

Pre-feasibility study of Helsinki–Tallinn fixed link

Executive Summary

The background of the Helsinki–Tallinn fixed link

The Helsinki–Tallinn fixed link is a growth vision for Finland and the Baltic region, the purpose of which is to reduce travel time, add mobility and create competitiveness in the area. In the pre-feasibility study, the preliminary target year for the completion of fixed link is 2030-2035.

The Helsinki–Tallinn growth zone is considered as a part of Europe-wide Trans-European transport networks supported by the European Union. The objective of the TEN-T is to promote the European internal market, regional cohesion and sustainable traffic network.

Nowadays, over four million people live in a 200 km radius from both Helsinki and Tallinn. Cargo and passenger traffic between Helsinki and Tallinn takes place by sea. The passenger flow has increased to approximately eight million passengers, increasing by two percent a year. The number of passenger cars has increased to over a million (2013), growing by 10 percent a year. Most of Finland's export and import is carried out by sea. Finland's cargo transport has increased significantly. The most important form of transport in cargo traffic between Helsinki and Tallinn is container and trailer traffic.

Both cargo and passenger traffic is estimated to increase via the Helsinki–Tallinn fixed link. Developing the link would have a significant effect especially on commuter traffic but also on tourism. The fixed link would not mean an end to sea traffic – as, for example, cruise traffic will continue and increase in the long term. The fixed link also has a significant impact on the development of other connections (for example railway traffic) as well as on the concentration of residential areas and companies' competitiveness with regard to available work force. Travel time will be shorter and accessibility will improve significantly compared to the present.

The objectives of the pre-feasibility study

The objective of the pre-feasibility study has been to produce an estimate about the most profitable way to implement the link between Helsinki and Tallinn, considering the technical solutions and transport networks of both countries and the financial costs and benefits of creating the link.

The aims of the study were to:

1. find out how the fixed link should be integrated to transport networks in both Finland and Estonia;
2. produce rough estimations of the space the link, and the traffic solutions it requires for general and county planning;
3. study whether it is possible to develop the fixed link in several stages and to serve several modes of transportation;
4. observe the financial terms and passenger and cargo flows that would make the project profitable.

Approach and methods of study

The pre-feasibility study has been prepared by several experts from various fields. Previous studies considering development of the Helsinki–Tallinn link and the relevant statistical material

have been used in the project. In addition, experience from the Øresund Bridge and the Channel Tunnel fixed links (impacts and studies) and experience from the Fehmarn Belt project have been taken into account.

Geological analyses were basis for route selections and possibilities for the technical report. Assumed scenarios of the increased traffic based on forecasts of both passenger and cargo transport have been made to support the assessment of financial and economic impacts.

Based on that, estimations of the amount of passengers have been made and a viable operating model for the tunnel has been prepared and used in the calculation of financial profitability. The assessment of impact has been followed up with a socio-economic evaluation and assessment of social impact. At first, optional routes and tunnel technical solutions were studied and the most viable one was selected to further studies. The results of the pre-feasibility study have been concentrated in a report to support detailed planning in the future.

Observed options

Different route and tunnel options have been studied in the pre-feasibility analysis to determine the optimal integration to traffic networks in Finland and Estonia. The objective was to find a solution where the travel time between city centres would be as short as possible and the fixed link technically feasible. This study took a look at five different solutions that were partly covered in previous studies.

As a result of studying different tunnel options, the railway tunnel with two separate rock tunnels is recommended for further planning. Trains would be operated with maximum speed 250 km/h to achieve 30 minutes travel time. European track width would be used and connected to Rail Baltic line. It was determined that implementing the fixed link also with road would not be profitable and are complicated from the technical and operational point of view.

The fixed link will be integrated to traffic networks in Estonia and Finland

The fixed link between Helsinki and Tallinn is supposed to be connected to the current public transport networks in both countries. The objective is to reduce the travel time between the two city centres as short as possible and to maximize the passenger, especially commuting, potential.

On the basis of the findings of the pre-feasibility study, the fixed link should be connect to the Central Railway station and the Pasila railway station and the airport in Helsinki in order to create a functional traffic network and develop commuter traffic (e.g. a rail connection to elsewhere in Finland, to Russia, bus connections, flight connections); the terminal for the passenger traffic would be situated at Pasila and the terminal for vehicles around Ring III with fluent traffic connections and the cargo terminal enabled by the new fixed link is proposed to be situated at Riihimäki or at Hyvinkää.

In Tallinn, it is recommended that the fixed link be integrated in the city to the traffic network at the Ülemiste (Rail Baltic, to Russia, flight connections and to local rail and bus connections). The cargo terminal is proposed to be situated in Muuga, slightly north-east of central Tallinn.

