Logistic Challenges: A Perspective from the Diamond Mines

"THE HEAT IS ON"

Prospects North September 20, 2007

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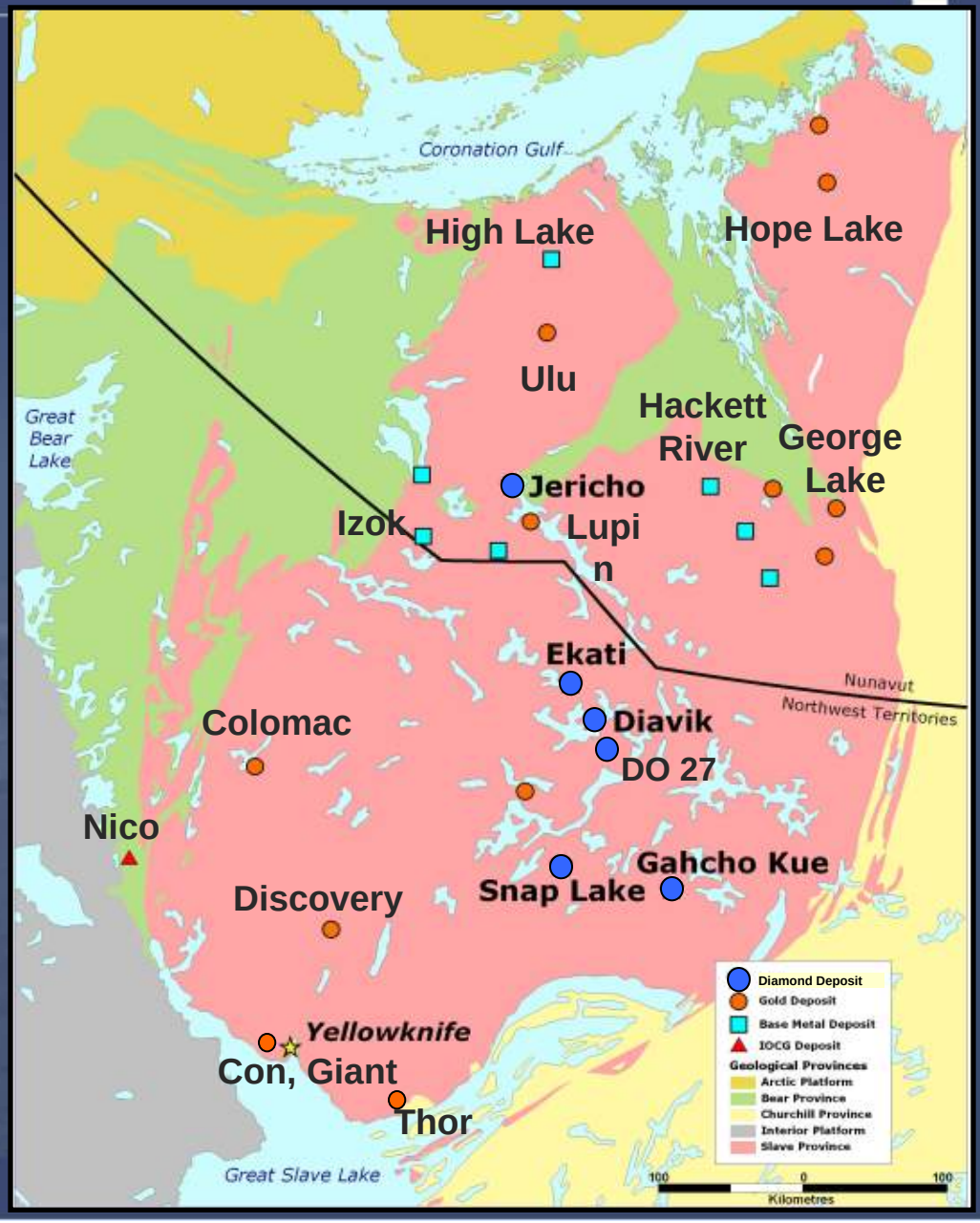
Key Messages

1) Industry has done a good job with transportation infrastructure
2) Winter road has reached capacity – problems emerging
3) We need additional infrastructure

Region of Interest
(the size of the prize)

- The Slave Geological Province
  - Many deposits
  - But few mines due in part to lack of infrastructure



Transportation Key to Mining 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

