More than just checking the box……

The Federal Climate Lens Vulnerability Assessment - Experience so far

Conduct a vulnerability assessment for a major funding application

Sign off by a “Qualified Party”

Outline

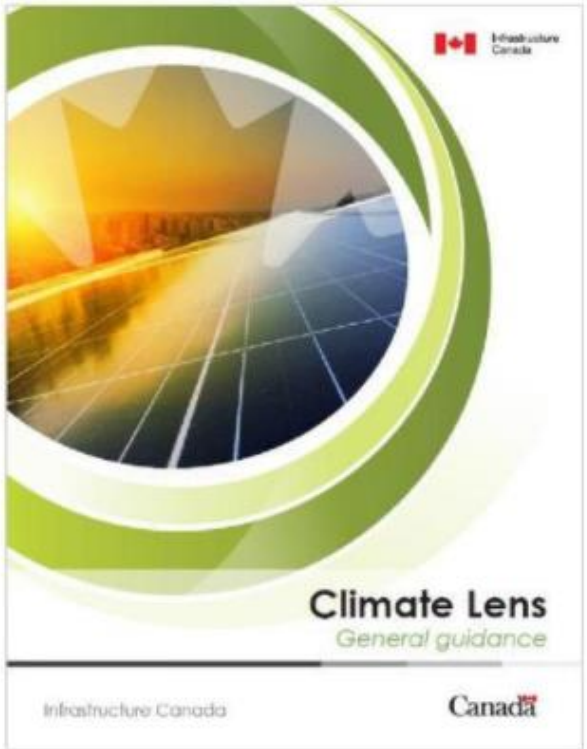
- Practical experience applying the Climate Lens Resilience Assessment
- Case Study – 6 GO Train Stations
- Other factors at play:
  - Task force on Climate Related Financial Disclosure
  - Possible lawsuit against big oil
  - Better sharing of information

OBJECTIVES OF THE CLIMATE LENS

- The **climate lens assesses opportunities** to **reduce carbon pollution** and helps identify **when and how a project should be adapting** project design to better withstand impacts of climate change.

- There is **guidance** to support the application of the lens to infrastructure projects.

- Climate change resilience assessments submitted to Infrastructure Canada **require a qualified party provide an attestation** that the assessment was carried out according to this guidance.



http://bit.ly/INFC_climatelens

Please direct questions to:
infc.info.infc@canada.ca

Drivers for a Climate Lens Assessment

Short term:

- Just check the box: allow a funding application to proceed
- Don’t cause project delays

Longer Term:

- Avoid project designs that will fail due to climate stresses
- Reduce future costs
- ALSO: Support GHG reduction and other values
    - Job creation, equity, mobility

Factors for designing your Climate Lens vulnerability assessment

- Time available before funding application to be submitted
- Budget available (external costs may be recoverable, but not internal staff costs)
- Past relevant climate vulnerability assessments
- Quality & relevance of future climate information available
- Availability of internal staff experts & consultants with relevant knowledge / skills

