

Transport Challenges: A Perspective from the Diamond Mines

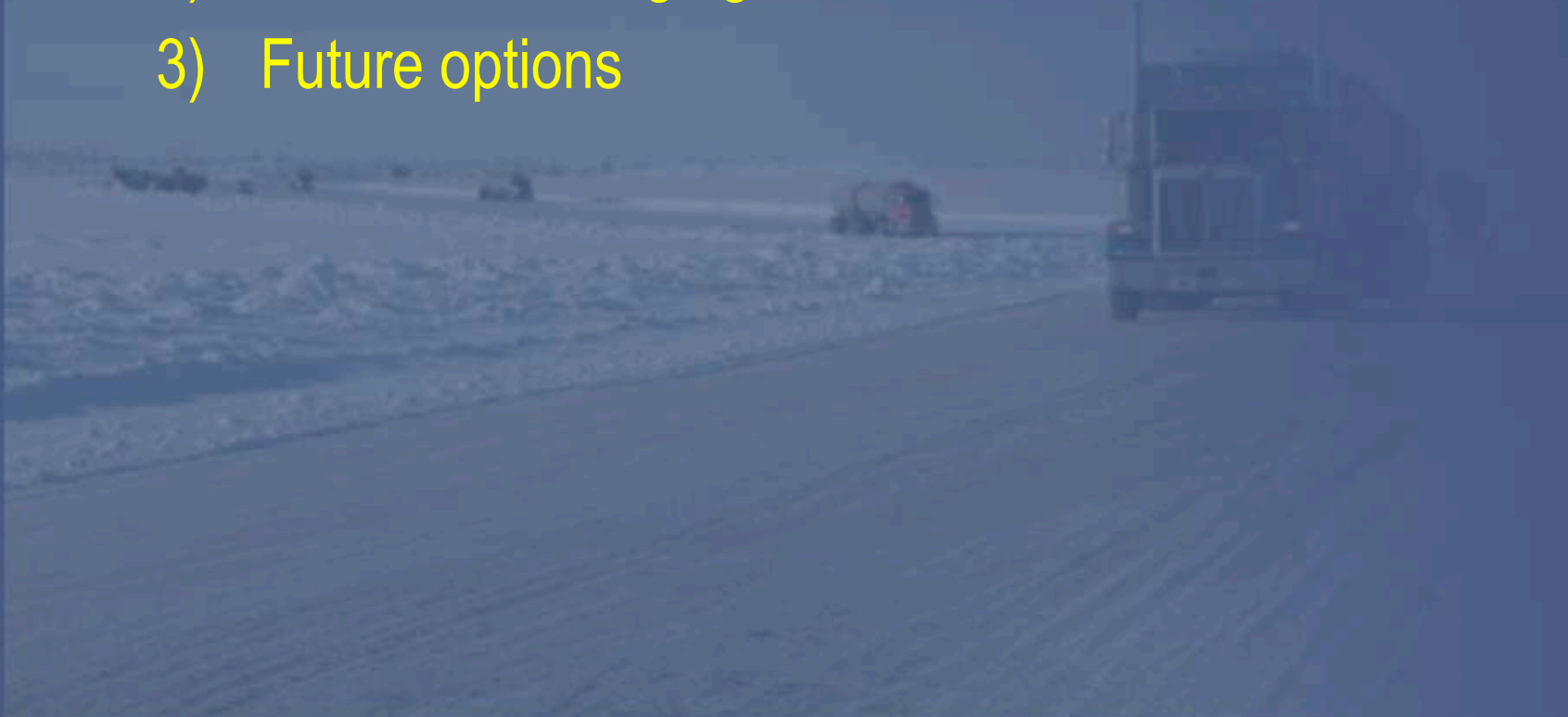
“THE HEAT IS ON”

