

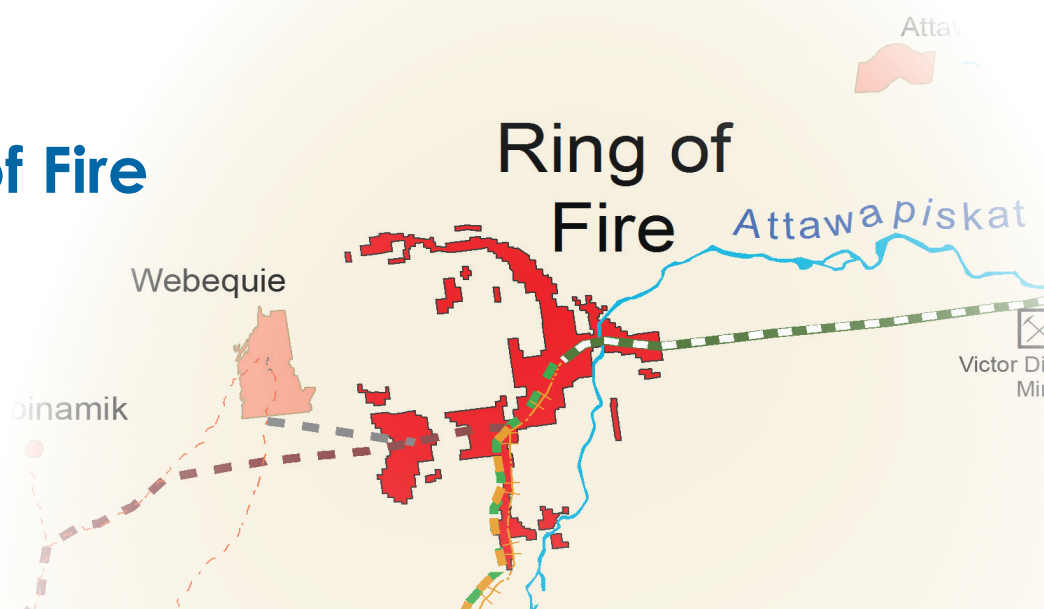


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Roads, Rail, and the Ring of Fire



By Rick Millette and Mike Commito

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About Northern Policy Institute

Northern Policy Institute is Northern Ontario's independent think tank. We perform research, collect and disseminate evidence, and identify policy opportunities to support the growth of sustainable Northern Communities. Our operations are located in Thunder Bay and Sudbury. We seek to enhance Northern Ontario's capacity to take the lead position on socio-economic policy that impacts Northern Ontario, Ontario, and Canada as a whole.

Vision

A growing, sustainable, and self-sufficient Northern Ontario. One with the ability to not only identify opportunities but to pursue them, either on its own or through intelligent partnerships. A Northern Ontario that contributes both to its own success and to the success of others.

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Northern Policy Institute is an independent policy institute. We exist for the purposes of:

- The development and promotion of proactive, evidence based and purpose driven policy options that deepen understanding about the unique challenges of Northern Ontario and ensure the sustainable development and long-term economic prosperity of Northern Ontario;
- The research and analysis of:
 - » Existing and emerging policies relevant to Northern Ontario;
 - » Economic, technological and social trends which affect Northern Ontario;
- The formulation and advocacy of policies that benefit all Northern Ontario communities that include Aboriginal, Francophone, remote/rural communities, and urban centres; and,
- Other complementary purposes not inconsistent with these objectives.

Values

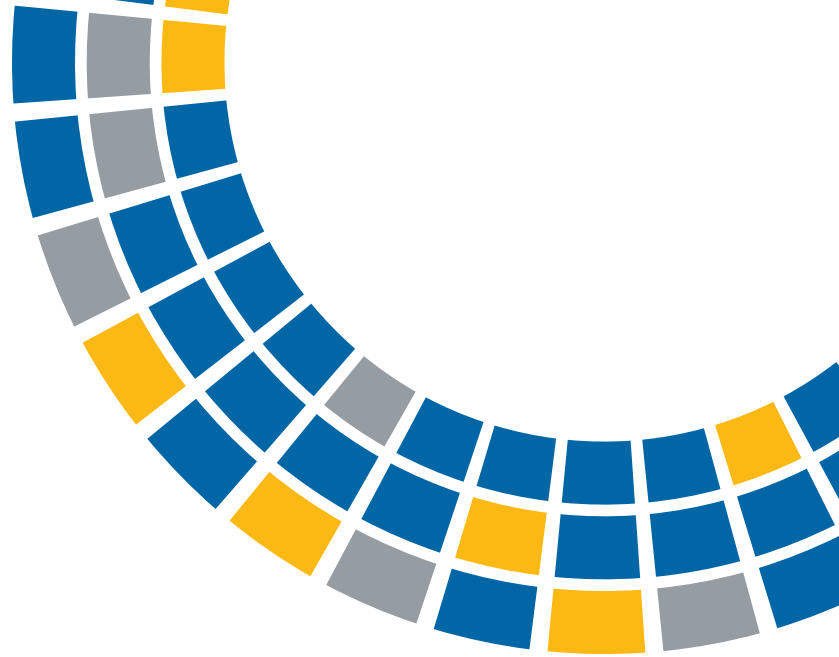
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About the Authors

