

# Helsinki – Tallinn tunnel task force Report of the main findings

## Description sheet

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| <b>Published by</b>  | Ministry of Transport and Communications, Finland   | 15.5.2018 |
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| <b>Title of publication</b>  | Helsinki–Tallinn tunnel task force<br>Report of the main findings   |           |
| <b>Keywords</b>  | tunnel, railway, infrastructure, transport  |           |
| <p><b>Abstract</b></p> <p>Finnish Ministry of Transport and Communications established a Helsinki–Tallinn tunnel task force in March 2018. The purpose of the task force was to analyse the main findings of the FinEst Link feasibility study published on 7- February 2018 and to present suggestions concerning further work on the Helsinki–Tallinn tunnel project. The task force was a joined effort between the public authorities of both Finland and Estonia.</p> <p>One of the tasks assigned to the task force was to examine the need for further studies and to determine how they could be financed. In its work, the group was instructed to take into account the results and recommendations of the FinEst Link study completed in February. The group was also instructed to consider the far-reaching economic impacts of the tunnel, questions related to financing, connections between transport and logistics and the associated business models, smooth travel chains and future technological development.</p> <p>The task force sees great potential in the Helsinki-Tallinn tunnel creating positive effects on various levels. However, given the complexity and scale of the such an unique megaproject, further work is still needed on various issues. In this report, the task force makes 8 recommendations for further next steps.</p> |   |           |
| <b>Publisher</b>   | Ministry of Transport and Communications  |           |

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## FOREWORD

In 1993, Finnish geologists and engineers conducted the first brief study on the technical and economic possibilities of a tunnel between Helsinki and Tallinn. The idea remained merely a dream for almost two decades.

In 2014, Harju County Government and the cities of Helsinki and Tallinn ordered a pre-feasibility study on a fixed link between Helsinki and Tallinn (<http://finestlink.niili.net/wp-content/uploads/2015/12/pre-feasibility-study.pdf>). The study proposed that a full feasibility study be done. The full feasibility study<sup>1</sup>, called the FinEst Link –project, studied the technical and economic feasibility of a fixed connection between Helsinki and Tallinn. The main findings of this study (<http://www.finestlink.fi/en/finest-link-project/>) are found in Chapter 2.

Following publication of the FinEst Link feasibility study, the Finnish Ministry of Transport and Communications established a Helsinki–Tallinn tunnel task force in March 2018. The purpose of the task force was to analyse the main findings of the FinEst Link feasibility study published on 7th February 2018 and to present suggestions concerning further work on the Helsinki–Tallinn tunnel project.

One of the tasks assigned to the task force was to examine the need for further studies and to determine how they could be financed. In its work, the group was instructed to take into account the results and recommendations of the FinEst Link study completed in February. The group was also instructed to consider the far-reaching economic impacts of the tunnel, questions related to financing, connections between transport and logistics and the associated business models, smooth travel chains and future technological development.

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<sup>1</sup> The project was led by Helsinki–Uusimaa Regional Council in partnership with the Cities of Helsinki and Tallinn, the Union of Harju Municipalities, the Finnish Transport Agency and the Estonian Ministry of Economic Affairs and Communications.

The task force was chaired by Director of Unit Laura Eiro from the Finnish Ministry of Transport and Communications. Senior Adviser Ulla Tapaninen from the City of Helsinki acted as the vice chair. The Estonian side was represented by Executive Officer Eva Killar and Deputy Secretary General Ahti Kuningas from the Estonian Ministry of Economic Affairs and Communications and Project Manager at City of Tallinn, Liivar Luts. The secretariat consisted of Senior Adviser Marjukka Vihavainen-Pitkänen and Ministerial Adviser Elina Immonen from the Ministry of Transport and Communications and Senior Adviser Anni Rimpiläinen from the Finnish Transport Agency.

The task force held six meetings during its term. Task force members have also consulted several experts, some of them from the public authorities and others private consultants. The list of people met is found as Appendix I.

Two studies were also commissioned by the Finnish Ministry of Transport and Communications. The study, carried out by Inspira Ltd., focused on the financing and funding options for further development of the Helsinki–Tallinn tunnel project. The study, done by Ad Economics, focused on the wider economic impacts that the construction of the tunnel could facilitate and also included a suggestion on further organisation of the project. In addition, the FinEst Link project commissioned McKinsey to do a study on further steps.

Even though the work done was based in particular on the FinEst Link study, it is thought that private-sector interest in the Helsinki–Tallinn tunnel project has also arisen under the FinEst Bay Area Concept. References to the Helsinki–Tallinn tunnel in this report should not be taken as a direct reference to either one of these projects. The view has been to examine a Helsinki–Tallinn tunnel project from an overall perspective – The FinEst Tunnel.

# 1 Recommendations of the task force for further steps

- 1. Based on the information currently available, the task force considers the Helsinki–Tallinn tunnel to have potential of being a unique mega-project generating positive outcomes at various levels.** The tunnel could create a unique opportunity to achieve structural industrial renewal not only related to new technologies and governance structures but also based on more efficient transport connections to Europe and Asia.
- 2. Given its scale and complexity, the project requires innovative actions on various issues and on funding and financing in particular.** Reference models can be found and the issue requires further investigation. Developing the eligibility for funding should be one of the project's main tasks. The project cannot rely on heavy funding from EU instruments although these can be a part of mixed funding sources. Some level of state involvement is needed due to the nature of the project, but it is considered that with further development, the project will also be able to attract private investments.
- 3. To proceed the project needs a strong project organisation as well as project management skills.** In practice, the next step could be to work towards establishing a development vehicle that would be set up in order to embark a development phase that would further advance the project on the basis of social and financial goals set by the project owners.
- 4. Private sector involvement can be seen as a necessity in carrying the process forward rapidly and in establishing a solid financial case.** As priority the public sector should act as an enabler for the project, and should be organised in a way that allows responding to possible private initiatives. In fact, the tunnel could represent a new model for infrastructure implementation projects. It is estimated that the next development stage of the project would cost 10 – 16 million euros. An initial timeline and activities is shown in Appendix II.
- 5. Alternative potential technological solutions should be studied further during the next phase.** The planning and building of the railway tunnel between Helsinki and Tallinn will take decades. It is very likely that the development of high-speed rail transport technology will be rapid during that time. The development of drilling technologies and more efficient way of implementing the project should also be studied/developed further.

