

Ishavsbanen

Finnish/Russian railway gauge between the Atlantic and Pacific Oceans



Visions and thoughts

Transportutvikling AS

Mach 2010



Introduction

Building railways require political will, and according to a South African Railway manager, -this will is limited by country borders.

“Building railways are based on political will, and the political will stops at the border.”

South African Railway CEO

This may be right or wrong, but looking to the north and the Barents region, very few border crossing railway connections exists.

This document is not a commercial or professional evaluation of a new railway connection. Its ambitions are to generate interest and introduce a few visions concerning a possible railway connection between Skibotn in Troms County, Norway and Finland. This 300 km railway section is named “Ishavsbanen” (The Polar Sea Railway).

Different railway gauges creates complications when performing border crossing railway transports. Norway (and Sweden) do not have the same gauge as Finland and Russia. An extension of the Finnish railway gauge into Norway introduces entirely new opportunities, which the operation of East-West railway transports will enhance.

Building new railway infrastructure has a cost side, but such a connection creates several opportunities connected to commercial transport and business development.

Should Norway and Finland/EU be willing to split rail investments incurred by finalizing this project, such a novelty innovation will be a major contribution to materializing both the Norwegian High North Strategy and the international visions expressed through the “Northern Dimension”.

“ Building a railway connection between Skibotn and Kolari has the same investment budget as 14 days of Olympic Games in Tromsø.”

**Mayor of Storfjord Municipality
Hanne Braathen
(NRK 13 2 2009)**



If this document can be contribution to create interest, discussion and that new opportunities occur, it may open for an enhanced development process and a future realization of “Ishavsbanen”.

Ishavsbanen on the agenda: The Finnish Minister for Foreign Trade and Development, Paavo Väyrynen and the Mayor of Storfjord Municipality, Hanne Braathen met in Tromsø on April 10. 2008.

Northern Railways

The railway structures on the North Calotte and in the Barents Region are quite easy to describe, as there are only a few of them.

Railway connections towards East are generally less developed, and particularly in Northern Norway. In the northernmost counties in Norway (Troms and Finnmark), the railways are nonexistent.

Border crossing transports are limited by lack of infrastructure, different gauges, signaling systems, power supply etc. The track gauges in Norway and Sweden are identical (1435 m.m.) while the Finnish gauge differs (1524 m.m.). The Russian gauge is almost the same as the Finnish and the gauge cause no major interoperability challenges.

In Northern Norway (Nordland County), an East-West connection exists from Narvik. The railway from Narvik can only operate on the Norwegian and Swedish tracks, not in Finland and further East, without additional costs connected to gauge variations.

A "Finnish Gauge Railway" from Norway will open a permanent Eastbound connection, with the gauge difference as a cost driver. In principle, the railway from Narvik and the railway from Skibotn cover two different markets, both originating in the same geographical region.

Gauge variations are costly

The international railways have different gauges. Gauge variations have negative impact on border crossing and interoperability.

Gauge variations cause:

- Loss of time
- Physical payments
- Increased damage risk

This challenge can only be solved by:

- Reloading from one train to another
- Changing wagon axles
- Infrastructure and wagon investments making it possible to use the same wagons on different gauges
- Building new railways

The national railways do also have interoperability challenges connected to signaling, power supply etc.

These variations cause additional costs.



"Haparanda-Tornio is the only place where the Finnish and Swedish railway systems meet and because of the different systems the border is a significant obstacle and a technical transport bottleneck."

Joint Finnish-Swedish infrastructure

Report to the Governments
By Banverket, Ratahallintokeskus,
Merenkululaitos, Sjöfartsverket, Tiehallinto
and Vägverket
(May 1-2009)

The gauge difference between Sweden and Finland is permanent unless Finland converts into Swedish gauge or Sweden converts into Finnish gauge. This will probably not happen.

By building a new railway to Skibotn, the gauge difference and the connected costs will be eliminated. A Finnish railway to Skibotn will also reduce the negative impact caused by other national infrastructure systems, like signaling and power supply.