Rick Millette



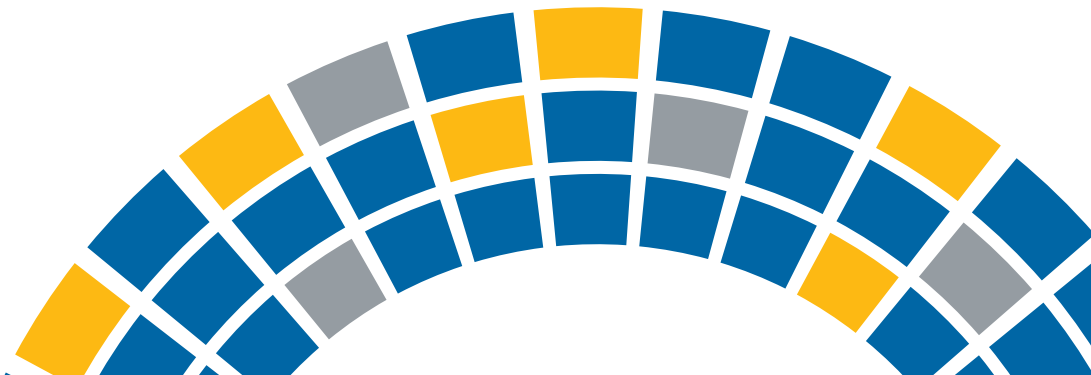
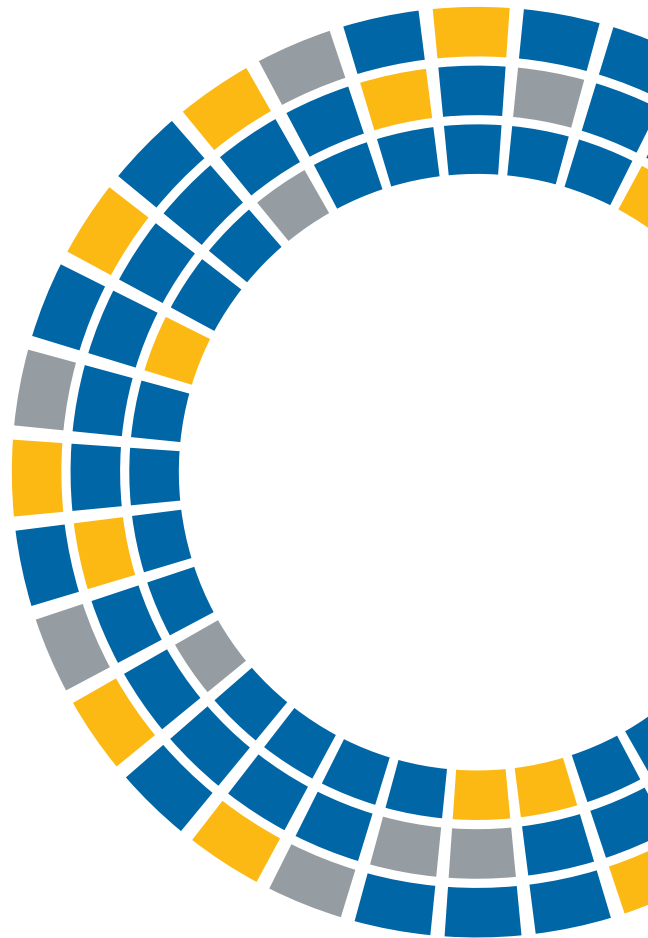
Rick Millette joined Northern Policy Institute through a residency with Laurentian University and the Canada School of Public Service. He brings many years of experience from the Federal Government and the Provincial Government of Ontario. Born and raised in the north, Rick is keen to work with Northern Policy Institute in the development of policies and initiatives that will contribute to the wellbeing of Northern Ontario's citizens. In particular, Rick has a strong focus on all facets pertaining to the development of the Ring of Fire.

Dr. Mike Commito



Dr. Mike Commito joined Northern Policy Institute as a policy analyst in June 2015. He has over seven years of experience in researching and writing about the history of natural resource management questions that affect northern Ontario, ranging from forestry to wildlife management.

Mike is a graduate of Laurentian University with a B.A. (2008) and a Masters (2010) in History. He recently completed his PhD in Canadian history from McMaster University.



This commentary was adapted from a presentation that Rick Millette, Senior Executive Director: Ring of Fire with Northern Policy Institute, gave on 24 February 2015 at the Ontario Good Roads/Rural Ontario Municipal Association Combined Conference. The presentation was titled, "Ring of Fire: Is it Still Ontario's Oil Sands?" Additional notes and comments have been included by Northern Policy Institute Policy Analyst, Mike Commito.