- 6. Land use planning should be coordinated in both Finland and Estonia at all necessary levels, to enable the Helsinki-Tallinn tunnel project to materialise.** The project alignment at this point should leave room, where possible, for the project decisions to be made after the necessary studies. This is a very timely aspect, taking into account the ongoing land use planning processes.
- 7. Finland and Estonia should jointly work together to ensure that the tunnel connection is included in the TEN-T Core Network when the network is revised in 2023.** This would both create visibility for the project and would enable applications for certain EU funding.
- 8. To this end the two states, by the end of 2018, should decide more concretely the state-level organisation and involvement for the project, for example in the form of an Memorandum of Understanding.** A strong public-sector network is a prerequisite for bringing the project forward and the form of public-sector activities may vary, depending on the private sector's interest in the project.

## 2 Main findings of the FinEst Link feasibility study

The FinEst Link project studied the technical and economic feasibility of a fixed connection between Helsinki and Tallinn. The study received co-funding from the EU's Interreg Central Baltic programme budget of 1.3 million euros. The project was led by Helsinki–Uusimaa Regional Council in partnership with the Cities of Helsinki and Tallinn, the Union of Harju Municipalities, the Finnish Transport Agency and the Estonian Ministry of Economic Affairs and Communications. The consultants who participated in the FinEst Link feasibility study are: Amberg Engineering, Sweco Finland, WSP, Ramboll Finland, Sito, Strafica, Kaupunkitutkimus TA, Inspira and Rebel Group.

The FinEst Link feasibility study presents an operational model where at peak hours, passenger trains would run at 20-minute intervals, at the speed of 200km/h including estimations for travel time and ticket costs. The travel time would be 30 minutes. Approximately 40 passenger trains would run between Helsinki and Tallinn daily. Car shuttle trains, truck trains and cargo trains would run approximately 30 times per day, at the speed of 120–160 kilometres per hour.

On the Finnish side, there would be three stations for passenger traffic: Helsinki city centre, Pasila and the Helsinki-Vantaa Airport. The terminals would serve the cargo traffic of all Finland. The tunnel would connect fluently to the planned Ring Road 4 (Kehä 4) and other road network, to logistic terminals and to the Hanko-Hyvinkää track creating a well-functioning connection to the rest of Finland.

In Tallinn, the tunnel would reach Ülemiste, a growing commercial area a bit more than three kilometres from the Old Town. For freight transport, the tunnel would connect to the Muuga terminal, which is the largest cargo harbour in Estonia.

The tunnel tracks would have the European gauge of 1435 mm but when joining the planned Airport Line in Helsinki, part of the tunnel tube would have both: the European standard tracks and tracks with the Finnish gauge (1524 mm). Following the planning phase, the building and boring of the tunnel could start in 2025, and construction of the tunnel would be completed in 15 years. The tunnel would be ready for passengers and cargo in 2040.

In the FinEst Link project, the investment cost of the railway tunnel was estimated at 13.8–20 billion euros. The project uses a mean value of 16 billion euros. The sum includes, for instance, tunnel construction, two artificial islands, planning costs, stations, terminals and depots but excludes the costs of rolling stock.



The Helsinki–Tallinn tunnel alignment is 103 kilometres long, which means that the tunnel would be the world's longest undersea railway tunnel. According to the FinEst Link calculations, approximately 12 million passengers would take the train and 11 million the fast ferries, totalling 23 million passengers per year in 2050. Daily commuters, who would have entirely new possibilities for living and working, would account for the significant increase in passenger volumes.

The FinEst Link project foresees significant growth potential for cargo if the tunnel is built. According to its estimates, 4.2 million tons of cargo would be transported both in the tunnel and on the ferries, resulting in an annual total of 8.4 million tons in 2050. The present amount of cargo between Helsinki and Tallinn is approximately 3.8 million tons. The FinEst Link feasibility study estimates that passenger and cargo volumes would double or triple in the next 30 years. Also, the ferry volumes would continue to increase even if the tunnel is built.

Seen merely as a transport project, the railway tunnel is not economically feasible (cost–benefit ratio 0.45), but from the viewpoint of the wider economic effects of regional development the tunnel could have major benefits. The tunnel would connect Finland to the Rail Baltic railway and the wider European rail network. In addition, the railway tunnel would help create a metropolitan twin-city region of three million inhabitants in the future: a region where people, goods and services could move around easily. The expanding labour market would create economic growth, open new possibilities for businesses and improve the quality of life. With its travel time of only 30 minutes, the Helsinki–Tallinn tunnel would enable daily commuting across the Gulf of Finland. Moreover, it would connect the European rail network from Central Europe to the Arctic.

