

# Sustainability Performance Metrics

City of Vaughan

Clean Air Partnership Webinar  
May 9, 2017



# Presentation Overview

- Project Partnership
  - ☐ The Need for Sustainability
  - ☐ Benefits
  - ☐ Phase 1: Framework for the Guidelines
  - ☐ Phase 2: Measuring the Sustainability Performance of New Development
- Testing Stage and Implementation
  - ☐ Overview of Testing Stage
  - ☐ Development of Threshold Scores
  - ☐ Improvements and Integration into the Development Approval Review Process
  - ☐ Staff Roles
  - ☐ Consultation and Training
  - ☐ External Design Features
- Next Steps

# **Project Partnership**

**City of Vaughan, City of Brampton and Town of Richmond Hill**



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# Project Partnership

## Vaughan, Brampton and Richmond Hill

- Sustainability Performance Metric Program was implemented in 2 phases
  - ❑ Phase 1: Sustainable Community Development Guidelines
  - ❑ Phase 2: Measuring the Sustainability Performance of New Development
- Funded by partner municipalities and Green Municipal Fund of the Federation of Canadian Municipalities
- Peer reviewed by the Toronto and Region Conservation Authority and the Greater Toronto Area Clean Air Council (Clean Air Partnership)



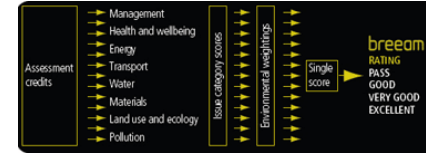
# The Need for Sustainability

## Public Health, Energy and Climate Change

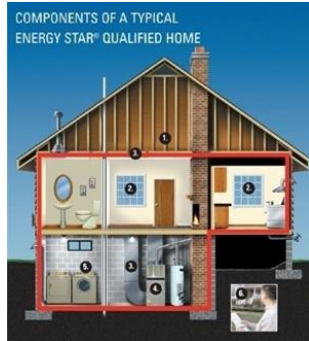
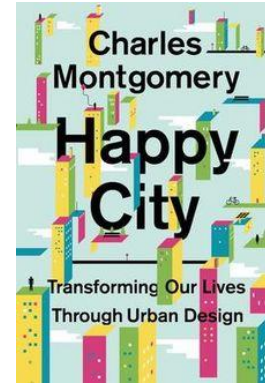
- We are facing issues related to the way we interact with our built environment including :
  - ☐ Rising greenhouse gas (GHG) emissions
  - ☐ Aging population
  - ☐ Cost reduction of renewable energy
  - ☐ Increasing public health challenges
  - ☐ Climate change adaptation
- Healthy, sustainable communities are necessary to ensure that we do not compromise future generations beyond their means to cope



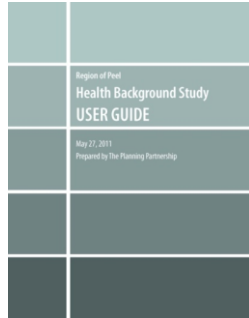
# Many organizations have developed standards to respond to this challenge...



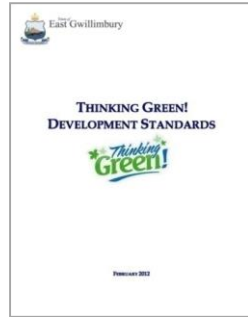
Green Globes Design Environmental Assessment For New Buildings



# Recent Examples of Sustainability Guidelines in Ontario



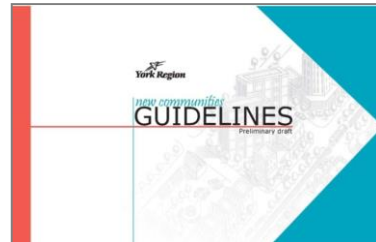
REGION OF PEEL  
HEALTH BACKGROUND STUDY AND  
USER GUIDE



EAST GWILLIMBURY  
THINKING GREEN! DEVELOPMENT  
STANDARDS



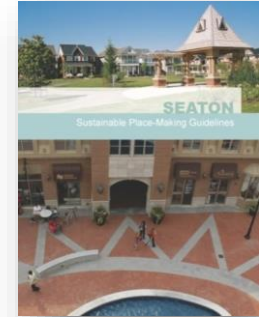
TOWN OF MARKHAM  
GREEN PRINT



YORK REGION  
NEW COMMUNITIES GUIDELINES



CITY OF TORONTO  
GREEN DEVELOPMENT STANDARDS



CITY OF PICKERING  
SEATON SUSTAINABLE  
PLACE-MAKING GUIDELINES

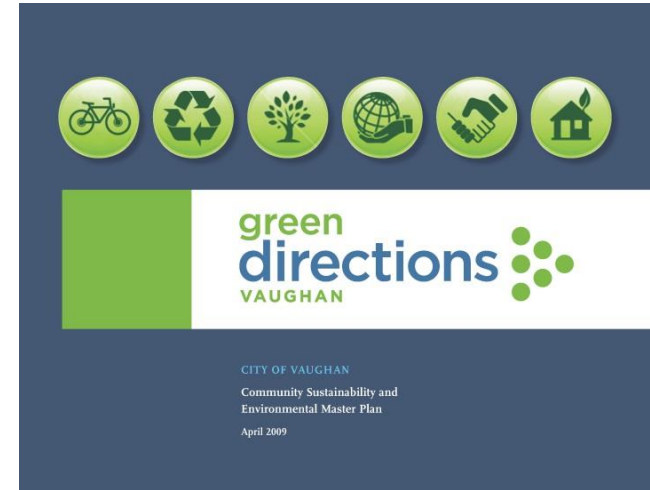
# Benefits

- **Consistent, comprehensive standards and targets** for all three municipalities
- Three key policy areas – **energy, public health and climate change** are addressed and brought to the forefront of planning communities
- User-friendly documents that **provide guidance and encouragement** to developers, property owners and municipal staff regarding issues of sustainable development
- Ensures the level of **commitment** from the municipalities and developers is mutually supported
- Opportunity to **address integrated design in the planning process** by providing specific criteria for assessing development applications with regard to sustainability issues



