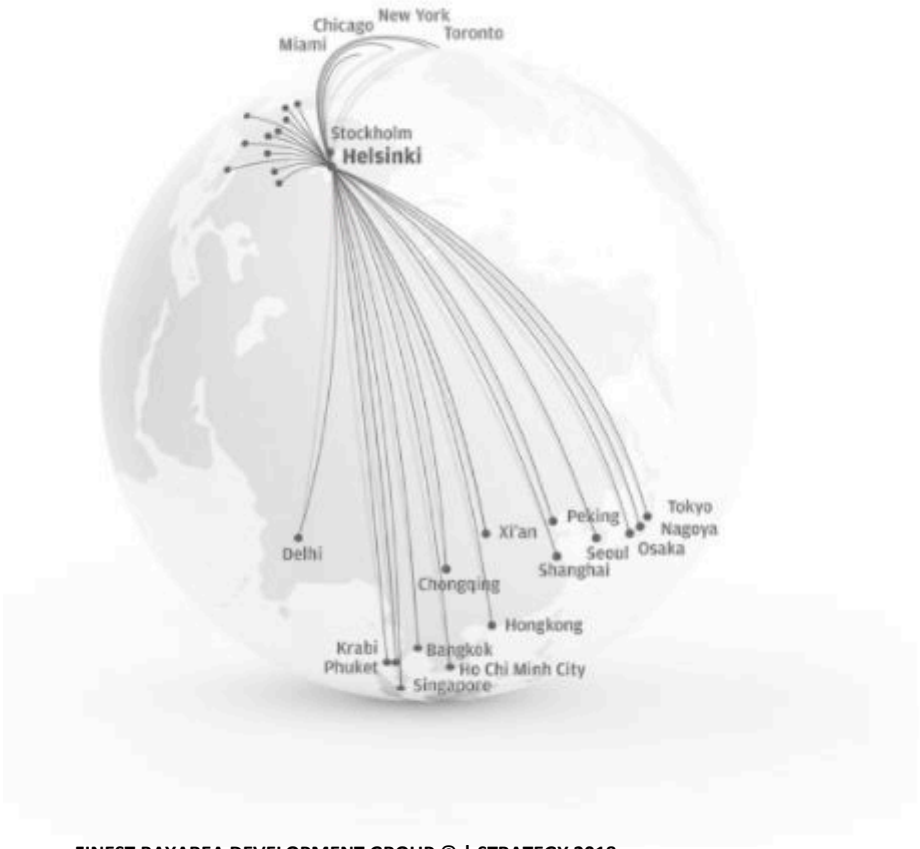
FINEST LINK

Fire protection and Safety in Tunnels
Oslo 12.09.2018

Kaarel Kose
Union of Harju County Municipalities

EUROPEAN UNION
European Regional Development Fund
Interreg
Central Baltic

Heart of Eurasia

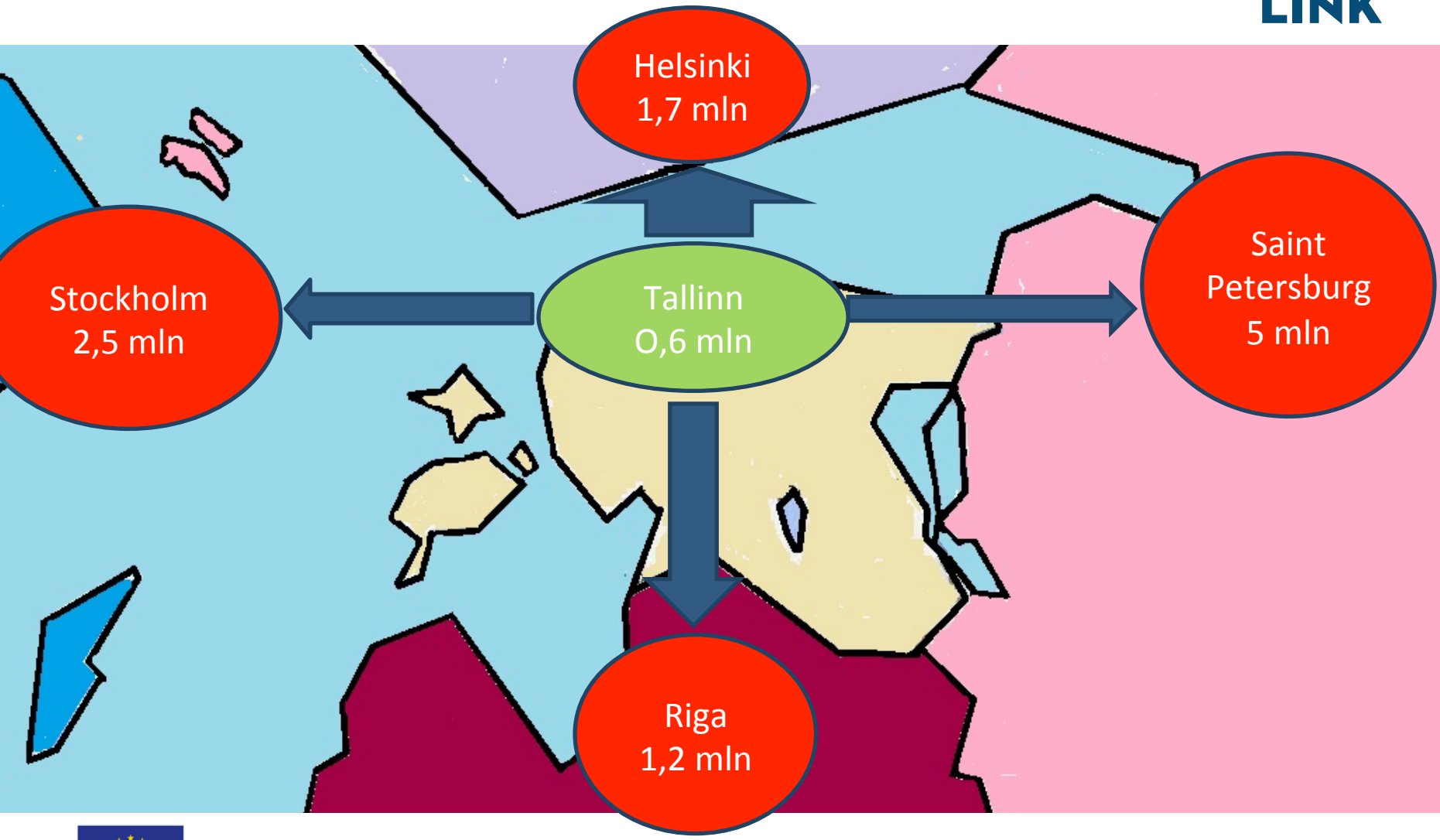


- Finland is the closest neighbor of China, India and Japan in the EU
- Direct 6 -8 hours connections to 8 hours connections to several cities in China, India, Japan and rest of Asia

