



# FinEst Link: Considerations for next steps of the project and key milestones

FINEST

DISCUSSION DOCUMENT | April 2018



EUROPEAN UNION  
European Regional Development Fund



- **Executive summary**
- Overview of the FinEst Link project
- Learnings from other megaprojects
- Considerations for the next project phase for FinEst Link
- The immediate next steps for FinEst Link
- Appendix

- **FinEst Link is in the final stages of the feasibility assessment with focus on next steps to ensure continuity of the project**
  - The feasibility assessment has concluded that the FinEst Link project is fundamentally implementable, with economic feasibility as the key issue that needs to be solved
  - The FinEst Link project has strong political support from both involved countries, but no firm go-live decision yet – target tunnel opening is 2040-2045
  - A taskforce has been set up to create an overall plan and immediate next steps going forward in order to ensure continuity
  - There are other projects affecting the FinEst Link, which should be taken into account in the planning phase to cater for potential cooperation opportunities in the future
- **Experience from previous megaprojects stresses the importance of project team capabilities, the right culture from the outset, well-planned risk mitigation and proactive communication**
  - Project should have a clear view on required capabilities for each phase, ranging from long-term dedicated leadership, knowledgeable core team and utilization of additional experts when needed
  - Continuous challenger mindset to question status quo ensures continuous improvement and identification of optimization opportunities throughout the project
  - Communicate and keep the business case visible in the minds of stakeholders including a set-up to mitigate risks to ensure investor attractiveness
  - Transparency is key to ensuring support from the wider stakeholder community – utilize public hearings and other means for frequent communications
- **The magnitude, complexity level and international nature of the FinEst project drive the project's agenda for the near term**
  - Secure a project team with required capabilities and set up a robust governance structure
  - Put in place master planning and create a first draft of the plan to ensure a complete view of upcoming milestones at every stage of the project
  - Develop a robust stakeholder management plan and process to ensure transparent communication
  - Define ownership structure and financing model, including the revenue generation model (from ticket sales and possible subsidies) to attract investors
  - Create a risk management process to ensure continuous risk identification and mitigation throughout the project
- **The main immediate next step for FinEst is to establish solid governance and a full time project team**
  - The initial timeline for 2018-2020 shows that considerable effort is needed already in 2018 to be able to start planning and permitting in 2019
  - To ensure successful launch of the concepting phase, FinEst Link should invest in a full time core team and put in place the initial governance structure

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# FinEst is currently in the final stages of the feasibility assessment with focus on next steps to ensure continuity of the project

## Background and FinEst objectives

- The goal of the FinEst Link initiative is to develop **commuter mobility between Helsinki and Tallinn** in order to deepen the economic co-operation between Finland and Estonia
- As a part of this initiative the FinEst Link project explores transport solutions to cater for increased freight and passenger volumes over the long term and has assessed the **feasibility connecting the capital cities by railway tunnel under the Baltic sea**
- The feasibility assessment is now in its final stages with **focus on a next steps roadmap to secure project continuation**, including design of organization and governance models for the Helsinki-Tallinn tunnel project
- The FinEst Link project needs to **create the roadmap and evaluate key design options by end of April**

## Objective of the report and main deliverables

- The objective of the report is to **help secure continuation of the FinEst Link project by creating a clear project roadmap and providing visibility on how to structure next steps** based on industry best practices and experience from similar megaprojects
- The report has been co-created with the FinEst Link project team and taskforce
- The main deliverables of the report include:
  - ① Project organization alternatives
  - ② Key stakeholders for communications planning
  - ③ Overview on options for owners organization and financing
  - ④ Risks for mitigation planning
  - ⑤ Key components of the FinEst master plan
    - FinEst Project overview until estimated completion
    - Milestones for 2018-2020
  - ⑥ A best practice guide to managing megaprojects

# Background: The feasibility assessment has concluded that the project is fundamentally implementable, with economic feasibility as the key issue that needs to be solved

## Technical concept

- The FinEst Link is based on a 1435 mm gauge railway tunnel with two rail tunnels and a service tunnel
- Passenger stations are in Helsinki city, Pasila and Helsinki-Vantaa airport
- Freight terminal in close proximity of the Helsinki airport with connection to the Finnish railway network (1524mm)
- Passenger stations in Ülemiste Tallinn
- Freight terminal near the airport
- A connection for both freight and passengers to Rail Baltica

## Strategic positioning

- The FinEst link forms a gateway to the wider European railway systems through Rail Baltica
- Improved connections between Helsinki and Tallinn will foster metropolitan growth through improved accessibility for people and companies

## Demand growth

- The tunnel will bring substantial growth in passenger travel and some increase in freight (main shift is from ferry to train) compared to scenarios without tunnel

## Planning objectives

- The FinEst Link has met all its six planning KPIs:
  - Improved daily commuting with frequent connections and competitive ticket prices
  - Smooth travel chains, with integration to other means of public transport
  - Effective travel chains through enabling multimodal and international travel
  - Environmental sustainability through energy efficiency and reduced truck traffic in cities
  - Improved travel safety through lowered risk levels with high safety standards
  - Economic viability through according to project financial modelling

## Costs

- Cost estimation 13-20 billion euros based on benchmarks from similar projects

## Economic feasibility

- Despite the high demand growth, the investment model shows low economic feasibility due to high initial investments
- Report findings suggest that the calculations do not account for wider economic impact

SOURCE: FinEstLink Feasibility Study – Final report

# The FinEst Link project has strong political support from both involved countries, but no firm go-live decision yet – target tunnel opening is 2040-2045



## Important topics to consider early on:

<p><b>Alignment with other projects:</b></p> <ul style="list-style-type: none"> <li>• Ülemiste railway station area</li> <li>• Muuga multimodal terminal</li> <li>• Helsinki Airport rail</li> <li>• Helsinki Airport multi-modal travel center</li> <li>• Helsinki underground general plan</li> <li>• Ten-T program (alignment for possible financing)</li> </ul>	<p><b>Need for more detail</b></p> <ul style="list-style-type: none"> <li>• Groundwater studies (Viimsi and Helsinki Airport area)</li> <li>• Artificial islands and its construction material logistics</li> </ul>	<p><b>Understanding of land use</b></p> <ul style="list-style-type: none"> <li>• Helsinki Uusimaa Regional Plan</li> <li>• General land use plans of the municipalities</li> </ul> 
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SOURCE: Press research, discussions with FinEst project team

# A taskforce has been set up to create an overall plan and immediate next steps going forward in order to ensure continuity

	Feasibility studies	Taskforce	Next steps
Timing and duration	<ul style="list-style-type: none"> <li>Started in 2017 and finished in March 2018</li> </ul>	<ul style="list-style-type: none"> <li>Started in April 2018 and will finish by beginning of May 2018</li> </ul>	<ul style="list-style-type: none"> <li>Taskforce to define next steps by creation of schedule, milestones plan and suggestion for the project set-up</li> <li>Decision in principle needed to secure continuation and to enable funding</li> </ul>
Responsibilities	<ul style="list-style-type: none"> <li>Conduct initial technical and economic feasibility of a fixed rail link between Helsinki and Tallinn</li> </ul>	<ul style="list-style-type: none"> <li>Create milestones plan and next steps for the following two years including suggestion on project organization</li> </ul>	
Funding	<ul style="list-style-type: none"> <li>Funded by the EU's Interreg Central Baltic Program with a budget of 1,3 mEUR</li> </ul>	<ul style="list-style-type: none"> <li>No separate funding</li> <li>Work conducted in parallel to existing national and regional budgets</li> </ul>	
Key outcome	<ul style="list-style-type: none"> <li>The feasibility study has concluded that the fixed link is feasible, but with questions concerning the business case</li> </ul>		

SOURCE: FinEst feasibility study; FinEst project team interviews

# There are other projects affecting the FinEst Link, which should be taken into account in the planning phase to cater for potential cooperation opportunities in the future

Globally, there are multiple other separate infrastructure projects are ongoing, with touchpoints to FinEst Link

## (Midway Alignment of) Bothnian corridor



- Midway Alignment of the Bothnian Corridor is an EU-project designed to expand the connections between strong, fast growing, internationally important regions that are in need of a ferry (e.g. Ostrobothnia and Westerbothnia)
- Co-financed by the TEN-T program

## Rail Baltica



- Project to link Finland, Estonia, Latvia, Lithuania and Poland with a European standard gauge rail line, providing passenger and freight service between the countries and improving rail connections between Central and Northern Europe<sup>2</sup>
- One of the priority projects of the European Union: Trans-European Transport Networks (TEN-T)

## Arctic Corridor – Arctic Railway



- A global economic region as well as a transport and development corridor
- Missing part from the railway route between the Mediterranean to the Arctic Ocean is the gap between Rovaniemi and Kirkenes.
  - Cost estimate for this Arctic Railway Project is €3 billion
  - Building of the railway could start as soon as in the 2020's

## Silk Road Economic Belt<sup>1</sup>



- Development strategy proposed by the Chinese government that focuses on connectivity and cooperation between
  - Eurasian countries, primarily the People's Republic of China (PRC)
  - The land-based Silk Road Economic Belt (SREB)
  - The ocean-going Maritime Silk Road (MSR)

Within Finland and Estonia, there are also multiple plans in progress which need to be steered to a direction positive/neutral to FinEst Link

## Finland

- Helsinki Airport rail
- Helsinki Airport multi-modal travel center
- Helsinki underground general plan

## Estonia

- Ülemiste railway station area
- Rail Baltica infrastructure in Harju county

## Alignment with EU budgeting

- Ten-T program (alignment for possible financing)
  - Financial period planned in 2021
  - Enforced 2023

<sup>1</sup> Known as One Belt and One Road (OBOR) until 2016;

<sup>2</sup> A continuous rail link from Tallinn (Estonia), to Warsaw (Poland), via Riga (Latvia) and Kaunas (Lithuania)

SOURCE: Press search, initiative websites, FinEst Project team

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# For FinEst Link, there is a lot to learn from other similar megaprojects



- A** **Ensure correct capabilities.** Project should have a clear view on required capabilities for each phase, ranging from long-term dedicated leadership, knowledgeable core team and utilization of additional experts when needed

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- B** **Support a challenger mindset.** Continuous challenger mindset to question status quo ensures continuous improvement and identification of optimization opportunities throughout the project

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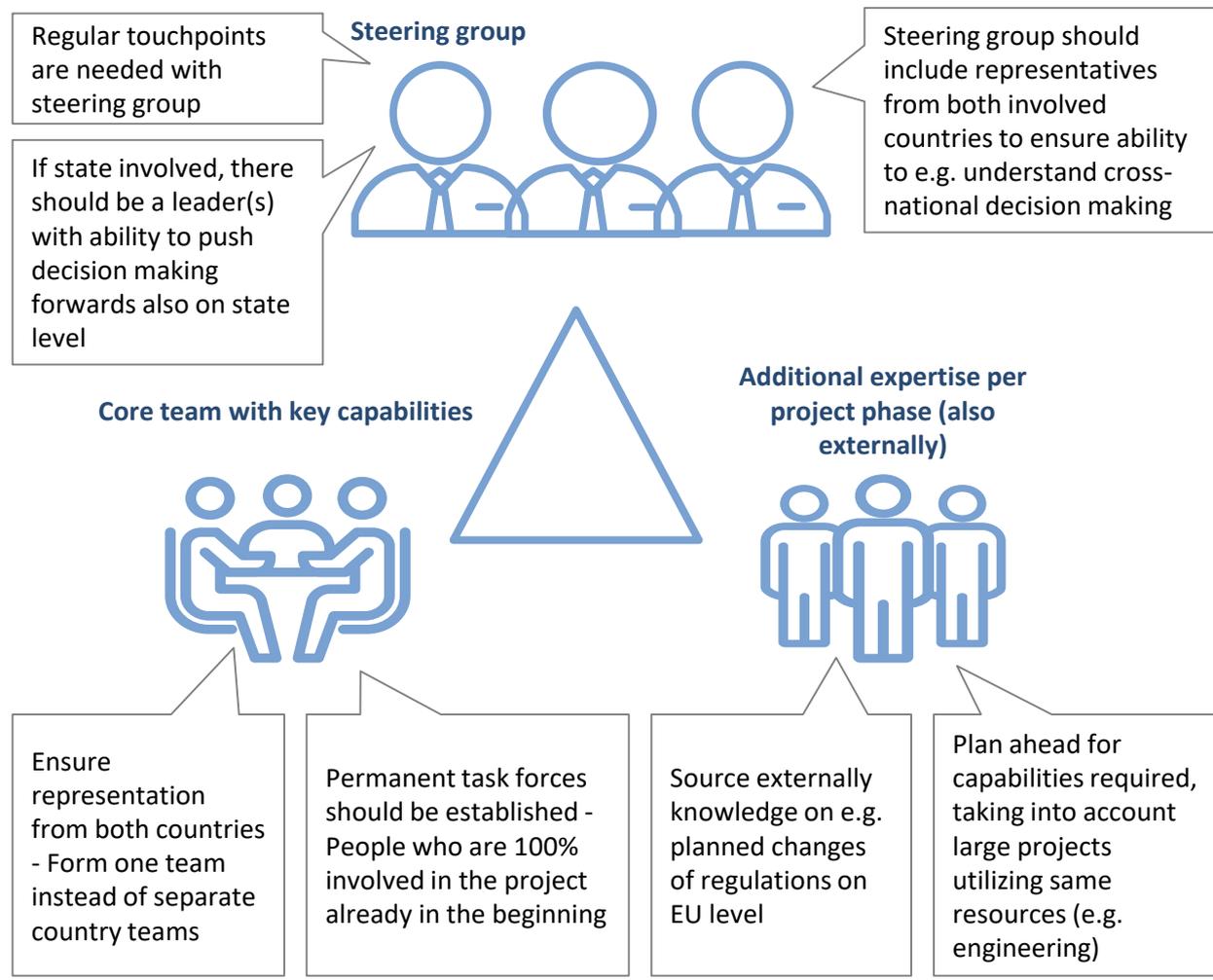
- C** **Create a clear and compelling business case.** Communicate and keep it visible in the minds of stakeholders including a set-up to mitigate risks to ensure investor attractiveness

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- D** **Utilize multiple means for communications.** Transparency is key to ensuring support from the wider stakeholder community – utilize public hearings and other means for frequent communications

# A Ensure correct capabilities are present in the project team – Either internally or sourced externally

Other megaprojects suggest that there are multiple parts of the project organization which need to be carefully thought through – already in the beginning of the project



## Ensure correct capabilities are present in the project team

- **Guarantee dedicated project steering.** Having a clear project steering group, political support early on and people driving the project forwards in the long term is crucial to secure continuity
- **Staff the core team with key capabilities.** The core team should be staffed full time and for the long term, integrating parties across state borders, ensuring key capabilities over the project timeline, e.g. critical local knowledge for permitting and stakeholder management
- **Ensure required additional expertise is available for each project phase.** Availability of required resources at the correct time is critical for project success, and can prove to be a bottleneck if not planned for in advance

# B Support a challenger mindset – Ensure identification of optimization opportunities

## Challenging the existing standards led to identification of large opportunities for optimization

### No / small differences in standard

#### 1 Handrails / guardrails

No significant difference in standards between Country B and Country A

#### 2 Asphalt

No significant difference in standards between Country B and Country A

#### 3 Assembly

No significant difference in standards between Country B and Country A

### Significant differences in standard

#### 4 Width

Country B's 4-lane roads have standard road widths 20m for roads with ANV<sup>1</sup> 12'-20' and 23m for ANV<sup>1</sup> > 20'. Country A's 4-lane roads have a minimum width of 18.5m for freeways and 16.5m for a no-frills road

#### 5 Lighting

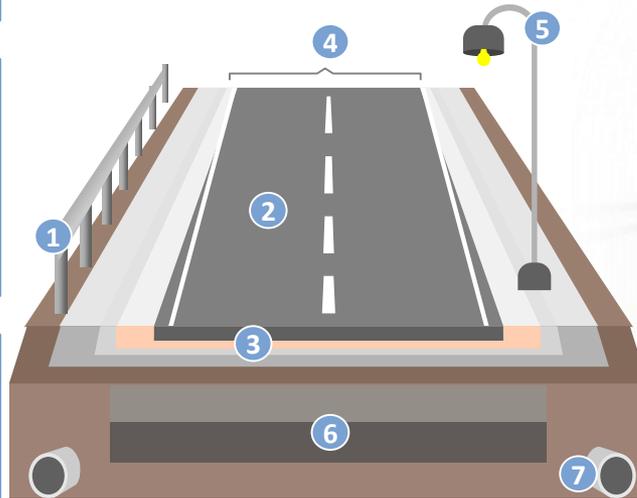
Country B requires lighting by road with ANV<sup>1</sup> > 6,000, while Country A requires lighting with ANV > 35,000 for 4-field

#### 6 Reinforcements and frost protection

Country B is entitled to 100-year frost protection for 4-field and 10-year frost protection for the 2-way road. This requires a total depth of up to 2.40 m for 4-field and 1.80 m for 2-field

#### 7 Drainage

Due to deeper superstructure, Country B uses largely closed drainage, while Country A uses open drainage in ditch



### Ensure a culture of challenging the status quo

- Ensure understanding throughout the organization understands why it is important to challenge the status quo
- Support all individuals sharing ideas on optimization opportunities
- Create formal mechanisms to support idea generation (e.g. idea boxes, putting ideas in action,...)
- Role model the required change by ensuring project leadership positively focuses on opportunity identification

1 Average number of vehicles per day

# C Create a clear and compelling business case to ensure investor attractiveness

## The business case needs to be fact based to ensure long term success for all stakeholders

### Eurotunnel investors get first dividend since 1987

About 80,000 long-suffering British shareholders in Eurotunnel were 4 euro cents a share better off for their troubles yesterday after the company announced the first dividend since its flotation in 1987.

