



# 18TH ROAD SAFETY CONFERENCE

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Resilience by Design: Global  
Innovations Shaping  
Canada's Climate Response

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Government of Canada

Hosted by



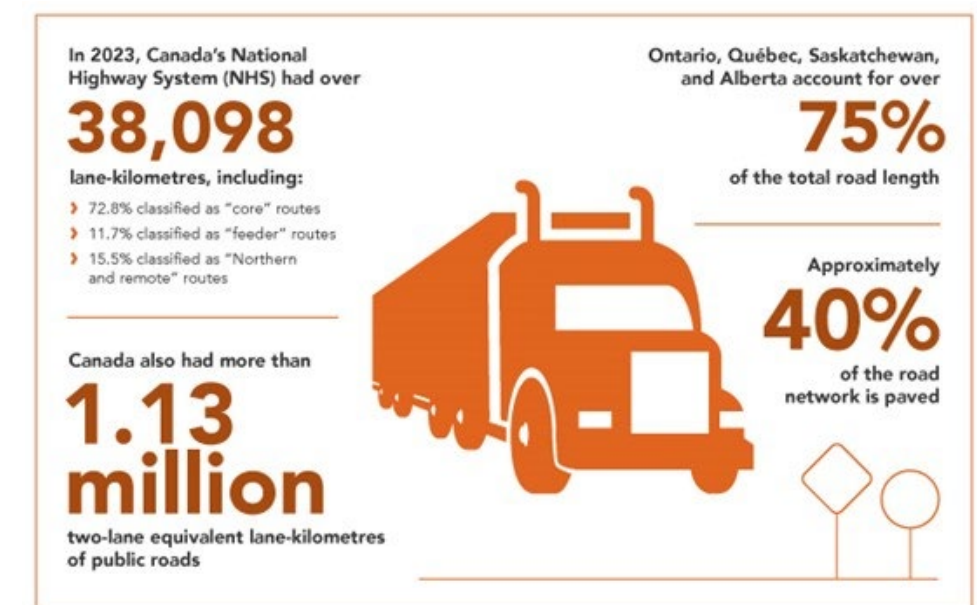
# The Canadian Context

## Canada's Road Network

- Over 1.1 million km of equivalent two-lane roadways
- Canada has established National Highway System consisting of over 39,000 lane-km of highways which moves the Country's 42.5 million inhabitants.
- Provinces/ territories and municipalities are responsible for design, construction, maintenance and operation of roadways and highways

## Canadian Road Network in Winter

- ~40% of road accidents occur in the winter months
- Approximately 8,000 km of official winter roads, only open for 6 to 12 weeks a year (January to March) when conditions allow for passage over land, lakes, rivers, and wetlands
- Crucial for supplying isolated communities when other transport is too costly
- Built and maintained by local communities, mining companies, and government partnerships
- Ontario has the longest winter road network in Canada – approx. 3,200 km, serving approx. 24,000 northern Ontarians



# Planning for Resilience

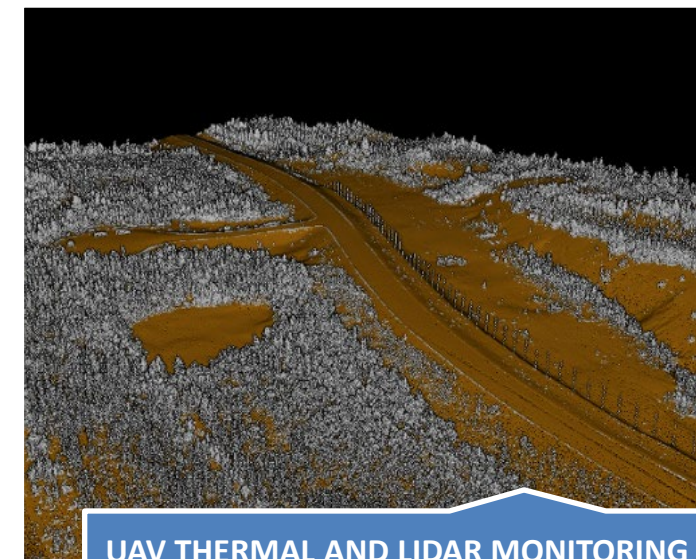
All levels of government in Canada—federal, provincial, territorial, and municipal—have been working alongside academia, Indigenous Groups, non-profits and the private sector to strengthen climate resiliency, coordinating investments, sharing data, and accelerating innovation so transportation networks can better withstand extreme weather and recover more quickly when disruptions occur.

## What's happening in Yukon?

Yukon's transportation system is becoming **harder to maintain because the once-frozen ground beneath highways, bridges, and airstrips are thawing and shifting as the North warms**. This leads to uneven roads, erosion, flooding, and other damage that can appear suddenly and threaten the safety and reliability of major routes.

To stay ahead of these problems, the project used drones equipped with thermal cameras and LiDAR to scan key corridors. These tools can spot warm, thawing ground and tiny changes in the landscape long before they're visible from the road.

Early detection helps governments fix issues before they become dangerous or expensive, reduces the need for difficult fieldwork in remote areas, and gives Yukon better information to plan upgrades and build more climate-resilient infrastructure in the decades ahead.



UAV THERMAL AND LIDAR MONITORING OF TRANSPORTATION INFRASTRUCTURE IN PERMAFROST ENVIRONMENTS, FABRICE CALMELS (YUKON UNIVERSITY)



Yukon Highways and Public Works

# Resilience in action

Climate change is intensifying extreme weather across Canada, putting pressure on transportation infrastructure as flooding, wildfires, and thawing permafrost wash out roads, warp rail lines, and disrupt vital supply routes.



**St. George Rainway** is a four-block green rainwater corridor that will **capture and treat runoff from 15,000 m<sup>2</sup> of street surface through a continuous bioswale**, while adding 800 m<sup>2</sup> of native plantings and 33 new canopy trees. It supports rapid neighborhood densification by **preserving limited sewer capacity and transforming an underserved, heat-vulnerable area into a park-like street**. The project is one component of a broader city initiative to manage runoff from 80 km of streets with green infrastructure.



The Bow Valley Gap Wildlife Overpass strengthens **ecological resilience** and **community safety** by restoring safe wildlife movement and sharply reducing dangerous collisions. It also encourages safer human behaviour on the Trans-Canada Highway, helping prevent some of the **14,000 wildlife-vehicle collisions Canadians experience each year**.

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# THANK YOU AND SEE YOU IN VANCOUVER!



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