



# FinEst Bay Area Development The Tallinn Tunnel Project

13.11.2019 FinEstBayArea Development Group



A map of the Baltic Sea region. The sea is shown in light blue, and the surrounding landmasses are in light orange. Major cities are labeled in blue text: Stockholm at the top, Helsinki in the center, Tallinn on the left, and St. Petersburg at the bottom. A network of red lines represents major roads or highways, and a black line indicates a national border.

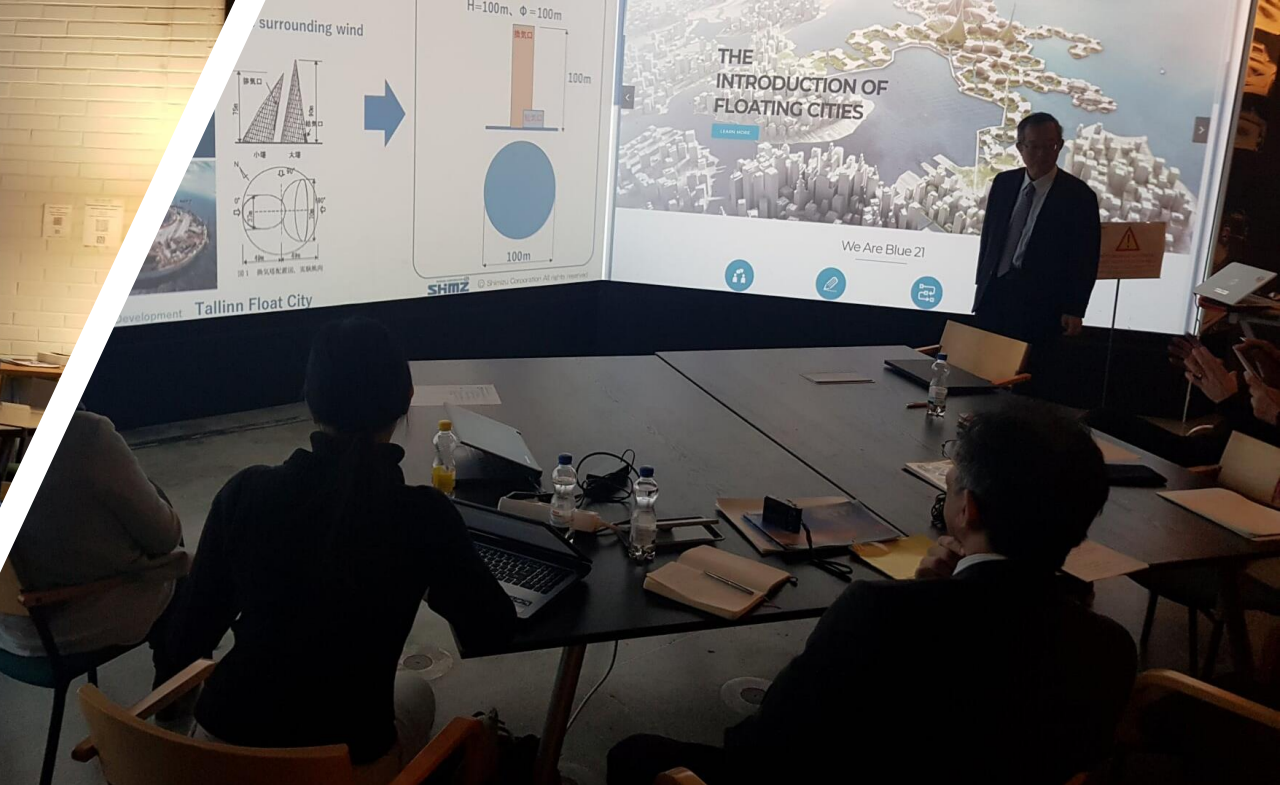
**STOCKHOLM**

**HELSINKI**

**TALLINN**

**ST PETERSBURG**

**Finest Bay Area**





# EXCELLENT GLOBAL LOCATION

## AT THE HEART OF EURASIA



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



# Finest Bay Area Global Attraction FINLAND

Best Education  
Happiest Nation  
Most entrepreneurial  
Cleanest Air  
Least Corruption

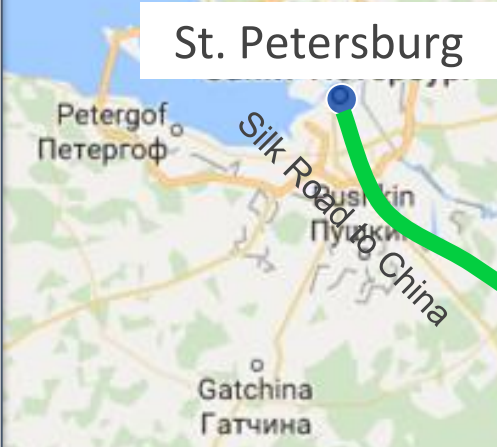
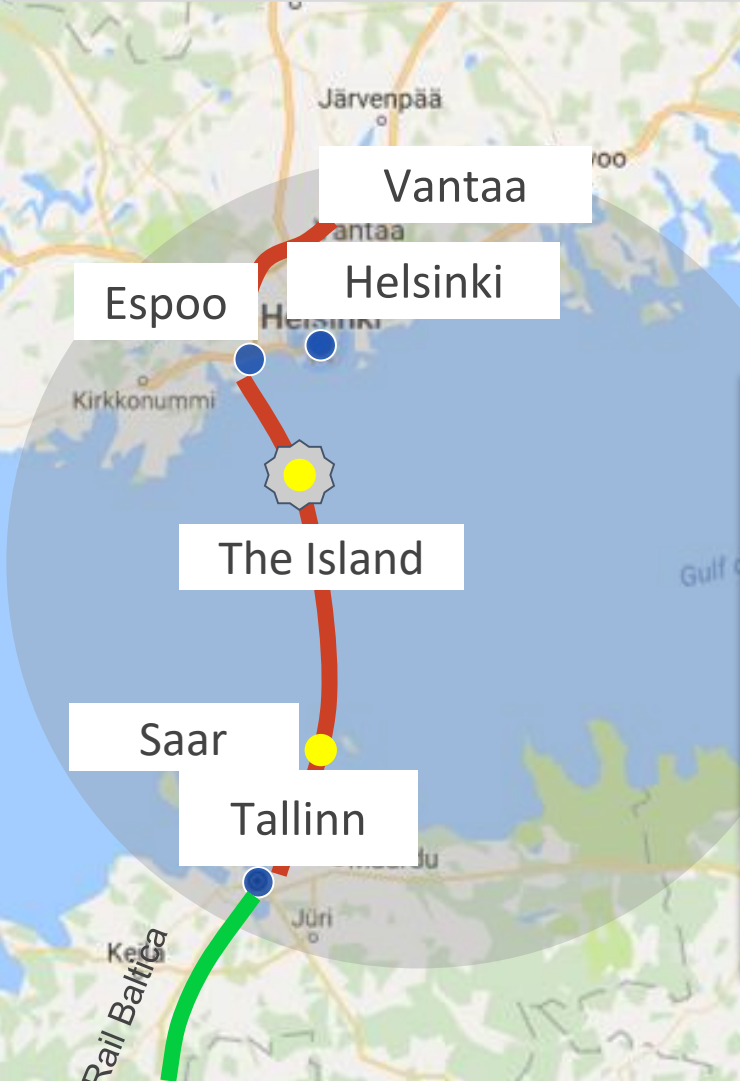


