Finnish Transport
Infrastructure Agency

HAILUOTO CAUSEWAY ALLIANCE PROJECT

Project Plan

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Finnish Transport
Infrastructure Agency

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Concepts

Alliance
A type of collaborative contract in which an owner and one or more service providers form a shared, integrated organisation for implementing a project.

Alliance Leadership Team (ALT)
The highest decision-making body in the Alliance.

Alliance Project Team (APT)
Is responsible for the Alliance's operational management and prepares matters to be discussed by the ALT. The APT is chaired by the Alliance Project Manager.

Alliance constructor
GRK Suomi Oy is the contractual party in the Alliance that is responsible for construction and therefore the main contractor. The main contractor steers design and planning during the development phase, ensures the feasibility of the construction plans, and is responsible for both general management of the construction site during the construction phase and the main contractor's legal obligations.

Alliance designers
The contractual parties in the Alliance who are responsible for design are AFRY Finland Oy and A-Insinöörit Planning Oy. Insinööritoimisto Ponvia Oy and Plaana Oy were merged into A-Insinöörit Planning Oy during the development phase. The designers draw up the project's construction plans.

Alliance owner
The contractual party that has commissioned the service providers to carry out the collaborative project, and that will accept handover of the project. The Hailuoto Causeway Alliance Project's owner is the Finnish Transport Infrastructure Agency (formerly the Finnish Transport Agency). The Agency focuses on the planning, development and maintenance of road, rail and maritime transport, and on reconciling traffic and land use.

Alliance fee
The compensation that is paid for procurements and work done in addition to any directly reimbursable costs that are allocated to the project. The Alliance fee covers the service provider's corporate overheads and margin.

Key objectives (KRA objectives)
The Alliance's jointly agreed (project) objectives on which the gainshare/painshare regime (bonuses and deductions) is based. Key objectives are distributed on a project-specific basis as part of the commercial terms and conditions for the target outturn cost and other key objectives.

Centre for Economic Development, Transport and the Environment (ELY Centre)
The ELY Centre for Northern Ostrobothnia's transport and infrastructure division will be the party responsible for road maintenance after the project is completed. It launched project planning and administrative deliveries, and was the permit applicant. The ELY Centre is represented in the project's leadership team with the right to speak.

Project Plan
Describes how the project will be planned, built, commissioned and handed over, including costs.

"Best interests of the project" principle
This principle states that all activities concerning the Alliance, such as tasks, organisation, resourcing, procurement and decisions, are to be carried out with the aim of achieving its jointly set objectives. The objectives and activities of the Alliance's contractual parties must not be in conflict with the common objectives set for the project.

Management system
The management system defines, on a project-specific basis, how the Alliance is managed, the authorisations held by representatives of its contractual parties, the Alliance's decision-making, and the procedures and methods for implementing the various phases of the project.

Gainshare/painshare regime
Consists of cost incentives and the objectives, metrics and major event modifiers for key result areas (KRAs). Key result areas and their metrics are collectively determined by the members of the Alliance.

Development phase
The development phase of the Alliance agreement. The technical scope, quality level, target outturn cost, key result area objectives, jointly agreed implementation schedule and details of the commercial model will be defined during this phase. The development phase ends when the owner decides to proceed to the implementation phase.

Machinery control model
A data model, consisting of design models, that is used to control machinery during construction. Control systems provide benefits in terms of construction quality and efficiency, quality assurance, collecting implementation data, and monitoring performance.

Bonus fund
A fund reserved by the owner from which bonuses may be paid to service providers for achieving objectives other than the target outturn cost. The bonus fund consists of the initial capital set by the owner and any increases earned by undercutting the target outturn cost. The bonus fund is not included in the target outturn cost.

Risks
The project's risks consist of assessable risks related to the project's successful implementation, such as risks relating to conditions, environmental factors, stakeholders and the operating environment) (cf uncertainty factors). A technical risk is an uncertainty related to unit prices and quantities. A cost-level increase risk is an uncertainty associated with changes in cost levels during the project.