# Benefits

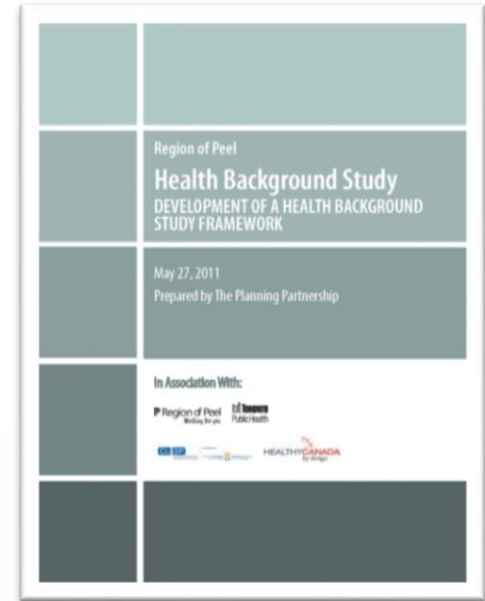
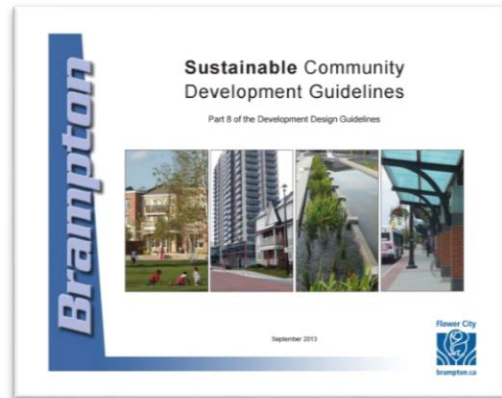
- Contributes to **community greenhouse gas emission reduction** actions, which assists the City of Vaughan reach commitments under the Federation of Canadian Municipalities Partners for Climate Protection program.
- Supports efforts to **raise awareness of indicators** used to track the implementation of Green Directions Vaughan, the Community Sustainability and Environmental Master Plan.



# Phase 1:

## Sustainable Community Development Guidelines

- Led by the City of Brampton
- New chapter in Brampton's Development Design Guidelines
- Developed in consultation with private and public stakeholders
- Integrates the Region of Peel Healthy Development Index
- Guidelines were used as a basis for Phase 2



# Phase 1:

## Framework for the Guidelines

- The sustainable development framework for the guidelines and Sustainability Performance Metrics (SPM) documents are broken down into four themes
- Themes represent major structuring elements for sustainable community development

**1. Built Environment**

**2. Mobility**

**3. Natural Environment and Open Space**

**4. Green Infrastructure and Building**

# Phase 1:

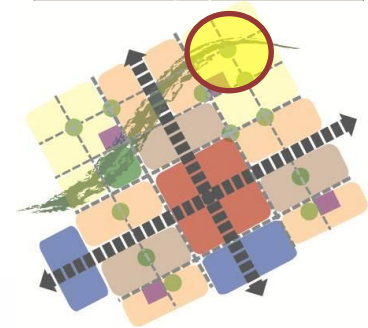
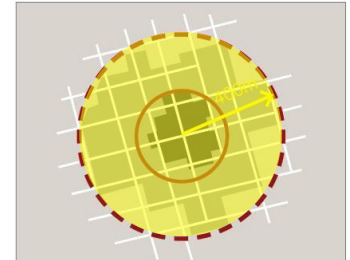
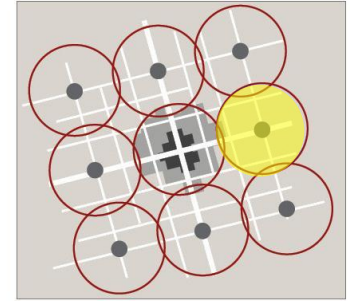
## Sustainable Community Development Guidelines

**Themes, Indicators and Guidelines** for the planning and design of new communities and neighbourhoods for:

- Secondary Plans
- Block Plans
- Draft Plans of Subdivision/Site Plans

For example:

DEVELOPMENT SCALE	Block Plan Area
THEME	Built Environment
INDICATOR	Community Form
GUIDELINE	The Block Plan should provide well distributed neighbourhood centres to provide daily activities and amenities within 400 metres (5 minute walk) of residences to support walking, cycling, and local transit within the community.