EUROPEAN UNION
European Regional Development Fund
Interreg
Central Baltic

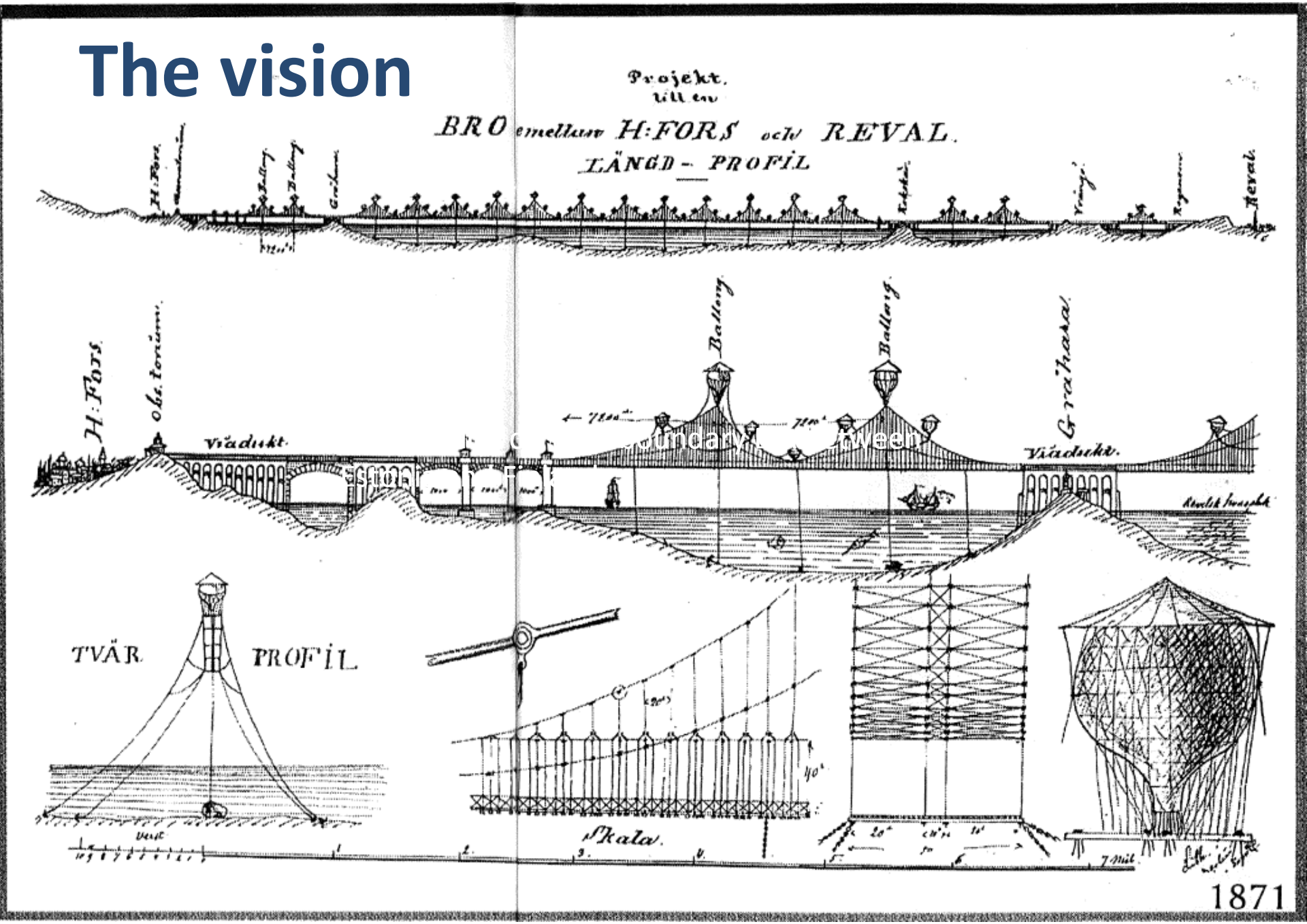
Centre of the Baltic Sea

FINEST LINK



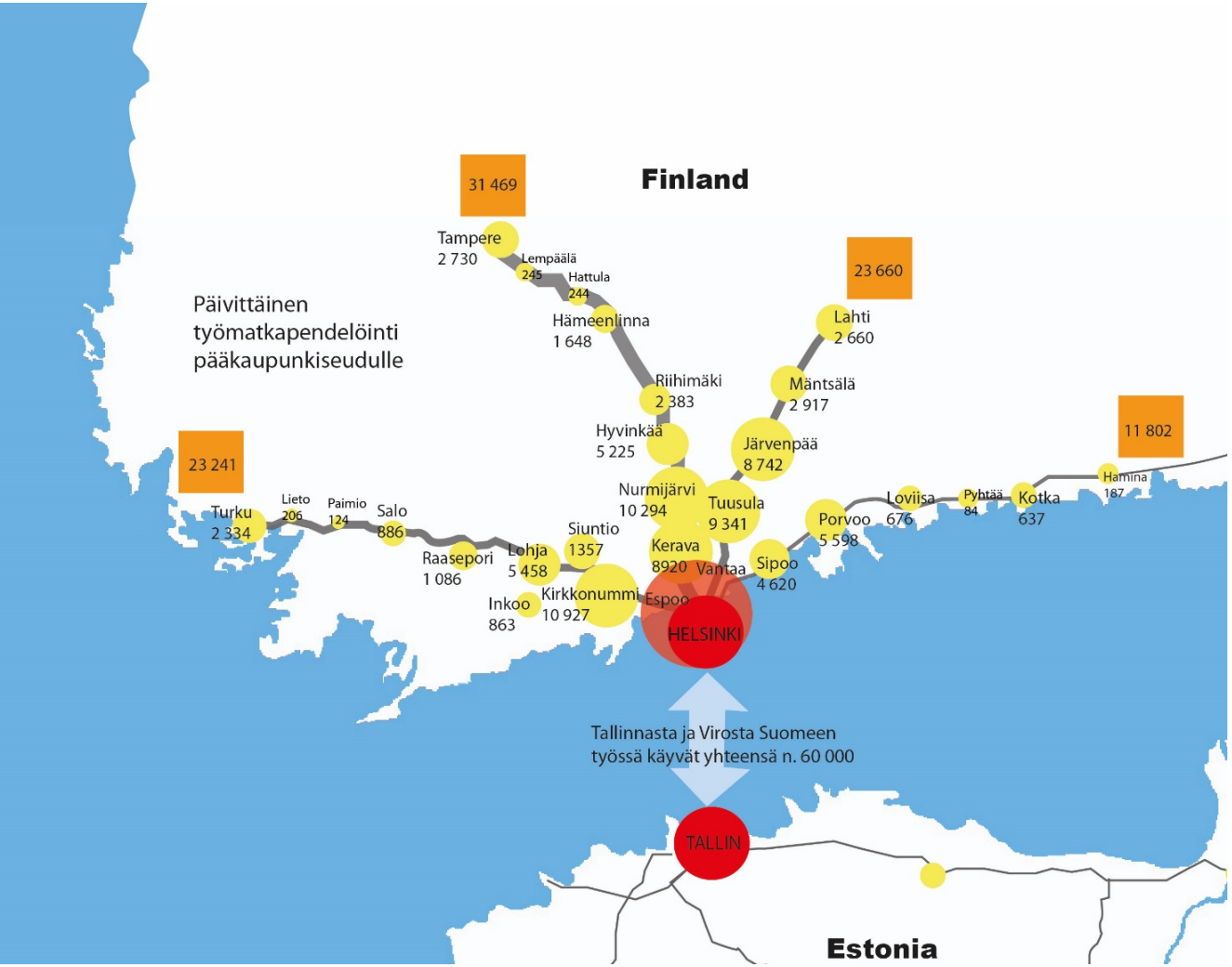
EUROPEAN UNION
European Regional Development Fund
Interreg
Central Baltic