Risk provision
A cost allocation that must be included in the target outturn cost to cover any identified external events or events independent of the contracting parties' activities that, in the event of their occurrence, may have a negative or positive impact on the achievement of the project's objectives. The Alliance identifies and specifies the risks to be included in the risk provision, and determines the risk provision during the development phase.

Design model
Design models describe how the initial data model will be turned into the planned structure. The design model may, for example, be a bridge or embankment surface.

Takt production
When using takt production, a project is divided into identical work packages that follow each other. The rate of production will be consistent throughout the selected period. This consistency makes the project more predictable than usual.

Target outturn cost
The total target outturn cost of the project, which is set by the Alliance at the end of the development phase and specified in the alliance agreement for the implementation phase. The Alliance aims to achieve this target outturn cost in accordance with the "best interests of the project" principle. The target outturn cost includes the reimbursable costs incurred at various stages of the project, the alliance fee, the risk provision, and any potential alliance-related costs incurred by the owner.

Technical teams
The Alliance's technical teams are established during the development phase in order to effectively solve any problems in different fields of design, and to develop design and implementation solutions. A coordinator and representatives from the designer, builder, constructor, owner's experts and owner are assigned to each technical team.

BIM
Building information modelling (BIM) means creating a three-dimensional representation of a structure to show its properties in digital format. Ideally, a single model will be used to manage the lifecycle of a structure all the way from design and implementation to maintenance and its eventual demolition.

Implementation phase
The stage during which the Alliance will carry out construction for the project. Unless it is terminated prematurely, this phase begins when the alliance agreement for the implementation phase is signed and ends when the warranty phase starts.

Water permit
The Water Act governs permits for water management projects. These include the construction of quays, bridges, dams, water pipes and cables in waterways; the use of hydropower, shipping lanes and other waterways; timber floating, ditching, regulating waterways and water intake. A valid water permit is required for launching all construction work in this project.

Combination model
The combination model combines a variety of design models (such as technology, engineering structures and surfaces) in a single view. The combination model is used to, for example, visualise and reconcile design data.