# THE HELSINKI TALLINN METRO AREA

2 MILLION+ PEOPLE AT THE HEART OF EURASIA

## The Tallinn Tunnel

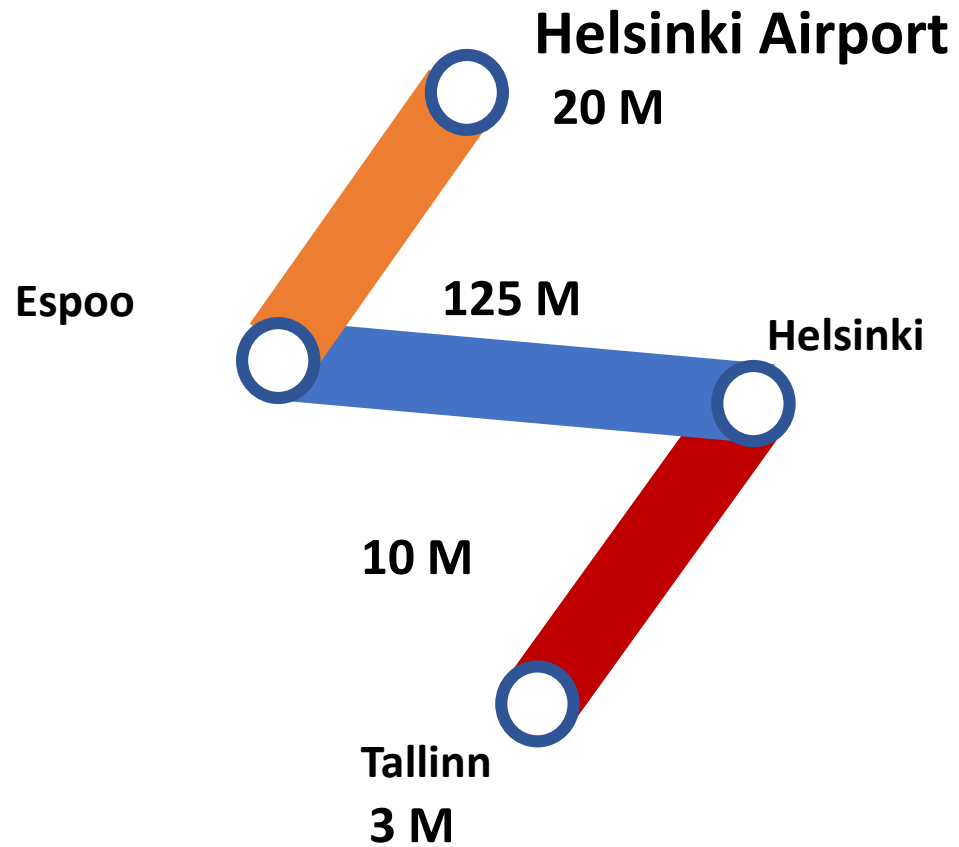
- Creating gravity
- Enabling future growth
- Affordable housing at scale
- University Platform



