

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



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;

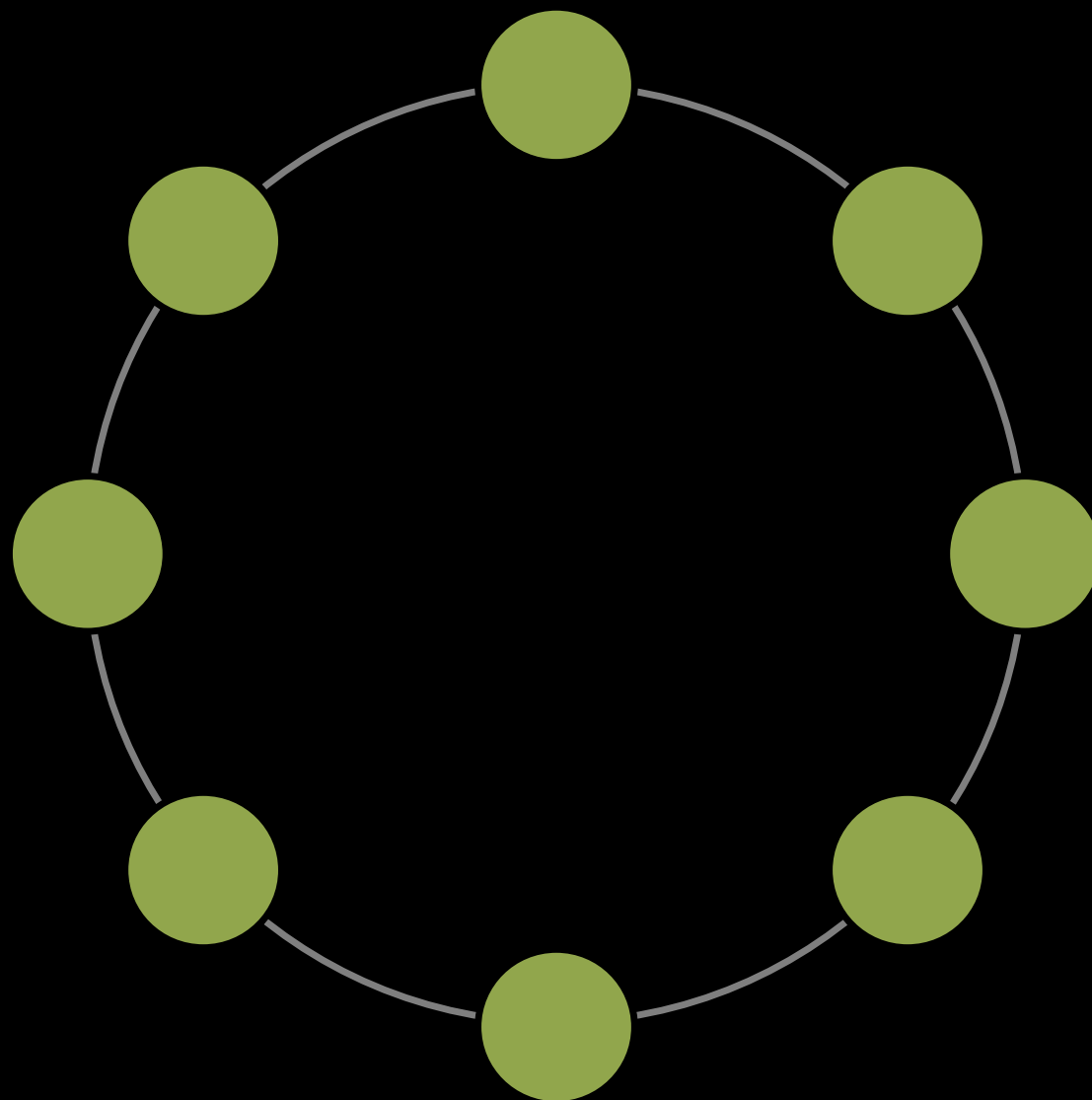
Learn from;

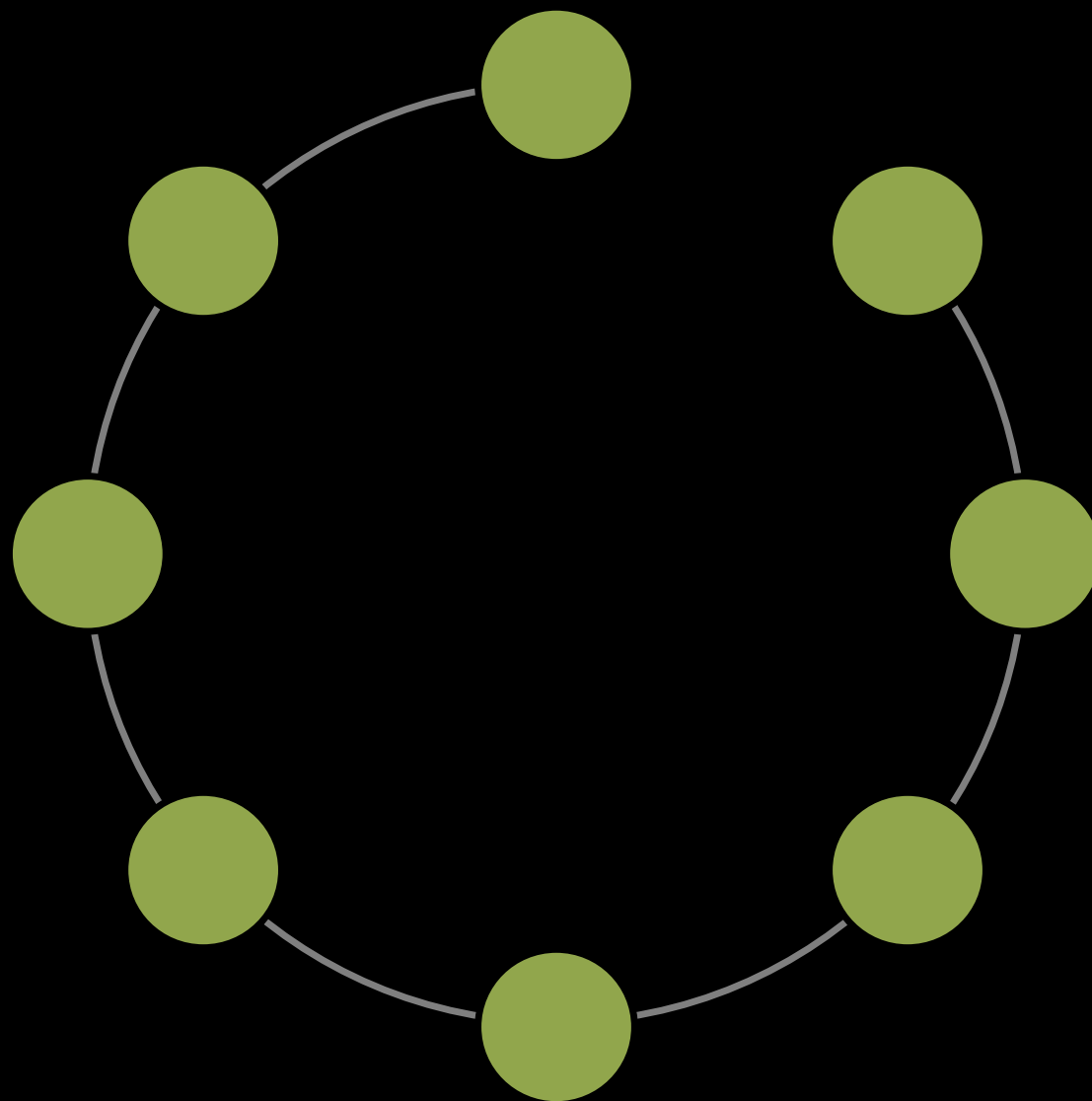
Chronic stresses and acute shocks.

