

# Helsinki Airport Rail Corridor

Spatial Development Potential, Accessibility Benefits and International Connectivity

Final Report | January 2018





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# Summary

#### **Spatial impact assessment**

This study provides a spatial impact assessment of a proposed underground rail connection – the Helsinki Airport Rail Corridor - from Helsinki city centre to the International Airport (Scenario 1). In addition, the study examines the link between the proposed new rail corridor and the Helsinki-Tallinn rail tunnel research carried out by FinEst and the possible implications it may have for the Airport link (Scenario 2). The Airport Rail Corridor analysis was undertaken as part of the EU Interreg funded NSB CoRe (North Sea Baltic Connector of Regions) project to improve sustainable accessibility for the Eastern Baltic Sea Region. The NSB project is coordinated by the Helsinki Uusimaa Regional Council.

The Helsinki Airport Rail Corridor study primarily focuses on the impact at the capital region scale. It acknowledges the impact on decreasing travel times from the Airport to the city centre by as much as a half to 15 minutes.

The Airport Rail Corridor will also have an important role to play at the national level because it will connect the Helsinki International Airport with Finland's major cities via the main track. However, the impacts for the national level are not studied in detail in this study. The new rail corridor will connect the city centre directly with the Airport via the Pasila station in comparison to the Circle Line (slide 16) that currently transverses around the capital region. A future scenario includes the possibility that the Airport Rail Corridor would join up with the proposed Helsinki-Tallinn tunnel connecting to mainland Europe.

The impact of the new Airport Rail Corridor at the capital region level is based on modelled changes to the possible increase in property values as a result of improved connectivity.

#### **Connectivity and agglomeration benefits**

In scenario 1, the major improvement in connectivity is at the Airport station zone, where connectivity is expected to increase up to 13%. The increased connectivity provides benefits to the surrounding area of the Airport and its neighbour, Aviapolis, so long as the internal transport system is upgraded accordingly. However, the impact is likely to be smaller for the station zones around Pasila and the Helsinki Central Railway station as they are already significant national and regional train terminals.

In scenario 2, the improved rail infrastructure is expected to bring an added 4 to 5% average increase in connectivity in Helsinki and Vantaa. The benefits to be derived from the increased connectivity created by the new Helsinki Airport Rail Corridor link together with the Helsinki-Tallinn tunnel will be highest close to the stations: within a radius of 400 metres +10% in the city centre, +7% in Pasila, and +18% at the Airport. For Tallinn, the Ülemiste station area, where the new international transport hub will be located, connectivity is expected to improve attractiveness in terms of offices, services, as well as aviation and logistics.

For Tallinn and its city-region, the Helsinki rail tunnel would bring a fast international connection to Helsinki city centre, the Helsinki Airport and surrounding business areas. The Helsinki Airport Rail Corridor combined with the rail tunnel to Europe via Tallinn would merge both city-region's commuting areas into a single framework. This combination would improve Rail Baltica's versatility in respect of its transport network.

In addition, in both scenarios (1 and 2) the vitality of cities situated along the main track at the national level, including the cities of Tampere as well as Lahti, profit from increased accessibility to the Helsinki international Airport.

#### **Real estate values**

In scenario 2, he Helsinki Airport Rail Corridor combined with the potential from the Helsinki-Tallinn rail tunnel will create superior connectivity and will likely raise real estate values in and around the new station growth zones. The anticipated rise for Helsinki city centre and surrounds would be 5% and for Pasila some 3.5% increase, whilst the Airport could expect gains of as much as 9%. The price levels represent higher levels of attractiveness, which in turn promote increased densification and more efficient land-use. The value increase in the city centre, Pasila and the Airport may altogether be in the region of €600-700million. In scenario 1, the real estate values will increase mainly at the Airport station zone.

#### **Development potential**

Development potential in the capital region is greatest when the Helsinki Airport Rail Corridor and the Helsinki-Tallinn tunnel in scenario 2 are combined. This is due to improved attractiveness which increases connectivity of the main land-use impact zones. In addition, for both scenarios, the proposed new rail tracks for inter-city trains (so-called 5th and 6th tracks) may no longer be required. It should be noted that the land-use benefits of the main track did not form part of the study.

#### **Travel time**

It is also the case, that there are significant benefits in travel time for the combined rail link and tunnel in scenario 2. For example, building the Airport Rail Corridor but using the existing ferry connections, the anticipated travel time in scenario 1 is between 3 hours 15 minutes and 4 hours 15 minutes from airport to airport. Scenario 2, on the other hand, can achieve the same distance in 50 minutes.

#### International competitiveness

In addition to the modelled regional impacts, based on expert interviews, the Airport Rail Corridor together with the Helsinki-Tallinn tunnel is very important for the future of Helsinki city-region's international competitiveness.

