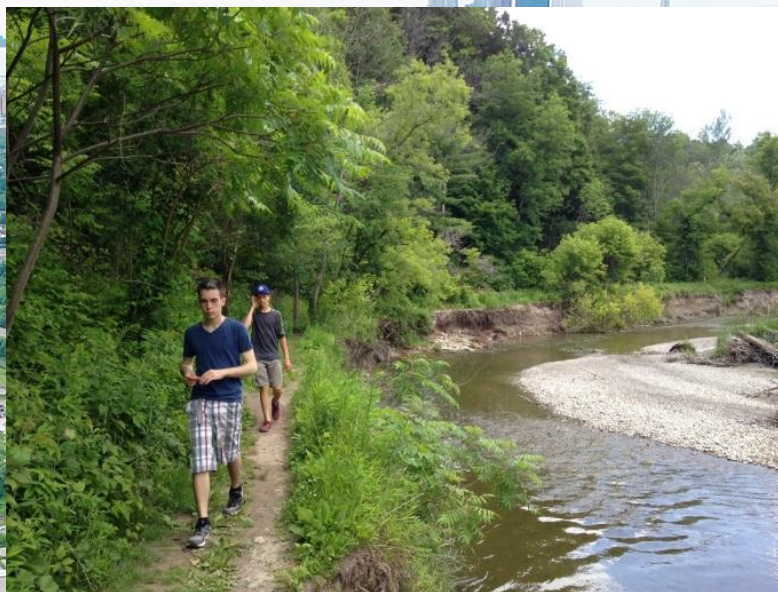
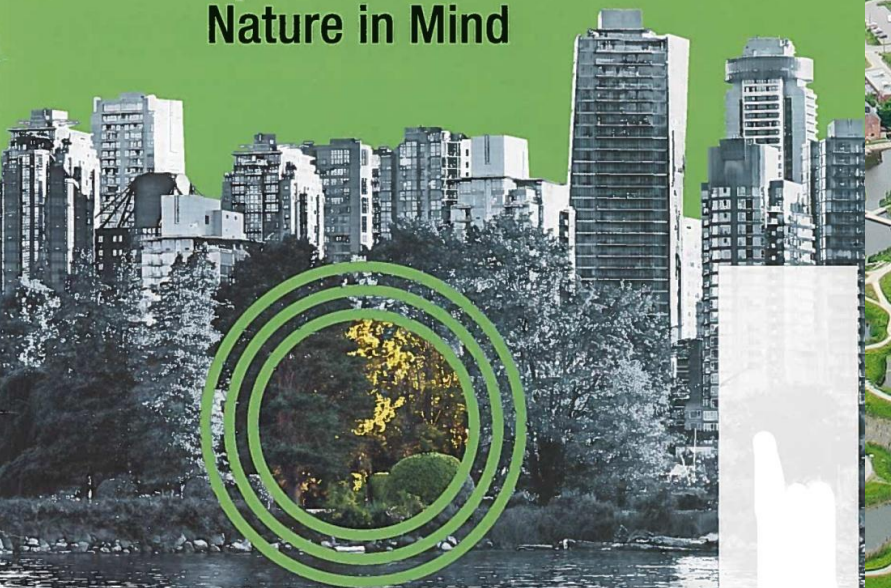
C A N A D A
The Infrastructure Magazine

+ A Guide to
Project
Prioritization

+ The Politics of
Mega-Projects

ALL ABOUT THE GREEN

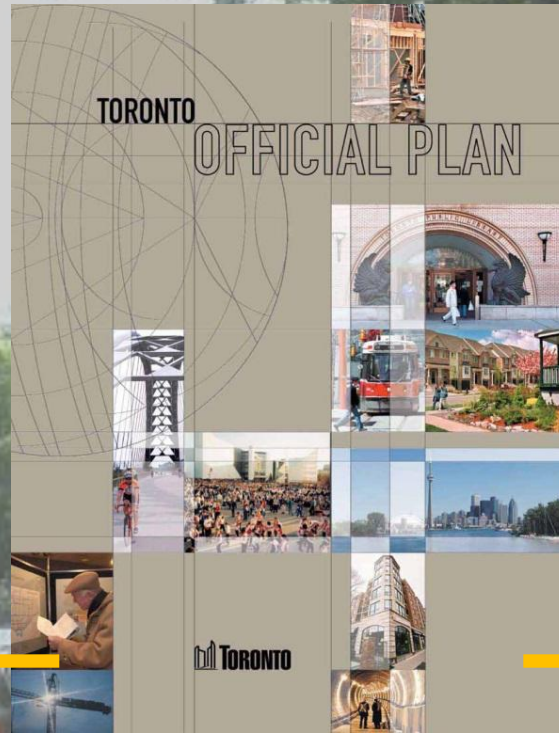
Building Urban
Spaces with
Nature in Mind