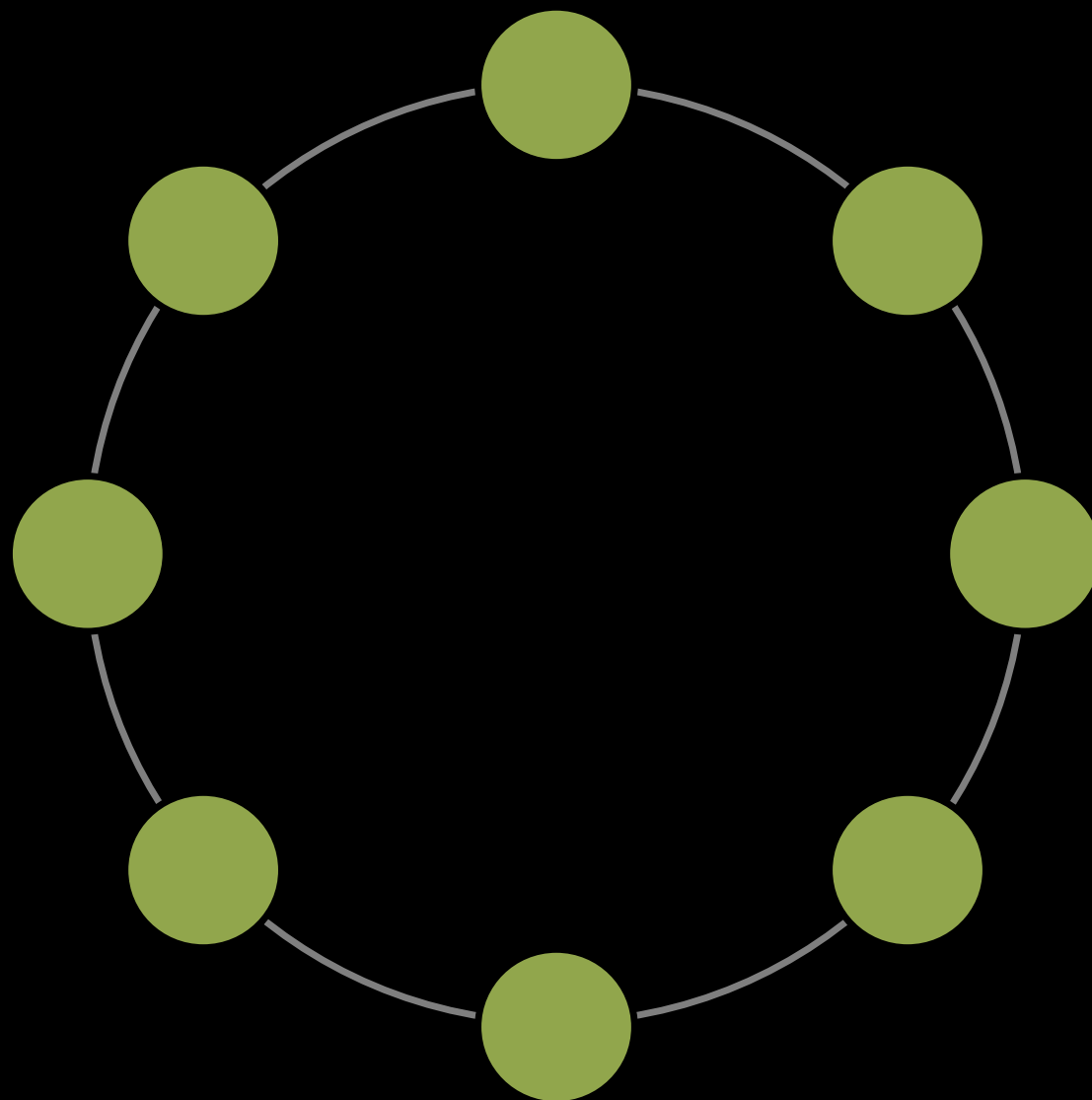


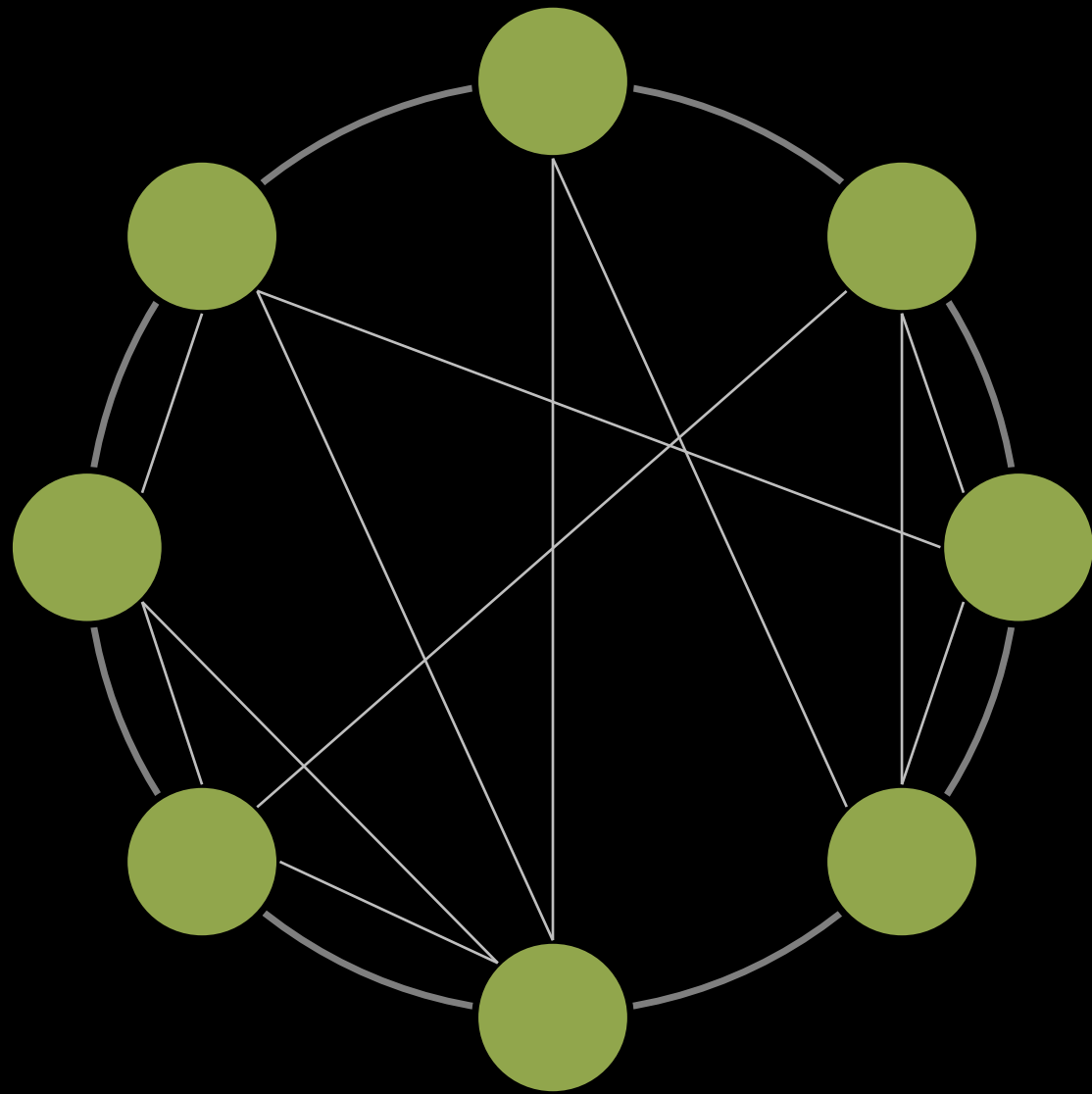
core concept 4

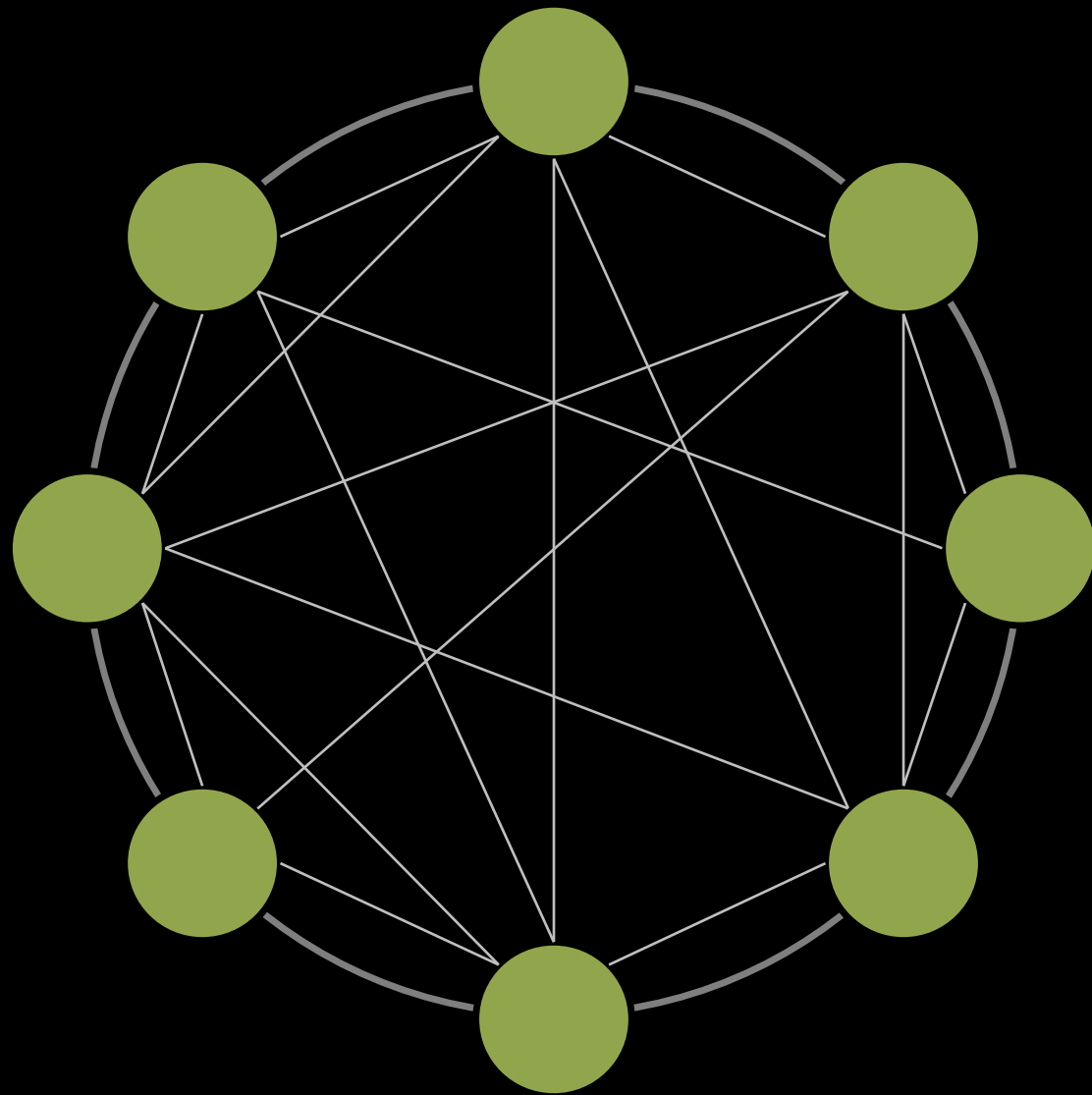


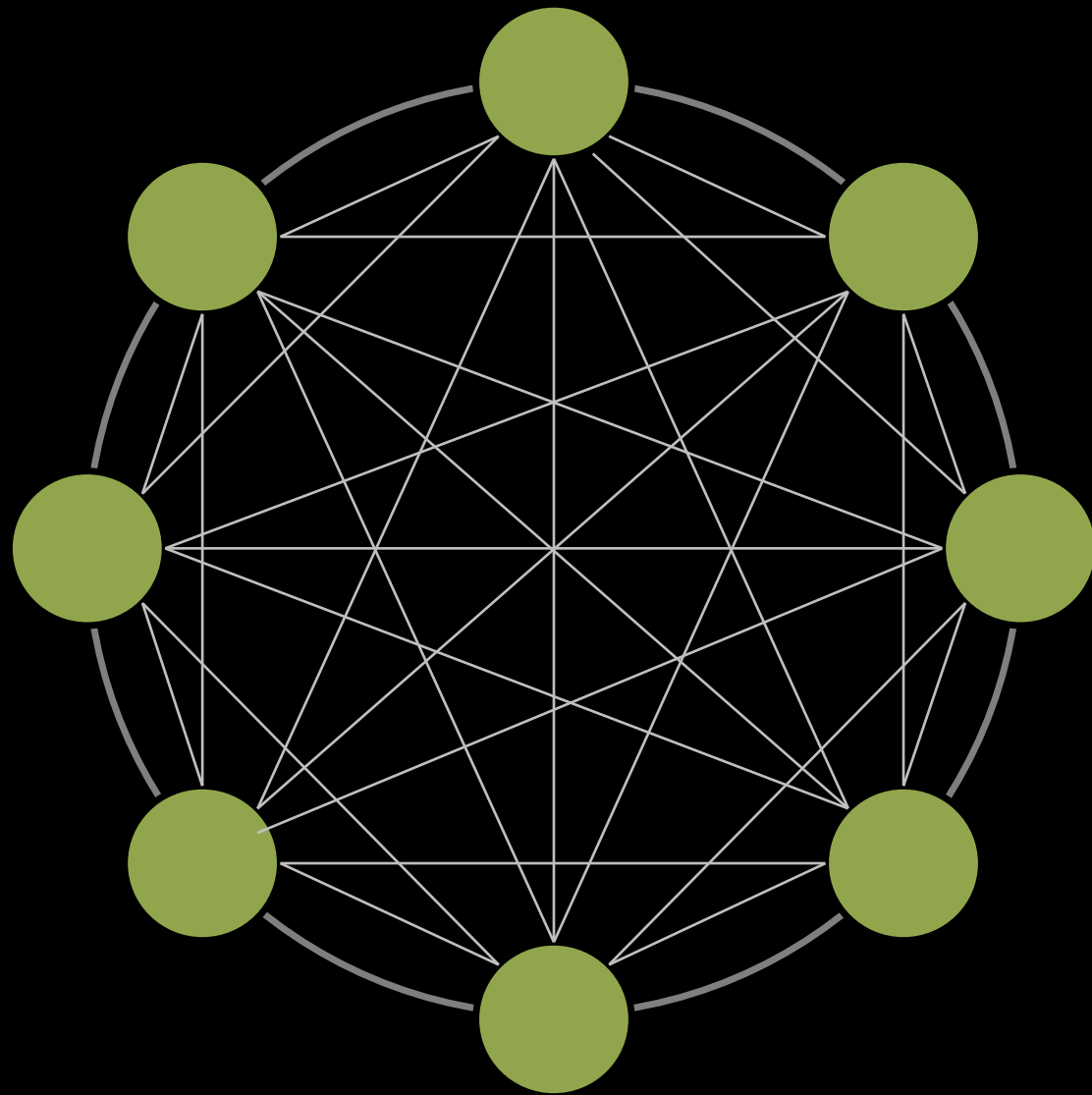


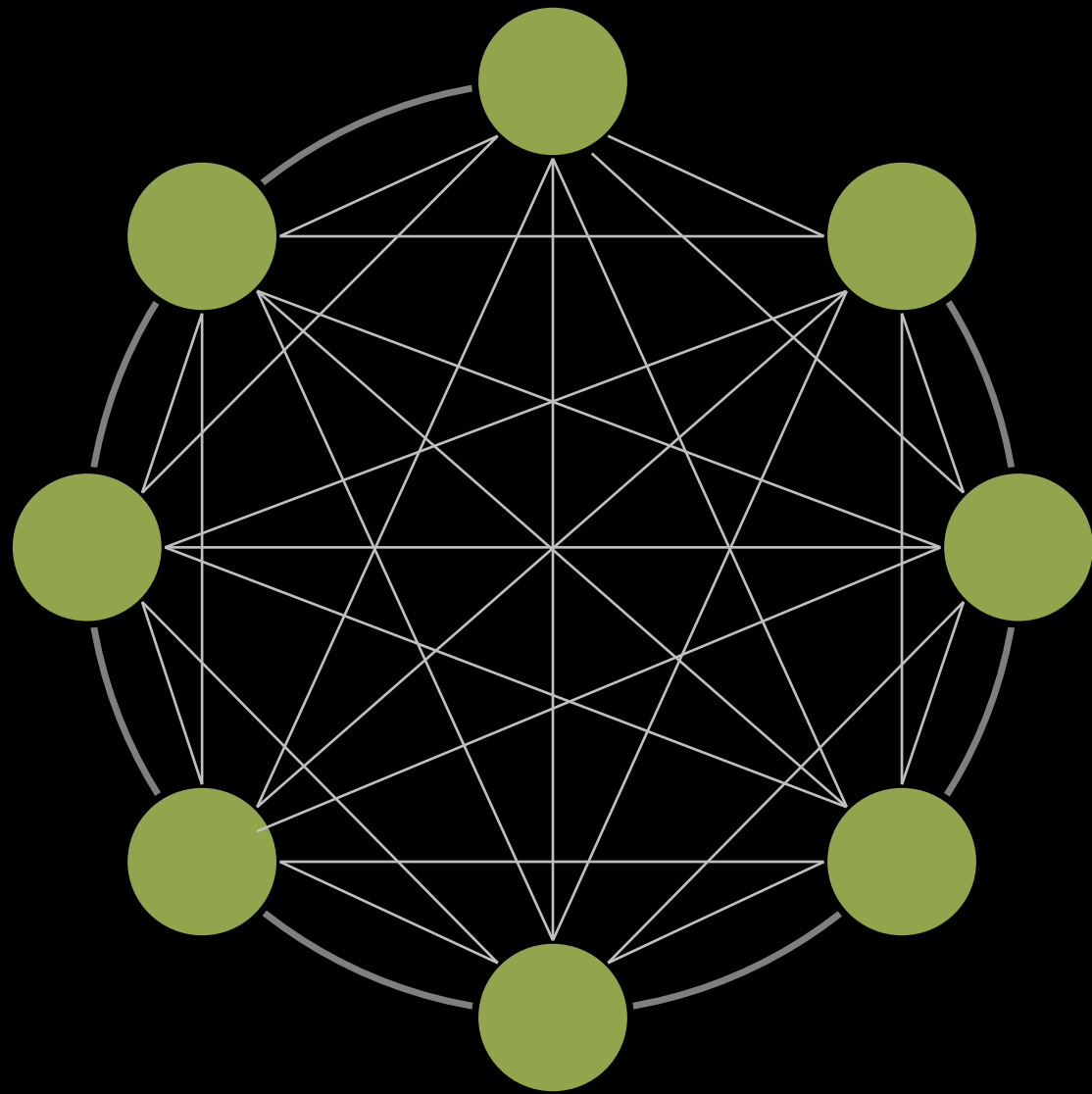


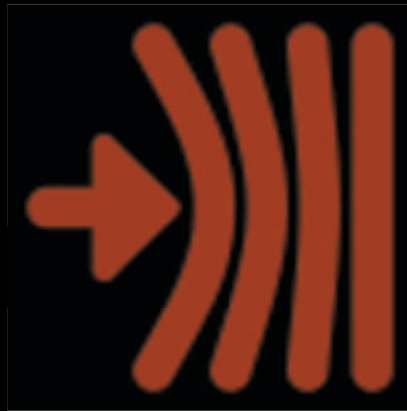












identify the stressors



PIONEERED BY THE
ROCKEFELLER FOUNDATION

100

RESILIENT CITIES



GET UPDATES

ABOUT US

OUR IMPACT

NEWS

OUR CITIES

OUR PARTNERS

RESOURCES



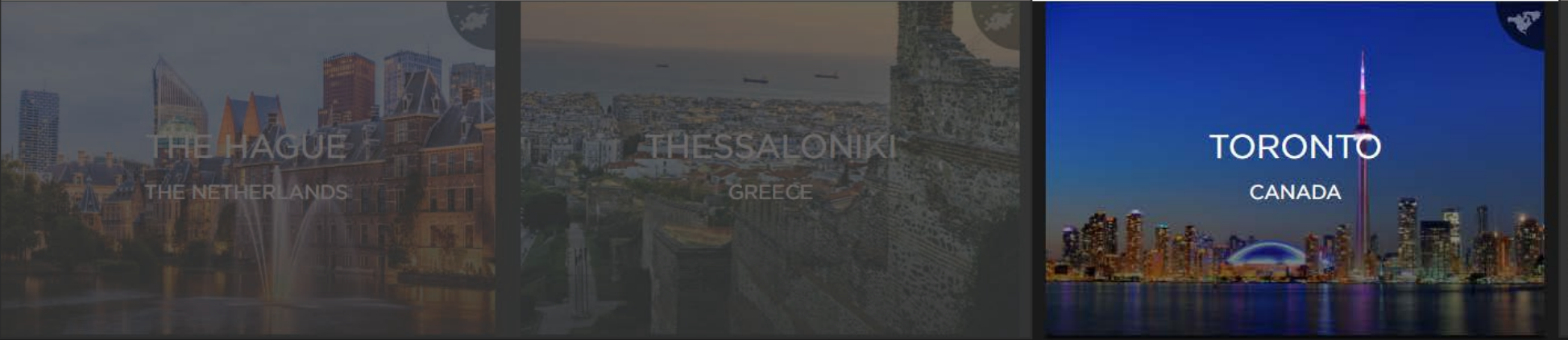
We help [cities](#) around the world become more resilient to the physical, social, and economic [challenges](#) that are a growing part of the 21st century.

THE HAGUE
THE NETHERLANDS

THESSALONIKI
GREECE

TORONTO
CANADA

TOYAMA
JAPAN



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.