# **OUTLINE OF REPORT**



Helsingin kaupunki – 7

# Introduction

### – The Purpose of the Airport Rail Corridor Study

- A rail corridor is not simply a capital investment. It offers competitive development potential. Helsinki is growing, and fast. Spatial planning is about managing change and ensuring sustainable growth towards a spatially cohesive, and economically and socially balanced city-region.
- The Airport rail corridor study is a key spatial and economic investigation of the Helsinki capital region that aims to evaluate the spatial development potential and economic agglomeration benefits of a new direct railway link connecting Helsinki International Airport and Helsinki city centre. The study aims to provide a basic understanding of the potential this corridor axis may bring and the accessibility for the capital region.
- In doing so, the study structure is linked to the integrated framework evaluation of connecting Helsinki and Finland by rail tunnel via Tallinn to mainland Europe. In this context, this study forms a part of the wider EU Interreg V NSB CoRe project to improve sustainable accessibility in the Eastern Baltic Sea Region for passenger and freight transport. The project also supports the TEN-T policy on regional development.
- · The corridor is central to the commitment of creating a common Helsinki city-regional space to help solve common problems for the future metropolis. The Airport Rail Corridor study analyses the impact the rail corridor may bring in terms of land-use development potential and to the city-region's real estate market by 2050. The study takes into account the significance of the interrelationships and interdependencies between the Helsinki Airport Rail Corridor and the Helsinki-Tallinn tunnel research by FinEst. The FinEst Link Feasibility Study is parallel to the Airport study, including comprehensive analysis of wider economic impacts of the Helsinki-Tallinn tunnel. This study also gives an insight into local land-use, attractiveness and other spatial development potentials of key rail traffic nodes in Helsinki city centre and Pasila, but also Ilmala, Käpylä and Oulunkylä.

- This analysis fits into the long-term strategy for the integration of the city and its region taking account of the EU Territorial and Urban Agendas. Both the Helsinki City Plan and forthcoming Regional Plan support the need to urbanise the city and surrounding municipalities through greater densification, which in turn aims to achieve a more compact city-regional polycentric structure.
- The study aims to show that additional public rail infrastructural investment in the form of a new Airport Rail Corridor aligned with the Helsinki-Tallinn rail tunnel will improve connectivity within the city and its metropolitan region and improve the city-region's international competitiveness. In turn, this is likely to bring tangible benefits that are considered essential if Helsinki is to maximise its spatial development potential and achieve greater agglomeration benefits internationally. The new rail development axis will act as a platform strategy to combat urban sprawl and achieve EU aims to render urban mobility more sustainable.

# Baseline

- This report forms part of the Helsinki-Uusimaa Regional Council's project for the EU Interreg NSB CoRe to improve transport connections and landuse development opportunities for the Eastern Baltic Sea Region's TEN-T core network. The NSB CoRe consists of four Work Packages, of which the Airport Rail Corridor belongs to WP4 for spatial planning.
- The study is based on three scenarios. These were used to assess the opportunities the Airport Rail Corridor may bring in terms of labour market agglomeration benefits and spatial development with regard to the key local areas Helsinki city centre, Pasila and the Airport.
- The study addresses also the additional benefits to be gained from linking the new Airport Rail corridor with the Helsinki-Tallinn rail tunnel and Rail Baltica connections to mainland Europe and the wider TEN-T network. International connectivity to the city-region is likely to be significantly enhanced by making a direct corridor link from Europe to the Airport.
- The study assumes that the TEN-T transport strategy for Rail Baltica is implemented by 2026. The study primarily focuses on passenger rail traffic to the Airport and excludes rail freight.

# **Project team**



#### Steering group

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Representatives from Tuusula municipality, Helsinki-Uusimaa Regional Council and FinEst Link project, as well as additional experts from the City of Helsinki, have taken part in the project workshops.

English version translation and text by Douglas Gordon in cooperation with Susa Eräranta, Mikko Jääskeläinen, Christina Suomi and Sakari Grönlund.



# Methodology

	Several <b>workshops</b> were organised to discuss the pros. and cons. and impacts of the Helsinki Airport Rail Corridor development on different spatial levels.			
	A land-use game and a land- use potential development framework were utilized to facilitate discussions and identify land-use agglomeration impacts.	Different <b>analyses and</b> <b>modelling</b> were used to study the impacts of the Helsinki Airport Rail Corridor spatial development in terms of connectivity.	Local level (Pasila/Ilmala	
<b>1 June 2017</b> Start	Representatives from various municipalities in the city- region, Helsinki-Uusimaa Regional Council and FinEst Link project were invited to join the workshops	Connectivity analysis was carried out in order to find potential development locations that would be best served by sustainable transport	and Käpylä/Oulunkylä -axis) land-use impacts were illustrated by making a <b>3D-model</b> of their land-use development potential.	<b>31 Janı</b> Report

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A common **understanding of the** study area, its characteristics and strengths and weaknesses on different spatial levels was compiled based on baseline data and workshops. The focus for further study was on areas where potentially significant benefits could be achieved.

The results of quantitative assessments were complemented with expert interviews on transport and land-use development, both in Finland and Estonia (see Annex 1).

The analysis concluded with **significant** impacts on land-uses, accessibility, land value, and the most important differences between alternative scenarios.

# OBJECTIVES, FORECASTS and SCENARIOS



# International, National and Regional Corridors



# **Objectives and Analysis**

- The study focuses on how the Helsinki Airport Rail Corridor will impact upon the capital region's connectivity, spatial attractiveness in terms of real estate values, land-use development potential and travel time.
- Scenario 1 focuses on impacts at the capital region level for the Helsinki Airport Rail Corridor.
- Impacts of the Helsinki Airport Rail Corridor combined with the Helsinki-Tallinn tunnel are studied in scenario 2.
- Impact study areas are as follows:
  - · Capital region level (Helsinki and Vantaa)
  - · City level (City of Helsinki)
  - Local level (Pasila/Ilmala and Käpylä/Oulunkylä -axis).
  - Existing rail network with Pisara extension Metro
  - Planned light rail tram network
  - •••• Airport Rail Corridor and Helsinki-Tallinn tunnel



# **Helsinki Airport Rail Corridor** in a Nutshell

The Helsinki Airport Rail Corridor is a new fast connection from Helsinki city centre to the Helsinki International Airport. It joins the main track further north, which is Finland's most significant railway corridor. Nearly all inter-city trains will go via the Airport. The new Airport Corridor will be connected to Rail Baltica via the Helsinki-Tallinn tunnel.