# Phase 2:

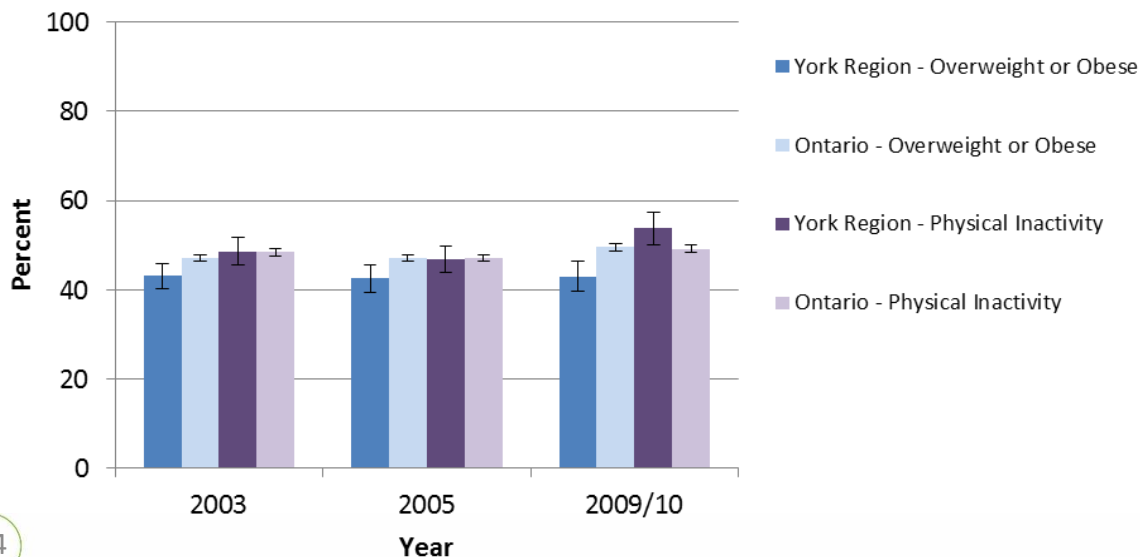
## Measuring the Sustainability Performance of New Development

- Led by Vaughan in collaboration with Richmond Hill and Brampton
- Overall format, logic, and priorities are shared from Phase 1
- Health issues were identified to inform metrics
- Main outcomes are tools to help municipal staff guide and quantify the sustainability performance of new developments:
  - ❑ Excel Spreadsheet Scoring Tool and Instruction Manual
  - ❑ Sustainability Metrics Summary
  - ❑ Metrics Tables (Site Plan and Block Plan/Draft Plan)
  - ❑ Guidebook and Glossary of Terms



# Half of York Region's residents are inactive and almost half are overweight...

Percent of individuals (aged 12+) who are overweight or obese and physically inactive, York Region and Ontario, select years 2003-2010

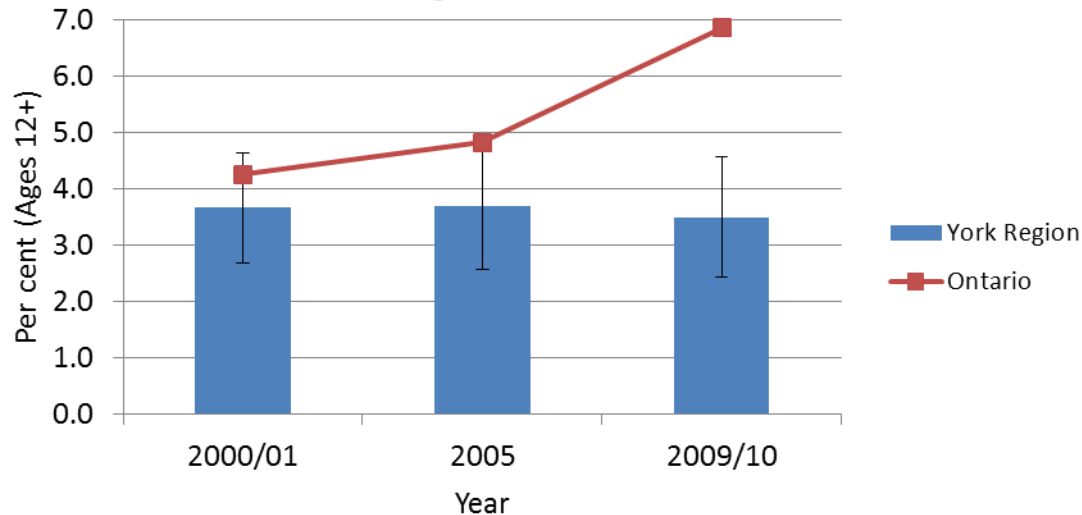


## Mitigating Factors

- Locate schools and services within walking distance of residential neighbourhoods
- Improve streetscape design
- Design communities so children can play more

# Provincial diabetes rates are increasing...

Percentage of residents who reported having diabetes diagnosed by a health professional  
York Region and Ontario