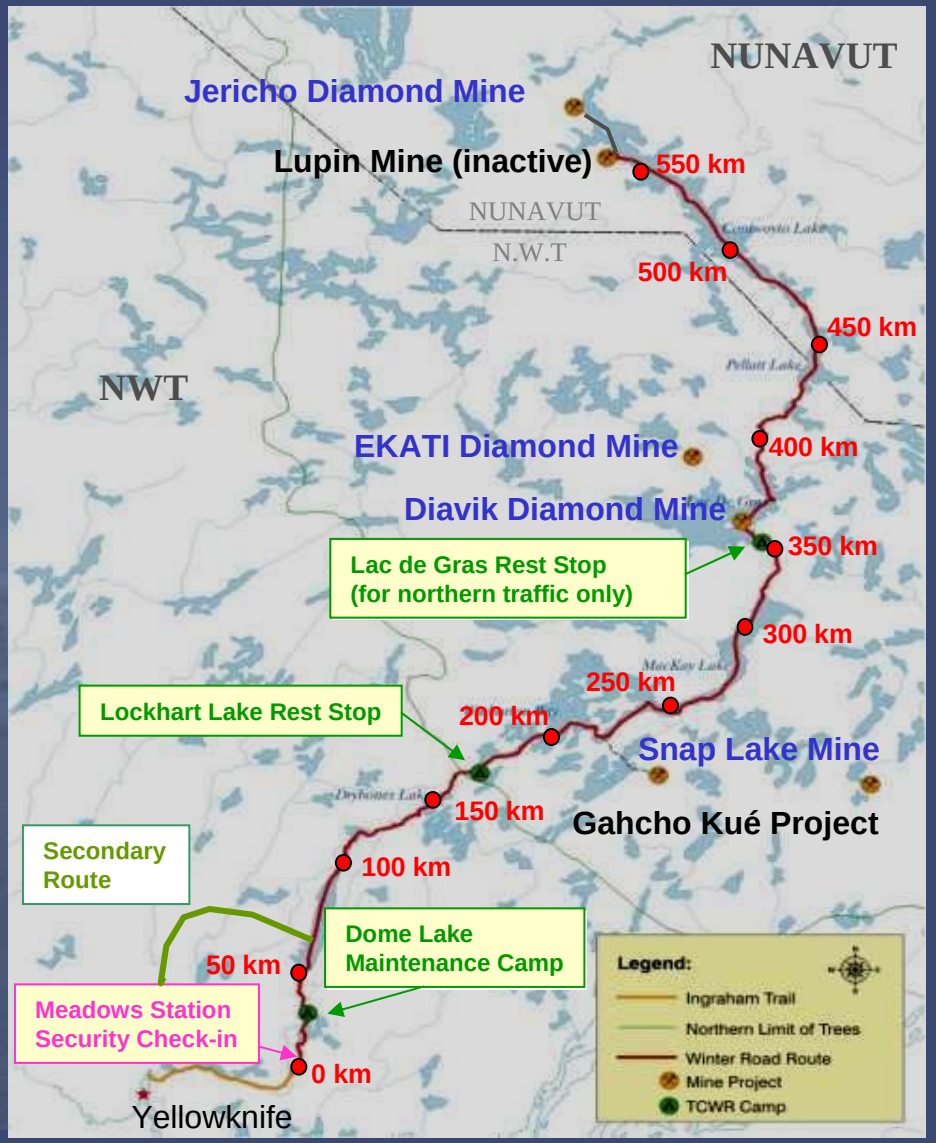
- A virtual highway on ice – large trucks, large loads
- Echo Bay used it to create new wealth in remote barrenlands
- Critical support for brand new diamond wealth

Management of the Winter Road

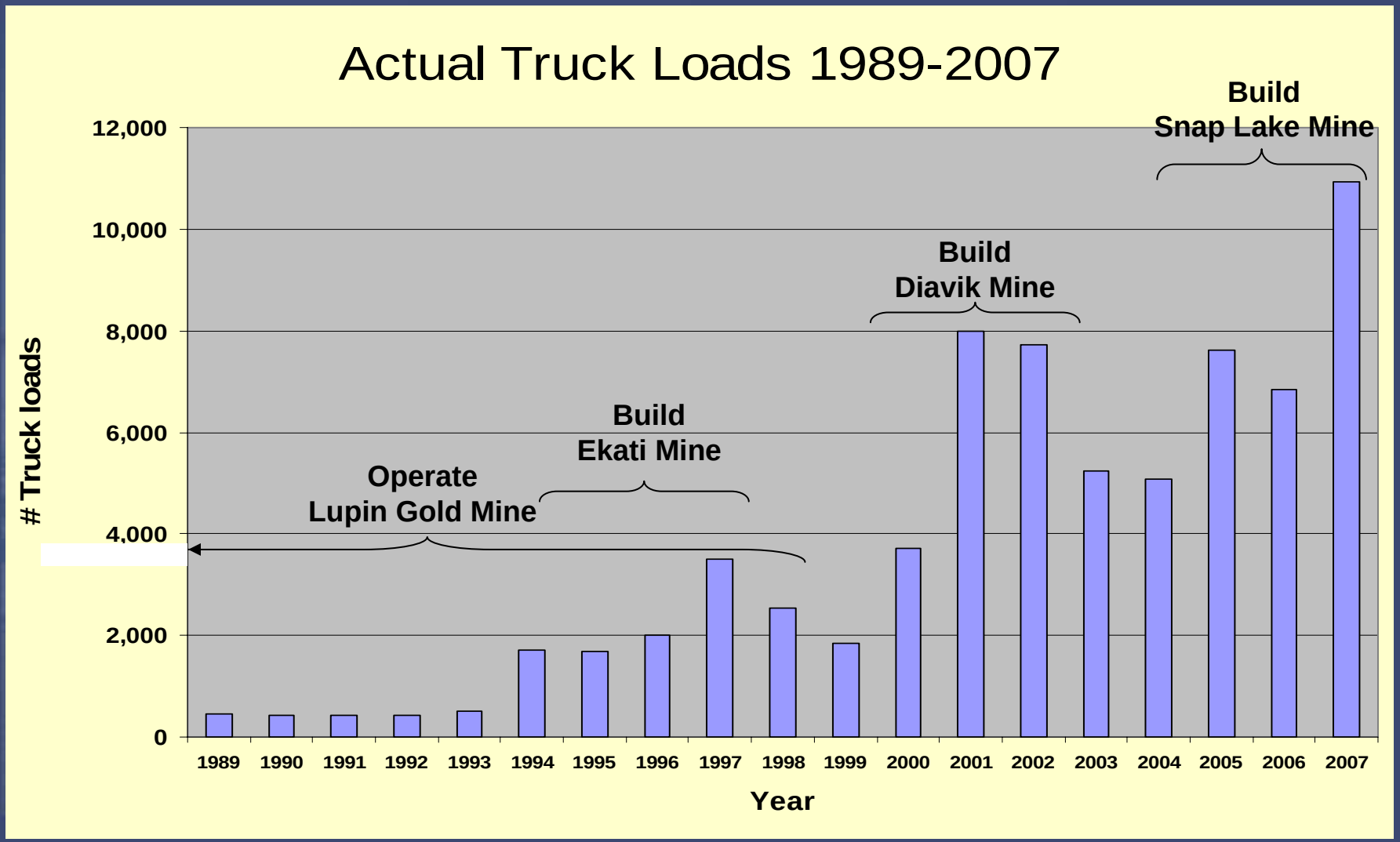
- The winter road is managed by the Tibbitt to Contwoyto Winter Road Joint Venture (JV)
- Current members of the JV are:
  - BHP Billiton Diamonds Inc.
  - Diavik Diamond Mines Inc.
- The JV is committed to constructing, operating and maintaining the winter road in a safe and environmentally responsible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

