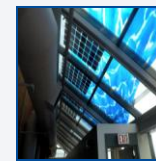




# Toronto Green Standard & Toronto Green Roof Bylaw



City School Boards Advisory Committee June 24, 2016  
Jane Welsh, Project Manager  
Strategic Initiatives, Policy & Analysis  
City Planning, City of Toronto

# Our city is growing...

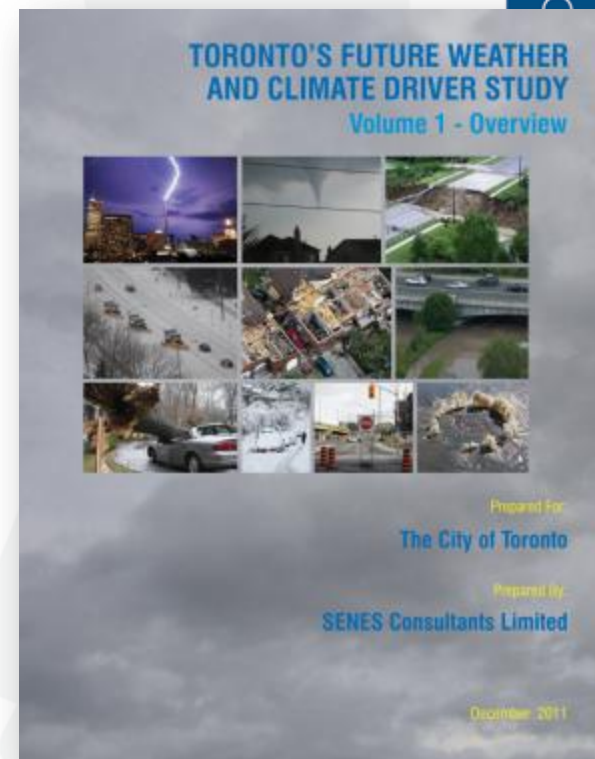


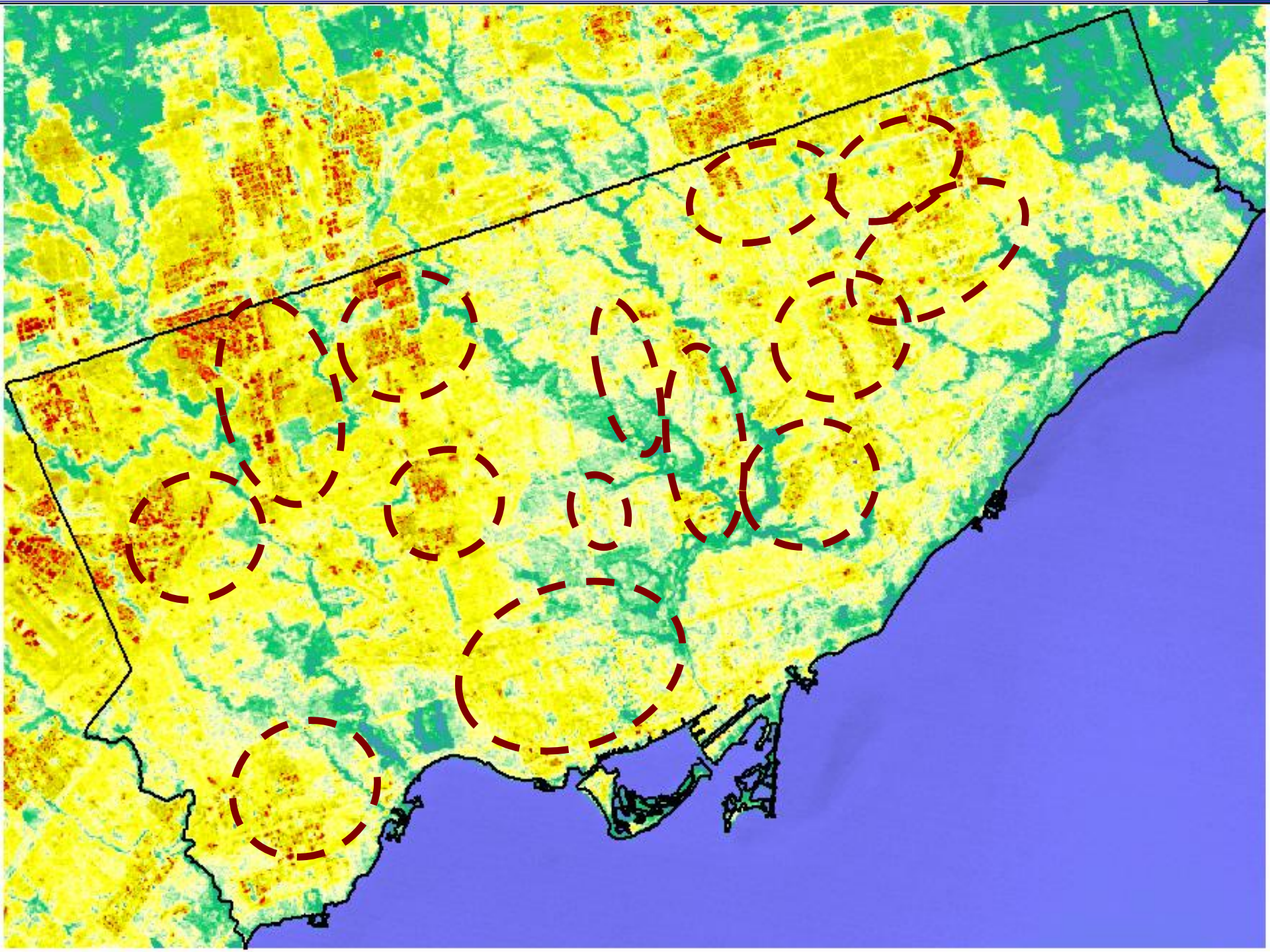
PLANNING A GREAT CITY TOGETHER

# Our Weather is Changing ....

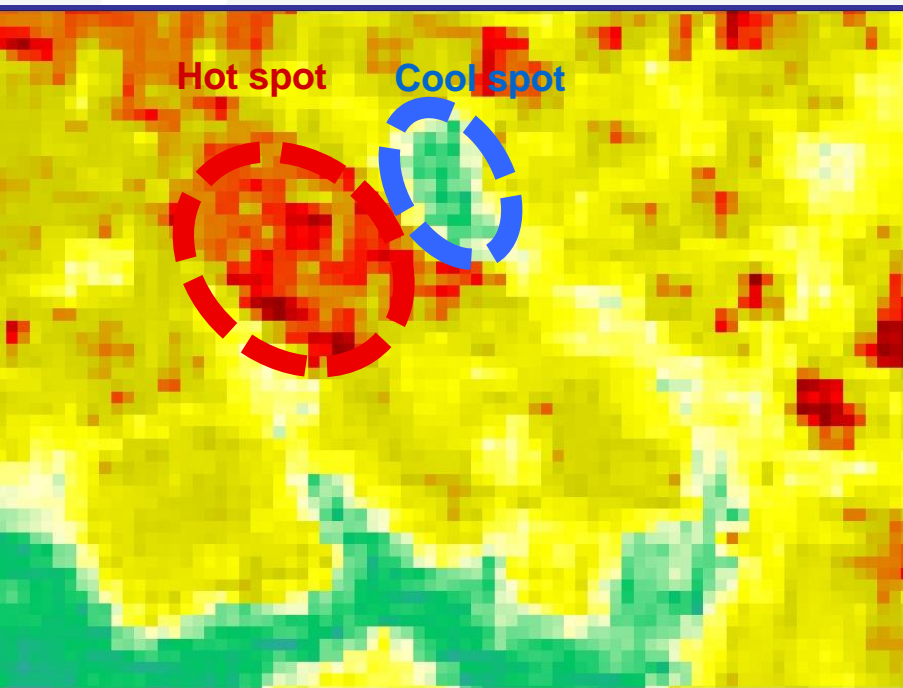


Climate Change and Resiliency:  
hotter, drier summers and extreme rainfall events