Finland-Estonia tunnel  
High speed tracks to St Petersburg and Tallinn

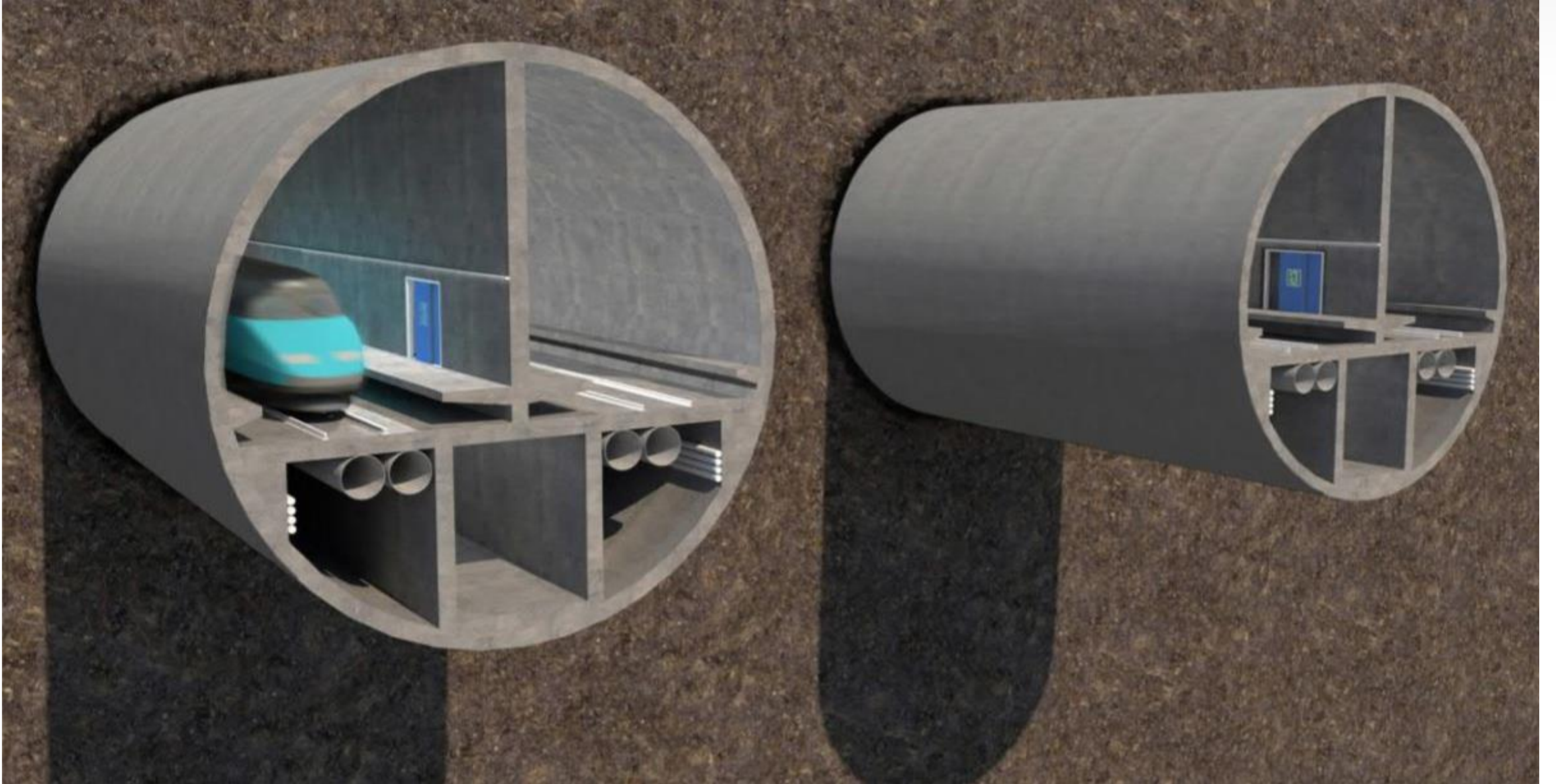
# Passenger traffic volumes

## Current



## Assumptions 2030

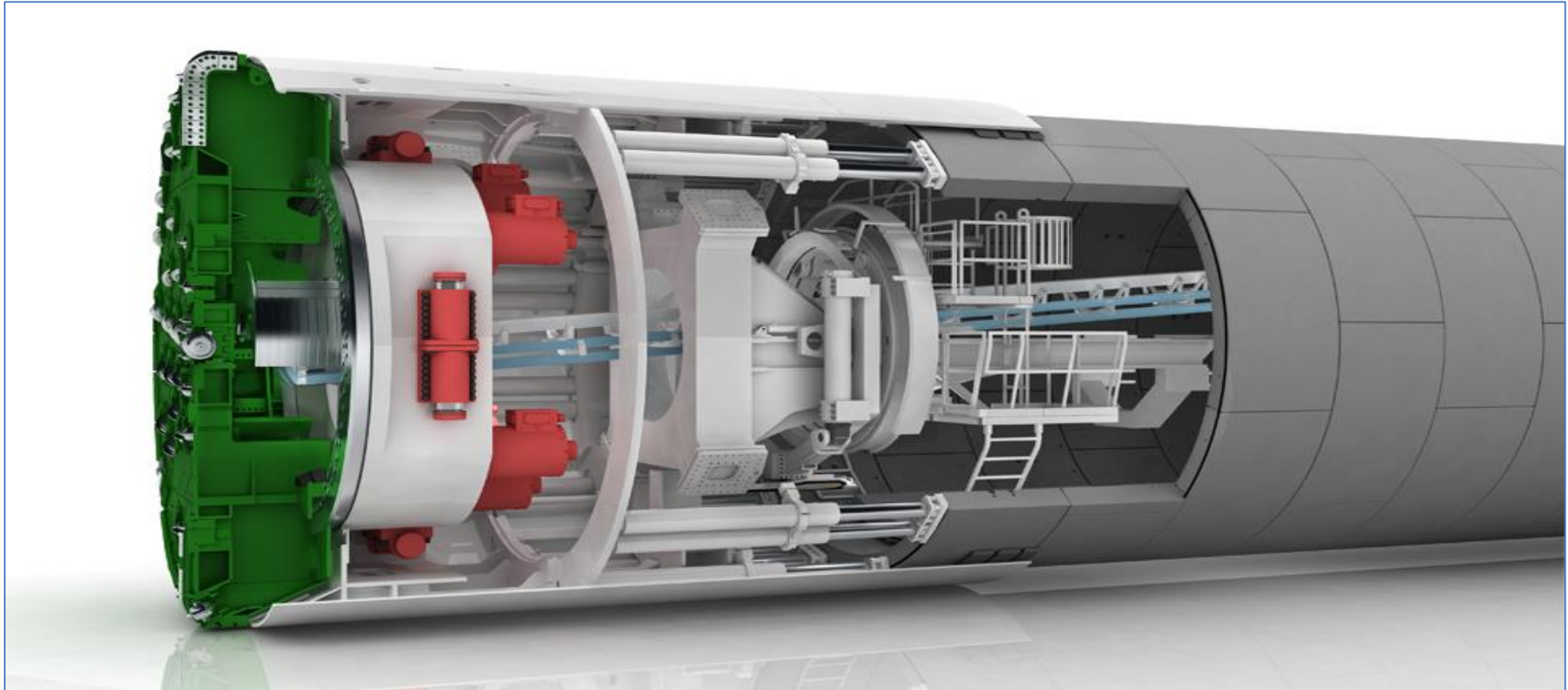






# Mechanised tunneling by TBM

TBM = **T**unnel **B**oring **M**achine





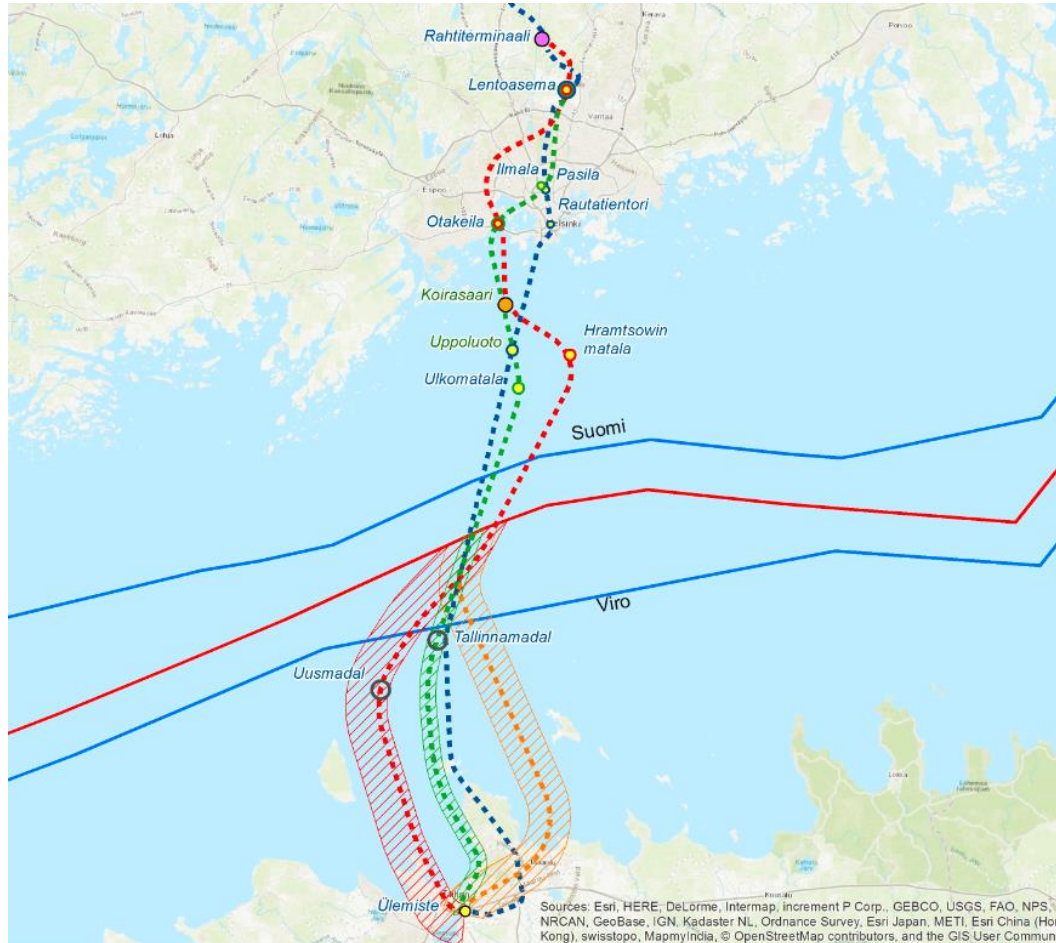
# Tunnel Project Timelines

- Project design, permits and planning 2017-2019
- Construction start 2019-2020
- Tunnel operational 24.12.2024





# FINEST BAY AREA PROJECT POSSIBLE ROUTES



- Four lines to be studied during the EIA procedure
  - red VE1a and green VE1b
  - VE2 reference line from the Finest Link feasibility Study
- 3 different comparable alternatives in the EIA procedure and a "0+-alternative"
- Cargo terminal
- Stations:
  - Helsinki-Vantaa Airport
  - Ilmala / Finnopolis
  - Otakeila
  - "The Island"
  - Tallinn Ülemiste Airport
- Access tunnels
- Artificial island
- Shafts