Some Ice Road Facts

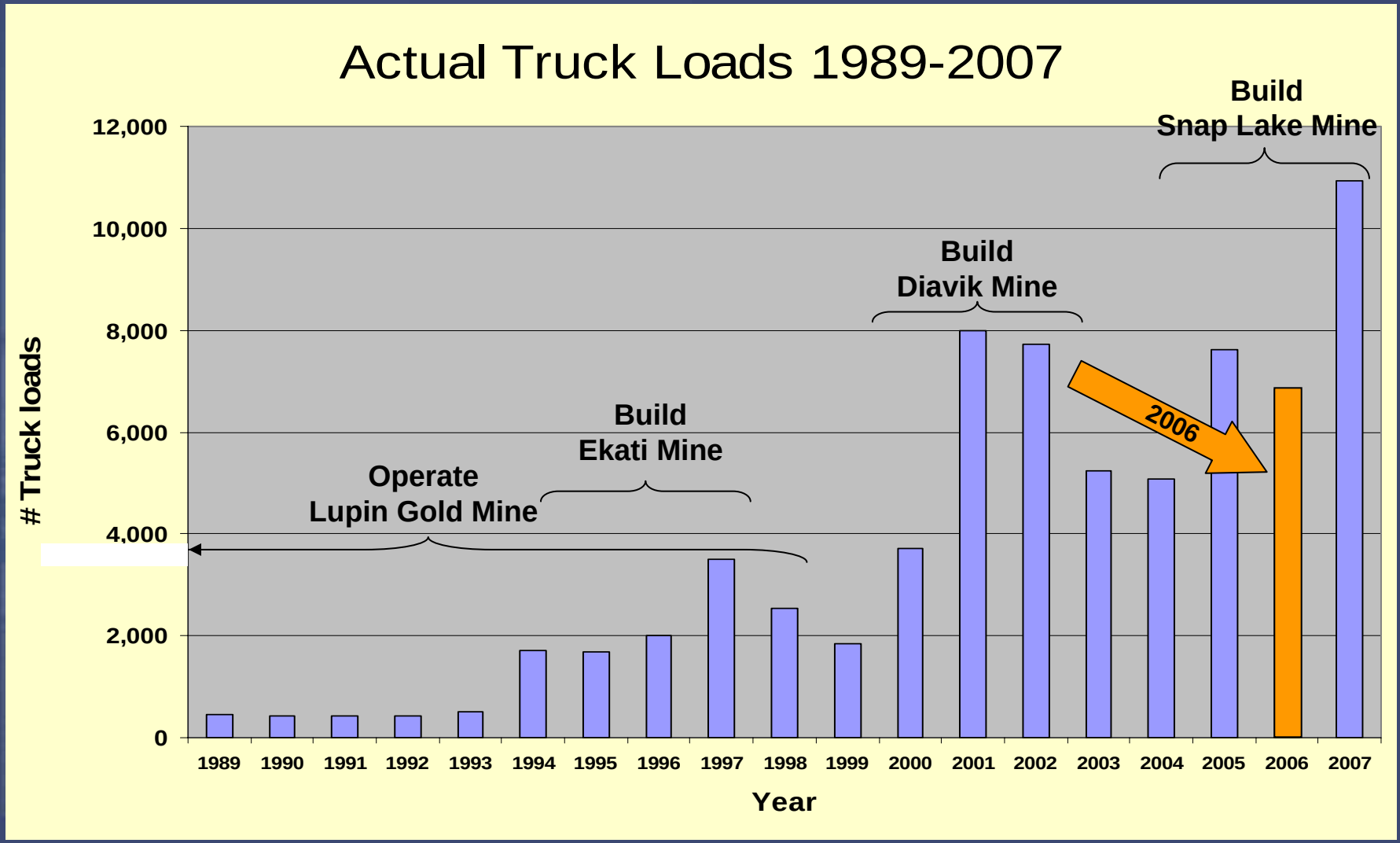
- 568 kilometres long, with 64 numbered portages
- Seasoned constructors – Nuna Logistics & RTL Robinson Enterprises (secondary route)
- Speed limits 25 km (loaded), monitored by radar
- Sophisticated engineering support
- 3 support camps
- Serves 4 diamond mines