City of Toronto Official Plan



Trees



Stormwater



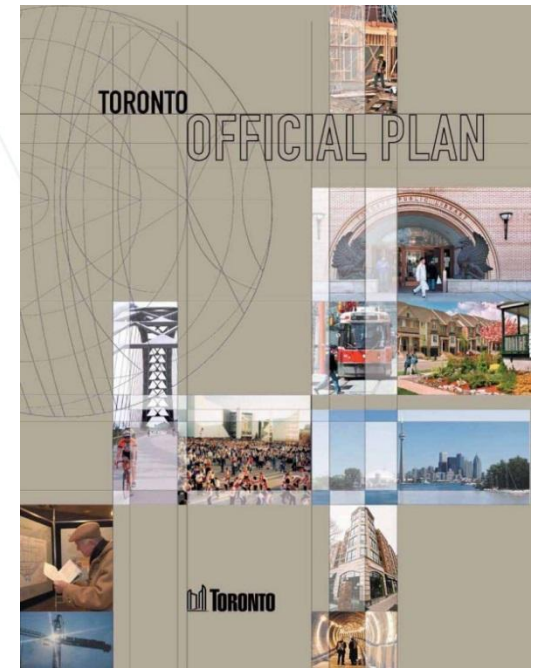
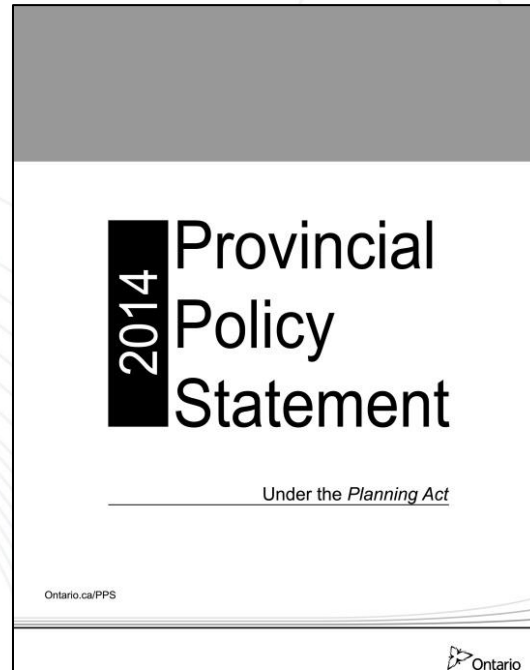
Policy Drivers

Min. of Municipal
Affairs & Housing

2014 PPS Definition:

“...natural and human-made elements that provide ecological and hydrological functions and processes”

- ***green roofs***
- ***‘low impact development’ stormwater management systems***
- ***street trees, urban forests***
- ***parklands***
- ***natural heritage features and systems***





'Lessons Learned' City Interviews

(Spring - Fall, 2015)

Interviews with : NYC, Philadelphia, Portland, Seattle, Washington DC.... etc.

COMMON FINDINGS:

- Strong guiding GI strategy/ planning objectives.
- All programs define GI broadly
- GI independent of Complete Sts. Guidelines
- Interdepartmental relationship-building
- Located within Water/SWM divisions
- Driven by water quality / CSO objectives.
- Water division initiates majority of projects
- Support from Council/Champions
- Continually evolving



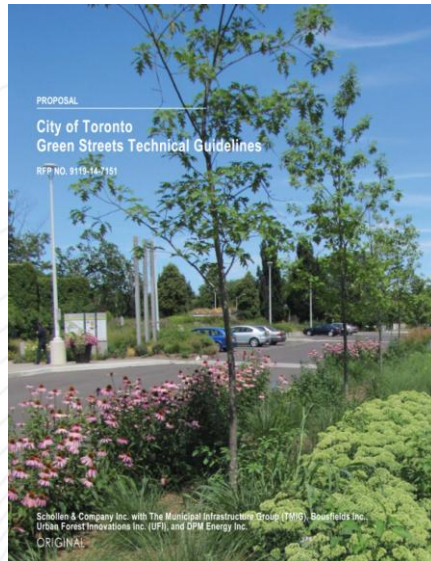
Program Strategy

Implementation

Planning



Foundational Work / FORUM



Standards



Permeable Concrete Interlocking Paver Staff Training

Cross-disciplinary



Ontario Association of
Landscape Architects

[Home](#) [Profession](#) [Membership](#) [News & Events](#) [Awards](#) [Ground Quarterly](#) [Find a LA](#) [Job Listings](#) [Contact](#) [Men](#)