The Helsinki Airport Rail Corridor (mainly for inter-city trains) stations at the Central Railway Station and Central Pasila are at ground level, whilst underground from Pasila to the Airport.

Airport Rail Corridor and Helsinki-Tallinn tunnel stations

To other Finnish cities and

Helsinki Airport Rail Corridor tunnel

Helsinki Airport Rail Corridor at ground level

Helsinki-Tallinn tunnel



# **Traffic Volumes**

#### Year 2010

- Based on the study of inter-city rail connections to Helsinki Airport, 2010\*, the main rush hour times are weekday mornings towards Helsinki.
- There are four inter-city trains and six commuter trains per hour on the main track between Kerava Pasila and Helsinki city centre. In addition, there is a frequent city train service available using other tracks.

### Helsinki Airport Rail Corridor capacity and traffic volumes (forecast 2050):

- Lentoradalla on mahdollista liikennöidä 10 junaa tun-Helsinki Airport Rail Corridor capacity is 10 trains/ hour in both directions.
- In 2050, the Helsinki Airport Rail Corridor will accommodate nine inter-city trains on weekday mornings every hour to the city centre.
- Based on a 2050 forecast, the Helsinki Airport Rail Corridor is likely to have a significant effect on rail users to Helsinki Airport. It is likely that during the morning rush hour there will be 3,600 passengers arriving at the Airport from all directions, i.e. from the city centre and also from the north. Simultaneously, there will be 1,500 passengers leaving from the Airport to the north and the city centre.

\* Study on the long-distance rail connections to Helsinki Airport. Finnish Transport Agency, Traffic System's Department. Projects of the Finnish Transport Agency 2/2010. The FTA will carry out more detailed studies on traffic and traffic volumes in 2018.

# Helsinki Airport Rail Scenarios 2050

#### Scenario 0+

Scenario 1

Helsinki Airport Rail Corridor is not built. All trains including long distance, commuter and local trains use the main track. Additional tracks for inter-city trains have been built on the main track corridor. Helsinki Airport Rail Corridor is implemented and located at ground level between the Helsinki city centre and Pasila. It will deviate from the main track and enter a new tunnel to the north of Pasila station. From there, the new railway tunnel will continue underground to the Helsinki International Airport. The tunnel continues from the Airport northeast where it merges with the main track. However, in this scenario, the Helsinki-Tallinn tunnel has not been built.

#### **Scenario 2**

Both the Helsinki-Tallinn tunnel and the Helsinki Airport Rail Corridor links are built. The Helsinki-Tallinn tunnel runs at underground level right through to the Airport. However, there will be a joint tunnel for both links from Pasila to the Helsinki International Airport, whereupon it merges with the main track at ground level to the north of the Airport



**Pisara**, the city rail loop is an underground connection for commuter trains. It will have three stations undergound between Pasila and the Central Railway Station. Programmed to be implemented 2016–2025 in the Helsinki Region Transport System Plan HLJ 2015.

HELRA aims at enhancing functionality of Helsinki (central) railyard. The project will be finalised in the year 2020.

The study is based on information available in 2017, thus not taking any position with regard to the location of the Helsinki Airport Rail Corridor.

# Helsinki Airport Rail Corridor and Helsinki–Tallinn Tunnel

- Assuming the Helsinki-Tallinn tunnel is built, it would be feasible to combine both the Helsinki Airport Rail Corridor tunnel from Pasila with the Helsinki-Tallinn tunnel that goes all the way underground to the Airport. Both tunnels could be incorporated within the same tunnel structure.
- Helsinki-Tallinn tunnel underground stations in Helsinki will be located at Central Railway Station, Pasila and Helsinki International Airport.



### Helsinki Airport Rail Corridor and Helsinki–Tallinn tunnel (scenario 2)

# STUDY AREA ANALYSIS and KEY ISSUES



# **Connectivity Benefits 2050** International Level

**Helsinki Airport Rail** Good international, national and regional **Corridor and Helsinki**connectivity is a key factor in maintaining **Tallinn tunnel improve** competitiveness for city-regions. polycentric and network High quality transport networks create development of major cities agglomeration benefits which in turn promotes and city-regions in the economic development. **Baltic Sea Area. Connectivity benefits have** Helsinki Airport Rail Corridor and Helsinkia positive impact on spatial development for Helsinki Tallinn tunnel strengthen the economies of and its region. the Nordic and Baltic countries and enhance European unity as well as providing greater Cohesion within the EU's Pentagon core. Helsinki Airport has a strong role in the Baltic Helsinki Airport Rail Corridor can be connected Sea Area. International with the future HST (High Speed Train) to St. flights serve not only whole Petersburg. of Finland but also Estonia Helsinki andSt. Petersburg. St. Stockholm Tallinn Helsinki Airport is highly Petersburg important for international transit traffic between **Europe and Asia.** Berlin Rail Baltica Helsinki is a competitive and growing city-region with good connectivity to the Baltic countries and **Central Europe via Helsinki-Tallinn tunnel and Rail** Baltica. 1 000 km 250 500 750 0

Transport network map: Trans-European Transport Network (TEN-T) Core Networks.