### 3 Wider impacts of the Helsinki–Tallinn tunnel – Creating a global innovation hub

Transport and communications networks are the cornerstone of the infrastructure of society. They are a prerequisite for growth, competitiveness and employment. Networks are a real force for change in society's development, and investments made in them return to society in the forms of competitive advantage and prosperity. The wider economic impacts (WEI) of transport projects refer to impacts beyond direct user and producer benefits. Wider impacts can affect the productivity of businesses directly, or they can materialise through the labour market, the product market or the land and property market.

Both FinEst Link study and Ad Economics explored the question of wider economic impacts of the tunnel. The tunnel between Helsinki and Tallinn would be an unique infrastructural project having an impact over the 21st century or longer. Most importantly, the region could become a globally visible innovation node. From the European perspective, the tunnel can be seen as a gateway that connects Europe from the High North to the Black Sea and enables a new route to Asia. With the new possible infrastructure connections, including the Rail Baltic railway, the Helsinki–Tallinn tunnel and the Arctic railway, Finland and Estonia would transform their positioning on the European maps. The physical connections combined with a globally leading ecosystem for intelligent transport, would create sustainable economic growth, generate new business, and enable high quality, user-centric transport and communications services for citizens.

The railway tunnel would combine the transport networks and local commuting systems of Finland and Estonia, increasing the level of interoperability and multimodality of the systems.

The vision of the future encompasses the Helsinki–Tallinn region of 3 million inhabitants living in a society with an intensive cross-border cooperation, education and business life. The society rests on a high level of digitalization, which enables fast rates of growth in productivity and international competitiveness.

This connection could allow cargo traffic from Europe to Asia as well as export transport from Finland and Northern Norway to both Europe and Asia. The tunnel would also connect with Rail Baltica and possibly have a further linkage to the Belt

and Road Initiative that has been proposed. Optionally the tunnel would also serve in data, energy and other transfer activities.



The tunnel between Helsinki and Tallinn would be a unique infrastructural project. The region could become a globally visible innovation node. From the European perspective, the tunnel can be seen as a gateway that connects Europe from the High North to the Black Sea and enables a new route to Asia. With the new possible infrastructure connections Finland and Estonia would transform their positioning on the European maps.

The tunnel could have four stations, which might become new urban living environments. Station areas could be built based on smart city opportunities. Smart city-based urban planning will balance between ecological, social and economic sustainability.

Both Finland and Estonia are small countries with ageing populations. Moreover, the two countries are at the far Northeast of Europe. Both countries face challenges related to industrial structure. New urban living environments could connect vibrant start-up ecosystems from Tallinn and Helsinki, creating a unique open innovation environment that can produce very new concepts and solutions for societal challenges.

Innovation and economic renewal require actions that foster growth, openness, trade and mobility. Building the tunnel between Helsinki and Tallinn would increase mobility between these states but would also foster a structural change that embraces the free flow of ideas and people, globally.

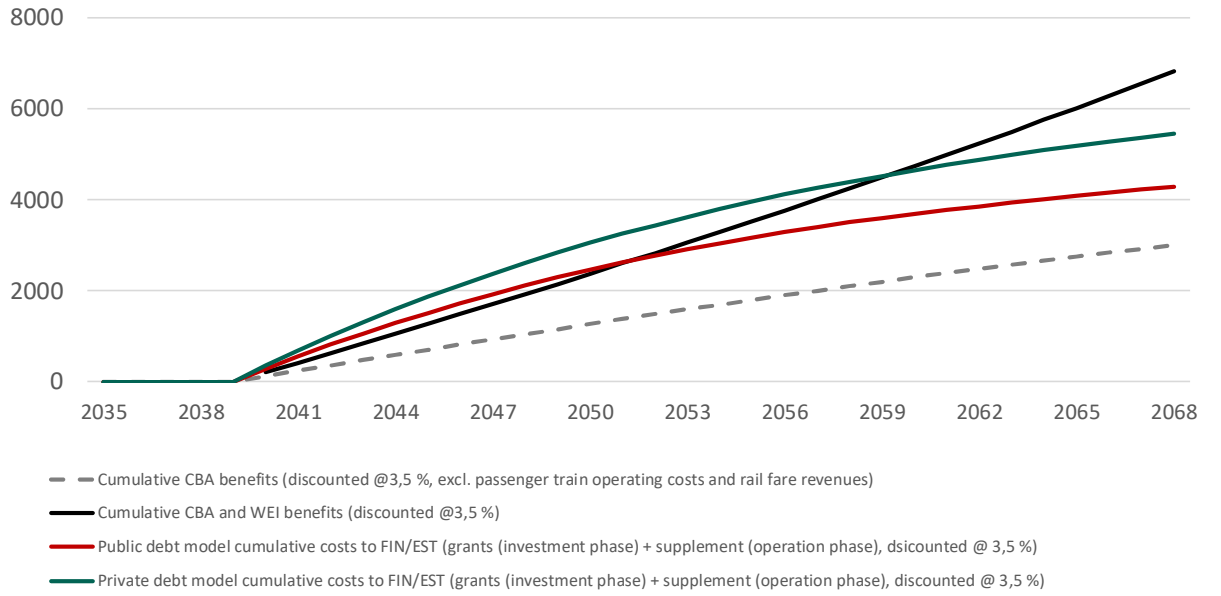
On the other hand, digitalisation has created another kind of a challenge for society, a challenge that is related to digital competence and automatization. In the future, the competences needed will differ remarkably from those of current professions. The ability both to develop competences and to acquire new competences will be needed. The tunnel could act as a catalyst for the attractiveness of the Finnish Gulf area.