SHOCKS AND STRESSES

BLIZZARD

ECONOMIC INEQUALITY

ENERGY INSECURITY

EXTREME COLD

EXTREME HEAT

INADEQUATE PUBLIC
TRANSPORTATION SYSTEMS

INFRASTRUCTURE FAILURE

INSECURE MUNICIPAL
FINANCES

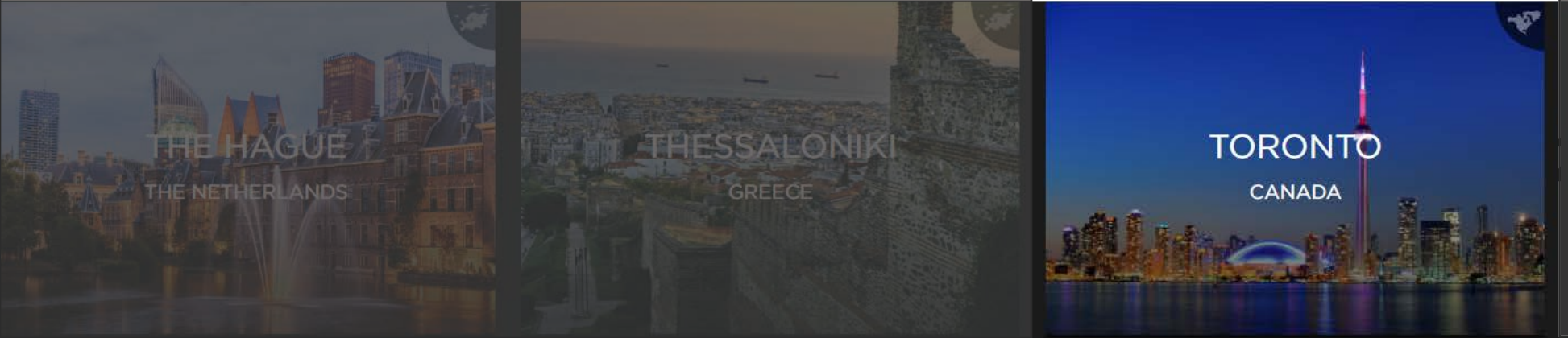
LACK OF AFFORDABLE
HOUSING

POOR GOVERNANCE /
REGULATORY CLIMATE

POWER OUTAGE

RAINFALL FLOODING

TRAFFIC CONGESTION



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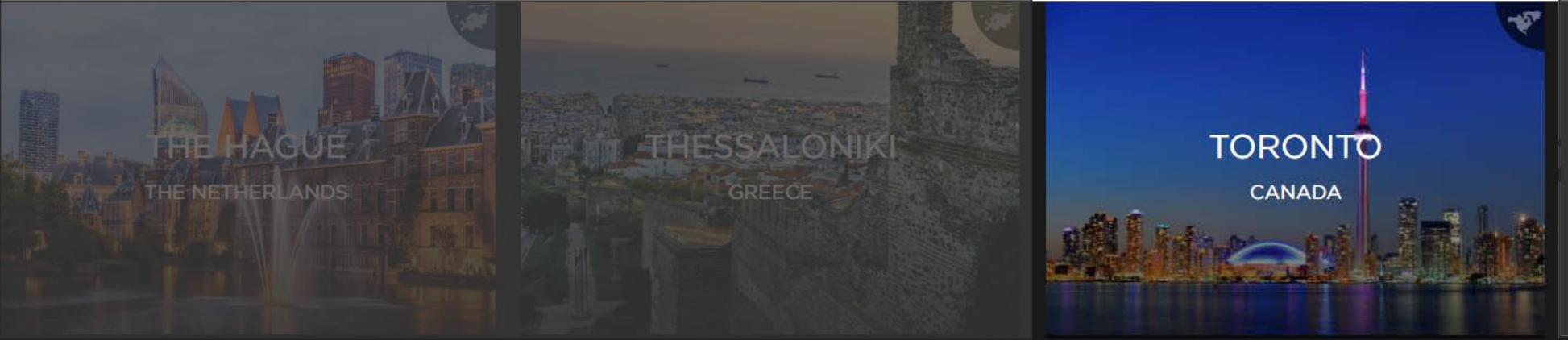
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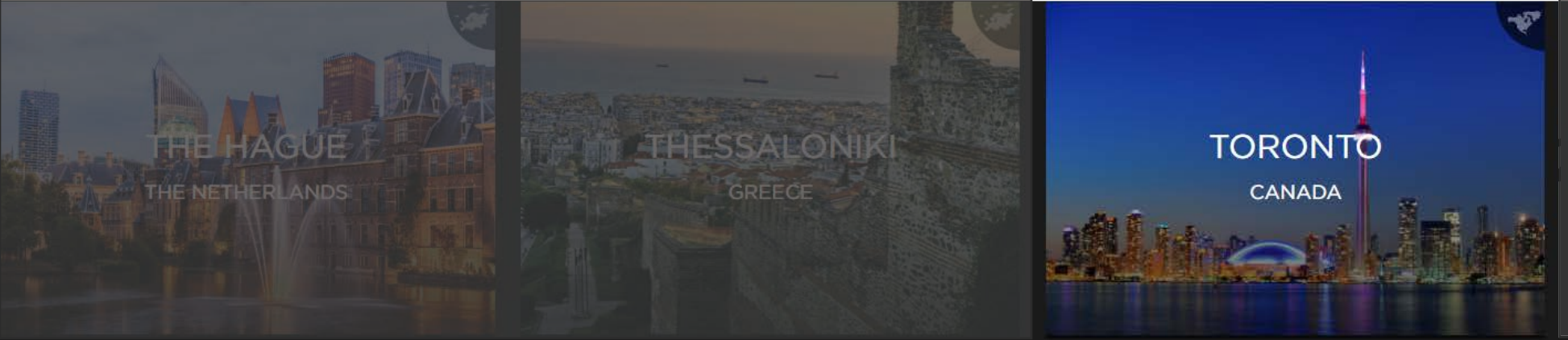
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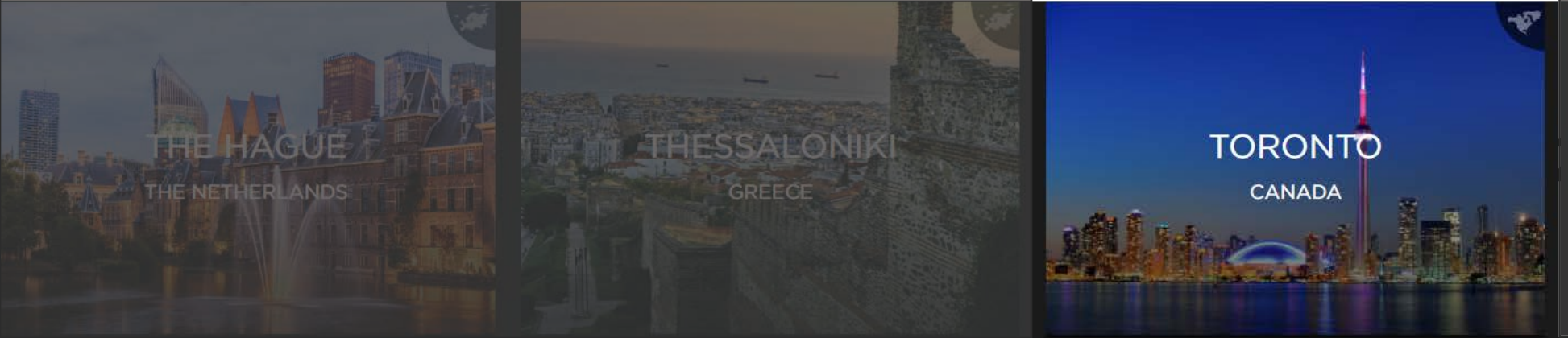
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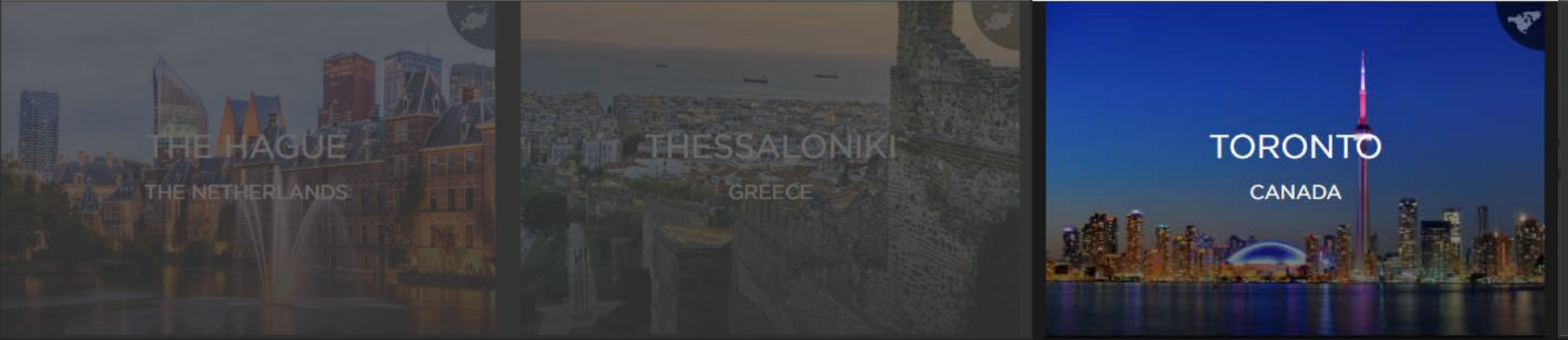
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TORONTO'S FUTURE WEATHER AND CLIMATE DRIVER STUDY

Volume 1 - Overview



Prepared For:

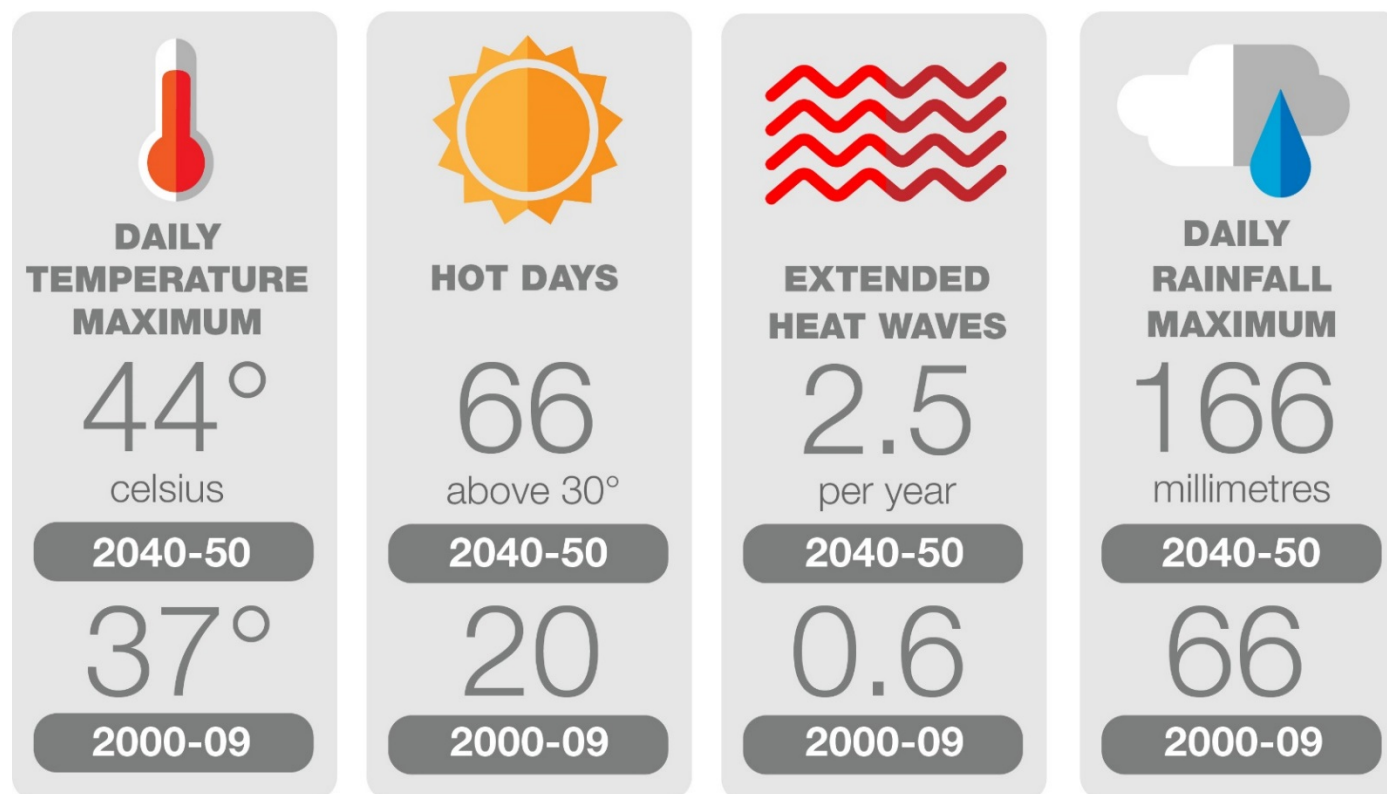
The City of Toronto

Prepared By:

SENES Consultants Limited

December 2011

Toronto's **Future Weather***

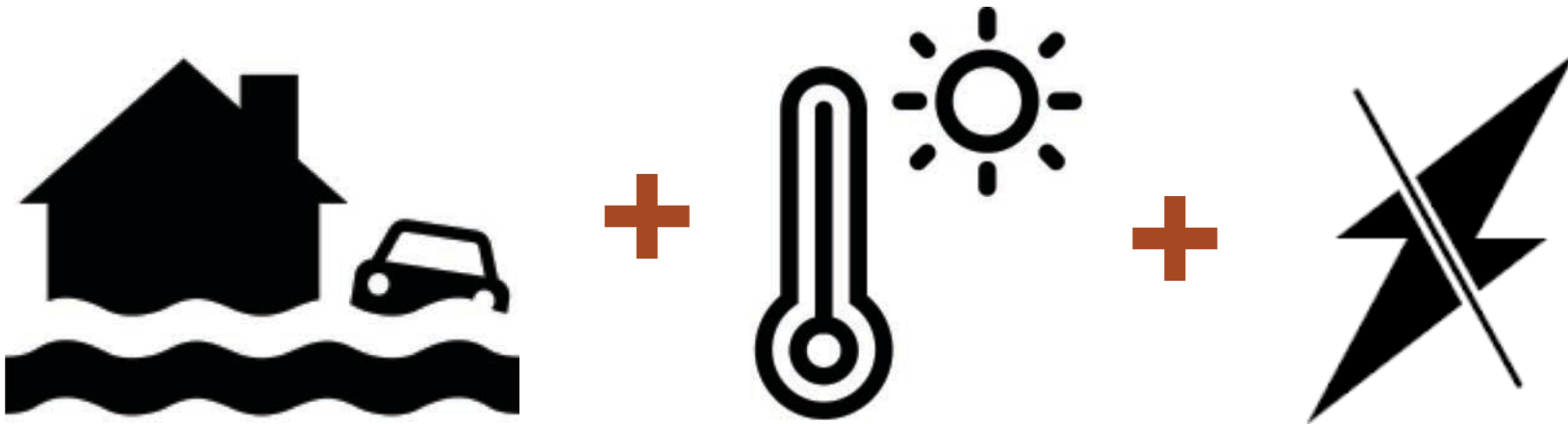


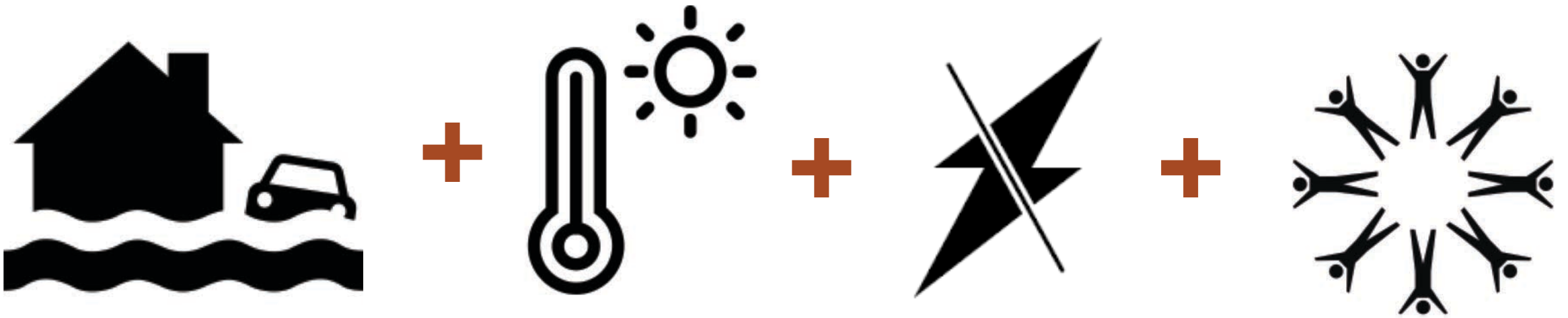
*Source: Toronto's Future Weather and Climate Driver Study, 2011