# Study Area Analysis and Key Issues 2050

Helsinki Capital Region Level

- By 2050 in the whole Helsinki city-region the number of inhabitants will have grown from 1.4 to 2.0 million and workplace numbers from 700,000 to more than one million.
- A significant part of the increase in population and workplaces outlined in the MAL 2019 city-region study on spatial planning, housing and transport will be located along the Helsinki Airport Rail Corridor.
- The **Helsinki city-region's role** as the capital of Finland will be enhanced through better international and domestic connectivity to Europe and Russia.
- The role of Helsinki city-region as an economic engine of Finland will be strengthened.
- The Helsinki Airport Rail Corridor together with the Helsinki-Tallinn tunnel will increase the attractiveness of not only their station zones but also other centres in the transport network. It is also possible some station zones within the region may lose their attractiveness while the Helsinki Airport Rail Corridor and Helsinki-Tallinn tunnel station zones strengthen.



- The circles on the map are based on growth analysis of centres in the Helsinki city-region as analysed by the MAL 2019 study (Land-use, housing and transport 2019).
- The main centres of the Helsinki Airport Rail Corridor impact area, including also some other centres shown on the map, have been jointly identified by the Helsinki city-region municipalities (MAL).
- All inhabitant and workplace numbers have been rounded up from the 2015 and 2050 projections on population and workplaces within a radius of 1,500 metres.
- The planned future light-rail tram network is shown on the map in green.



#### Change in inhabitants and workplace numbers for $2015 \rightarrow 2050$

### Helsinki Local Level



Potential increase of inhabitants and workplace numbers (2015–2050) at the local level is based on information derived from MAL 2019 study.



# IMPACT of INCREASED CONNECTIVITY on HELSINKI and CAPITAL REGION



# **Connectivity Analysis**

The impact analysis of labour market agglomeration potential is based on workforce and workplace connectivity analysis.

The study is based on the MAL 2019 study of development potentials for the Helsinki city-region for 2050. In Tallinn, the estimates are derived from the FinEst Link Feasibility Study (0,6 million inhabitants and 0,4 million workplaces).

**Method: Travel time, workforce and workplace connectivity** First, travel times between all squares\* were calculated for each of the scenarios. The analysis also includes waiting and transit times. Then, the number of inhabitants and workplaces were weighted by the appropriate coefficient for all squares. Weights were derived from the function illustrated below. The process gives more weight to functions that are closer to each location. Travel times greater than 2 hours were excluded.

The method gives an approximation of the likelihood of the volume of commuting as a function of travel time. The distance function is based on the analysis of commuting statistics for the Helsinki city-region commuting area (Statistics Finland). The uncertainties and limitations of the analyses and modelling are described more in detail in Annex 6.

\* The study area is divided into GIS squares of 250 x 250 m.



# **Impact on Travel Times**

### Scenarios 1 and 2

Modelling includes the main daily commuter zone of Helsinki and Tallinn cityregions.

Travel time zone illustrations are in relation to Pasila, one of the central nodes in the city-region.



- The Helsinki Airport Rail Corridor (scenario 1) would open new and faster connections for most of Finland's cities and regions using the main track to the Helsinki Airport. Travel times from Helsinki city centre would nearly halve whilst from the north they would shorten by approximately 10 to 20 minutes.
- Implementation of both the Helsinki Airport Rail Corridor and the Helsinki-Tallinn tunnel (scenario 2) would have the greatest positive impact on city-regional connectivity. The impact would be due to much faster travel and convergence of Helsinki and Tallinn economic areas and labour markets.
- From the point of view of Tallinn and Estonia, the Helsinki-Tallinn tunnel would provide a fast connection to Helsinki International Airport, as well as Pasila and Helsinki city centre. Many other major business areas in Finland benefit from this effect too.

### Helsinki Airport Rail Corridor and Helsinki–Tallinn tunnel (scenario 2) stations and travel time estimates between them



### Summary of travel times in scenario 1

### Summary of travel times in scenario 2

Estimated time from Airport to Airport

Estimated time from airport-to-Airport



### Accessibility Impacts Scenario 1



- The Helsinki Airport Rail Corridor scenario 1 creates significant increases in connectivity for the Airport. The results show that within a radius of 400 m from the station the increase in connectivity is up to + 13 % (+120,000 inhabitants/workplaces). The increase in connectivity is smaller the further away from the station. A slight increase of connectivity for workplaces will also happen in Pasila and the city centre.
  - Improved rail connections along the Helsinki Airport Rail Corridor will increase connectivity at the Airport as the travel time to Helsinki city centre and Pasila residential and business areas shortens. The increase in accessibility will be dependent upon the travel patterns of Inter-City, regional and local trains to the Airport using the new Rail Corridor link.
  - The impact is marginal in Pasila and the city centre because these two stations are already major long distance rail terminals.

The maps show how many thousands more inhabitants and workplaces are accessible with public transport as a consequence of the Helsinki Airport Rail Corridor.

The darker the squares, the more the attractiveness increases in terms of workforce and workplace accessibility compared to base scenario 0+.