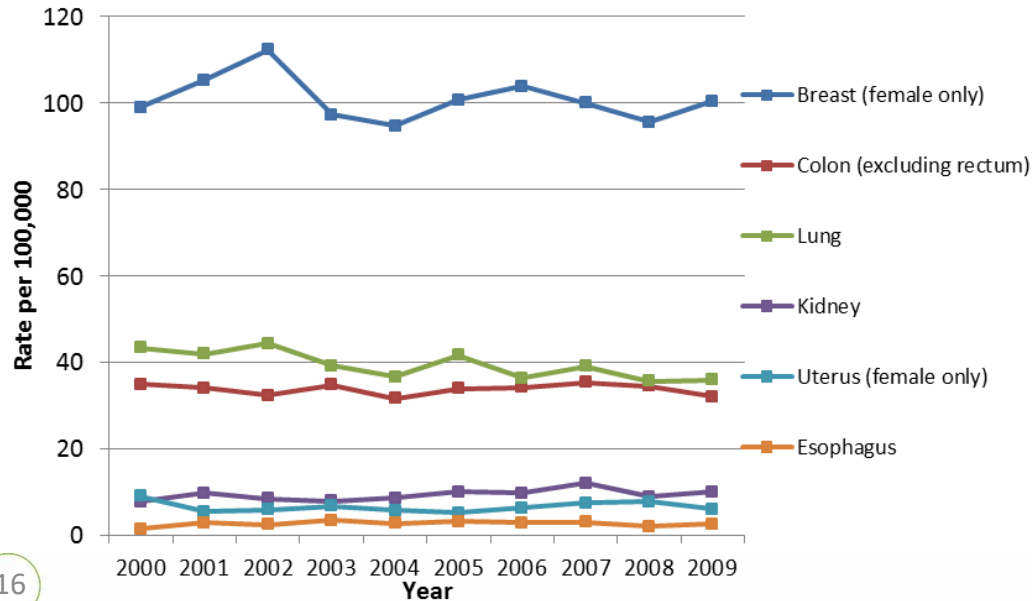


## Mitigating Factors

- Design communities so people can walk and cycle more
- Retrofit sprawling communities (e.g. pedestrian cut-throughs)

# Rates of cancers associated with obesity are remaining stable...

Age-standardized incidence rates of cancers associated with built environment risk factors, York Region, 2000-2009



## Mitigating Factors

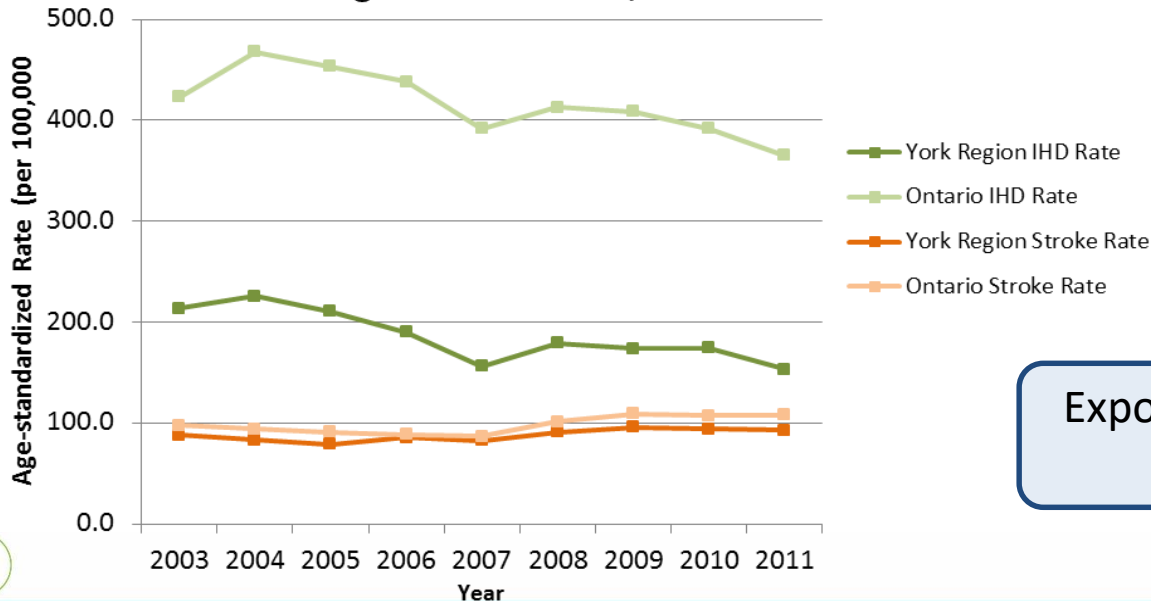
- Similar to those that reduce obesity and increase physical inactivity

One quarter to one third of cancers of the breast, colon, kidney, uterus and esophagus are attributed to excess body weight and physical inactivity



# There is still room to improve in relation to stroke and heart disease...

Stroke and Ischemic Heart Disease  
emergency ambulatory visit rates,  
York Region and Ontario, 2003 to 2011

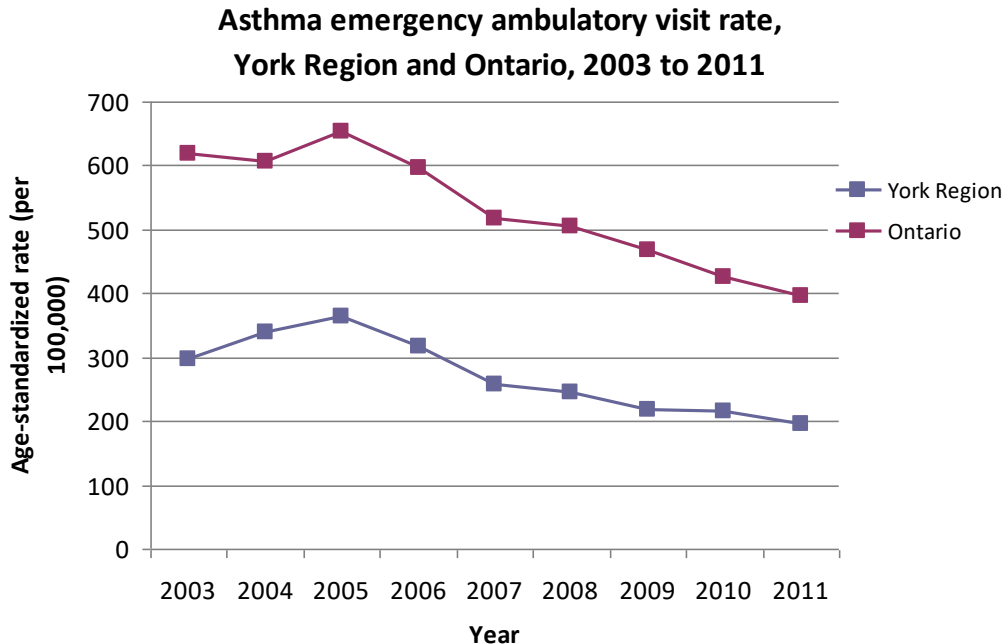


## Mitigating Factors

- Similar to those that reduce obesity and increase physical inactivity, and to those that reduce air pollution