create the framework



Evacuation vs. Shelter in Place

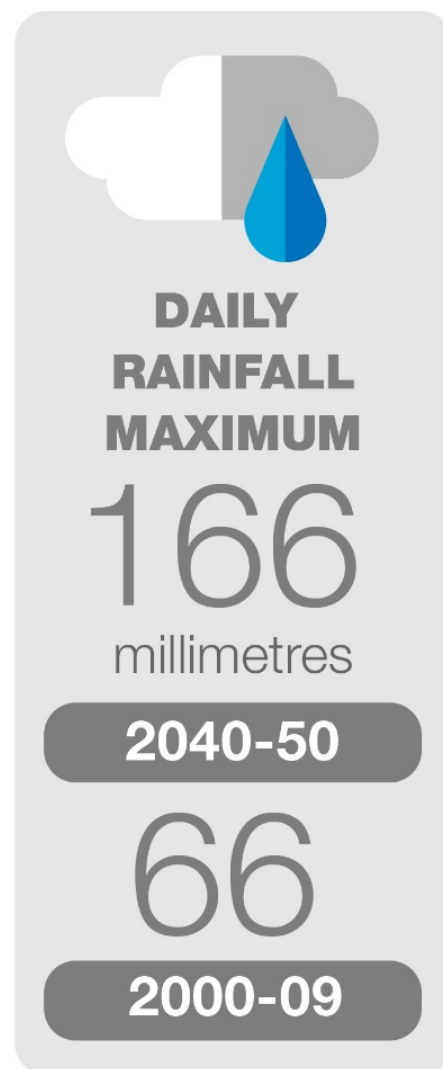


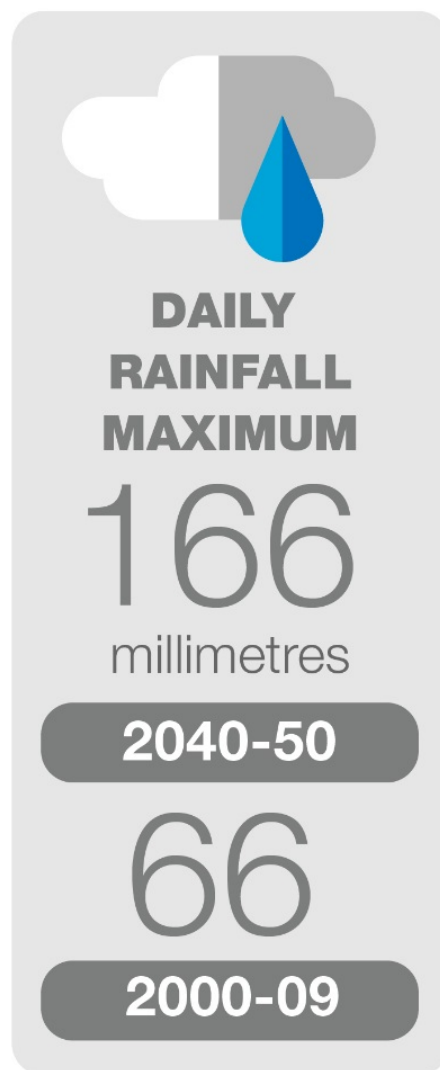
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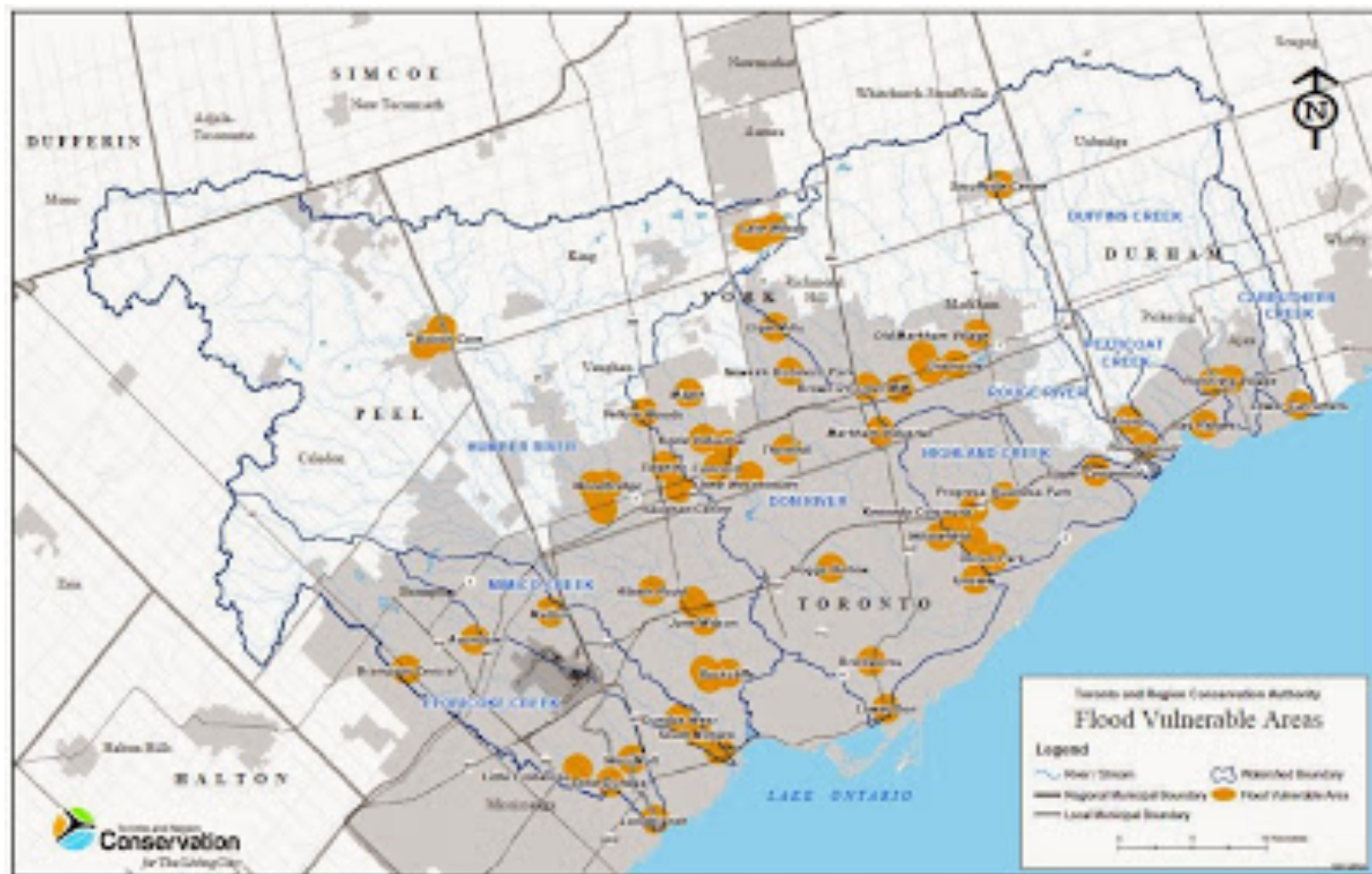
Passive Survivability

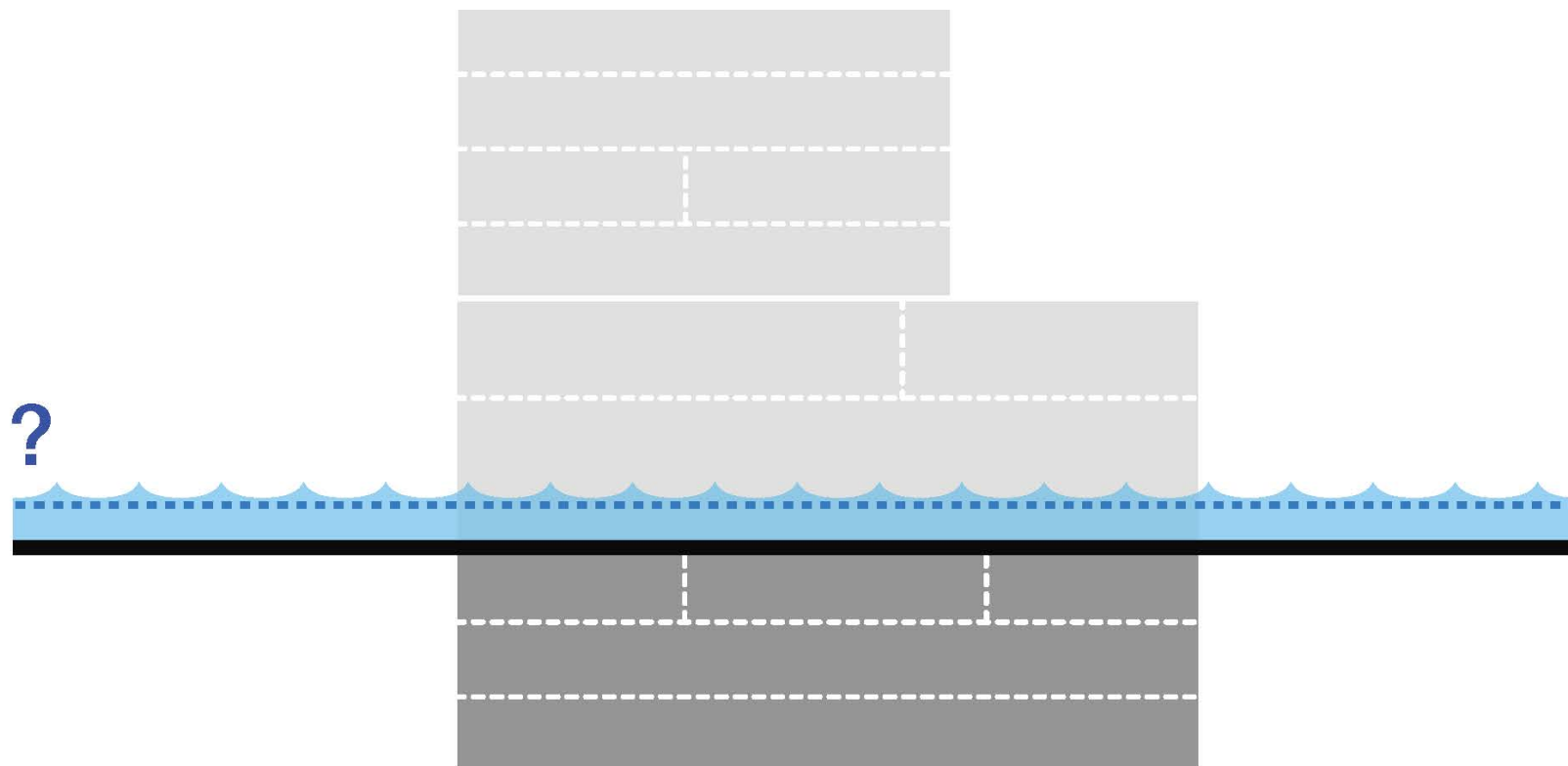
refers to a building's ability to maintain critical life-support functions and conditions for its occupants during extended periods of absence of power, heating fuel, and/or water.