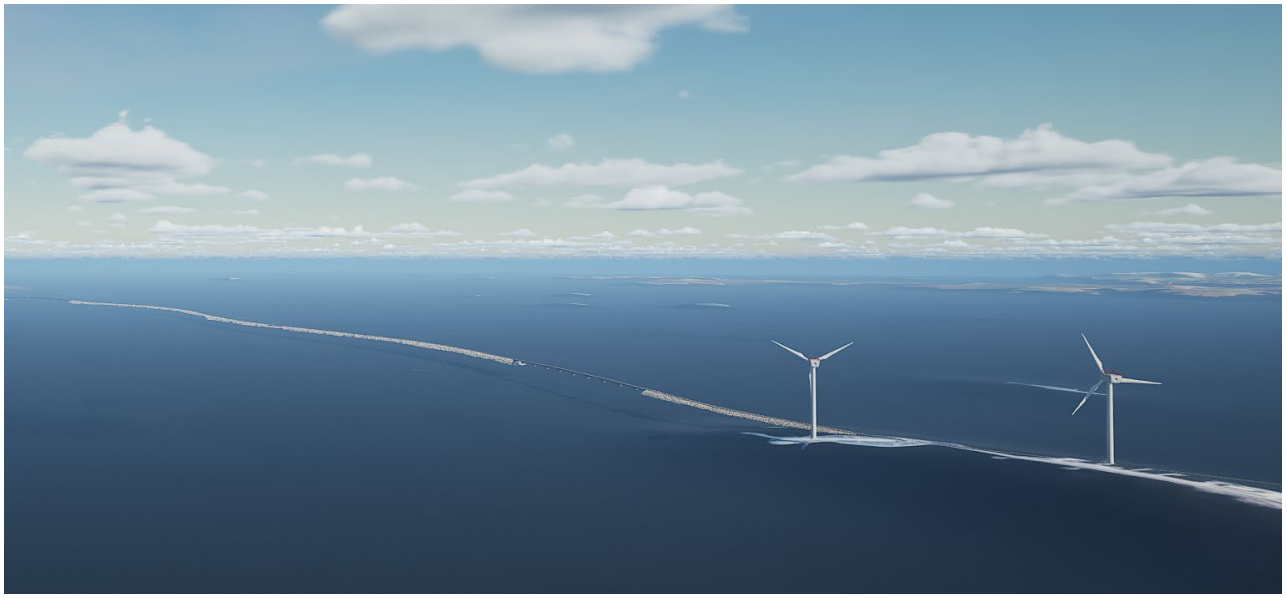
Contents

Abstract

Project

The Hailuoto Causeway project will build a causeway between Riutunkari in Oulu and Huikku on the island of Hailuoto. The causeway will replace the current ferry service. The causeway will be approximately 8.4 kilometres long, and will consist of the Huikku and Riuttu Bridges and a section of road running along an embankment. The causeway will improve Hailuoto's national and regional accessibility, and make travelling to Hailuoto easier.

The causeway is being built using an alliance model, that is, a collaborative contract in which the contractual parties share the risks and benefits of the project. The alliance organisation, aka the HAIKI Alliance, consists of the Finnish Transport Infrastructure Agency (the owner), GRK Suomi Oy (the constructor) and AFRY Finland Oy and A-Insinöörit Suunnittelu Oy (the designers).



Visualisation of the planning area.

The project's objectives	
Schedule and cost-effectiveness	› The implementation phase has an optimal duration and is on schedule › Project planning and implementation takes lifecycle costs into account › Construction costs remain within budget
Minimising disruptions to traffic	› The project does not cause any unplanned interruptions in ferry and other vessel traffic › The project causes minimal inconvenience to local residents, and road users do not experience congestion › Crushed rock is transported efficiently and without causing a disturbance
Safety and the environment	› No work-related accidents occur during the project › No traffic accidents are caused by the project › Environmental issues are taken into account in accordance with permit terms and conditions, and the project does not cause any environmental damage
Efficient working methods	› The project maintains high quality standards › Excellent collaboration between parties › Real-time reporting that includes underwater structures

Goals and leadership

The owner's objectives have steered the Alliance's design solutions, leadership, management and working methods, implementation planning, the comparison of various alternatives, and the project's impact assessments. The project's objectives are listed in the table on page 8.

The key principles of the Alliance's leadership are: openness, honesty and trust, and reaching unanimous decisions that are in the best interests of the project. The management system aims to ensure that the project's objectives are achieved by developing the Alliance's working culture and decision-making.

Target outturn cost

The Alliance's target outturn cost is EUR 105,407,807, which includes the planning, construction, commissioning and warranty phases of the project. The target outturn cost includes reimbursable costs, service providers' fees and a risk provision.

Gainshare/painshare regime

The Alliance's gainshare/painshare regime consists of cost incentives, key result area objectives and metrics, and major event modifiers. Any bonuses or penalties that result from either exceeding or undercutting the target outturn cost will be divided between all of the parties in accordance with the Alliance's commercial model.

In addition to the target outturn cost, the owner has made a separate provision, aka the bonus fund, from which service providers can be paid a bonus for success in key result areas. Similarly, failure in key result areas will trigger penalties for service providers. Undercutting the target outturn cost will increase the amount in the bonus fund. The project's key result areas, including their metrics and positive and negative modifiers, are:

Key objectives	
Efficient working methods and continual improvement	HAIKI Walk, the project's version of GEMBA Walks
Safety	Accident frequency
Environment	Stakeholder survey
Aikataulu	Ready to be opened to traffic on schedule
Metrics to be defined later during the implementation phase	

Positive/negative modifiers	
Safety	Developing safety culture and safety observations
Elimination of incidents	Smooth flowing ferry traffic
Efficient working methods	Media coverage
Environment	Media coverage
Schedule	Milestones x 3

A "major event modifier" is defined as an interruption in Hailuoto's ferry traffic for at least 48 hours as a result of damage caused by the Alliance. If realised, it will have a major negative impact on service providers' fees.

