

LOADS



ON THE GO

From hoverbarges to airships and new industrial parks, a look at the latest strategies in keeping equipment and modules moving

by **Melanie Collison**

The first argument against developing the natural resources in a remote area is that building infrastructure does environmental damage.

The second—and often more important—argument is that remediation can never be complete because the path of entry into the wilderness is left behind. That is especially true in a wilderness area where the growing season is short, like in Alberta's oilsands. It's not as if roads built through the muskeg will ever be overgrown with jungle vines.

Roads have a long-term impact on wildlife and vegetation, especially if they invite continued human use, as has so often been demonstrated along the Eastern Slopes of the Rockies.

On the conventional side of the oilpatch, northern roads have traditionally been built to be strong enough to bear heavy vehicles with aggressive treads that service million-pound drill rigs.

Recent years have seen the introduction of low-ground-pressure vehicles that have huge balloon tires that distribute the weight of their loads so broadly they can cross tundra in the summer without leaving a mark. Ball-bearings locate the slip between the wheel and vehicle, rather than between the wheel and the ground. A fully loaded gravel truck can drive over a person lying on the ground without doing any harm.

On the unconventional side, transportation experts are looking to be equally progressive. They're working on how

to move enormous, heavy, bulky equipment across muskeg without destroying fragile ecosystems that have taken centuries to develop.

Air support is one promising answer, in two quickly evolving applications.

The first is hoverbarges, which travel two metres above the ground surface, their weight shouldered by a bed of air forced underneath a huge payload platform by diesel engines and captured by a skirt—rather like Marilyn Monroe in *The Seven Year Itch*.

The second is helium-filled airships that rise more than 1,300 metres above the ground, buoyed because helium is lighter than air. They can carry all manner of heavy, awkward payloads dangling below.

Hoverbarges are currently in use in remote areas around the world while airships may not hit the market for some years yet.

The key to the emergence of both is the leap forward in manoeuvrability. To be practical in northern Alberta, they have to be self-propelling, not dependent on tugboats as the river hoverbarges are, and not dependent on big crews to tether them to the ground as the airships of old were.

On the telephone from the United Kingdom, Hovertrans spokesman Stuart Turner chats about the progress the company has made in designing a hoverbarge able to travel over muskeg carrying 2,500-tonne loads. ▶



Modules destined for oilsands plants are a regular sight on Alberta's Highway 63.

PHOTO: JOEY PROULBY



PHOTO COURTESY: HOVERTRANS

Hovertrans is designing a hoverbarge that would be able to travel over muskeg carrying 2,500-tonne loads. This one is travelling over mud in Siberia.

The self-propulsion system being designed is a series of wide side-wheels that gain enough traction through adjustable contact with the ground to reach a speed of 11 kilometres per hour in a strong headwind. The craft itself exerts only one pound per square inch against the ground surface in hover mode, compared to the seven to eight pounds per square inch a person exerts walking.

The diesel engines that force air under the craft to create the air cushion can be in soundproof enclosures, and using a wheeled system helps reduce the noise levels, Turner says. Hoverbarges were originally proven on the peat bogs of Scotland.

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— Barry Prentice,
Director of the Transport Institute at the University of Manitoba

“They’re ideal where there’s no infrastructure,” says Turner. Although the propulsion system does make contact with the ground, he says the environmental impact is minuscule compared to the damage done by building roads, or dredging a river to open it up for normal barges.

“That’s why you find them operating in remote places. Hovertrans has a 330-tonne payload hoverbarge being used for drilling in the swamps of Suriname,” which is southeast of Venezuela along the northern coast of South America. “They have just placed an order for a second one.”

Construction is nearly finished in the United Kingdom on a 200-tonne payload hoverbarge to be used in Siberia to move modules for a process plant down a frozen river and across the Siberian wilderness.

Another—the largest yet—is near completion in Portland, Oregon for a mining company to use on a shallow river.

Hovertrans likes to build as near as possible to where the barges will be used. “The facility to build it is a standard shipyard. It’s simple, almost like a pontoon,” Turner says.

Hoverbarges have a track record up north. Two were used across the Yukon River during Alaska pipeline construction. With the growing urgency of environmental concerns in oilsands development, Hovertrans did a route survey in 2006 from Herschel Island in the Beaufort Sea to Fort McMurray, primarily along rivers too shallow for conventional barging.