“ Particularly as regards freight, an option is to extend the track until the nearest multimodal logistic centre in the neighbouring country. Such practice is already operational between e.g. Poland and Ukraine.”

NETWORKS FOR PEACE AND DEVELOPMENT
Extension of the major trans-European transport axes to the neighbouring countries and regions

Report from the High Level Group chaired by Loyola de Palacio (November 2005)

EU “recommends” track extension

The report “*Networks for peace and development*” (EU’s High Level Group) analyzed the transport connections between EU and neighboring countries. One of the main challenges was related to different national railway gauges.

The Group concluded that there were “three ways to address the problem of different gauges and other technical standards at borders……”: **1:** Reloading, **2:** Gauge changing devices **3:** extending the tracks from one country to another.

Such an extension (3) is believed to be more commercial viable if the tracks are built to a region close by, minimizing the distance of new track investments.

Development of the Kolari-Kemi railway

The railway between Kolari and Kemi (both in Finland) is currently being “modernized” for the purpose of transporting a share of the iron-ore resources in the Pajala (Sweden)/Kolari (Finland) area. Even after the investments made, the railway can still be considered as a side-track in Northern Finland with no access to the nearby Atlantic Ocean. An extension of this railway, towards Skibotn, will substantially improve the railway’s market- and development potential, as it opens for transport in both directions and a connection to the Atlantic Ocean.

Without a new railway connection to Skibotn, Finland’s overland railway connections will depend on two different gauges to Narvik or the presently more complicated route to Russia and Murmansk.

Technical evaluation by SWECO

The well reputed engineering company SWECO completed (Summer 2009) a technical evaluation where, among other issues, various route options in Norway and Finland were looked into. The evaluation concluded that it is technically possible to build this infrastructure.

“This study has shown that it is possible to build a railway between Kolari and Skibotn. The distance is 266 km in Finland and 46 km on the Norwegian side.”

“Ishavsbanen” - SWECO report
(10.6.2009)

Skibotn in the Municipality of Storfjord

The transport junction Skibotn is located in the Municipality of Storfjord and the Lyngen Fjord in Troms County. Troms County is a part of the Barents Region, bordering both Sweden and Finland. Skibotn is located 40 km from the Finnish border and along one of the Barents region’s highly utilized East-West road connection (E8 to Finland). E8 is connected to E4 (connected to South Sweden) in Tornio (Finnish/Swedish border). North-South in Norway, Skibotn is connected to E6, which is the major road system in Norway. The Lyngen Fjord is sheltered, deep, and Skibotn is closely connected to the open sea (Atlantic Ocean).



Skibotn is a small community, but located in the region of Northern Norway with the highest population density and close to Northern Norway's largest city, Tromsø. By considering the regional influence area for the railway as northern part of Nordland county, Troms County and Western Finnmark, -more than 55% of the population in Northern Norway is found in “the region”. Ca. 37% of Northern Norway's population lives south in Nordland and only 6-7% in Eastern Finnmark.

“All in all, winter navigation is a specific Baltic challenge”

Joint Finnish-Swedish infrastructure

Report to the Governments
By Banverket, Ratahallintokeskus,
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and Vägverket
(May 1-2009)

Ice is a challenge for many ports in the Barents Region, particularly in the Gulf of Bothnia. Several ports are kept open by the use of ice-breakers. Keeping such ports open during the winter season is costly and the expenses have to be paid by someone. Fairway dues and port fees are often increased during winter, causing more expensive transports.

The Norwegian Coast is ice-free as a Gulf Stream consequence. So is Skibotn and the Lyngen Fjord.

Iron-ore from Northern Finland can be transported to an Atlantic Port

The company Northland Resources Inc has ongoing extractions of iron-ore in Pajala (North Sweden) and the Kolari Region (North Finland). The iron-ore fields contain substantial deposits and iron-ore concentrate from the Swedish fields in Kaunisvaara will through the initial phase be shipped through the port of Kemi, Finland.