The vision



1871

Tallinn - Helsinki



Helsinki is the busiest passenger port in the world. Surpassed Dover in 2017

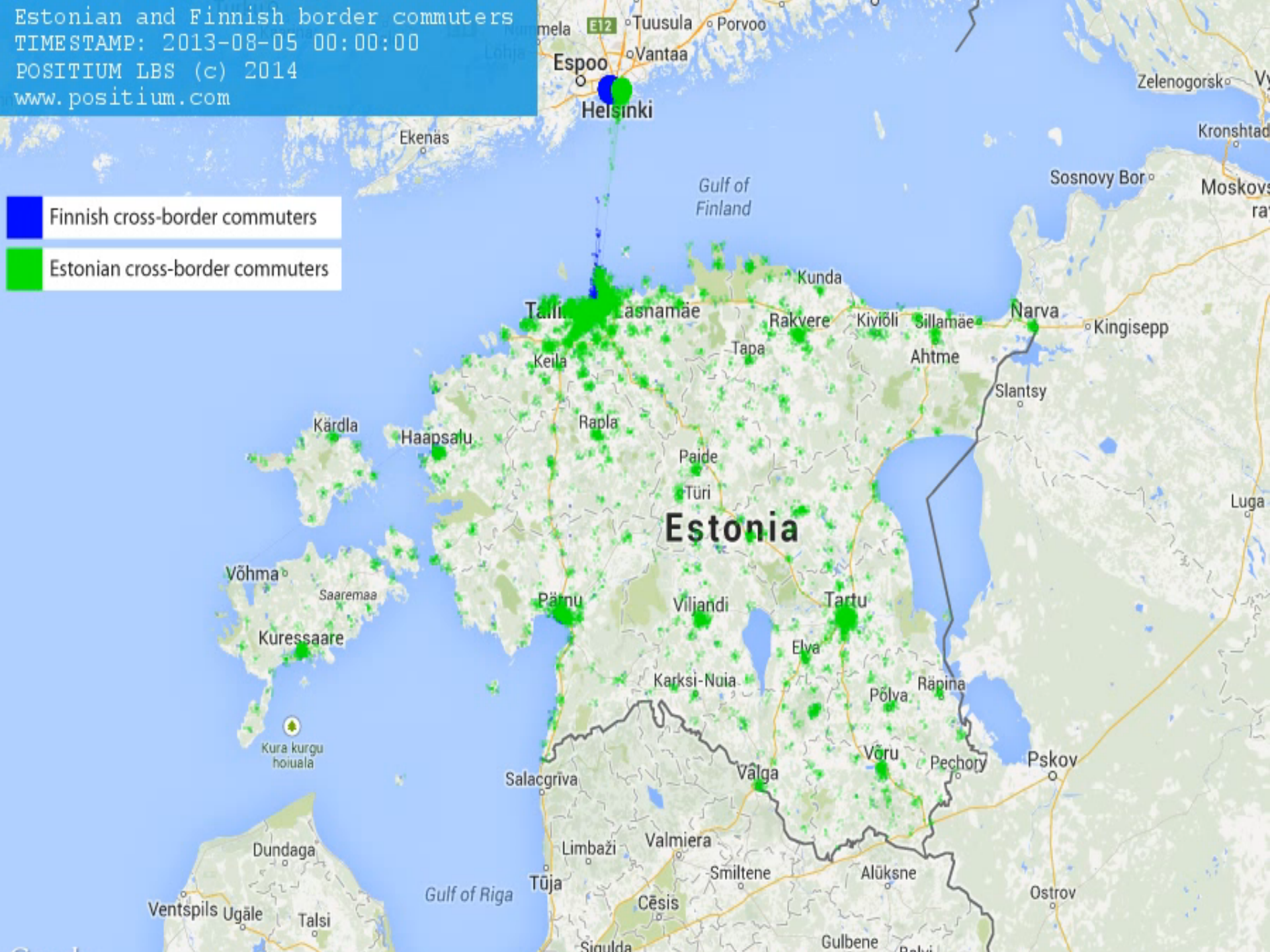
Growth fuelled by Helsinki-Tallinn traffic

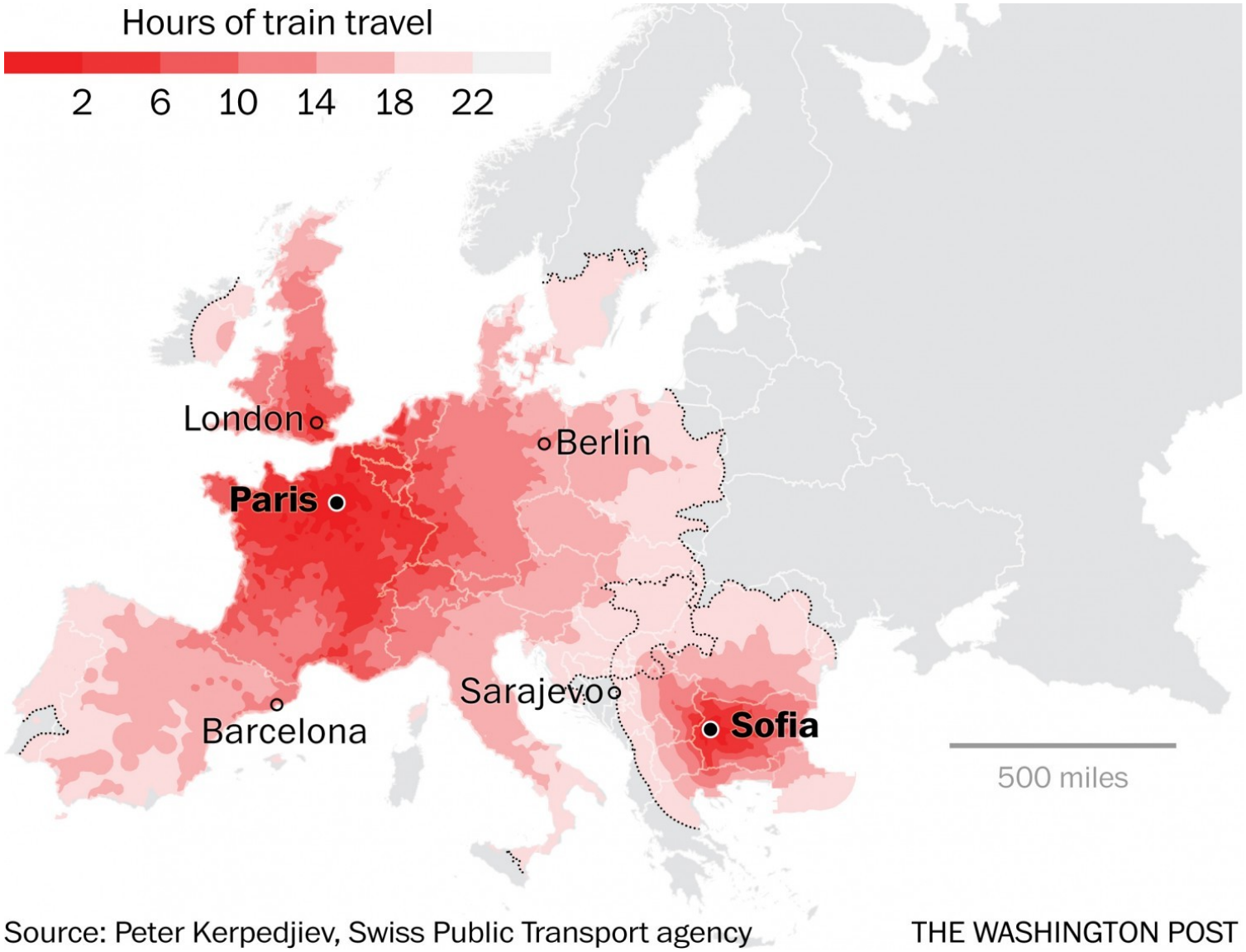
8,83 million trips in 2016 between Helsinki and Tallinn *(Port of Tallinn)*
Helsinki -Tallinn 2 hours by ferry

