Breaking the Rules: Innovation Mindset for an Eco Neighbourhood: Resilience in Mount Dennis

ULI Urban Leadership Program
28 March 2019
Agenda

• Core concepts
• Identify the stressors
• Create the framework
• What can you do?
core concept 1
climate change
climate changed
core concept 2
sustainability

mitigate
sustainability

mitigate

adapt
sustainability
mitigate
adapt
thrive
core concept 3
Resilience

The capacity of individuals, communities, businesses, buildings and infrastructure to:

Cope with;
Adapt to;
Respond to;
Recover from, and;
Learn from;

Chronic stresses and acute shocks.
core concept 4
identify the stressors
We help **cities** around the world become more resilient to the physical, social, and economic **challenges** that are a growing part of the 21st century.
Toronto’s Resilience Story

Despite recognition as a prosperous city of opportunity that has attracted over 2 million immigrants, Toronto tops Canada in levels of working poverty and has seen the greatest increase in income inequality in the country. The city has begun taking substantial steps to increase affordable housing and to address income inequality and transit equity. City officials predict that without further action, 60% of the city’s neighborhoods will be classified as low or very low-income by 2025.

Toronto is also vulnerable to a number of climate related shocks including rainfall flooding, blizzards, and heat waves. Severe flooding in 2013 was the most costly natural disaster in the city’s history, as 4,579 homes were flooded and 750,000 people lost power. Officials are concerned that a stronger storm could lead to even power disruptions that would impact the entire city and region, disproportionately affecting the city’s neediest.
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Toronto’s Future Weather

- **Daily Temperature Maximum:**
  - 44° celsius (2040-50)
  - 37° (2000-09)

- **HOT Days:**
  - 66 above 30° (2040-50)
  - 20 (2000-09)

- **Extended Heat Waves:**
  - 2.5 per year (2040-50)
  - 0.6 (2000-09)

- **Daily Rainfall Maximum:**
  - 166 millimetres (2040-50)
  - 66 (2000-09)

*Source: Toronto’s Future Weather and Climate Driver Study, 2011*
create the framework
Evacuation vs. Shelter in Place
Passive Survivability refers to a building’s ability to maintain critical life-support functions and conditions for its occupants during extended periods of absence of power, heating fuel, and/or water.
DAILY RAINFALL MAXIMUM

166 millimetres

2040-50

66

2000-09

https://www.cdp.net/en/research
? =
500 year flood line
or
3’-0” + 100 year flood line

Source: Fortified  https://disastersafety.org/fortified/safer-business/
MOVE CRITICAL EQUIPMENT ABOVE THE WATER LINE
Toronto Green Standard T3
Residential: Minimum 93m2 (1000 sqft), and/or 0.5m2/occupant

72 hours back-up power to the refuge area

Create one area on emergency power that can be heated and cooled during an event, allowing people to gather, normalize temperature and recharge key communication devices.
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Thermal Resilience refers to a building’s ability to maintain liveable temperatures in the event of a power outage or disruption in fuel supply for prolonged periods of time.
Orient building with long axis facing south

Keep the window to wall ratio to 40-50%

Provide operable windows

Use walls, not window walls.

Projected balconies on South, Inset on East and West

Use the best windows.
Zero Carbon Building refers to a building that is highly energy efficient, that produces on site, or procures carbon-free renewable energy in an amount sufficient to offset the annual carbon emissions associated with building operations.
Building Integrated Photovoltaics
Concrete
410 kg Co2

Steel
8,200 kg Co2

Wood
-1,000 kg Co2
“Wood has the performance potential of a race car, but we are only allowed to drive it up and down residential streets at 20km/hr”

- Steven Street, Technical Director at WoodWORKS!
Create Opportunities for Social Connection

Amenity spaces at multiple levels or loveable stairs - a community that knows one another will react and recover more quickly in the event of an emergency.
Use Art to Tell Local Stories
Create Opportunities for Food

Food connects people and brings them together. Include rooftop gardens and sidewalk level community gardens. Integrate fruit trees into the landscaping.
“We are all temporarily able-bodied”
- Susan Ruptash, Quadrangle

Design for Inclusion
Make environments more usable, safer and healthier in response to the needs of an increasingly diverse population.
Micro retail opportunities
Reclaiming of Streets
what can you do?
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3. Design for future weather and energy independence;
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3. Design for future weather and energy independence;
4. Engage with the people of the neighbourhood and understand what connects them;
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6. Use micro-retail to stimulate the local economy;
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7. Integrate inclusive design principles into your thinking;
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7. Integrate inclusive design principles into your thinking;
8. Consider opportunities for…
...disruptive and ambitious change that inspires the imagination.
how will you reimagine mount dennis?