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| <p><b>GLOBAL STATUS</b></p> <p>Global Innovation Node<br/>First Twin Capital<br/>Strategic Geopolitical Positioning<br/>Global Mobility</p> | <p><b>SUSTAINABILITY</b></p> <p>Services<br/>Tourism<br/>Urban &amp; Real-Estate Development<br/>Social: Employment &amp; Growth<br/>Environmental Impact<br/>Urban Innovation</p> | <p><b>CORE CASE</b></p> <p>Mobility<br/>Data<br/>Energy<br/>Water</p>                 |

**Tunnel impact structure: The tunnel project is of the size that will have global impact without mentioning wider regional and direct impacts to all relevant stakeholders. Source: Ad Economics.**

The recent Inspira study concluded that with the current estimate, including cost–benefit analysis benefits and wider economic impacts benefits, the cumulative benefits for the public sector would be greater than the direct costs. The time period for this estimate was however very long and involved significant uncertainty and risk regarding the parameters and actual outcomes. A more accurate analysis is still needed on the CBA and wider economic impacts in the next phase.

Comparison of CBA benefits and supplement payments by Finland/Estonia, cumulative values



Source: Inspira

## 4 Funding & financing

In addition to the studies done by the FinEst Link project, the funding and financing possibilities of the Helsinki–Tallinn tunnel were further evaluated in reports by Inspira and Ad Economics, where various alternatives were explored further.

For all large infrastructural projects funding should be the main focus. This also applies to the Helsinki–Tallinn tunnel. Financing will be available if sufficient funding sources and acceptable risk allocation structures are employed. Due to the magnitude of this kind of megaproject, it is already quite clear, that the funding and financing of the project cannot rely solely on the public resources.

The most important considerations for ensuring bankability are:

1) sufficient project preparation (including feasibility and risk studies, value for money analysis, contract and procurement document development and other studies,

2) market sounding with project stakeholders, especially potential future lenders

and

3) overall risk allocation that is acceptable from the lenders' position.

The Inspira study presents public and private funding models, with a total of four case studies where the models have various practical implementations. Aspects of financing models and case studies that should be considered in the Helsinki–Tallinn tunnel project are Öresund bridge (public), Thames Tideway Tunnel (hybrid), Malaysia - Singapore HSR (PPP), LGV Sud Europe Atlantique (concession). Even though comparable commercial could not be identified, the tunnel project could be comparable to very large scale real estate developments.

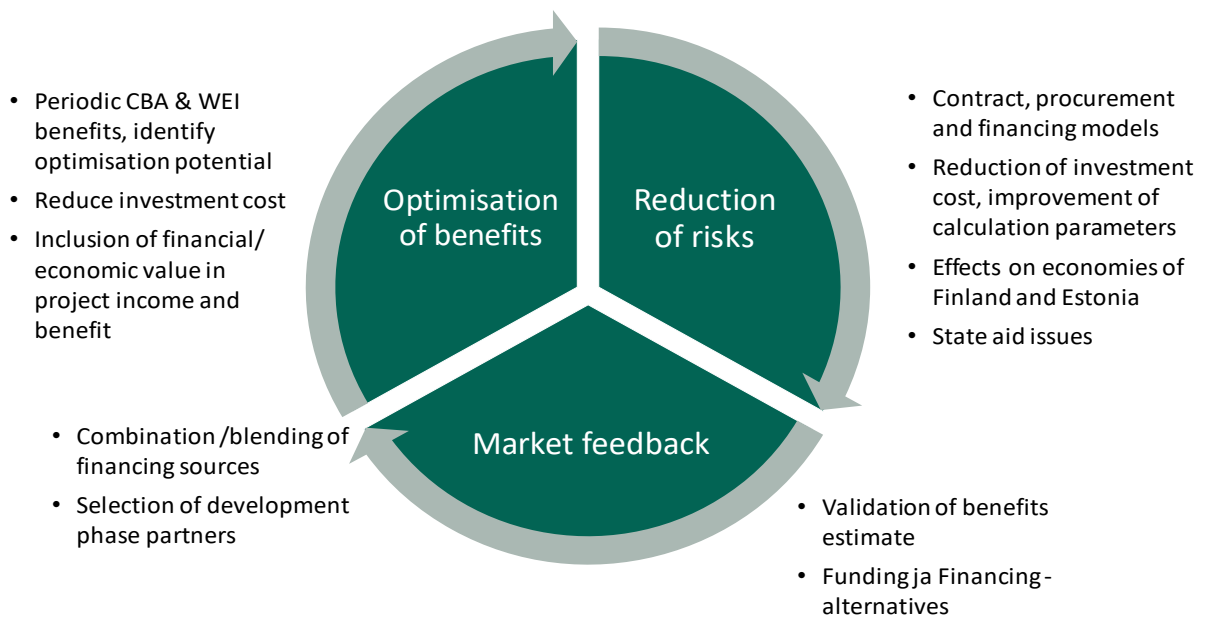
In the Ad Economics study, the privately-led project company option was investigated. The tunnel project requires appropriate legal and organizational arrangements for each stage of its life-cycle. It is proposed that in the project initiation and design phase, the roles of stakeholders, finance and potential contractors are taken into account by establishing a tunnel project company. The private company model has proved to be a successful governance model in large infrastructure cases implemented recently, such as the Äänekoski bioproduct mill. A further proposal is proposed that when the tunnel is opened for use, the company would be restructured into

an operational mode. The company's financial structure and financial management instruments would then be restructured correspondingly. It is proposed that the company would be publicly listed in order to ensure full scrutiny of environmental, social and governance responsibilities. Moreover, its project stage debt instruments would then be transformed into normal corporate bonds that are openly traded.