2,3 million inhabitants in metropolitan regions (Uusimaa 1,7 , Harju 0,61)

EUROPEAN UNION
European Regional Development Fund

Interreg
Central Baltic


Estonian and Finnish border commuters
TIMESTAMP: 2013-08-05 00:00:00
POSITIUM LBS (c) 2014
www.positium.com
Finnish cross-border commuters
Estonian cross-border commuters
Helsinki
Espoo
Vantaa
Tuusula
Porvoo
Ekenäs
Gulf of Finland
Sosnovy Bor
Zelenogorsk
Kronshtadt
Kunda
Tallinn
Lasnamäe
Rakvere
Kiviõli
Sillamäe
Narva
Kingisepp
Tapa
Ahtme
Keila
Slantsy
Kärdla
Haapsalu
Rapla
Paide
Türi
Estonia
Luga
Võhma
Saaremaa
Pärnu
Viljandi
Tartu
Kuressaare
Elva
Karksi-Nuia
Räpina
Põlva
Kura kurgu hoiuala
Võru
Pechory
Pskov
Salacgrīva
Valga
Limbaži
Valmiera
Dundaga
Tūja
Smiltene
Alūksne
Ostrov
Gulf of Riga
Ventspils
Ugāle
Talsi
Cēsis
Gulbene