Eurotunnel, which announced a €40m (£35.6m) net profit - only the second in its history - for last year, said it was paying €7.6m to shareholders.

Jacques Gounon, chairman and chief executive, defended the meagre payout by promising that it would be the first of many. "It [the payout] was not because it's an exceptional dividend. It's because we want to start a dividend policy," he said.

"We were predicting that on Eurostar there would be 21 million passengers (annually)," admits David Freud of Warburg, the investment house which sold Eurotunnel shares to the public.

The actual figure was less than a third of that.

"So the traffic forecasts were not just out by a little bit. They were completely potty; they were nowhere."

Those who drafted Eurotunnel's prospectus failed completely to foresee a robust response from the ferries.

## FinEst Link should consider multiple alternatives to ensure a successful business case and investor interest

### Reduced financial risks

- Government guarantees, e.g. passenger volume subsidies
- Long contracts
- Separate contracts, e.g. construction and operations as separate deals

### Additional upside

- "Package" deal with e.g. developer rights
- Good PR and new capabilities

### Strong backbone

- Skilled core team
- Good management practice with experienced project manager and independent chair
- Predictable political decision making

## D Utilize multiple means for communications – Create a culture of transparency

**Not addressing all relevant stakeholder early on can lead to negative results** - Public letter was signed by over 400 people to demand stop for Rail Baltica

### Public letter of the 400

Dear Member of Parliament, on June 19, 2017, the Riigikogu ratified the transnational agreement of the Rail Baltic project with which Estonia adopted the obligation to construct Rail Baltic in its currently planned form together with Latvia and Lithuania. Legislation was passed based on the flawed conclusion of the EY feasibility study, according to which the new railroad would be of socioeconomic benefit to society.

Until international and independent Estonian experts have verified the Rail Baltic feasibility study and the results of said analysis are published, we, the undersigned, demand an immediate halt to all Rail Baltic preparation and construction work!

### Multiple means for communications should be utilized to address all stakeholders

- **Facilitate political support already early on** to ensure leadership for project is available also on a wider environment outside project team
- **Activate business community** to support project by involving them in discussions and educating them on the long term benefits
- **Hold open meetings regularly**, with easy access for stakeholder, ensuring transparent and real time communication, e.g.
  - Meetings for parliament sections at parliament buildings
  - Meetings for environmental committees
- **Involve key opinion leaders** to help shape the opinion of general public
- **Celebrate early success openly** and share with a wide group of stakeholders

SOURCE: Postimees.ee; expert interviews

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# FinEst Link is a megaproject with unique characteristics, which lead the activities for the next phase of the project

## Characteristic of the FinEst Link project

### Description

**A very long project timeline** before being operational

- Long projects are demanding in light of task and team continuity due to changes in e.g.
  - Resources
  - Legislation

**High investments** required to complete infrastructure construction

- Investments of this magnitude (20b EUR) and associated risks require either
  - A strong business case to attract private money
  - Strong public entity support (e.g. from EU TEN-T) to ensure subsidies

**A complex stakeholder environment**, with main parties including Finland, Estonia and the EU

- Success of infrastructure projects is often put at risk by how they manage multiple stakeholders and conflicting interests
- For FinEst Link the list of stakeholders is especially long due to e.g.
  - International reach of the project
  - Involvement of two nations
  - Involvement of EU

**Technically demanding project** in global context and no firm decisions on technical solutions yet

- Project team, including owner's representatives and chosen contractors need to have required capabilities to manage complexity

➤ To manage all of the requirements for the next phase, FinEst Link needs to take the following steps:

- ① **Secure a project team with required capabilities and set up a robust governance structure** to ensure success in the next project phase
- ② Put in place **master planning** and create a first draft of the plan to ensure a complete view of upcoming milestones at every stage of the project
- ③ Develop a robust **stakeholder management** plan and process to ensure transparent communication
- ④ Define **ownership structure and financing model**, including the revenue generation model (from ticket sales and possible subsidies) to attract investors
- ⑤ Create a **risk management process** to ensure continuous risk identification and mitigation throughout the project

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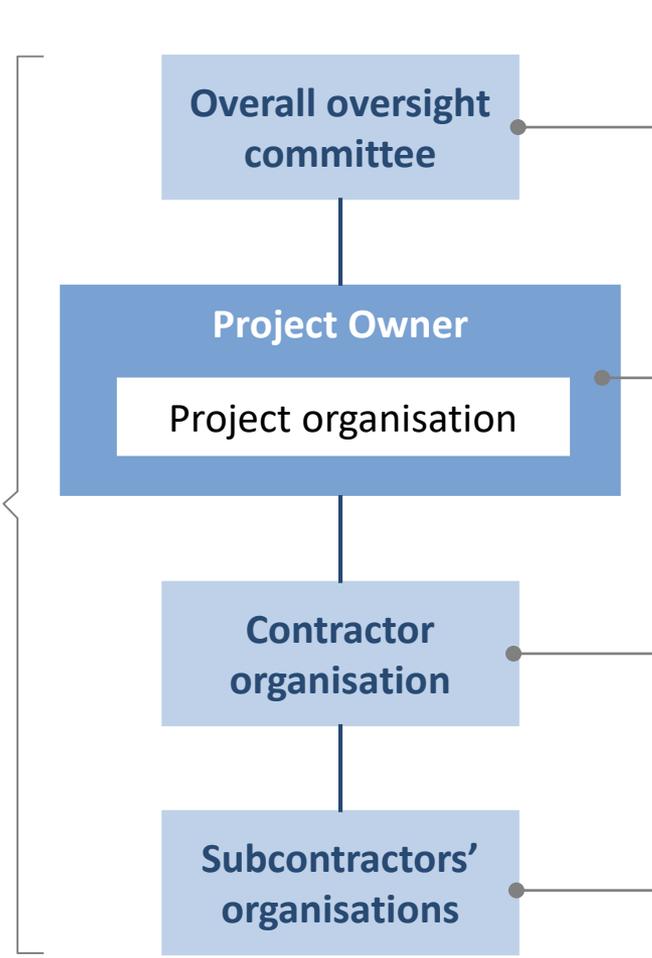
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# ① On a high level, a project organization is comprised of the project owner's team, contractors and oversight committee

Further details on following pages

Includes all external stakeholders like local community, NGOs, political functionaries, civil authorities and others

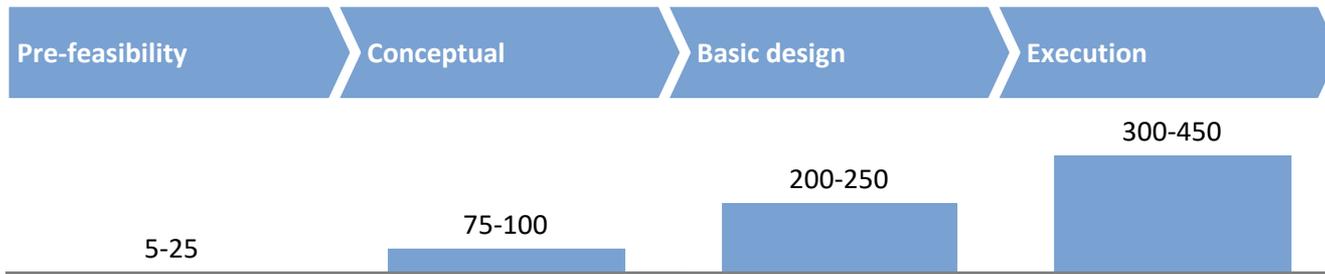


## For you, this could mean the following

- Comprised of government agencies, project financiers, and selected representatives such as independent consultants and experts
- Project owner organization:
  - Project organization to oversee design and construction and to monitor contractor performance
  - Functional departments and scope delivery streams to lead the work
- Typically under the auspices of EPC (engineering, procurement, and construction) or D&B (design and build) or other types of contracts
- Includes suppliers of materials, labor resources, or design and construction services

SOURCE: Expert interviews; Construction Industry Institute

# ① Over the course of a megaproject, the project owner's organization will see a substantial increase in staffing needs as the project moves from pre-feasibility towards execution



Mega-projects (E.g. ~\$10B)

Required key capabilities

- |  |  |   |  |
|--|--|---|--|
| <ul style="list-style-type: none"> <li>Regulatory expertise to <b>identify needs for permitting</b></li> <li>Basic engineering to <b>identify technical feasibility</b></li> <li>Capabilities to <b>assess feasibility of business case</b></li> </ul> | <ul style="list-style-type: none"> <li>Regulatory expertise to <b>start permitting process</b>, including required initial assessments</li> <li>Engineering <b>skills to detail out the required technical solution</b></li> </ul> | <ul style="list-style-type: none"> <li>Regulatory expertise to <b>conclude the permitting processes</b> (e.g. construction license)</li> <li>Detailed engineering to <b>finalize the required drawings and plans</b></li> <li><b>Quality assurance</b> to confirm design is up to requirements</li> </ul> | <ul style="list-style-type: none"> <li>Detailed engineering to ensure <b>effective change management</b></li> <li>Construction <b>capabilities to ensure on-time and on-budget delivery</b></li> <li>Quality assurance to <b>guarantee required construction quality</b></li> <li><b>Site safety</b> to guarantee safe construction environment</li> </ul> |
|--|--|---|--|

**Required throughout the project:**

- Stakeholder management and communication** skills to ensure a positive outlook both external and internal, with emphasis in project phases before the political decision making
- Project management skills** to ensure success of complex project over a long timeline

- The organization will evolve over time and project phase
- Required capabilities change as the project develops
- The exact sizing and required capabilities depend on owner's organization involvement vs. contracted scope
- In Scandinavian countries the tendency is to utilize more contracted capabilities in infrastructure projects, leading to lighter owner's teams

SOURCE: External benchmarks

# ① Governance structures need to be put in place to ensure efficient decision making and transparency on progress

## Key governance structure entities

### Main responsibilities

### Key success factors

<b>Advisory board</b>	<ul style="list-style-type: none"> <li>• Provide outside perspective and counsel</li> <li>• Provide general direction</li> <li>• Advise on specific topics</li> </ul>	<ul style="list-style-type: none"> <li>• Include private and public sector capabilities</li> <li>• Consider limiting political stakeholders to ensure long term perspective</li> </ul>
<b>Steering Group</b>	<ul style="list-style-type: none"> <li>• Final decision-maker and approval entity, e.g.               <ul style="list-style-type: none"> <li>— Review and Approval of scope and high level design choices</li> <li>— Review and Approval of talent selections</li> <li>— Review and Approval of process (decision rights, metrics, governance)</li> </ul> </li> <li>• Bring required topics for political discussion and decision making</li> </ul>	<ul style="list-style-type: none"> <li>• External chair to ensure independent decision making and conflict resolution</li> <li>• Whole steering group should have independent perspective</li> </ul>
<b>Project manager</b>	<ul style="list-style-type: none"> <li>• Leads the whole project on a day-to-day basis</li> <li>• Accountable upwards and downwards for project success</li> </ul>	<ul style="list-style-type: none"> <li>• Project manager should have previous experience from senior role in large infrastructure projects to drive extensive permitting and planning process effectively</li> </ul>
<b>Project core team</b>	<ul style="list-style-type: none"> <li>• Manage all day to day work</li> <li>• Report to Steering Group with updates, issues, and decision making requests</li> <li>• Manage the master plan and ensure schedule and cost adherence</li> <li>• Manage risk planning and contingencies</li> <li>• Facilitate de-bottlenecking in workstreams</li> <li>• Identify interdependencies and facilitate collaboration between each workstream</li> </ul>	<ul style="list-style-type: none"> <li>• Invest early on in full time resourcing</li> <li>• Cross-functional team with mix of experience from senior positions and drive and new thinking</li> </ul>
<b>Function and scope leads</b>	<ul style="list-style-type: none"> <li>• Drive own work stream and ensure transparency both upwards and down into the steam</li> <li>• Facilitate decision making by preparing information</li> <li>• Report regularly on progress and deviations</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure relevant experience</li> </ul>
<b>External experts</b>	<ul style="list-style-type: none"> <li>• Provide specific expertise on topics as per need</li> <li>• Should be actively utilized e.g. for detailed engineering and design, as due to the project nature of the work (not needed permanently)</li> </ul>	<ul style="list-style-type: none"> <li>• Be sure to utilize external advice actively, as the project organization will not have all knowledge in-house</li> <li>• It is critical to align incentives correctly with external support</li> </ul>

# 1 The project organization can be formed by scope or by function – the model should be chosen early on, and scaled up over time

## Project organization model examples for consideration

### Project model

### Basic description

### Overview

**A** Scope delivery model

- Separate organization is setup for each package or area

	Project manager		
Scope 1	Scope 2	Scope 3	
Function 1	Function 1	Function 1	
Function 2	Function 2	Function 2	
Function 3	Function 3	Function 3	

**B** Functional matrix model

- Specialized service groups (e.g. structural groups) are setup to do all structural work

	Project manager		
	Scope 1	Scope 2	Scope 3
Function 1			
Function 2			
Function 3			