Unlocking the Ring of Fire's Economic Potential

The Ring of Fire is located approximately 540 kilometers northeast of Thunder Bay in the James Bay Lowlands. It is a 5,120 square kilometer mineral resource-rich area that is estimated to generate roughly \$25 billion in economic activity over the next three decades (Ontario Chamber of Commerce, 2015). Specifically, it is believed to contain at least 343 million tonnes of chromite, a black mineral that is used in the production of stainless steel.¹ Most of the world's chromite is mined in South Africa but large extraction also occurs in India, Kazakhstan, Russia, Turkey, and Finland. As a result, the Ring of Fire provides a unique opportunity for Ontario to break into the global chromite trade and tap into the increasing market for stainless steel. The area also includes significant deposits of nickel, copper, platinum, palladium, zinc, and potentially gold, which could spur even greater economic potential due to the presence of these more valuable metals. Given the variety of mineral deposit types present, the expansive size of known deposits, the fact that all deposits found to date are "blind" under string bog/muskeg, and the potential for economic development in the region, the question remains, can the Ring of Fire still become Ontario's next big project?

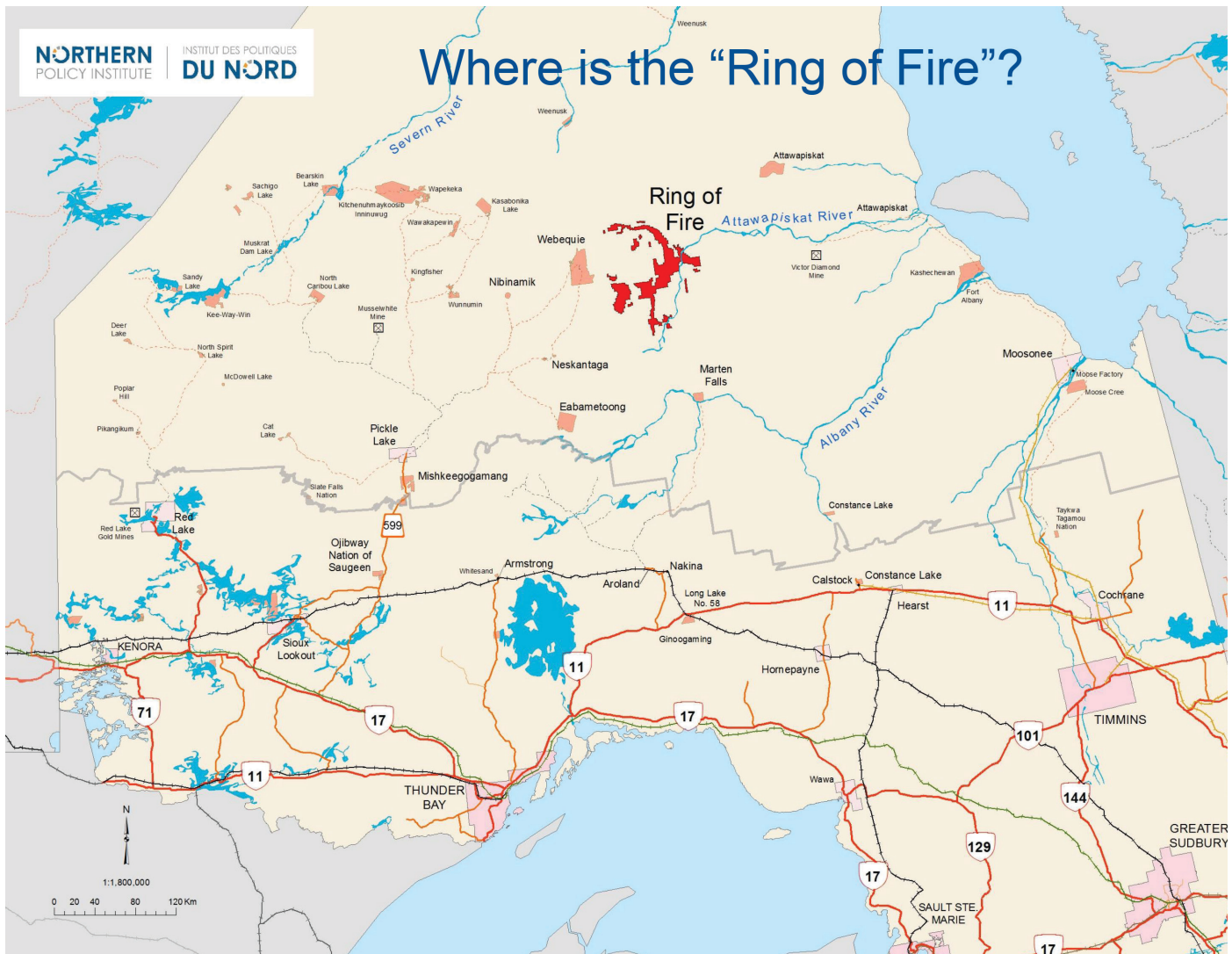
It certainly has the potential to be, and this will largely depend on the lifespan of the Ring of Fire. One interesting facet of the Ring of Fire development is that history has shown that large discoveries often lead to new discoveries. For example, even after initial discoveries of nickel and copper in Sudbury, Ontario, new deposits continue to be found more than one hundred years later. But there are no guarantees and exploration is extremely expensive. One exploration drill hole can cost up to \$1 million and there is still a great deal of exploration that needs to be done. There could be many more discoveries to be made in the Ring of Fire. Therefore, Ontario's Ring of Fire could be a significant project in Ontario, but the question remains, when will it start?

