Ad Hoc Expert Meeting on

Climate Change Adaptation for International Transport: Preparing for the Future

16 to 17 April 2019

Transportation and Adaptation: a Canadian Perspective

Presentation by

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TRANSPORTATION AND ADAPTATION
A Canadian Perspective

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April 2019

OVERVIEW

1 | Canada’s Transportation System

2 | Climate Risks to the Canadian Transportation System

3 | Pan-Canadian Framework on Clean Growth and Climate Change

4 | Transport Canada’s adaptation priorities

5 | Additional Adaptation Activities and Investments

1 | CANADA'S TRANSPORTATION SYSTEM

CANADA'S MULTI-MODAL TRANSPORTATION INFRASTRUCTURE NETWORK

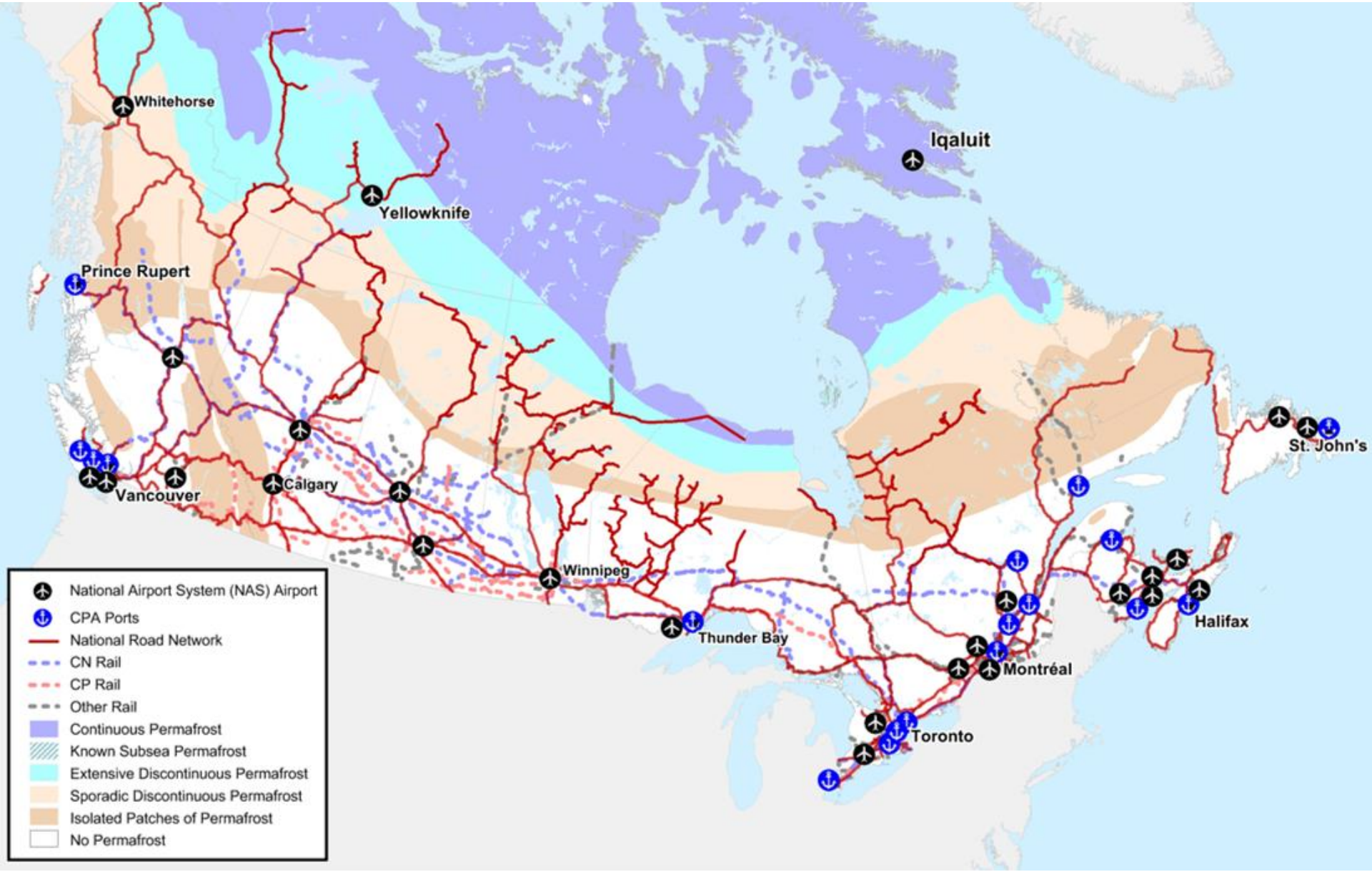
Airports: 26 National Airport System (NAS) airports; Regional/local **(71),** remote **(13)** and Arctic **(11)** airports; **1594** certified sites