There are multiple sources of funds for equity and debt, including pure financial investors who would provide equity, institutional investors, development banks, and commercial banks. In a privately financed project, the project financiers would include various financiers acting as equity investors in project equity or lenders/ investors in infrastructure debt.

It seems clear that further work should consider various financing / credit support structures for the Helsinki–Tallinn tunnel in order to make the project bankable. For these to be of use, they should be developed in connection with ensuring economic and technical feasibility and political support for the project. The direct exposure (e.g. guarantees, if they are so called) involved in the Helsinki–Tallinn project could be so large that it might impact on the state financing and budgeting capacity.

Both public and private finance models include certain benefits and risks. In further work, it would be necessary to develop a structure, where the following aspects should be taken into account:



Source: Inspira

## 5 EU funding and financing

At present (4/2018) the post-2020 Multiannual Financial Framework (MFF) for the EU is being prepared. The upcoming changes in EU priorities can be seen as a source of uncertainty for the Helsinki–Tallinn project, but on the other hand it might be possible to develop the project so that it could be incorporated as a priority project in the upcoming MFF for 2020-. Due to its size and complexity, it can also be expected that implementation of the project would span over several EU MFF periods.

In practice it is impossible to estimate the total amount of EU financing for the Helsinki–Tallinn tunnel in advance. Any estimate would have to assume that the project would fulfil future EU transport priorities. However, it is evident that the proportion of EU funding used in the FinEst Link study, i.e. 40%, is in practice not a feasible assumption. It is also estimated that EU funding is not available in the preliminary planning stage of the project, but it should be developed further. Appendix III contains more information on the background of CEF funding.

In the next phase, the project should approach suitable EU parties (INEA, DG-Move) regarding the requirements of and opportunities for the project to receive EU financing, including among others CEF, EFSI and other financing sources. If the project's feasibility can be developed and documented before the upcoming MFF decisions are made, the project could be seen as a candidate for EU priority financing in future decisions.

In any case, Finland and Estonia should jointly work together to ensure that the tunnel connection is included in revision of the TEN-T Core Network in 2023. This would both create visibility for the project and enable applications for certain EU funding. One should also consider horizontally all the infrastructure projects in relation to EU funding opportunities.

When subsidy payments are used to facilitate project development, EU state aid rules must be adhered to carefully. Furthermore, using CEF funds also imposes several obligations for the project operations.



## 6 Environmental and geological aspects

Several additional environmental and technical studies are needed in order to pursue the tunnel project further. This is also required by the land use plan and construction permit processes.

*The Strategic Environmental Assessment (SEA)* is the process by which environmental considerations are required to be fully integrated into the preparation of plans and programmes prior to their final adoption. Also the Environmental Impact Assessment (EIA) procedure needs to be carried out. The appropriate time for carrying out an EIA is in connection with the general engineering of the Helsinki–Tallinn tunnel. Before this, there needs to be clear project ownership. On the Estonian side, the National Designated Spatial Plan needs to be carried out in. This plan includes the compulsory strategic environmental assessment. The land use plans needed in Finland also include the SEA.

The environmental concerns are complex and require further studying and careful consideration. It is self-evident that the negative impacts on the environment should be minimized in all phases of the construction process. For example, it is necessary to study the possibility of minimizing the carbon emissions caused by the construction phase. Other major elements to consider are the construction of the artificial islands and the re-location of the material from the tunnel drilling. Questions relating to artificial islands depend heavily on to what extent the potential is being explored.

According to the FinEst Link feasibility study, the largest geological risk is related to ground-water resources in Estonia. These risks could be avoided by circumvention or special constructions. Moreover, the “Ruskeasanta” groundwater area near Helsinki-Vantaa Airport also needs to be taken into consideration.

Direct positive environmental impacts are related to the potential decrease in sea vessels traffic. The electric trains produce less CO<sub>2</sub> emissions than the ferries, and there will be less pressure on coastal ecosystems. The tunnel option would also have less traffic impact on urban systems when there is less cargo in the city centers than in the ferry options. The indirect and social impacts would still be largely positive but the support of strategic programmes would be needed to maximize the positive effect.

Geological Survey of Estonia proposes that drillings at possible sites of the tunnel route be made in the next stage of studies, in order to study the physicommechanical, geotechnical, and hydrogeological properties of Quaternary deposits.

## 7 Future technological development

It is very likely high-speed rail transport will undergo rapid technological development during the planning and building of the railway tunnel. During the FinEst Link project, several companies presented their alternative proposals for the railway. Unfortunately, most of them were only new technological ideas that have not been operationally tested yet and therefore they cannot be evaluated.

The most interesting proposal was the Maglev train, an ultra-high speed train two to three times faster than conventional high-speed rail that can transport up to 20 000 passengers per hour. A Maglev train solution is already in operation for example in Shanghai. According to the proposal, Maglev train costs would be 40% less than the overall costs of high-speed rail (due to the requirement of only one tunnel). Furthermore, it is a fully automated self-driving system. The system can handle car shuttles and freight in standardised airline containers on specialised trains. However, cargo transports would not be possible and the trains could not be connected to national railway networks and Rail Baltica. Heavy freight and lorries would be transported by the ferry system.

The Maglev train and other potential technological solutions should be studied further during the next phase.

A train ferry option has also been evaluated. There have been several attempts on the train ferry connection in the past years between Finland and Sweden and Germany. All train ferry traffic has since then been stopped due to its low economic competitiveness. The train ferry option is also a clearly more time-consuming option when compared to the tunnel regardless of what exact technical solution would be applied with the tunnel.