It has been eight years since the initial Ring of Fire copper-nickel and chromite discoveries. There has already been exploration work, (identifying six chromite deposits, the Eagles Nest nickel-copper deposit, and several copper-zinc deposits that are sub-economic in size to date, but require further exploration), Aboriginal community engagement, agreements negotiated, and proposals for infrastructure established. While it might seem slow to some, the reality is that these projects often take a long time to get up and running. Case examples suggest that the process to build a mine from initial exploration/discovery to production

can be a fifteen to twenty year journey. Consider for a moment the DeBeers Victor diamond mine, which is located about 150 kilometers to the east of the Ring of Fire. It currently boasts an annual production capacity of 600,000 carats but its mineral discovery dates back to 1987 (DeBeers, 2013). Access to the area is only possible by winter road or aircraft so DeBeers had to construct an ore processing mill, on-site accommodations, operational buildings, hydro lines, and an airstrip. In addition, the company also needed to undertake an environmental assessment, establish impact benefit agreements with First Nations communities (Victor is 90km west of Attawapiskat), create plans, and train and hire personnel. Of course, this was all before the actual building of the open pit mine/mill could begin and it was not until 2008 before DeBeers reached commercial production. Another example is the Musselwhite gold mine, located 728km north of Thunder Bay. The first traces of gold were found in 1962 and it took almost a quarter century for drilling results to warrant a mine. Musselwhite did not even begin producing gold until 1997, thirty five years after the initial discovery. With the Ring of Fire, it has not even been ten years since the drill results of Noront and other companies created the scenario for actual mining. Companies have only begun to scratch the surface on the work that needs to be done (Millette, Jul. 2014).

It's clear that mining projects in the far north take considerable time to develop but this might not necessarily be a bad thing. The pace might facilitate the larger goal of making sure that the process is correct. Ontario's Minister of Mines and Northern Development, Michael Gravelle, has previously stated that there is no "absolute deadline in place" and similarly, Eabametoong Chief Elizabeth Atlookan has said, "We're not in such a rush[. . .] yet we're willing to do this well." (Porter 2015) The key to securing the development of the Ring of Fire hinges on resolving land use issues with First Nations. The utmost priority is developing partnerships and implementing an infrastructure network that will not only facilitate the industrial development of the area but will improve the quality of life for the people living in these far North communities.

¹ Personal communication with Thunder Bay Community Economic Development Commission, August 27, 2015.



Is the Ring of Fire still Ontario's oil sands?

It has the potential to be. It will depend on the lifespan of the oil sands and the lifespan of the Ring of Fire. History has shown that large discoveries often lead to new discoveries. The Ring of Fire could be as big as the oil sands, but the question remains - when will it start?

Overcoming the Terrain

The next stage of development will likely be the construction of an access road or railway. Unlike diamonds and gold at Victor and Musselwhite, chromite and nickel cannot be transported out on small aircraft. As Rick Millette has previously written, “even after blasting, crushing and concentrating chromite and nickel, you’re left with a lot of heavy concentrate to get to a smelter. To do that, you need a substantial road, slurry pipeline or a railway [. . .] to move that kind of volume and weight” (Millette, Jul. 2014). KWG acutely recognized this reality and proposed to construct a slurry pipeline in late 2014 as one option to pump out the chromite from the Ring of Fire area.

Road and rail construction to the Ring of Fire area will be challenging because of the vast landscape in the far north, consisting of muskeg and waterways. These natural obstacles are not limited to transportation infrastructure either. Noront is planning to build its processing mill underground to minimize the environmental footprint on the surface ecosystem including the water table. This option, while necessary, is much more time-intensive than above-ground construction.

While the landscape presents some considerable, logistical hurdles, there are a number of different ideas that are currently up for discussion, such as the implementation of new public infrastructure, which will be of significant benefit to First Nations communities. To help facilitate this process, the Ontario government established the Ring of Fire Infrastructure Development Corporation in August 2014. Headquartered in Thunder Bay, it was implemented to “bring First Nations and the public and private sectors together to create partnerships and facilitate investment decisions in strategic transportation infrastructure” (Ontario Ministry of Northern Development and Mines, 2014). In March 2015, Webequie First Nation, the federal and Ontario government, along with Eabametoong, Neskantaga and Nibinamik First Nations agreed to implement a study to investigate on how best to open the area for development, including the prospect of establishing a year-round transportation corridor (Maclean’s 2015). After the study announcement was made, Canadian Minister of Natural Resources, Greg Rickford, called it an “opportunity to hook First Nations communities up, to be anchored by other towns and cities in the region and be physically connected” (Porter, 2015).

North-South Road and Rail

The first proposal calls for a north-south all-season road or railway line that would connect to Nakina. It makes for an ideal connection site because of its relative proximity to the Canadian National Railway (CN) line and there is also a naturally occurring sand ridge (a glacial feature also known as an “esker”) that runs much of the distance between Nakina and the Ring of Fire. Moreover, the TransCanada gas pipeline runs through the Nakina area, making this a potential processing site as well.