Construction

The project's development phase began in spring 2022. It progressed to the implementation phase in April 2024, after the project's water permit came into effect on 31 January 2024. Construction will take about three years and the causeway is scheduled to be opened to traffic in late 2026.

The working conditions, construction site logistics and the limitations on construction work imposed by environmental factors all lend this project special characteristics. About 1.1 million cubic metres of crushed rock will be required to build the causeway.

Construction will be carried out in accordance with the terms and conditions of the water permit and special permissions, thereby minimising environmental impacts. Environmental monitoring will be carried out in accordance with a separate monitoring programme both during and after construction.

1 Project

1.1 General overview of the project

Hailuoto is located approximately 50 kilometres from Oulu, and is the largest island in the Bay of Bothnia. The distance between the island and the mainland is approximately seven kilometres. Hailuoto has a population of about 1,000. It is a municipality in its own right and the only archipelagic municipality in Northern Ostrobothnia. There is currently a ferry service between Riutunkari in Oulu and Huikku on Hailuoto (Figure 1).

Hailuoto is accessed by a regional road (No 816), which begins in Kempele, passes through Oulunsalo and the municipal centre of Hailuoto, and ends in Marjaniemi on the western side of Hailuoto. The route also includes a 6.9-kilometre ferry crossing, which takes approximately 25 minutes. Depending on ice conditions, the road manager also maintains an ice road between the island and the mainland during the winter. Average daily traffic (ADT 2018) is 981 vehicles, of which about 10 per cent is heavy traffic.

The project will build a causeway between Riutunkari in Oulu and Huikku on the island of Hailuoto. This causeway will replace the current ferry service. The causeway will be approximately 8.4 kilometres long, and will consist of the Huikku and Riuttu Bridges and a section of road running on top of an embankment.