Advantage North Conference, Whitehorse – May 29, 2007

By: Erik Madsen, Director of Winter Road Operations

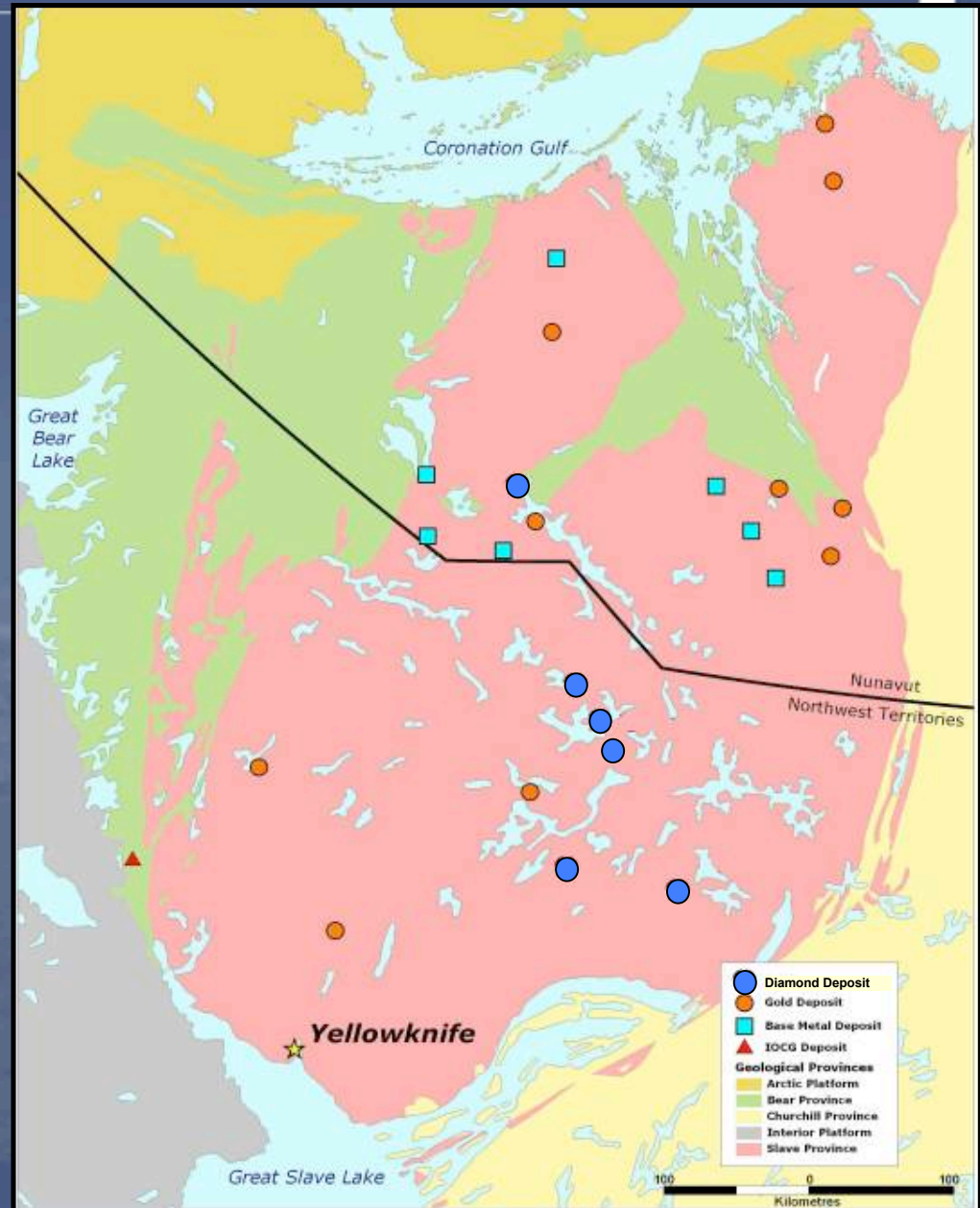
Outline

- 1) Transportation History Success
- 2) Problems emerging
- 3) Future options



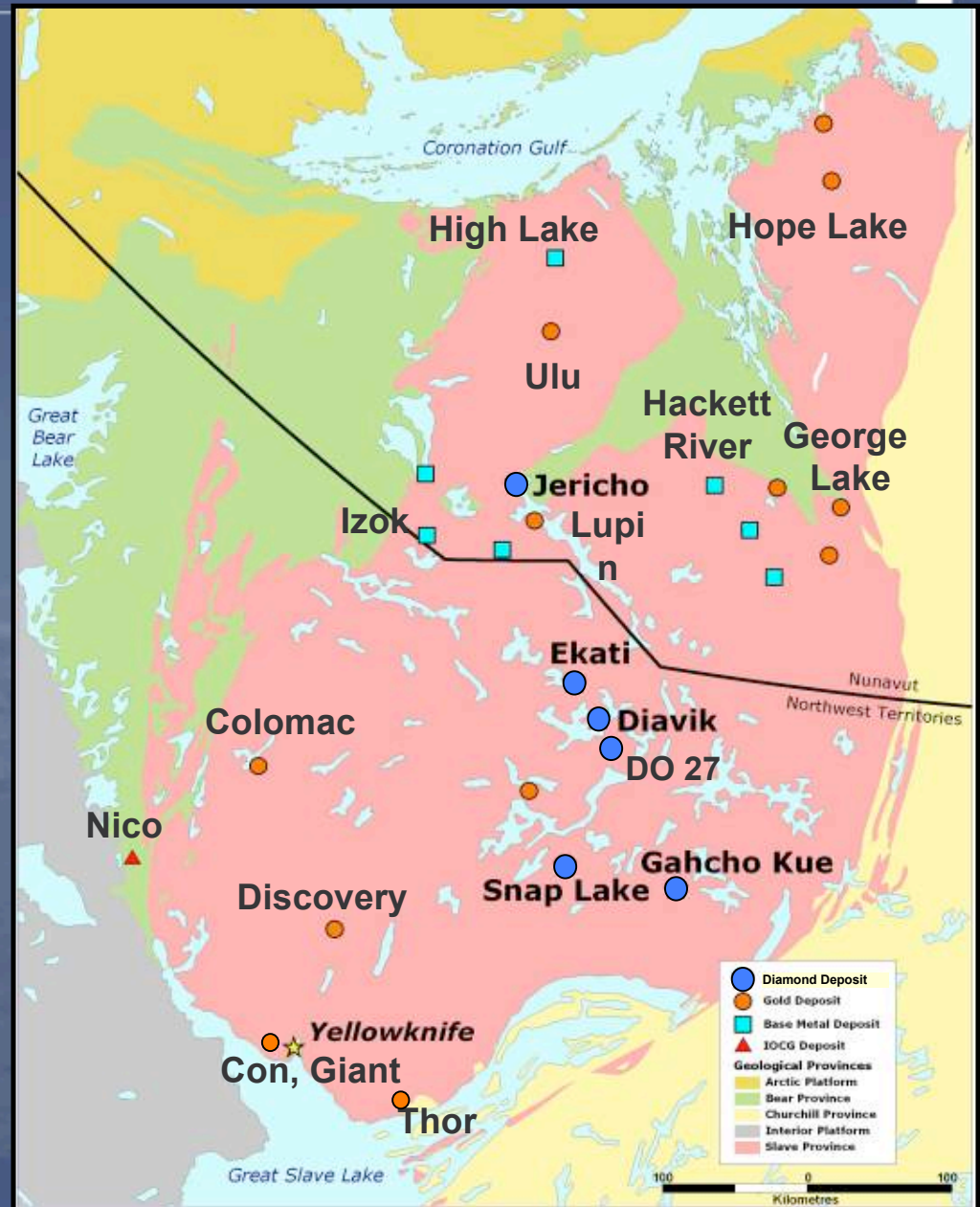
Region of Interest

- The Slave Geological Province



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 - Many deposits
 - But few mines due to lack of infrastructure



Transportation Has Been Key to Success

- Barging & cat trains in 1930s to 1960
- All weather road – Mackenzie Highway in 1960s
- Early Ice road – Denison in 1960s
- Aircraft throughout, with fly in innovation in 1980s
- “Modern” Ice road – 1980s



The Modern Ice Road – Big Innovation

- A virtual highway on ice – large trucks, large loads
- Echo Bay used it to create wealth where others gave up
- Critical support for brand new diamond wealth