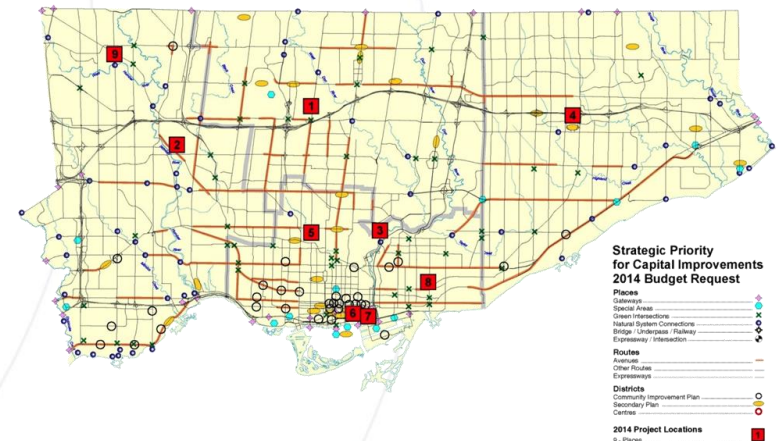
Events

CEC Workshop: Properly Construct LID Stormwater Management



Toronto, ON
November 6, 2015

Knowledge/Skills



Projects





Sustainable Sidewalk Queensway Pilot Project

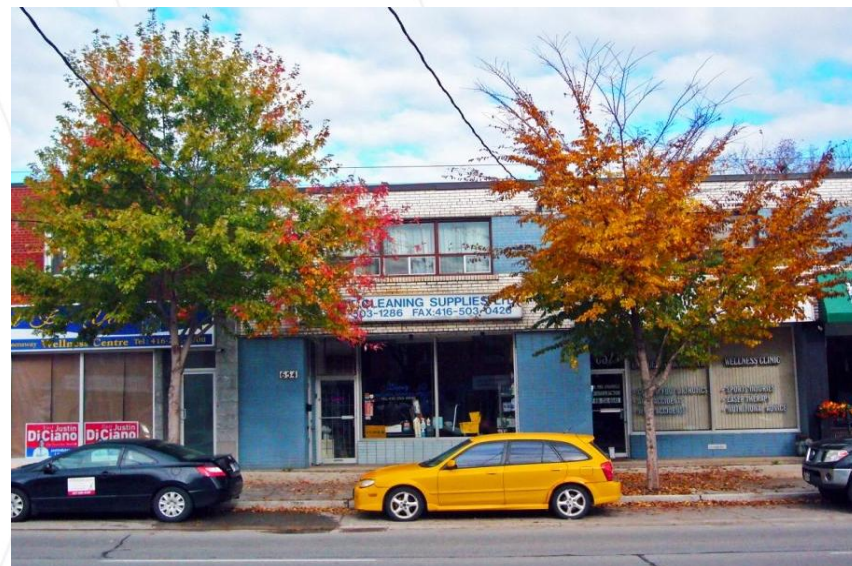
(Spring - Fall, 2015)

Originally anticipate that discernible and conclusive results may not be available for years. However, there are signs of very healthy growth at this time.



Without Water

(Fall, 2014)