## 8 Land use planning

The influence of the Helsinki–Tallinn tunnel on the urban structure are much larger than just the cities of Helsinki and Tallinn. Therefore, the tunnel planning needs to be taken into consideration in various stages of land use planning on both sides of the gulf. Environmental assessment is required in all of these phases. Another open question influencing the land use planning is the decision on the exact location of the tunnel as well as location of the exit and station points.

On the maritime side there is a new type of planning called Marine Area Plans. The purpose of marine area plans is to promote the sustainable development and growth of the various uses of marine areas, the sustainable use of natural resources and the achievement of a safe state for the marine environment. A marine area plan is needed in particular because of the artificial islands.

On the Finnish side, there is a reservation to the tunnel connection in the Uusimaa regional plan. The process of renewing the Uusimaa regional plan to extend up to the 2050 is presently underway. The next step of the Uusimaa regional plan will be to draw up a more detailed plan of the Helsinki region. The land use plan contains the tunnel option at the general level; the city plan is more precise. The artificial islands are not laid out in the land use plans at moment. The Helsinki general land use plan 2016 includes the tunnel. An airport track has also been laid out in the general plan. A new underground land use plan for 2020 is also under preparation now. The north-west part of the Vantaa master plan 2007 includes the airport area and its surroundings. The airport track will also be included in the new Vantaa master plan. In Tuusula a general plan of Ruotsinkylä-Mylyskylä should concern the FinEst link areas above ground. That new track alignment connecting the tunnel rail to existing Finnish railway infrastructure should be in several Nurmijärvi general plans.

On the Estonian side, the tunnel corridor is added to the Harju County Plan in 1999 and it runs from Viimsi peninsula (Äigrumäe) to Sõjamäe. The need to reserve the tunnel corridor in the Harju County Plan is stated in Estonian national plan "Eesti 2030+" established by the Government of the Republic of Estonia. The perspective railway corridor is added in 2003 to the general land use plan of Jõelähtme Municipality, to the general land use plan of Maardu town in 2008 and to Viimsi Municipality's general land use plan in 2000. Although many municipalities have tunnel corridor in their land use plan there still is a need to prepare National Designated Spatial Plan conducted by Estonian Ministry of Finance. In Rail Baltica Plan (in accordance with Harju County Plan) foresees possible connection with Rail Baltica and tunnel railway near Iru intersection. Tallinn General Plan has no direct linkage with Tallinn-Helsinki

tunnel, however discussions have been started to move Ülemiste cargo terminal away and provide possible tunnel opening or train depot in Ülemiste area.

## 9 Legal framework

The legal aspects of an international megaproject such as the Tallinn tunnel are complex. The legal considerations vary from administrative processes to contractual law. In addition to legislation considering construction and infrastructure (such as various permits and contracts), there are also matters of international law to be considered (such as taxation, water and land use rights).

Furthermore, one must in bear in mind the EU legislative framework, since EU law applies to several aspects of the project from environmental impacts to the role of the public sector. Some of the legal aspects are of an administrative nature; these also involve the possibility of appeals, and the time they require need to be taken into consideration. A possible benchmark could be the case of the Channel Tunnel and the legislative arrangements used. In addition, taxation solutions could have a major impact on the project financials.

## 10 Considerations on organizing the future work

The tunnel is an extensive construction project. The scale of the project requires the ability to develop innovative funding and financial solutions. Moreover, its operation requires special expertise and service capabilities. A strong stakeholder management and open public discussion are also required during the course of the project.

The FinEst Link feasibility study proposed different models for organising the next phase, and more options were studied in the Ad Economics and McKinsey reports. It is possible that the next phase will be driven by either the private sector or the public sector, depending in particular on the interests of private-sector actors.

To implement the tunnel and take responsibility for its operation, safety and maintenance, the establishment of a tunnel preparation organisation for the next two to four years is proposed.

The purpose of the tunnel organisation would be to:

- Carry out next-stage studies, in particular economic, geological and environmental studies.
- Carry out detailed land use and tunnel planning with the relevant public authorities.
- Carry out discussions at the EU level and promotion of the project's inclusion in the TEN-T network.
- Prepare materials needed for making decisions and obtaining permission for the tunnel.
- Prepare the financing model and financing structures.
- Take responsibility for stakeholder management and communications.

The organisation would need full time core team to lead concepting phase consisting of about 5-10 resources, with external expertise utilized on need-to basis. It is important to ensure a balanced representation from both Finland and Estonia. An advi-

sory board or other similar structure should guide the organisation, with representatives from all of the major stakeholders. The personnel demand multiplies once the project proceeds.

Permissions and authorisation of operation requires co-operation with a large number of stakeholders, including authorities, citizens, real-estate and infrastructure companies, service providers, firms, cities, regional councils, public entities, associations, environmentalists, international bodies, and states. Therefore, stakeholder representation and co-operation on a stakeholder committee, or even specified taskforces, will be required. Moreover, an alliance partner structure should be established in order to align the interests of all major stakeholders, such as cities, construction and project companies and other infrastructure providers as well as the operating company.

Co-operation and alignment with other projects affecting the Helsinki–Tallinn tunnel, such as Rail Baltica, the Arctic Railway and the Silk Road Initiative – should also be handled. The tunnel would increase the potential of these other projects and vice versa. The tunnel solutions should also be taken into consideration when planning transport infrastructure in general. In addition, the effect of transport system planning on all the relevant cities and regions needs to be investigated further in order to ensure smooth and seamless transport connections.

The funding required for the next planning phase is estimated to be around 10–16 million euros for the for organisation and studies over the next 3-4 years, of which approximately 2 million euros per year for the management of the project.