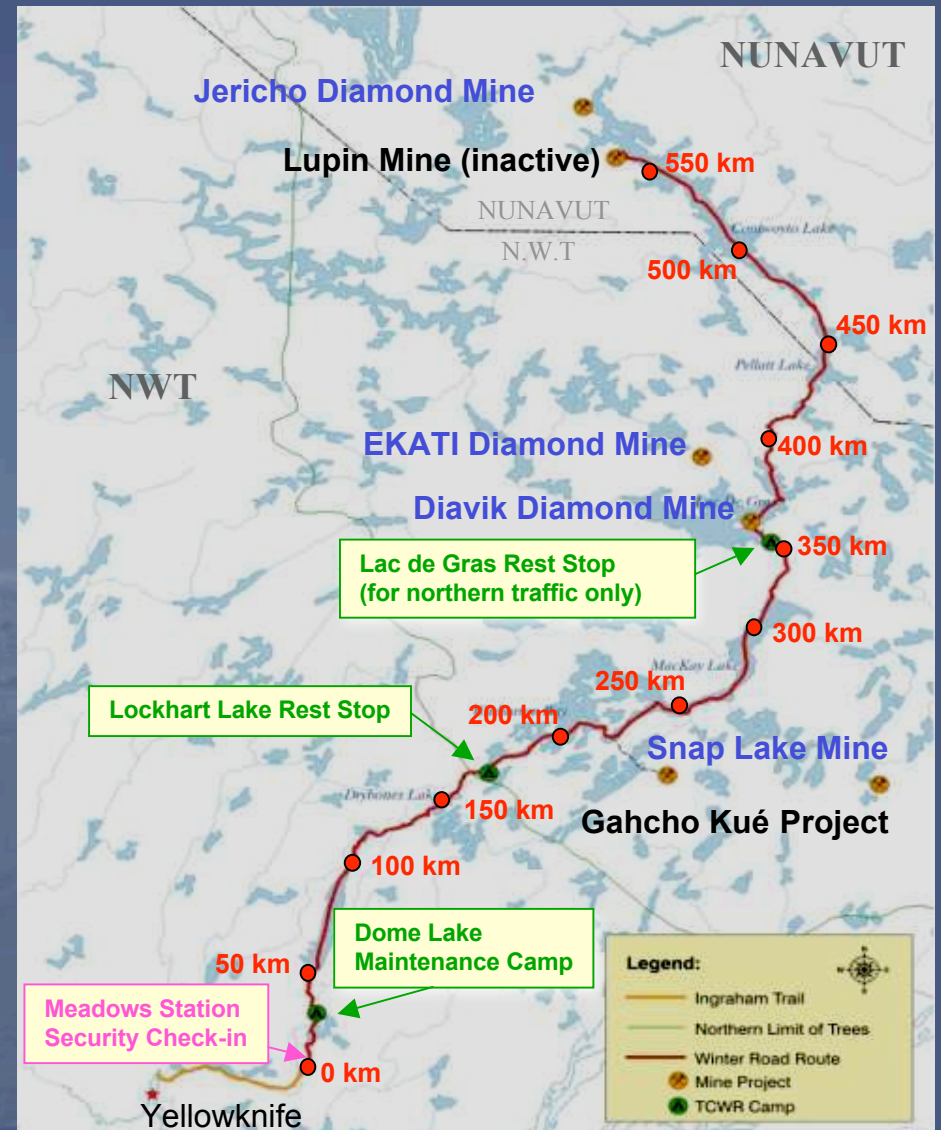
Management of the Winter Road

- The winter road is managed by the Tibbitt to Contwoyto Winter Road Joint Venture (JV)
- Current members of the JV are:
 - BHP Billiton Diamonds Inc.
 - Diavik Diamond Mines Inc.
- The JV is committed to constructing, operating and maintaining the winter road in a safe and environmentally responsible manner.