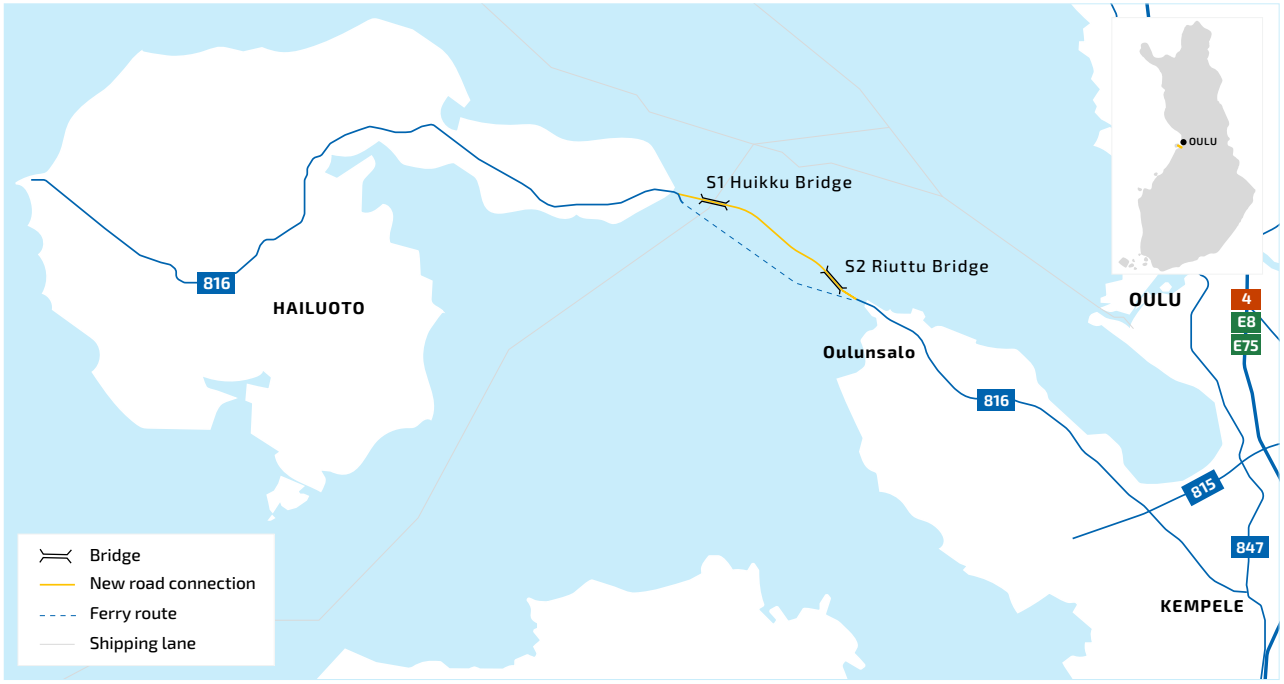


Figure 1. General map.

The causeway will improve Hailuoto's national and regional accessibility, and make travelling to Hailuoto easier. It will enable better passenger and cargo transport connections to the island, and improve conditions for local businesses. The causeway will also widen the area in which Hailuoto residents can look for work. Construction of the causeway is expected to increase traffic volumes by about 400 vehicles per day.

The causeway will make Hailuoto equal to other municipalities in the Oulu region in terms of transport connections. The causeway's planned capacity can also accommodate a considerably larger increase in traffic volumes than forecast. The causeway will enable the objectives set for private and public transport, logistics, and pedestrian and bicycle traffic to be met.

1.2 Starting points

Building a permanent land connection (causeway) from the island of Hailuoto to mainland Finland has been contemplated for decades (Figure 2). Alternatives, reports and plans have been drawn up as the scheme has become more detailed and specific.