Even though in a situation where the project is driven by the private sector, the role of the public sector is fundamental over the project life cycle. Large infrastructure construction processes have traditionally been led by the public sector. This might not be the most agile and cost-efficient structure in all cases, and other possibilities should also be examined further.

In order to minimize the direct and indirect costs of the project to governments, the alliance approach could be used. Typically, the alliance model applies a cross-organisational communication and decision-making model in order both to ensure the commitment of all the relevant organisations and to minimize communication and other administrative costs. In the tunnel case, the alliance model would be even cross-cultural as representatives from both countries, Estonia and Finland, should be involved. In addition, participants from cities, international bodies and other relevant institutions should be included.

The role of the governments in a private-led model would be to support, give commitment, facilitate, monitor, authorise and accept. Even this would require a strong and clear organisation on the side of the public sector, so that it could respond on behalf of public sector initiatives and coordinate activities falling into the sphere of the public sector as well as preparing the necessary political decision making.

It is proposed that the two states, by the end of 2018, should make more concrete decisions on the state-level organization of and involvement in the project, taking into account the considerations presented above. A strong public-sector network is a prerequisite for bringing the project forward. The public-sector activities may vary in form, depending on the private sector's interest in the project.



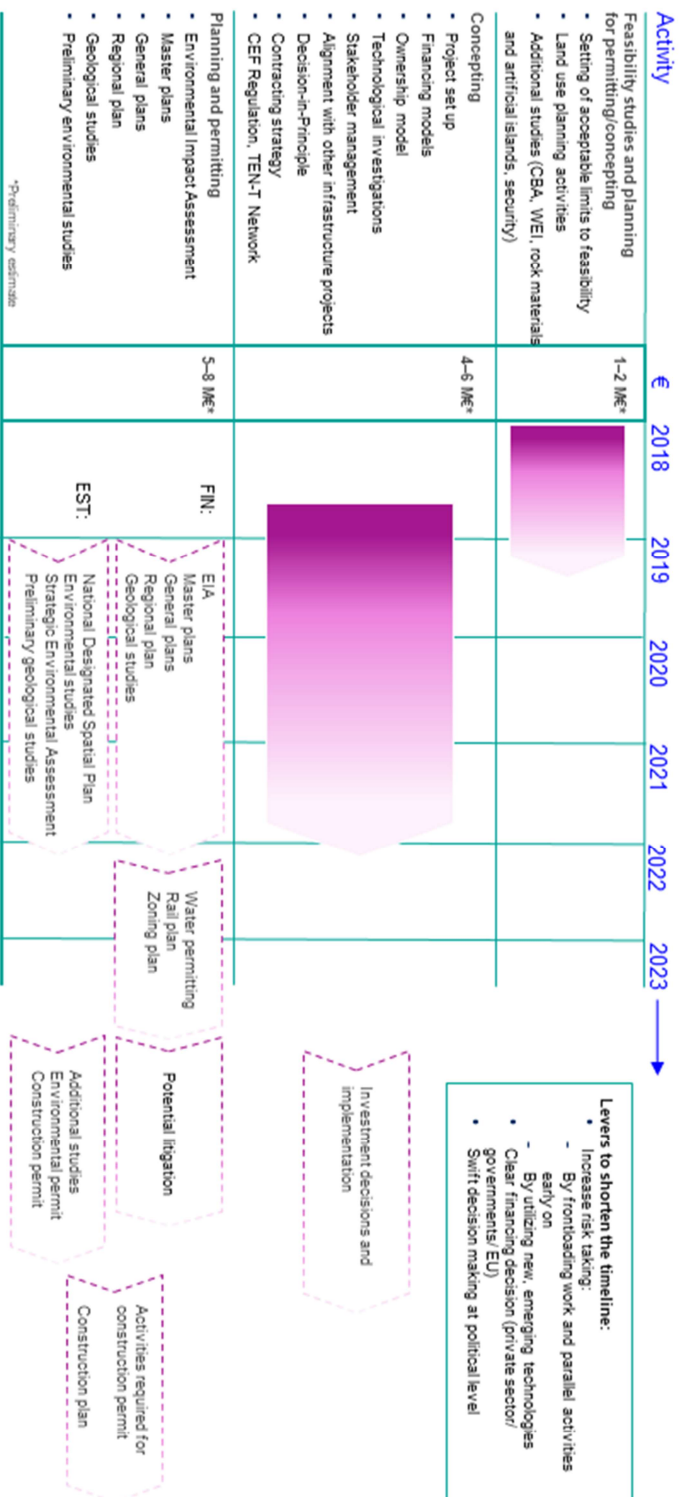
# 11 APPENDIX

## 11.1 APPENDIX I A list of stakeholders and consultants met

- Ad Economics (Atso Andersen)
- The Baltic Connector Project (Priit Heinla)
- The Estonian Ministry of Environment (Rainer Persidski)
- Estonian Ministry of Finance (Tiit Oidjärv, Anni Konsap & Heddy Klasen)
- Estonian Navy (Risto Saimla)
- FinEst Bay Area project (Peter Vesterbacka & Kustaa Valtonen)
- The FinEst Link feasibility study team (Malla Paajanen & Kari Ruohonen)
- The Finnish Ministry of Environment (Petteri Katajisto, Seija Rantakallio, Ulla Koski & Lasse Tallskog)
- The geological team of the FinEst Link project (Kimmo Alhi, Ossi Ikävalko, Kirsi Melander, Risto Niinimäki, Mika Räisänen & Ilkka Vähäaho)
- Geological Survey of Estonia (Alvar Soesoo, Kalev Kallemets)
- Helsinki EU office (Krista Taipale)
- Inspira Ltd. (Jon Forssell & Matias Vitie)
- The land use plan experts from relevant cities: Marko Härkönen (Tuusula), Essi Leino (Espoo), Rikhard Manninen (Helsinki), Anita Pihala (Nurmijärvi), Mari Siivola (Vantaa) & Merja Vikman-Kanerva (Helsinki-Uusimaa regional Council).
- The Finnish Transport Agency (Heidi Mäenpää, Juha Kansonen, Pekka Petäjaniemi, Elisa Sanasvuori & Esa Sirkiä)
- The Union of Harju County Municipalities (Joel Jesse & Kaarel Kose)