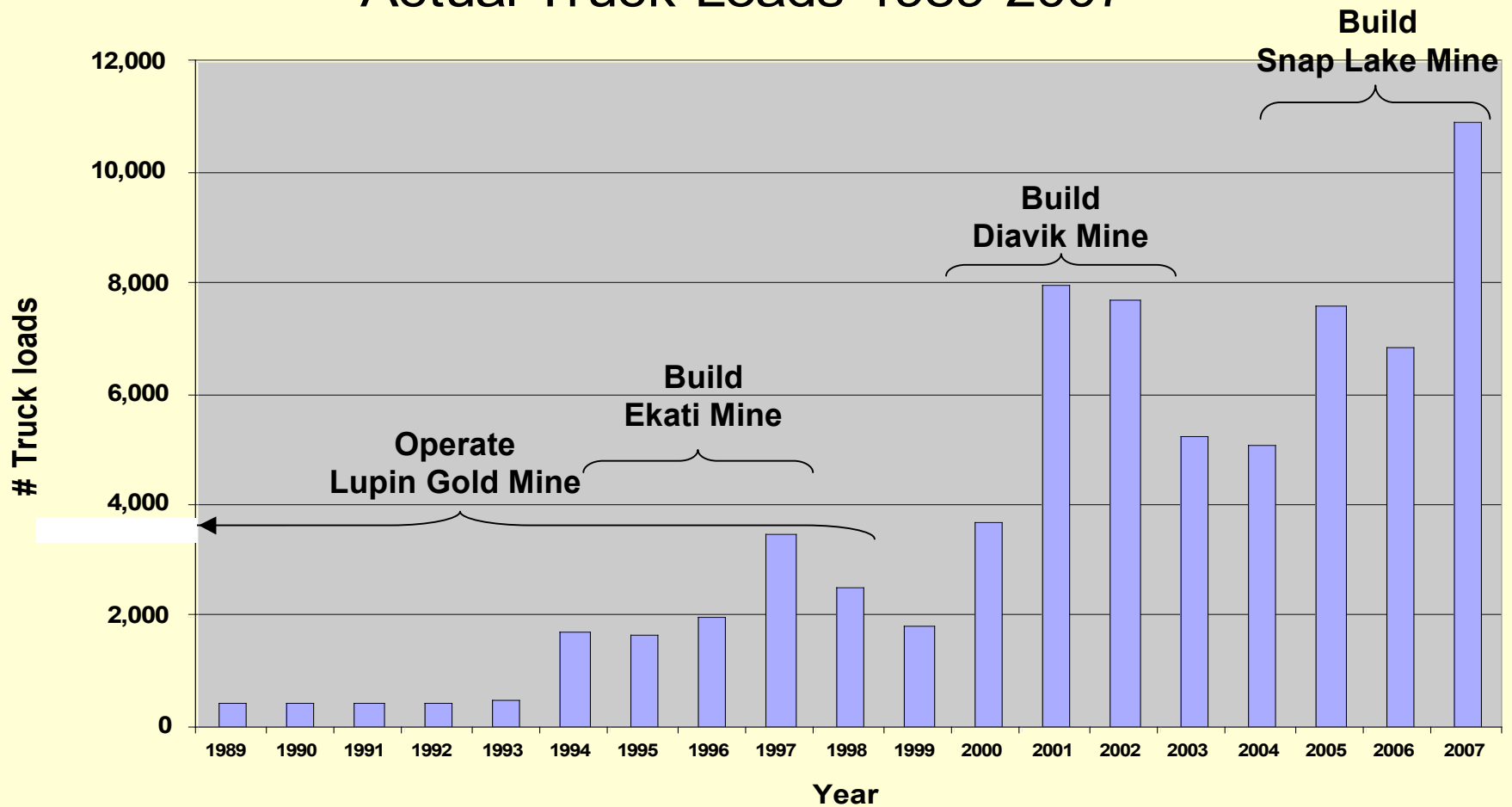
Some Ice Road Facts

- 568 kilometres long, with 64 numbered portages
- Seasoned constructors – Nuna Logistics & RTL Robinson Enterprises (secondary route)
- Speed limits 25 km loaded, monitored by radar
- Sophisticated engineering support
- 3 support camps
- Serves 4 diamond mines