Exposure to particulate matter  
is linked to mortality

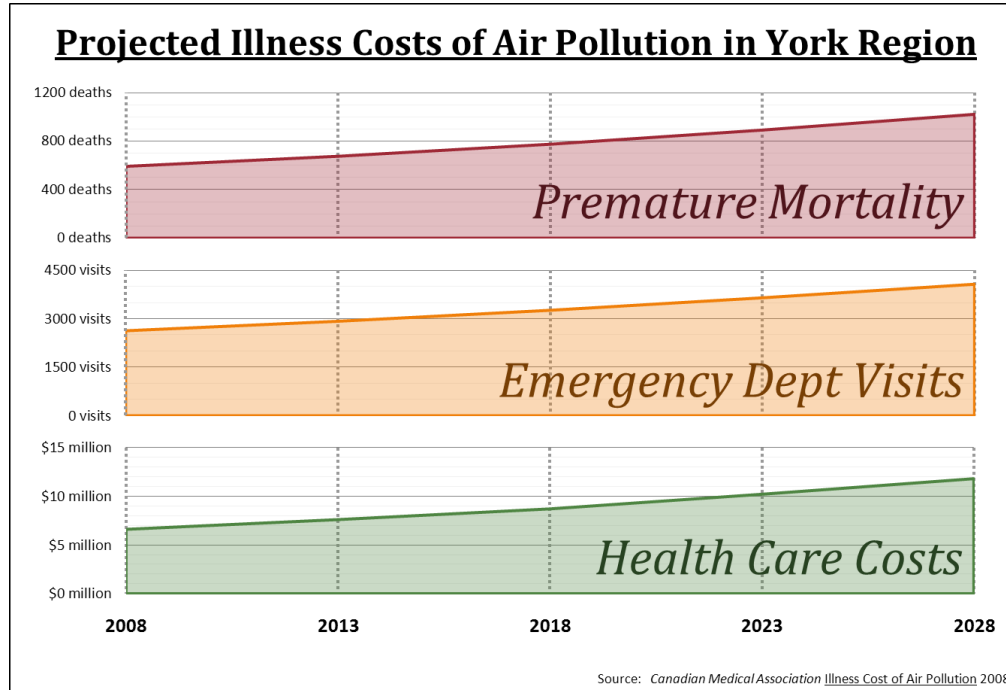
# The emergency ambulatory visit rate for asthma has come down in York Region...



## Mitigating Factors

- Active transportation to reduce vehicle emissions (e.g. walk-to-school programs, bike-sharing programs)
- Active safe routes to school
- Separate sensitive land uses (e.g. schools) from sources of pollution.

# Illness costs of air pollution are projected to increase...

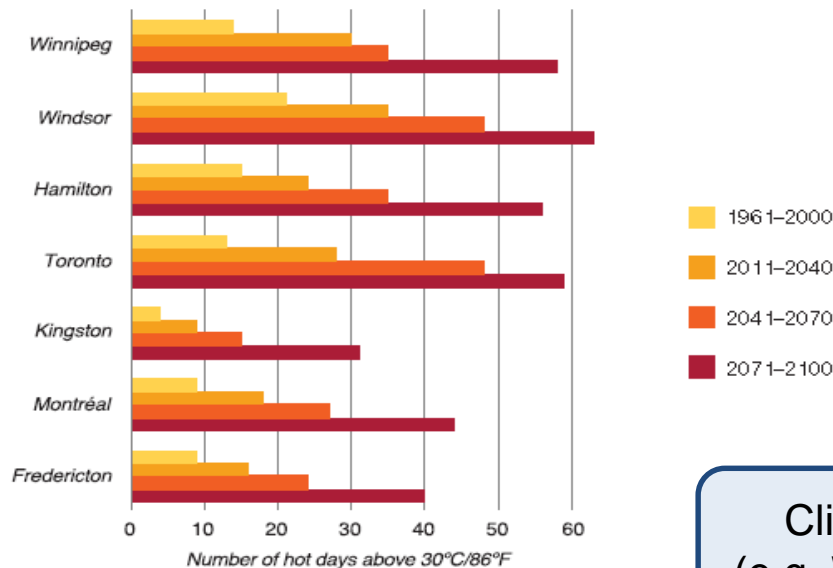


## Mitigating Factors

- Develop carpooling/efficient vehicle parking
- Smart commuting
- Improve access to public transit

# Our cities are getting warmer...

## Historical and Projected Number of Hot Days for Select Canadian Cities



Source: B. Casati and A. Yagouti, in press.<sup>50</sup>

### Mitigating Factors

- Incorporate green roofs in building design to reduce urban heat island effect
- Increase green space, shade and canopy coverage

Climate change results in new health threats  
(e.g. West Nile virus, Eastern Equine Encephalitis)