We've Done A Good Job Meeting Growth

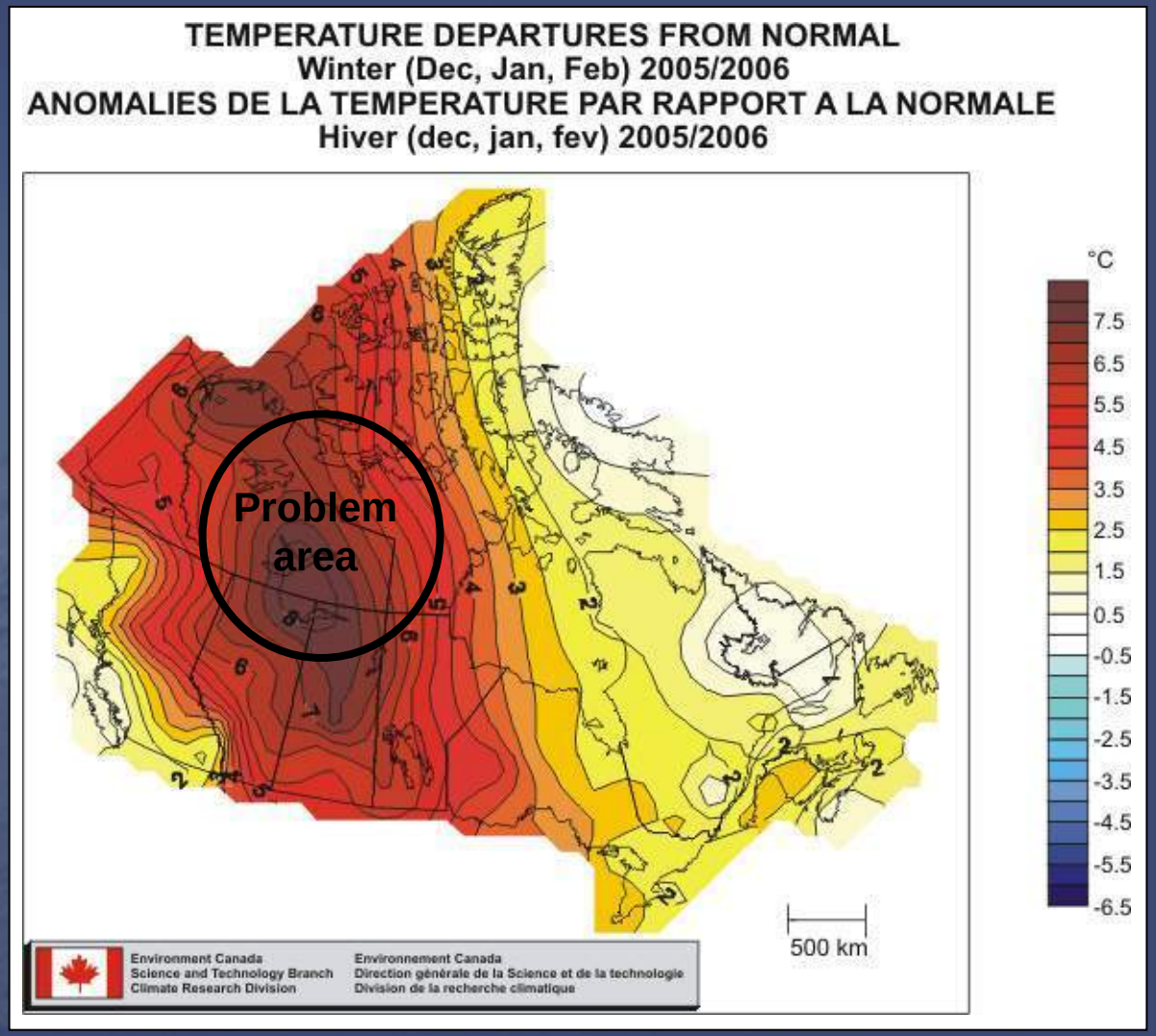


But … Warning Signs Appearing



2006 – A Glimpse of the Future

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



Treeline Issues 2006 Season

- Thin ice – blew out shorelines within 1st two weeks (small lakes) – due to wave action