“Ishavsbanen is a very interesting opportunity, however seen on a longer time perspective.”

Anders Hvide,
Chairman Northland Resources
(Helsinki, 21.1.2010)

Upgrading of the railway and the port of Kemi has commenced and it is believed that full production implies approximately 5 million tons per year. The production will be running from 2012 and full production in Kaunisvaara may start in 2014. The 3 mines have indicated resources of 250 mill. tons.

This figure includes both measured and indicated reserves. It is projected that the present deposits defend 24 years of production. Additional reserves may arise from under surface mining.



Improved transport solutions may increase volumes

It may be possible to extract larger volumes if the transport solutions improves. New solutions may open fields with marginal profitability.

The Finnish mines have a longer development perspective compared with the Swedish mines. By summer a PEA (*Preliminary Economic Assessment*) will be completed and the progress depends on the PEA. The profitability is also influenced by some gold and copper reserves.

This will require access to larger ships than the usual vessel size in the Gulf of Bothnia, and open for reduced transport cost to e.g. Asian markets.

The deposits on the Finnish side are estimated to, at least, 160-200 mill. tons. The port of Kemi (Gulf of Bothnia) is not able to handle the largest dry-bulk carriers. A commercial viable transport to e.g. Asia depends on larger ships and access to deep water ports. The closest alternative where a railway connection can be build is Skibotn in Troms County.

Transport options – more than minerals

A railway between Skibotn and Finland has to be more than an iron-ore line, because the preliminary projected volumes probably are too small to defend the entire investment. But, this railway connection will be an opportunity for other transports and trade balance, particularly when the railway is connected to an effective port in Skibotn.

The railway will, at least:

- be an opportunity for transit between East and West due to a broad gauge connection to the Atlantic Ocean
- open a new export route for the Finnish Industry, which has substantial western markets. In principle, Skibotn will be a "Finnish port in Norway".
- Open a new export route for Norwegian fish, both wild catch and farmed. For instance for Lerøy Aurora,
- Open for land transport of Norwegian oil and gas in connection with industrial development in Finland etc

"Ishavsbanen will improve our access to Eastern markets.

Operational manager, Lerøy Aurora, Skjervøy
Jan Børre Johansen
(3.3.2010)

It is necessary to conduct an evaluation of the opportunities and a market study is planned to be completed by primo 2011.

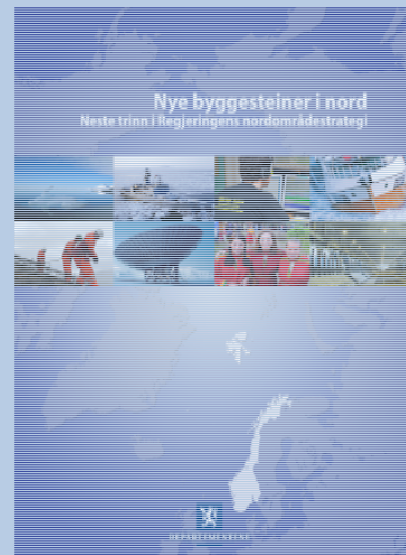
"New building Blocks in the North" (Nye Byggesteiner i Nord)

The Norwegian Government has concluded that the "High North" is Norway's most important strategic priority area. The overall ambitions are to improve knowledge, activity and presence in the area and lay the foundations for sustainable economic and social development in the years to come.

The Government (Nye byggesteiner i Nord, next step of the Governments High North Strategy, March 2009) *concludes* that the Government will *"establish transport infrastructure between Norway and neighbouring countries to link different parts of the Barents region more closely together. Facilitating transport east-west will help to increase trade and cooperation with our neighbouring countries. This effort is primarily motivated by international and national concerns, but the results will also be important for regional development in the north."*

"Ishavsbanen may, for decades to come, be the most important project in Troms."