Source: Peter Kerpedjiev, Swiss Public Transport agency

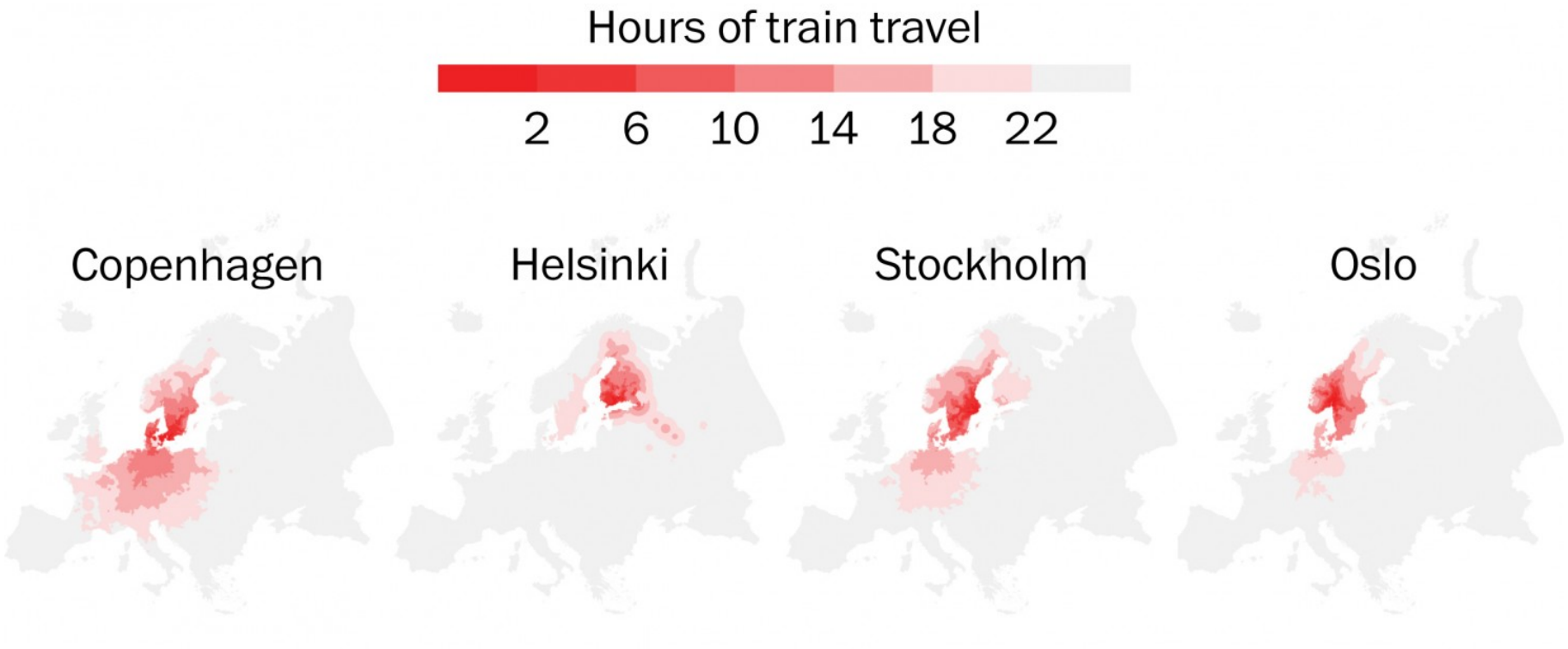
THE WASHINGTON POST

FINEST LINK

EUROPEAN UNION
European Regional Development Fund

Interreg
Central Baltic

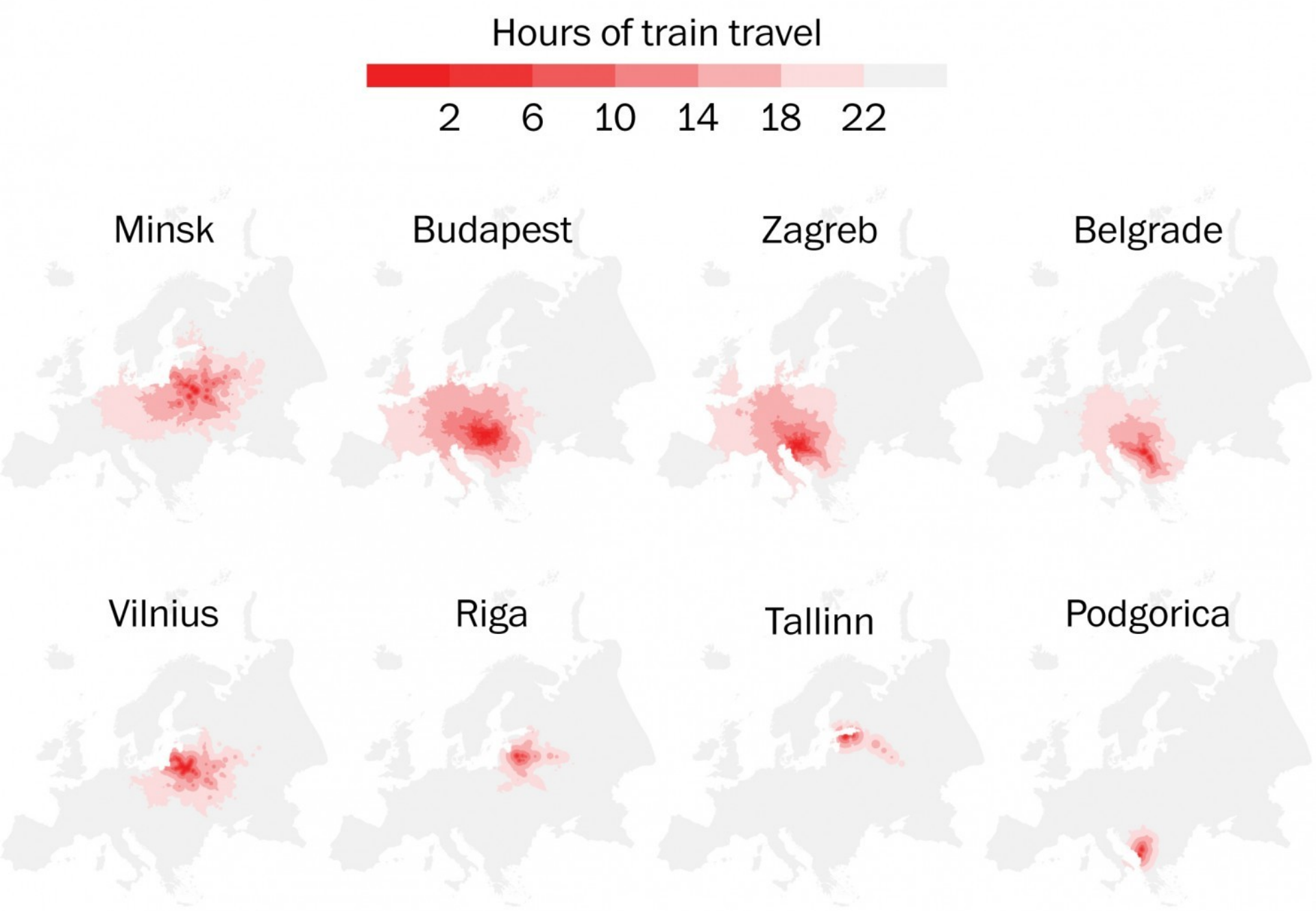
FINEST LINK



Source: Peter Kerpedjiev, Swiss Public Transport agency

THE WASHINGTON POST

EUROPEAN UNION
European Regional Development Fund
Interreg
Central Baltic



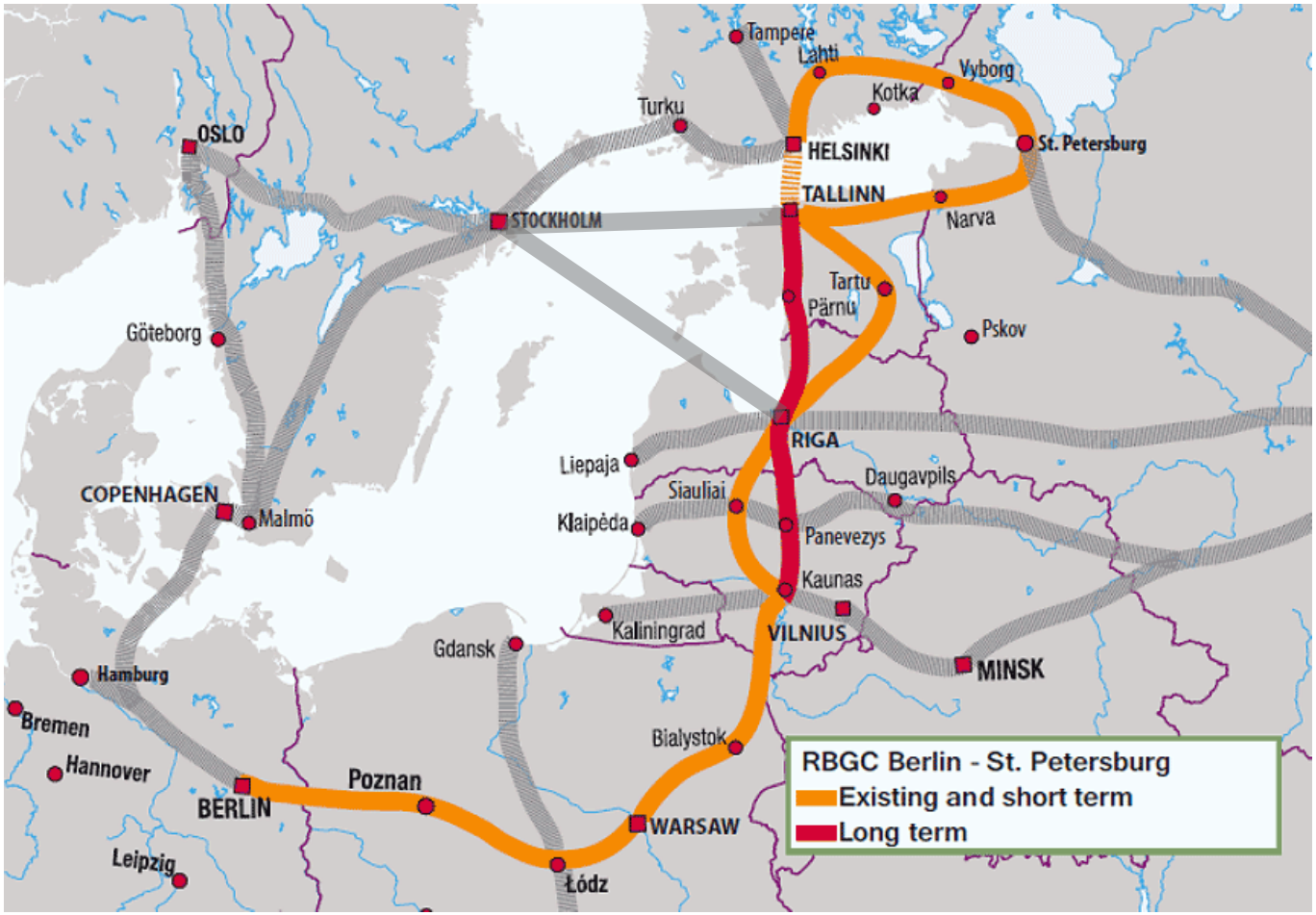
Source: Peter Kerpedjiev, Swiss Public Transport agency

THE WASHINGTON POST

Rail Baltic

FINEST LINK

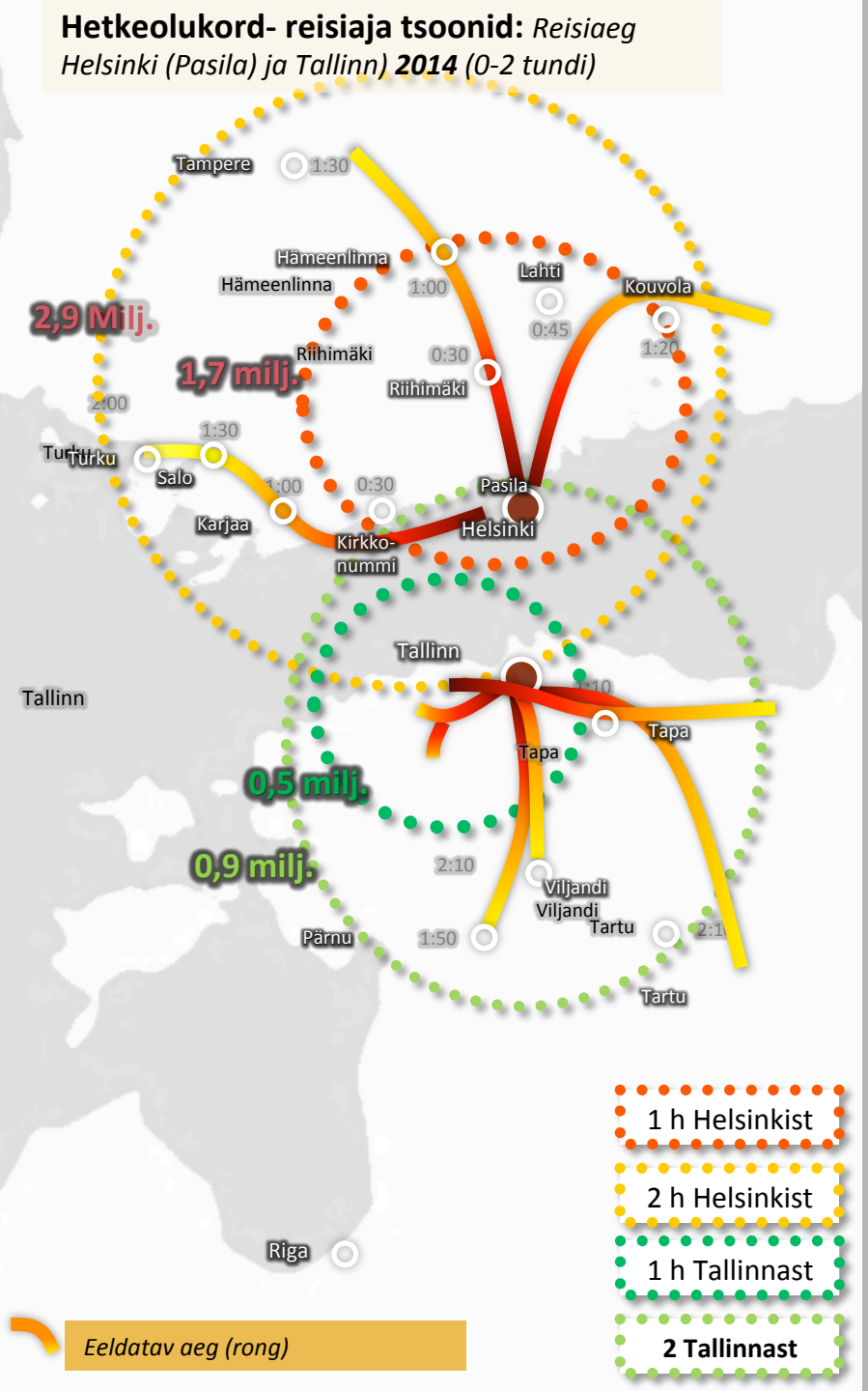
- 728 km from Tallinn to Lithuania - Poland border
- Travel time 4,1 h (little over 6 h to Warsaw)
- 1435 European gauge
- Top speed 240 km/h
- Cost 3,6 b EUR
- Operating 2025