This proposed route for access was originally proposed and staked by Canada Chrome Corporation, a subsidiary of KWG Resources. KWG hired Krech Ojard and Associates in 2009 to complete a geotechnical study of the corridor, and engaged Tetra Tech to do a cost analysis comparative of a road and railway option (Krech Ojard and Associates, 2010). In February 2013, Tetra Tech concluded that the longevity of the ore body would make it much more economic over time to ship by rail and it would be more environmentally friendly than hundreds of diesel trucks travelling down a road every day. They concluded that the “rail option is more robust, low maintenance, cost-reflective and demand-responsive to operational and market conditions than the road option” (Tetra Tech, 2013). The only catch was that the estimated total up-front cost for the railway was \$508 million more than a road. Tetra Tech estimated that the total cost for a road would be \$1,051,748,608 compared to \$1,560,685,236 for the railway. But as Greg Gormick has previously noted for Northern Policy Institute, “On a capital basis, it would seem rail loses. But once that hurdle is cleared, rail becomes the clear winner with its ability to move one tonne of mine output for as little as \$6.33 compared to \$59.28 by truck” (Gormick, 2014).² Constructing a rail line certainly involves significantly more up-front cash, but in the long-term, it could be the most viable option from both an environmental and economic perspective. In fact, Tetra Tech estimated that the additional half billion dollars spent on a railway compared to a road would be recovered after six years due to lower shipping costs.

Cliffs Natural Resources also followed KWG's north-south orientation but planned to build an all-season road to transport chromite concentrate to the CN rail line where it would be shipped to Cliffs proposed smelter in Capreol (32km north of Sudbury). But there were snags in the Cliffs road proposal. KWG and Cliffs had acrimoniously shared what is known as the Big Daddy chromite deposit. In 2009, and prior to the engineering studies, KWG had staked the entire

Aerial view of esker (sand ridge). Photograph courtesy of KWG Resources

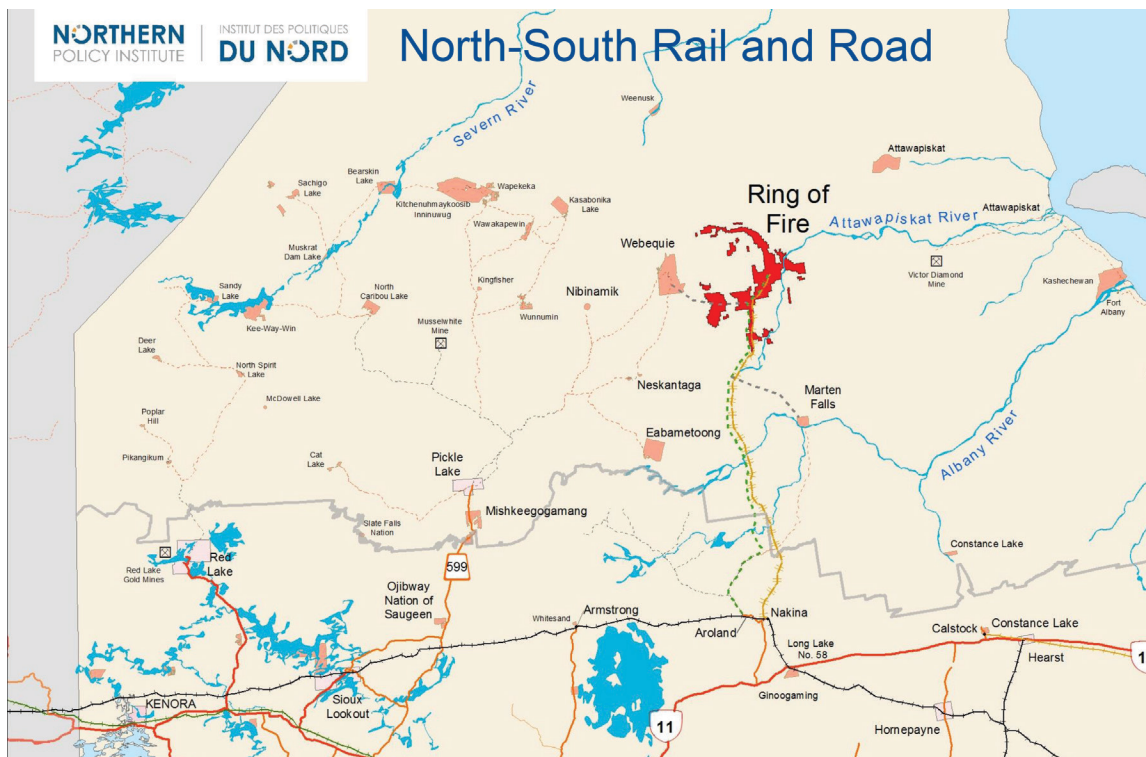
2 This is based on an estimate of five million tonnes per year.

north-south sand ridge that Cliffs would later propose as their preferred route to build the roadway. As a result, Cliffs filed an easement over the issue with the Ontario Mining and Lands Commissioner, which was denied (Northern Ontario Business, Jan. 2015). But the matter did not end there. Cliffs appealed to an Ontario Superior Court and won a judgement on the grounds that building the road would not interfere with KWG's activities (Northern Ontario Business, Jun. 2015). Cliffs has since bowed out of the Ring of Fire development, suspending its operations indefinitely in November 2013 over concerns about challenges in the region and the costs associated with the project (Younglai, 2013). Planner and architect, John van Nostrand, called Cliff's withdrawal a wake-up call. He cautioned that "this is what resource development is going to look like in the near future without comprehensive national and provincial strategies for infrastructure, environmental issues, and Aboriginal involvement" (van Nostrand, 2014).