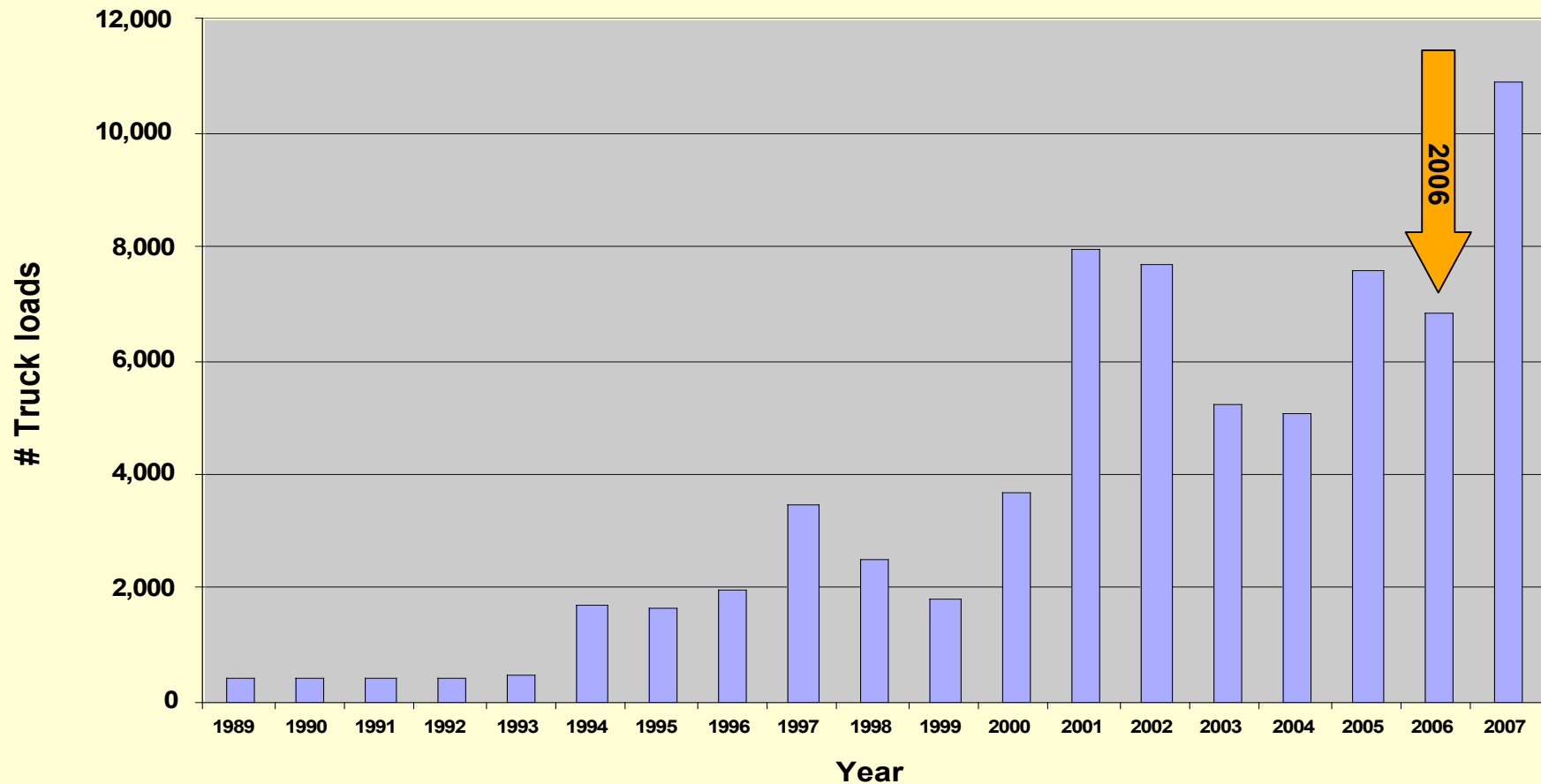
Modern Ice Road Supported Growth

Actual Truck Loads 1989-2007



But Warning Signs Appearing

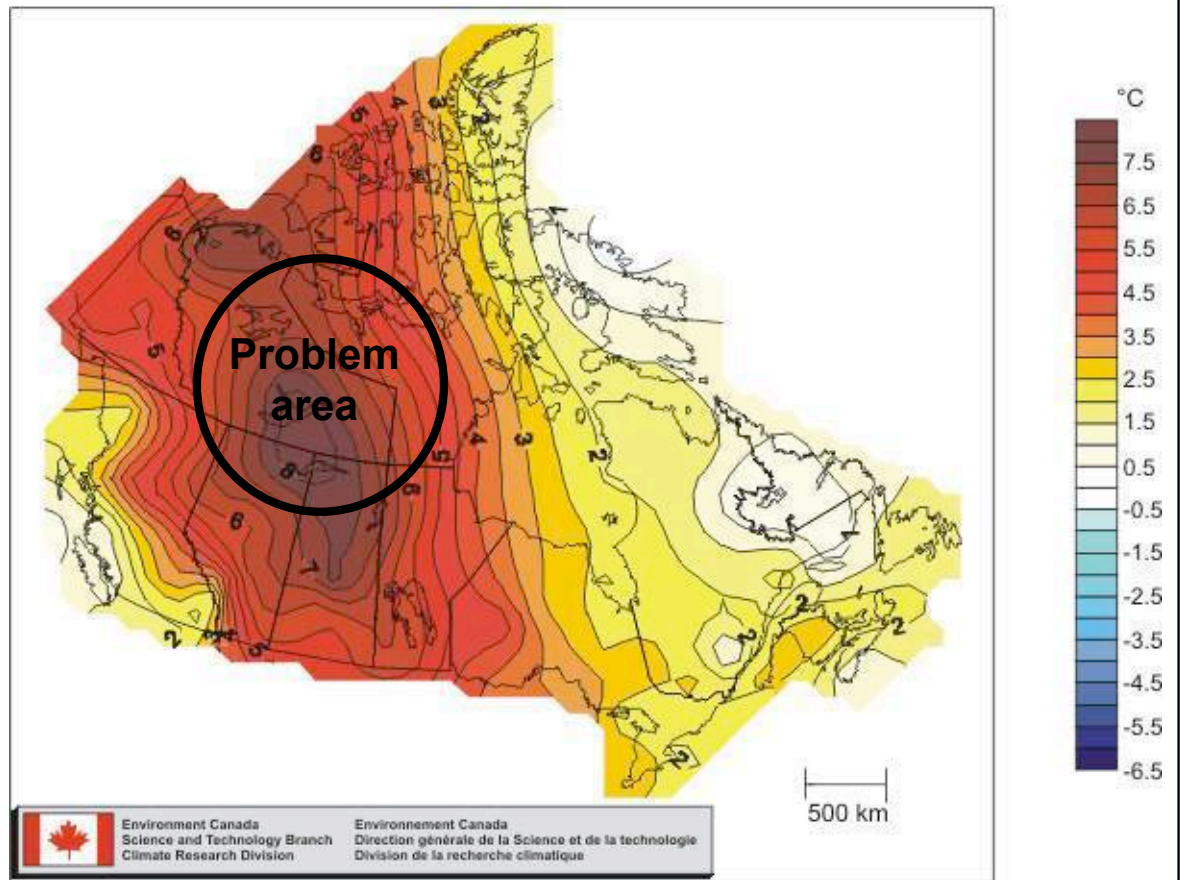
Actual Truck Loads 1989-2007



2006 – A Glimpse of the Future

- Canada's hot spot.
- The warmest winter in 70 years of records.
- Centred on ice road.

TEMPERATURE DEPARTURES FROM NORMAL
Winter (Dec, Jan, Feb) 2005/2006
ANOMALIES DE LA TEMPERATURE PAR RAPPORT A LA NORMALE
Hiver (dec, jan, fev) 2005/2006