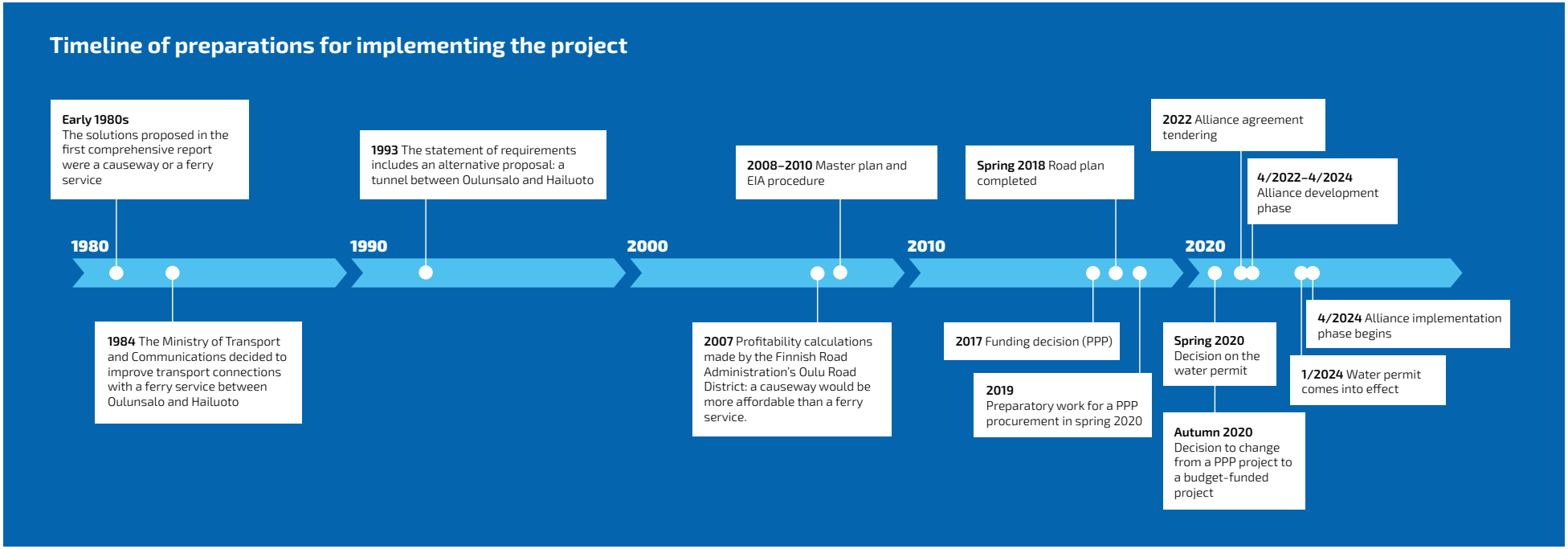


Figure 2. Timeline of preparations for implementing the project.

The environmental impact assessment (EIA) procedure for the Hailuoto transport connection was completed in 2010, and the contact authority, the ELY Centre for North Ostrobothnia, returned a statement in that same year.

Drafting of the general plan for Hailuoto Causeway began in 2010, and the general plan report was completed in 2014. The Finnish Transport Agency approved the general plan in 2016. Appeals against the plan were made to the Administrative Court of Northern Finland. The Court rejected these appeals on 2 March 2017. An appeal against the general plan was then made to the Supreme Administrative Court, which rejected the appeal on 12 April 2018.

The perspectives presented by the contact authority in its EIA statement have largely been taken into account in the overall project plan and road plan.

The road plan and water permit documents for Hailuoto Causeway were completed in spring 2018. The road plan was approved in October of the same year, and the water permit was issued in February 2020. An appeal against the water permit was made to Vaasa Administrative Court, which gave its ruling on 29 December 2022. An appeal against the permit decision was made to the Supreme Administrative Court, which gave a final ruling on the matter on 31 January 2024.

The project's special characteristics include the working conditions, organisation of construction site logistics and the limitations on construction work imposed by environmental factors.

1.3 Type of contract

The Hailuoto Causeway is being implemented using an alliance model, that is, a collaborative

Figure 3. Visualisation of Huikku Bridge (S1).

contract. Alliancing is an implementation model in which an owner and service providers form a shared, integrated organisation for implementing a project. The alliance parties are jointly responsible for project planning and construction, and also share the risks and benefits of the project.

The advantages of using an alliance model are largely a result of the project's integrated organisation. It enables the best possible expertise to be allocated to the project's various phases and tasks at an early enough stage, so that each party's knowledge, capabilities and resources can already be harnessed during the development phase to find value-added solutions, speed up implementation and reduce risk factors.

In order to achieve an optimal outcome, the Alliance should invest in building mutual trust, as this supports collaborative innovation and open communications between parties. The tools and approaches that will help to create a culture of openness and cooperation include working together in the same premises (Big Room), common and co-developed operating models and tools, cost transparency, sharing information, and creating common values and management principles.

This project's alliance organisation consists of the Finnish Transport Infrastructure Agency (the owner), GRK Suomi Oy (the constructor) and AFRY Finland Oy and A-Insinöörit Suunnittelu Oy (the designers). The project's alliance organisation has been named the HAIKI Alliance.

1.4 Stakeholders

The project has several stakeholders, including: the Municipality of Hailuoto, the City of Oulu, road users, local residents and operators, authorities and partners. A number of Centres for Economic Development, Transport and the Environment (ELY Centres) are some of the most significant stakeholders (Table 1).

Table 1. Roles of ELY Centres.

Remit	Project-related task
ELY Centre for North Ostrobothnia: transport and infrastructure division	EIA and water permit applicant. Draws up the master plan and road plan. Is responsible for road maintenance in the region, a member of the Alliance Leadership Team (with the right to speak)
ELY Centre for North Ostrobothnia: environment and natural resources division	Water Act supervisor; issues and supervises noise notifications
ELY Centre for Southwest Finland: environment and natural resources division	Issues and supervises exemptions for disturbing birdlife
ELY Centre for Lapland: trade and commerce division	Fishing industry
ELY Centre for Southwest Finland: transport and infrastructure division	Is responsible for organising road ferry traffic nationally, including the Hailuoto ferry service

Figure 4. Visualisation of Riuttu Bridge (S2).

