

**The Future for Transport to Canada's North: Airships and Other Options**

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**Transportation in Northern Canada**

Challenges

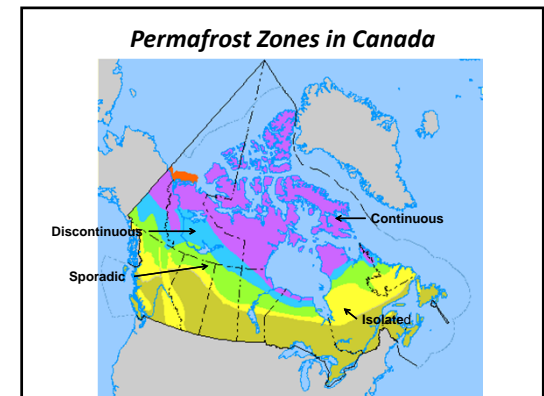
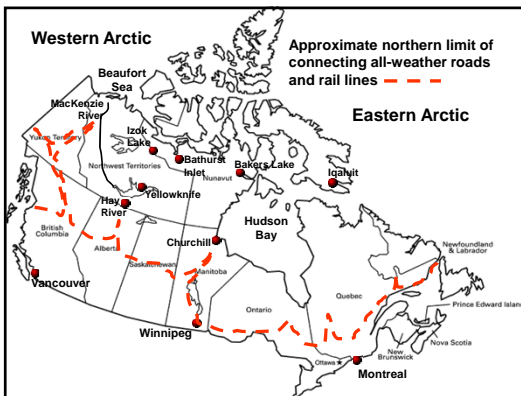
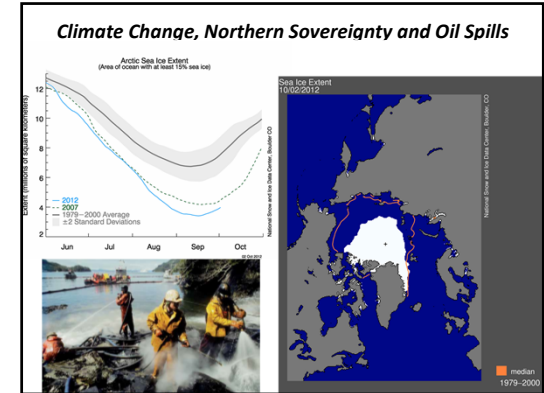
- Infrastructure Gaps
  - Vast Distances
  - Seasonal Service
- High Freight Rates
  - Thin Markets
  - Few Backhauls
- Harsh Conditions
  - Constant Climate Change
  - Permafrost

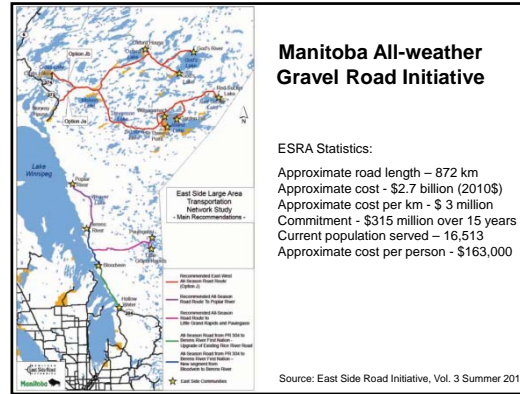
Current Solutions

- Ships
- Barges
- Trucks
- Airplanes
- Helicopters

Potential Solution

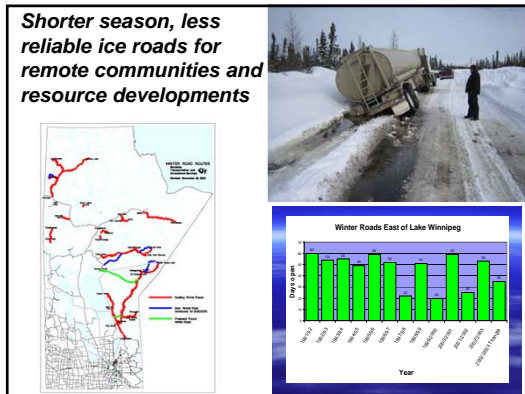
- Airships





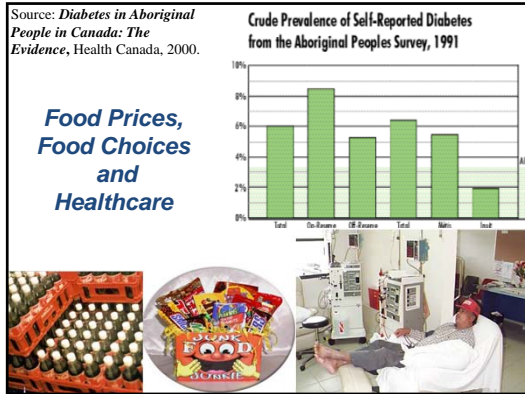
**Aircraft Cost Comparison for a 300 km Flight**