Even with Cliffs out of the picture, the north-south route presents some significant challenges regardless if rail or road is implemented. Based on a cursory evaluation, Tetra Tech has stated that nearly 27km of the route is located in areas where peat is over of two metres thick. There are other sections of the proposed-route where the peat is believed to be even thicker (Tetra Tech, 2013). String bogs and the muskeg will be a significant hurdle to overcome and other natural obstacles such as major waterways, which flow west to east, including

the Albany River, will need to be crossed to build the route. Muskeg and water take no pity on heavy machinery and are extremely unforgiving. Not long ago, the CN had plans to construct a \$5 billion railway and terminal project in Newfoundland and Labrador to access iron ore mines being developed in the Labrador Trough. Logistical considerations and harsh market realities prompted the company to cancel a feasibility study into the proposal for the 800km line (Marotte, 2013). Two years later the proposed infrastructure for access still remains on the shelf.

While the Labrador Trough example highlights some more recent difficulties with northern rail construction, history shows that far north roads are not out of the question. Take for example the James Bay Road in Quebec. Originally built in the early 1970s for Hydro-Quebec's James Bay project, it spans 620km from Matagami up to Radisson and is fully paved. The road also aligns with spurs that link up with First Nations communities, including the Cree Nation of Chisasibi, located on the eastern shore of James Bay. The most northerly paved road in Ontario is Highway 599, which services Pickle Lake at its highest terminus. The end of the James Bay Road is Radisson, Quebec, which is over two degrees of latitude farther north than Pickle Lake.³ Therefore, while a north-south route will present a unique set of challenges, it is certainly not outside of the realm of possibility and the James Bay Road in Quebec is a prime example.



North-South Rail and Road Map. Source: Northern Policy Institute, created by Julien Bonin.

3 Pickle Lake's coordinates are 51.4667° N, 90.1833° W and Radisson is 53.7936° N, 77.6178° W.

East-West Roads

Since February 2015, Noront Resources has emerged as the key player in the Ring of Fire development. While Noront initially had claims to both nickel-copper and chromite deposits on the western edge of the ring, in March 2015, it purchased Cliffs' chromite deposits for \$27.5 million, a fraction of what Cliffs originally paid (\$550-million) to acquire and develop the area (Younglai and Marotte 2015; Northern Ontario Business, Jun. 2015). The acquisition gave them approximately 103 claims previously owned by Cliffs, making Noront the largest player in the Ring of Fire. The company now holds 257 claims that cover an area of approximately 57,840 hectares (Noront Resources Ltd., 2014). Noront has since proposed a 231-kilometre east-west corridor that would extend to Pickle Lake, thereby linking up with the existing provincial road system and provide access to the company's Eagles Nest nickel-copper deposit on the Ring of Fire. Noront's vision is to produce nickel-copper concentrate at a mill on site and then truck the concentrate to Sudbury for smelting. Transporting nickel-copper concentrate would translate into moving far less tonnage per day, compared to much larger chromite concentrate shipments out of the Ring of Fire in the future. Transportation options, on the back of chromite concentrate production, will have to be assessed at that time.

The mayor of Pickle Lake, Roy Hoffman, favours this route and believes it will provide the greatest

advantage to people west of Thunder Bay, particularly his constituents. Pickle Lake was once a thriving mining town but since gold mining operations shuttered in 1966 it has sustained itself by serving as a supply post at the base of the regional network where groceries, fuel and other materials are shipped and flown into remote Far North communities (Ross, 2014). Unlike the North-South rail and road proposals, Hoffman has said that an east-west road would be a natural path of least resistance because it is on Canadian Shield bedrock for a considerable distance, and it follows the flow of rivers and lakes, whereas the north-south corridor would have to cross many large waterways and string bogs. More recently, Federal Minister of Natural Resources, Greg Rickford, called the east-west corridor "as viable an option as any other" but also conceded there are other options (Porter, 2015).

Noront's price estimate is \$400 million for the road construction, which follows the current winter road routes and allows for spur connections to four of the fly-in First Nations communities in that area. Similarly, KWG has also proposed an east-west oriented route but one that takes a more southerly route. It is estimated to cost considerably less, with a price tag of \$120 million, and includes the construction of a bridge across the Attawapiskat River.