- Lost ice from underneath due to washing along shoals (middle of lakes)

Ice Bridge Constructed

Removal of Rig Matting (Ice Bridge)

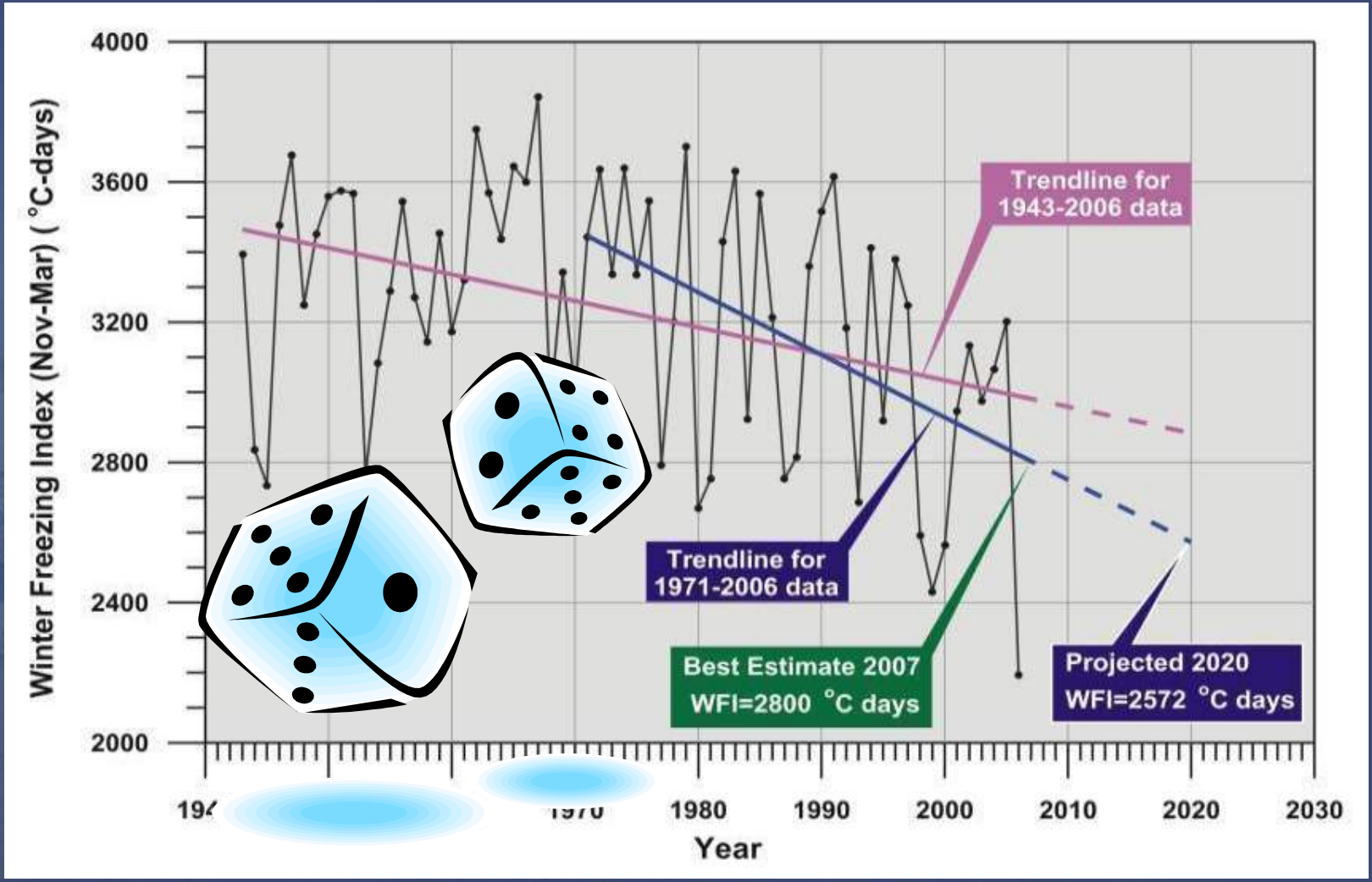
A Costly Solution – take to the Air

- All mines forced to fly freight
- Materials flown to Diavik:
  - Diesel fuel – 15,000,000 litres
  - Prill – 3,000 x 1 tonne bags
  - Cement & bentonite – 5,600 tonnes
  - Production shovel – 22 loads at maximum sling load 20 tonnes
- Can we afford this again?