EUROPEAN UNION
European Regional Development Fund

Interreg
Central Baltic

Hetkeolukord- reisiaja tsoonid: *Reisiaeg Helsinki (Pasila) ja Tallinn)* ***2014*** *(0-2 tundi)*



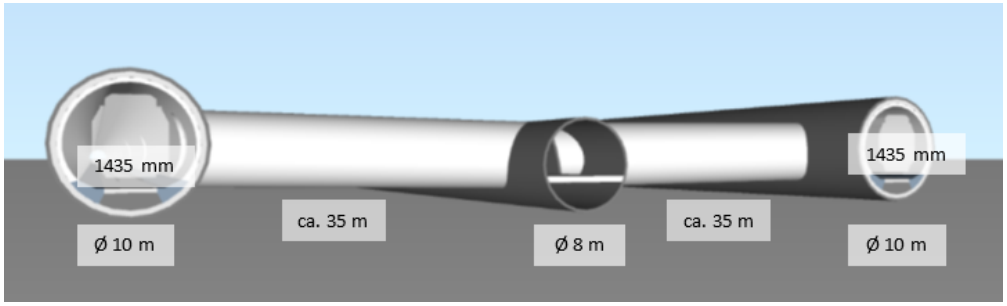
Tulevikuvisioon – reisiaja tsoonid

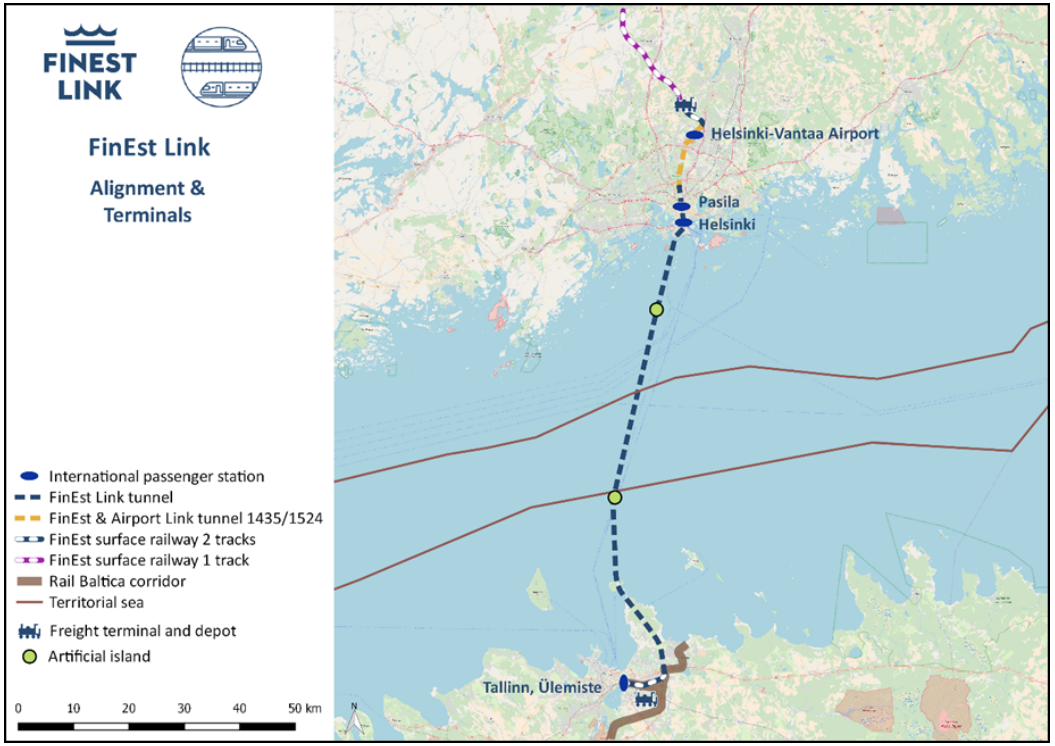
Põhineb: Ratahallintokeskus Str
selvityksiä 1/2009 Tulevaisuuden
henkilöliikenneselvitys
Rail Baltica

Technical concept

The technical concept of FinEst Link:

- a 1435 mm gauge railway tunnel (two rail tunnels and a service tunnel)
- two artificial islands (Uppoluoto, Tallinnamadal)
- Stations in Helsinki city centre, Pasila and Helsinki-Vantaa airport for passengers, and freight terminal area close to the airport with connection to the Finnish railway network (1524 mm)
- A passenger station at Ülemiste in Tallinn and a connection to Rail Baltica for passengers and freight





EUROPEAN UNION
European Regional Development Fund
Interreg Central Baltic

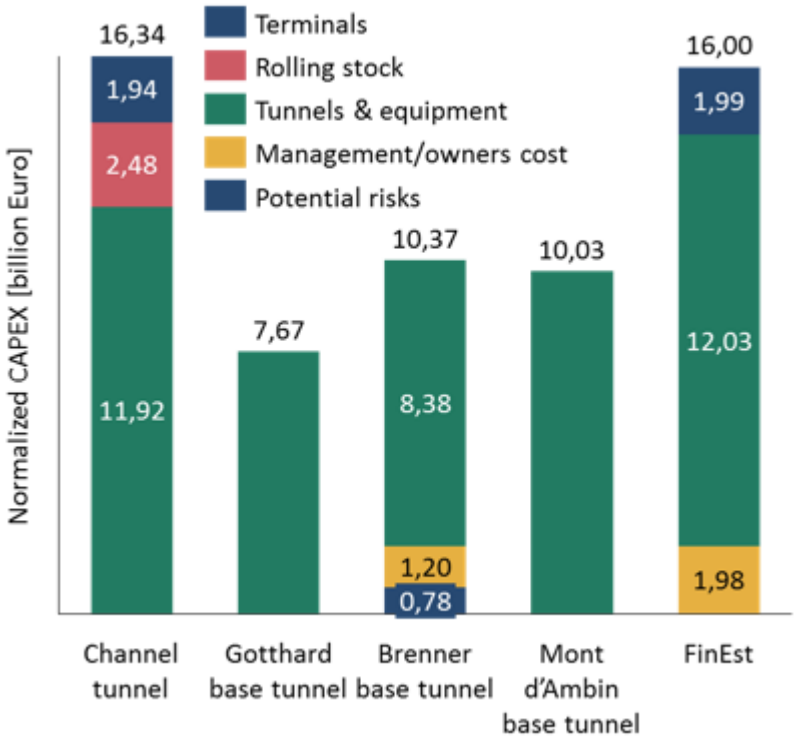
Cost estimation

The cost estimation of the railway tunnel between Helsinki and Tallinn including railways (1435 mm gauge), terminals and stations is 13-20 billion euros.

