



OSLO ↔ GBG

AND EUROPE

The final link in northern Europe's megaregion

Double-tracks are imperative on the stretch between Oslo and Gothenburg

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STRING is a cross-border political member organization of:

- 4 countries: Norway, Sweden, Denmark and Germany
- 8 regions: Viken, Västra Götaland, Halland, Skåne, The Capital Region of Denmark, Region Zealand, The region of Southern Denmark and Schleswig Holstein
- 5 cities: Oslo, Gothenburg, Malmö, Copenhagen and Hamburg
- 14 million inhabitants

A step towards a megaregion within the STRING-corridor Oslo–Hamburg

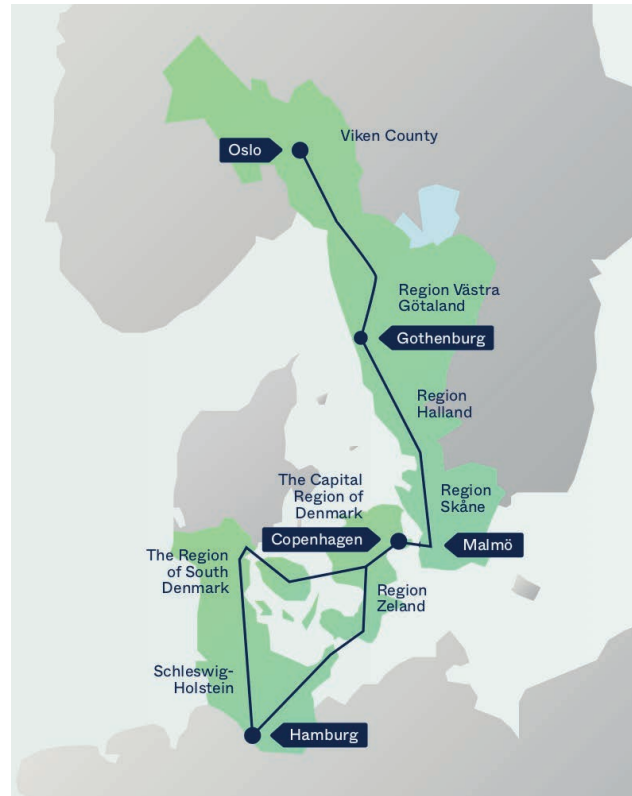
Today the 350 km stretch in between the capital of Norway and Gothenburg has an insufficient railway. An area with a huge potential connecting Europe via the Oresund Bridge and the Fermanbelt tunnel. The following report shows an increased need for double track along the entire stretch:

- The travel time for freights reaches now up to 7 hours. Compared to half the time by road.
- Only 3% of the total freight transport goes by train.
- A reduction of travel time for freight will increase the transport in rail by 40%.
- A double track will reduce the CO₂ emissions from transport.
- The stretch is identified as an important railway on the Core network and can be financed by EU with 50%.

It's time to get serious about the Oslo–Göteborg double-track visionary STRING corridor between Oslo and Hamburg. Across the world, urbanization continues to shape megaregions where collaboration across disciplines contribute to prosperity and welfare.

The STRING corridor from Hamburg to Oslo is a critical venue to connect this megaregion to Europe. The STRING-corridor is the unofficial name that eight regions from four countries have chosen to give the stretch binding up Oslo, Gothenburg, Malmö, Copenhagen and Hamburg, with their hinterlands.

The STRING-corridor is from the position of EU and OECD, expected to be part of the Scandinavian–Mediterranean corridor of the Trans-European Transport Network. While connectivity within this part of Scandinavia has improved in terms of road infrastructure, rail infrastructure remains underdeveloped. To succeed the creating of a Megaregion sustainably infrastructure development is crucial.



Moving transport from air and road to rail is a key tool to comply with the Paris Climate agreement. Norway has, as part of the Paris Climate agreement, committed to decrease emissions by 55% by 2030 compared to 1990 level¹. Both Sweden and Norway have committed to working towards climate neutrality as per the Declaration on Nordic Carbon Neutrality (2019). Further, the European Green Deal calls for a 90% reduction in greenhouse gas emissions from transport, and asks that a substantial part of the 75% of inland freight on roads shift to rail and inland waterways.

To develop the STRING-corridor into a competitive and attractive megaregion, it is time to prioritize a double-track train line between Oslo and Gothenburg to open up the bottle-neck to sustainable, emission free integration with Europe.

¹ TÖI-report 2021, pp.4



Double-track Oslo–Gothenburg, why now?