Ports: 18 Canadian Port Authorities (CPA); Nearly **550** public ports and **1035** small craft and fishing harbours

Rail: Nearly **46,000** route-kilometres of track; Majority Canadian National Railway **(49%),** Canadian Pacific Railway **(26%),** other railways **(24%)**; Via Rail operates passenger rail services

Roads: More than **1.13** million two-lane equivalent lane-kilometres of public road; **38,000** km National Highway System, and winter roads

Report Reference: https://www.tc.gc.ca/media/documents/policy/comprehensive_report_2016.pdf


Whitehorse
Iqaluit
Yellowknife
Prince Rupert
Vancouver
Calgary
Winnipeg
Thunder Bay
Toronto
Montréal
Halifax
St. John's
National Airport System (NAS) Airport
CPA Ports
National Road Network
CN Rail
CP Rail
Other Rail
Continuous Permafrost
Known Subsea Permafrost
Extensive Discontinuous Permafrost
Sporadic Discontinuous Permafrost
Isolated Patches of Permafrost
No Permafrost

2016 | PASSENGER / TRADE FLOW STATISTICS

Travellers

- **Airports: 140** million enplaned and deplaned passengers
- **Ports:** International cruise ships carried approximately **1.4** million passengers; BC Ferries carried approximately **17.2** million passengers on various routes
- **Rail: 4** million VIA Rail passengers
- **Roads: 52** million two-way passenger vehicle movements were recorded at Canada/ U.S border crossings

Domestic Trade

Of the produced goods that remained within Canada, over **875 million tonnes** were transported by the commercial sector in 2015. Nearly **72% of this amount was carried by for-hire trucking**, **21% by rail** and **7% by marine**.

International Trade

In 2016, the value of Canadian international waterborne trade amounted to **$199 billion**, **$125.2 billion** for Canada's international air cargo trade, **$128.3 billion** for international rail trade traffic and the value of trucking traffic between Canada and the U.S totalled **$418 billion**.

Report Reference: https://www.tc.gc.ca/media/documents/policy/comprehensive_report_2016.pdf

GOVERANCE OF THE CANADIAN TRANSPORTATION SYSTEM

FEDERAL

Aviation and **marine transportation**, major **railways**, **interprovincial and international bridges and tunnels**, some transportation **assets**, and **standards for new and imported motor vehicles**

PROVINCIAL

Intraprovincial transportation undertakings/works including: **intraprovincial rail, marine, ferry, truck and bus carriers**; use of **road vehicles**; **roads and bridges within a province**, except national parks

MUNICIPAL

In many cases, the provinces have **delegated responsibilities to local governments**, including: **local roads; public transit systems**

STAKEHOLDERS & PARTNERS

Industry * Academia * Indigenous Peoples * International Partners

2 | CLIMATE RISKS TO THE CANADIAN TRANSPORTATION SYSTEM

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THE CHALLENGE OF A CHANGING CLIMATE

- Canada's climate is changing - observed and projected climatic trends across Canada include:
  - **Increasing temperatures and temperature fluctuations**
  - **Changing precipitation patterns**
  - **More severe and more frequent extreme weather events**
  - **Decreasing water levels**
  - **Permafrost thaw; increased freeze-thaw cycles (Northern Canada)**
  - **Changes in sea ice – marine transportation (Northern Canada)**
  - **Sea level rise and increased storm surges; increased coastal erosion (Coastal Canada)**

- Transportation is essential to virtually every economic sector in Canada (e.g. agriculture, natural resources, consumer goods, tourism)
  - Transportation systems in Canada have always been vulnerable to climatic variation and extremes
  - Climatic conditions are changing more rapidly and dramatically, and existing design values, standards and practices may not reflect new realities

Arctic shipping through sea ice

Derailment near Kingston, ON

Bridge failure, Stewart, BC

Permafrost degradation, Dempster Highway, NWT

Changes in water levels, Great Lakes

Sea surge, Sandspit Airport, BC

3 | PAN-CANADIAN FRAMEWORK ON CLEAN GROWTH AND CLIMATE CHANGE

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PAN-CANADIAN FRAMEWORK

The Pan-Canadian Framework on Clean Growth and Climate Change was developed with the provinces/territories and through engagement with Indigenous peoples – to meet our emissions reduction targets, grow the economy, and build resilience to a changing climate.