# Consortium partners



**Fira**

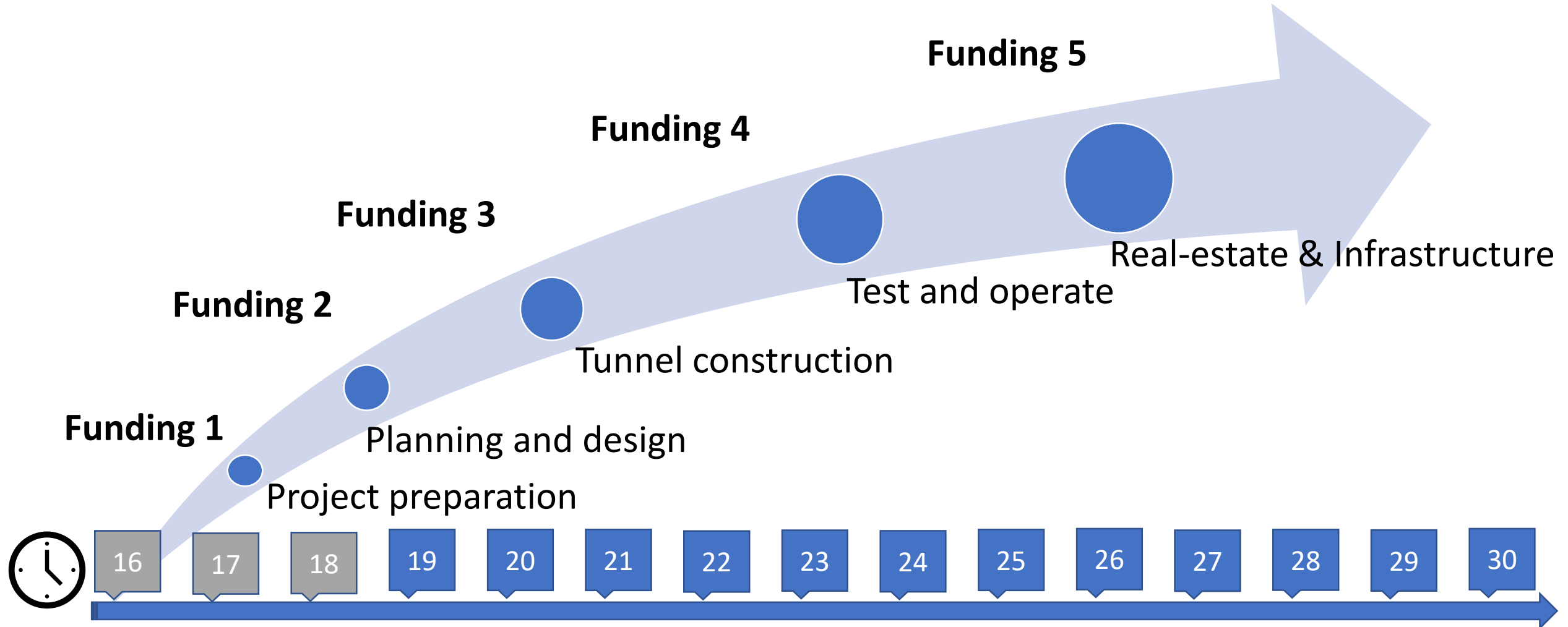


# Project Funding

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# Annual Phased Funding



# Financials

Tunnel project estimate total cost 15B€

Design 750M€

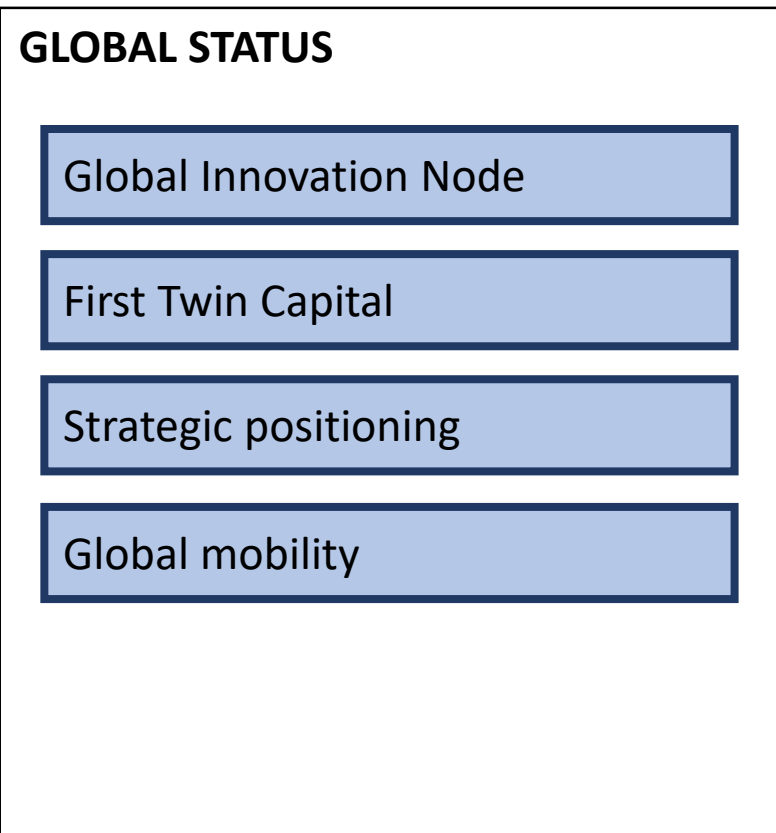
Construction 12,5B€

Project management 1B€

Management 750M€



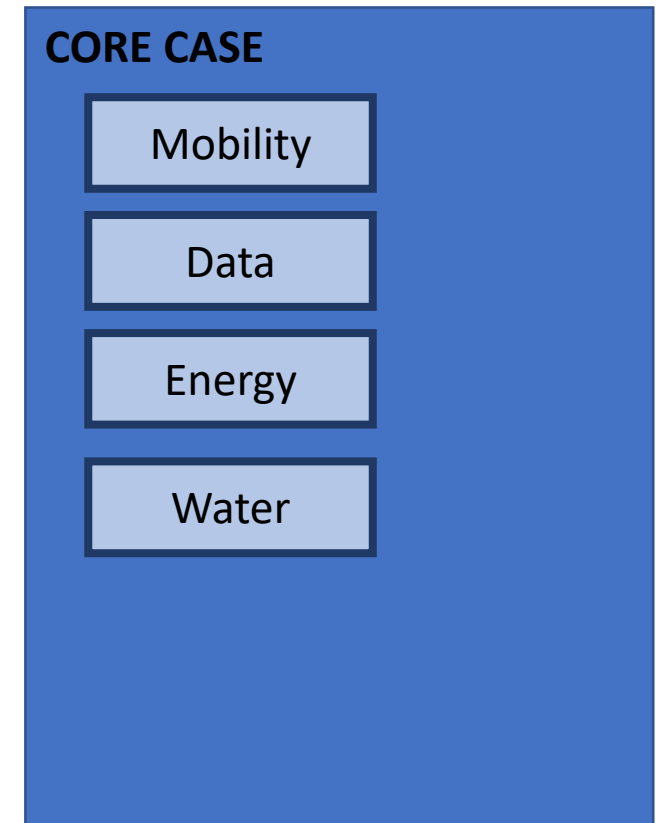
# FinEst economic impact structure: 3 levels



50+ years



20+ years



10+ years

# Tunnel

Project case for the tunnel



# 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)



**PPIAF**  
Enabling Infrastructure Investment



SUPPORTED BY  
**WORLD BANK GROUP**

# 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
- Residual value after 30 year is assumed to be 60% of nominal investment, 9 160 M€
  - No inflation adjustment
- 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)
- No taxes applied at this stage of planning
- No risk reserves applied at this stage of planning