Double train-track between Oslo and Gothenburg is a project of such high European interest that the EU offers to finance up to 50% of the 100 km track in Sweden. The double-track, which will reduce the train travel time between Oslo and Gothenburg from almost 7 hours to 4 hours for goods, is one of five prioritized crossborder rail infrastructure projects in the Scan-Med Corridor aimed to connect Europe in a sustainable and efficient manner.

With the aim of decreasing the total travel time Oslo–Hamburg to 9 hours, which is 4 hours and 40 minutes faster than today, STRING advocates to prioritize this infrastructure project. The double-track will help realize The European Green Deal's call for shifting freight from roads to rail. It will also create economic and environmental benefits on a national, regional and local level in the STRING corridor megaregion.

Fehmarn opens Scandinavia to an increasingly streamlined European rail network

Today, the value of the Oslo–Gothenburg double-track project must be seen in connection with two major developments of the European rail network. The whole rail network is becoming more efficient, and a new connection is opening up when the Fehmarn Belt Fixed Link removes the rail transport bottleneck between Scandinavia and the European continent. With its sub-sea tunnel, Fehmarn is expected to be ready in 2029. It will shorten travel time between Copenhagen and Hamburg from 4,5 to 2,5 hours by rail.

The Fehmarn link is a strategic component in a resilient transport corridor between Northern and Central Europe, the so-called Scandinavian Mediterranean (Scan-Med) corridor, described in

the Trans European Transport Network (TEN-T) regulation. The TEN-T regulation is central to the functioning of the European transport system and policies. It addresses the implementation and development of a Europe-wide network of railway lines, roads, inland waterways, maritime shipping routes, ports, airports and railroad terminals.

The second major development is The European Commission's conclusion rail freight needs serious boosting. This means increased capacity, strengthened cross-border coordination and cooperation between rail infrastructure managers. It implies better overall management of the rail network, and the deployment of new technologies such as digital coupling and automation. The Commission will therefore propose the revision of regulations governing Rail Freight Corridors and the TEN-T core network corridors at the end of 2021.

According to the TØI report a reinforced railway will change travel patterns. Train traffic will increase, and rail will play a larger role in the transportation system for both people and goods. This will grow the demand for efficient rail infrastructure within Scandinavia, such as the Copenhagen–Gothenburg–Oslo connection.

Finally, the Fehmarn link combined with double-track Oslo–Gothenburg will enhance the territorial cohesion of Northern Europe by fully connecting regions and urban nodes on the corridor through quicker long-distance, regional and local means of transportation. And not the least, on the Norwegian side between the border and Oslo, double-tracks will improve inter-city connection and efficient commuter rail.



The train line between Oslo and Gothenburg is a bottleneck for the region and the European rail network

Currently the travel time by rail on the 350 km long Oslo–Gothenburg line is almost 7 hours². To take advantage of opportunities unleashed by Fehmarn, and to be a compatible and integrated part of the European rail network, the speed and capacity of the Oslo–Gothenburg rail line must improve. According to the modeling in the TÖI report the implementation of double-tracks on the stretch between Oslo and Gothenburg, will reduce the travelling from almost 7 hours to 4 hours for goods during the night and 5 hours during daytime³. Today driving takes only 3,5 hours, making roads today's transport winner. The sub-optimal train-stretch, where 60% is single track, is a serious hurdle to fulfilling the vision of a sustainably and efficiently connected Europe.

Double-tracks between Oslo and Gothenburg, will reduce transport time for goods from almost 7 to 4 hours during night and to 5 hours during daytime.

The Gothenburg–Oslo route is a part of TEN-T's core network until the year 2030⁴. According to a TEN-T regulation, all routes included in its core network should be able to facilitate trains 740 meter long by 2030. Other requirements include speeds of 100 km/h, being able to transport 22,5 tons, together with some more overarching requirements like ERTMS and the electrification of the railway system⁵.

Today 60% of the Oslo–Gothenburg stretch is single-tracked, causing delays and capacity limitations. Only 130 out of the 350 kilometers of the railway have double-tracks⁶. The train speed on the route is approximately 50–60 km/h slower than the 100 km/h that the TEN-T regulation asks for⁷. Not surprisingly, 97% of all freights on the Gothenburg–Oslo route go by road⁸. Even if some road HDV traffic is shifting to emission free vehicles, dense road traffic still causes CO₂ emissions, crowding, noise, particle pollution and accidents. This will all be reduced by shifting to rail.

The missing double-track on the Swedish side is 100 km – between Öxnered and Kornsjö. The cost of constructing a track alongside the existing line is roughly estimated to be SEK 20 billion, of which 10 billion may be funded by the EU through CEF.

This estimation is based on an assumption that a general cost of 2 billion per 10 km railway. The Swedish transport administration needs to start investigate a more accurate calculation of the costs in time for the next revision of the Swedish national transportplan in order to be able to apply for founding from CEF.

