

**A Better Mousetrap  
by Brian Bosse**

Every single business can be considered in some way to be about technology, not necessarily technology in the ‘cutting edge’ or particle-discovery senses of the word, but rather in the ‘best-design-of-business-operations’ sense of the word. At our end we have eliminated the need for a physical office in Victoria, British Columbia. Internet technology, has replaced office rent, parking, and commuting! Murenbeeld & Co is clearly not a ‘tech company’, but we are a consumer of technology and changing in ways to take advantage of new technologies.

The adoption of improved technology has lowered our “cost of supply” and more broadly, the cost curve for whole industries. For example, Uber has brought down the cost of supply within the taxi industry. Whereas a taxi company must not only endure the expense of owning, maintaining, and depreciating its cars, Uber does not actually own any of its cars. A Taxi company can never serve more customers than the number of cars that it owns. The benefits to Uber from having a better mouse trap, a better technology, are clear for all to see. It follows that investors are supportive of the company.

**The concept of better mousetrap technology was on display at PDAC 2017.**

Quest Rare Minerals published NI 43-101 TECHNICAL REPORT ON THE PRELIMINARY ECONOMIC ASSESSMENT (PEA) FOR THE STRANGE LAKE PROPERTY QUEBEC, CANADA on April 9 2014. We accessed this document via their website [www.questrareminerals.com](http://www.questrareminerals.com) on March 7, 2017. Figure 18-1 of that report is a picture of a 170km road necessary for the mine to exist. Figure 20-1 shows the environmental study area around the road.

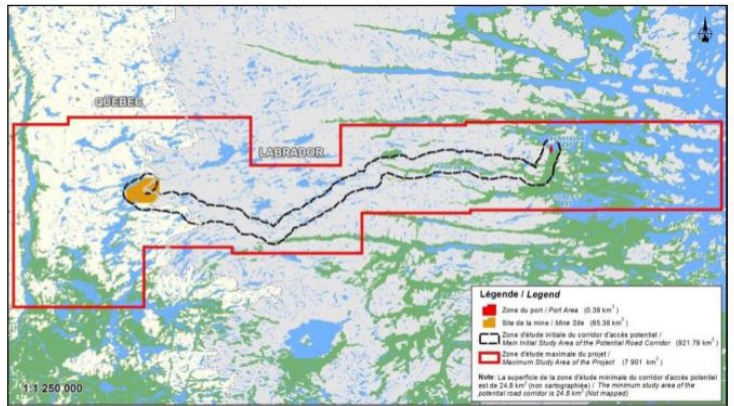
Roads are expensive; they are often just “sunk costs” because construction costs cannot

**Figure 18.1  
Proposed Mine Access Road**



Micon December, 2013 Technical Report.

**Figure 20.1  
Study Area for Project Environmental Baseline Studies, Northern Québec**



Micon December, 2013 Technical Report.

be recouped by selling the road after the mine is exhausted. In the absence of government support, every dollar spent on the environmental study, the construction, and the maintenance of such a road is a dollar which lowers the mine’s return on investment – ROI.

But here is the better mousetrap! Lockheed Martin has developed a Hybrid Airship (images of which were pulled from [www.hybridhe.com](http://www.hybridhe.com) on March 7, 2017). The airship supersedes the necessity of an access road. Each airship can carry a 21-metric tonne load, at 1/15th the fuel cost of a helicopter!

The airship is made of Kevlar and filled with helium. It has four diesel-driven swivel-mounted propellers. It can seat 19 passengers and 2 pilots. And it can land on water, ice, mud, snow grass, rock, etc. The cargo bay has dimensions similar to Lockheed Martin’s Hercules cargo



transport. The balloon itself is a three-loaves design that creates additional lift via forward motion. The vehicle operates below 10,000 feet without cabin pressurization. Landing and takeoffs are possible in both vertical and traditional modes. Its overall length is similar to a Goodyear blimp. And flight operations can be conducted day and night, good weather or bad.

Quest Rare Mineral's PEA document estimates (on page 194) that construction for the mine access road alone is 228.3\$ million dollars, excluding the environmental study and various approvals. Total projected costs for this mine are estimated to be \$1,631 million. The access road is therefore 14% of capital invested – a significant item in the overall project's development.

Lockheed Martin sells its airship for \$40 million per copy, and stands behind a 30-year service lifespan. The global dealer is Hybrid Enterprises, which has sold 12 units to a company named Straightline Aviation, with whom Quest Rare Minerals has entered into a 10-year service agreement providing for seven airships, crew, fuel, flight operations, ancillary facilities, and 200,000 tonnes of concentrate shipping per year.

No access road will be built and mine production is expected to begin in 2020.

We at Murenbeeld & Co. think this is a potential game-changer in the development of remote mines. The shift away from large investments into sunk costs being borne by mining companies towards annually-contracted airship services provided by someone else's balance sheet, is our view of a better mousetrap. This new way of doing business will improve the industry for everyone. Our name for this upcoming shift is **Physical Assets as a Service**. Our acronym will be **PAaaS**, to be pronounced as '**pace**' – in reference to the higher pace at which projects will repay capital invested, and also the increased speed with which projects can come online.

We will continue to search for and report upon similar business models and mousetrap improvements of which our readership (mining companies, asset managers, and metals investors) should be aware.

Readers interested in joining a factory tour regarding these vehicles are encouraged to contact [brian@murenbeeld.com](mailto:brian@murenbeeld.com).