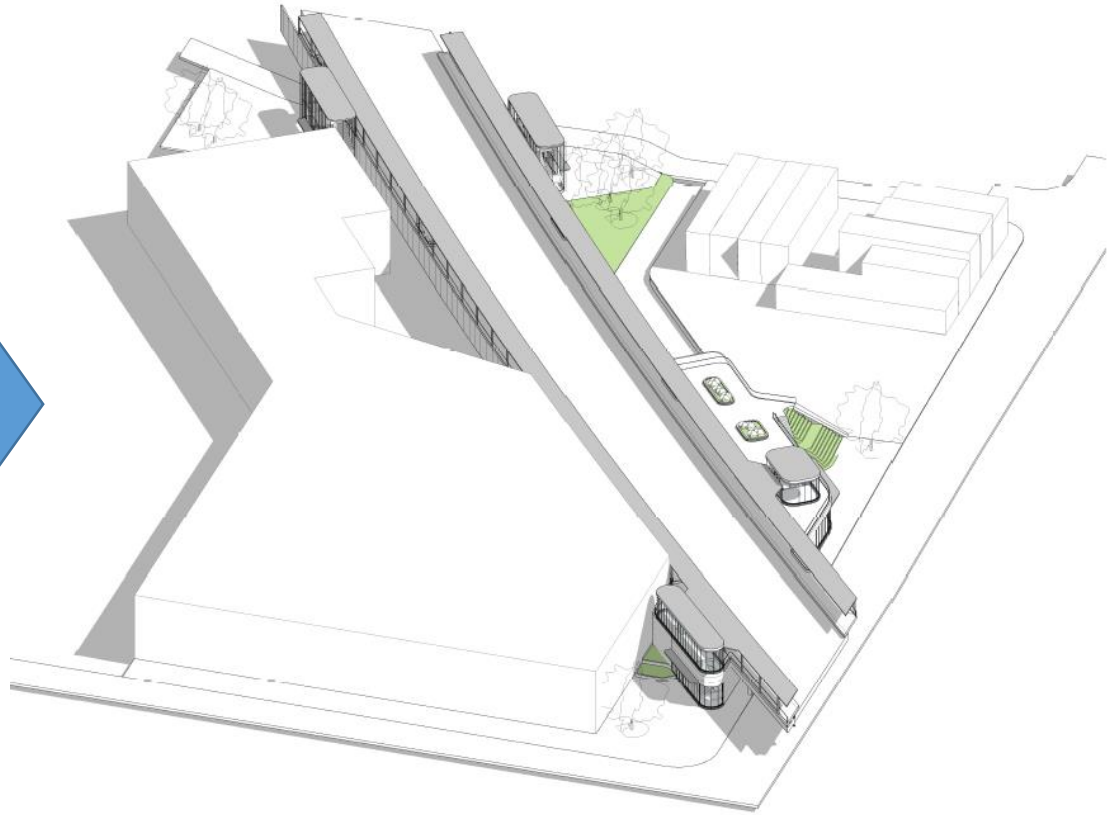
Leadership required

- Support / endorsement from top management
  - Motivate staff to respond to requests from the assessment team in a timely rigorous manner.
- Vulnerability assessment leader
  - May or may not be the “Qualified Person” (QP)
  - QP can be part of the project team *(per INFC rule interpretation)*
- Project proponent / designers able and willing to accept or reject recommended “Adaptation Measures or Risk Treatments”
  (per Table 4, page 38 of Climate Lens)

Body of Skills & Knowledge Required

- Skills
  - Project management
  - Interpersonal tact and diplomacy
  - Audit / Critical assessment
  - An inquiring devious mind always thinking “what could go wrong”
- Knowledge
  - Engineers and Architects professional design expertise
  - Experience with applying ISO 3100 or PIEVC
    - PIEVC training is much more specific to climate risks
  - Multi-sectoral / multi-disciplinary knowledge relevant to project
  - Interdependencies with infrastructure systems
  - Access to best available climate hazard parameters
  - Project specific design specifications
  - Operational experience on how climate affects infrastructure
  - Climate risk reduction measures relevant to the type of project

CASE STUDY:
Climate lens for 6 Proposed SmartTrack Stations



Case study background

- City to apply for $585.2 million of Federal funding from Infrastructure Canada (INFC) for six new stations
  - These are GO Train stops on existing rail lines
- Toronto leading the funding application
- PIEVC PREVIOUSLY DONE:
  - Looked at rail lines, 2 maintenance facilities & 2 stations
  - 12 months duration from development of RFQ to Project completion

Disclaimer: This abbreviated case study is for learning purposes only and does not constitute a position, commitment or endorsement by Metrolinx or the City of Toronto. Rather this is an illustrative teaching tool to share experiences with other practitioners to encourage the practice of Climate Lens vulnerability assessment.

Project Steps

1) Gap Analysis: Federal Climate Lens Requirements v.s. Metrolinx's Existing Consideration of Climate Vulnerability (40 page report)
2) Document review
3) Site visits
4) Modify existing PIEVC study to fit 6 proposed stations
5) Workshop 1 – introduce Climate Lens requirement
6) Interviews with staff experts / adjust scores
7) Workshop 2 – validate risk scoring

Determining Vulnerability and Probability

STATIONS
ROOFS
Main building
Roof canopies

WALLS
Solid
Glass
Mechanical (elevator, sprinkler systems)

STATIONS
SITE
Platforms
Platform canopies
Parking lots
Parking structures
Street access
Back-up power