# 11.2 APPENDIX II An Initial timeline

## The Helsinki–Tallinn tunnel project: the initial activities and timeline for 2018 onwards



## 11.3 APPENDIX III Connecting Europe Facility funding

The European Commission has published a proposal for a new multiannual financial framework (2021-) on May 2, 2018 and the Communication on the Connecting Europe Facility, CEF Regulation for the next funding period is expected to be published in June 2018 in which the frames for the next funding period starting in 2021 will be prepared. The decisions will be taken in 2020. The current regulations on TEN and CEF funding were given in December 2013.

The Trans European Transport Network (TEN) is described in the TEN Guidelines. The TEN-T network is a two-tiered transport network consisting of a core network and a comprehensive network. The core network is due to be completed by the end of 2030 and the comprehensive network by the end of 2050. The CEF Financial Regulation outlines the principles for granting financial support to the TEN in transport, energy and telecommunications infrastructure projects.

In the transport sector the national contribution is usually 80%. On the other hand, the Cohesion Envelope may have a national contribution of far less than 20%. For project planning, CEF funding can be up to 50%. The CEF Regulation lists nine core network corridors and horizontal priority areas for which support is available. The European Union's financial frameworks determine how much CEF funding is available. The transport sector's budget for the 2014-2020 financial period is € 24.1 billion, of which € 11.3 billion is earmarked for cohesion countries. More than 90% of the current funding period is already committed.

In Finland the two parts of the corridors in Finland are, the North Sea – Baltic Sea Corridor (the corridor covers only the ports of Helsinki and the airport) and the Scandinavian-Mediterranean Sea Corridor (this includes the section from the Russian border - Hamina/Kotka - Helsinki - Turku/Naantali). CEF support can only be granted for rail projects, the projects of the Motorways of the Seas, ERTMS, SESAR, innovative and ITS projects. Horizontal priorities include innovative management and services (various modes of transport), and new technologies and innovation.

Investments in the TEN-T network have traditionally been direct granted financial support. However, grant is not enough for all projects and therefore the Commission wants to mobilize other funding means for transport projects using the EU funding leverage. For this purpose, in 2017, the Commission has launched the so-called blending funding. Direct grant is supplemented by an equivalent amount of loan financing. The maximum amount of grant is 20%. In order to receive EU support, the applicant must receive the same amount of other, usually private, loan financing. Any other

funding, including private financing or EFSI funding, may be eligible for financing the projects. EFSI (European Fund for Strategic Investments) is a fund established by the European Investment Bank and the European Commission, from which you can apply for funding for economically viable projects. The funding to be granted is against payment. Funding can be, for example, different financial instruments or guarantee arrangements. Funding may also be given for projects with a higher level of risk than projects funded by the European Investment Bank. The aim in EFSI is to increase the volume of private investment, accelerate economic growth and improve employment in Europe. The overall objective is to start the EUR 315 billion investment in Europe by 2020. There is a constant need to find solutions for innovative models for combining public and private funding.

Even though the Helsinki-Tallinn tunnel or the Arctic railway connection are not part of the TEN-T core network or its core network corridors and cannot be used for TEN-T funding, they are indirectly linked to the MFF. Even a plan on the Arctic Ocean Railway will increase the European dimension of the extension of the North Sea-Baltic Sea corridor to Tornio, as the route would be the connection of the TEN-T network to the Arctic Ocean ports. The Helsinki-Tallinn tunnel project has a parallel effect. This situation will remain the same at least until the entry into force of the new TEN Guidelines (around 2027).

Finland's main objective is to increase the share on CEF funding. The challenge for the current funding period has been the lack of suitable projects. In the forthcoming financial framework negotiations, in a situation, where the overall level of the instrument is declining, Finland is seeking a relatively higher yield from the Connecting Europe Facility. The policy line approaches the question of how the gap, related to the exit of the UK, is replaced in the EU budget. The EU Ministerial Committee supports the allocation of financial support to cross-border transport networks, the integration of various parts of the network and the elimination of bottlenecks, the reduction of negative environmental impacts, and intelligent transport and innovative projects.

The Interreg Baltic Sea Region Program 2014-2020 supports integrated territorial development and cooperation for a more innovative, better accessible and sustainable Baltic Sea region. Partners from countries around the Baltic Sea work together in transnational projects on common key challenges and opportunities. The Program is implemented in the EU member states Denmark, Estonia, Finland, Latvia, Lithuania, Poland, Sweden and the northern parts of Germany as well as in Norway and the northwest regions of Russia. The Program is funded by the European Union and approved by the European Commission. Projects have to involve at least three partners from three different countries from the Program area. Total project budgets typically range between EUR 1.5 and 4.5 million for seven or more partners working together for two to three years. One of the investment priorities is interoperability of transport

modes. It aims to increase interoperability in transporting goods and persons in north-south and east-west connections based on increased capacity of is also a priority which aim to improve the accessibility of the most remote areas and regions whose accessibility is affected by demographic change based on increased capacity of transport actors.