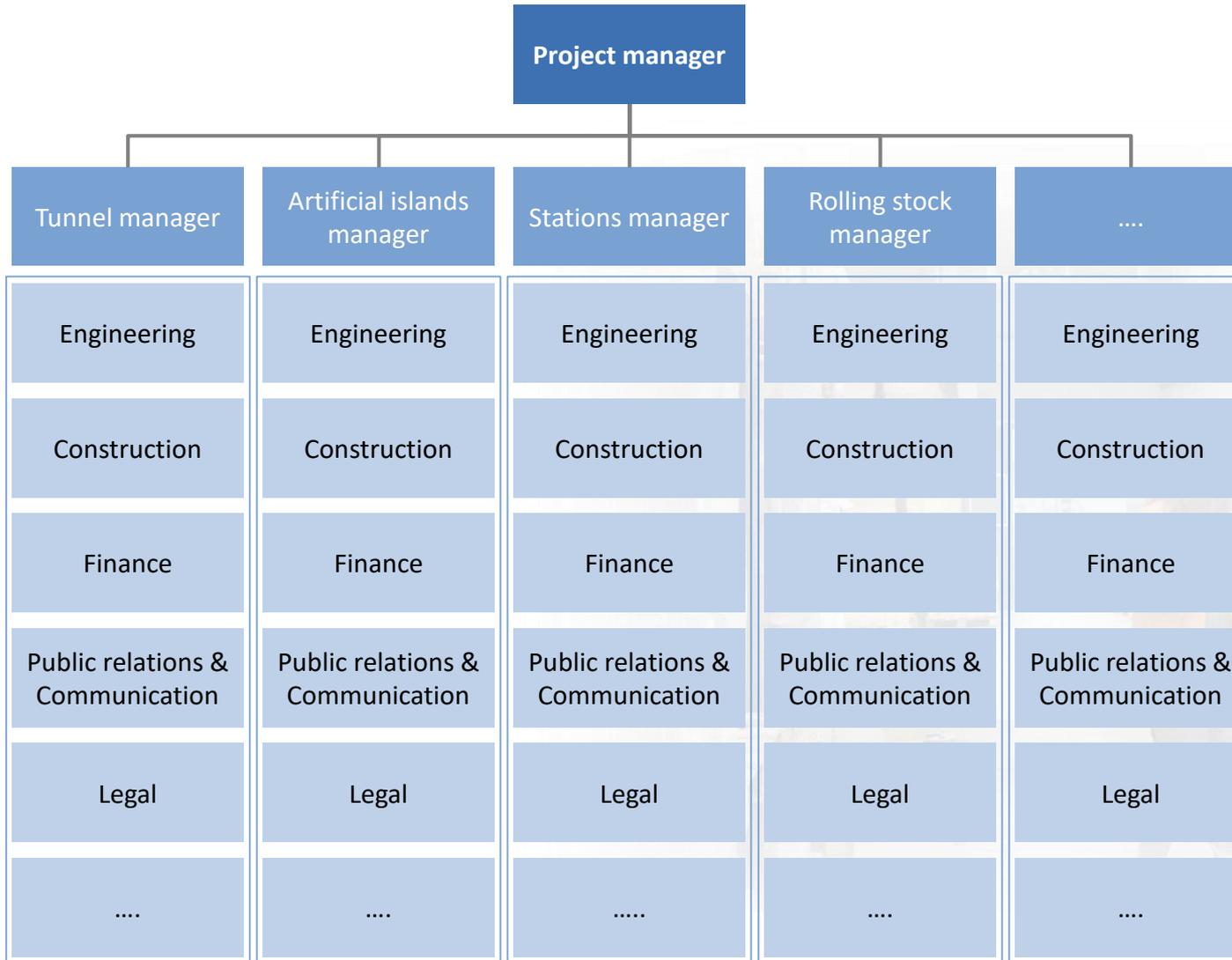
**C** Hybrid model

- Separate organization is setup for each package or area, but there is also internal functional support (e.g. project controls) that serves multiple packages/areas

	Project manager		
	Scope 1	Scope 2	Scope 3
Function 2			
Function 3			

# 1a Scope delivery model: Focused delivery of clearly defined packages

■ Function ■ Scope/area

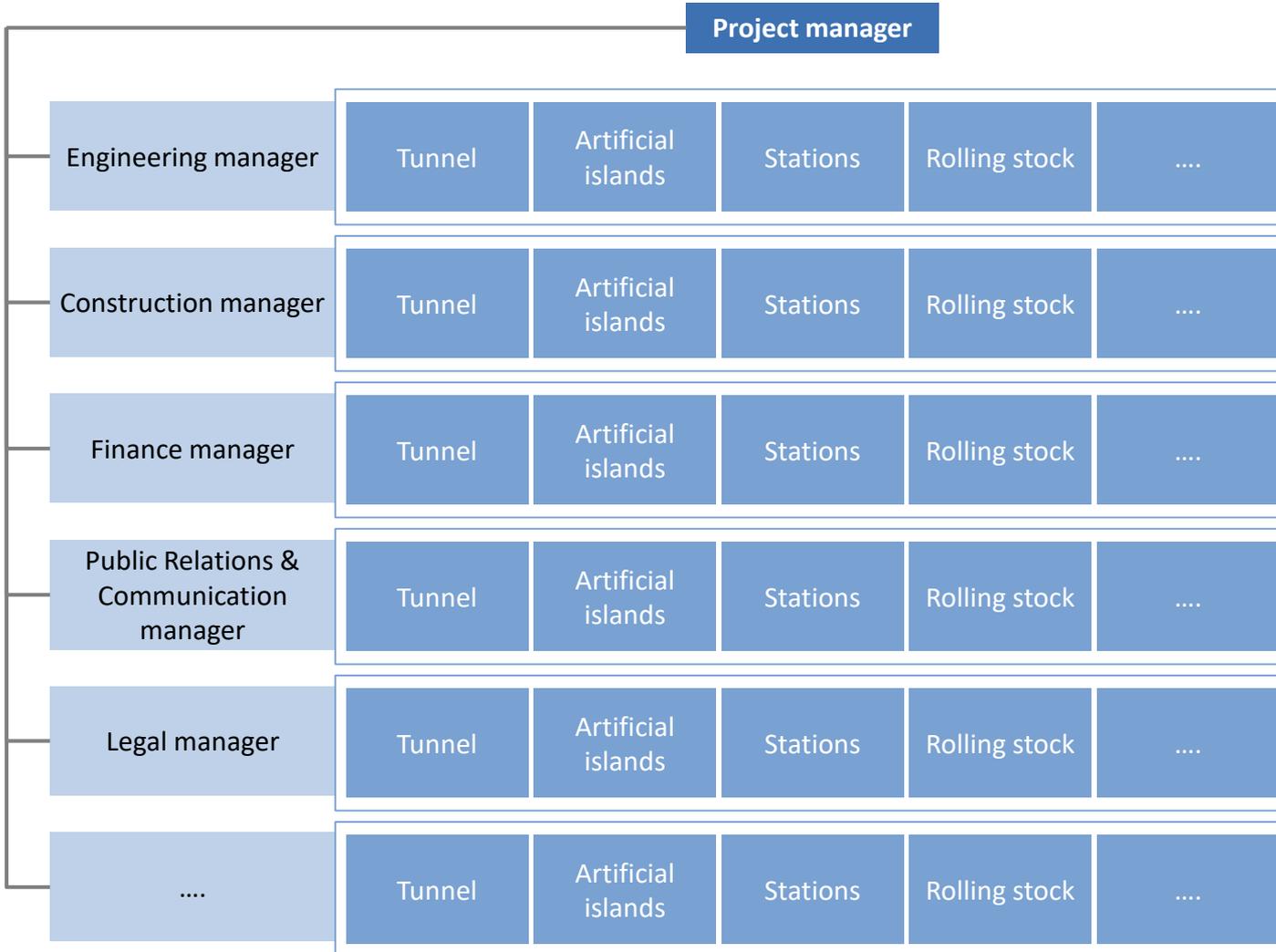


**Considerations**

- + Provides focused delivery of individual packages
- + Scope managers have full control of resources required to deliver the package
- Creates "silo" approach to delivery
- Interface management problems are more difficult to resolve

# 1b) Functional matrix model: Focused delivery of functional best practices across project organization

Function Scope/area



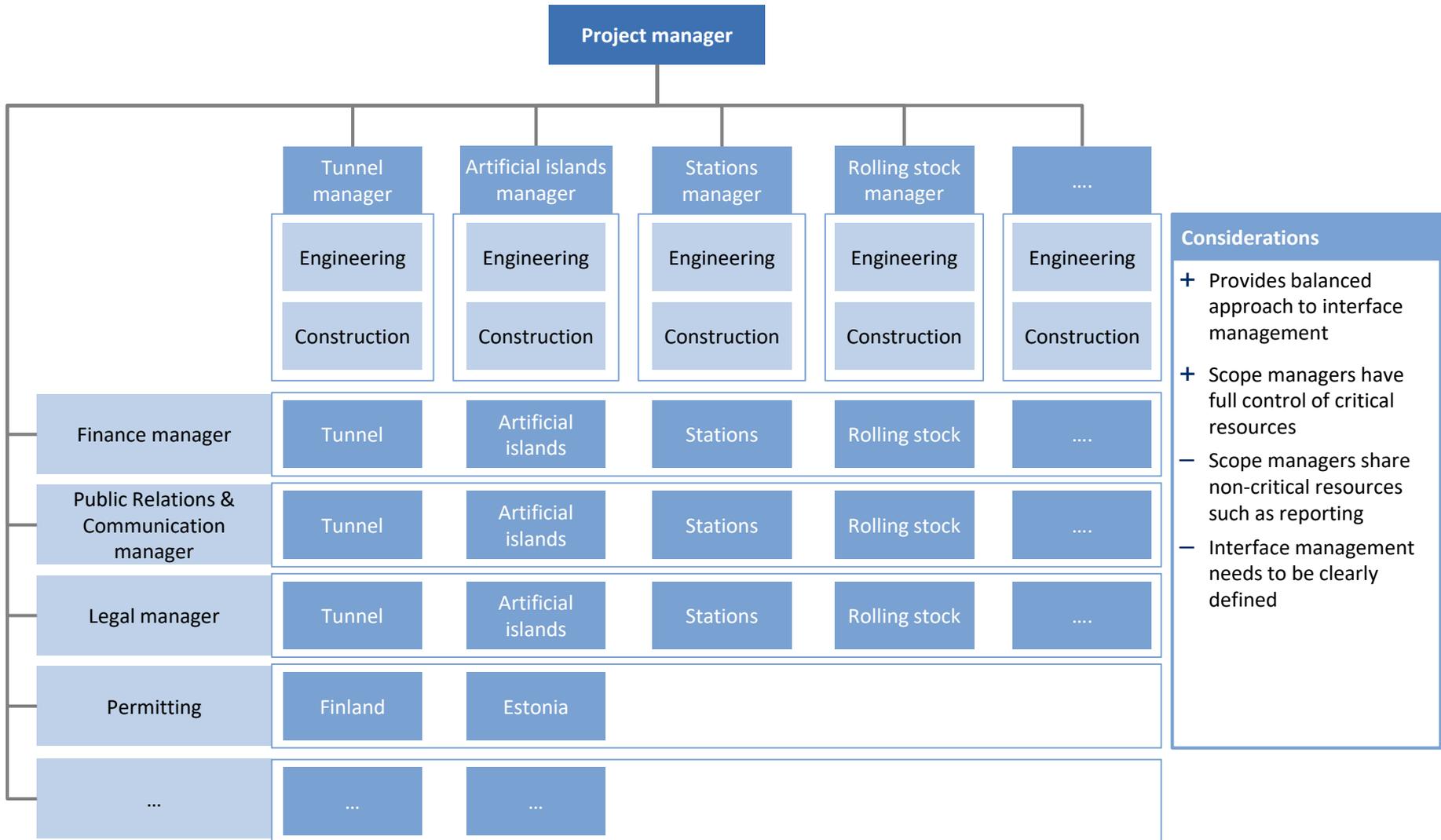
## Considerations

- + Provides focused implementation of best practices at functional level
- + Improves transparency on function level
- + Interfaces are easier to manage
- Creates "silo" approach at functional level
- Scope managers do not have full control of functions required to deliver the project

# 1C Hybrid model: Balanced approach to interface management

■ Function ■ Scope/area

ILLUSTRATIVE



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## ② Core beliefs on masterplan creation and management

### Core beliefs

### Details

#### More detail is not better

- High-level milestone plan sufficient in early stage of project
- Plans can be detailed later on

#### Keep partial plans consistent using sync milestones

- Make sure that partial plans of workstreams share common sync milestone with others to build a consistent master plan

#### Validate timelines through independent expert estimates

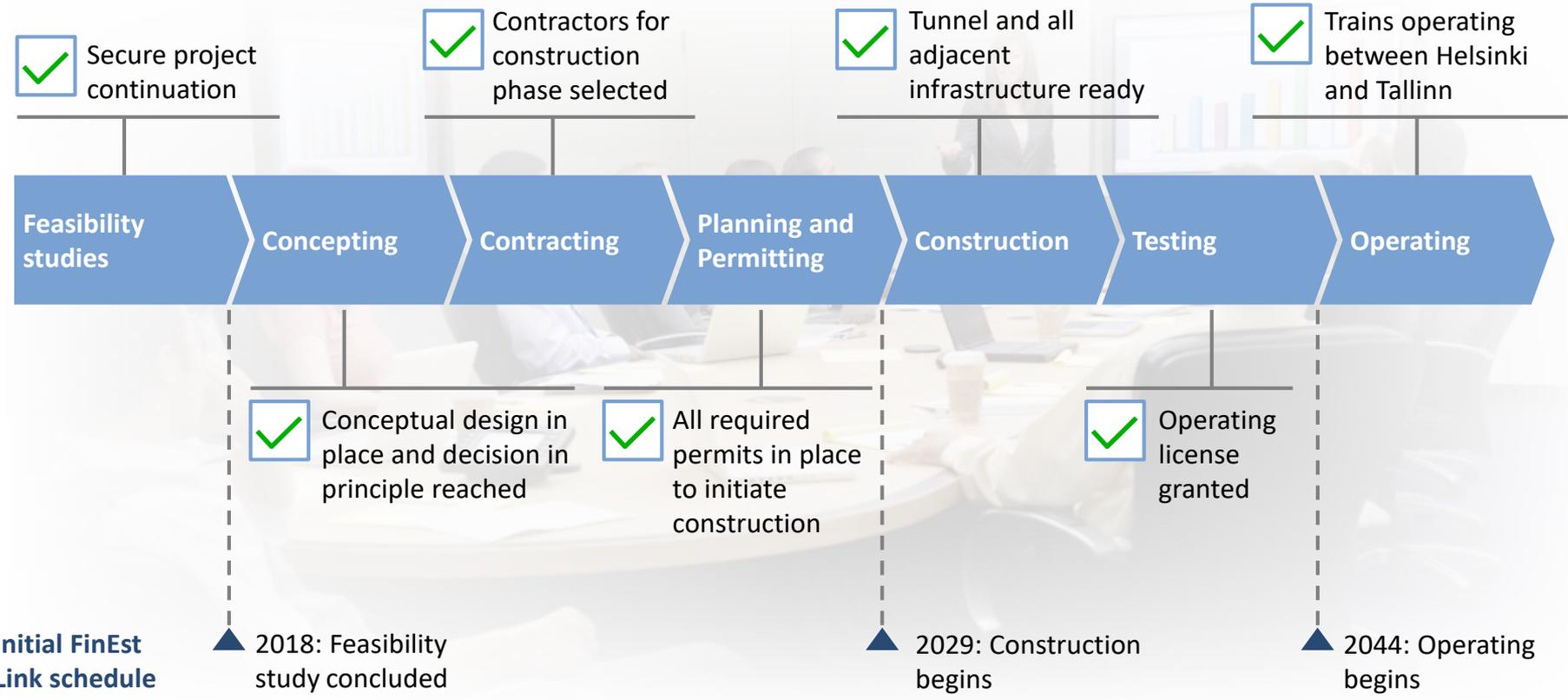
- Interview several experts outside the project to validate time estimations for every workstream

#### Enable informed top management decisions

- Ensure that the high-level masterplan includes all relevant/critical data elements (in particular critical path) that enable informed top management decisions