Aircraft Type	Cargo (kg)	Cost (\$/km)	Cost (\$/kg)	Airstrip (m)	Rates (\$/ T-km)
Twin Otter	955	\$6.50	\$4.09	310	\$13.63
DC3	2500	\$10.60	\$2.46	925	\$ 8.20
Curtis C-46	6800	\$17.95	\$1.58	1075	\$5.27
DHC Buffalo	7500	\$17.00	\$1.37	925	\$4.57
Hercules	20000	\$28.50	\$0.86	1700	\$2.87



**Freight Rates, Food Prices and Poverty**

	Winter 2005	St. Theresa Point	Winnipeg
• Milk 4 Litres	\$ 12.19	\$ 3.48	
• Tomatoes	\$ 3.80 lb	\$ 1.99 lb	
• Bananas	\$ 2.31 lb	\$ 0.59 lb	
• Apples, Macintosh	\$ 2.94 lb	\$ 1.29 lb	
• Head Lettuce	\$ 2.69 each	\$ 1.49 each	
• Bread 60"	\$ 2.49 each	\$ 0.99 each	
• Ground Beef	\$ 9.19 Kilo	\$ 4.29 Kilo	
• Red Potatoes	\$ 1.60 lb	\$ 0.79 lb	
• Cheerios	\$ 8.45 box	\$ 3.50 box	
• Coke 2 Litres	\$ 7.99	\$ 2.09	
• Coffee	\$ 11.89 Kilo	\$ 6.99 Kilo	
<b>Total Basket</b>	<b>\$ 65.54</b>	<b>\$ 27.49</b>	



### Buoyant Aircraft History

- 1670 Francisco de Lana
- 1783 Montgolfier brothers
- 1783 Prof. Charles & Robert
- 1784 Jean Baptiste Meusnier
- 1785 Blanchard & Jeffries English Channel Flight
- 1854 Henri Giffard
- 1870 Paris airift
- 1901 Santos Dumont – first dirigible airship
- 1919 R-34 Crosses Atlantic both ways
- 1926 Norge First flight across the North Pole
- 1929 Graf Zeppelin Circumnavigation of the world
- 1930 R100 – Flight to Canada
- 1935 DZR Regular air passenger service across the Atlantic
- 1961 USN 113,740 ft
- 1979 SkyShip 500
- 2000 Zeppelin NT
- 2003 21<sup>st</sup> Century Airships altitude record - 6,234-metres
- 2006 LM P-70J flight

- Strength:**
  - Robust, lightweight envelope materials
  - Carbon fibre composites
  - All aluminum rigid designs
- Control:**
  - Vectoring engines
  - Modern avionics/hydraulics
  - Tail and bow thrusters
  - Pressured gas ballasting
- Safety:**
  - Computer design tools
  - Satellite weather information
  - “Glass” cockpit screens
  - GPS
  - No human contact during ground handling



### Technological advances have been applied to a new generation of cargo transport airships.

### New airships under development

<b>Status of Airship Developers</b>			
Location and Company	Aerostats	LTA Vehicles	Hybrid Vehicles
<b>U.S.:</b> Lockheed-Martin		design/testing	prototype
TCOM	certified		
Worldwide Aeros	certified	certified	prototype
American Blimp Co.		certified	
Ohio Airships			design/testing
<b>Germany:</b> CargoLifter KG	testing		
Zeppelin		certified	
<b>U.K.:</b> Vialift Airships		design/testing	
Hybrid Air Vehicles		certified	prototype
<b>Canada:</b> BASI		prototype	
<b>Russia:</b> RosAeroSystems	certified	certified	design
<b>Japan:</b> National Research		testing	
<b>South Korea:</b> National Research		testing	
<b>China:</b> Vantage Airship Co.		certified	



**Obstacles to Commercialization**

- Absence of Appropriate Infrastructure, i.e. Hangars
- Lack of Business Confidence
- Policy Vacuum
- Regulatory Gaps





### ***Conclusions***

- Airships are not just another aircraft
  - They require a specific regulatory framework
  - Airships cannot operate without unique infrastructure anymore than a ships can operate without dry-docks
- A worldwide competition is emerging for leadership in buoyant aircraft
  - Canada has the skills and the market to dominate of the airship industry, with modest investment we can capture the business in Manitoba