FinEst Bay Area Development
The Tallinn Tunnel Project

Financial indicators
Passenger traffic volumes

Current

- Espoo
- Helsinki Airport 20 M
- Helsinki 125 M
- Tallinn 3 M
- 10 M

Assumptions 2030

- Espoo
- Helsinki-Tallinn Airport 70 M
- Helsinki 200 M
- Tallinn 50 M
- 200 M
Finest economic impact structure

GLOBAL STATUS
- Global Innovation Node
- First Twin Capital
- Strategic geopolitical positioning
- Security policy
- Global mobility

SUSTAINABILITY IMPACT
- Services
- Tourism
- Urban & real-estate development
- Social: Employment & growth
- Environmental impact
- Urban innovation

CORE CASE
- Mobility
- Data
- Energy
- Water

50+ years  20+ years  10+ years
Financial model based on World Bank methodology

• Project finance methodology is based on Rail Reform Toolkit provided by World Bank and PPIAF (2017)
• Additional calculations and application is provided by the Finest Bay Area Development Company
• Benchmark operators are
  • Getlink (Channel Tunnel)
  • Tallink (Baltic sea ferry operator)
  • VR (State Railway in Finland)
Assumptions for financial calculations

• Total tunnel investment 15 017 M€
• Discount Interest rate 6%
• Inflation rate 2%
• Tunnel investment timespan 30 years
• Tunnel life-cycle is 120 years, major service interval 40 years
• Passenger traffic and freight included in investment calculations
  • 51 M annual trips (2016: 9M)
  • € 50 single (41% of passengers)
  • € 100 return (42% of passengers)
  • € 2 499 annual pass (17% of passengers)
  • 22 M tonnes freight (2016: total 8,4M)
Fare and tariff assumptions

Facts: pricing 11/2018*

• Finnish train 2018
  • Helsinki - Oulu 56€
  • Helsinki - Tampere 18€
  • Helsinki - Lahti 13€

• Finland - Estonia ferries 2018
  • Tallink, return 50€ (2,5h)
  • Ecerö line, return 24€ (2h 15min)

• Finland - Estonia flight 2018
  • 165 € (30min)

Helsinki - Tallinn pricing assumptions 2024*

• Inflation assumption 2% p.a. will result 13% price increase in all prices

• Reference prices
  • Tallink return 56,5€
  • Finnair flight 186,5€

• Tunnel train will be 10 min faster than flight

• Pricing arbitrarily assumed between flight and ferry ticket prices
  • 100€ return ticket

*single adult
Passenger transit assumptions for 51M annual passengers

- **Return 42% (21,42M passengers)**
  - Leisure trips by Finnish and Estonian citizens
  - Intermittent commuting
  - Tourists
    - 365 days / 2 trips / 29 000 passengers

- **Single 41% (20,91M passengers)**
  - Tourists
  - Terminal change travel between Helsinki and Tallinn airports
    - 365 days / 1 trip / 57 000 passengers

- **Annual pass 17% (8,67M passengers)**
  - Commuting passengers
    - 200 days / 2 trips / 21 000 passengers

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**Assumed Helsinki Tallinn metropolitan area 2030:**
- Region population 2,5M (FI 2M, EST 0,5M)
- Commuters 425 000

**Assumed each station area 2030:**
- Population 50 000
- Commuters 12 000

**Reference (2017):**
- City of Vaasa Population 67 000
- Vaasa region population 113 000
- Commuters 16 000
  - https://www.vaasa.fi/node/13531/

**Reference to growing traffic volumes for example Öresund bridge and tunnel and Eurasian tunnel**
Freight tariff assumptions

Assumptions

• In calculations average train freight cost for 1 tonne 9,64 EUR per 103km is used
  • Equivalent to 0,093 EUR/Ton-km

• One train*
  • Average 700 tons per trip => 15 trucks per train
  • 450 EUR tariff per truck per direction => total 6750 EUR per direction