# Example Metric: Mobility

Metric	Recommended Minimum	Enhanced	Precedent	Available Points
Block length	75% of block perimeters do not exceed 550m. 75% of block lengths do not exceed 250m. (2 POINTS)	100% of block perimeters do not exceed 550m. 100% of block lengths do not exceed 250m. (2 POINTS)	Thinking Green Item 3 LEED NPDp1	4
Intersection density	Street Intersections per sq. km = 40 to 50 (2 POINTS)	Street Intersections per sq. km =51 to 60 (1 POINT) Street Intersections per sq. km >61 (1 POINT)	LEED NPDp3 Neptis Foundation	4

550 m block perimeter referenced in the Pickering Sustainability Guidelines, but no other reference;

Pickering Neighbourhood Sustainability Guidelines refers to 40 intersections per square km while Neptis Foundation's "Shaping the Toronto Region" report calculated intersection densities for various neighbourhoods between 24 to 66 intersections per square km. From the Neptis Foundation work, 40 intersections per square km is a minimum while 50 intersections per square km may be an enhanced performance metric.

Emerald Hills integrated design process used "pedestrian route directness" (PDR, ratio of walking distances from specified origin points to central node vs. straight line distances) as an indicator of walkability. A PDR value of 1.5 or lower is recommended.

# Example Metric: Mobility

Metric	Recommended Minimum	Enhanced	Precedent	Available Points
Distance to Public Transit	<p>Site is within 800m walking distance to an existing or planned commuter rail, light rail, bus rapid transit or subway with stops</p> <p>Or</p> <p>Site is within 400m walking distance to 1 or more bus stops with frequent service. (3 POINTS)</p>	<p>Site is within 400m walking distance to an existing or planned commuter rail, light rail , bus rapid transit, or subway with frequent stops</p> <p>Or</p> <p>Site is within 200m walking distance to 1 or more bus stops with frequent service. (3 POINTS)</p>	<p>Regional OP (proximity)</p> <p>Municipal OP (if revised to speak to connectivity)</p> <p>LEED NC 2009 SSc4.1</p>	<b>6</b>

York Region OP policy 5.6.12(d) requires distance to a transit stop in the Urban Area is within 500 metres of 90% of residents, and within 200 metres of 50% of residents. The YROP policy could be recognized as a requirement while 400 m walking distance to a transit stop for all residents can be an enhanced performance metric.

# Example Metric: Built Environment and Mobility

Metric	Recommended	Enhanced	Precedent	Available Points
Connection to Natural Heritage	Visual and physical connections (such as public access blocks, single loaded roads) are provided to 25% of the natural heritage system and parks. (1 POINTS)	Visual and physical connections (such as public access blocks, single loaded roads) are provided to 50% of the natural heritage system.(1 POINTS)		2

## Built Environment – Public Health (Proximity to Green Space)

Vaughan's Active Together Master Plan, the City's Recreation Master Plan, regarding number of parks per population and access to parks. York Region New Communities Guidelines (nH8) speak to providing an integrated open space network that provides some form of open space within 500 metres of all residents.

Work by William Sullivan (Sullivan, Kuo and DePooter. 2004. The fruit of urban nature: vital neighbourhood spaces. Environment and Behaviour. Vol. 36, No. 5, pp. 678-700) and Faber-Taylor and Kuo (Andrea Faber Taylor, Frances E. Kuo and William C. Sullivan. 2001. Coping with ADD: The Surprising Connection to Green Play Settings. Environment and Behavior, Vol. 33 No. 1, January 2001 54-77) are quantitative studies about the human health benefits of nature and green spaces, but do not provide guidance about the proximity of open space and amount per population.

# Example Metric: Urban Forest

Metric	Recommended	Enhanced	Precedent	Available Points
% Tree canopy within proximity to building/pedestrian infrastructure	Provide shade within 10 years for at least 50% of the walkways/sidewalk lengths All trees should be selected from the applicable municipal tree list. (2 POINT)	Provide shade within 10 years for at least 75% of the walkways/sidewalk lengths. All trees should be selected from the applicable municipal tree list. (2 POINTS)	Municipal OP  LEED ND NPDc14	<b>4</b>
Maintain existing healthy trees	Where healthy mature trees must be removed, new trees (not including street trees) are provided on site or as determined by the municipality to mitigate the lost canopy coverage of the trees removed. (2 POINTS)	75% of healthy mature trees greater than 20 cm. DBH are preserved in situ on site. (3 POINTS)		<b>5</b>

York Region Comment – Official Plan target of 25 % Forest Cover, have also started a York Region Urban Forest Study (Draft, February 2012). Since original development of Sustainability Metrics, much more information is available about the benefits of the urban canopy including TD Economics report on the value of Toronto's trees, the EcoHealth Toolkit and the final York Region Forest Management Plan with recommended woodland and urban canopy targets.



# Test Sites, Indicators and Metrics

CITY OF VAUGHAN  
**Block 61 Nashville Heights**  
Draft Block Plan - greenfield



- Evaluated the SPM against a selected site from each municipality
- Served as a means to test and ensure that the proposed metrics are realistic, clear, measureable, and have an impact.