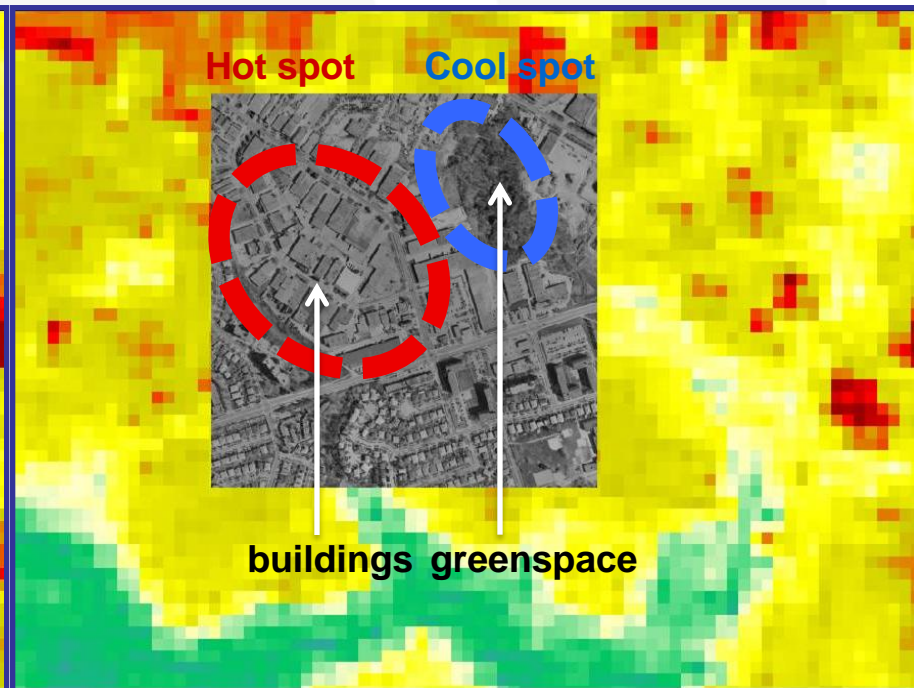


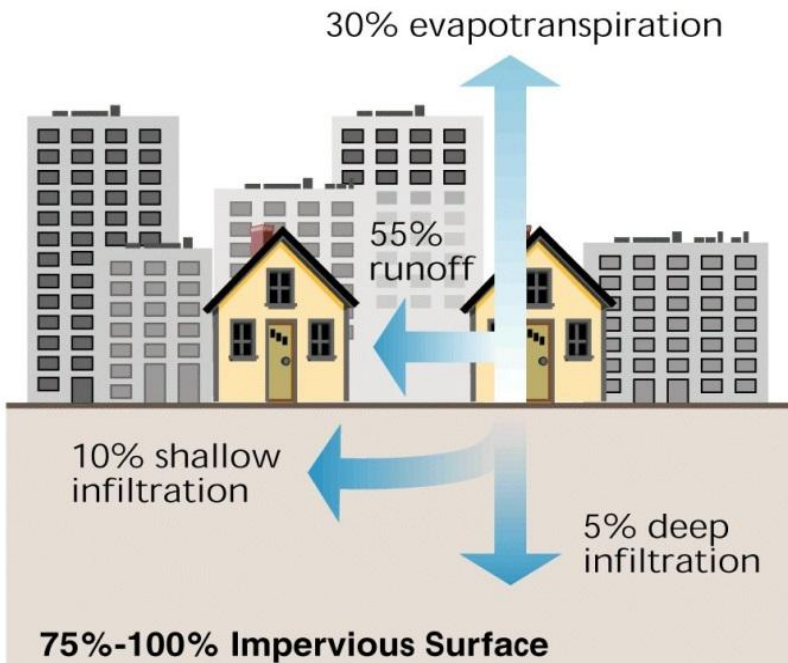
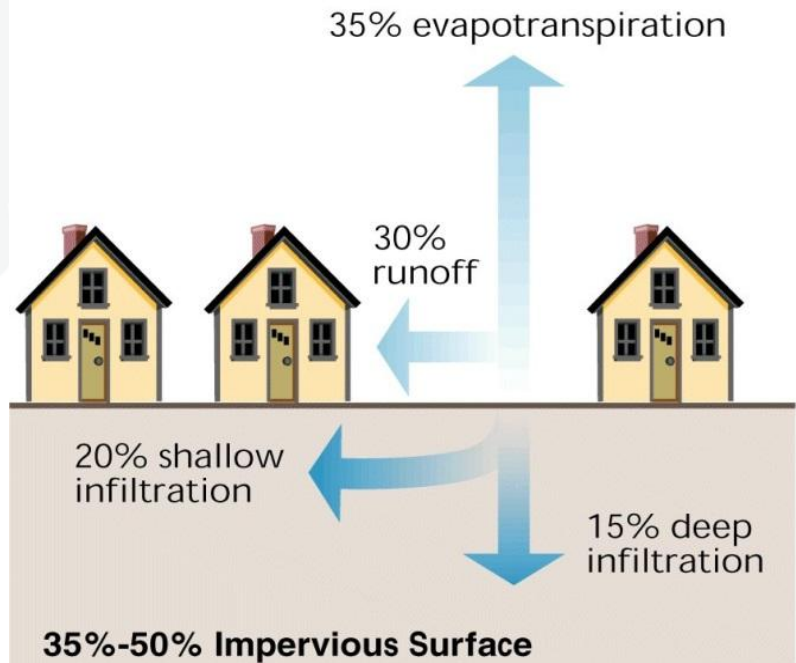
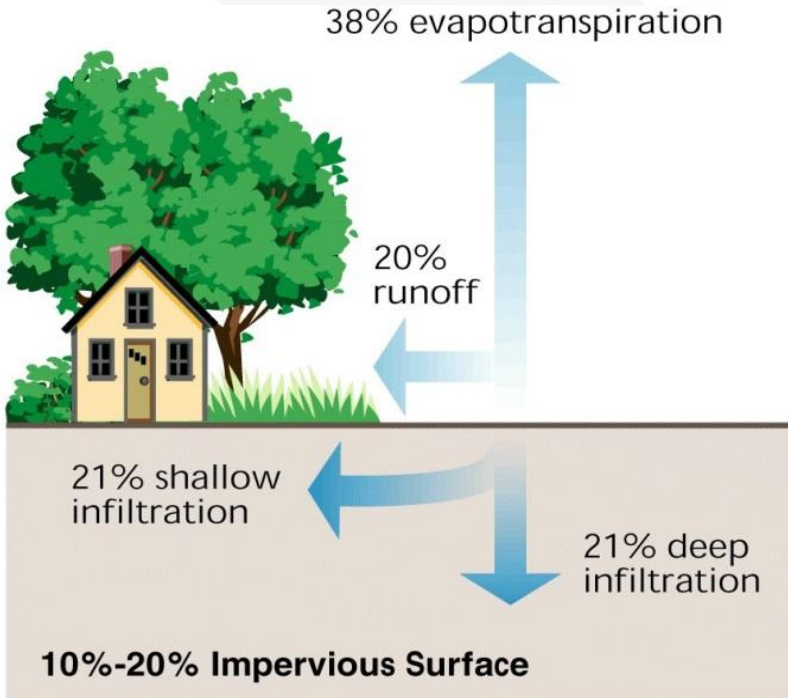
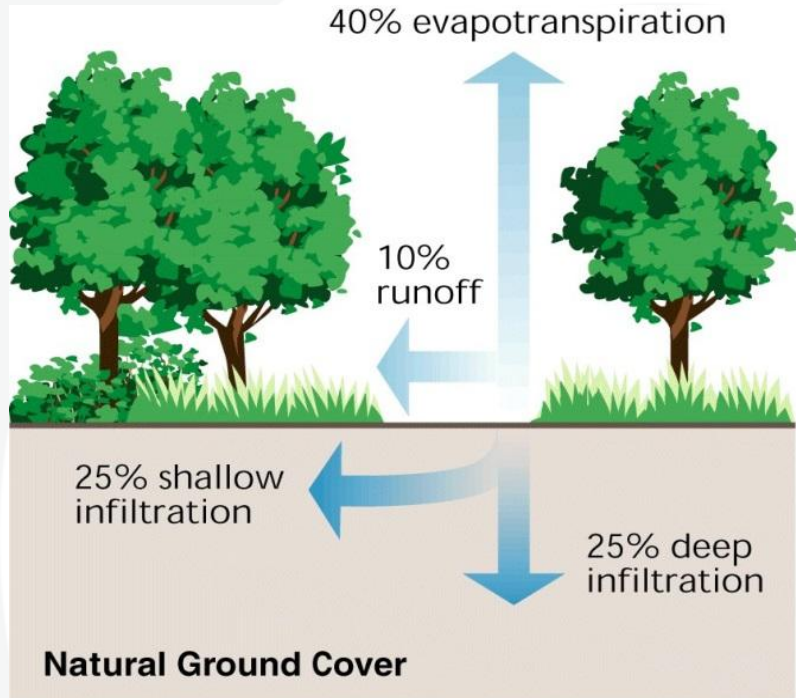


## Thermal Mapping



## Land Use Mapping





# Our approach is shifting...



Regent Park

# Environmental Policy & Tools

**RAVINE AND NATURAL FEATURE PROTECTION By-Law**

*"The ravines are to Toronto what canals are to Venice, hills are to San Francisco and the Thames River is to London. They are the heart of the City's emotional geography, and understanding Toronto requires an understanding of the ravines."*

Assistant City, Robert Pallard, (1993)

**Toronto** **Livegreen Toronto**

City of Toronto  
**GUIDELINES for Biodiverse Green Roofs**

**Toronto** **Livegreen Toronto**

**TORONTO OFFICIAL PLAN**

**Toronto**

**Toronto Green Standard**  
*Making a Sustainable City Happen*

For **Mid to High-Rise Residential and Non-Residential Development**  
(Residential apartment buildings 4 stories and higher and all industrial, commercial and institutional (ICI) buildings)