With Water



Coxwell Av/Fairford Av Bioretention Parkette

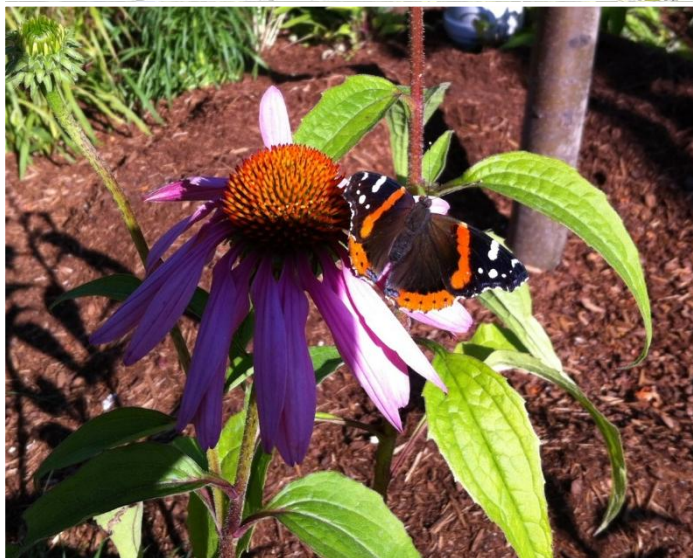


Project Successes/Lessons





Project Successes/Lessons



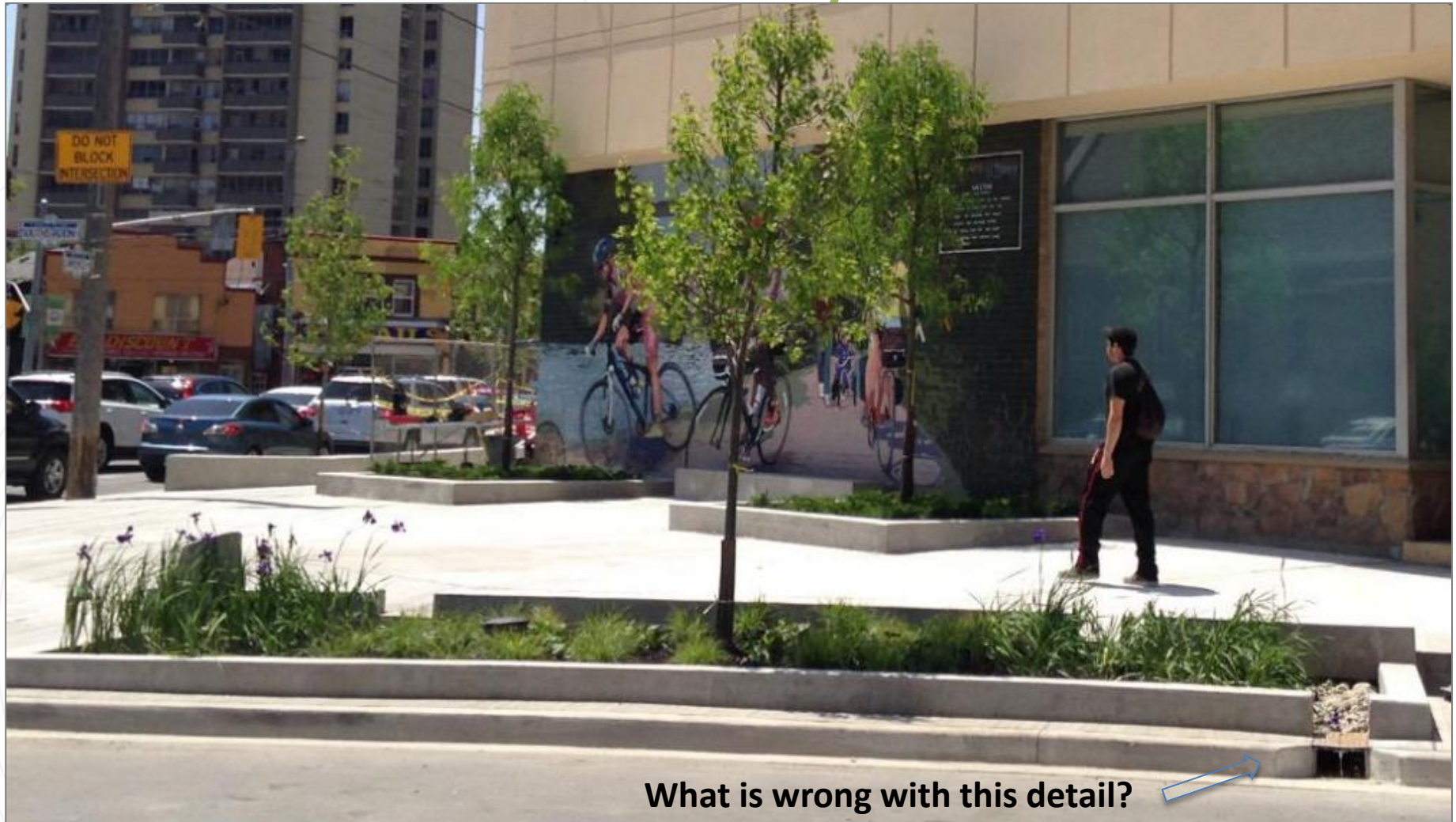


'Policy on the Ground'





'Policy on the Ground'



What is wrong with this detail?