Trend

• Tariffs increase over time by inflation

*Truck model 1 (12 metres, max. 13 tons)
Truck model 2 (18 metres, max. 44 tons)
Freight volume

Assumptions

• 2016: 8.4 million tons per year total transports
  • 4.2 million tons per year maritime transports
  • 4.2 million tons per year transports via tunnel
  • The potential for Rail Baltica would be 3.9 million tons per year.
• FBA calculations 8,4 M tons per year, no maritime transports
• Helsinki-Tallinn maritime cargo 2016
  • 3,8 million tons

Volume trend

• 2017: Finland - Estonia
  • Sea freight: 3,5M tons
  • 2016-17 growth 11,4% *
• Trend
  • 2025 is the first year 6,8M tons
  • 2025-26: 13M tons
  • 2027-28: 17M tons
  • 2030-2048: 22M tons

Freight volume forecast

• Current freight 2017
  • 3,4M tons

• Scenario
  • Growth will continue at 10% pa resulting 8,3M tons in 2025
  • Tunnel will get 82% market share
  • Rail Baltica and Arctic Railway will have major positive impact in the future
Tunnel case cash flow breakdown*

*Debt payments not included
** Interest rate assumption 5% + 2% margin
Cumulative cash flow, tunnel

- Payback period: 17 years
- IRR: 10.11%
Definitions

- A **tonne-kilometre**, abbreviated as **tkm**, is a unit of measure of freight transport which represents the transport of one tonne of goods (including packaging and tare weights of intermodal transport units) by a given **transport mode** (road, rail, air, sea, inland waterways, pipeline etc.) over a distance of one kilometre. Only the distance on the national territory of the reporting country is taken into account for national, international and transit transport.
  - Calculated as freight tariff (€/t) per kilometre

- **Gross Tonne Kilometres (GTK)** The sum of the total train weight multiplied by the distance travelled: frequently used to mean GTK trailing

- A **passenger-kilometre**, abbreviated as **pkm**, is the unit of measurement representing the transport of one passenger by a defined **mode of transport** (road, rail, air, sea, inland waterways etc.) over one kilometre.
  - Calculated as passenger fare (€/trip) per kilometre

- The **twenty-foot equivalent unit** (often **TEU** or **teu**) is an inexact unit of cargo capacity often used to describe the capacity of **container ships** and **container terminals**. It is based on the volume of a 20-foot-long (6.1 m) **intermodal container**, a standard-sized metal box which can be easily transferred between different modes of transportation, such as ships, trains and trucks.
Assumptions: general

- All calculations are based on World Bank / PPIAF Rail Renewal Toolkit assumptions
- Other assumptions are based on World Bank / PPIAF Rail Renewal Toolkit assumptions
- Calculations include
  - Train infrastructure
  - Passenger and freight traffic
- Calculations do not include
  - Urban infrastructure
  - Real estate
  - Other services
- All values increase by inflation (assumed 2%)
- Euribor forecast: 5%
- Tunnel operation will start 24.12.2024
- Construction project will start Q4/2019
- Specific assumptions are based on Finest Link project when applicable
  - Scenario: Fixed Link, FL
  - Exceptions are mentioned
  - Exceptions mainly in fares (eg. One-way fare 18e => 50e)
Rolling stock assumptions

- Track length 103km
- 100% electric rolling stock
- Each train has 1 000 passenger seats
- 6 trains per hour
- 700 tons of cargo per train
- Freight and units
  - Max. 96 TEU per train
  - Max. 48 trucks per train
  - 600-700 tons per train
  - Average length of train 800-1 000 metres
- Average cargo
  - 8 tons per TEU (source Port of Helsinki)
  - 12-13 tons per truck per trailer (source Finnish Transport Agency).
How to follow the project?

Facebook: ”FinestBayArea Tunnel Project”

YouTube: FinestBayArea Channel & with Finestbayarea search word videos

Website: www.finestbayarea.online