TOWN OF RICHMOND HILL  
**Yonge and 16<sup>th</sup> Avenue**  
Site Plan – urban node intensification



CITY OF BRAMPTON  
**Queen St East Redevelopment**  
Draft Plan – corridor infill



# Example of Metric Structure

SCALE	Site Metrics
THEME AREA	Mobility
INDICATOR	Site Permeability
METRIC	Connectivity
MINIMUM TARGET	Connect buildings to off-site paths, surface transit stops, parking areas (car and bike) or other destinations (schools).  The building main entrance should have a direct pedestrian linkage to that transit stop (if possible).
ASPIRATIONAL TARGET	Provide amenities and street furniture (benches, bike parking, landscaping) along connections on the site and between the site and adjacent destinations



Potential Building Massing (View from South West)



Potential Building Massing (View from North East)

# Excel Spreadsheet Scoring Tool

- Excel-based tool for applicants to determine the **Overall Application Score** and **Overall Community Score** for the application
- Uses a series of close ended questions, such as “Yes”, “No” and “Not Applicable (N/A)”
- Filters out metrics that are not applicable to the proposed development
- Applies point system to Recommended **Minimum Targets** and **Aspirational Targets** for each metric
- Tool and Metrics Tables are structured with the following headings:
  - ☐ Core Themes
  - ☐ Indicators
  - ☐ Performance Metrics
  - ☐ Mandatory, Minimum and Aspiration Targets
  - ☐ Precedents
  - ☐ Metric weight/point allocation for each of the metrics

scoring\_tool.xlsm - Microsoft Excel

File Home Insert Page Layout Formulas Data Review View Acrobat

Normal Page Layout Page Break Preview Custom Views Full Screen

Workbook Views Show

Zoom 100% Zoom to Selection

New Window Arrange All Freeze Panes

Split Hide Unhide

View Side by Side Synchronous Scrolling Reset Window Position Window

Save Workspace Switch Windows

Macros

BF46

SUSTAINABILITY PERFORMANCE METRICS

GENERAL INFORMATION

User Name: Applicant Name

Company Name: Applicant Co

Project Name: Applicant's Project

Municipality: Vaughan

Type of Development Site: <select>

Plan Type: <select>

Type of Development Properties: Single Family Homes <select>

Multi-Family Buildings (>3 Floors) <select>

Commercial/Industrial/Institutional <select>

Show All Metrics

Block Plan Draft Plan Site Plan

RESULTS

POINTS ACHIEVED

OVERALL (Application) 0 of 0 N/A

OVERALL (Community) 0 of 0 N/A

ENERGY (Application) 0 of 0 N/A

ENERGY (Community) 0 of 0 N/A

WATER (Application) 0 of 0 N/A

WATER (Community) 0 of 0 N/A

WALKABILITY (Application) 0 of 0 N/A

WALKABILITY (Community) 0 of 0 N/A

NATURAL SYSTEMS (Application) 0 of 0 N/A

NATURAL SYSTEMS (Community) 0 of 0 N/A

BUILT ENVIRONMENT

Compact Development: Floor Space Index

Have the Municipal Official Plan Floor Space Index (FSI) or Floor Area Ratio requirements been satisfied? <select> Mandatory

Compact Development: Persons & Jobs per Hectare

Has the plan conformed to the following relevant minimum density targets?  
Places to Grow - 50 ppl+jobs/hectare OR,  
York Region - 70 ppl+jobs/hectare OR,  
Targets set within the Municipal Official Plan/Secondary Plan

<select> Mandatory

Compact Development: Location Efficiency

Building heights and/or densities conform to the minimum or maximum targets established in the applicable Municipal Official Plan

<select> Mandatory

Input the percent increase in density along existing or planned mid block collectors planned for transit (50% to 79% = 1 point, 80% to 100% = 2 points)

0% Up to 3 points (M and A)

Land use Diversity Mix Proximity to Basic Amenities

Please Populate Both Cases

Select amenities which are within 800m walking distance of 50% or more of the Dwelling Units (DU) (2 Points Each) (This minimum metric must be satisfied to earn aspirational points)

Greenery/Store/Farmer's Market

<select>

Instructions SPM - Dynamic Tool

Ready

# Overall Application and Overall Community Score

## Overall Application Score

- Considers design elements controlled by the applicant
  - ☐ Building Energy Efficiency
  - ☐ Urban Tree Diversity
  - ☐ Design for Lifecycle Housing, etc.

## Overall Community Score

- Includes the Overall Application score
- Includes elements typically controlled by the City or Region
  - ☐ Proximity to Schools
  - ☐ Proximity to cycling network, etc.
- Intent is to monitor the implementation of the Sustainability Performance Metrics and to inform future policies or implementation projects

# Testing Stage and Implementation



30

# Overview of Testing Stage

- Identified and implemented improvements
- Integrated the SPM into the development application approval process
- Worked toward development of Threshold Scores
- Initiated updates to guidance documents
- Commenced internal/external consultation and training
- Reviewed the feasibility of an incentive program
- Conducted analysis on metrics related to external design features

# Improvements Made During Testing Stage

- Created criteria to clarify which applications trigger the SPM process  
Example: Site Plan Approval Applications should be exempt from the SPM:
  1. single detached dwellings in a Heritage Conservation District
  2. all commercial/retail corporate rebranding for existing building elevations and signage
  3. minor changes to existing or approved buildings or site alterations (ex. changes to windows, doors, landscaping, parking, signage etc.)
- Examined the feasibility of an online web-based tool (adaptation of Brampton's tool)
- Developed tools to assist staff with review and approvals of applications





# Integration into the Development Approval Review Process

## Guiding Principles:

- Minimize additional steps
- Make it easy for applicants to submit SPM score and required materials
- Make it easy for staff to circulate and verify metrics

## Pre-Consultation Requirements:

- SPM Score
- Written SPM Summary (to replace Sustainability Metrics Summary)