## Innovation platform:

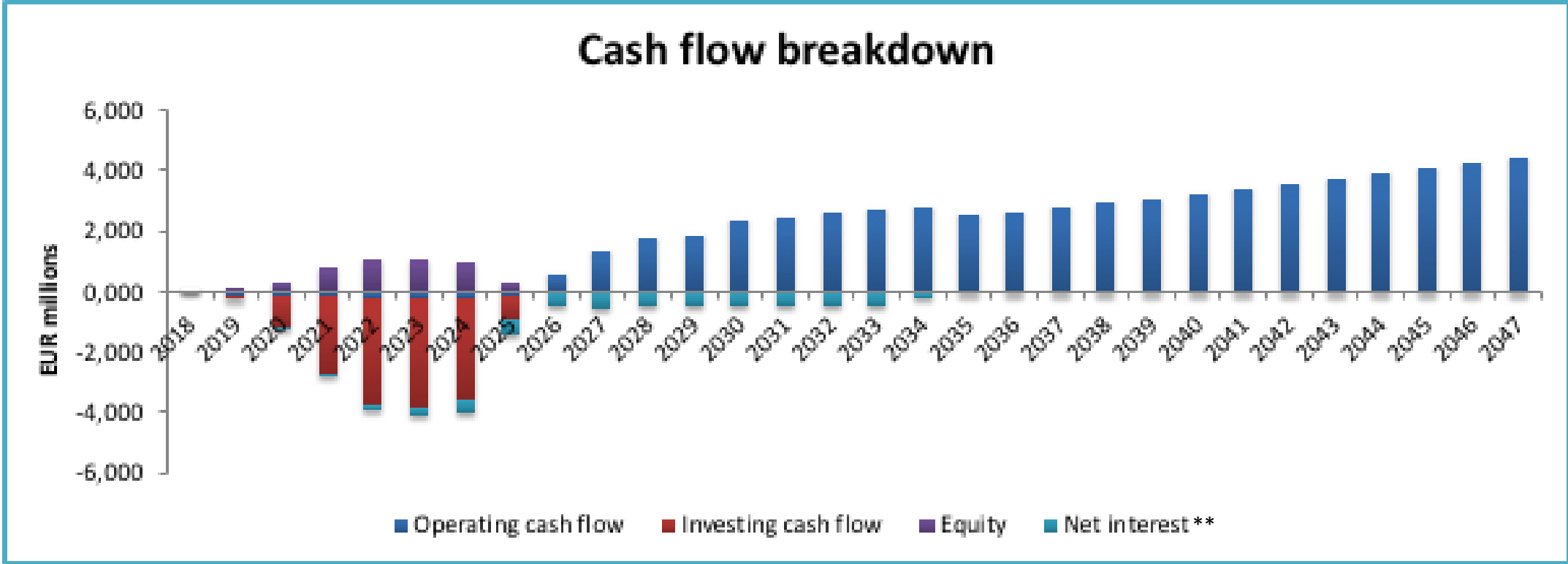
- 225 M€ innovation funding for technology and service development and environmental impact (1,5% of total value)
- Use for developing construction project firms and their technology
- Included in FEBAY Infrastructure investment

## Financing costs:

- Equity 4,6B€:
  - Dividend payout ratio average 11,7%
  - Average annual dividends 216M€ (2025 onwards)
- Debt 10,4B€:
  - 2,6B€ fixed 5%, bullet 15y with 5y grace period
  - 6,9B€ variable Euribor+1%, bullet 15y with 5y grace period
  - 0,9B€ variable Euribor+1%, bullet 15y with 5y grace period
  - Average net interests paid annually 356M€ (first 15 years)