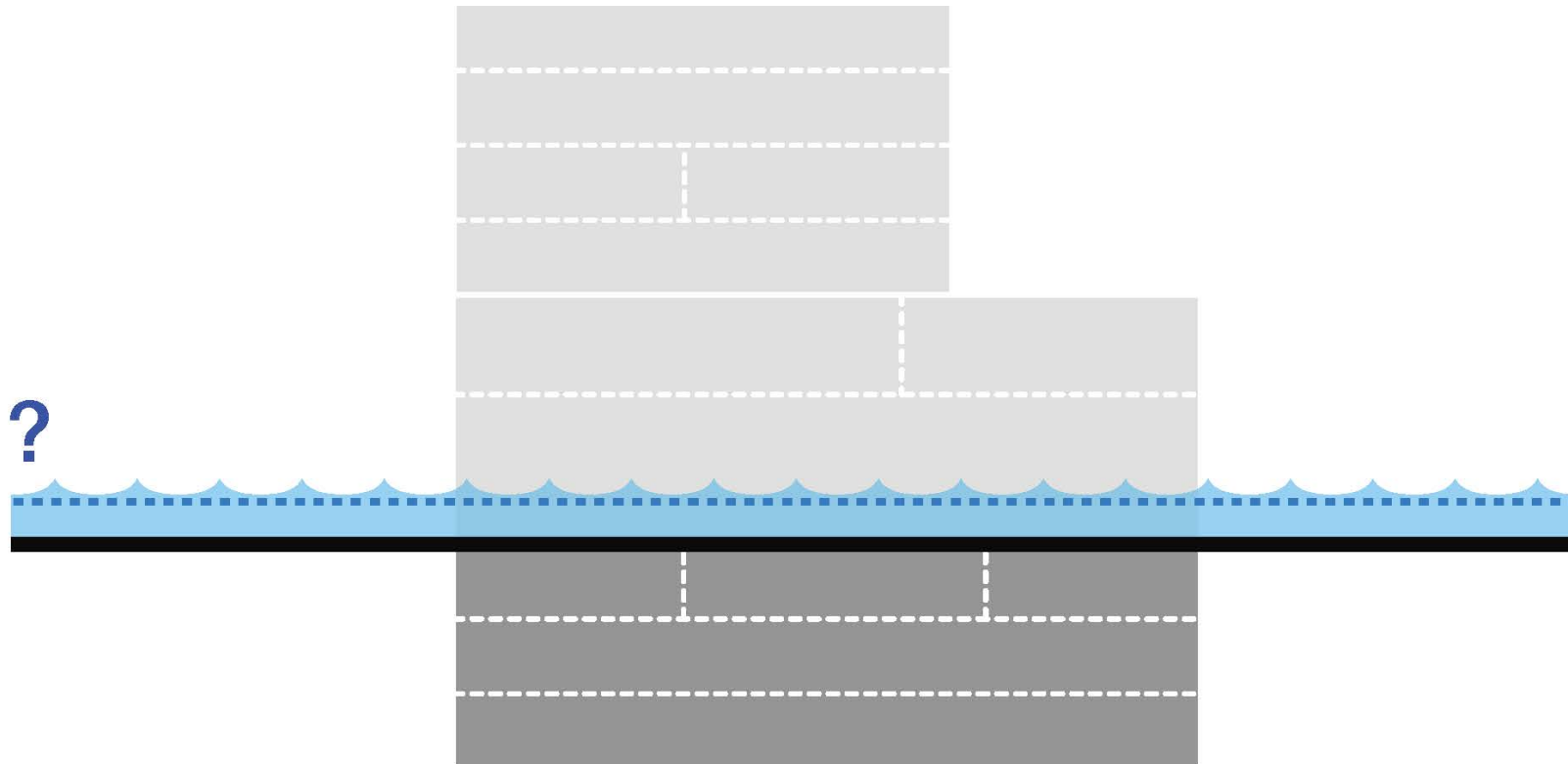


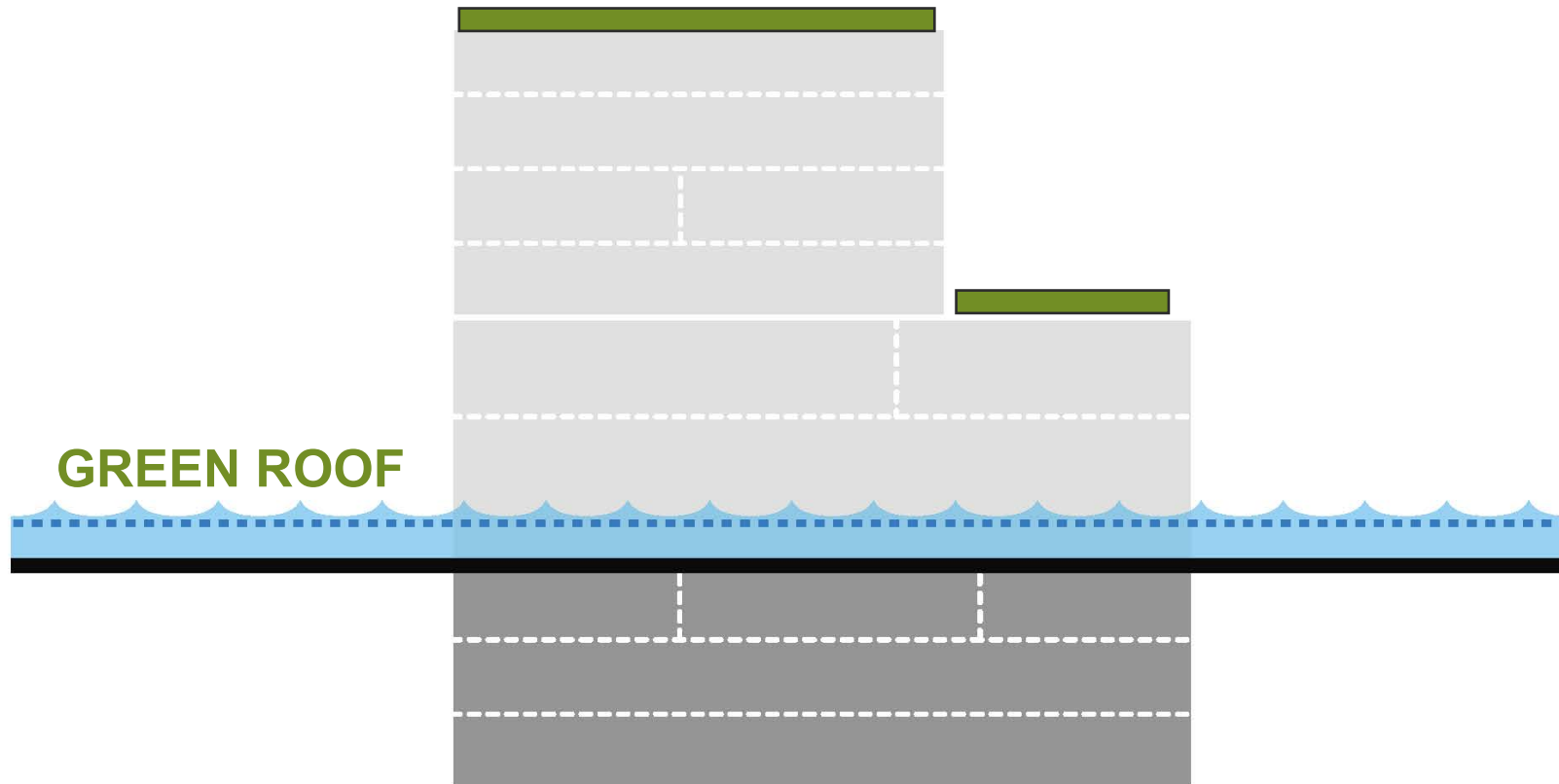
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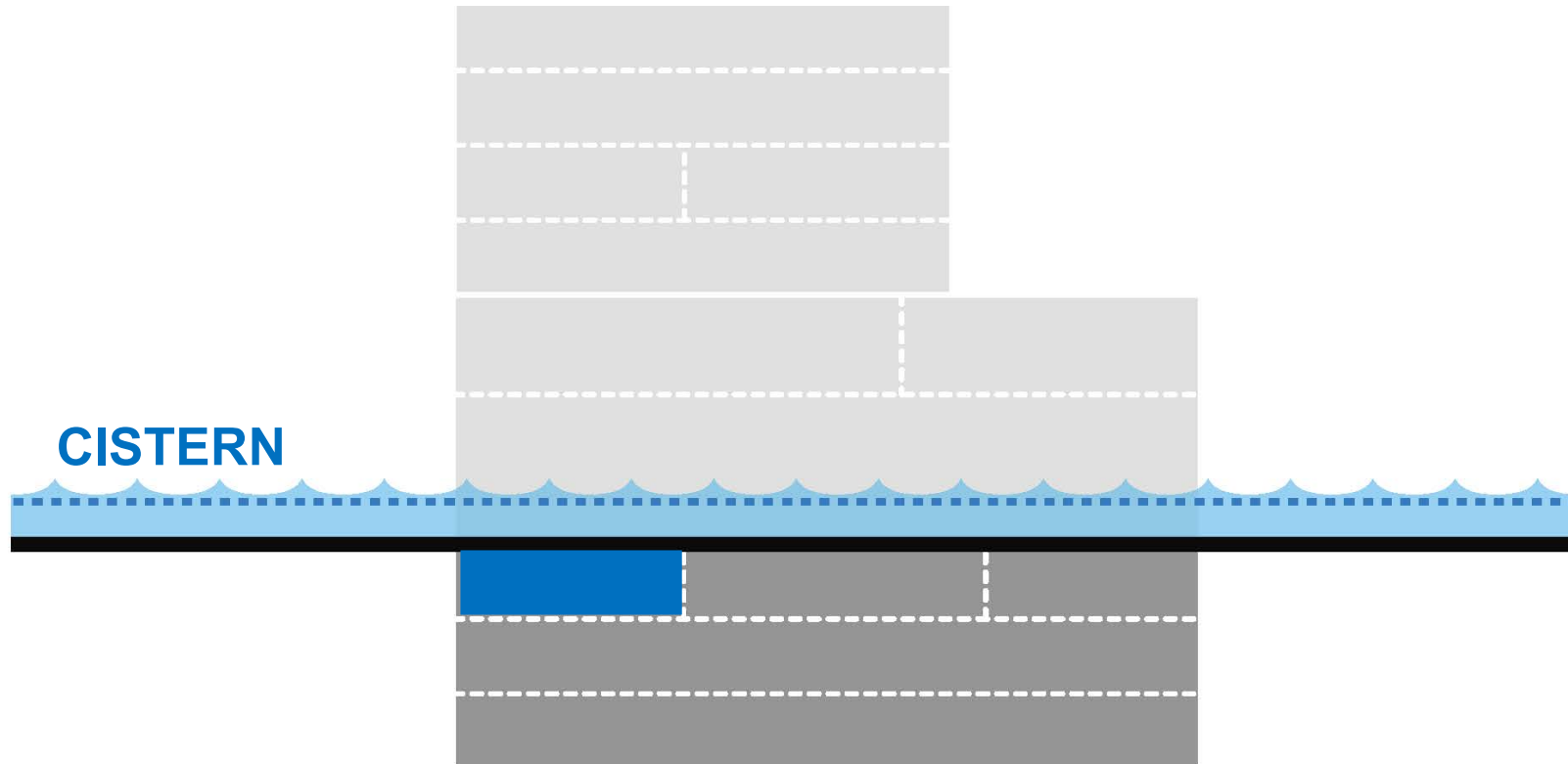
500 year flood line