## ② The master plan ensures key outcomes for each project phase are reached and the project can move to the next stage

■ Project phase    ✓ Key outcome of the project phase



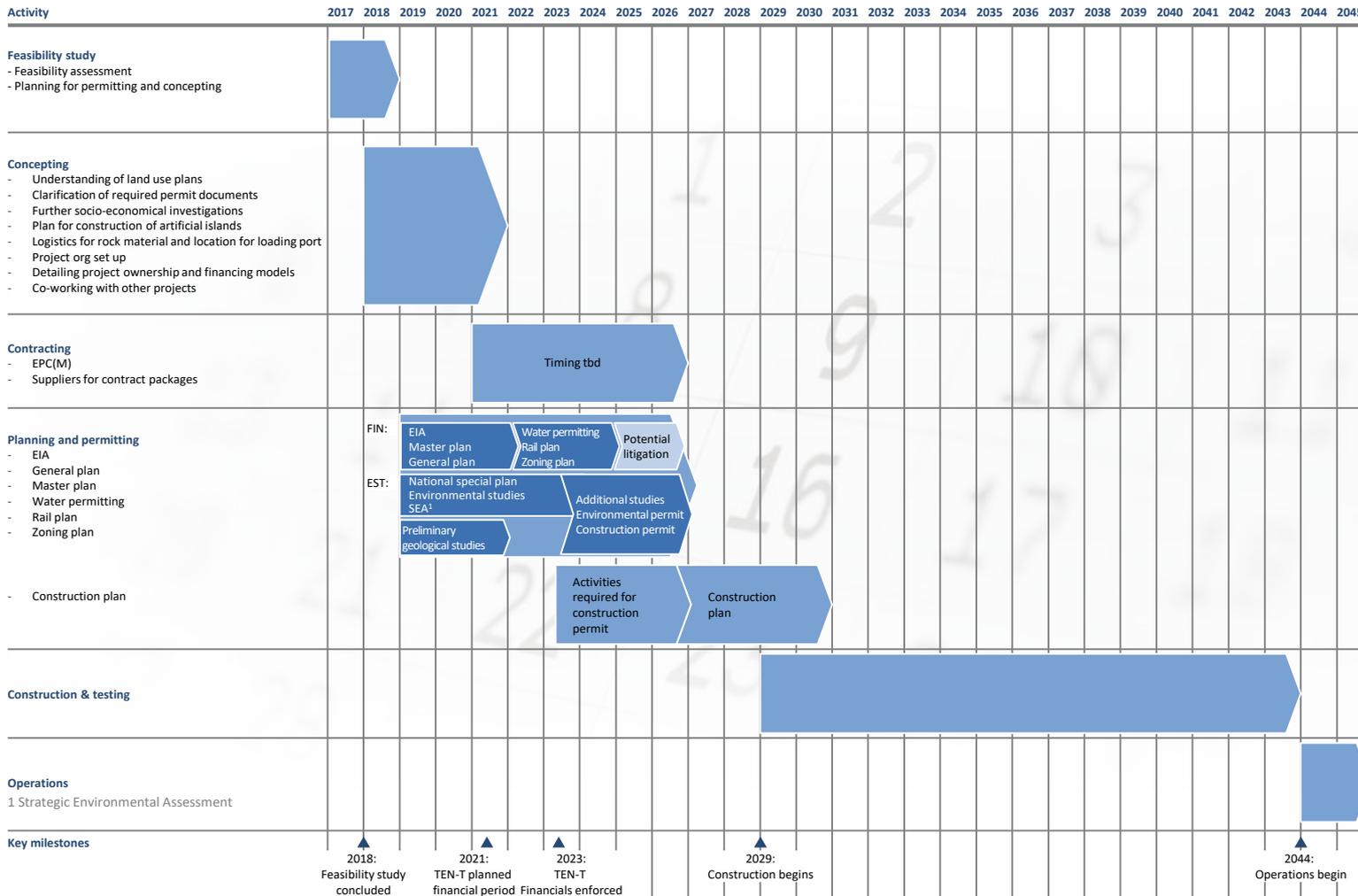
## ② A good master plan is developed at increasing levels of detail<sup>1</sup>, with ability to show both the high level schedule and the highly detailed plan

Level description	Purpose and target audience
<p><b>L1 High-level ‘program one-pager’</b></p> <ul style="list-style-type: none"> <li>• Activities divided into major work areas and milestones, e.g., “Complete EIA Assessment”, “Set up project organization”</li> <li>• Activity duration of more than 10 weeks, horizon to end of project</li> </ul>	<ul style="list-style-type: none"> <li>• High-level assessment of overall project health</li> <li>• Selection of critical (path) structures to focus efforts on</li> <li>• Supporting interaction with client/purchaser</li> </ul>
<p><b>L2 High-level program by structure</b></p> <ul style="list-style-type: none"> <li>• Individual structures represented by single activities, e.g., “Divide construction project into work packages”</li> <li>• Activity duration of 2-10 weeks, horizon to end of project</li> </ul>	
<p><b>L3 Detailed program by activities within structures</b></p> <ul style="list-style-type: none"> <li>• Activities typically handled by a single work crew, e.g., “Construct tunnel area 1 columns from foundation to first floor”</li> <li>• Activity duration of 5 days-2 weeks, horizon to next milestone/development phase</li> </ul>	<ul style="list-style-type: none"> <li>• Optimization of activity sequencing, development of acceleration programs</li> <li>• Supporting planning discussions with subcontractors</li> </ul>
<p><b>L4 Highly detailed program for day-to-day tracking</b></p> <ul style="list-style-type: none"> <li>• Granular activities allowing daily progress tracking; e.g., “Prepare formwork for tunnel area 1, between grid lines A-E”</li> <li>• Activity duration of 1-5 days, horizon of 1 week</li> </ul>	<ul style="list-style-type: none"> <li>• Daily assessment of subcontractor performance and productivity</li> <li>• Supporting daily check-ins with subcontractors to enable continuous improvement</li> </ul>

**At this stage of the project, L1 is the relevant level of planning – a master plan should be transparent within the whole project organization**

<sup>1</sup> Duration and horizon definitions can vary for individual projects

# ② FinEst Link: High level project master plan ensures a complete view of upcoming milestones at every stage of the project until estimated completion



- Levers to shorten the timeline:**
- 1 Increase risk taking:
    - By frontloading work and parallel activities early on
    - By utilizing new, emerging technologies
  - 2 Clear financing decision from governments and/or EU
  - 3 Swift political decision making

SOURCE: FinEst project team interviews; Expert interviews

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### ③ Core beliefs for stakeholder management



- **Your stakeholders make you better**
  - Managing stakeholders requires projects to develop their thinking and assess alternatives
  - Good stakeholder management can at best result in strong external support leading to attracting top talent and financing
- **Direct stakeholders are important, but do not overlook:**
  - Indirect influencers: your stakeholder's bosses
  - Anyone who gains/loses if you gain/lose (e.g. other departments, providers)
- **The individuals matter, not the entity:**
  - Within each stakeholder organization (e.g. the regulator, the ministry) identify who the top 3-4 most influential people are
  - For each individual understand thoroughly what matters to them (their objectives, incentives, background)

# 3 Stakeholder prioritization is crucial to focus and tailor your communication efforts

## 1 Identify and prioritize stakeholders

- List all relevant individuals or groups that are important for the success of your program
- Determine where each stands in terms of **overall importance to project success** and **perceived attitude toward project**
- Place them on the matrix appropriately for prioritization

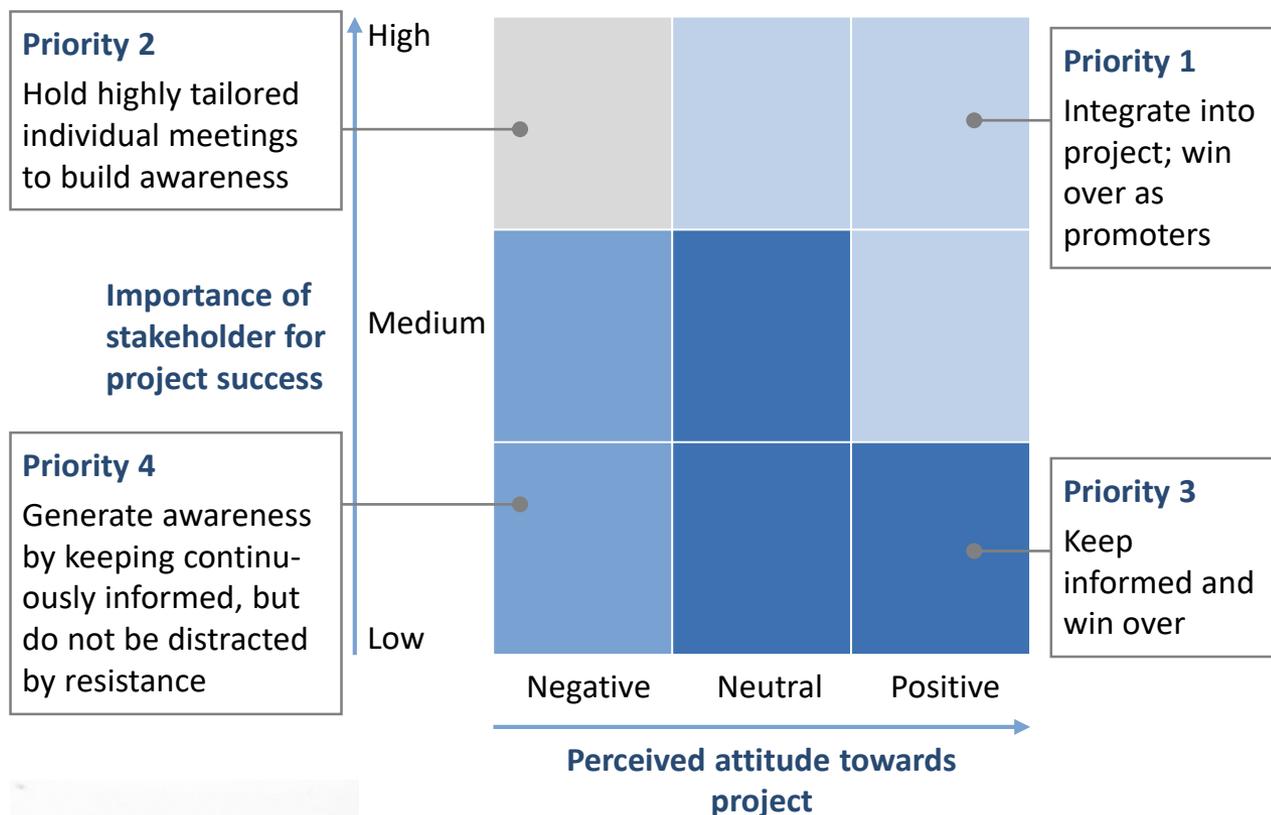
## 2 Analyze where stakeholders stand

- Assess **what impact the change will have on them** and where they stand in terms of change readiness

## 3 Develop communication plan

- Specify messages, communication action, timing and feedback mechanism for all relevant stakeholders

Prioritization of stakeholders (per project or work-stream)



### 3 Individual stakeholder action plans to be developed for each key stakeholder

<b>Stakeholder</b>	BU finance leaders	<b>Person leading management of stakeholder</b>	CFO
<b>Current stakeholder position</b>	Medium influence/opponent	<b>Required stakeholder position</b>	Medium influence/neutral
<b>Summary of issues</b>	Must follow revised budgeting and performance measurement process, which provides for central rather than business-unit-driven target setting	<b>Monitoring approach</b>	<ul style="list-style-type: none"> <li>Obtain feedback from BU finance leaders on monthly CFO call</li> <li>Review of data coming from each BU finance team throughout budgeting cycle</li> <li>Conduct annual "deep dives" in each team</li> </ul>

Date	Event(s)/action(s)	Objective	Messages	Medium	Messenger
July 9th	Business unit leader briefings of business unit finance leaders	<ul style="list-style-type: none"> <li>Lay groundwork for successful implementation of revised budgeting process by ensuring that business unit finance leaders:</li> <li>Understand the rationale for the changes (context and business drivers)</li> <li>Understand the timing of those changes</li> <li>Know they will help to determine exactly how the approach will operate</li> <li>Are aware that support will be available to help them throughout the transition</li> </ul>	<ul style="list-style-type: none"> <li>Leadership team has agreed to move toward a more integrated operating approach for the business</li> <li>Finance is a critical component in that change</li> <li>Reporting relationship will shift from being with the BU leader to primarily being with finance (CFO)</li> <li>Do not review this with respective teams until they have heard the details of the approach from the CFO</li> <li>Process will be prototyped during this fiscal year</li> </ul>	One-on-one, face-to-face discussion	Business unit leader responsible for each function
July 15th	CFO briefing	<ul style="list-style-type: none"> <li>Ensure that business unit leaders receive a single, consistent message about the initiative and that they understand the commitment of the CFO</li> <li>Ensure that participants are aware of how they should move forward</li> </ul>	<ul style="list-style-type: none"> <li>Outline "from-to" changes in behavior</li> <li>Review timeline for revised budgeting cycle including key inputs and outputs at each stage in the process</li> </ul>	Workshop	CFO supported by controller

# 3 FinEst Link: Key stakeholders identified for communications planning

Category	Country	Stakeholder	Key contacts	Importance for project success	Perceived attitude	Category	Country	Stakeholder	Key contacts	Importance for project success	Perceived attitude
Contractors	Global	EPC(M), Construction, engineering, etc.				Political - affected	Finland	Lapland			
External expert	Global					Political - affected	Estonia	Tartu			
Financing partners	Global					Political - affected	Global	Latvia			
Infrastructure owners	Global	Future train operator				Political - affected	Finland	Pirkanmaa region			
Landlords	Finland	Land owners				Political - involved	Finland	Finnish government			
Landlords	Estonia	Land owners				Political - involved	Estonia	Estonian government			
Logistics infrastructure	Estonia	Port of Tallinn				Political - involved	Finland	Uusimaa region			
Logistics infrastructure	Estonia	Port of Muuga				Political - involved	Estonia	Harju county			
Logistics infrastructure	Estonia	Tallinn Airport				Political - involved	Finland	Helsinki			
Logistics infrastructure	Finland	Helsinki-Vantaa Airport				Political - involved	Estonia	Tallinna			
Logistics operators	Global	Viking Line				Political - involved	Finland	Vantaa			
Logistics operators	Global	Tallink				Political - involved	Finland	Nurmijärvi			
Logistics operators	Global	Deutsche Bahn				Political - involved	Finland	Tuusula			
Media	Finland	Journalists				Political - involved	Finland	Adjacent municipalities			
Media	Estonia	Journalists				Political - involved	Estonia	Adjacent municipalities			
Media	Finland	Blogs				Political - involved	EU	EU			
Media	Estonia	Blogs				Public	Finland	General public			
NGOs	Finland	Environmental groups				Public	Estonia	General public			
NGOs	Finland	ProRautatie				Public	Finland	Key opinion leaders			
NGOs	Global	BaltiRail				Public	Estonia	Key opinion leaders			
NGOs	Estonia	Environmental groups				Security authorities	Finland	City of Helsinki Rescue Department (Pelastuslaitos)			
Operator	Estonia	Estonian Railways				Security authorities	Finland	Helsinki Police Department			
Other projects	Global	Rail Baltica				Security authorities	Finland	Customs of Finland			
Other projects	Global	Arctic Corridor				Security authorities	Finland	Finnish Border Control			
Other projects	Estonia	Ulemiste railway station area				Security authorities	Estonia	City of Tallinn Rescue Department			
Other projects	Estonia	Muuga multimodal terminal / new terminal				Security authorities	Estonia	Tallinn Police Department			
Other projects	Finland	Helsinki Airport Rail (Lentorata)				Security authorities	Estonia	Customs of Estonia			
Other projects	Finland	Helsinki Airport Multimodal Travel Center				Security authorities	Estonia	Estonian Border Control			
Other projects	Finland	Helsinki station (underground general plan - city planning department)				Security authorities	Finland	Finnish Army			
Permitting authorities	Finland	ELY-keskus (TBD, to be merged with region)				Security authorities	Finland	Finnish Ministry of Defence			
Permitting authorities	Finland	AVI (tbd, will be disappearing - part of LUOVA authority)				Security authorities	Estonia	Estonian Army			
Permitting authorities	Finland	Trafi				Security authorities	Estonia	Estonian Ministry of Defence			
Permitting authorities	Finland	Security authorities				Wider business community	Finland	Businesses affected by project (e.g. possible customers)			
Permitting authorities	Estonia	Technical Regulatory Authority				Wider business community	Finland	Business competing with project (e.g. other logistics companies, ferry companies)			
Permitting authorities	Estonia	Estonian Road administration				Wider business community	Estonia	Businesses affected by project (e.g. possible customers)			
Permitting authorities	Estonia	Geological institute				Wider business community	Estonia	Business competing with project (e.g. other logistics companies, ferry companies)			
Permitting authorities	Finland	Geological institute				Wider business community	Finland	Union of Logistics companies			
Political - affected	Global	Arctic Corridor				Wider business community	Estonia	Union of Logistics companies			
Political - affected	Finland	Merenkurkku (Vaasa - Umeå)				Wider business community	Finland	Chamber of Commerce			
Political - affected	Finland	Häme				Wider business community	Estonia	Chamber of Commerce			