The completion of Rail Baltic is fundamental for the Helsinki–Tallinn fixed link project. After Rail Baltic is completed, travel time from Tallinn to Riga will be less than two hours. If the fixed link is completed within the 30-minute travel time, the connection to Tallinn from Tampere or Turku would be less than two hours.

Transport and traffic will change

According to rough estimate, four to five million inhabitants will live in the daily working area of the Helsinki–Tallinn fixed link. Nevertheless, the fixed link will impact the whole Fenno-Baltic zone that has about 17 million inhabitants. According to the pre-feasibility study, the amount of passengers between Helsinki and Tallinn could increase from eight million (2013) even to 41 million passengers in the next 70 years. Today 30,000 people commute weekly or monthly from Estonia to Finland. Everyday commuting will be a new segment in Tallinn-Helsinki traffic. It is estimated that number will be up to 25,000 ten years after opening. Travel and business between Estonia and Finland is going to grow significantly when the fast connection opens. Container and trailer transportation via the link is estimated to increase significantly in the first ten years when the link opens. According to the estimate, about half of the cargo traffic will in the future go through the fixed link.

Socio-economic impacts are substantial

As a part of the socio-economic impacts, the development of passenger flow, change in travel time and its impacts on mobility, impact on commuter traffic and financial impacts have been studied.

After the Helsinki–Tallinn fixed link is completed, mobility will change and accessibility of areas will improve on a larger scale. The attractiveness of neighbourhoods near the the traffic network can escalate with better accessibility and connections. The need of new land use planning is emphasized. The economy will benefit from wider consumer markets, shared labour markets as well as from the different cost and regulation levels the two countries.

Direct and indirect benefits from both the constructing and operating period to both countries will be significant. Planning, building and maintaining will create jobs, enable companies to grow and evolve in the twin-city area, enhancing also the need for new services.

The estimated increase in traffic (work, study, business, leisure) will have a strong impact on the competitiveness of the areas. Changes in the traffic system and the development of new appealing areas will reflect on both businesses and inhabitants. For example, when new logistic and tourism services appear, the service structure of the areas can change significantly.

The competitiveness of the twin-city area will be strengthened by improved accessibility, new companies and business, better image and variety in living options. Significant improvement in accessibility via different traffic solutions will influence regional competitiveness as well as the competitiveness of the whole of Finland and Estonia. A benchmark study of the Øresund Bridge shows stimulating effect on business life from the fix link.

Public support is needed to implement the fixed link

The cost estimate of the tunnel and traffic solutions is 9 – 13 billion euros. According to the socio-economic analysis, income from the tunnel will cover the operating and maintenance costs and a part of investment costs during the operating period. Financial support in the extent of 40 percent would be needed from the public sector (from governments and the EU). The EU funding of the Fehmarn Belt project constructed in Denmark was approximately 40 percent. A possible model for organizing the construction, funding and operating of the tunnel could be corporation-based. In future planning, arrangements based on different corporation models in which a corporation is contracted to implement the construction, operation and maintenance of the tunnel should be studied in more detail. The construction of the tunnel could start approximately 2025–2030, and construction work would take eight to ten years.

When constructing the tunnel, a significant amount of stone material will be generated from mining the rock tunnel. Utilizing the stone material, for example, to build up a new plot of land in water should be studied in more detail in the future. The construction of the tunnel could be partly financed by the possible land usage fees due from the plot of land. Utilizing the stone material as a plot of land could also be a broader question in urban planning and land use planning, which will also require further studies.

Further studies necessary

The preliminary study of route options of the Helsinki–Tallinn fixed link and the assessment of socio-economic impacts shows that the study considering the construction of a tunnel should be continued. The assessment of financial impacts shows that the project would not be profitable without some funding in the investment stage. Regardless, the socio-economic impact (for example the shortening of travel time) will make up a big part of the deficit. The project has a significant positive impact on competence and attractiveness on both regional and national level.

It has been learned for example from building the Channel Tunnel between England and France and also from the Fehmarn Belt project that the technical process of the project takes time. A subsequent study should take a detailed look at the technical options and possibilities of the tunnel, as well as location possibilities for terminals. In addition to financial impacts, the possible environmental, social and cultural effects of the tunnel should also be estimated more precisely. As a basis for the study, the estimates of cargo and passenger traffic should be specified.

Progress of the project is ensured by joint project organisation by Estonia and Finland

In the benchmark chapter of the pre-feasibility study, experience from other planned and implemented tunnel projects and their organization models were collected. Especially based on experience from the Fehmarn Belt project a proposition was made to establish a Finnish-Estonian project organization for further planning. The next phase and the preparation of the studies calls for active actions from the stakeholders, communication within the project and finding possible outside funding, in which case the most recommendable option is a cooperation project with enough resources for work force and financing to implement the project.