NHO (Confederation of Norwegian Enterprise) CEO in Troms, Arne



Even though "Ishavsbanen" is a long term project, it may be a viable tool to materialize segments of the High North Strategy.



"The Northern Dimension" synergy among countries

"The Northern Dimension is cooperation between the EU, Russia, Norway and Iceland, which are all equal partners in the Northern Dimension policy. The United States of America and Canada are observer countries.

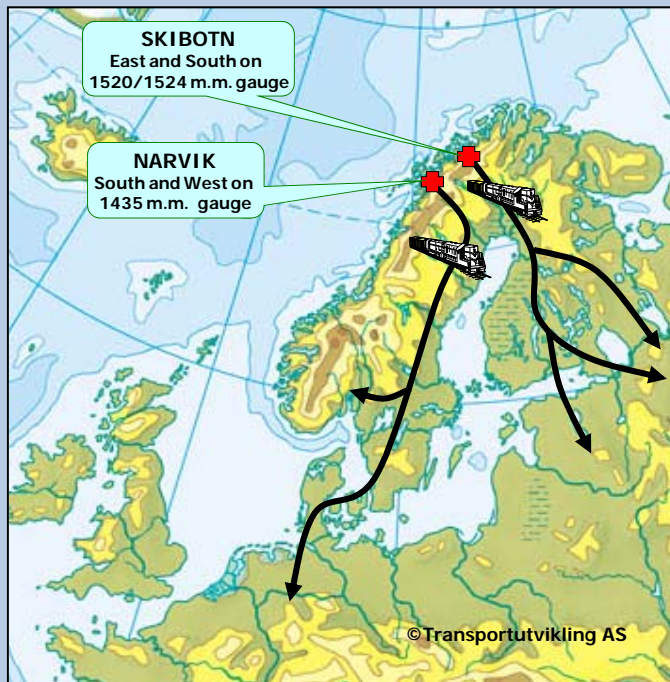
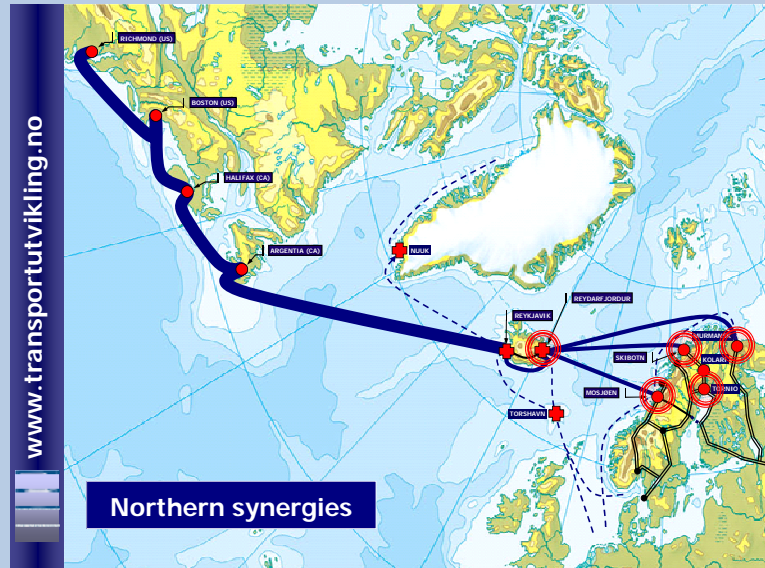
The objective is to support sustainable development, welfare and stability in northern Europe"

(Kilde: Ministry of Foreign Affairs, Finland, January 2010)

Limited regional transport volumes in the North do usually not defend high frequencies and new routes. It is therefore required to look at synergies, market expansion and cooperation. This perspective is regional, national as well as international.

The Northern Dimension focuses on international cooperation, among countries like Russia, EU, Norway/Iceland and the western markets (USA and Canada).