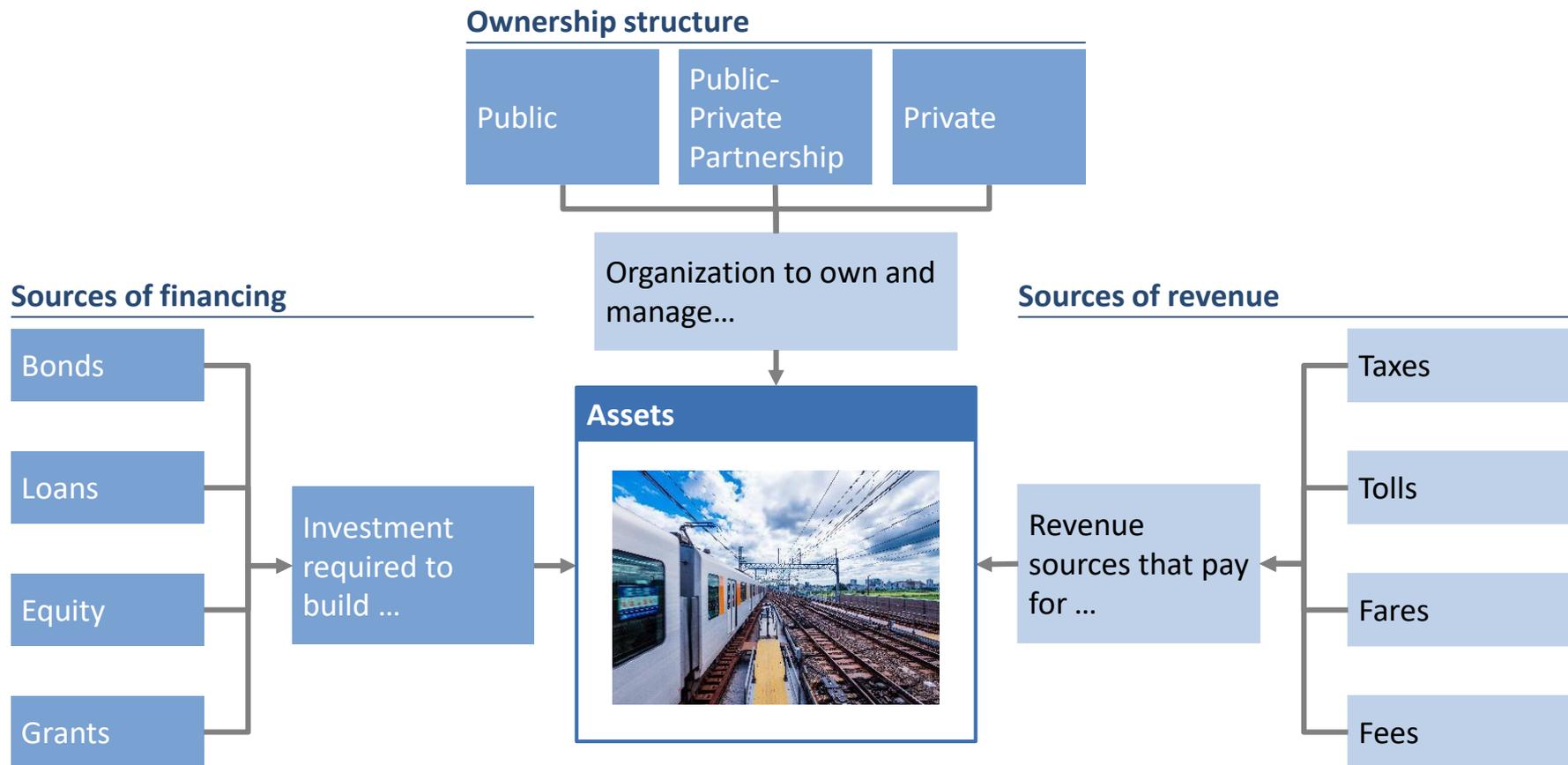
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See excel for further information

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④ For FinEst it is critical to create an ownership structure that can secure project financing and continuity – considerations also include sources of revenue when the trains become operational



# 4 Financing and sources or revenue decisions are influenced by how you define ownership – As owners choose between public and private ownership, they face trade-offs along the 5 dimensions

## Basic ownership alternatives

**Public sector**

- Public sector ownership is typically justified for assets for which social equity is important, free public services as offered, or which are considered too strategic to privatize

**PPP**

- PPPs find a way to balance these trade-offs if the partnership is constructed appropriately
- Additionally, there are things the public and private sector can do to minimize trade-offs

**Private sector**

- Private sector ownership is best suited for assets with clear ROE and a strong business case

## Dimensions

## Questions to address when considering ownership alternatives

<b>Ownership and control</b>	<ul style="list-style-type: none"> <li>What are <b>legal, regulatory, and political constraints</b> to the transfer of ownership to the private sector?</li> <li>Who controls the <b>revenue stream</b> for the asset?</li> <li>Who controls the <b>scope of the asset</b> (e.g., size)?</li> <li>Who controls <b>policy and regulation for usage</b> of the asset?</li> </ul>
<b>Private sector skills</b>	<ul style="list-style-type: none"> <li>Does the <b>public sector have inherent constraints</b> that cause it to be less efficient than the private sector (e.g., labor force collective agreements, procurement processes)?</li> <li>Does the private sector bring additional <b>intellectual capital</b> to the technology and or process?</li> <li>What <b>efficiency gains</b> could a private player bring (e.g., accelerated timing, reduced cost, construction and materials procurement)?</li> </ul>
<b>Freed-up capital</b>	<ul style="list-style-type: none"> <li>Does the government want/need to monetize an existing asset in order to <b>divert funds to other public uses</b>?</li> <li>How do <b>legal and tax concerns</b> affect where the private sector is willing to invest and free up funds for the public sector?</li> </ul>
<b>Risk transfer</b>	<ul style="list-style-type: none"> <li>Who bears the <b>ultimate risk of loss</b>?</li> <li>Who bears various risks (e.g., weather risk, labor strike risk, change of technology risk)?</li> <li>What is the cost of transferring those risks? Who <b>can bear the risk most efficiently</b>?</li> </ul>
<b>Social equity</b>	<ul style="list-style-type: none"> <li>Does a <b>private sector investor require a return over a shorter time frame</b> than the asset's useful life?</li> <li>How does this <b>social inequity affect current users</b> and the cost they incur to use the asset?</li> </ul>

# 4 For FinEst the considerations along five dimensions imply that some form of private involvement is an option to be explored further

Dimensions	Questions to address when considering ownership alternatives	Key considerations for FinEst
Ownership and control	<ul style="list-style-type: none"> <li>• What are <b>legal, regulatory, and political constraints</b> to the transfer of ownership to the private sector?</li> <li>• Who controls the <b>revenue stream</b> for the asset?</li> <li>• Who controls the <b>scope of the asset</b> (e.g., size)?</li> <li>• Who controls <b>policy and regulation for usage</b> of the asset?</li> </ul>	<ul style="list-style-type: none"> <li>• Private involvement feasible considering current plans to open the rail transport operations to private competition</li> </ul>
Private sector skills	<ul style="list-style-type: none"> <li>• Does the <b>public sector have inherent constraints</b> that cause it to be less efficient than the private sector (e.g., labor force collective agreements, procurement processes)?</li> <li>• Does the private sector bring additional <b>intellectual capital</b> to the technology and or process?</li> <li>• What <b>efficiency gains</b> could a private player bring (e.g., accelerated timing, reduced cost, construction and materials procurement)?</li> </ul>	<ul style="list-style-type: none"> <li>• Private financing can potentially speed up decision making as tax payer money is not required – no need to allocate state budget to project</li> <li>• Managing the megaproject requires extensive experience, which will need to be acquired from the private sector</li> </ul>
Freed-up capital	<ul style="list-style-type: none"> <li>• Does the government want/need to monetize an existing asset in order to <b>divert funds to other public uses</b>?</li> <li>• How do <b>legal and tax concerns</b> affect where the private sector is willing to invest and free up funds for the public sector?</li> </ul>	<ul style="list-style-type: none"> <li>• Government capital allocation plans needs further assessment</li> </ul>
Risk transfer	<ul style="list-style-type: none"> <li>• Who bears the <b>ultimate risk of loss</b>?</li> <li>• Who bears various risks (e.g., weather risk, labor strike risk, change of technology risk)?</li> <li>• What is the cost of transferring those risks? Who <b>can bear the risk most efficiently</b>?</li> </ul>	<ul style="list-style-type: none"> <li>• The risk transfer needs to be evaluated for both the construction phase and the operational phase separately</li> </ul>
Social equity	<ul style="list-style-type: none"> <li>• Does a <b>private sector investor require a return over a shorter time frame</b> than the asset's useful life?</li> <li>• How does this <b>social inequity affect current users</b> and the cost they incur to use the asset?</li> </ul>	<ul style="list-style-type: none"> <li>• From a public sector perspective, additional adjacent returns are a part of the equation (e.g. mobility and labor market expansion)</li> <li>• Private sector expectations on return directly linked to project</li> </ul>

# 4 Public-Private Partnerships provide alternatives potentially suited for FinEst Link context

## Alternatives to private investor involvement

### Main features

### Considerations for FinEst Link

Alternatives to private investor involvement	Main features	Considerations for FinEst Link
<b>Concession</b>	<ul style="list-style-type: none"> <li>Gives a concessionaire the long term right to use all utility assets conferred on the concessionaire, including responsibility for operations and some investment. Asset ownership remains with the authority and the authority is typically responsible for replacement of larger assets. Assets revert to the authority at the end of the concession period, including assets purchased by the concessionaire</li> </ul>	<ul style="list-style-type: none"> <li>Private sector bears a significant share of the risks</li> <li>Highly complex to implement and administer</li> <li>Eurotunnel: Increase in construction costs and below plan traffic almost led to insolvency of project company</li> </ul>
<b>Design-Build (DB)</b>	<ul style="list-style-type: none"> <li>The public sector owns and finances the construction of new assets. The private sector designs and builds the assets to meet certain agreed outputs. The documentation for a DB is typically simpler than a BOT or Concession as there are no financing documents and will typically consist of a turnkey construction contract plus an operating contract in some cases or a section added to the turnkey contract covering operations.</li> </ul>	<ul style="list-style-type: none"> <li>Increased risk transfer provides greater incentive for private sector contractor to adopt a whole life costing approach to design, Greater potential for accelerated construction program</li> </ul>
<b>Build-Operate (BO)</b>	<ul style="list-style-type: none"> <li>Typically used to develop a discrete asset rather than a whole network and is generally entirely new or greenfield in nature (although refurbishment may be involved). In a BO Project the project company or operator generally obtains its revenues through a fee charged to the utility/ government rather than tariffs charged to consumers.</li> </ul>	<ul style="list-style-type: none"> <li>Key driver is the transfer of operating risk in addition to design and construction risk to the private player</li> <li>Commits public sector to long term demand risk</li> </ul>
<b>Management contract and O&amp;M</b>	<ul style="list-style-type: none"> <li>The awarding authority engages the contractor to manage a range of activities for a relatively short time period (2 to 5 years). Management contracts tend to be task specific and input rather than output focused. Operation and maintenance agreements may have more outputs or performance requirements</li> </ul>	<ul style="list-style-type: none"> <li>Can be implemented in a short time and significant private investment possible under longer term O&amp;M agreements</li> <li>Management contracts, almost all risks are borne by the public sector</li> </ul>
<b>Joint Venture</b>	<ul style="list-style-type: none"> <li>Under a joint venture, the public and private sector partners can either form a new company or assume joint ownership of an existing company through a sale of shares to one or several private investors</li> <li>The joint venture structure is often accompanied by additional contracts (concessions or performance agreements) that specify the expectations of the company</li> </ul>	<ul style="list-style-type: none"> <li>Under a joint venture, all partners have invested in the company and have an interest in the success of the company and incentives for efficiency</li> </ul>
<b>Lease/ Purchase</b>	<ul style="list-style-type: none"> <li>A lease/purchase is an installment-purchase contract. Under this model, the private sector finances and builds a new facility, which it then leases to a public agency. The public agency makes scheduled lease payments to the private party and accrues equity in the facility with each payment</li> <li>At the end of the lease term, the public agency owns the facility or purchases it at the cost of any remaining unpaid balance in the lease.</li> </ul>	<ul style="list-style-type: none"> <li>Private sector takes full construction risk while ownership is public (only leasehold with investor)</li> </ul>
<b>Tax-Exempt Lease</b>	<ul style="list-style-type: none"> <li>A public partner finances capital assets or facilities by borrowing funds from a private investor or financial institution. The private partner generally acquires title to the asset, but then transfers it to the public partner either at the beginning or end of the lease term. The portion of the lease payment used to pay interest on the capital investment is tax exempt</li> </ul>	<ul style="list-style-type: none"> <li>Tax savings and reduced cost depending on tax model</li> </ul>
<b>Developer Finance</b>	<ul style="list-style-type: none"> <li>The private party finances the construction or expansion of a public facility in exchange for the right to build residential housing, commercial stores, and/or industrial facilities at the site.</li> <li>The private developer contributes capital and may operate the facility under the oversight of the government. The developer gains the right to use the facility and may receive future income from user fees</li> </ul>	<ul style="list-style-type: none"> <li>Could be interesting as additional upside through e.g. real estate for investors</li> </ul>

# 4 In order to attract private investors early on as financiers, it is critical to think of alternatives for revenue generation once the train service becomes operational

Framework to identify options on revenue generation

		Type of payment	
		Fixed	Variable
Source of payment	Everybody	Fixed subsidy, that is not dependant on passenger or freight volumes	A variable (train user based) subsidy similar to “shadow tolls”
	Users only (indirectly)	Centralized subscription model managed by a public entity, e.g. that works on multiple different means of public transport (similar to vignette system on roads)	Centralized single ticket model managed by a public entity, e.g. that works on multiple different means of public transport (e.g. Strippenkaart in the Netherlands)
	Users only (directly)	Monthly subscription for train tickets (e.g. 1-month card)	Individual train tickets purchased by freight or passenger customers

Additionally, funds can be compensated through separate structures, such as awarding development rights, e.g. commercial or residential real estate

# 4 Financing and ownership structures need to be considered for three different project stages – private involvement depends on availability of alternatives to fund investments

■ Cost ■ Cost risk ■ Revenues ■ Demand risk

Project phase	Concepting Planning Permitting	Construction	Operations
Cost & revenue profile			
Cost/revenue description	<ul style="list-style-type: none"> <li>Concepting, planning and permitting costs to reach construction permits</li> </ul>	<ul style="list-style-type: none"> <li>Costs related to construction of tunnel and technical solution for train operations</li> </ul>	<ul style="list-style-type: none"> <li>Revenues from passengers</li> <li>Cost for operations and sustaining CAPEX</li> </ul>
Example risks associated to costs and revenues	<ul style="list-style-type: none"> <li>Costs exceed budget due to complications in permitting in two countries</li> <li>Cost exceed budget due to litigation</li> </ul>	<ul style="list-style-type: none"> <li>Costs exceed budget due to technical difficulties resulting in prolonged schedule</li> <li>Some risks are purely execution-related and more predictable, while others include unknowns related to local micro-conditions</li> </ul>	<ul style="list-style-type: none"> <li>Revenues are hit by lower than expected demand</li> <li>Revenues are hit by trains not running due to technical issues</li> <li>Costs increase due to technical issues</li> </ul>
Risk ownership considerations	<ul style="list-style-type: none"> <li>Typically a public sector entity owns the risk and provides financing due to long time horizon to payoff               <ul style="list-style-type: none"> <li>Especially permit process often financed by public sector (e.g. EU TEN-T and states) due to long time horizon to pay off</li> <li>Transfer of execution risk to the private sector possible through procurement structuring</li> </ul> </li> <li>However, bringing in private sector funding creates long term commitment</li> </ul>	<ul style="list-style-type: none"> <li>Predictable execution-related risks can typically be transferred to the private sector through LSTK-contracts for selected work packages</li> <li>Public sector is often the best owner for risks including significant (e.g. geological or new technology-related) unknowns</li> </ul>	<ul style="list-style-type: none"> <li>Demand risk as the primary risk               <ul style="list-style-type: none"> <li>Tunnel operation would be a competitor to other means of transport between Finland and Estonia</li> <li>No inherent reason necessitating public ownership of the risk, typically demand risk owned by a private operator</li> </ul> </li> <li>In case states see the need for a strategic guarantee for tunnel operations or positive externalities, potential public sector subsidies can be considered</li> </ul>
Financing considerations	<ul style="list-style-type: none"> <li>Several combinations of public and private financing possible</li> <li>Effective use of private financing at reasonable cost requires 1) mitigation of risks related to unknowns such as geology, 2) mitigation of pay-off risk related to demand for tunnel services and 3) mitigation of the cash-flow delay (can be 20+ years)</li> <li>Potential mechanisms for facilitating private financing include               <ul style="list-style-type: none"> <li>Public guarantees incl. potential subsidies to mitigate demand (revenue) risk</li> <li>Public guarantees for debt taken by the construction company</li> <li>Tying parts of the pay-off to development rights to adjacent projects such as real estate (commercial or residential)</li> <li>Tax benefits (e.g. tax-exempt lease financing models)</li> </ul> </li> </ul>		<ul style="list-style-type: none"> <li>Operations typically funded directly from their cash flow</li> </ul>