TOGreen Streets @TOGreenStreets · Jun 5

New [#bioretention](#) [#tree](#) planting beds at South Station St. [@CityLab](#) [@TRCA_News](#) [#greeninfrastructure](#)



1



1





'Policy on the Ground'



Stones are
too high

Instead of smooth
returns the curbs
were cut



Green Streets Tech. Guidelines



Part I

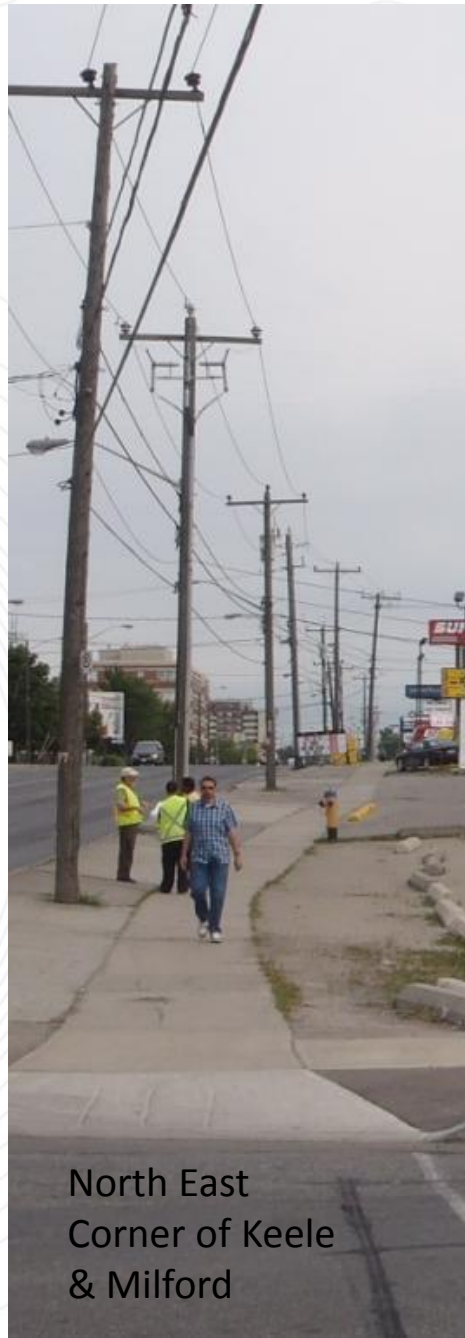
Foundation
Framework

Part II

Exploration/Evaluation
of Opportunities

Part III

Selection Tool
Tech. Guidelines
O & M Plans



North East
Corner of Keele
& Milford



From the Greening
Surface Parking Lot
Guidelines



Collaborative Approach

CORE GROUP

Toronto Water / City Planning

(3)

WORKING GROUP

City Planning / Toronto Water
Parks, Forestry & Recreation
Transportation Services
Engineering & Construction Services

(22)

ADVISORY GROUP

(in progress...)

TRCA, CVCA
MOE
Universities

BIA Office
TTC
TPA

NGOs

Utilities

Industry

(20+)

A photograph of a tree-lined residential street in Toronto. The street is paved and has a blue recycling bin on the right side. A stop sign is visible on the left. The trees are lush green, and the scene is bright and sunny.

CITY OF TORONTO

GREEN STREETS TECHNICAL GUIDELINES

INFORMATION SESSION

Schollen & Company Inc.
with
The Municipal Infrastructure Group (TMIG)
Bousfields Inc.,
Urban Forest Innovations Inc. (UFI)
DPM Energy Inc.

October 20, 2015

Project Overview:

“Green Streets” initiatives are aimed at:

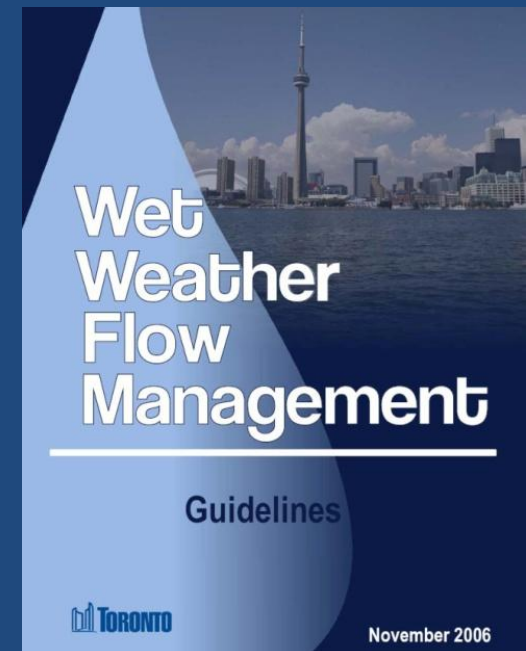
- Enhancing the extent and longevity of the urban forest
- Mitigating urban heat island effect
- Managing stormwater runoff to mitigate flooding and enhance water quality
- Promoting infiltration to sustain shallow groundwater systems and maintain interflow patterns
- Enhancing air quality
- Moderating micro-climate
- Conserving / generating energy

The integration of potential ‘Green Streets’ initiatives into Toronto’s streets will necessitate a change in how streets are designed, constructed, operated and maintained.