On the Norwegian side, today double-tracks are still lacking from Oslo down to Kornsjö. However, double-track Oslo–Ski is projected for 2022/2023 and through Moss by 2027. There is an ambition to build approximately 60 km of double-tracks between Moss and Halden, but more concrete plans and timing need to be reentered in the national transport plan. For the remaining stretch from Halden to Kornsjø (about 30 km) there are currently no plans.

2 TÖI-report, pp.11

3 TÖI-report, pp. i (Summary)

4 CEF-report, pp.6

5 CEF-report, pp.14

6 TÖI-report, pp.1

7 CEF-report, pp.4

8 CEF-report, pp.4

Cost and financing of the Oslo–Gothenburg double-track

A double-track railway between Oslo and Gothenburg is a joint Swedish–Norwegian project. Financing depends on support by both parliaments and is subject to differences in national policies, budgets and political climate.

Trafikverket’s study “Fördjupad bristanalys 2021” recommends double-track as the more cost effective way to increase train capacity. Laying new tracks next to an existing one significantly reduces time, cost and the scope of projecting. It also avoids the need for negotiation with property owners and new intervention in vulnerable landscapes.

The cost of establishing 100 kilometers on the Swedish side is roughly estimated to ca. 20 billion SEK. Sweden can apply for 50% financing through CEF (Connecting Europe Facility). CEF can help co-finance up to 50% of cross border links.

The double-track project lies within CEF’s priorities and objectives and is in line with the guidelines set up by TEN-T. CEF prioritizes cross-border links and missing-links to make the network meet the guidelines and long-term plans for 2030 and 2050.

The EU can finance up to 50% of the 100 km long track on the Swedish side of the border.



The CEF regulation describes how co-financing can be given to cross-border links that demonstrate a particularly high degree of integration. The Gothenburg–Oslo link is highlighted as such a cross-border link of importance in the annex to the regulation.

In Sweden the project must be seen as a way of reaching bigger national infrastructure goals as well as a venue for fulfilling obligations in the Paris Agreement. Collaborating with industry and understanding their transport needs now and in the future will be crucial in Sweden to show the significance of the project and gain support.

In Norway, the Intercity Østfoldbanen is approved and partly financed. However, the project is delayed due to ground conditions among other issues.

Cost benefits from faster rail transport

The EU has an ambition of a minimum of 70% of all freight transport to be conducted via rail and will invest heavily to reach the goal. With many of Norway and Sweden's most crucial export partners being located in the EU, establishing a connection to this network should be a key priority, in order to remain competitive on the global stage. Industries will benefit from increased access to other markets, both in terms of cheaper and faster imports, and improved opportunities for export.

According to TÖI, transporters who already freight goods by train on this stretch can expect cost savings with double-track. Several cost factors will benefit transport operators and their customers⁹. There is a reduction in the time-based transport cost, such as salaries, since rail allows for a higher degree of

automation and e-optimization. Cargo time cost will be affected, since the buyer will be less willing to pay a premium to receive the goods faster since the average time of transportation is reduced. Reduced cost of transport will increase the competitiveness of goods from the region.

In the economics of rail transport there are fixed cost associated with loading and unloading of railway carriages – as well as time-based transportation costs. Accordingly, the longer the goods travel, the more profitable is the option of rail. Connecting to existing railway networks is both an economically sensible solution and a climate neutral way to future-proof the infrastructure of tomorrow.

⁹ TÖI-report, pp. i (Summary)

Shifting to rail reduces emissions from transport

A reduction in total emissions from the transport sector can be expected with a shift from road to rail. As the decreased travel time makes rail a more attractive option, rail will pull freight volume from other modes of transport. Specifically, rail transport is projected to increase by 40% compared to baseline levels¹⁰. Since rail is a clean alternative to e.g. road transport, a decrease in emission is to be expected. The TÖI report calculates CO₂ savings for the year of 2040 to 2062 to be between 66,000 tons and 289,000 tons – depending on the complementing initiatives implemented concurrently¹¹. To put this number in perspective, it would require the removal of more than 70,000 passenger vehicles for a full year, to achieve a similar reduction¹².

Aside from the economic and environmental benefits, there are also distinct advantages to individuals in the vicinity of the project. Local pollution of particle matters causing disease such as asthma, are known to plague areas with intense volumes of heavy-duty vehicles (HDV) Shifting supply chains to rail would help alleviate local pollution and improve air quality. Trains are also less accident prone than lorries, and as such road safety would benefit as well. Finally, as modes of transportation shift from roads, less congestion can be expected.