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## 5 Core beliefs on risk management

**Manage the risks, not just monitor them** – most companies have risk registers, often with proper quantification of impact; be proactive managing the risks, don't rely on the contractor / supplier



**Bring the sceptics** – when risk identification is performed by a small group of project-related people, the list will be narrow and obvious; invite challengers and “out of the box” thinkers to risk identification sessions

**Push for detail** – a generically defined risk (e.g., “Engineering delays”) that does not allow for formulation of practical action plan is not useful

**It's not just about mitigation** – Good risk management also means designing sound risk contingencies (Plan A, Plan B) – not all risks can be prevented, but most can be dealt with efficiently if project teams are prepared

**Establish accountability** – risk management requires daily activities, which should be assigned to each risk owner, tracked (also software-assisted) and discussed

**Put your resources behind top risks** – don't be afraid to invest in preventing, mitigating or designing management strategies for 3-5 risks that have biggest impact on project targets

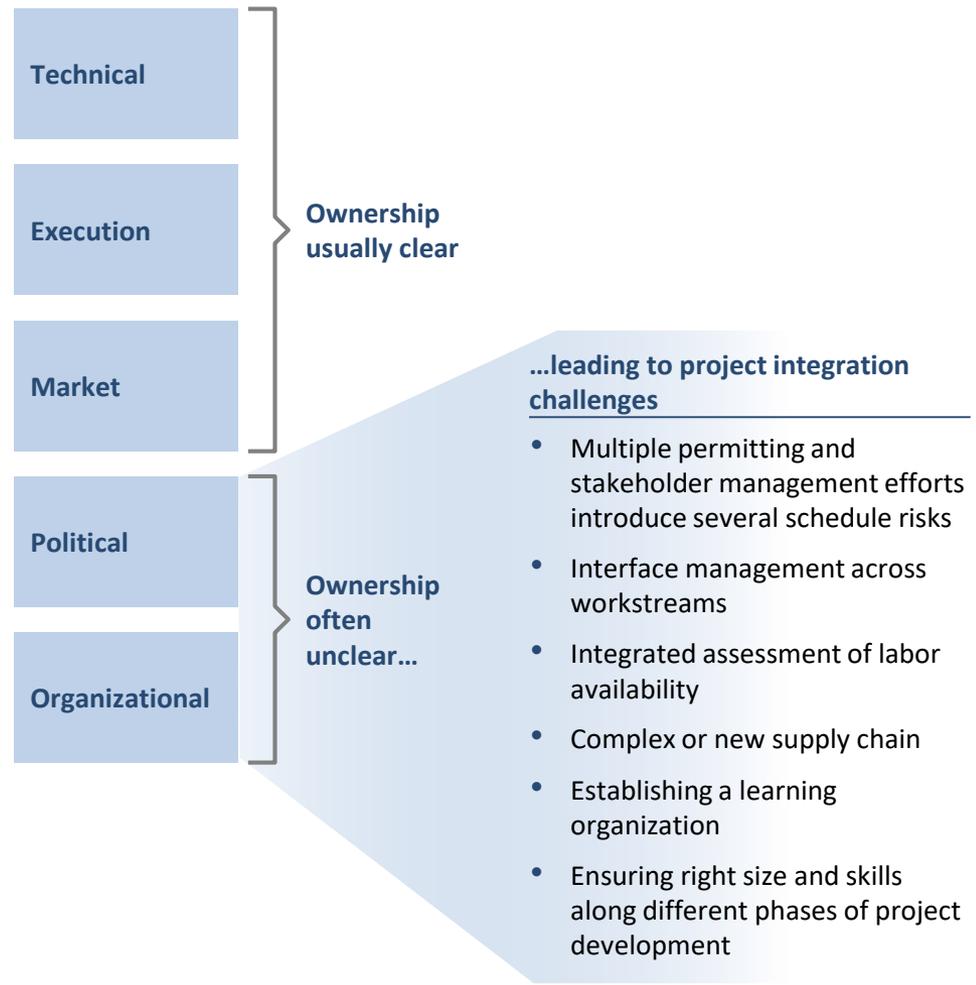
**Understand root-causes** – always use “5 whys” when an event occurs

# 5 FinEst Link should use a holistic framework to capture key project risks and uncertainties, ensuring ownership within the project organization

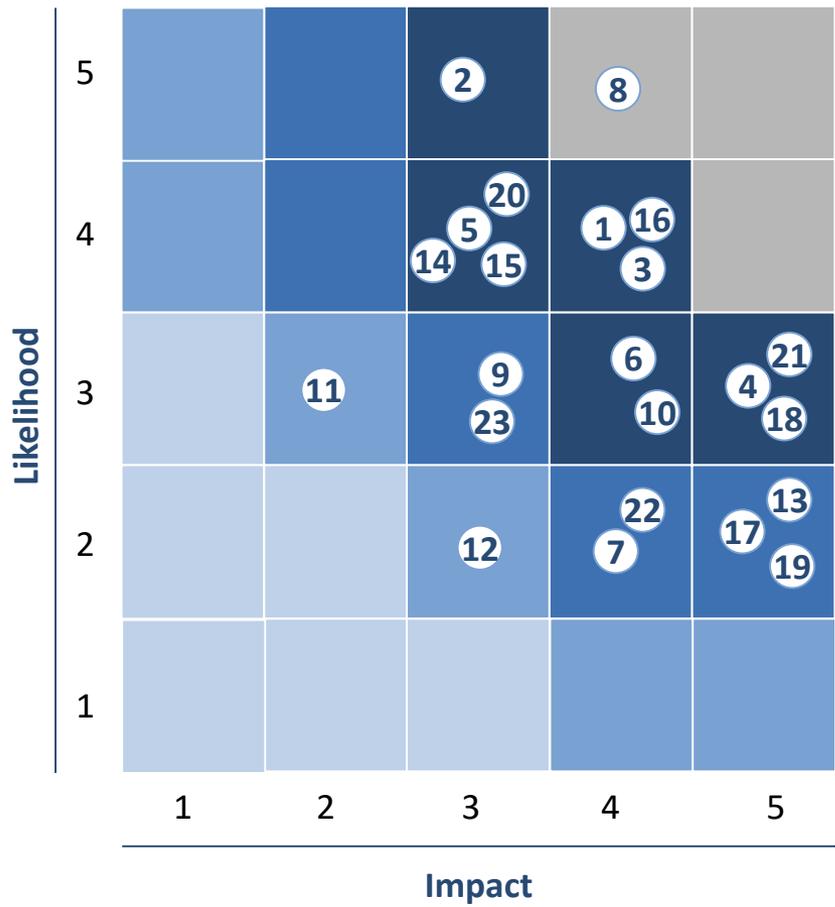
## Framework for risk categories

	Examples of risks
 <b>T</b> echnical	<ul style="list-style-type: none"> <li>Recovery efficiency</li> <li>New technology</li> <li>Operability, integrity, reliability</li> </ul>
 <b>E</b> xecution	<ul style="list-style-type: none"> <li>Equipment costs and delivery lead time</li> <li>Construction costs and time</li> <li>Infrastructure costs</li> <li>Operating costs</li> </ul>
 <b>M</b> arket	<ul style="list-style-type: none"> <li>Commodity pricing</li> <li>Financial market risks</li> <li>Contracting</li> <li>Competitive reaction</li> </ul>
 <b>P</b> olitical	<ul style="list-style-type: none"> <li>Environmental impact</li> <li>Stakeholders (NGOs, community, etc.)</li> <li>Reputation risks</li> <li>Taxation and royalties</li> <li>Permitting</li> </ul>
 <b>O</b> rganizational	<ul style="list-style-type: none"> <li>Labor availability and productivity</li> <li>Processes, procedures and systems</li> <li>Learning and safety</li> <li>Leadership</li> </ul>

## Ownership of several key risks within large-scale project organizations often unclear



# 5 Using the standardized criteria, risks should be plotted onto a risk matrix to prioritize and to help focus mitigation efforts



Mitigation rigor must be tailored to prioritization levels

Very high priority	<ul style="list-style-type: none"> <li>Manage at <b>project level</b></li> <li>Develop detailed mitigation plan with <b>daily actions</b> and expected outcomes, resource requirements, success metrics and progress reporting plan</li> </ul>
High priority	<ul style="list-style-type: none"> <li>Manage at <b>project level</b></li> <li>Develop detailed mitigation plan with <b>weekly actions</b>, resource requirements, success metrics and progress reporting plan</li> </ul>
Medium priority	<ul style="list-style-type: none"> <li>Manage <b>within area or function</b></li> <li>Develop detailed mitigation plan with <b>weekly actions</b>, resource requirements and success metrics</li> </ul>
Low priority	<ul style="list-style-type: none"> <li>Manage at <b>system/function level</b> for continuous improvement</li> <li>Develop <b>high-level mitigation strategy</b> with resource requirements</li> </ul>
Very low priority	<ul style="list-style-type: none"> <li><b>Monitor for change</b></li> </ul>

# 5 A risk dashboard allows for effective tracking of risk mitigations

## Control

- Ability to select the mitigation actions to be reviewed by score of the risks and status of the mitigation
- Risk dashboard automatically updated with data from the register

## Mitigation Actions

- Actions required by each individual risk under a certain group

## Status

- Current status of each action (e.g., not started, behind schedule, on schedule, and ahead of schedule)

**RISK MITIGATION DASHBOARD**

**Risk score**

Very high

High

Medium

Low

Very low

**Status of the mitigation**

Not started

In progress - behind schedule

In progress - on schedule

In progress - ahead of schedule

Mitigation completed

[Update risk dashboard](#)

Category	Risk group	Description of risk item	Score	Owner	Mitigation actions	Status of mitigation	Comments on status	Date for mitigation completion
Execution	Equipment preservation	There is no area for protecting equipments from exposure to elements	Very high	Mr. xxx	Build protected warehouse for keeping uninstalled equipment by week WW	Not started	Final design of warehouse; waiting for engineering approval from Mr. aaa	dd / mm / yy
Execution	Equipment preservation	Rust in the existing equipment will possibly require replacement of piston pumps	Very high	Mr. xxx	Assess current status of equipment damage, list those requiring replacement, and purchase replacing units	In progress - behind schedule	List with damaged equipments ready; pending approval from Mr. ZZZ for purchase	dd / mm / yy
Execution	Equipment preservation	Specialized workers required for refurbishment of damaged equipment is not readily available	High	Mr. xxx	Expedite hiring process - 3 people on site, by month X, are required	In progress - on schedule		dd / mm / yy
Execution	Equipment preservation	Warranties do not cover equipment damages after site delivery	Medium	Mr. xxx	Hire insurance or negotiate warranty extensions for next contracts	In progress - ahead of schedule		dd / mm / yy

## Risk group

- Risk groups combine related risks to allow for clear owner assignment and effective mitigation tracking

## Description of Risk Item

- Specific risks under each grouping will be the base for:
- Likelihood and impact evaluation
- Mitigation action development and tracking

## Comments and completion date

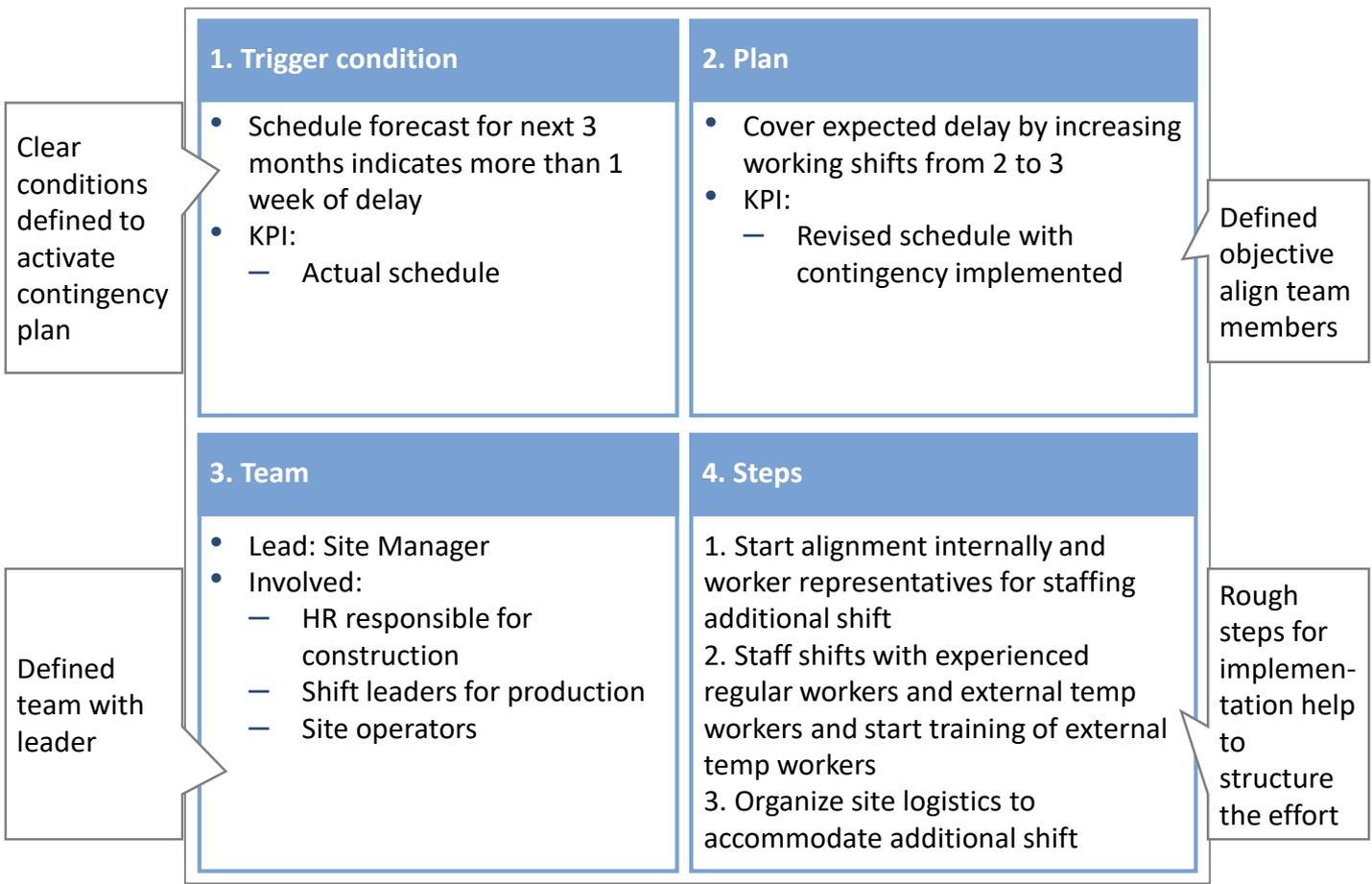
- Comments explaining the status or required actions
- Date expected of mitigation completion

# 5 Even when risk planning is on a satisfactory level, some risks will most likely still materialize – reliable contingency planning ensures absorption capability

## Contingency / risk management

- Projects such as new tracks, tunneling and new signal system installation are **high volume, medium to low complexity but have high risk of time and schedule overruns**
- **Analysis shows that up to 20%** of the budget should be allocated for the contingency and it is mostly spent during execution
- Project contingencies are typically **calculated without detailed assessment** and not less monitored during execution
- As an example, Fehmarn Belt project has budgeted 1bn EUR as contingency with a 7bn EUR overall budget