Four key pillars:

1 | Pricing Carbon Pollution

2 | Complementary actions to reduce emissions

3 | Clean technology, innovation and jobs

4 | Adaptation and climate resilience

- **Translating scientific information and Traditional Knowledge into action**
- **Building climate resilience through infrastructure**
- **Protecting and improving human health and well-being**
- **Supporting particularly vulnerable regions**
- **Reducing climate-related hazards and disaster risks**

4 | TRANSPORT CANADA'S ADAPTATION PRIORITIES

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TRANSPORT CANADA

Our Vision : A transportation system in Canada that is recognized worldwide as safe and secure, efficient and environmentally responsible.

Transportation 2030: A Strategic Plan for the Future of Transportation in Canada

1 | The Traveller

2 | Safer Transportation

3 | Green and Innovative Transportation

4 | Waterways, Coasts and the North

5 | Trade Corridors to Global Markets

TRANSPORT CANADA INITIATIVES

NTAI (Northern Transportation Adaptation Initiative)

Objective: Aims to enhance northerners' capacity to adapt their transportation systems to climate change.

Funding: Established in 2011; $6.9M over three years (2018-2021)

Activities:

- Research to generate new knowledge
- Development and testing of innovative technologies and practices
- Collaborative activities to share knowledge and build capacity

TARA (Transportation Assets Risk Assessment initiative)

Objective: Better understand climate risks to federally-owned transportation infrastructure and potential adaptation solutions that could be employed

Funding: $16.35M over five years (2017-2022)

Activities:

- Climate risk assessments
- Purchases and installations of tools and technology
- Associated training
- Research and analysis

CLIMATE RISK & ADAPTATION KNOWLEDGE ASSESSMENT

Climate Risks & Adaptation Practices for the Canadian Transportation Sector (2016)

- Comprehensive report of the current state of knowledge on climate risks and adaptation practices for the Canadian transportation sector
- Scope: All modes of transportation, all regions of Canada with specific examples and case studies
- Over 700 publications synthesized by 42 lead and contributing authors, and 228 expert reviewers were engaged in the process.
- Each chapter includes:
  - a profile of the region's population, economy, climate and transportation networks;
  - observed climate impacts, future risks, opportunities; and
  - adaptation approaches for road, rail, air, and marine transportation

NATIONAL TRADE CORRIDORS FUND

Program Features:

- Funding for infrastructure projects supporting fluidity of Canadian trade
- $2 billion, 11-year, competitive, merit-based program
- Leverages investments from multiple partners
- One of the four objectives is to "*help the transportation system withstand the effects of climate change and make sure it is able to support new technologies and innovation*"

Climate Change Adaptation & Resilience Assessment ('Climate Lens'):

- Applicants required to provide information on degree to which they take climate change impacts into consideration
- Proposals evaluated on how they will strengthen resiliency of Canada's transportation system in a changing climate

5 | ADDITIONAL ADAPTATION ACTIVITIES AND INVESTMENTS

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FEDERAL FUNDING - EXAMPLES

Green Infrastructure Priority

Budget 2017 laid out the Government's plan to invest **$21.9 billion in green infrastructure.** Of this, Infrastructure Canada will provide **$9.2 billion** to provinces and territories over the next decade through bilateral agreements. An additional **$5 billion** will be available for green infrastructure projects through the Canada Infrastructure Bank

Other Infrastructure Canada initiatives:

- **$2-billion**, merit-based Disaster Mitigation and Adaptation Fund
- providing **$40 million** to the National Research Council of Canada
- **Climate Lens:** applies to projects under the *Investing in Canada Infrastructure Program*, *the Disaster Mitigation and Adaptation Fund*, and finalists of the *Smart Cities Challenge*

Federation of Canadian Municipalities (FCM)

- The **$75-million** Municipalities for Climate Innovation Program, delivered by Federation of Canadian Municipalities
- The **$50-million** Municipal Asset Management Program, delivered by Federation of Canadian Municipalities

Natural Resources Canada

- Adaptation Platform

PUBLIC TRANSIT | GREEN | SOCIAL | TRADE AND TRANSPORTATION | RURAL AND NORTHERN COMMUNITIES

TRANSPORTATION ADAPTATION ACROSS CANADA

- Transportation adaptation stakeholders - at various stages of 'readiness'
  - shift from more reactive to proactive approaches

- Range of adaptation work across Canada. Some examples:
  - most provinces/territories have adaptation plans
  - operational planning, policies and design (e.g. BC Ministry of Transportation technical circular)
  - risk and vulnerability assessments (Greater Toronto Airport Authority engineering vulnerability assessment)
  - structural and physical engineering adaptation (e.g. testing of thermosyphons in the North to reduce permafrost thaw under infrastructure)
  - smart technologies (e.g. Port Saint John using real-time weather and wave forecasting tools)
  - operations and maintenance practices (e.g. cities more regularly monitoring and clearing drainage culverts)
  - adaptation research

THANK YOU

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