¹⁰ TÖI-report, pp. ii (Summary)

¹¹ TÖI-report, pp. ii (Summary)

¹² What exactly is 1 tonne of CO₂? We make it tangible – Climate Neutral Group

The Rise of a Megaregion – the STRING-corridor can make the region into an economic and cultural success-story

Megaregions are highly populated regions that reflect powerful economic success and attract population growth. The term originates from the United States. America's metropolitan regions are expanding at a rapid pace. As these regions grow, they connect and overlap with their neighboring regions. They not only encompass multiple cities and counties, but many also include several states, all of which must work collectively to manage a competitive megaregion. Over the last two years it has become commonplace to focus on transportation challenges that exist within megaregions¹³.

Megaregions are not formally recognized in the hierarchy of governance structures like a city or metropolitan planning organization (MPO). Yet, they generate large sub-systems of production and consumption. These economic systems result in the movement of goods and people and impact modal logistics, industry location, urban housing, city services, and more. Strong megaregions attract talents and investors. Inside the megaregions economic connections are strong and growing. Opportunities for collaboration as well as proximity to a large market and a large pool of competencies enable business to innovate and upscale.

The STRING-corridor is a megaregion based on the criteria used by the EU and the OECD. OECD has designated the STRING-corridor as an area with extraordinarily strong competencies within green solutions. According to an analysis conducted by the Danish Technological Institute, STRING demonstrates the potential to become an internationally acknowledged Green Hub; In the STRING-region there are more than 4 000 green tech-companies and 50 new ones are established every year.

The number of patented green tech inventions have tripled over the past 20 years, but to maintain and strengthen the region's position there is a need to increase the conversion of research to innovation in companies.

The Fehmarn Belt Fixed link provides a window of opportunity to break down silo thinking across borders in the public and private sector to increase competitiveness. This will further advance the STRING-region's position as a Green Hub.

With more than 4 000 green high tech-companies, the STRING megaregion has the potential of becoming an internationally renowned green hub.

The OECD points out that the functional integration in the STRING region is hindered by weak railway infrastructure. The roads are often better. The national political interest in solving these problems is described by the OECD as lukewarm¹⁴.

The OECD has credibly shown the need for closer cooperation between our metropolitan regions, for us and not least for growth and welfare in our countries. They point out how shortcomings in connections between our regions obstruct our common potential and the potential of our countries. Today's situation means lost opportunities for economy, sustainability and for long-term well-being.

¹³ *The consortium of Cooperative Mobility for Competitive Megaregions (CM2), CM2's consortium partners include the University of Texas at Austin, Louisiana State University, Texas Southern University, and the University of Pennsylvania.*

¹⁴ *OECD Territorial Reviews, The megaregion of Western Scandinavia 2018.*

Double-track Oslo–Gothenburg will boost collaboration between Norway and Sweden

Exchanges between Norway and western Sweden have increased rapidly in virtually all areas of society in recent decades. Norway is now Sweden's largest trading partner and Norwegian investments in western Sweden are extensive. Residents of both Norway and Sweden meet more and more frequently in our everyday lives.

The region Oslo–Gothenburg–Øresund is already today one of the most attractive and ambitious in Europe. Oslo and Gothenburg are two of the largest cities in northern Europe. Both have bustling enterprise and innovative business environments, specializing in a broad range of in-demand products and services, from the automotive industry, to shipping and maritime, to telecommunications. Trade plays a major part in the economies of both cities, and both cities are major transport hubs, housing the largest ports of their respective countries. Gothenburg is

the largest port in Scandinavia, it is a key gate to the world for Swedish Industry and for Norwegian import and export.

However, the potential is far from being exploited. The Nordic governments have signed a vision that the Nordic region will be the world's most integrated and sustainable region by 2030. Still there is no adequate railway connection between two of the Nordic region's five metropolitan regions, even though the distance between them is less than 300 km.

The ambition must be to create a region with significantly fewer border barriers, with extensive exchanges and close cooperation. Central areas for collaboration are accessibility, education, research and development, culture, industrial development, care and nursing.



Sources

This paper by STRING network is a tool for policy-makers to gain knowledge about the opportunities that lie within the establishment of the double track train line between Oslo and Gothenburg. Looking at the Oslo–Gothenburg connection through a European, Scandinavian and local lens, the paper outlines social, economic and environmental benefits for cities, countries and regions.

The paper is based on reports and studies conducted by STRING partners as well as policy documents from Norway, Sweden, the EU and OECD.

- Report Double-track railway between Oslo and Gothenburg – An analysis using the Norwegian Freight Transport model. TØI, Transportøkonomisk Institutt September 2021.
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Contact

STRING stringnetwork.org



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