# Tunnel case cash flow breakdown\*

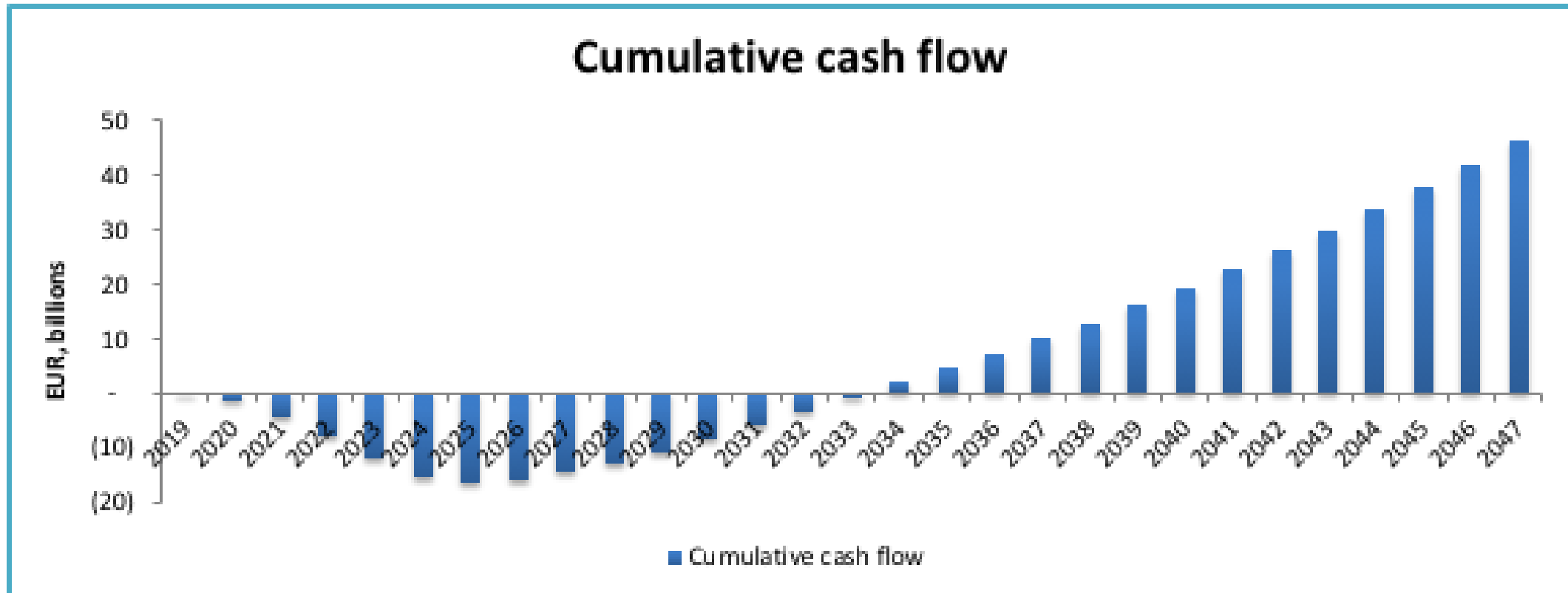


\*Debt payments not included  
 \*\* Interest rate assumptionc 5% + 2% margin

# Cumulative cash flow, tunnel

Payback period  
17 years

IRR 10,11%

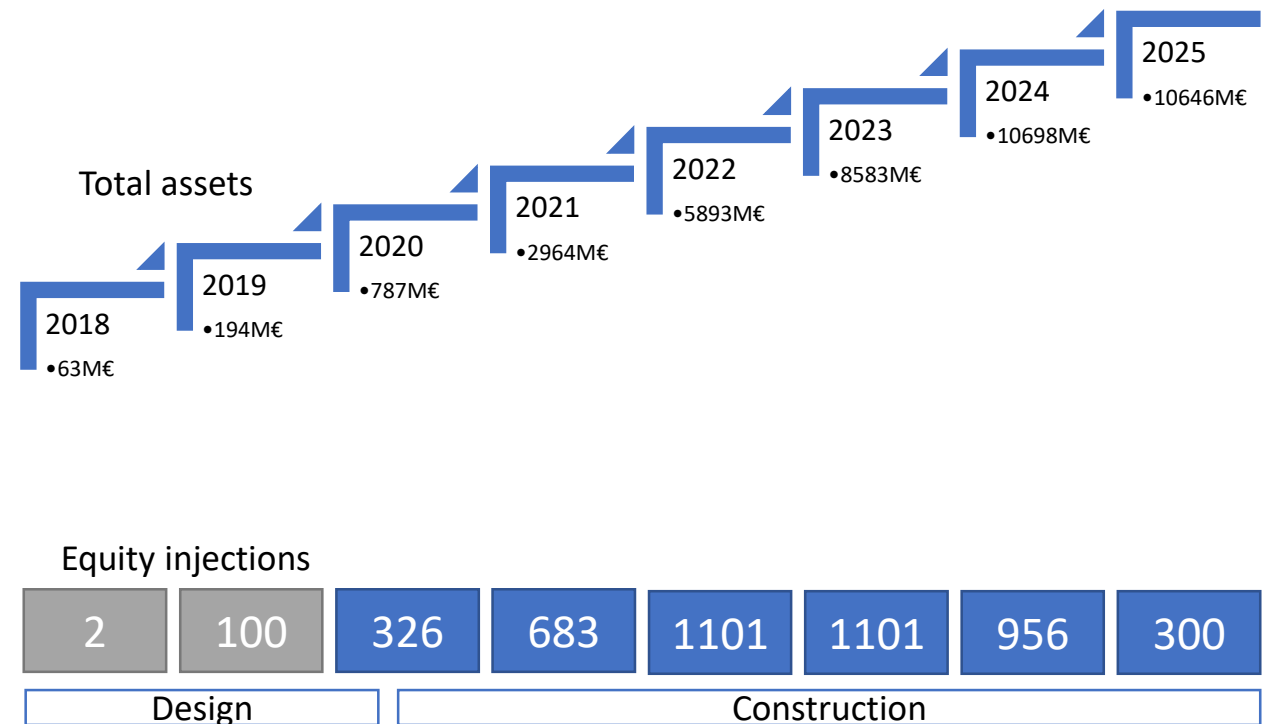


# Case for equity investors, tunnel

## Investments

- Long-term infrastructure equity investment
- Exit opportunities
  - Equity sale during injection stages
  - IPO to be considered
- Estimated net present value (NPV)
  - 22 139 M€
- Equity injections
  - 4 567M€
- Net value / equity 4,89

## Phased approach



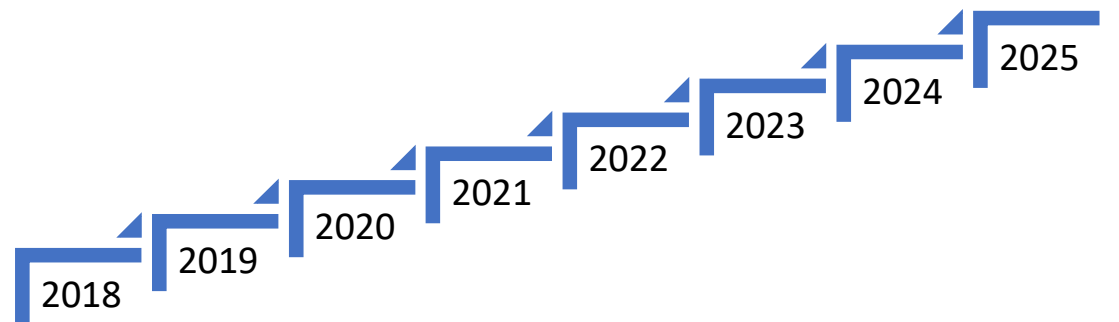


# Case for debt investors, tunnel

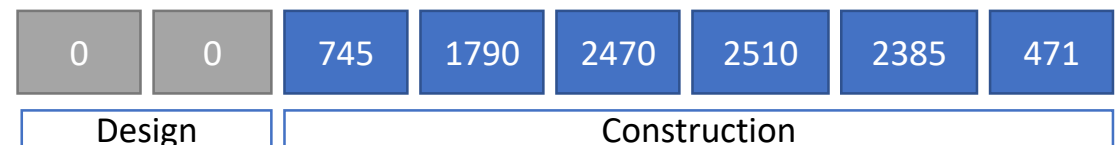
## Investments

- Starting from construction phase
- Principal amounts in €
- Role of contractors still open
  - Construction contracts
  - Equipment contracts
- Debt injections
  - 10 371M€