**Version 2.0**  
January 2015

**Toronto** **Livegreen Toronto**

The Toronto  
**Green Roof Bylaw**



**BUTTERFLIES OF TORONTO**  
A GUIDE TO THEIR REMARKABLE WORLD  
• City of Toronto Biodiversity Series •

**Toronto** **Livegreen Toronto**

**BIRD-FRIENDLY DEVELOPMENT GUIDELINES**

**Toronto** **Livegreen Toronto**



# INTEGRATION – Green Strategies Framework

*Policies and Guidelines*

Toronto Green Standard



Climate Change Action Plan



Green Roof Bylaw



Wet Weather Flow Management



Wet Weather Flow Management Guidelines

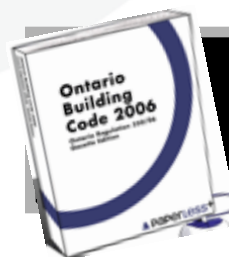
Municipal Official Plan



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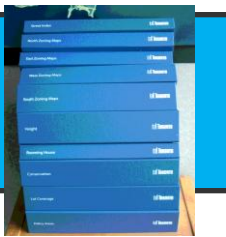
*Regulations*

Ontario Building Code 2006

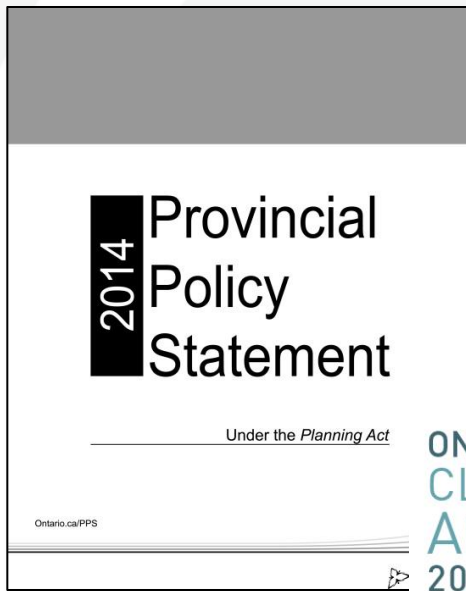


Ontario Building Code

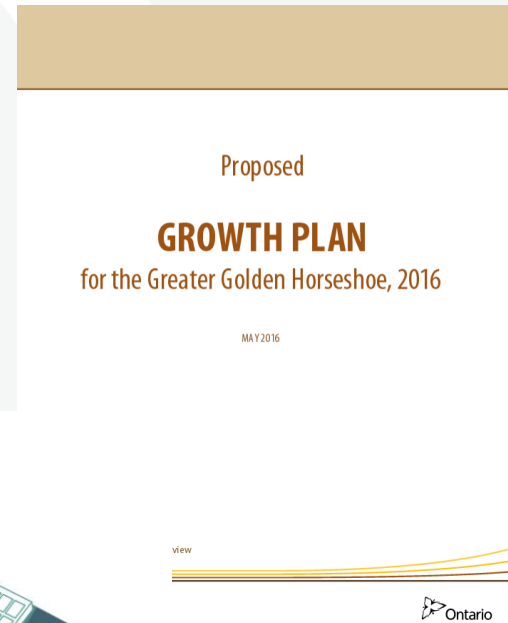
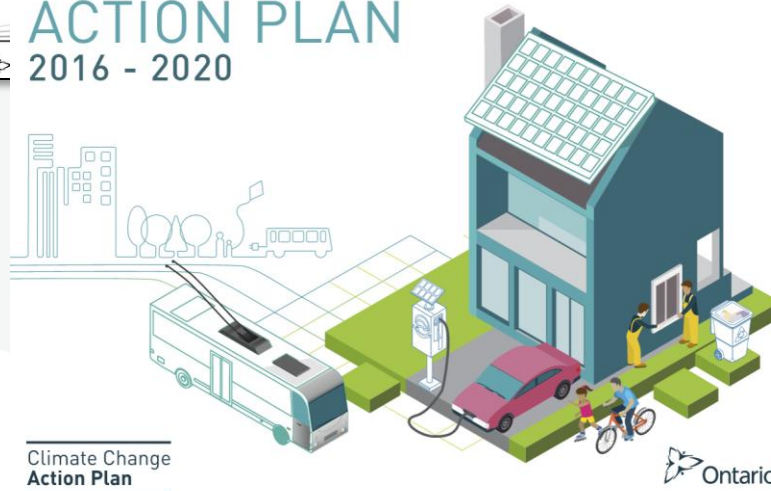
Zoning Bylaw