Climate Parameter	Threshold	Annual Probability		Probability of Occurrence (2015-2050)	2080s
		Historical	2050s		
Extreme Temperatures	40°C	~0.01 per year	1-7 days per year	~100%	↑
	32°C	6.5 days per year	27.5 days per year	100%	↑
	-23°C	1.1 days per year	0.1 days per year	100%	↓
	-30°C	0.05 days per year	<0.01 days per year	<90%	↓
Temperature Range	60°C in one year	0.1 days per year	<0.01 events per year	<90%	↓
Reduced Visibility (e.g. fog, blowing snow)	400 m (or ¼ mile)	49 hours per year, 15.1 days per year	Strong trend ↓, stable recent period	100%	↓
	200 m	33 hours per year, 11.9 days per year	Strong trend ↓, stable recent period	100%	↓
Frost Penetration	1.2 m or below	0.17 per year	Trend ↓ but some conflicting factors	>90%	?
High Wind (Gusts)	90 km/h	2 per year	≥2.5 per year	100%	↑
	120 km/h	0.05 days per year	Likely ↑	>90%	↑
Tornadoes	EF1+	1-in-6,000	Unknown	~0.6%	?
Heavy Rainfall	≥60 mm in 2 hours	~0.8 events per year	Very likely ↑	100%	↑
	≥100 mm in 2 hours	≤0.03 events or less per year	Very likely ↑	~70%	↑
Freezing Rain	≥10 mm	~0.2 days per year	~0.3 days per year	100%	?
	≥25 mm	0.06 days per year	>0.09 days per year	>95%	?
Snow	Blowing snow	7.8 days per year	No significant change in trends	~100%	?
	Daily Snowfall ≥20 cm in one day	0.1 days per year	Conflicting trends, differs by month	≥95%	?
	Snow (Design loads-snow-water-equivalent)		No observed trend; some factors indicate ↑	40%	?
Hail	"Golf ball"/45 mm or larger	0.07 per year	Unknown	>90%	?
Horizontal Wind-Driven Rain	Gusting 50 km/hr + >25 mm rain	1.8 days per year	Slight trend ↑	100%	↑
Lightning	Direct strikes	~0.3% per year	Likely ↑	100%	?

TORONTO METROLINX

This table is the key Climate Lens output

Table 4 – Risk Mitigation and Adaptation Measures

Risk Event	Adaptation Measure or Risk Treatment (use as many rows as needed for each event)	Timeframe	Cost	Effectiveness	Acceptability	Comment/ Evaluation

Sample adaptation measures identified

PART 2: ENHANCING RESILIENCE TO FLOODING		
2. 01 Flooding of stations	Conduct an urban flood analysis for the area around each station.	
2.02 Flooding of stations	Provide a second sump and second storm water pump on back up power in case the primary pump fails.	
2.03 Flooding of stations & vicinity	Tree canopy, landscaping and cool permeable paving around stations as per TGS requirements to provide runoff retention and infiltration, to reduce localized flooding.	
2.04 Flooding destabilizing retaining walls	Stability of retaining walls and slopes, especially at underpasses should be designed taking into account the possibility of flood conditions.	
2.05 Flooding of stations	25 mm precipitation retention on site.	
2.06 Flooding of stations	25% increased stormwater management system capacity.	
2.07 Flooding of stations	Measures to reduce siltation, and / or measures such as geotextile to extend life of ballast absorption capacity.	

Sample adaptation measures identified

PART 4: ENHANCING RESIENCE TO ELECTICAL POWER SUPPLY FAILURE	
4.01 Power disruption	Provide backup power for station taking into account performance requirements and GHG emissions reduction objectives (e.g. natural gas vs battery).
4.02 Power disruption	A second electrical feeder line to stations to increase redundancy of electrical supply where practicable.
4.03 Power disruption	PV panels on platform canopies or retrofitable to hold PV panels.
4.04 Electrical power disruption affecting customers with disabilities and GO Transit service vehicles	Electric vehicle charging stations for persons with disabilities and for Metrolinx service vehicles.

Unexpected Outcomes of the SmartTrack Climate Lens Vulnerability Assessment

- REALLY did identify 33 realistic resilience / GHG reductions majority of which were not previously considered.

- Surfaced opportunities beyond the actual Climate Lens vulnerability mandate.
  - PV solar installation on platform canopies

- The federal process supported & enhanced the profile of staff working hard to promote climate resilience within the proponent organization.

Go Forward Synergies

- More federal funding applications anticipated: let's share content
- Toronto Risk Tool Online uses ISO 3100 coming soon…..
- Toronto's CFO seeking a 'climate lens' for internal budget process decisions
- Ontario Asset Management Regulation 588/17 requires consideration of climate change
- Task force on Climate Related Financial Disclosure (TCFD) / CDP disclosure
- Law suit against big oil?

TCFD / Climate Risk Information

- CPA Canada leading project with Toronto, Vancouver, Montreal to develop framework to assess and report per TCFD
  - Vancouver first in the world TCFD public disclosure this week!

- Preliminary discussions about climate risk information organization for Ontario this morning
  - Considering need for an organization in Ontario to connect the ‘ecosystem’ of climate risk organizations with decision makers

Just tackling the problem one day at a time.
Nothing fancy.
Seeing the trees and hope in what's left of the forest.

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