## Schedule



## Debt injections



# 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

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  
<https://www.oresundsbron.com/en/traffic-stats>



# The 4 Station Areas

Aviapolis,  
Vantaa



OtaKeila,  
Espoo



Island



Ulemiste,  
Tallinn



## Aviapolis - Vantaa

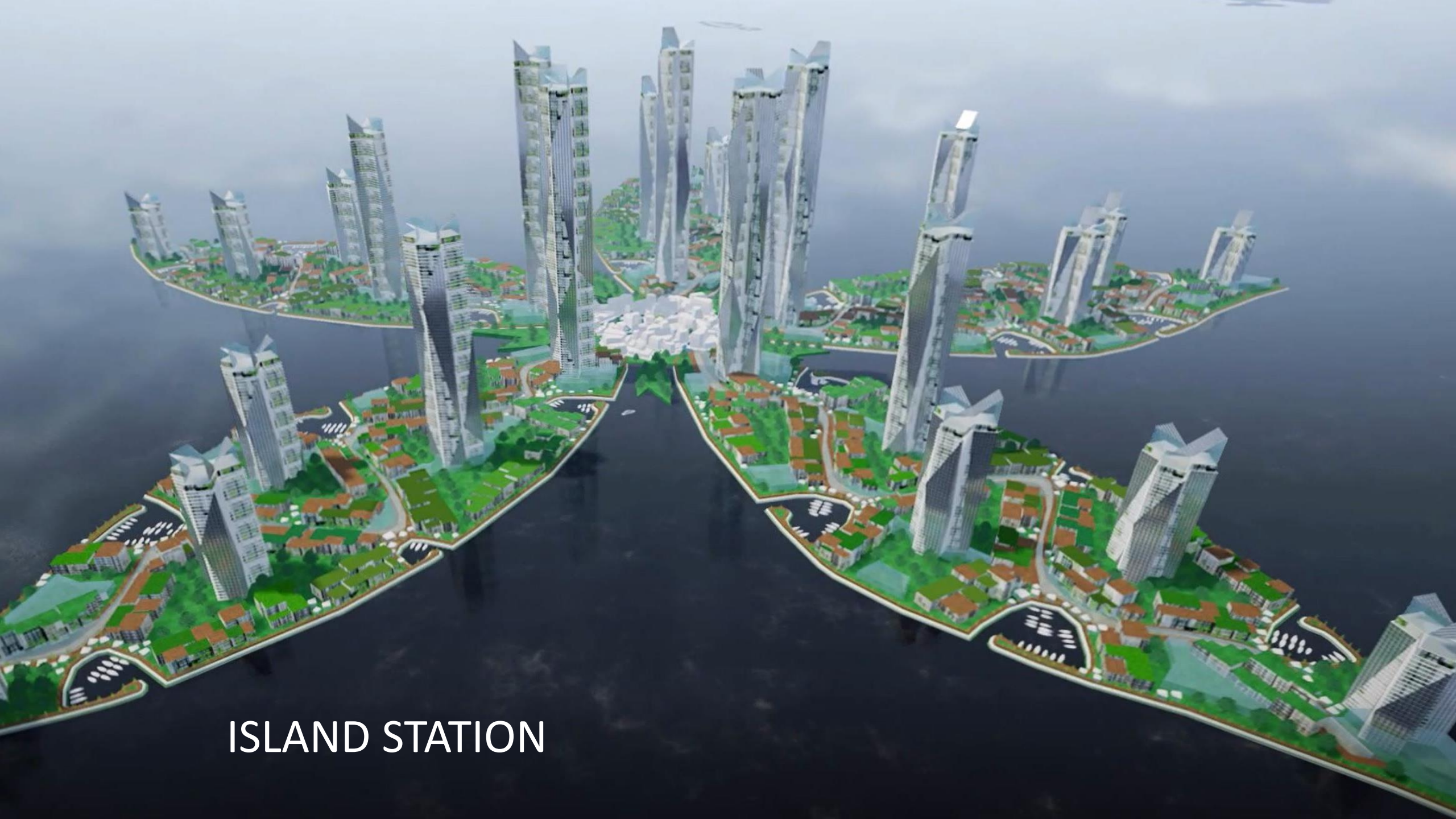
- The Helsinki Airport Station
- Connecting Europe and Asia
- Fast rail to Tampere, Turku, Oulu and St Petersburg
- Massive parking hub
- Co-Living and Co-Working area
- Walkable/cyclable
- International schools and universities
- Population 50 000, international demographic, 20% students
- Official languages Finnish, Swedish



## OtaKeila - Espoo

- Home of Aalto University
- Regional HQ area
- Co-Living and Co-Working area
- 120000+ M2 startup hub, home of 1000s of startups
- Walkable/cyclable
- International schools and universities
- Population 50 000, international demographic, 30% students
- Official languages English, Finnish, Swedish





ISLAND STATION





## The Island (AI) - Helsinki

- New Artificial Island with a tunnel station
- Planned size for the Island is 3-5km<sup>2</sup>
- Co-Living and Co-Working area
- International schools and universities
- Island population 50 000, international demographic, 20% students
- Official languages English, Chinese, Finnish, Swedish and Estonian



## The Island

- Energy self-sufficient
- Food self-sufficient
- NO CARS, walkable/cyclable
- Convention, sports and entertainment center
- 10 000 hotel rooms
- 10 minutes train ride from two international airports





## Ulemiste - Tallinn

- The Tallinn Airport Station
- Connecting Europe and Asia
- Fast rail to Riga, Vilnius, Central Europe
- Co-Living and Co-Working area
- Walkable/cyclable
- International schools and universities
- Population 50 000, international demographic, 20% students
- Official languages Estonian and English

# How to follow the project?

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Download the Tunnel App!

Facebook: "FinestBayArea Tunnel Project"

YouTube: FinestBayArea Channel & with Finestbayarea search word videos

Website: [www.finestbayarea.online](http://www.finestbayarea.online)









Thank You!

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FINEST BAY AREA DEVELOPMENT