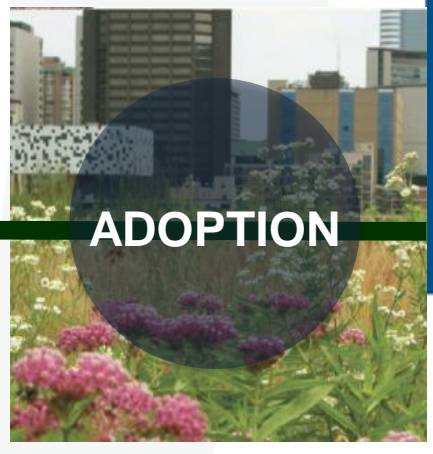


# PPS and new Plans



## ONTARIO'S FIVE YEAR CLIMATE CHANGE ACTION PLAN 2016 - 2020





# Toronto Green Standard

Voluntary Green Standard

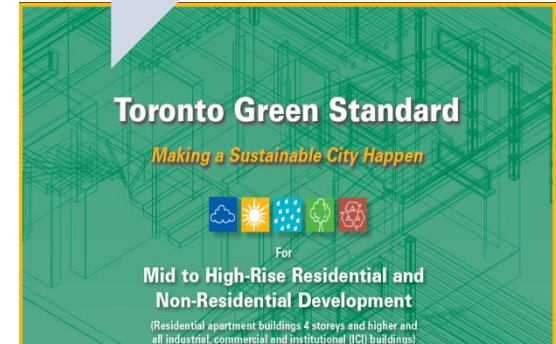
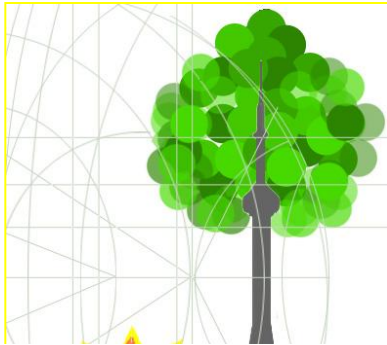
2006

Two tier mandatory/  
voluntary

2010

Revised two tier  
mandatory/ voluntary

2014



## Phase 1

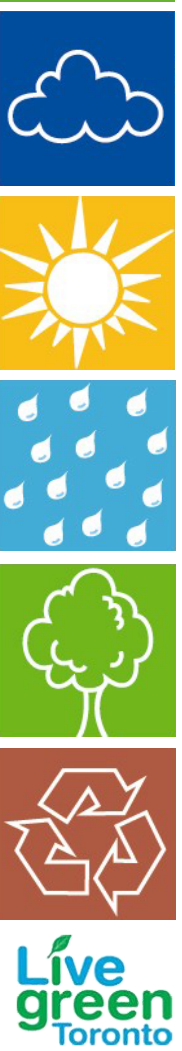
- Sustainable cities/design symposium
- Discussion papers to Council
- Internal & external round tables
- Technical research- City best practises
- Consultant study- green standards around the world
- LEED/BOMA comparison

## Phase 2

- How to make it mandatory
- Legal analysis
- Cost Benefit study
- Verification protocol
- Internal development approvals process
- Staff training
- Toronto LEED Supplement
- DC refund/ procedures
- Development review support

## Phase 3

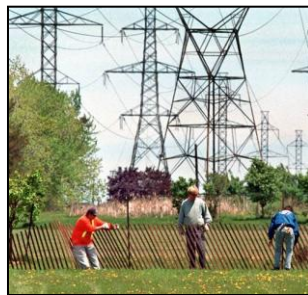
- New Bylaws and OBC
- Revision from development review experience
- Updated City guidelines/references
- Alignment with other systems -LEED '09
- Direct industry involvement – technical advisers
- Studies e.g. bird friendly design, tree planting standards



# ENVIRONMENTAL DRIVERS

TGS is patterned to address the City's "Environmental Drivers":

1. Air Quality
2. Green House Gas Emissions, Energy Efficiency and Climate Change
3. Water Quality and Efficiency
4. Urban Ecology
5. Solid Waste



