

Actions to move Northern Ontario forward

RESPONSE TO THE DRAFT 2041 NORTHERN ONTARIO MULTIMODAL TRANSPORTATION STRATEGY

Alternative Methods of Transportation – Airships

By Dr. Barry Prentice | No. 2 | December 2017

In July, 2017, The Ministry of Transportation (MTO) and the Ministry of Northern Development and Mines (MNDM) released a Draft 2041 Northern Ontario Multimodal Transportation Strategy to align with the 2011 Growth Plan for Northern Ontario.

Northern Policy Institute (NPI) recognizes the importance of an innovative, diverse transportation strategy that takes all communities into account. As part of our role to propose evidence based, practical solutions that support the sustainable development of Ontario's northern regions, we've put forward this series of action items that outline concrete next steps that the public and private sectors can use to inform the implementation and management of transportation policies.

These action items relate directly to directions outlined in the draft strategy.

DIRECTION 4.4:

Facilitate the adoption of new and emerging innovative methods of goods movement, where appropriate, such as airships and hoverbarges.

Summary of Proposed Action Items:

MNDM and MTO should:

- 1) Conduct a thorough study of the various alternative methods of transportation to assess their potential in Northern Ontario and determine the stage of the industry.
- 2) Assess the range of airship developments worldwide and choose two to three cargo airship designs for more extensive testing and development.
- 3) Study the infrastructure requirements needed to allow airships to function to their full potential and identify opportunities for private sector participation in the development of this infrastructure (where possible).
- 4) Identify the appropriate size, location and cost of a public airdock to support the airship industry.
- 5) Construct a public airdock in conjunction with one or more of the Northern Ontario universities to test and adapt airship technology to operate in frigid temperature conditions.
- 6) Assess the economic impact on the Near North of setting up a manufacturing location to build airships that are designed to operate year-round in the Far North.

BACKGROUND

It is very positive that the NOMTS addresses the need to consider alternative strategies for transportation in the Far North. The winter road network is failing, and evidence suggests that climate change is progressing much faster than anticipated (Point 3.3). It is also clear that while some incremental expansion of the all-season road network would be desirable (Point 3.6), the funding relies on other parties and has a very uncertain timeframe. Consequently, alternative transport means need to be assessed.

The technologies identified in the NOMTS are listed without any discussion or assessment. Given the nature of the Strategy it is understandable that not more can be done in this document, but the suggested actions could be strengthened. First, a thorough study of the various alternate methods of transport is needed to assess their potential and the stage of the industry. For example, hoverbarges are only used for moving heavy loads like oil drilling rigs over difficult terrain, such as swamps and marshes. In general hovercraft have been rejected for northern transportation because of the challenges of terrain, their high operating and maintenance costs and noise. They would not be suited to the movements as illustrated on Figure 14 in the NOMTS. Similarly, drones are limited to line-of-sight operations (about one kilometer) and have very limited range or cargo capacity (less than 25 kg). Any analysis of these technologies would quickly rule them out for any further consideration as a substitute for winter roads.

Airships are receiving increasing attention as a solution for northern transportation. These vehicles were a proven technology 80 years ago, and need only to be redeveloped using modern materials and methods. Many types of airships are being proposed, of which the Solarship, is just a variant, not a unique technology. Rather than passively monitoring this technology, and hoping that some other jurisdiction resolves these issues, a series of concrete actions should be taken to evaluate the potential for cargo airships to serve the Far North before the ice roads fail completely. A first action would be to assess the range of airship developments worldwide and choose two or three cargo airship designs for more extensive testing and development.

A transportation system encompasses more than just a vehicle. The ground-handling requirements of airships are often glossed over with the assumption that they require none, and can simply land anywhere. While this may be

possible, it ignores the need for regular service that is being contemplated. Cargo airships require security, mooring sites, ballast provision, ground-handling equipment, and ability to tranship to trucks for final delivery, fuel and ground-power. Moreover, airships could carry passengers as well as freight, which is highly desirable in the Far North. An action item would be a study to assess how these needs could be met and the division between public and private provision of this infrastructure.