Contingency plans need to be prepared on the basis of the risk assessments with clear understanding of how to react in case trigger conditions are met – and KPIs to understand the effect

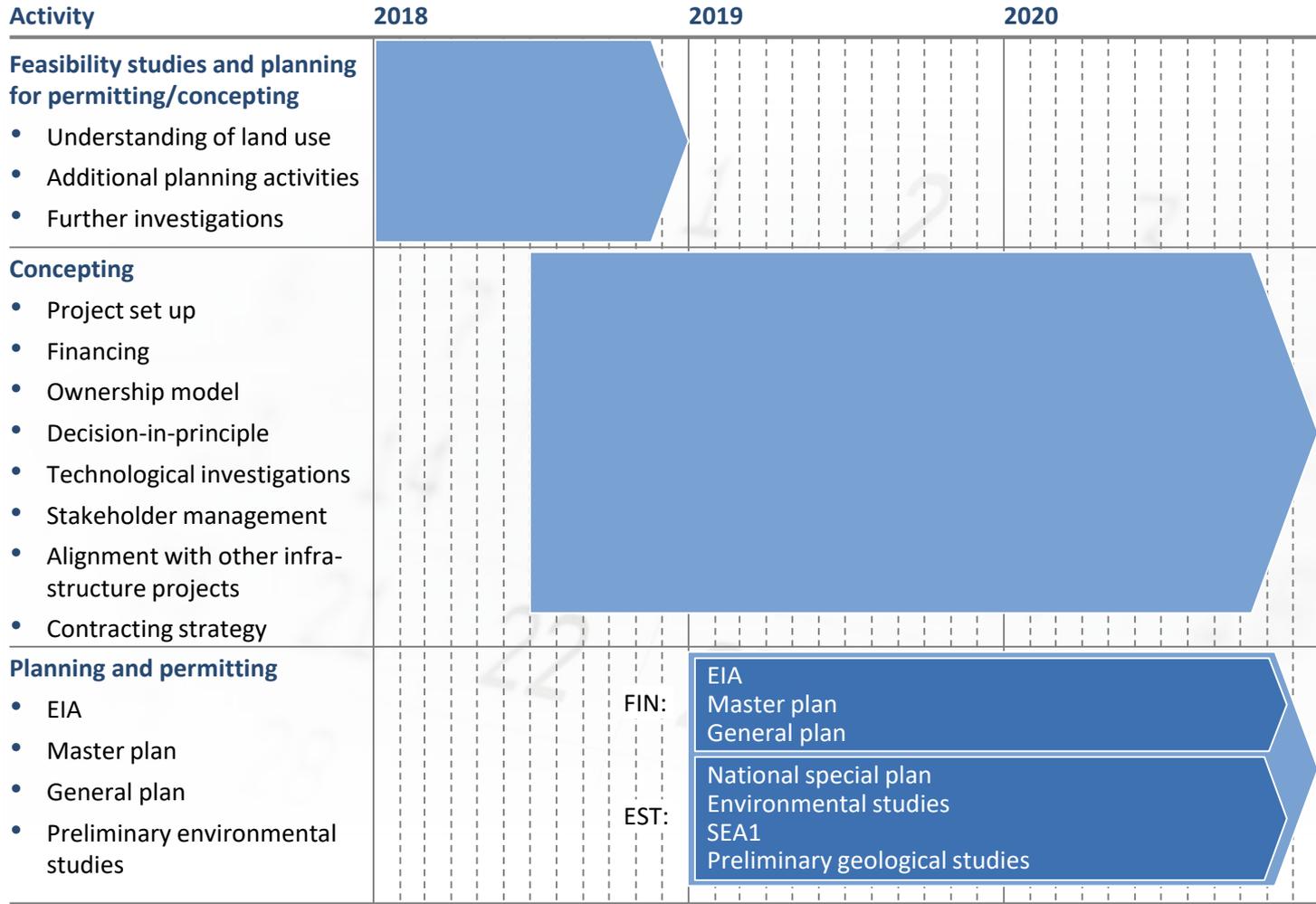


# 5 FinEst needs to start preparing and maintaining a risk registry throughout the project

Risk categories	Key risks for the FinEst program in concepting phase	Underlying reason	Examples of mitigation options
Technical	<ul style="list-style-type: none"> <li>• Technology will not work as planned in the later stages</li> <li>• The required costs are much higher than anticipated</li> <li>• Tunnel excavation technology</li> </ul>	<ul style="list-style-type: none"> <li>• Tunnel excavation and train technology has not been chosen in feasibility phase               <ul style="list-style-type: none"> <li>– There is a clear interest in utilizing latest innovation in the FinEst project (such as Maglev and Hyperloop)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Utilizing proven technology (conventional electric trains)</li> <li>• Keeping technological options open for as long as possible to allow for new technology to be developed further</li> </ul>
Execution	<ul style="list-style-type: none"> <li>• Construction costs exceed estimation</li> <li>• Construction time exceeds estimation</li> </ul>	<ul style="list-style-type: none"> <li>• The executional challenge is building a 103 km tunnel under the seabed</li> <li>• The feasibility study cost estimate is based on extrapolation of other megaprojects</li> </ul>	<ul style="list-style-type: none"> <li>• Detailing technical studies to understand composition of rock under the sea</li> <li>• Detailing tunnel engineering to understand real project execution plans</li> </ul>
Market	<ul style="list-style-type: none"> <li>• Markets will not develop as projected</li> </ul>	<ul style="list-style-type: none"> <li>• The wider economic impact of the FinEst Link has been estimated as a part of the feasibility study</li> <li>• The reliability is debatable and could still cause issues to the financial feasibility of the project ( as was the case in Eurotunnel)</li> </ul>	<ul style="list-style-type: none"> <li>• Subsidies are a way to reduce pressure on financial performance for the project</li> </ul>
Political	<ul style="list-style-type: none"> <li>• Political support reduces over time</li> <li>• Brexit and impact on TEN-T</li> </ul>	<ul style="list-style-type: none"> <li>• The FinEst Link project is currently enjoying strong support from both governments</li> <li>• Previous experience shows, that political support can change during the planning and permitting phases (as was the case in Stuttgart 21)</li> </ul>	<ul style="list-style-type: none"> <li>• Efficient stakeholder management</li> <li>• Full privatization of the project would reduce debate by removing public financing from the political agenda</li> </ul>
Organizational	<ul style="list-style-type: none"> <li>• Inability to find capable key resources</li> <li>• Organizational set-up slow and inefficient</li> </ul>	<ul style="list-style-type: none"> <li>• The project success is dependent on finding right capabilities for each project phase, which in case not found would put the project timeline in trouble</li> </ul>	<ul style="list-style-type: none"> <li>• Creating mechanisms to attract and retain top talent in the project</li> <li>• Contracting strategy</li> </ul>

- Executive summary
- Overview of the FinEst Link project
- Learnings from other megaprojects
- Considerations for the next project phase for FinEst Link
- **The immediate next steps for FinEst Link**
- Appendix

# The initial timeline for 2018-2020 shows that considerable effort is needed already in 2018 to be able to start planning and permitting in 2019



- **Prerequisites for this plan to realize:**
  - Firm political concepting
  - Clear financing secured for concepting phase, estimated at 1m Eur per year per country, with additional costs for e.g. environmental studies
    - Financing channels include states, municipalities and EU
  - Full time core team to lead concepting phase consisting of about 5-10 resources, with external expertise utilized on need-to basis
  - Political decision to go-ahead

▲ Where we are

# To ensure successful launch of the concepting phase, FinEst Link should invest in a full time core team and put in place the initial governance structure

Key governance components to be put in place now to drive the effort forwards

Selected considerations for FinEst

Advisory board	<ul style="list-style-type: none"> <li>• Ensure senior and independent knowledge is available from the start to provide perspective on permitting and political decision making</li> </ul>	<ul style="list-style-type: none"> <li>• Senior involvement creates trust among stakeholders</li> <li>• Consider mix of independent advisors and governmental knowledge</li> </ul>
Steering group	<ul style="list-style-type: none"> <li>• Select external chair with no governmental ties to ensure independency</li> </ul>	<ul style="list-style-type: none"> <li>• Some taskforce members could be potential steering group members to ensure continuity</li> <li>• Keep political involvement limited, consider ministry and municipality participation</li> </ul>
Project manager	<ul style="list-style-type: none"> <li>• Dedicated resource to drive day-to-day work on full time basis</li> </ul>	<ul style="list-style-type: none"> <li>• Experience from early stage project leadership</li> <li>• Neutral profile to handle bi-national project, e.g. consider resourcing from third country (e.g. Sweden)</li> <li>• Manager can be changed as project evolves, e.g. to construction phase so ensure right fit for now</li> </ul>
Project core team	<ul style="list-style-type: none"> <li>• 100% dedicated resources</li> <li>• A team of about 5-10 persons to initiate               <ul style="list-style-type: none"> <li>– Political decision making to achieve decision in principle</li> <li>– Detailing of the project costs</li> <li>– Projecting and procurement discussions</li> <li>– Permitting process</li> <li>– Financing options</li> <li>– Communications and stakeholder management</li> <li>– Project structuring over time</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Ensure balanced representation from Finland and Estonia</li> <li>• Team should possess following capabilities: Project management, environmental assessment, engineering, procurement, financing, legal, communications</li> <li>• Look for profiles who are willing to support the project over long term (e.g. more than three years to secure continuity)</li> <li>• Utilize experts early on to ensure progress and right level of expertise for diverse topics</li> <li>• Invest early on in transparent communications and detailing the current budget by e.g. successive calculation as used by Swedish traffic authority</li> </ul>

## To facilitate the governance structure, core team needs to implement:

- Early stage KPIs, incl. budget adherence, schedule adherence, communications plan adherence, issues tracker, risk registry completeness
- Master plan
- Decision templates
- Weekly meeting cadence

- Executive summary
- Overview of the FinEst Link project
- Learnings from other megaprojects
- Considerations for the next project phase for FinEst Link
- The immediate next steps for FinEst Link
- **Appendix**

# Fehmarn Belt – A megaproject delayed due e.g. to a complex cross-border permitting process

TIMELINE PHASES AND TIMING INDICATIVE

## Key details

### Description

- At a length of 18 km, the Fehmarn Belt fixed link will be the world's longest road and rail tunnel
  - Proposed to connect the Danish island of Lolland with the German island of Fehmarn (cross over the Fehmarn Belt in the Baltic Sea – 18 km wide)

### Cost and financing

- Currently estimated cost ~7 bEUR, including a contingency reserve of ~1 bEUR
- Cost estimates from 2009 (~5 bEUR) have been exceeded
- Project costs fully financed by Danish government-guaranteed loans (repaid through user charges)

### Organization



- Femern A/S and A/S Femern Landanlaeg, **100% owned by the Danish state**, are respectively authorized to build and operate the fixed link and associated landworks in Denmark
- Plan approval split per country in project organization

### Status / Outcome

- Project delayed due to unforeseeably complex cross-border permitting process**
  - Permits in Denmark approved, German permits estimated to be approved during 2018
  - Full launch of construction pending German approval
  - Current delay from original estimation for completion expected to reach 10 years

## Timeline



### Key learnings

- Complexity of cross-border permitting processes should not be underestimated
- Essential to have a core team representing both sides across state borders to ensure
  - Local trust
  - Process knowledge



SOURCE: Femern.com, press research

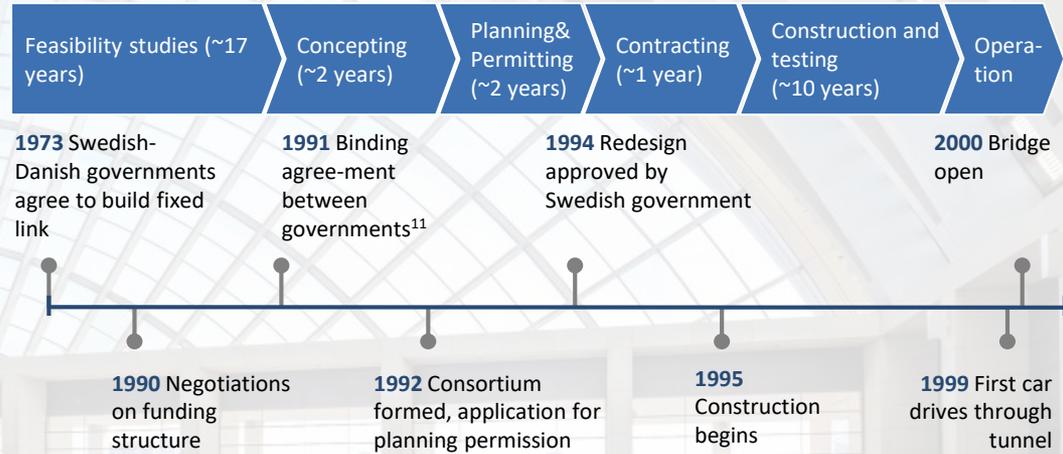
# Öresunds bro – A joint venture with Sweden and Denmark to build an effective link in between, resulting in cost overruns due to incorrect estimations

TIMELINE PHASES AND TIMING INDICATIVE

## Key details

<b>Description</b>	<ul style="list-style-type: none"> <li>The Øresund Bridge is a bridge, a tunnel and the island Peberholm, resulting in an effective link between Denmark and Sweden</li> </ul>
<b>Cost and financing</b>	<ul style="list-style-type: none"> <li>Øresunds bron is 100% privately financed through loans and bond issues in the domestic as well as the international capital markets (plan to repay in 30 years through toll collection and ticket combos), with additional EU funds</li> <li>The financing of Øresundsbro Konsortiet is jointly guaranteed by the Kingdom of Denmark and the Kingdom of Sweden</li> </ul>
<b>Organization</b>	<ul style="list-style-type: none"> <li>Øresundsbro Konsortiet's owned by A/S Øresund and SWEDAD AB                             <ul style="list-style-type: none"> <li>A/S Øresund owned Sund&amp;Baelte Holding A/S, owned by the Danish state</li> <li>SWEDAD AB owned by the Swedish state</li> </ul> </li> </ul> <div style="display: flex; align-items: center;"> <ul style="list-style-type: none"> <li>• Project set up organized by function</li> <li>• Construction contract split in three: Bridge (Sundlink contractors), Tunnel (Øresund Tunnel contractors), Artificial islands (Øresund Marine Joint Venture)</li> </ul> </div>
<b>Status / Outcome</b>	<ul style="list-style-type: none"> <li>Construction finished three months ahead of schedule, but ~40% over initial budget                             <ul style="list-style-type: none"> <li>Budget overruns due to connecting infrastructure on both Danish (substantially higher than estimates) and Swedish sides, and maritime safety efforts</li> </ul> </li> </ul>

## Timeline



## Key learnings

- Representation of both states (Sweden and Denmark) in project ownership and leadership mitigates inefficient collaboration, ensuring local trust and process knowledge available and easily attained when needed
- State guarantees make project more attractive to private investors
- Functional set up of the project organization reduced silos
- Budget overruns resulting from incorrect initial estimates – important to focus on early in the project



<sup>1</sup> To start construction in 1993 and finish in 2000

SOURCE: oresundsbron.com

# Eurotunnel – A private consortium consisting of French and British companies finance, build and operate the train service but struggle with profitability issues

TIMELINE PHASES AND TIMING INDICATIVE

## Key details

- Description**
  - The Channel Tunnel is one of the biggest engineering projects ever undertaken in the Europe, linking the UK and France via rail
- Cost and financing**
  - Initial budget Eur 4.7 B -The project was privately funded with bank loans and equity payments
  - The construction consortium consisted of 10 contractors called TransManche Link or TML for short and was divided between UK and French responsibilities