A Costly Solution – take to the Air

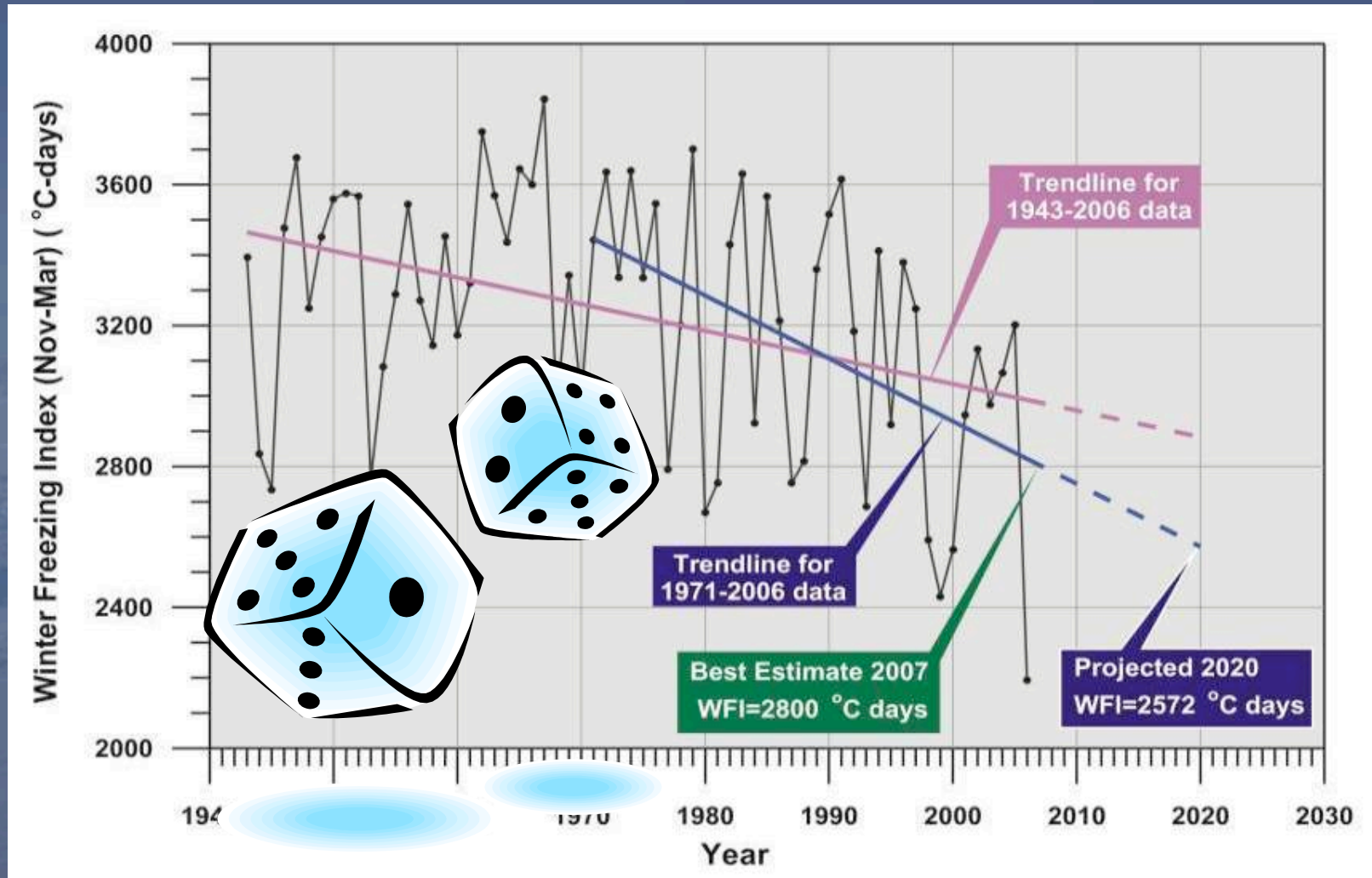


Materials Flown to Diavik Site

- 15,000,000 litres diesel
- 3,000 tonnes (1.0 tonne/bag) - prill
- 5600 tonnes (1.8 tonne/bags) cement & bentonite
- 22 Inbound MI26 - Chopper loads Carbody & other parts for RH200 shovel
- Max sling 44,000 lbs