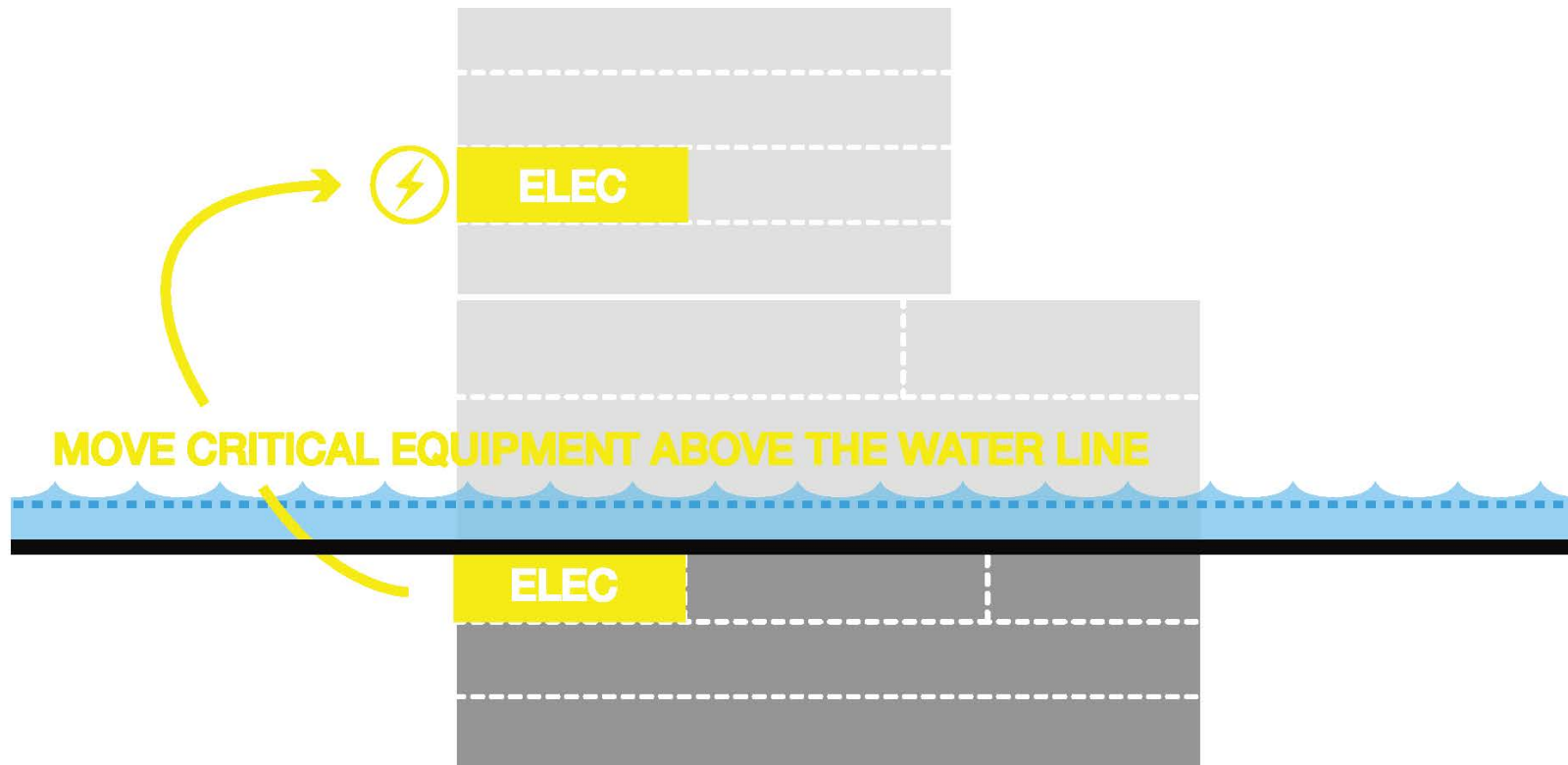
or

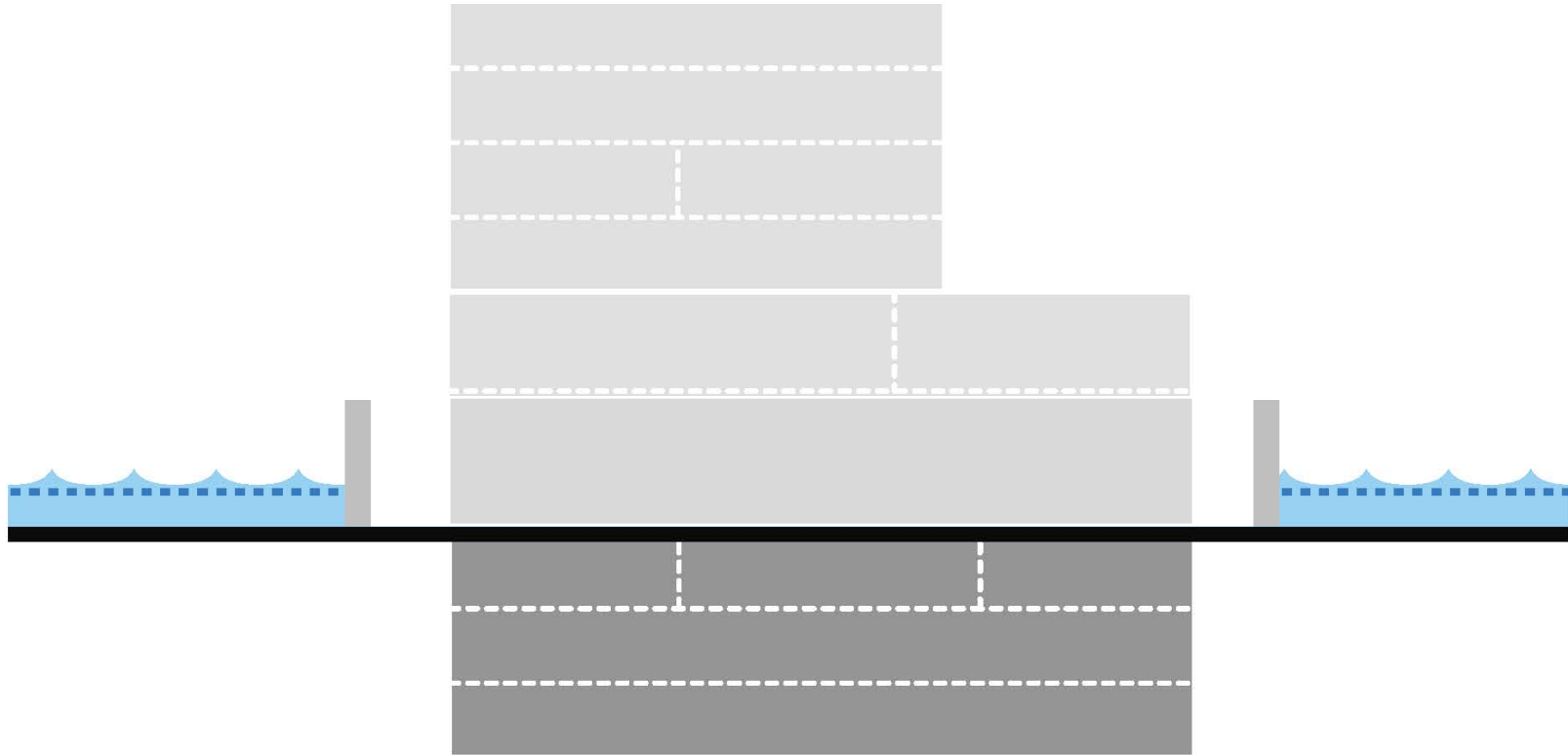
3'-0" + 100 year flood line

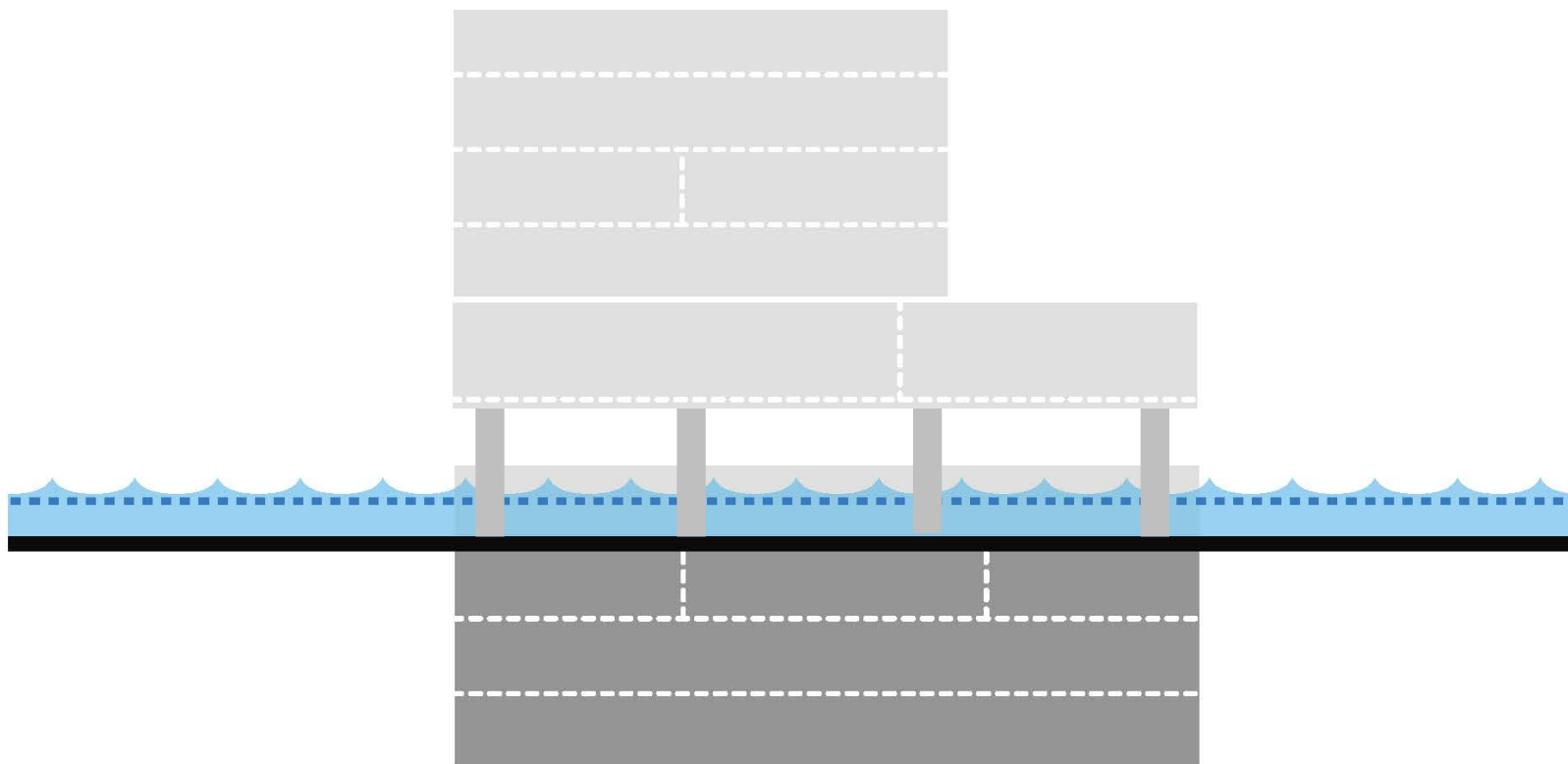










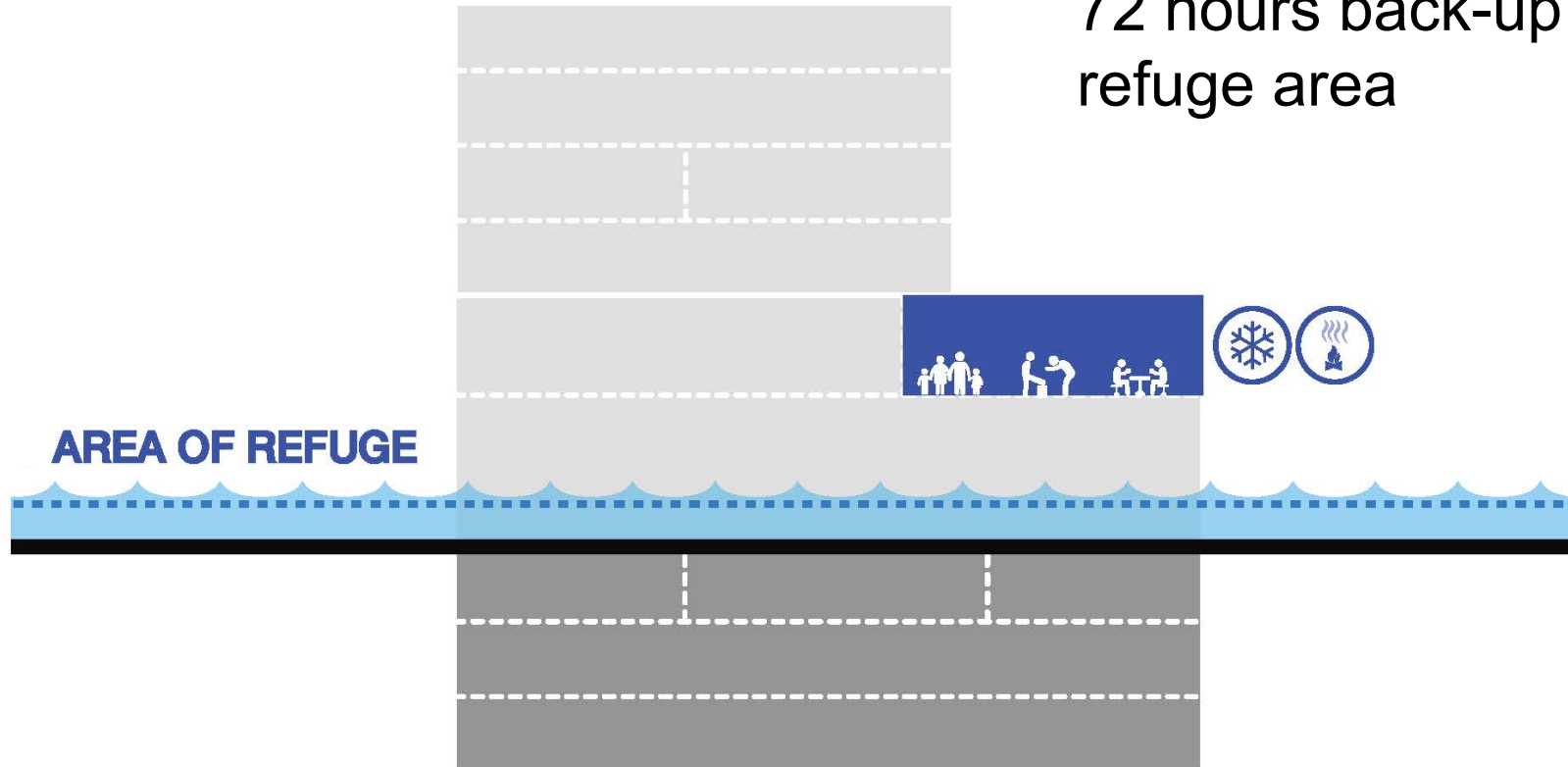




Toronto Green Standard T3

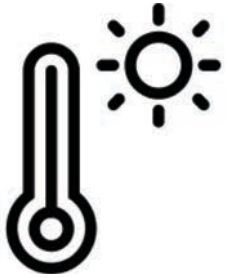
Residential: Minimum 93m² (1000 sqft), and/or 0.5m²/occupant

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.





**DAILY
TEMPERATURE
MAXIMUM**

44°
celsius

2040-50

37°

2000-09



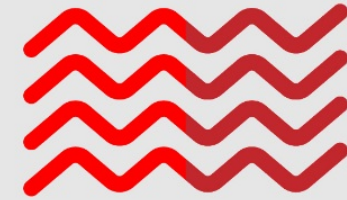
HOT DAYS

66
above 30°

2040-50

20

2000-09



**EXTENDED
HEAT WAVES**

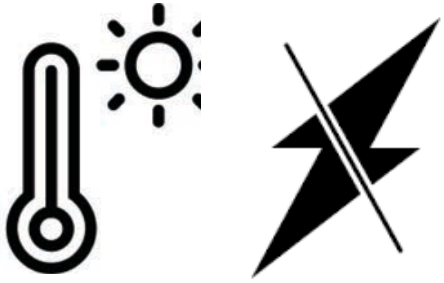
2.5
per year

2040-50

0.6

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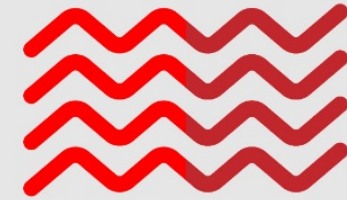
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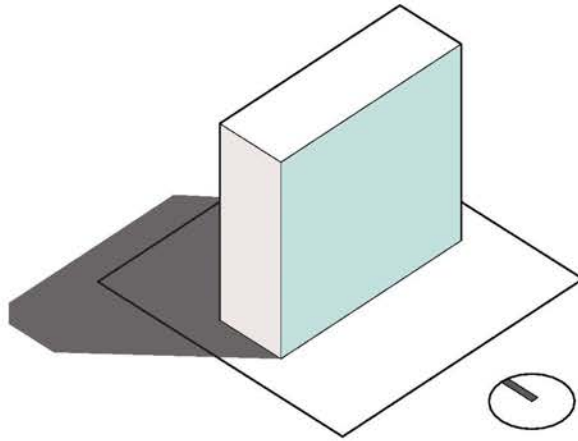
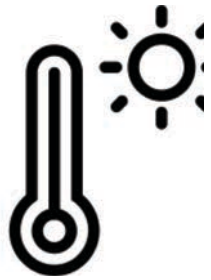


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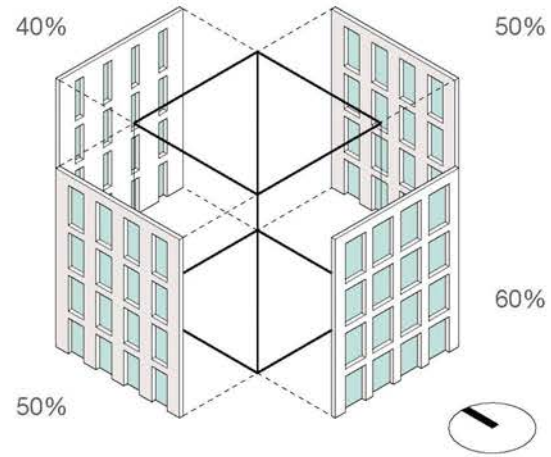
Thermal Resilience

refers to a building's ability to
maintain liveable temperatures
the event of a power outage
disruption in fuel supply for
prolonged periods of time.

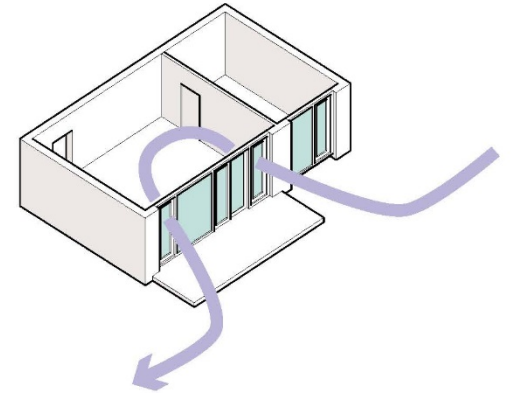




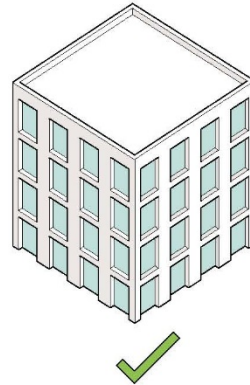
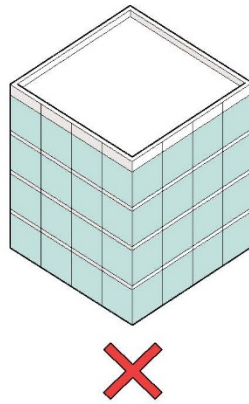
Orient building with long axis facing south



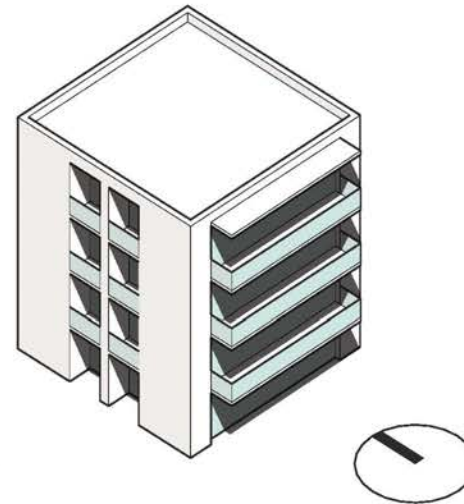
Keep the window to wall ratio to 40-50%



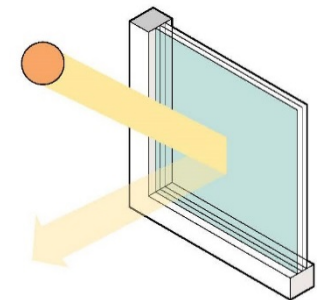
Provide operable windows



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.