On May 13, 2009, Hovertrans will be presenting at a summit in Edmonton organized to explore the transit and freight transportation alternatives available for the Fort McMurray and oilsands regions. The host is the Van Horne Institute, a transportation industry-sponsored think-tank housed at the University of Calgary.

“We’ve had a number of companies come to talk to us about getting workers back and forth to the mines plus getting heavy goods up the highway,” Van Horne president and chief executive officer Peter Wallis recently told *Oilsands Review*. “We went out to a fairly wide range of solution providers and had a number come back and say they would like to present.”

Among them are the Renata Project, a concept to design communities entirely around high-speed rail; as well as rail, trucking and air commuter companies.

Airships will have their day at the fifth international Airships to the Arctic symposium in Edmonton Oct. 7 to 9, 2009. Winnipeg’s four-year-old ISO Polar airship research institute is co-hosting the symposium with the Van Horne Institute.

“There are no cargo airships anywhere for sale, but the tipping point is getting close,” says Barry Prentice, director of the Transport Institute at the University of Manitoba.

With the advance of global positioning systems, computerized controls, and the addition of diesel engines, airships are poised to become an excellent solution to the problems of transportation in the North. They need no infrastructure and where they are no longer needed, they leave behind no stranded assets.

"Skyhook Company in Calgary has a partnership with Boeing, looking at lifting loads of 40 tonnes of very awkwardly shaped goods," Prentice told *Oilsands Review*. "The airship lifts the weight of the ship and fuel, and helicopter [rotors] lift the weight of the load." Once the load is delivered, the rotors are turned off so the ship doesn't have to bring back a ballast of water or sand for balance.

"Boeing is six months into a four-year plan. We will see test vehicles within a couple of years," Prentice says, "then there will be competition. There are 16 projects in 8 or 9 countries already, all under-funded, but the big companies are watching and won't be left behind."

To lift 50 tonnes it takes a ship 100 metres long, 65 metres wide, and 35 metres high, yet it can land on water, ice, or any piece of flat ground without doing damage because it's so light. Airships burn fuel only to travel through the air, not to stay in the air as an airplane does.

Airships will travel at a speed of 130 to 160 kilometres per hour at heights up to 5,000 metres. Above that, the air is too thin to provide enough buoyancy. The ships cruise better in cold air than warm because it's denser, and will provide the steadiest ride over a snow-covered surface that has no thermal updrafts coming off the land.

They travel well in the dark, which is certainly handy in the North. "The movement of goods and people and equipment out in the frontier is where they shine. That's 70 per cent of Canada's land mass," Prentice points out. "You'll have very high utilization rates."

Another way to tackle the transportation problems of the oilsands region is to locate manufacturers and suppliers closer to where products will be used. It's easier to ship steel plate, for instance, than to move the gigantic modules made of steel for oilsands projects.

That's why Weldco Heavy Industries built its heavy steel fabrication and repair plant in Caribou Energy Park at Fort McKay. Weldco is co-owned by the Inuvialuit of the Western Arctic through their Inuvialuit Development Corporation and by the Inuit of Nunavut through their Nunasi Corporation.

"Proximity is everything," says Darren Lunt, director of sales and marketing.

Weldco handled its first work order in March. As well as repairing and refurbishing worn boxes for surface mine trucks, Weldco is geared up to assemble new bodies.

"Our shop allows it all to be done inside," Lunt says. At other plants, the piece of work "has to be dragged outside the shop and flipped with large industrial cranes, then dragged back in. Ours has a high ceiling and rotators, so our guys are always welding on the flat."

TaigaNova Industrial Park, seven minutes north of downtown Fort McMurray, is expected to ease highway congestion as well. Developed by the Wood Buffalo Housing and Development Corporation, TaigaNova is geared towards protecting the environment and reducing operating costs by encouraging businesses to adopt cooperative industrial practices.

Being located north of Fort McMurray, the industrial park will reduce truck traffic in town and over the crowded Athabasca River bridges. Businesses are also being coached in eco-industrial networking techniques, such as sharing a trucking service or ordering shipping supplies together to get a group discount. They're being prompted to maximize land use by sharing parking lots and loading areas. **OSR**



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