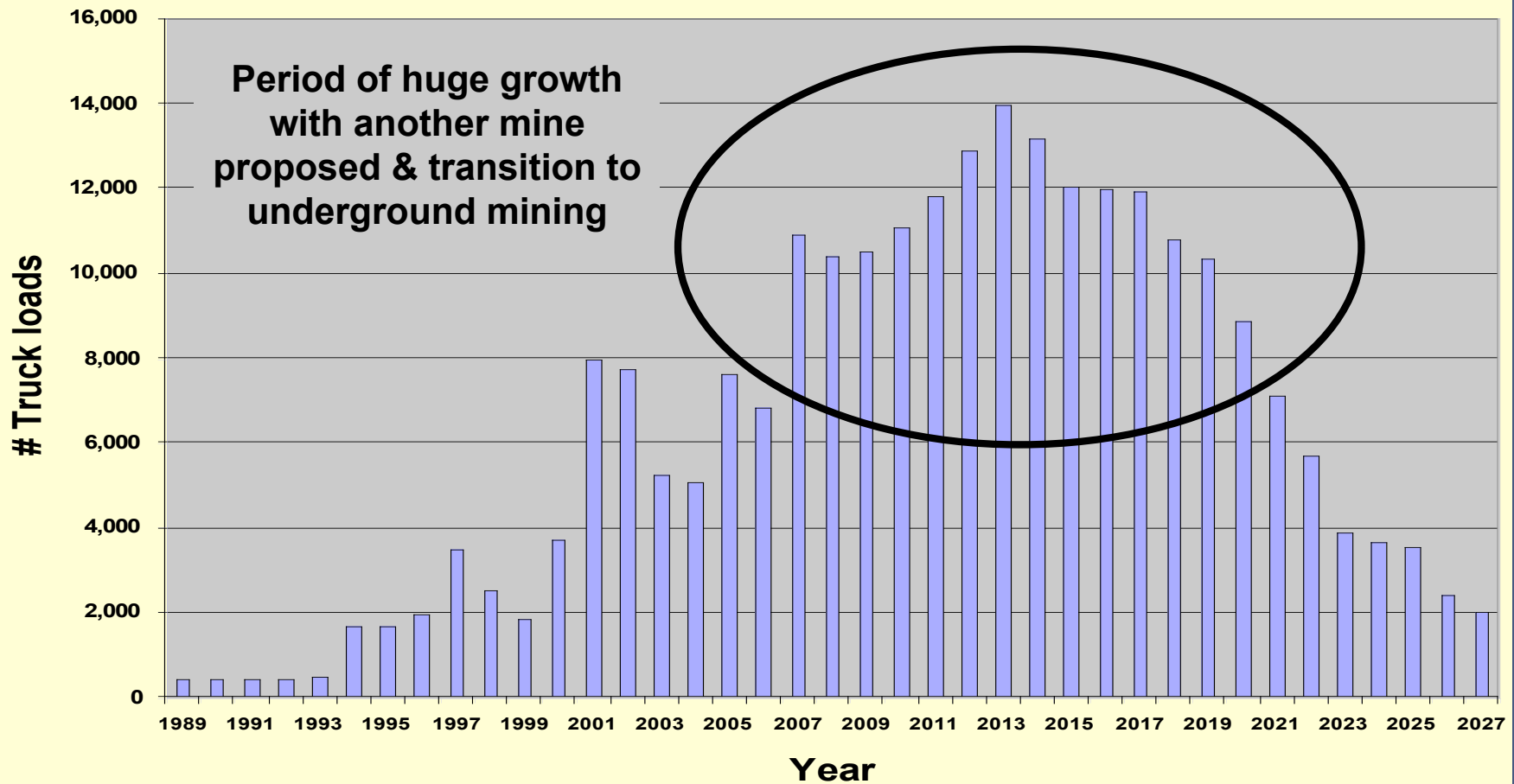


The Challenges Facing Us – Climate Change



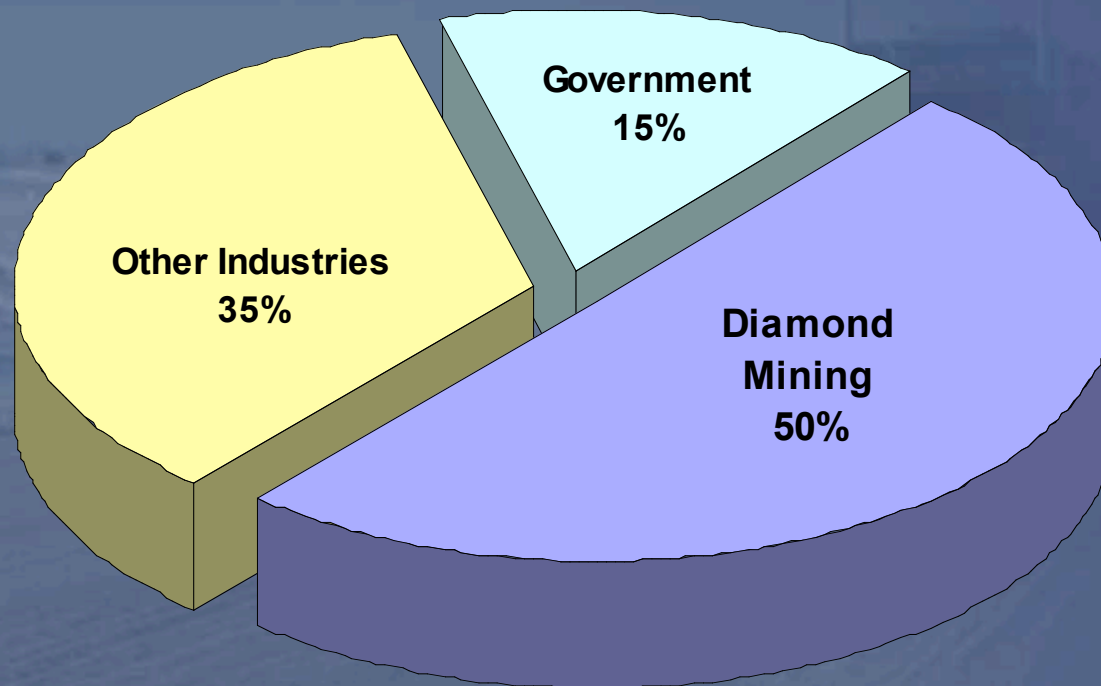
The Second Challenge – Forced Growth

Total Truck Loads 1989-2027



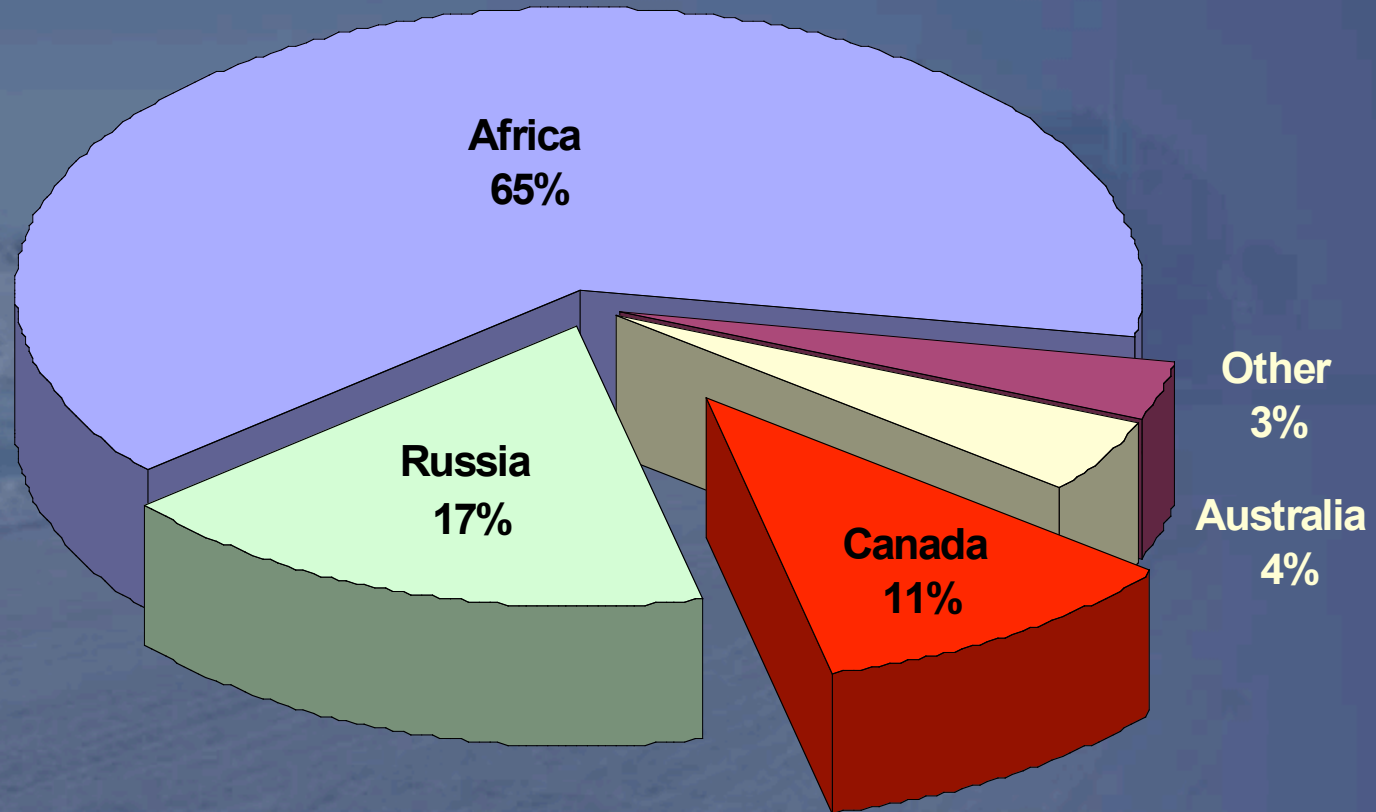
Risks of Inaction are Great: Diamonds Now the Economy's Backbone

Diamond Mining Contribution to Northwest Territories
Real Gross Domestic Product in 2006



Stakes at Risk – Canada

Value of 2005 Global Diamond Production
(Canada's Contribution from 2 NWT Diamond Mines)