2007 Road – A Different Story

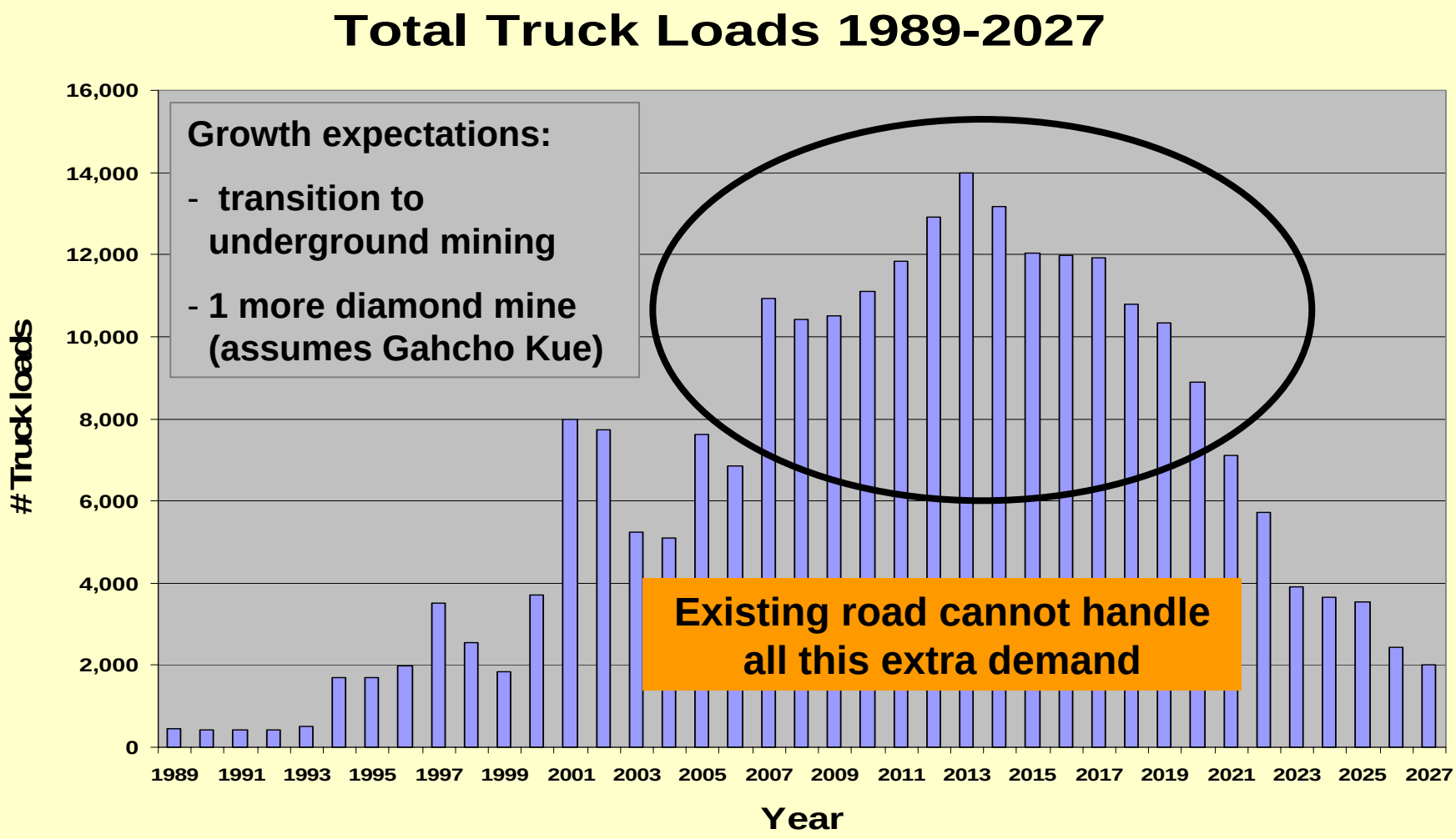
- Record haul year
- 10,922 loads northbound
- 821 backhauls
- Why the difference?
  - weather cooperated
  - operational efficiencies

The Challenges Facing Us – Climate Change



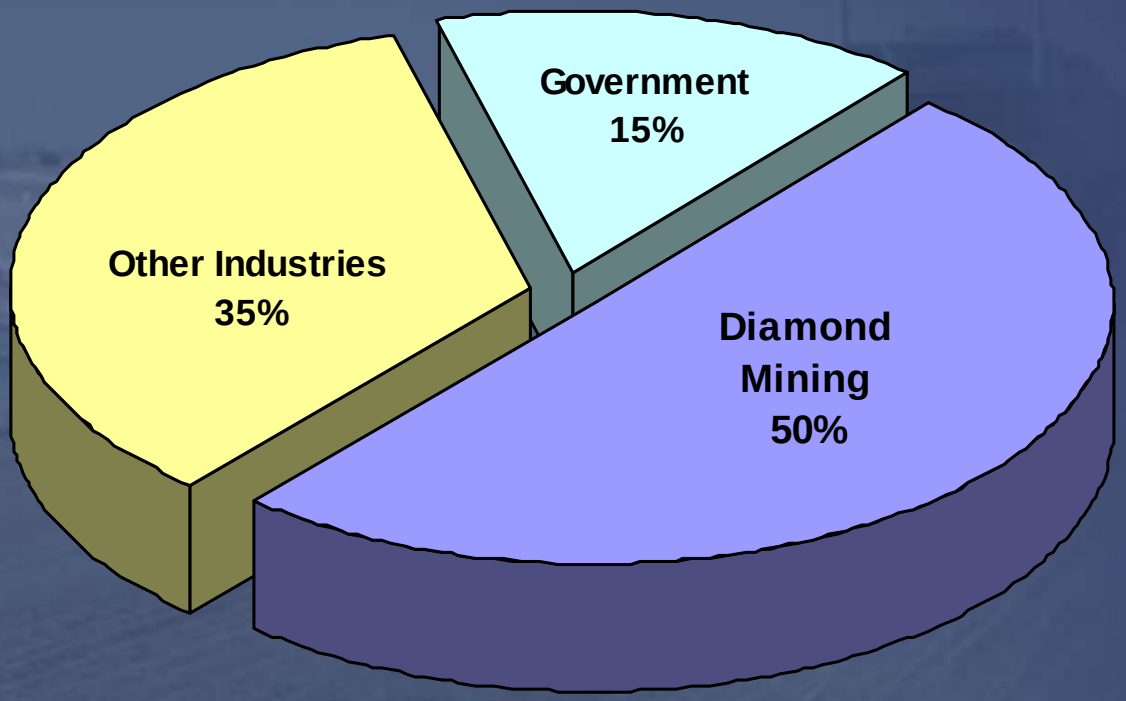
Summary of Yearly Freezing Index for Yellowknife