The wide gap between the minimum and maximum cost estimation is due to the lack of information of planning details of the fixed link and its technical concept.

The cost estimation is based on information of costs in Finnish, Estonian and other large international transport projects.

In international benchmarking, FinEst Link appears cheaper per kilometer which is due to the lower costs of boring in the Finnish conditions.



EUROPEAN UNION
European Regional Development Fund

Interreg
Central Baltic

Estimation of demand

FINEST LINK

The demand in passenger transport in different scenarios is as follows:

- 9 million (in 2017)
- 14 million (in 2050 scenario without tunnel)
- 23 million (in 2050 scenario with tunnel) of which 12,5 million passengers in tunnel and 10,5 million on ferries

Maritime transport between Helsinki and Tallinn continues to grow also if the rail tunnel service will be built. This is due to the overall growth of the Helsinki-Tallinn twin city and transport volumes.

The demand in freight transport in different scenarios is as follows:

- 3,8 million tons (in 2017)
- 7 million (in 2050 scenario without tunnel)
- 8 million (in 2050 scenario with tunnel) of which 4 million tons in tunnel and 4 million on ferries; freight in the tunnel represents value/ton above the average.

EUROPEAN UNION
European Regional Development Fund
Interreg
Central Baltic

Cost-benefit analysis

Tunnel compared to 0+ ferry connection

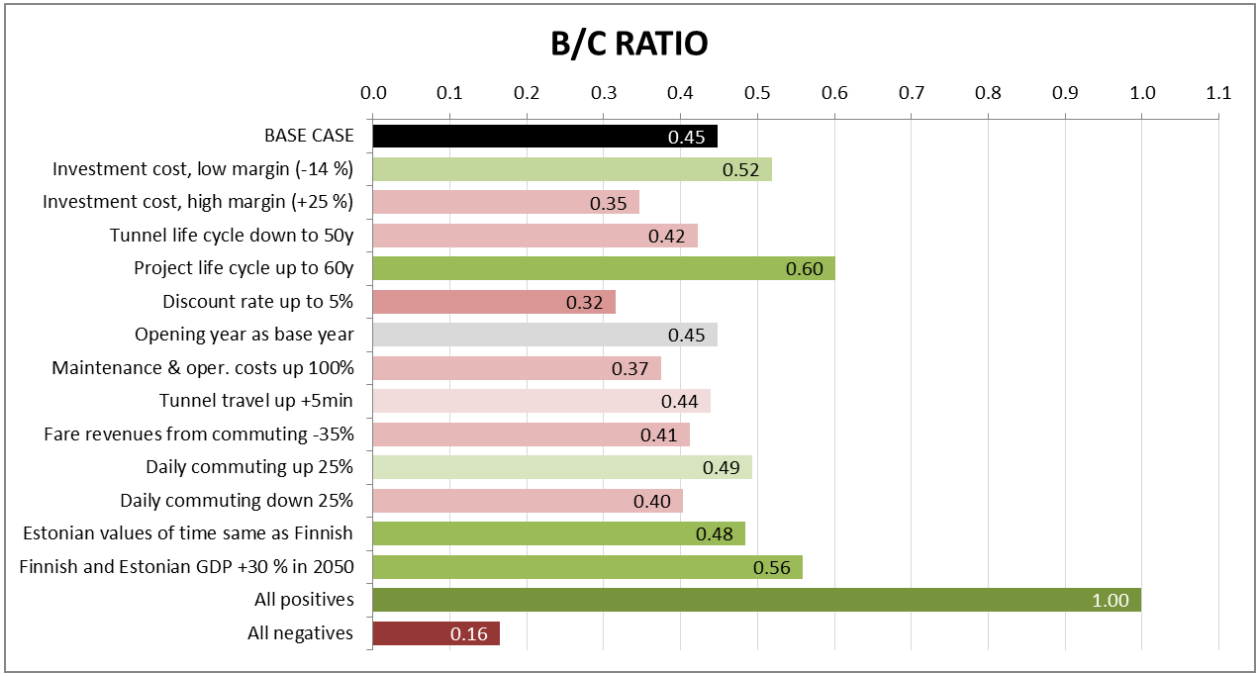
FINEST LINK

The standard model of cost-benefit analysis shows low economic feasibility to the railway tunnel due to its large investment costs.

The problem with the standard cost-benefit analysis is that it applies weakly to other than traditional transport infrastructure projects. Helsinki-Tallinn railway tunnel represents a totally new connection concept in the macro-regional transport system, and therefore requires more innovative research approach than traditional models can offer.

Result with 3,5% discount

- Total economic costs 11200 million euros
- Total economic benefits 5000 million euros
- ENPV/Net benefits are -6200 million euros
- ERR is 0,8%
- B/C ratio is 0,45



EUROPEAN UNION
European Regional Development Fund
Interreg
Central Baltic

Wider Economic Impacts – summary of results

FINEST LINK

Summary of the wider economic impacts to GDP by impact factor

Low and base alternatives

Impact factor	M€ p.a. Year 2050		M€ 30 years discounted	
	Low	Base	Low	Base
Agglomeration impact	107	214	1 821	3 642
Labour supply	51	51	983	983
Work relocation	6	11	1 096	2 192
Competition	6	6	110	110
Total	169	281	4 010	6 928

The study on wider economic impacts focuses on the growth of the national economies of Finland and Estonia and on macro-regional development.

The wider economic impacts are in total **+6 928 million euros**.

Agglomeration impacts form the most important positive economic impact. These include, for instance, price of land, and mobility of work force, which result from the Helsinki-Tallinn twin-city development. The wider economic impacts extend widely into both countries.

Further methodological development is needed on wider economic impacts, as there is no international standard for modeling.

EUROPEAN UNION
European Regional Development Fund
Interreg
Central Baltic

FinEst Link has succeeded in meeting its key planning objectives

1. Improvement of the travel service to facilitate daily commuting between Helsinki and Tallinn. KPIs:
   - travel time ca. 30 min
   - Passenger trains with frequency of 20 min in peak hours; car and truck shuttle trains
   - ticket price 18€ single trips / 480 € 30-days ticket, 70 €/car, 450 €/truck
2. Smooth travel chains and integration with transport systems. KPIs:
   - Integration with the Finnish rail network, possibly including the Airport Rail Line and Arctic Rail, and the Estonian rail network including Rail Baltica.
   - Integration with airports and with public transport systems in both cities.
3. More effective freight transport chains. KPIs:
   - Price, frequency, reliability and delivery time enable multimodal and international travel chains in passenger and freight transport.
4. Improved environmental sustainability. KPIs:
   - improved energy efficiency, healthy urban environments and lower emissions of CO2 and NOX due to modal shift to rail with electrified railway and less truck traffic in city centers.
5. Improved safety and security. KPIs:
   - Lowered risk levels in the transport system. Less truck traffic in city centers and less vessels in Gulf of Finland. High safety standard in tunnel system.
6. Economic viability. KPIs:
   - A financial model has been designed in which transport operator's revenues cover all operative costs, and the project implementation model is based on minimal public support for the investment cost.

