



# Transport Canada's Northern Transportation Adaptation Initiative

Northern Transportation Conference 2013 (Yellowknife, NWT)

October 29 - 30, 2013



## OVERVIEW

- Program Summary
- Networks of Expertise
  - Network of Expertise on Permafrost
  - Network of Expertise on Transportation in Arctic Waters
- Collaboration / Partnerships
- Sharing Results



# PROGRAM SUMMARY

## Background:

- Transport Canada's Northern Transportation Adaptation Initiative (NTAI) is part of the Government of Canada's efforts to help Canadians adapt to a changing climate (involving 9 departments/agencies).
- 5 year initiative (2011 – 2016).

## Key Objective:

- To develop and implement new innovative technologies, advance knowledge, and ensure capacity-building with a view to enhancing the resilience of existing and future Northern transportation infrastructure and operations to climate change.





## PROGRAM SUMMARY (CONTINUED)

- NTAI supports **five research priorities**, including:
  - collection of baseline data and data modelling;
  - climate change vulnerability assessments of the northern transportation system;
  - fundamental knowledge and understanding of climate change;
  - development/evaluation of innovative tools, technologies, and best practices; and
  - training and capacity-building.
- Examples of **activities** supported by the NTAI:
  - scoping studies;
  - new adaptive technologies;
  - training and exchange seminars;
  - development of best practices and guidelines;
  - workshops/conferences to foster collaborative relations and knowledge sharing; and
  - recommendations to support future policy development and decision making.

## NETWORKS OF EXPERTISE

- The NTAI is supported by two networks of expertise: The Permafrost Network and the Network of Expertise on Transportation in Arctic Waters (NEXTAW).
- The Permafrost Network and NEXTAW bring together subject matter experts from government, academia and the private sector.



- Both Networks serve as forums for collaboration between the research community and northern-based practitioners while advising on priority transportation research needs in the North;
- Targeted invitations to submit project proposals are sent bi-annually through the Networks. Proposals from within TC, including regional offices, are also welcomed.
- Project proposals are peer reviewed by the Networks, providing a constructive challenge function and ensuring synergies between proposals.

# THE NETWORK OF EXPERTISE ON PERMAFROST (PERMAFROST NETWORK)

- TC established the Permafrost Network in June 2010
- The Network has focused its work on the following research areas:
  - collection of baseline data and data modelling,
  - highway embankment studies;
  - effects of snow accumulation on transportation infrastructure;
  - innovative tools, technologies and best practices; and
  - climate change vulnerability studies.



# THE NETWORK OF EXPERTISE ON PERMAFROST (PERMAFROST NETWORK): STUDIES

- Scoping studies were funded through NTAI to better define the scope of future work in the priority areas for research.
- **Completed Studies:**
  - Highway Embankment Vulnerability to Snow Accumulation in Permafrost Terrain
  - Remote Sensing Literature Review
  - Vulnerability Assessment of NWT Airports
  - Air Convection Duct Techniques
- **On-Going Studies:**
  - Evaluating the Performance of Highway Embankments on Degraded or Degrading Permafrost
- **Projects to be Explored/Approved:**
  - Best Practices for Ice Wedge Characterization and Mapping;
  - Improving Maintenance Operations (post-construction) for Transportation Infrastructure in Permafrost Regions; and
  - Detailed Analysis (case studies) of Construction Techniques for Transportation Infrastructure in Permafrost Regions.



# THE NETWORK OF EXPERTISE ON TRANSPORTATION IN ARCTIC WATERS (NEXTAW)

- TC established the Network of Expertise on Transportation in Arctic Waters (NEXTAW) in February 2012
- The Network has focused its work on the following research areas:
  - efficient hydrographic data collection;
  - impacts of changing ice and weather conditions on marine infrastructure, community re-supply and maritime traffic;
  - innovative construction methods for resilient marine infrastructure;
  - sustainability of marine re-supply in support of communities and resource development; and
  - training and capacity building.







# THE NETWORK OF EXPERTISE ON TRANSPORTATION IN ARCTIC WATERS (NEXTAW): STUDIES

- Scoping studies were funded through NTAI to better define the scope of future work in the priority areas for research.
- **Completed Studies:**
  - Ice islands and icebergs fluxes
  - Climate change adaptation assessment for transportation in Arctic waters
  - Scoping Study to Examine Strategies for Managing Arctic Yacht Tourism
- **On-Going Studies:**
  - Exploring Plausible Futures for Marine Transportation in the Canadian Arctic – A Scenarios Based Approach
  - Canadian Arctic Bathymetry Data Compilation and Assessment
  - ARCTRAN: Arctic Transportation Training for Northern Residents
- **Projects to be Explored/Approved:**
  - Impacts of a changing climate on navigation on the Mackenzie River
  - Sea ice changes in Hudson Bay and their impacts on shipping to and from the Port of Churchill
  - Adaptation strategies and policy options for Arctic shipping



## COLLABORATION / PARTNERSHIPS

- Transport Canada leverages many different collaborative relations and partnerships to support the adaptation of the northern transportation system to climate change.
- On-going agreements with all three territorial governments (Nunavut, Yukon and NWT) and several academic institutions (e.g., Université Laval and Université de Montréal):
- Research projects in collaboration with other federal departments:
  - Assessing Risks of ship-mediated aquatic invasive species introduction and efficacy of treatment technologies in context of adapting to a warming arctic environment (with the Department of Fisheries and Oceans Canada)
  - Evaluating Response Time to Search & Rescue Assets (with the National Research Council Canada)
- International engagement through Arctic Council initiatives, participation of Alaska on our Permafrost Network and a Joint Research Program between Canada and China.





## SHARING RESULTS / INVOLVEMENT

- **Webinar Series**
  - Highlight Canadian research and showcase program results
  - Encourage knowledge sharing and promote synergies between disciplines (e.g., engineering, geography, permafrost science)
- **Arctic Council Initiatives**
  - *Arctic Adaptation Exchange: Facilitating Adaptation to Climate Change* – develop an on-line information portal. NRCan is the lead department, while TC contributes through an interdepartmental working group [ON-GOING]
  - *Arctic Maritime and Aviation Transportation Infrastructure Initiative (AMATII)* – <http://arcticinfrastructure.org/> [COMPLETED]
- **How can you get involved?**
  - Read about our Innovation Policy Branch, Grant & Contribution Program, etc., at <http://www.tc.gc.ca/eng/innovation/innovation-policy-menu.htm>
  - Share information related to on-going research initiatives/projects with TC
  - Contact us to become involved in the Network

# THANK YOU!

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