“Ishavsbanen”, linked to ocean transports in Skibotn, Norway, may be a viable tool when building synergy between for instance Alcoas industrial transport routes to/from Mosjøen and further development of the sea routes from Murmansk. Both projects are aiming for transshipments on Iceland, which may support new routes between Iceland and USA. Such a development will improve the northern industry's transport opportunities.



Potential regional synergy

Regionally, it is also possible to identify synergies between a broad gauge railway connection from Skibotn and a standard gauge solution from Narvik.

Such a railway infrastructure, where huge markets can be reached from the same region, by using two different gauges, is unique, also on a global level.

It may be possible to introduce completely new transport concepts to be promoted internationally, common maritime operation and port cooperation.

“ Proposal for new rail solutions in northern Norway must be seen in the context of today's infrastructure and plans for future infrastructure investments, also in northern parts of Sweden and Finland. It will, among other things, be important to analyze if the traffic potential implies further assessment of some of the railway projects..”

National Transport Plan 2010-2019
(St.meld. nr. 16 (2008-2009))

The railway's market potential

The railway connections' commercial market will be closer looked into during 2010/2011.

This is a vital activity which aims to create a better fundament for further work.

We do appreciate further contacts with market players, or others, which may have ideas and suggestions. Please contact Storfjord Municipality (see contact information, last page).

Political conditions and environment

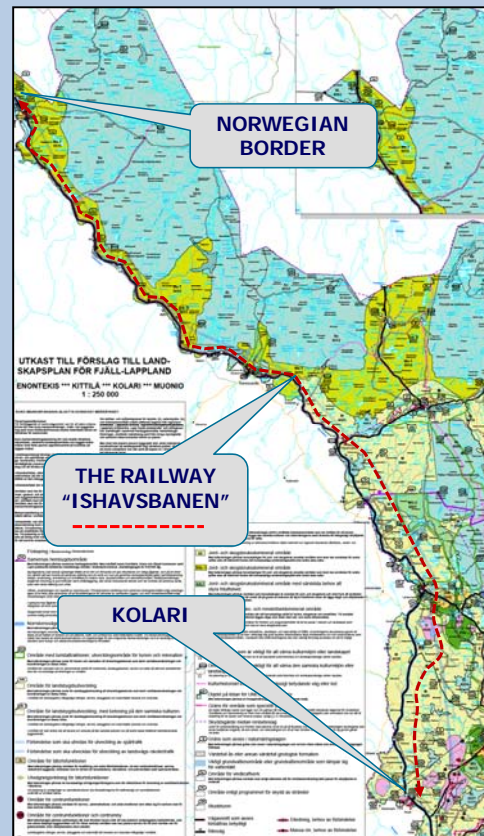
Railway ranks high on the political agenda, nationally and internationally. This importance is influenced by the railway’s positive impact on the environment; particularly electrified railways where emissions are low.

The E8 road between Norway and Finland is utilized by a huge share of heavy vehicles. A share of this transports can be replaced by rail, and consequently contribute to more environmental friendly transports..

Finnish interest shown in Regional Plans

The draft proposal for a County Area Plan for Fjell-Lappland (Rovaniemi 2009), shows “Ishavsbanen” as a railway connection to be further studied (Hannukainen-Kilpisjärvi-Norwegian Border).

The figure (right) shows a fraction of the map used in the County Plan. The red dotted line indicates the Finnish section of “Ishavsbanen”.



“ The Finnish Minister of Foreign Trade and Development, Paavo Väyrynen, during his visit to Kirkenes and Tromsø in 2008 confirmed that Finland is considering the possibility to build a railway line from Kolari in Northern Finland to the Norwegian town of Skibotn.

Barents Observer
(28.1.2010)



“ It is interesting to note that Väyrynen will revitalize the old plans for a railway line from Kolari to Skibotn, which I also expressed. It remains to find out how Finland really considering such plans. Should they draw the conclusion that there are reasons to proceed with this project, I can assure you that we on the Norwegian side will face such a development, with positive interest. ”

Minister of Foreign Affairs Jonas Gahr Støre
(Nordlys 17.4.2008)

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