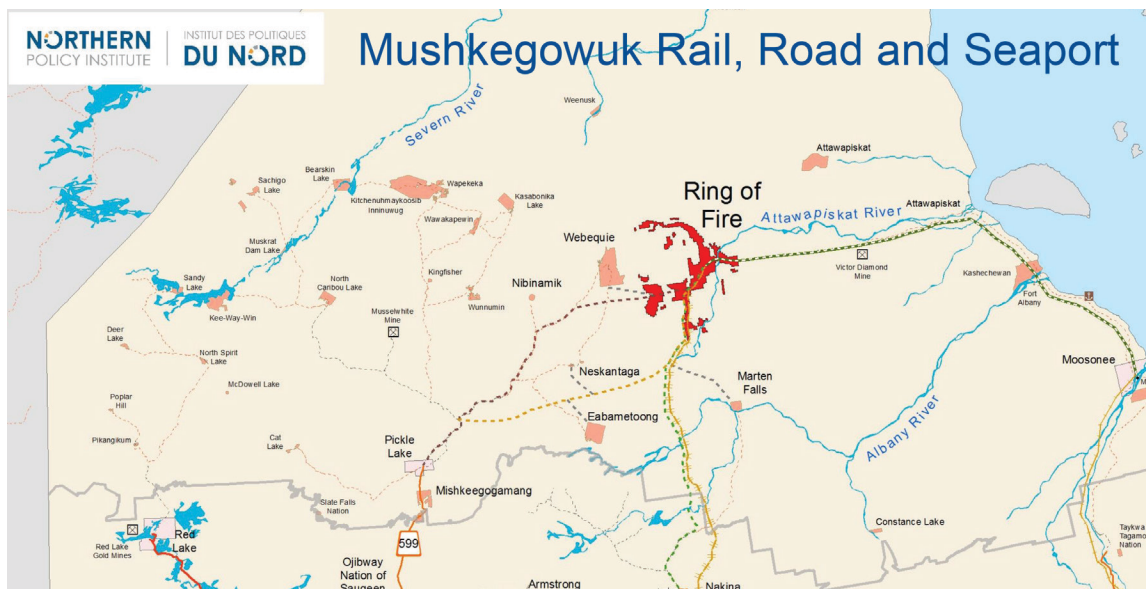
East-West Roads Map. Source: Northern Policy Institute, created by Julien Bonin.

Mushkegowuk Rail, Road and Seaport

In August 2014, the Mushkegowuk Council⁴ announced that it was leading an Aboriginal led alliance to develop a business case in support of a Ring of Fire rail, sea port, fibre optic, and energy transportation corridor. According to the Council "if a rail option were to be developed from the eastern corridor of the Ring of Fire to a seasonal sea port, this could bring investment certainty and positive economic benefits to many resource related projects in northern Ontario" (Mushkegowuk Council, 2014). James Bay has been earmarked in the past as a possible location for a seasonal sea port and Vern Cheechoo, Director of Lands and Resources for Mushkegowuk Council, believes that establishing a sea port could facilitate the worldwide shipment of products from the Ring of Fire area (Grech, 2014). Part of the proposal involves a partnership with TGR Rail Canada to extend the Ontario Northland Railway from Moosonee up the James Bay coast and then westward to the Ring of Fire. Grand Chief Lawrence Martin told the Timmins Daily Press that the implementation of a rail link and high-voltage energy transmission line would be a boon for economic development initiatives in First Nations such as Moosonee, Kashechewan, Fort Albany, Attawapiskat, and Peawanuck (Gillis, 2015). Some of the First Nations in the Mushkegowuk Council have already had considerable success with the development of infrastructure projects in the area,

such as the Omushkego Ishkotayo transmission project on western James Bay. This 270km line, built by Five Nations Energy Inc. (FNEI)⁵ services the communities of Attawapiskat, Fort Albany, and Kashechewan and supplies power to a line that hooks up with DeBeers' Victor mine. Currently, FNEI is the only First Nations-owned electricity transmission company in Canada (Five Nations Energy, 2012).

An east-west road looks to be the most likely. If built, it would have several positive economic impacts for both the mining industry and First Nations communities. Aside from making it more economical to bring materials in and ore out, it would also be less costly to install electricity and broadband internet. But more importantly, it would create the potential to attract a return of exploration companies and send a positive message to the mining industry that the Ring of Fire is open for business. Writing for Mining Markets in August 2014, Stephen Stewart echoed these arguments when he remarked that "Canada must invest in infrastructure: If you build it they will come. Creating infrastructure for the 21st century will provide the tools for Canada's mining industry to thrive, and the investment will pay incalculable dividends" (Stewart, 2014). This aptly applies to the Ring of Fire, and once its broader potential has been recognized, only then will the true value of the development be realized.



Mushkegowuk Rail, Road and Seaport. Source: Northern Policy Institute, created by Julien Bonin.

4 Mushkegowuk Council is the senior representative for seven First Nations in the Western James Bay and Hudson's Bay. These include Attawapiskat First Nation, Taykwa Tagamou First Nation, Kashechewan First Nation, Fort Albany First Nation, Moose Cree First Nation, Chapleau Cree First Nation, and Missanabie Cree First Nation.

5 FNEI is owned equally by Attawapiskat Power Corporation, Fort Albany Power Corporation, and Kashechewan Power Corporation.

It's Not Only About Industry

The Ring of Fire would create a significant economic impact for industry in the region, but there is also a tremendously positive impact that can be made for the social well-being of First Nations communities through the development of an infrastructure corridor. Many communities in the far north are dependent on flying goods and people to their communities at an astronomical cost. For example, Webequie First Nation is the closest community to the Ring of Fire but is still 260 km away from Pickle Lake. In early March 2015, Rick Millette estimated the following prices for basic goods at the local store in Webequie: "\$4.50 for a quart of milk, \$42.00 for 10 kilograms of sugar, \$49.00 for 10 kilograms of flour or \$6.00 for a loaf of bread."