### Scenario 2



- The Helsinki Airport Rail Corridor together with the Helsinki-Tallinn tunnel (scenario 2) significantly enhance both workforce and workplace connectivity. In the station zones (radius = 400 m) the increase in connectivity is +10 % in the Helsinki city centre (+135,000 inhabitants/workplaces), +7 % in Pasila (+100,000 inhabitants/workplaces), and +18 % at the Airport (+165,000 inhabitants/workplaces).
  - In general, the increase in connectivity in the Helsinki city centre is +7–9 % (+100,000 inhabitants/workplaces) and in Pasila-Ilmala +5–6 % (+75,000 inhabitants/workplaces). At the Airport, in order to harness the benefits of the increased connectivity within the broader Aviapolis area, local accessibility needs to be improved.
- At the city level in Helsinki and Vantaa, the Helsinki Airport Rail Corridor and Helsinki-Tallinn tunnel

The maps show how many thousand more inhabitants and workplaces are accessible with public transport as a consequence of Helsinki Airport Rail Corridor and Helsinki-Tallinn tunnel.

(scenario 2) together enhance significantly workforce and workplace connectivity on average by 4-5 % (+40,000-50,000 inhabitants/workplace).

• The connectivity increase in scenario 2 is due to much faster travel time between the city centre and the Airport and the convergence of inhabitant and workplace potentials from Tallinn due to fast connections to and from Tallinn.

# **Impact on Real Estate Values** Scenarios 1 and 2

#### **Connectivity benefits:**

- Helsinki Airport Rail Corridor and Helsinki-Tallinn tunnel together in scenario 2 enhance connectivity at the station zones (radius = 400 m) significantly:
  - Helsinki centre +10 % increased connectivity
  - Pasila +7 %
  - Helsinki Airport +18 %
- In the case of the Helsinki-Tallinn tunnel (scenario 1) not being built, connectivity increases significantly only at the Helsinki Airport.

#### Agglomeration benefits:

- According to other research results, the elasticity of real estate floor prices per m2 in relation to connectivity is approximately 0,5 in the capital region in that a 1 % increase in connectivity increases real estate value by approximately 0,5 %.
- A rise in prices is indicative of the increase in attractiveness, which in turn leads to greater densification and efficiency around station zones.
- Densification of station zones create preconditions for agglomeration benefits, which in turn lead to increased productivity.

### Real estate price level changes for the Helsinki Airport Rail Corridor station zones (r=400m) based on MAL 2019 land-use figures and transport network based upon scenario 2.

Zone	Volume floor-m <sup>2</sup> 2050	Price level change %	Change of value M€ (2016 price level)
Helsinki city centre	1,800,000	5	200–250
Pasila	1,000,000	3.5	120–150
Helsinki Airport	400,000	9	250–280

- Helsinki Airport Rail Corridor and Helsinki-Tallinn tunnel (scenario 2) will also impact positively by raising real estate price levels for example in Käpylä-Oulunkylä zone (near the main track), Ilmala and the Kalasatama-Vallila zone (southeast from Pasila station), but the impact will not be as high as around the Helsinki Airport Rail Corridor station zones.
- In the case of scenario 1 where the Helsinki-Tallinn tunnel is not built, there are likely to be significant changes in real estate values only in and around the Helsinki Airport station zone. In that respect, the change in real estate values at the Airport is close to the results as in scenario 2.
- A rise in real estate values generate benefits for property owners. In the Helsinki city-region, when municipalities approve planning permission for development, the local authority normally receives a share in the increase of property values through a form of agreements. The rise in value of existing and new real estate properties affect long term property tax revenues of the municipality in a positive way.

Real estate values begin to rise at the moment the market foresees a rail or metro project to be likely.

Impact on price levels tend to become higher after the investment decision has been approved and reaches near to final levels at the time the investment project begins to be implemented.

The adjustment of the real estate market will be seen for several years to come after the rail project's implementation.

## **Impacts on Land-use** Scenarios 1 and 2

- The Helsinki Airport Rail Corridor and the Helsinki-Tallinn tunnel (scenario 2) add significantly to the attractiveness through increased connectivity of the main land-use impact zones\* for creating new development potential. Development will also take place faster. The magnitude of impact will be highest in the station zones, but will also reflect positive changes in other parts of the metropolitan area, particularly along the trunk network as the level of service improves.
- The impacts in scenario 1 for development potential are fairly small, except in the Helsinki Airport zone where they are significant.
- Inter-city trains will use the new Helsinki Airport Rail Corridor track instead of the main track. This will free up capacity on the main track, thereby enabling more opportunities to improve regional and local train networks. The potential removal of additional track reservations could free up land for more housing alongside the main track (scenarios 1 and 2).
- The attractiveness of the cities situated along the main track and Lahti direct track is enhanced due to better connectivity to the Helsinki Airport. The growing city regions such as Tampere will benefit from the direct and fast rail connection to the Helsinki Airport (scenarios 1 and 2).

\* It is evident that changes in the attractiveness of other areas will take place than just those shown on the map.

Helsinki Airport Rail Corridor and the Helsinki-Tallinn tunnel will particularly enhance the development potential of the station zones with good connectivity to the new rail corridor. The total impact is dependent on how fast, convenient and attractive the connections to the trunk network and feeder traffic are. Helsinki Airport Rail Corridor is likely to create new travel routes and lines.

The land-use benefits of the Airport Rail Corridor will depend upon whether or not local trains also use the same track used by Inter-city trains as well as the frequency of trains.

Growth will concentrate on areas of high connectivity.