# TORONTO GREEN STANDARD

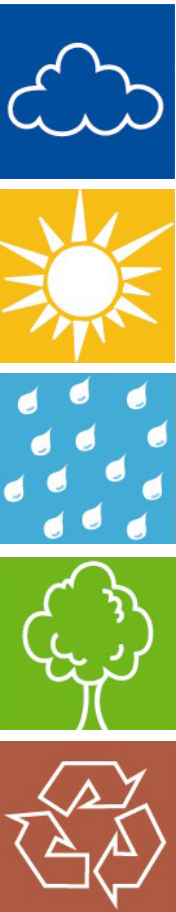
## Two Sets of Standards; 3 Types of Development



**1. Low-rise  
residential  
 $\leq 4$  stories,  $\geq 5$  units**

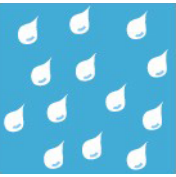


**2. Mid-rise to  
High-rise  $\geq 4$  stories and  
ALL non-residential uses**

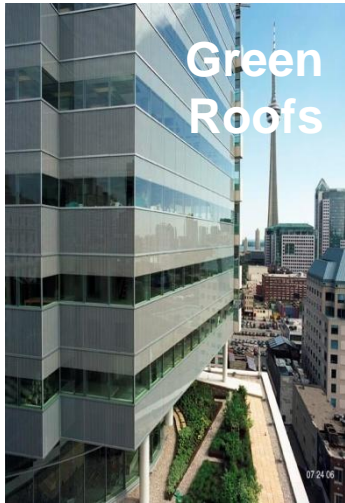


# 1

# TIER 1: MINIMUM REQUIRED STANDARD



+ 15%  
Energy  
Efficiency  
above  
OBC



# 2 TIER 2 PACKAGE

+25% Energy Efficiency above OBC



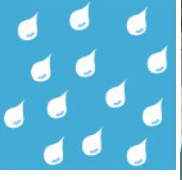
+30% Water Efficiency



75% construction waste diversion



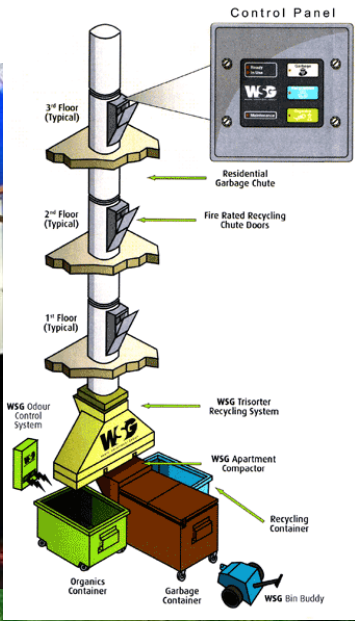
Bird-Friendly



+75% UHI treatment at-grade



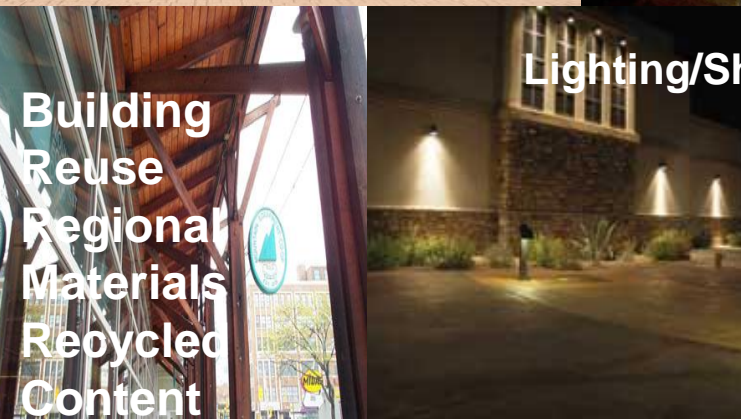
Building Commissioning



10mm Stormwater Retention



1.2/unit Enhanced Bike Parking; Bike Share



Lighting/Shielding

Building Reuse Regional Materials Recycled Content



Natural Restoration



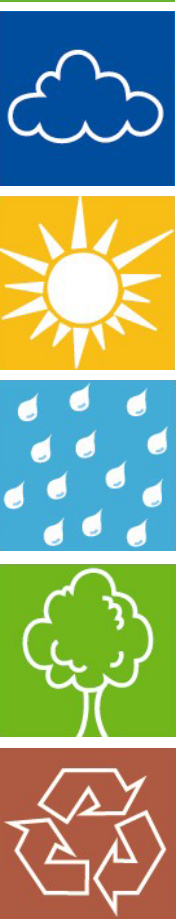
1% renewable energy





# Progress...

- > 850 development projects have applied Tier 1
- 15% are Tier 2
- Saved 115,205 tCO<sub>2</sub>eq per annum
- 2 million litres of potable water saved (TGS Tier 2 buildings)