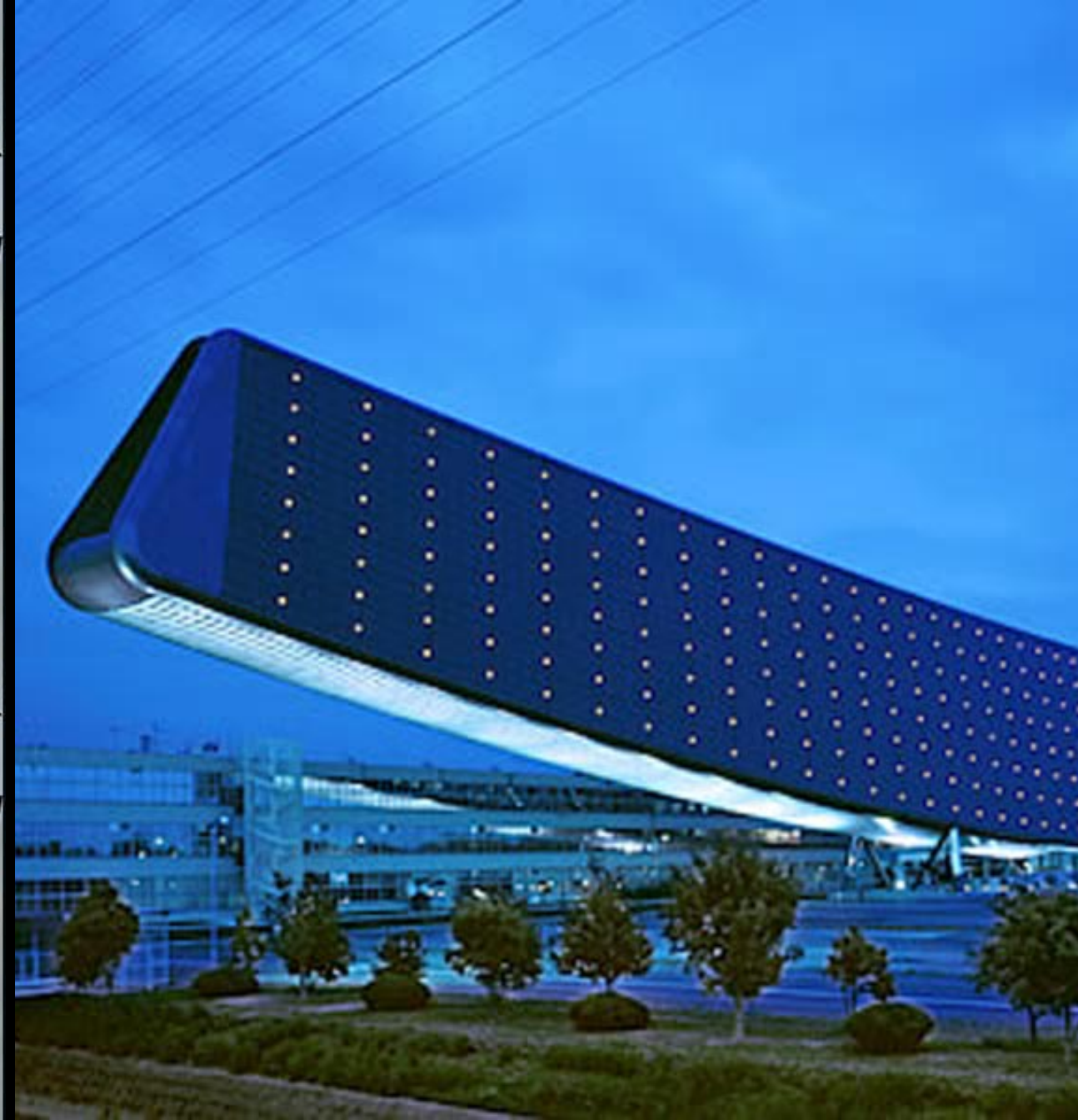
Large Passive House Buildings



Passive Shading



Punched Windows and real Walls





Building Integrated Photovoltaics



Concrete
410 kg Co2



Steel
8,200 kg Co2

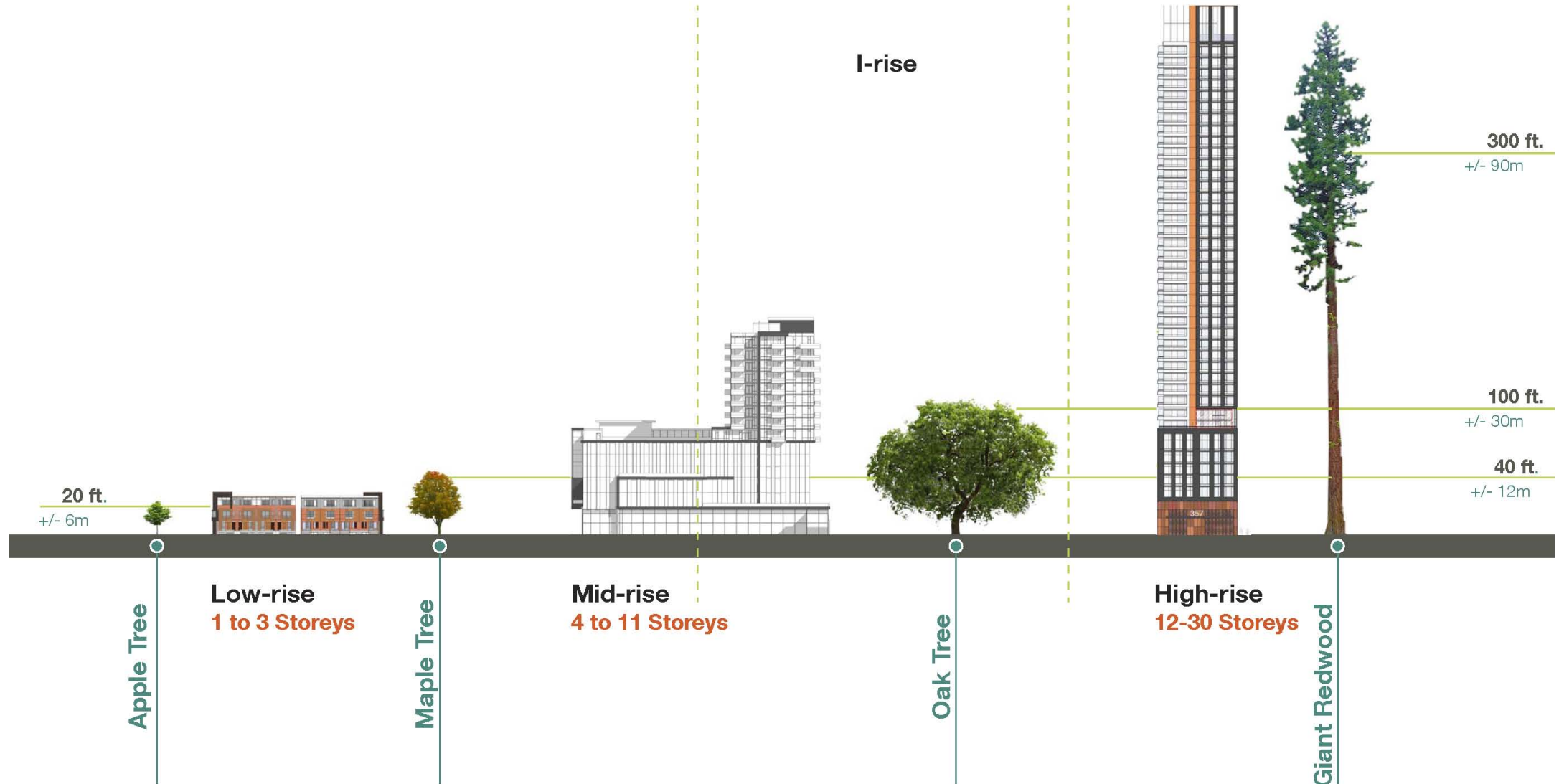


Wood
-1,000 kg Co2



“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!





2:9

imcoe
Premium Building Wrap

imcoe
G CENTRE
87-3705
edSolutions

imcoe
87-3705

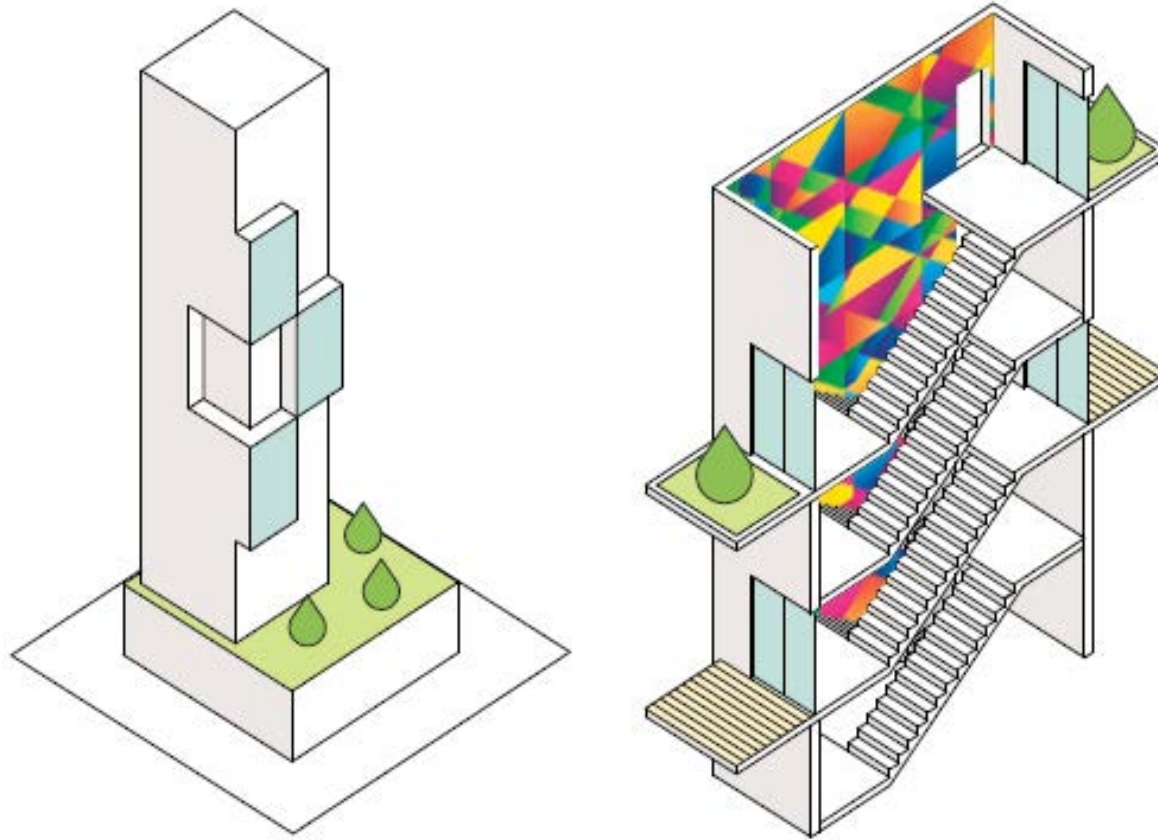
imcoe
87-3705





Embodied Carbon and Panelization

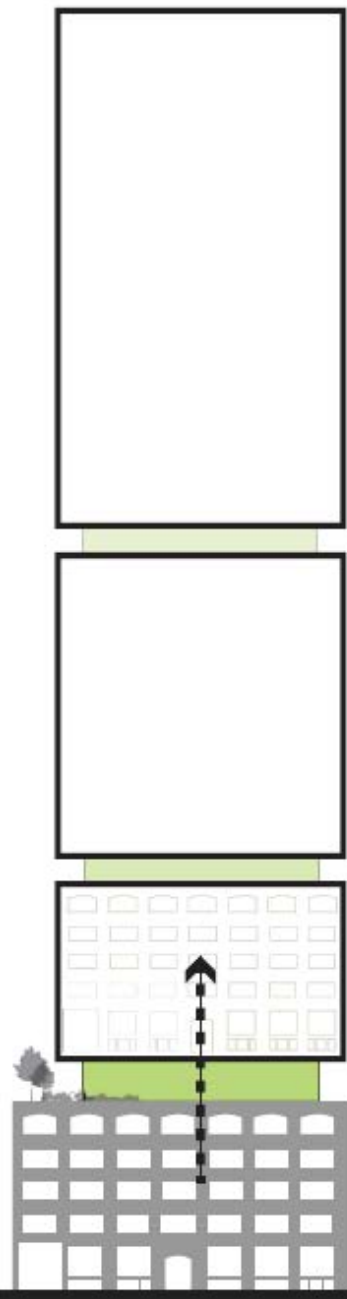
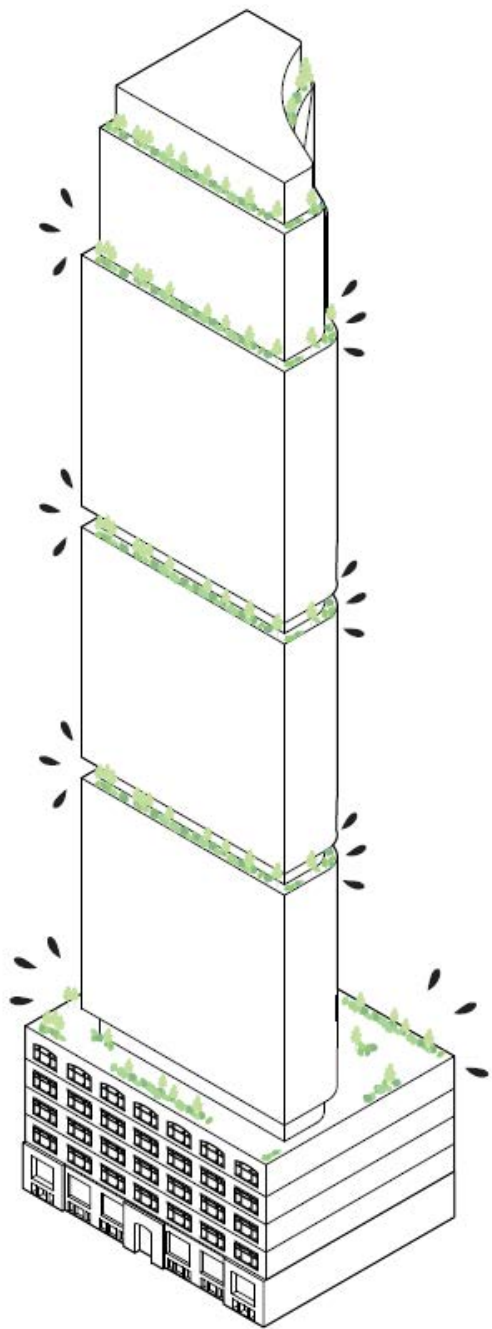




Create Opportunities for Social Connection

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.