## Two Submissions

1. **Initial Submission** with other requirements (as part of a complete application)
2. **Final Submission** (closer to approval)

# Integration into the Development Approval Review Process Continued

- Developed an internal process to circulate, review, verify, and document scores for an application
- Determined roles for internal staff
- Developed Site Plan checklist and Draft/Block plan checklist
  - ☐ Lists which staff member is to be circulated on which metrics
  - ☐ Lists metrics and provides checkboxes for recommended minimum targets and aspirational targets

# Role of the Project Lead with Project Team Collaboration

- Assess testing stage results of program
  - ❑ Track scores
  - ❑ Identify future improvements to program
- Recommend improvements
  - ❑ Development of tools to streamline circulation and verification
- Provide guidance and conduct training for technical staff
- Develop SPM threshold scores
- Integrate SPM into the development application review process
- Consult with BILD, relevant agencies, and other stakeholders



# Role of the Development Planner

1. Inform the applicant about the SPM requirements at pre-application consultation meeting
2. Ensure the complete SPM package is submitted at initial application submission (deem application complete)
3. Circulate SPM to technical staff for review and approval
4. Verify satisfaction of relevant metrics and request any necessary additional information from technical staff
5. Suggest and negotiate improvements to increase score
6. Verify final score once project is near approval (final submission)
7. Report on the SPM score threshold (staff report)



# Role of the Technical Staff

1. Verify indicators relevant to their area of discipline
  - Urban Design, Transportation Engineering, Stormwater Management etc.
2. Provide technical comments on improvements to their indicators
3. Suggest and negotiate improvements to increase score



# Development of Threshold Scores

- Working towards developing threshold scores to set goals for new applications
- Testing representative samples of development applications at each scale and applying improvements to the status quo
  - ❑ Benefits Sample of Block Plans
  - ❑ Sample of Plan of Subdivisions
  - ❑ Sample of Site Plans (greenfield, employment, VMC etc. )
- Adopt a similar structure to Brampton and Richmond Hill's threshold scores



# Development of Threshold Scores

## City of Brampton Threshold Scores

<b>Bronze Threshold</b>	Site Plan - 35 to 52 points Draft Plan - 29 to 39 points Block Plan - 30 to 38 points
<b>Silver Threshold</b>	Site Plan - 53 to 69 points Draft Plan - 40 to 50 points Block Plan - 39 to 48 points
<b>Gold Threshold</b>	Site Plan - 70+ points Draft Plan - 51+ points Block Plan - 49+ points

## Town of Richmond Hill Threshold Scores

<b>Performance Level</b>	<b>Sustainability Score</b>
Good	Draft Plan: 21 to 35 points Site Plan: 32 to 45 points
Very Good	Draft Plan: 36 to 55 points Site Plan: 46 to 65 points
Excellent	Draft Plan: 56 points or more Site Plan: 66 points or more

# Consultation and Training

## Internal

- Undertook interdepartmental consultation to update staff on project process and gain input
- Recorded input received from staff
- Developed consultation and training plan for development planners and technical staff (to be implemented)

## External

- Recorded input received from applicants
- Developed consultation and training plan for external stakeholders (to be implemented)





# Incentive Program Feasibility

- Examining marketable incentives for higher scoring applications
  - ☐ Recognition strategy
  - ☐ Awards program
  - ☐ Stamp of recognition for brochures



# External Design Features and Bill 51

As per Bill 51, Municipalities have the authority to consider matters relating to exterior design and their sustainable design

- Vaughan Staff determined SPM scores derived from metrics related only to exterior design elements.
- Metrics used to determine these scores directly relate to common urban design items routinely incorporated into development projects such as:
  - ☐ Landscape Elements
  - ☐ Surface Parking Reduction
  - ☐ Improvements to Mobility Connections, etc.



# Analysis of Metrics Pertaining to External Design Features

	Site Plan				Draft Plan			
			Cumulative Score				Cumulative Score	
	Min Recommended	Aspirational	Min Recommended	Aspirational	Min Recommended	Aspirational	Min Recommended	Aspirational
Landscape Elements - Living Green Infrastructure & Heat Island Reduction	6	14	6	14	4	16*	4	16
Reducing Surface Parking	2	4	8	18	n/a		n/a	
Improving Mobility - Pedestrian Connections	3	10	11	28	5	12	9	28
Energy Conserving Lighting Exterior Only	3	4	14	32	3	3	12	31
Potable Water Reduction for Irrigation	2	4	16	36				
Bird Friendly Design			16	36				
Cool Roof / Green Roof	2	4	18	40				
Energy Conservation - Passive Solar Alignment					3	6	15	37
Totals	18	40			15	37		
*Aspirational score includes soil volume metric								

## Findings:

- SPM quantifies external matters that Municipality has authority to consider
- Considerable number of points can be gained by including design features that are already commonly asked for by Urban Design and are relatively easy to accomplish

# Next Steps

- Final rollout of SPM program
- Development of awards-based and marketable incentives program
- Implementation of additional changes to the development approval review process
- Financial considerations for maintenance and ongoing refinement
- Ongoing internal/external consultation and training
- Tailoring of Brampton's web-based tool for Vaughan's use
- Creation of automated tracking and monitoring tool
- Update City of Vaughan Official Plan policies at the next Municipal Comprehensive Review



# 2014 OPPI Excellence in Planning Award

- Partner municipalities won the 2014 OPPI Excellence in Planning Award in the Research/New Directions category for the Sustainability Performance Metrics
- Recognized for its innovation as a tool to measure sustainability and improve the function of the built environment