Zones of enhanced spatial development possibilities created by the Helsinki Airport Rail Corridor and Helsinki–Tallinn tunnel



# FinEst Link Feasibility Study Results

Impacts upon the City of Tallinn and Tallinn Region for Scenario 2

- FinEst Link Feasibility Study Draft Final Report 2017\* contains estimates of the wider economic impacts(in addition to direct user and producer benefits) to be gained from the Helsinki-Tallinn tunnel in respect of agglomeration benefits, labor market impacts and increased competition. The wider economic impacts are distributed as follows:
  - Tallinn Region: 38 %; rest of Estonia 2 % and Riga 1 %
  - Helsinki city-region 50 % and rest of Finland 10 %
  - In terms of the total economic benefits, 52 % consists of agglomeration impacts and 32 % is caused by workplace relocation.
- Connectivity changes due to the Helsinki-Tallinn tunnel are assessed in respect of property values in central locations\*\*:
  - In Tallinn, the impact is widely spread in the area of Ülemiste, Tallinn Airport and Tallinn city centre. Real estate values of property would generally rise by 5–15 % compared with the situation without the Helsinki-Tallinn tunnel being built.
  - In Helsinki the corresponding impact would concentrate around the station zones (radius = 400 m): property values would increase by some 3–5% in Pasila and Helsinki city centre, whilst the Airport could expect an increase of 10%.

### \* The Feasibility Study basic assumption is that Rail Baltica is built and in operation.

\*\* Note: the results of the FinEst Link Feasibility Study are not comparable with all respects of the Helsinki Airport Rail Corridor Study due to methodological differences.

# IMPACT at the LOCAL LEVEL





# Impacts per Different Users at the Local Level

- Based on expert analysis the Helsinki Airport Rail Corridor and Helsinki–Tallinn tunnel together in scenario 2 have significant positive impacts on tourism, transit traffic and business trips between home and workplace.
- Connectivity is a major location factor for firms. Faster and more attractive trips between workplace and home provide greater opportunities for firms and their workforce. This in turn makes Helsinki city centre, Pasila, Ilmala, Käpylä and Oulunkylä more attractive for firms to locate (scenario 2).
- The city centre and Pasila will be more attractive as tourist destinations. Hotels, shops and stores, cafes and restaurants benefit from higher numbers of tourists and a more flexible workforce (scenarios 1 and 2).
- Station zones and passenger ports benefit from transit traffic (scenarios 1 and 2).

Function	Business	Commuter	Tourist	Transito	Inhabitants
Office/ office-hotel	+++	++	-	-	-
Hotel	+++	++	+++	++	-
Store, cafe, restaurant	+++	+++	+++	++	++
Culture and recreation services	+	+	+++	++	++
Wellness and other services	+	+	+++	++	++
Station Zones	+++	+++	+++	+++	+
Passenger ship ports	+	-	++	+++	-
Housing	-	-	++	+	+++

### Impact of Helsinki Airport Rail Corridor by user group and land-use category

+++	Signifcant impact
++	Fair impact
+	Low impact
-	No impact

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# Connectivity Impact and Development Potential at the Local Level



The increased attractiveness and connectivity of Pasila station creates further possibilities to spearhead the renewal of west and east Pasila and to develop the area north of Pasila. Increase of commuter train capacity will create opportunities for land-use development at Käpylä and Oulunkylä station zones.

Improved connectivity enhances the role of station zones as favourable location for firms and increases opportunities for tourism.



Better connectivity to and from the city centre and Pasila are likely to increase office and commercial building and apartment prices by 3–5 % if the Airport Rail Corridor and the Helsinki-Tallinn tunnel are completed.

Improved connectivity is also likely to have a positive impact on development potential for Ilmala, Käpylä and Oulunkylä.

The impact of agglomeration benefits is highest in the city centre and Pasila, which are stations for both the Airport Rail and the Helsinki-Tallinn tunnel, assuming both are completed.

# CONCLUSIONS



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# Findings

- The Helsinki Airport Rail Corridor offers significant importance to Helsinki capital region's competitiveness, particularly with respect to improved connectivity for the Helsinki International Airport, which in turn will improve business travel and tourism in general.
- The Airport Rail Corridor will also open up growth opportunities for the rest of Finland via the upgraded connectivity to the International Airport.
- The Helsinki Airport Rail Corridor will add to the attractiveness of the main impact zones and improve the development potential for these areas. The additional growth will focus on the areas of high connectivity. The entire capital region will benefit from the increased connectivity, which in turn will bring agglomeration benefits and enhance the capital region's attractiveness. The increased connectivity will raise land values and enable higher levels of densification through development.
- Rail transport capacity will grow with the extension of the Airport Rail Corridor to the main track. This will improve land-use development opportunities because the areas currently reserved for track extension may no longer be required and may be put to alternative use. These new development areas will have great connectivity, thereby improving their development potential. However, these areas have not been included within the scope of the study and will require further research.
- The benefits of the joint Helsinki Airport Rail Corridor and Helsinki-Tallinn tunnel will be dependent on how densely the station zones will be built.
- The increase in densification of the station areas will bring more agglomeration benefits, which in turn will enhance productivity.
- The Helsinki Airport Rail Corridor is a vital element for the development of the St. Petersburg high speed rail connection.

### Scenario 0+

- No investments have been made to create a fast rail link from Helsinki to the Airport nor a rail tunnel between Helsinki and Tallinn.
- The main track is not going via Helsinki International Airport, but uses the current Circle Line connection.
- Rail Baltica from Tallinn to Berlin is fully operational in 2026 as Estonia becomes connected to the European rail network.
- Tallinn Ülemiste multimodal station is opened.
- Travel connections between the two capital cities rely on port to port ferry connections with crossing time 120 minutes.
- From Airport to Airport the connection time is estimated to be 3.5-4.5 h.