# Green Roof Bylaw:

## Required for all New Large Buildings



Gross Floor Area (Size of Building)	Coverage of Available Roof Space (Size of Green Roof)
2,000 – 4,999 m <sup>2</sup>	20%
5,000- 9,999 m <sup>2</sup>	30%
10,000- 14,999 m <sup>2</sup>	40%
15,000- 19,999 m <sup>2</sup>	50%
20,000 m <sup>2</sup> or greater	60%

# Green Roof Bylaw:

## GREEN ROOF CALCULATION: AVAILABLE ROOF SPACE

### Total Roof Area excludes:


- areas devoted to renewable energy
- private terraces
- required outdoor amenity areas
- Tower roof area (<750 sq.m floorplate)



# Green Roof Bylaw: GREEN ROOF CONSTRUCTION STANDARD

- Contained in Article IV of the Bylaw
- Sets out minimum requirements for the construction and maintenance of green roofs
- Provides certainty and clarity for designing and building green roofs in Toronto





“Combining alternatives that perform well in a few particular areas can improve the overall performance of a roof system, sometimes at lower cost as compared to a green roof.

**However, none of the lower cost options perform as well as a green roof overall.”**



Our achievements are increasing...



80 Front St. E

# Green Roof Bylaw 2016

Between January 2010 – May 2015:

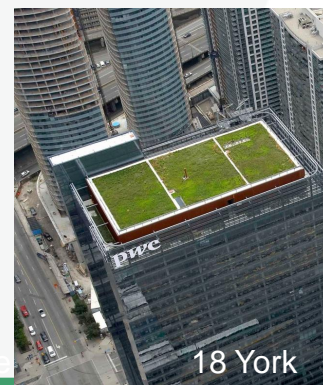
- 265,000 m<sup>2</sup> built or to be constructed
  - schools: 13000 m<sup>2</sup>
- 33 Cash-in-lieu (approved variances or exemptions)
  - schools: 6 exemptions, 2 variances
- 300 building permits issued for green roofs (includes required and voluntary)
- Green Roofs saving 95,000 m<sup>3</sup>/yr Storm Water retention



MEC King Street



The Pinnacle 295 Adelaide



18 York

# ECO-ROOF INCENTIVE PROGRAM

- To reduce energy use and the emissions that contribute to climate change

## **Green roofs: eligible for up to \$100,000**

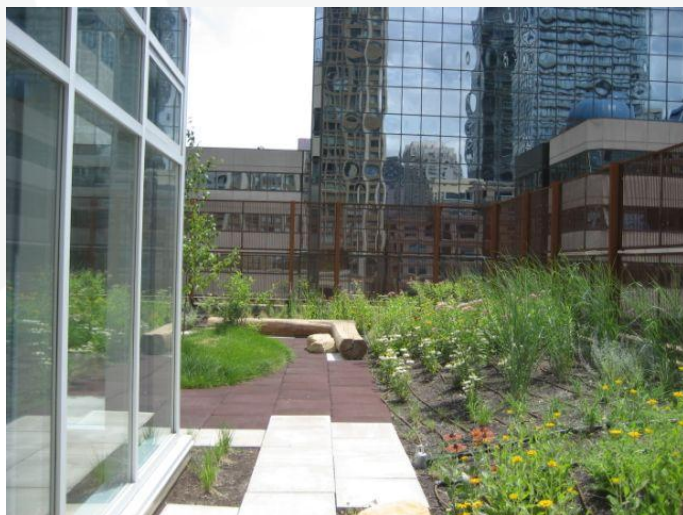
- \$75/m<sup>2</sup>

## **Cool roofs: eligible for up to \$50,000**

- \$2/m<sup>2</sup> for a coating over an existing roof; \$5/m<sup>2</sup> for a new membrane
- applies to existing residential, commercial, industrial and institutional buildings and **new schools** and development less than 2,000/m<sup>2</sup>

## Results:

44 green roofs  
132 cool roofs



eco  
roof  
INCENTIVE  
PROGRAM





“Perhaps it will be the City that reawakens our understanding and appreciation of nature, in all its teeming, unpredictable complexity.” Jane Jacobs

Toronto City Hall Green Roof Photo Credit: Antoine Belaieff (<http://creativecommons.org/licenses/by-nc-nd/2.0/deed.en>)



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**TO**GETHER