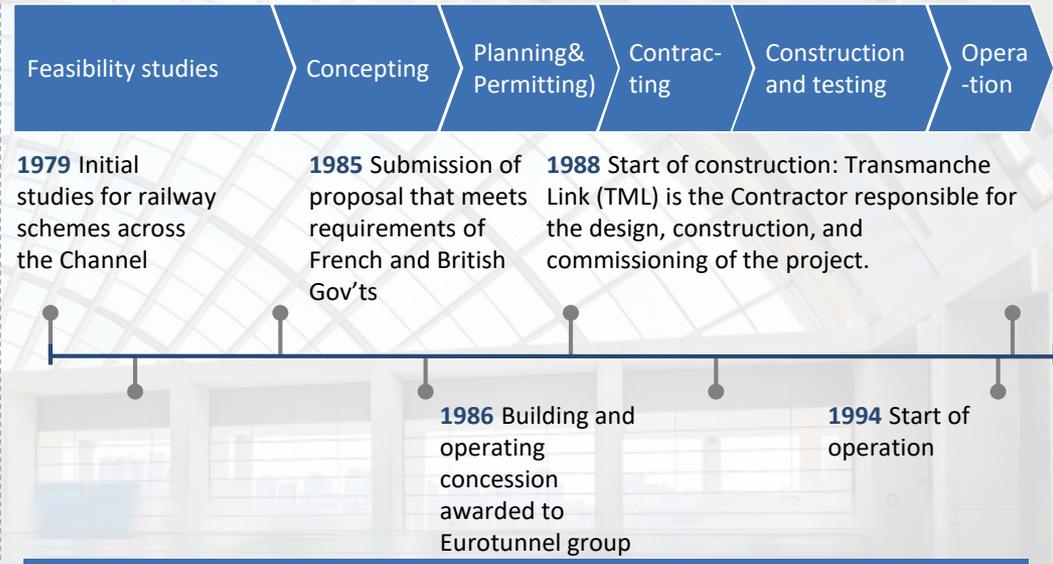
## Organization



## Status / Outcome

- The project was completed 80% over budget and 1 year late
- Eurostar had initially projected 21 million passengers, when actual figure was ~1/3 of that
- Even though the Eurotunnel has been considered a failure in terms of ROI and debt repayment, it has recently undergone revenue and profit increases

## Timeline (current estimate)



## Key learnings

- Ensure financial projections take into consideration market reactions (here ferries improved business model and retained market share) and up and coming new technologies (e.g. budget airlines)
- The organizational structure with separate British and French teams caused communication gaps between teams tunneling from different sides

SOURCE: Press search

# Gasum BalticConnector – A natural gas pipeline between Finland and Estonia highlighting the difference in permitting processes

TIMELINE PHASES AND TIMING INDICATIVE

## Key details

**Description**

- Balticconnector is a bi-directional natural gas pipeline project between Ingå, Finland and Paldiski, Estonia, which will connect Estonian and Finnish gas grids

**Cost and financing**

- In 2016, the European Commission (CEF) granted funding of EUR 187.5 million to the project. The Finnish government will also provide Baltic Connector Oy with funds amounting to EUR 30 million
- Initial cost ~ Eur 3000M



**Status / Outcome**

- No deviation reported so far

## Key learnings

- The BalticConnector project highlights the differences in permitting processes between Finland and Estonia – requiring local knowledge from both countries in the project organization

## Timeline (current estimate)



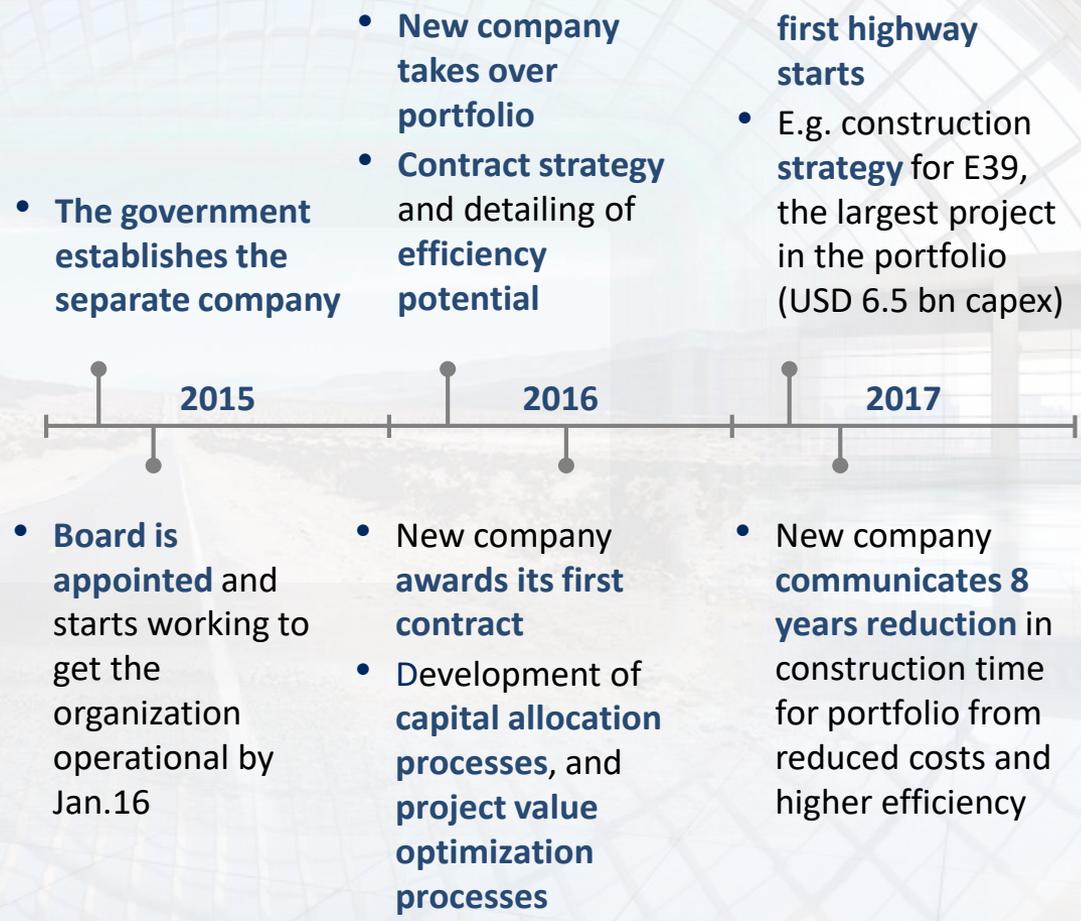
### The regulations differ between the countries

Finland	Estonia	Finland
<ul style="list-style-type: none"> <li>Pipeline construction and pre-operational testing in territorial water and the EEZ<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>Special water usage permit according to Water Act needed from Ministry of the Environment (MoE)</li> </ul>	<ul style="list-style-type: none"> <li>Water permit required from the Southern Finland Regional State Administrative Agency</li> </ul>
<ul style="list-style-type: none"> <li>Environmental surveys regarding pipeline route location</li> </ul>	<ul style="list-style-type: none"> <li>Consent from Estonian Government, permission from the Ministry of Foreign Affairs (MFA)</li> </ul>	<ul style="list-style-type: none"> <li>Consent from the Council of State via Ministry TEM (EEZ Act)</li> </ul>
<ul style="list-style-type: none"> <li>Right to use pipeline in EEZ</li> </ul>	<ul style="list-style-type: none"> <li>EEZ consent from Estonian Government via MFA, Superficies license according to the Water Act</li> </ul>	<ul style="list-style-type: none"> <li>EEZ consent via the ministry TEM</li> </ul>
<ul style="list-style-type: none"> <li>Import and transmission of gas in the Estonian territory</li> </ul>	<ul style="list-style-type: none"> <li>A protection zone of gas equipment is set by the Government and the Estonian Technical Surveillance Authority supervises</li> </ul>	
<ul style="list-style-type: none"> <li>Operating as service provider</li> </ul>	<ul style="list-style-type: none"> <li>Permission from Estonian Competition Authority</li> </ul>	
<ul style="list-style-type: none"> <li>Safe construction of pipelines on- and offshore and Storage of natural gas and gas in liquid form in the Finnish territory</li> </ul>		<ul style="list-style-type: none"> <li>Construction license from the Safety Technology Authority (Chemical security Act, decree on dangerous chemical goods)</li> </ul>
<ul style="list-style-type: none"> <li>State technical inspections</li> </ul>	<ul style="list-style-type: none"> <li>Estonian Technical Surveillance Authority</li> </ul>	<ul style="list-style-type: none"> <li>Private certified bodies for technical inspection</li> </ul>

# Nordic Road Agency –The new government road authority was set-up from scratch to identify and implement very ambitious cost improvement targets

## Background

- Country has **one of the world's highest BNP/capita**, but is lagging on road infrastructure
- The goal was to **setup of a new government owned company** given a mission and mandate to build roads *better, faster and cheaper*
- The company was allocated a **portfolio of 530 km 4-lane highway with USD 18 bn capex** - to be built over a **20-year period**



## Impact

- The sum of all projects are estimated to yield **cost reduction of 20% and an increase in gross socio-economic benefit of 16%**
- **Construction time to complete highway portfolio reduced by 40% - from 20 to 12 years**
- **First awarded contract yielding cost reductions of USD 60 mill**

# Nordic Road Agency – A new road agency is formed with the ambitious targets to cut costs and schedule of new road construction

## High aspirations

- Established as **response to high cost and slow execution**
- Set up as **“public sector start-up”** with need to fight for its existence
- Launched early **target of 20% cost savings and 40% reduced time** to completion

## Independent organization

- Fully state owned limited company with **independent Board of Directors** at arm's length from politicians
- **‘Promised’ \$1bn p.a.** over govt. budget plus ~30% toll road financing
- **Small, highly skilled team** that scales dynamically to project needs
  - Attractive employee value proposition
  - Significant use of 3rd party services
  - Early contractor involvement

## Challenger mindset

- Bound by existing regulations, but **mandated to challenge status quo**
- Working to **replace many of the 7,500 road requirements** by functionality standards
- **Negotiating with municipalities** to optimize location of main road, crossings, and feeder roads

# Stuttgart 21 – A railway project with complex technical requirements, multiple stakeholder interests and a long preparation phase

TIMELINE PHASES AND TIMING INDICATIVE

## Key details

### Description

- Stuttgart 21 is a **railway and urban development project in Stuttgart**, Germany. It is a part of the Stuttgart–Augsburg new and upgraded railway and the Magistrale for Europe (Paris—Vienna) in the framework of the Trans-European Networks
- A very **large rail infrastructure project** (117 km of total track length, 60 km of tunnels, high-speed-rail line, 3 underground stations<sup>1</sup>)

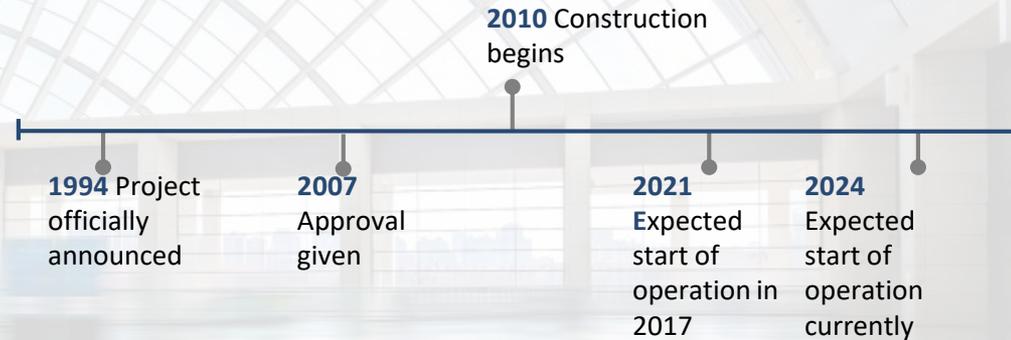
### Cost and financing

- Cost estimate in 2009 of 4.1 bEUR, rising to 6.3 bEUR in 2016 and to 7.6 bEUR in the end of 2017
- Financed by Deutsche Bahn, State of Baden-Württemberg<sup>2</sup> and the Federal Government

### Status / Outcome

- Construction began in 2010 and completion is expected for 2024 (Expectation in 2017 was 2021)
- The project has been under a lot of questioning and public pressure on its actual efficiency and usefulness after many delays and extensive cost overruns
- Heated debate ensued on a broad range of issues, including the relative costs and benefits, geological and environmental concerns, as well as performance issues

## Timeline



### Key learnings

- Planning delays and regulation changes should be mitigated – can easily cause delays
- It is important to ensure continuity through long planning periods
- Stakeholder management in public projects with large public interest is even more important

<sup>1</sup> The agreement also made provision for possible increases over the Eur 2.8 B estimate of up to Eur 1 B, with Baden-Württemberg agreeing to fund up to Eur 780 M and DB agreeing to fund up to Eur 220 M. According to the statement, Eur 2 B would also be invested in the railway to Ulm, with the total budget amounting to EUR 4.8 B initially

<sup>2</sup> Region of Stuttgart

SOURCE: Press search

# Rail Baltica –EU financed project to connect the Baltic states through a modern rail link

TIMELINE PHASES AND TIMING INDICATIVE

## Key details

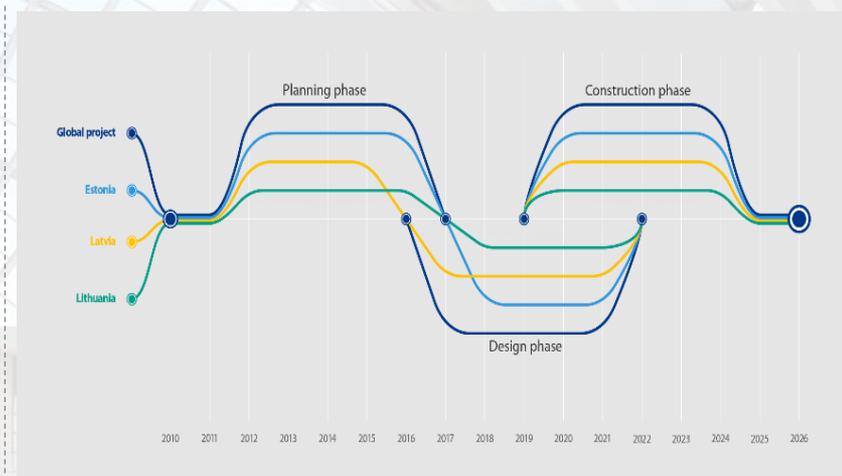
### Description

- Rail Baltica is a greenfield rail transport infrastructure project with a goal to integrate the Baltic States in the European rail network. The project includes five European Union countries – Poland, Lithuania, Latvia, Estonia and indirectly also Finland.

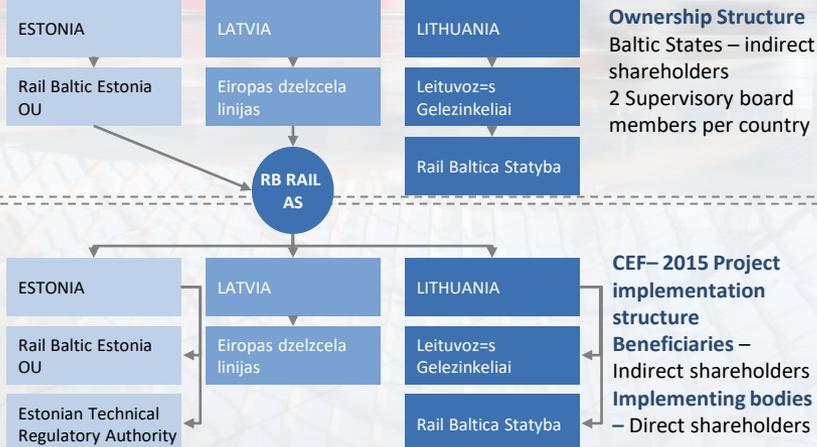
### Cost and financing

- The implementation of the Rail Baltica project is financed by the national states — Estonia, Latvia and Lithuania — and co-funding from the European Union up to 85% of the total eligible costs.
- So far, the three Baltic states and RB Rail AS have received two grants designed under the CEF for the construction of the Rail Baltica railway, having signed Grant Agreements to a total value of Eur 765 M.
- RB Rail has submitted a new application for EU funding for Rail Baltica at the beginning of 2017.

## Timeline



## Organization



## Key learnings and success factors based on expert interview

- Smooth political alignment due to frequent touchpoints between states
- Public hearings were necessary to keep stakeholders up to date
- Full time core team facilitated getting project running
- Competences have been aligned with project phase – change as per need
- The project also highlighted the need for considering technical engineering as a capacity constraint -> flooding the market with requests can cause delays in response and availability

SOURCE: Rail Baltica website; Press search, expert interview