3.5–4.5 h

### Scenario 1

- For Helsinki, scenario 1 streamlines the transport connections within the city and adds additional rail capacity to the main track corridor for local and commuter trains.
- On the assumption that the Helsinki-Tallinn tunnel in scenario 1 is not built the increase in connectivity and other consequences are materially reduced in comparison with scenario 2. Accessibility only improves significantly for the Airport and immediate surroundings as well as a positive influence on those cities lining the main track and the Lahti direct track.
- Scenario 1 opens up further economic opportunities for the Helsinki capital region through improved connectivity between the Airport and the future St Petersburg HST (high speed train).



Estimated time from Airport to Airport

### 3 h 15 min–4 h 15 min

### Scenario 2

- The Helsinki Airport Rail Corridor, combined with the Helsinki-Tallinn tunnel (scenario 2), supports the City Council's Strategic policy on internationalisation of its economy and residents. Scenario 2 will pave the way for closer and quicker integration with Europe as well as offering improved sustainable mobility through creating an alternative to short flights, which is the EU TEN-T policy.
- Scenario 2 supports the EU policy on spatial cohesion. The EU's Territorial Agenda interprets spatial cohesion as being a 'polycentric process of development' in making regions and cities to become polycentric city-regions. Additionally it generates greater economic potential and improved cohesion between Finland, the Baltic countries and the EU core economic zone (EU Pentagon).
- Scenario 2 strengthens the Baltic's Gulf of Finland development triangle of Helsinki-Tallinn-St. Petersburg and opens up the economic potential of some 8–10 million inhabitants within the triangle.
- Scenario 2 creates further development opportunities to promote the Helsinki-Tallinn Twin-Cities concept converging the commuter areas.
- Connecting up the Helsinki Airport Rail Corridor to the Helsinki-Tallinn Tunnel will greatly improve workforce and workplace connectivity by as much as 4–5% on average in Helsinki and Vantaa. In and around the station zones (r=400 m) the relative changes in connectivity will be even larger.
- Better connectivity will likely increase the value of apartments and offices and commercial space within Helsinki city centre as well as Pasila and the Airport by as much as 3.5–9 % compared with the alternative scenario of no Helsinki Airport Rail and no Helsinki-Tallinn tunnel. The total expected change in value within the three major station zones would be altogether 600–700 million Euros.



Estimated time from Airport to Airport

50 min

# Conclusions

- The Helsinki Airport Rail Corridor in scenario 1 primarily streamlines connectivity to the Helsinki International Airport. In addition, it improves performance and convenience of the national and regional rail connections. However, based on the findings of this study, scenario 1 does not offer major land-use benefits in general, other than for the Airport. On the other hand, scenario 1 (also in scenario 2) provides some additional development opportunities due to the areas currently reserved for track extension may no longer be required and may be put to alternative use. The travel time from Tallinn airport to Helsinki airport is a minimum of 3 hours 20 minutes and up to 4 hours.
- Scenario 2 represents the combined Helsinki Airport Rail Corridor with the Helsinki-Tallinn tunnel. Together, they would have a more positive impact on connectivity and sustainable mobility at the international level and offer quicker integration with Europe. This improved connectivity would also benefit the national and city-regional levels by enabling Helsinki and Tallinn to merge their commuter belts into a single unified whole and create polycentric city-regions. In turn, there would be higher demand for land-use development, leading to significant increase in land-values in and around the station zones and greater potential for more densification. The travel time from Tallinn airport to Helsinki airport is reduced to 50 minutes.



Estimated time from Airport to Airport

Estimated time from Airport to Airport

### 3 h 15 min–4 h 15 min

50 min

# **ANNEXES**



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# Annex 1.

### Interviews

- Selected experts from the Helsinki and Tallinn city-regions were interviewed on the impacts of the Helsinki Airport Rail Corridor and Helsinki-Tallinn tunnel.
- In respect of the Helsinki city-region interviews, the main question was with regard to the benefits to be derived from the Helsinki Airport Rail Corridor both on its own and in the scenario with Helsinki-Tallinn tunnel. The focus in the interviews was the impact on business and land-use development, especially:
  - Helsinki Airport and the surrounding business zone;
  - · Central business district of Helsinki;
  - Pasila station zone;
  - · Other centres of the Helsinki region;
  - Other cities potentially connected to the Helsinki airport, particularly Tampere, Lahti and Tallinn.
- The interviews in Tallinn focused on the impact of the Helsinki-Tallinn tunnel. The main view was how the rail tunnel under the Baltic would impact upon connectivity to Helsinki's Airport.
- The interviewees represented the following organisations:
  - City of Vantaa
  - City of Tallinn
  - Harju Regional Council
  - Ministry of Economic Affairs and Communications, Estonia
  - Helsinki region Chamber of Commerce
  - Finavia (Finnish airport operator)
  - University of Helsinki
  - · Technical University of Tallinn.