EUROPEAN UNION
European Regional Development Fund
Interreg
Central Baltic

Summary

1. In the FinEst Link project the vision of the Helsinki-Tallinn fixed link has developed into a technically and economically feasible concept of an undersea railway tunnel.
2. European added value of the vision is highest when seeing the Helsinki-Tallinn railway tunnel as a direct continuation to Rail Baltica. This gateway would connect Europe from High North to Black Sea and could enable also new routes to Asia.
3. The FinEst Link concept of the railway tunnel combines Finland's and Estonia's transport networks and the local twin-city commuting systems. The level of interoperability and multimodality in the system is higher than those without the railway tunnel.
4. The greatest direct beneficiaries of the railway tunnel are citizens, workers, students and tourists as passengers. When considering the wider impacts, the railway tunnel would benefit remarkably businesses, trade, investments and culture related to the Helsinki-Tallinn twin-city development.

The FinEst Link vision to the future encompasses the Helsinki-Tallinn twin-city of 3 million inhabitants in a society of intensive cross-border cooperation, education and business life. The society is built on high level of digitalisation, which enables fast growth rates in productivity and international competitiveness.

EUROPEAN UNION
European Regional Development Fund
Interreg
Central Baltic

Towards the next phase of FinEst Link

FINEST LINK

- Further studies on the technical and economic feasibility are needed: logistics during the construction phase of an undersea mega-project, construction of artificial islands, environmental impact assessment, dynamic demand forecasts that take into account changes over time as the region repositions through better accessibility.
- Special focus on wider economic impacts: understanding the dynamics and wider impacts of regional development of twin cities.
- Communications for political decision-making in Finland, Estonia and EU
- Maintaining the credibility of the tunnel vision is important without becoming a lobbying project.

EUROPEAN UNION
European Regional Development Fund
Interreg
Central Baltic

Next Steps and FinEst Bay Tunnel Project

EUROPEAN UNION
European Regional Development Fund
Interreg
Central Baltic

Tallinn-Helsinki tunnel

FINEST LINK

- Finnish minister Anne Berner and Estonian minister Kadri Simson set up a task force
- The Estonian and Finnish Governments joint jubilee meeting in Tallinn
- Next steps discussed during 2018 between governments
- Ad Hoc working group for cross-border EIA

EUROPEAN UNION
European Regional Development Fund
Interreg
Central Baltic

FinEst Bay Area Tunnel Project

FINEST LINK

FinEst Bay initiative – Peter Vesterbacka

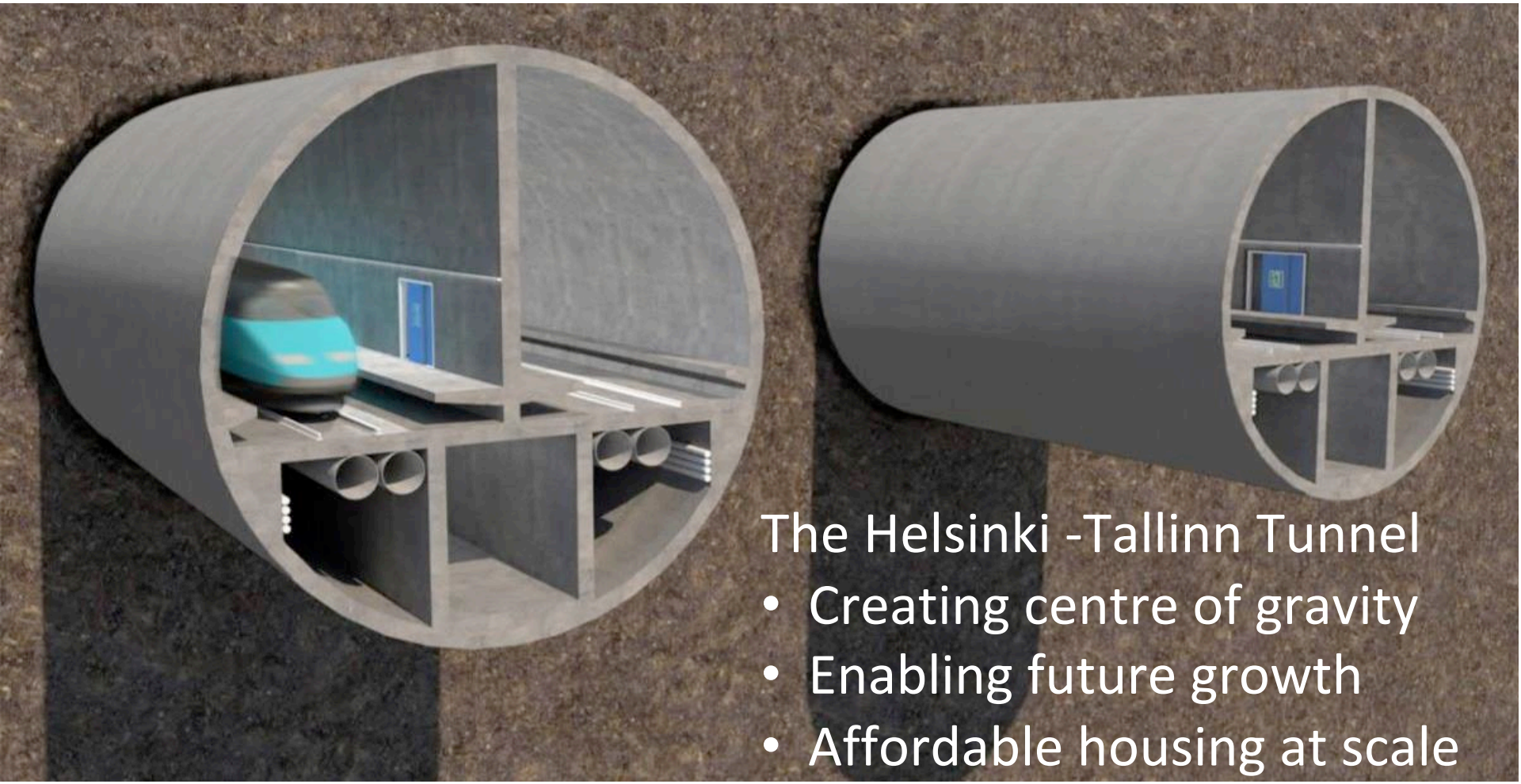
- Planning and technical concept underway
- Commission on transboundary EIA between Estonia and Finland
- Fundraising tour
- Deadline 24.12.2024

Financials:
Tunnel project estimate total cost 15B€
Design 750M€
Construction 12,5B€
Project management 1B€
Management 750M€

EUROPEAN UNION
European Regional Development Fund
Interreg
Central Baltic

FinEst Bay Are Tunnel Project

FINEST LINK



The Helsinki -Tallinn Tunnel

- Creating centre of gravity
- Enabling future growth
- Affordable housing at scale

EUROPEAN UNION
European Regional Development Fund

Interreg
Central Baltic

How is it going to happen?

FINEST LINK

EUROPEAN UNION
European Regional Development Fund

Interreg
Central Baltic

Thank you!

Kaarel Kose
Union of Harju County Municipalities
Kaarel.Kose@hol.ee
www.hol.ee

www.finestlink.fi

EUROPEAN UNION
European Regional Development Fund
Interreg
Central Baltic