Infrastructure development in the Ring of Fire should not be limited solely to increasing industrial capacity, it should be implemented as part of a larger socioeconomic project to benefit far northern First Nations communities.

Even if goods were purchased and sent to Webequie by air, it would cost around \$1.32 per pound (including fuel surcharge and HST). So, while that 10-pound bag of potatoes for \$4.00 at a Pickle Lake grocery store might seem like a good deal at first glance, it would cost another \$13.20 to get it shipped up to Webequie (Millette, 2015). Other communities, like Neskantaga, have been on a boil water advisory for twenty years,

the longest ongoing advisory in Canada, and there are correlations between the improvements of food quality, housing, clean drinking water, health care and education in communities with year-round access compared to those that rely on fly-in services.

Infrastructure development in the Ring of Fire should not be limited solely to increasing industrial capacity, it should be implemented as part of a larger socioeconomic project to benefit far northern First Nations communities. Stan Studol has adroitly advocated for what he has termed the "Mining Marshall Plan." The term harkens back to the post-Second World War period when United States Secretary of State, George C. Marshall, advocated for a comprehensive strategy to rebuild Western Europe in order to stave off Communist expansion and jump start their war-ravaged economies. For Studol, when applied to Northern Ontario, the Mining Marshall Plan "would provide the necessary transportation and social infrastructure as well as address potable water and other housing, health and education issues, allowing Ontario to finally meet our treaty obligations" (Studol, Jul. 10 2015). The federal government has also been preaching this same message. Aime Dimatteo, director general for FedNor, stated that in order for the federal government to invest in the Ring of Fire development, it needs to see the potential for community development. According to The Chronicle-Journal, during his presentation at the Northwestern Ontario Municipal Association in April 2015, Dimatteo said "if it is just about putting a road from a highway into a mining site that's not going to have any community benefit, the federal government's programs won't come to bear" (The Chronicle-Journal, Apr. 2015).

All parties involved recognize that the Ring of Fire is about more than simply economic development and that the project also has the potential for community capacity building. Why not use the momentum and the expertise of the construction crews and the trained local workers who will be ready to operate everything from heavy equipment to survey tools? Let's have a construction plan and a timetable to eventually connect all the North's fly-in communities with permanent roads (and electrical transmission). The momentum of building year-round roads should continue to all fly-in communities in Ontario to improve the quality of life for the First Nations communities in the far North.

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Who We Are

Internally, Northern Policy Institute seeks to be as “lean” as possible with much of the work contracted out to experts in the fields under consideration. This approach avoids the risks associated with large bureaucratic organizations. It also allows Northern Policy Institute to flexibly respond across a wide range of issues while also building up in house and regional expertise by matching bright young minds on temporary placements and project specific work with talented experts who can supply guidance and coaching.

Some of the key players in this model, and their roles, are as follows:

Board: The Board of Directors sets strategic direction for Northern Policy Institute. Directors serve on operational committees dealing with finance, fundraising and governance, and collectively the Board holds the CEO accountable for achieving our Strategic Plan goals. The Board's principal responsibility is to protect and promote the interests, reputation, and stature of Northern Policy Institute.

President & CEO: Recommends strategic direction, develops plans and processes, and secures and allocates resources to achieve it.

Advisory Council: A group of committed individuals interested in supporting, but not directing, the work of Northern Policy Institute. Leaders in their fields, they provide advice on potential researchers or points of contact in the wider community.

Research Advisory Board: A group of academic researchers who provide guidance and input on potential research directions, potential authors, and draft studies and commentaries. They are Northern Policy Institute's formal link to the academic community.

Peer Reviewers: Ensure specific papers are factual, relevant and publishable.

Authors and Research Fellows: Provide independent expertise on specific policy areas as and when needed.

Standing engagement tools (general public, government stakeholders, community stakeholders): Ensure Northern Policy Institute remains responsive to the community and reflects THEIR priorities and concerns in project selection.

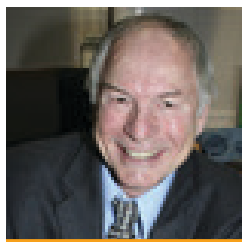
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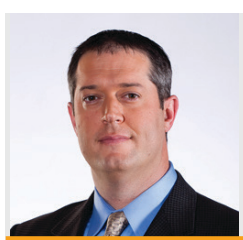
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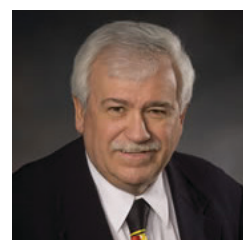
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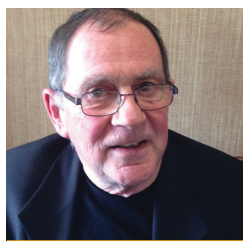
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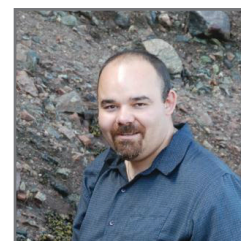
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