Second Challenge – Growth Expectations



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

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



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**





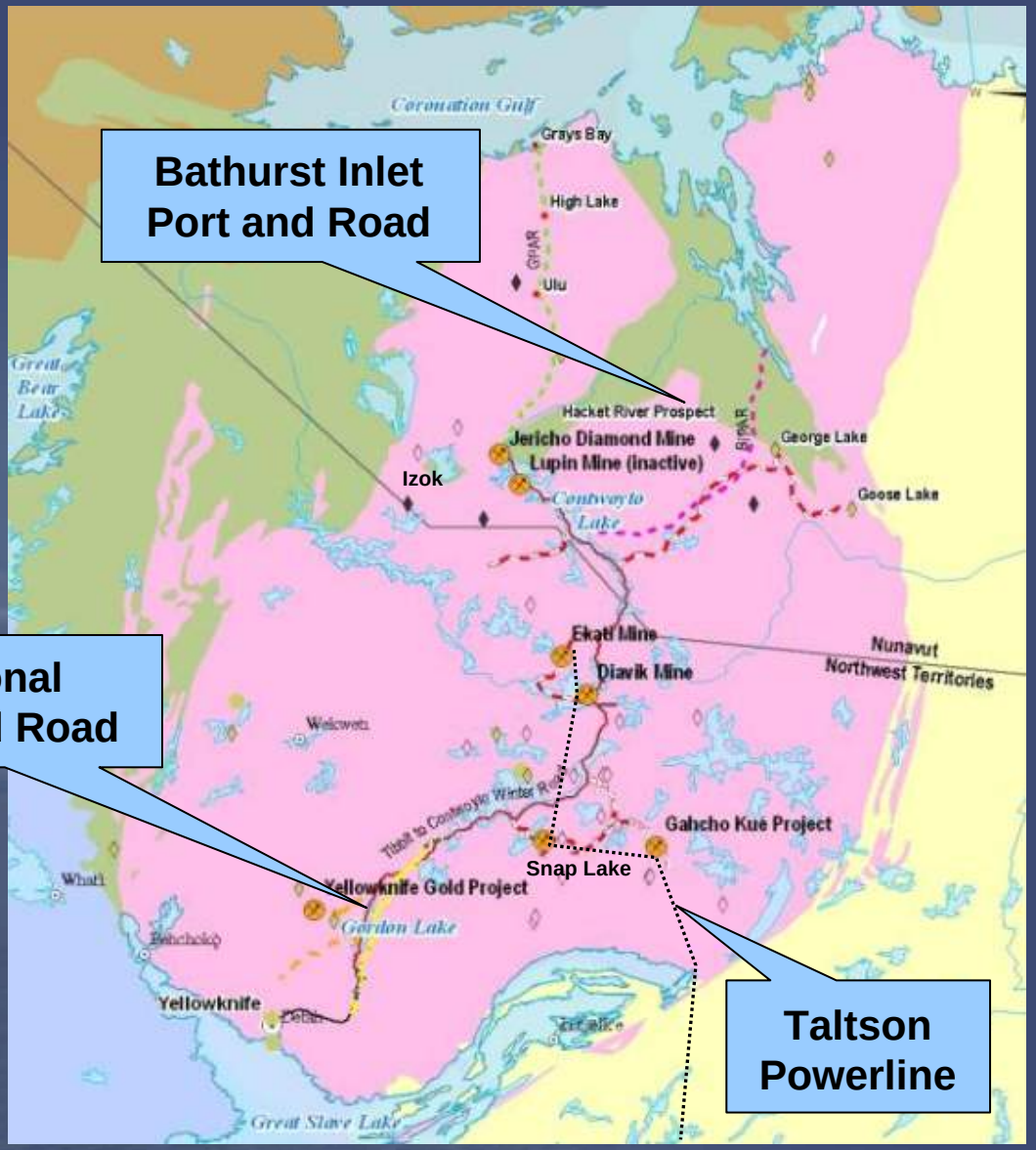


The Most Promising Options

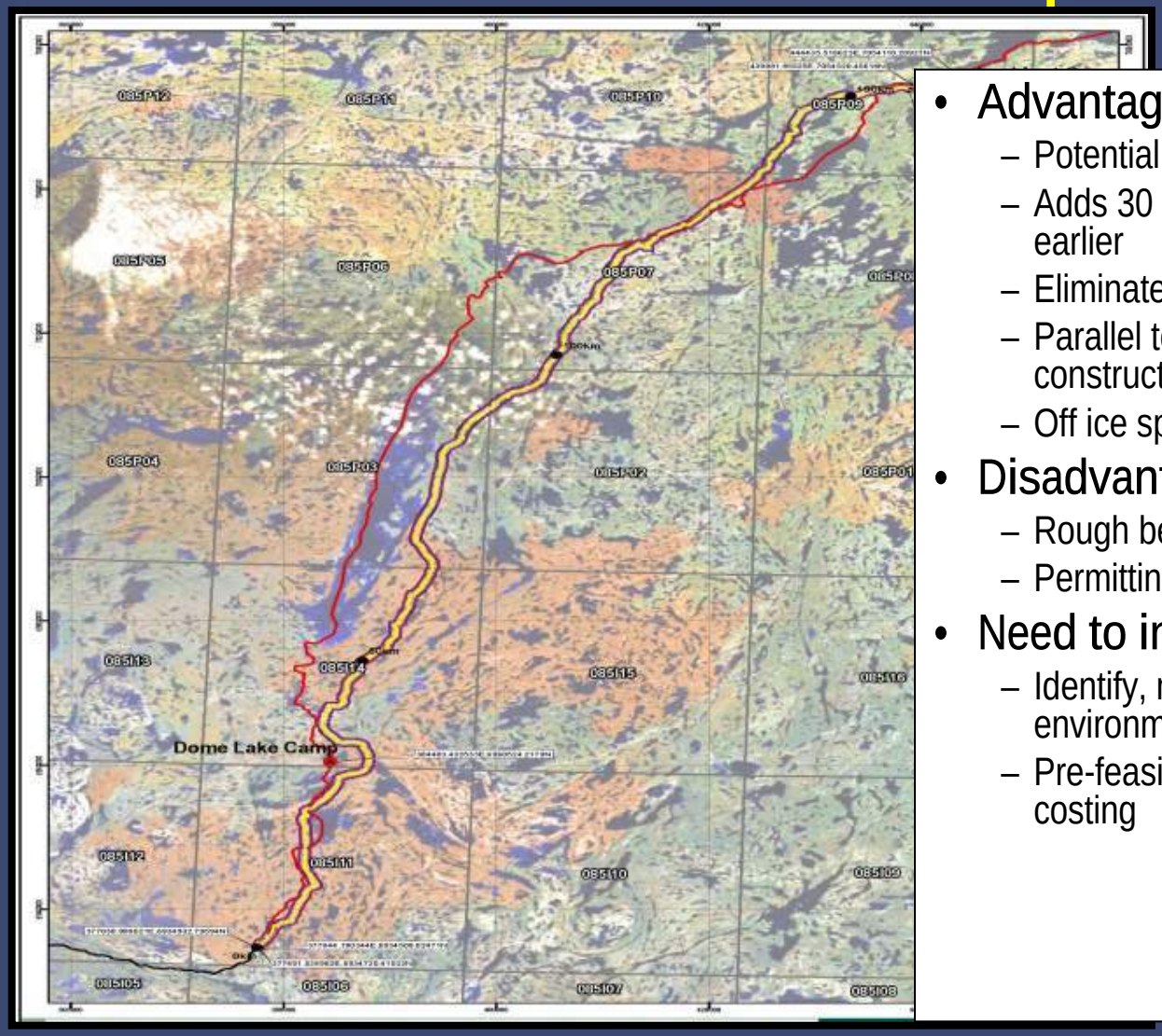
- Seasonal Overland Route (SOR)
  - 150 km. of Seasonal On-land Road to augment ice road; low environmental impact; add 1 month to shipping season; Costs?
- Bathurst Inlet Port & Road (BIPR)
  - Nunavut support and benefits; access new base & precious metal deposits; Canadian sovereignty over Arctic; Costs?
- Hydropower
  - 600 km of power line to diamond mines; feasibility underway; Costs?

TIBBITT TO CONTWOYTO WINTER ROAD

Location Map: Promising Options



Possible SOR Option



- Advantages:
  - Potential short implementation time
  - Adds 30 shipping days – gets to cold weather earlier
  - Eliminates lake ice with greatest climatic risk
  - Parallel to TCWR – allows staged construction
  - Off ice speeds allow faster & more truck trips
- Disadvantages:
  - Rough bedrock terrain & stream crossings
  - Permitting complexity?
- Need to investigate further:
  - Identify, mitigate and accommodate all environmental sensitivities
  - Pre-feasibility level engineering design and costing

Conclusion

- Traffic is increasing – need for infrastructure solution by 2011
- Climate change is adding to urgency
- Mining costs are increasing (UG) – infrastructure can help lower them
- The viable solution(s) are yet to be determined
- SOR, BIPAR and /or hydro can help secure the strong economy diamonds has created
- All provide opportunity for government support