Green Streets Guidelines:

Key Components:

- Background / Content
 - Foundation – Toronto Green Standards (TGS)
 - Wet Weather Flow Management Master Plan and Guidelines (WWFMMP)
 - City of Toronto Official Plan
 - Linkages – Complete Streets
 - Streetscape Manual
 - Urban Forest Strategy



Green Streets Guidelines:

Key Components:

➤ Selection Tool:

Interactive 'excel' based tool that will identify the most appropriate 'Green Street' solutions for a specific application.

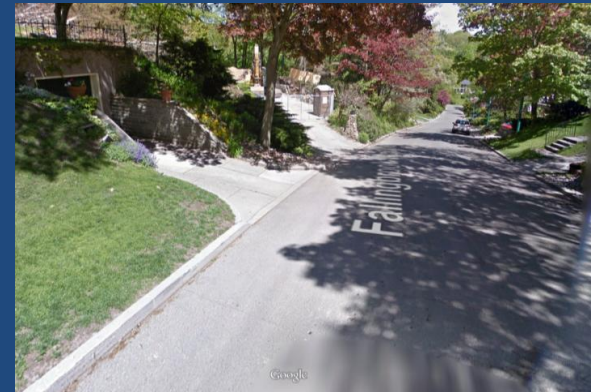


Green Streets Selection Tool:

Screening Level:

➤ Screening Level Parameters:

- Physiography
- Topography
- Complete Streets Typology



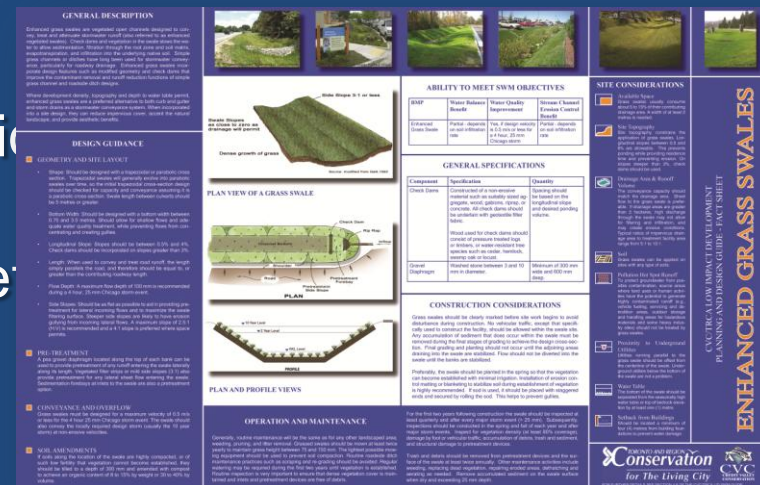
“Complete Streets” Typologies

Proposed Street Type	Place					Link						Examples by ROW Width				
	Where in the city is the street?		What are the land uses along the street?	What civic role does the street play in the city?	Streetscape Manual	What is the volume of people the street must serve?				What is the network role of the street?	Road Classification	35 to 45m+	25 to 34m	20 to 24m	15 to 19m	12 to 15m
						Pedestrian	Transit	Bicyclists	Automobile (Drivers and Goods)							
	• Location	• Intensity and type of street level activity	• Informs understanding of uses that should be served and accommodated.	• Historical, cultural, physical and/or functional characterisitics. • Informs material choices, details and design qualities.	Main Streets • Special Major • Existing Main • Emerging Main Green Streets • Scenic Streets • Intermediate Streets Special Areas						• Arterial (Major, Minor) • Collector • Local • Other • Laneway • Park Road					
8. Mixed Use Connector	• Throughout city	• Low	• Mixed Use • May have some Residential • Open spaces	• Low	• Intermediate Green Streets	• Low	• Med to High • Primarily surface	• Low	• High	• High for all modes	• Major Arterial • Minor Arterial • Collector		Bayview South			
9. Residential Connector	• Throughout city	• Low	• Primarily Residential • Open spaces	• Low	• Intermediate Green Streets • Scenic Green Streets	• Low	• Med to High • Primarily surface	• Low	• High	• High for all modes	• Major Arterial • Minor Arterial • Collector	Warden	Burhamthorpe	Doris / Beecroft		
10. Scenic Street	• Green Spaces	• Low	• Green Spaces	• Medium • Views and vistas	• Scenic Green Streets	• Low	• Low to Med	• Low to Med • Primarily Recreational	• Medium to High at peak hours	• Med to High for cars • Low to med for others	• Major Arterial • Minor Arterial	Eglinton West	Keele / York U	Rosedale Valley Rd		
11. Park Street	• Green Spaces	• Low • Recreation	• Green Spaces	• Medium	• N/A	• Low to Med • Recreational	• Low	• Med • Recreational	• Low	• Low	• Park Road			Humber Bay Park Rd	Colborne Lodge Rd	
12. Employment Street	• Employment Areas	• Medium	• Commercial	• Low	• Intermediate Green Streets	• Low to Med	• Low to Med	• Low to Med	• High	• High for Cars • Low to Med for all others	• Minor Arterial • Collector	Caledonia	Milner	Orfus		
13. Shared Street	• Downtown/ Core • Centres	• High • Retail / dining	• Commercial • Institutional	• High	• N/A	• High	• Low • Rarely present	• Med	• Low	• Low for all modes	• Local			• Market • Gould	West Donlands	
14. Mixed Use Lane	• Downtown/ Core • Centres • Avenues	• Low • Primarily Access	• Mixed Use • Commercial	• Low	• N/A	• Low	• N/A	• Low	• Med	• Low for all modes	• Laneway					St. Nicholas
15. Residential Lane	• Throughout city	• Low • Primarily Access	• Residential	• Low	• N/A	• Low	• N/A	• Low	• Low	• Low for all modes	• Laneway					June Callwood Way

Green Streets – Technical Guidelines :

- Description of Green Street technique
- Green Street technical “Fact Sheet”
- Implementation process

- Administration structure
- Funding requirements
- Education and training
- Public consultation

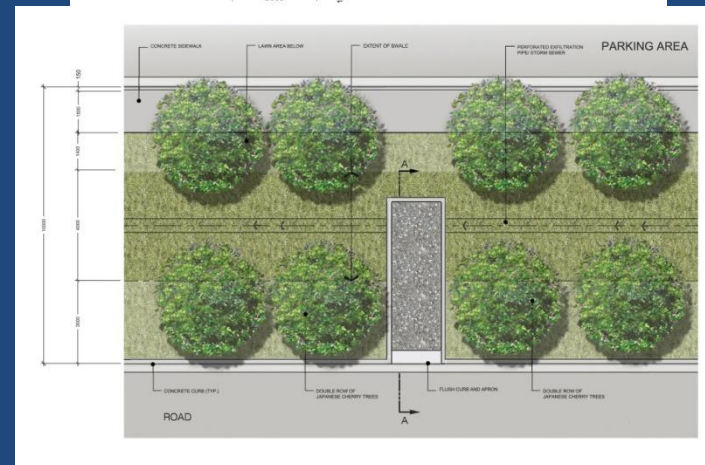
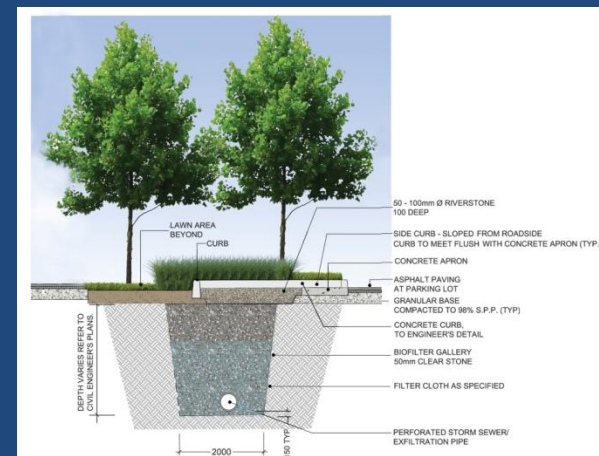


- Design process
- Consultation process
- Monitoring and tracking

Green Streets – Technical Guidelines:

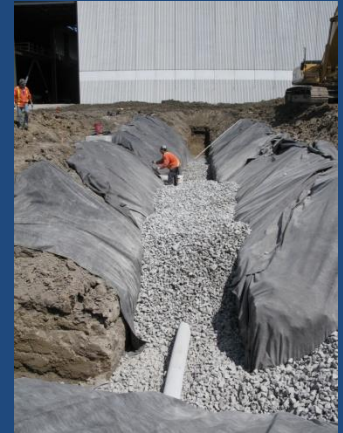
➤ Performance specifications and construction guidance:

- Dimensions
- Materials
- Soils
- Products
- Integration with utilities
- Planting methods
- Tree species selection tool
- Plant material selection tool



Green Streets – Operation, Maintenance and Monitoring Guidance:

- Repair and replacement
- Maintenance methods
- Monitoring objectives
- Monitoring methods
- Mapping and tracking



Green Streets – Study Process:

Part III – Green Streets Technical Guidelines

Duration: January 2016 to August 2016

- Includes
- Preparation of:
 - Guideline Document
 - Operations and Maintenance Manual
 - Planning and Design Checklist
 - Working Group Review Sessions
 - Senior Staff Review Session
 - Summary presentation

Green Streets – Process To Date:

Precedent Review – Review of Green Streets documents and project examples from municipalities throughout North America

➤ City of Boston

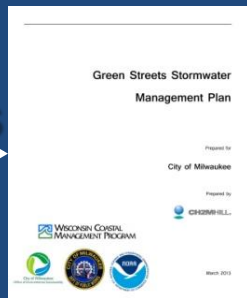
➤ City of Chicago

➤ City of Cleveland

➤ City of Edmonton

➤ City of Los Angeles

➤ City of Milwaukee



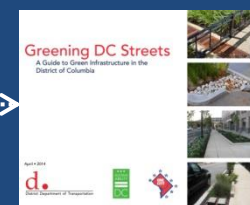
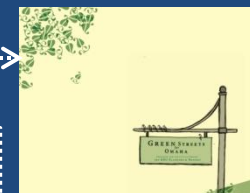
➤ City of New York

➤ City of Omaha

➤ City of Philadelphia

➤ City of Portland

➤ Washington, D.C.



Green Streets – Process To Date:

Complete Streets

Consultation with 'Complete Streets' team to integrate and align study objectives and components



Green Streets – Process To Date:

Stakeholder Interviews

One on one interviews with key City staff:

- 31 interviews completed
- 10 departments represented



Green Streets – Process To Date:

Stakeholder Interviews

- Engineering and Construction Services
- Business Improvement Standards – Engineering Support Services
- Toronto Water
- City Planning
- Transportation Services
- Parks, Forestry and Recreation
- Toronto Parking Authority
- Economic Development and Culture-BIA
- Forestry Operations

Green Streets – Process To Date:

Interview Summary – Key Points

1. Document Format / Contents

- Concise and simple
- Integrate with City standard
- Ease of use is critical
- Should map out implementation process

Green Streets – Process To Date:

Interview Summary – Key Points

2. Integration

- Should be fully integrated with capital planning process
- Integration with existing guidelines / policies / standards is important
- Fit with Complete Streets is essential

Green Streets – Process To Date:

Interview Summary – Key Points

3. Challenges

- Funding
- Design process
- Delivery / implementation
- Utility coordination
- Monitoring
- Administration

Green Streets – Process To Date:

Interview Summary – Key Points

4. Policy Considerations

- Integration with MOECC approval process and regulations
- Hybrid systems – Building Code vs. Water Resources Act
- Testing / monitoring procedures

Green Streets – Process To Date:

Interview Summary – Key Points

5. Maintenance Considerations

- Who maintains what?
- Funding requirements
- Special equipment / procedure
- Utility cuts / restoration
- Maintenance requirements must be realistic



Green Streets – Process To Date:

Toronto Public Utilities Coordinating Committee (TPUCC)

TPUCC comprises all utility/service providers and coordinates utility design, installation and maintenance.

- Presentation and Q&A with TPUCC
- TPUCC representatives to join Advisory Committee
- Future follow up with TPUCC with Draft Guidelines and Details



Green Streets – Document Outline:

Structure and composition of document has been drafted and refined for review by Project Team. Key changes from initial draft:

- Integration of Complete Streets Typologies
- Incorporation of “Selection Tools”
 - Green Street options
 - Tree and plant material species selection
- Addition of design and administration process recommendations

Green Streets – Next Steps:

- Coordination with “Complete Streets” team
- Development of Selection Tools
- Generation of long list of techniques
- Preparation of preliminary guidelines



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