# Annex 2.

### Sources and Assumptions

- The work undertaken for the MAL 2019 study on land-use, housing and transport acted as the primary source of information and maps on transport networks and land-use development in the Helsinki city-region.
- At the European level, the EU's TEN-T Core Network Corridors and Map have been used.
- The basic maps and materials used in this study are from the National Land Survey of Finland 2017 (NLS 2017).
- The accessibility analysis is also based on the MAL 2019 results together with the FinEst Link Feasibility Study for Tallinn.
- The potential changes in real estate values are based on the MAL 2019 results.
- FinEst Link Feasibility Study Final Report was not published during the Helsinki Airport Rail Corridor Case Study. In this respect, initial draft reports from FinEst Link Feasibility Study were the main source of information. The study is based on information available in late 2017.

# Annex 3.

# MAL 2019 Study: Basic Assumptions and Calculation Method

The analysis of the Helsinki capital region and local area development is based upon the Helsinki city-region of 14 municipalities contained in the MAL 2019 study for housing, land-use and transport. All baseline material was produced in 2017 by mapping the population estimates for 2016 and workplace estimates from 2012 by using squares of 0.25 km2. Similarly, land-use reservations for housing and workspace for 2030 and development potential for 2050 were compiled.

The consulting firm, Kaupunkitutkimus TA, provided the calculation principles and rules for population and workplace estimates for the years 2030 and 2050. Figures for regional centres are derived from assessing the figures of squares inside a circle with a 1,500 m radius from the midpoint.

#### **Basic assumptions**

- Municipal estimates are based on building volumes for new housing and workplaces 2016–2029, and development potential for the years 2030–2049.
- Alternative scenarios for population and workplace estimates were provided by Helsinki-Uusimaa Council (Uusimaa regional council E 179, 2017).
- Actual changes in population and workplace numbers from 2011 to 2016.
- Previous MAL studies on city-regional development for the period 2013–2015.
- Consolidation of city-regional growth estimates.

# **Annex 4.** European TEN-T Network

- The Trans-European Transport Network (TEN-T) is a European Commission policy directedtowards the implementation and development of a Europe-wide network of roads, railway lines, inland waterways, maritime shipping routes, ports, airports and railroad terminals. It consists of two planning layers:
  - The Comprehensive Network covering all European regions
  - The Core Network most important connections within the Comprehensive Network linking the most important nodes.
- The main objective of TEN-T is to close gaps, remove bottlenecks and eliminate technical barriers that exist between the transport networks of the EU Member States, strengthening the social, economic and territorial cohesion of the Union and contributing to the creation of a single European transport area. The policy seeks to achieve this aim through the construction of new infrastructures; the adoption of innovative digital technologies, alternative fuels and universal standards; and the modernising and upgrading of existing infrastructures and platforms.

#### For more information:

http://ec.europa.eu/transport/infrastructure/tentec/ tentec-portal/site/index\_en.htm

Transport network map: Trans-European Transport Network (TEN-T) Core Networks.

# Annex 5. Definitions

**Helsinki-Tallinn tunnel** is a rail tunnel under the Gulf of Finland connecting Helsinki (Finland) with Tallinn (Estonia) and mainland Europe via Rail Baltica.

**Rail Baltica** is a planned western standard gauge railway connection from Tallinn, Estonia via Latvia and Lithuania to Warsaw, Poland which forms part of the EU's TEN-T Core Network Strategy. *http://www.railbaltica.org/* 

**TEN-T network** is Trans-European Transport Network (see Annex 4).*http://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/site/en/abouttent.htm* 

**HLJ** is Helsinki Region Transport Plan which covers all 14 municipalities in the Helsinki city-region. The HLJ Plan 2015 outlines the future transport system for the city-region up to 2040. The transport plan includes a development strategy and priority of development measures.

**MAL** is Helsinki city-region's development strategy for land-use, housing and transport. The aim of MAL is to coordinate a long-term development set of principles and solutions in cooperation with the State and the region.

**Main track** is Finland's most important rail corridor. It runs from the south northwards, along the Helsinki-Hämeenlinna-Tampere-Seinäjoki-Kokkola-Ylivieska-Oulu line.

Helsinki Airport Rail Corridor is a new, fast direct route from the city centre to the International Airport that aims to connect up with the Helsinki-Tallinn tunnel.

**Finland's growth region: Helsinki-Hämeenlinna-Tampere corridor (HHT)** is a development corridor running north from Helsinki via Hämeenlinna to Tampere and up to Seinäjoki. This is the strongest development zone in Finland. *http://suomenkasvukaytava.fi/* 

Lahti direct track (Oikorata) is a main rail track for intercity trains between the cities of Kerava and Lahti. Trains between St. Petersburg (Russia) and Helsinki is via this Lahti direct route.

**HELRA** project aims at improving Helsinki's central railyard efficiency. The report will be ready in 2020.

**The city rail loop (Pisara)** is a planned underground rail loop for commuter and local trains running between Pasila and the Central Railway Station. It will have three stations. Implementation is expected between 2020–2025 (Helsinki Region Transport System Plan HLJ 2015).

# Annex 6.

### Uncertainties and Limitations of the Analyses and Modelling

- The analyses and modelling include multiple uncertainties:
  - The prediction of transportation pricing is uncertain and the pricing changes have been ignored in the analyses. The connectivity analyses are based on changes in travel times.
  - The models are based on current mobility preferences and do not consider the possible changes in values and preferences over time.
  - The analysis is based on the current understanding of future land-use and transportation network development until 2050.
  - The model considers only the city-regions of Helsinki and Tallinn, largely ignoring the situation outside that area. The results of the analysis cover only selected areas in Helsinki capital region outlined on page 13.









European Union

ONSB CoRe

European Regional Development Fund