Our Search for Options



Options that involve Energy Supply that is not Reliant on Roads	
Option 1:	Pipelines
Option 2:	Railway
Option 3:	Hydroelectric transmission
Option 4:	Airships
Options that involve Alternate Energy Transport on Winter Roads	
Option 5:	Liquefied Natural Gas (LNG)
Option 6:	Hovercraft
Options that involve Upgrades to the Current Tibbitt-Contwoyto Winter Road or Related Facilities	
Option 7:	Yellowknife Fuel Storage Facilities (To optimize TCWR operations)
Option 8:	Supplemental winter road from Edzo via Wha Ti and NICO
Option 9:	Supplemental winter road from Edzo via Wha Ti and NICO with all weather section from Edzo to NICO
Option 10:	New winter road from Ft. Resolution east of Great Slave Lake
Option 11:	Secondary road via old Discovery Mine (To optimize TCWR operations)
Options that involve Major New Infrastructure Construction	
Option 12:	All weather road from Tibbitt to Lockhart Lake with fuel storage at the terminus
Option 13:	All weather road from Tibbitt to Lac de Gras
Option 14:	Bathurst Inlet Port and Road proposal (BIPAR)
Option 15:	Gray's Bay Port and Road proposal (GPAR)
Option 16:	Barge across Great Slave Lake to East Arm with new winter road to Snap Lake/Gahcho Kue and connection to Tibbitt to Contwoyto Winter Road at Mackay Lake
Option 17:	All weather road north from Ft. Resolution around east side of Great Slave Lake

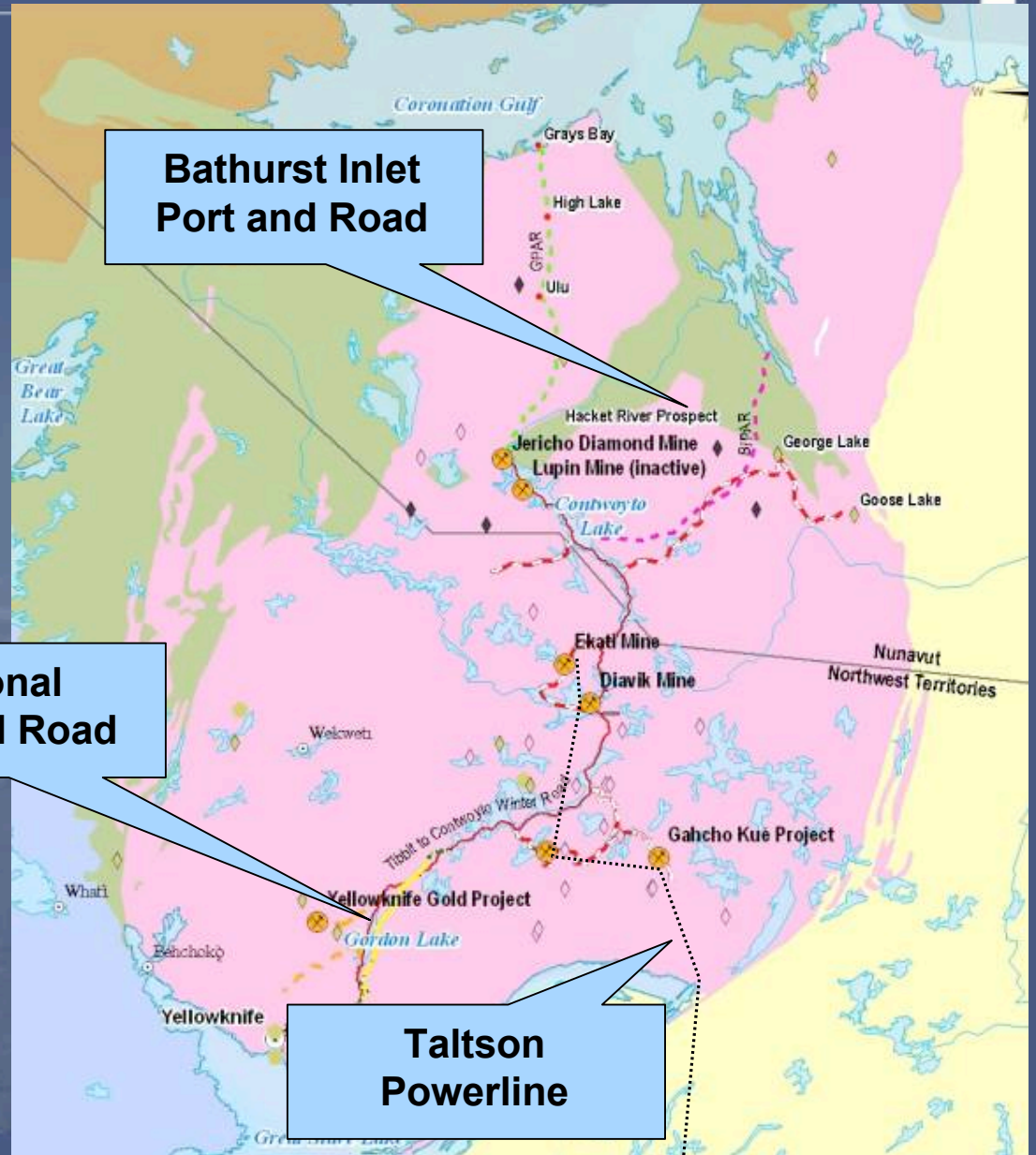
Most Promising Options

- Bathurst Inlet Road & Port (BIPAR) –
 - Nunavut support and benefits; new base metal deposits; Canadian sovereignty over Arctic
- Hydropower
 - 600 km of power line; feasibility underway; can't amortize over current mine lives
- Seasonal Overland Route (SOR)
 - Preferred industry option; low environmental impact; could be expensive



TIBBITT TO CONTWOYTO WINTER ROAD

Promising
Options



Conclusion

- We need to find alternatives
- For we winter road operators, the Seasonal Overland Route and Bathurst Inlet Road & Port are high on our list
- Nunavut Government likes BIPAR
- NWT Government likes hydropower
- Time has come to add Infrastructure to the North!
- Watch this space for more developments!



TIBBITT TO CONTWOYTO WINTER ROAD



Questions?