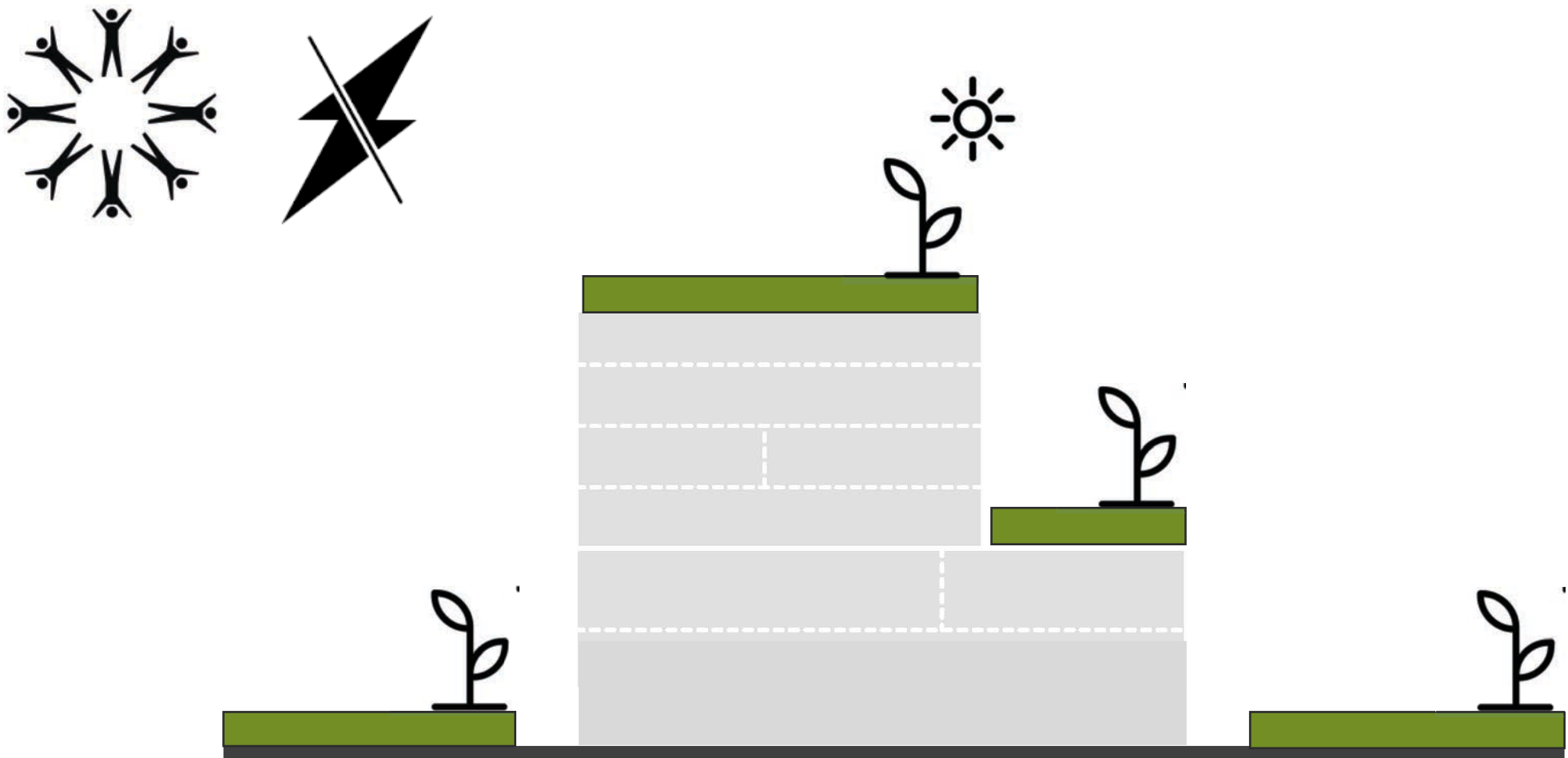




Active Stairs



Use Art to Tell Local Stories

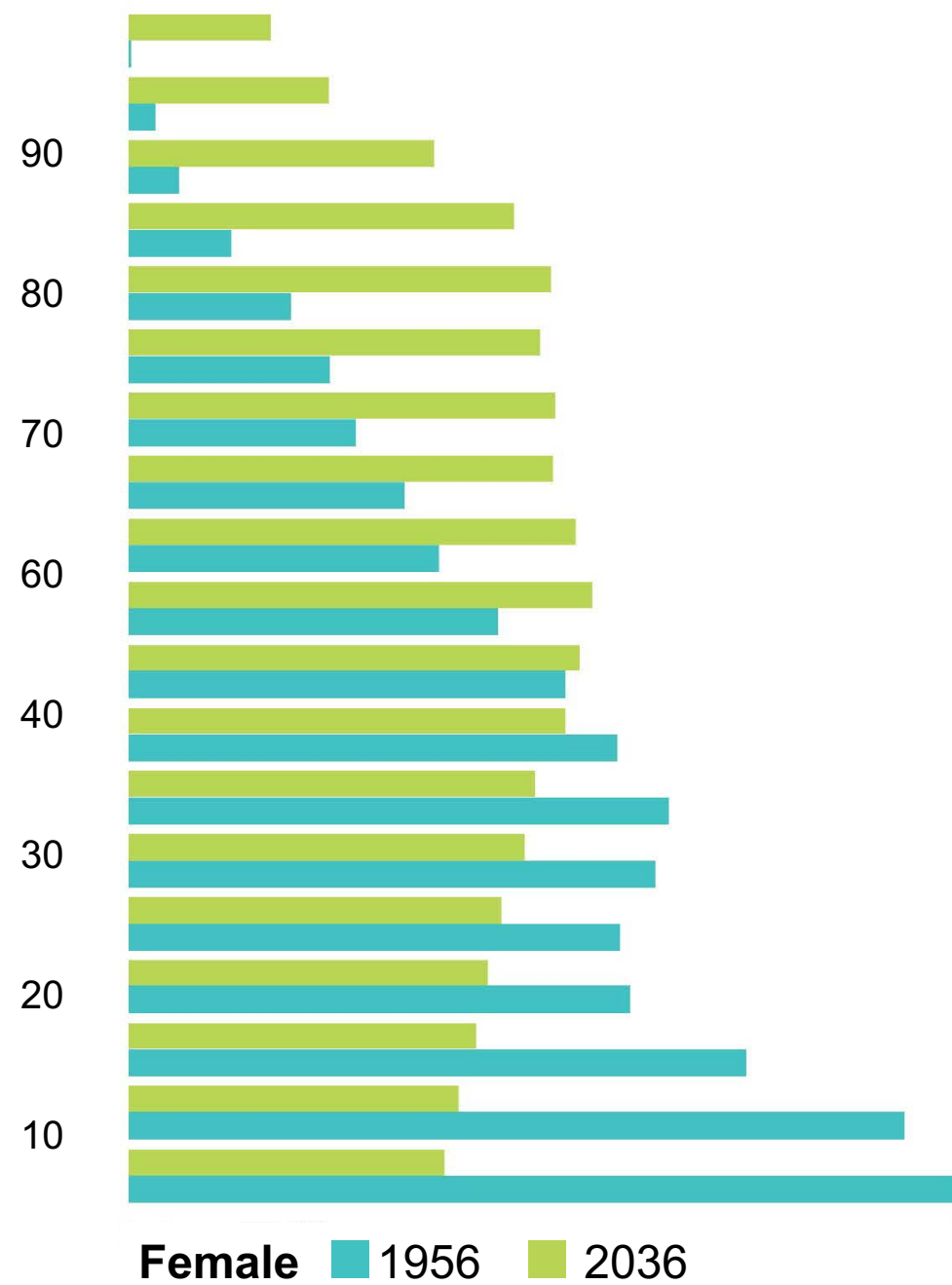
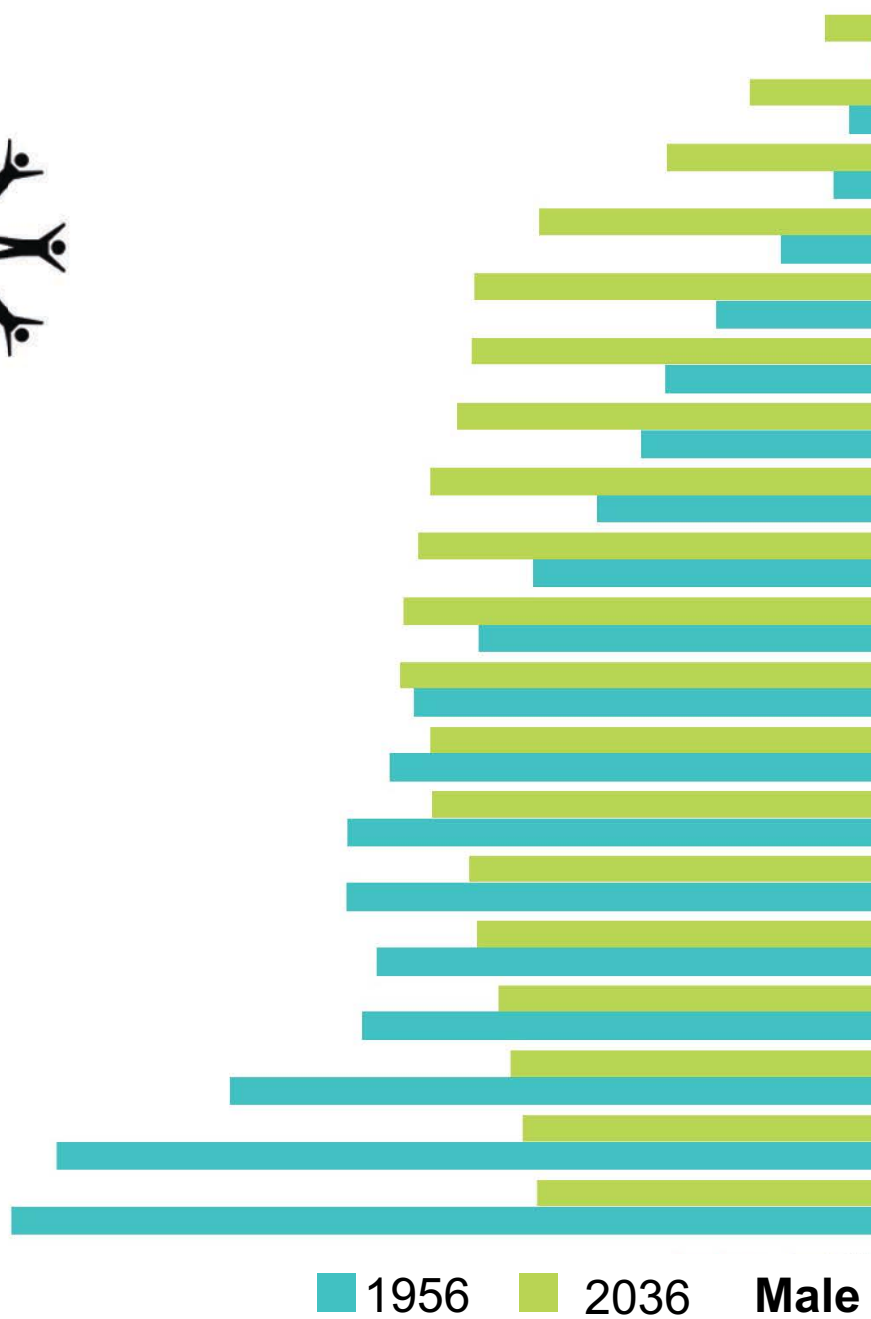


Create Opportunities for Food

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



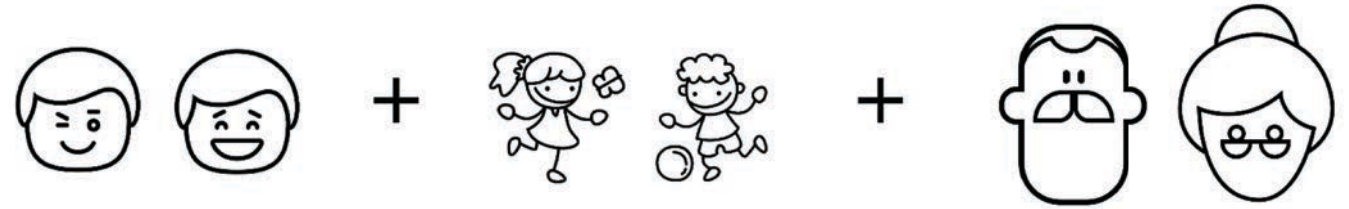
Design for Inclusion

Make environments more usable, safer and healthier in response to the needs of an increasingly diverse population.





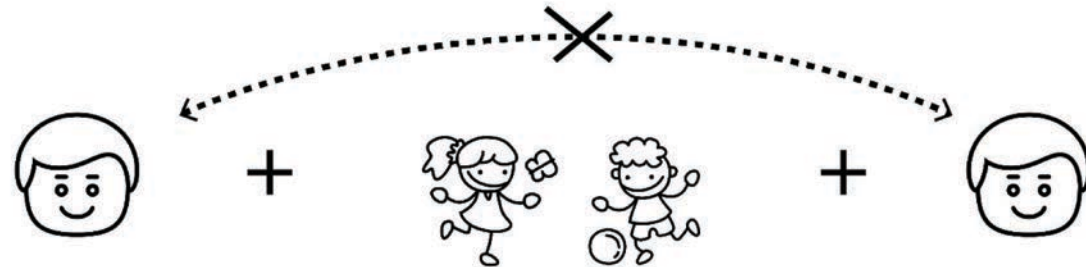
Multi-generational

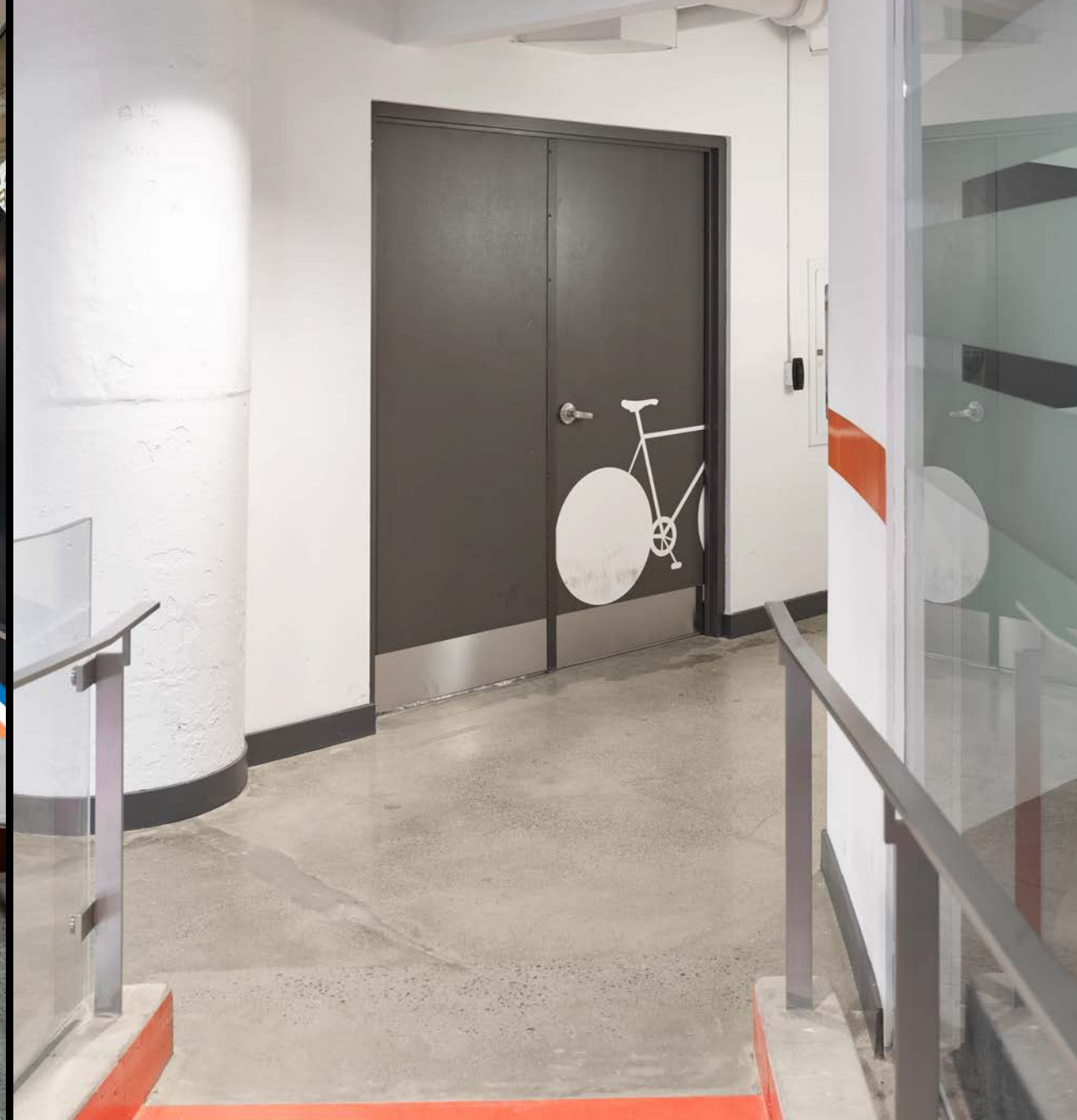


Multi-generational



Modern Family







Micro retail opportunities



Reclaiming the In-between



Reimagining of Public Infrastructure



Reprioritization of Infrastructure



Reclaiming of Streets



Reclaiming of Public Space

what can you do?



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2. Prioritize passive design solutions;



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3. Design for future weather and energy independence;



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5. Provide opportunities for people to socialize, especially around food;
6. Use micro-retail to stimulate the local economy;
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?



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