Airships require a location for assembly, inspection and maintenance. It is easy to confuse the hangar needs of airplanes and airships, but they are very different. Airplane hangars are relatively small buildings and are generally privately-owned. Airships operate more like ships of the ocean, and require extremely large hangars, or what are more appropriately called "airdocks" because they operate like marine drydocks. Each airdock can support about 25 airships because each airship would only use the facility for about two weeks per year. This makes private ownership very expensive and the high entry cost greatly constrains competition if each company must provide its own airdock. While the airdock is not used often, without a suitable building to undertake repairs and inspection, no airship can operate. This makes the public provision of airdocks a good policy to promote a competitive and vibrant cargo airship industry. The action item would be to identify the location, size and cost of a public airdock to support the airship industry.

Any airship could operate in the Far North during the summer, but the colder seasons bring challenges that need to be addressed.

Any airship could operate in the Far North during the summer, but the colder seasons bring challenges that need to be addressed. A cold weather testing facility is needed somewhere in Canada that could engage in research and testing to determine the impacts of the cold weather on airships. Thus, the action item would be to build the public airdock in conjunction with one or more of the Northern Ontario universities to test and adapt airship technology to operate in frigid temperature conditions.

The economic impact on the Far North of cargo airships would be very significant because the cost of food transport could be reduced by half, and similarly all other building materials and economic developments (e.g. mining) would become more affordable. However, the wider impact could be much larger. The Near North needs manufacturing jobs. The fabrication and assembly of cargo airships could generate an entirely new source

of employment in major centres like Thunder Bay and Sudbury. The action plan should assess the economic impact on the Near North of setting up a manufacturing location to build airships that are designed to operate year-round in the Far North.

The [recommendation is welcome], **but it lacks definition.** What would constitute a valid project, and when might it be staged?

The general recommendation of the NOMTS to consider a pilot project is welcome, but it lacks definition. What would constitute a valid project, and when might it be staged? The action plan should be more specific and set parameters for the pilot. For example, it should include a minimum 10 tonnes lift and operate for a

12-month period. The NOMTS suggests “willing partners” to support for this demonstration. Clearly, no cargo airship developer is going to choose the thin market of Northern Ontario with its lack of infrastructure. Many other more economically attractive and less environmentally challenging locations for testing exist in Africa, South America and Asia. A demonstration to bring a solution to the failing winter roads of the Far North must be shouldered mainly by the two levels of government. Moreover, every year of delay increases the risk that emergency resupply efforts at much higher costs are going to be required.

To summarize, it is a positive sign that the NOMTS addresses the need for exploration of new technologies for the movement of goods in the Far North. That said, the specific action items identified in the strategy are general and could be developed in more detail. This note has outlined six next steps for MNDM and MTO to undertake to move ahead with this direction.



ABOUT THE AUTHOR

Dr. Barry Prentice is a Professor of Supply Chain Management, at the I.H. Asper School of Business, University of Manitoba and the former Director (1996-2005) of the Transport Institute. His major research and teaching interests include logistics, transportation economics, urban transport and trade policy. Dr. Prentice holds a degree in economics from University of Western Ontario (1973) and graduate degrees in agricultural economics from University of Guelph (1979) and University of Manitoba (1986).

Through the Transport Institute, Dr. Prentice has organized national and international conferences on sustainable transportation (Railways and the Environment), supply chain logistics (Planes, Trains & Ships), agribusiness logistics (Fields on Wheels), the potential use of airships for northern transportation (Airships to the Arctic) and food trade between Canada and Mexico (La Cadena de Frio).

Dr. Prentice is a Fellow in Transportation at Northern Policy Institute and the President of ISO Polar Airships that he co-founded in 2005 as a not-for-profit research institute to promote the use of airships as sustainable transport for the northern latitudes.



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