2 The phases of the Alliance and their objectives

2.1 The phases of the Alliance

The Alliance is divided into the tendering phase, the development phase, and the implementation phase. However, the transition to the implementation phase requires a separate decision from the owner (Figure 5). Separate alliance agreements will be drawn up for the development and implementation phases. In addition to the implementation phase itself, the implementation phase agreement also includes a five-year (5-year) warranty phase.

The sea area component master plan and the road plan for the project came into effect at the beginning of the development phase in spring 2022. An appeal against the water permit was filed at Vaasa Administrative Court, and this appeal was still pending at the beginning of the development phase. The water permit only came into effect after a ruling from the Supreme Administrative Court on 31 January 2024. This ruling triggered the end of the development phase.

2.2 The project's objectives

The owner had already set preliminary objectives for the implementation of the Hailuoto Causeway at the procurement stage.

After the service providers had been selected, the Alliance created joint goals for both design and implementation, taking into account the costs, scope, quality and environmental impact of the project. The objectives presented in Table 2 have steered project management, the selection of design solutions, implementation, impact assessments, and the targets and metrics for the gainshare/painshare regime.

2.3 Development phase targets and tasks

The goal of the development phase was to create the conditions required for the project to proceed to the implementation phase. The development phase is the foundation for a successful implementation phase.

The target outturn cost, key result area objectives, jointly agreed implementation schedule, and details of the commercial model were defined during the development phase. The Alliance's development phase ended when the cli-

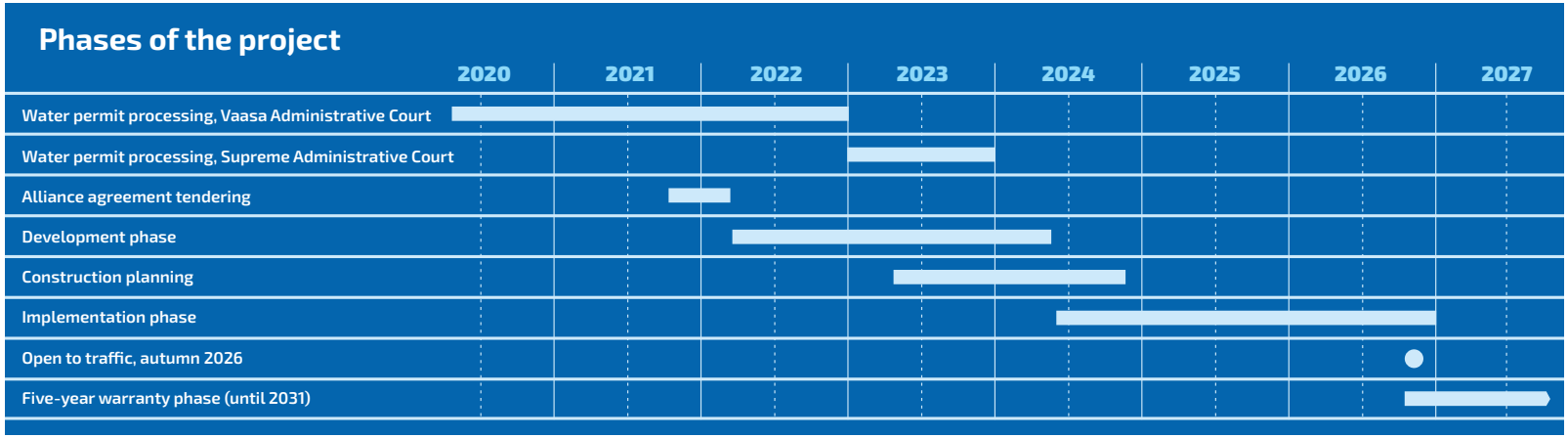


Figure 5. Schedule.

Table 2. The project's objectives.

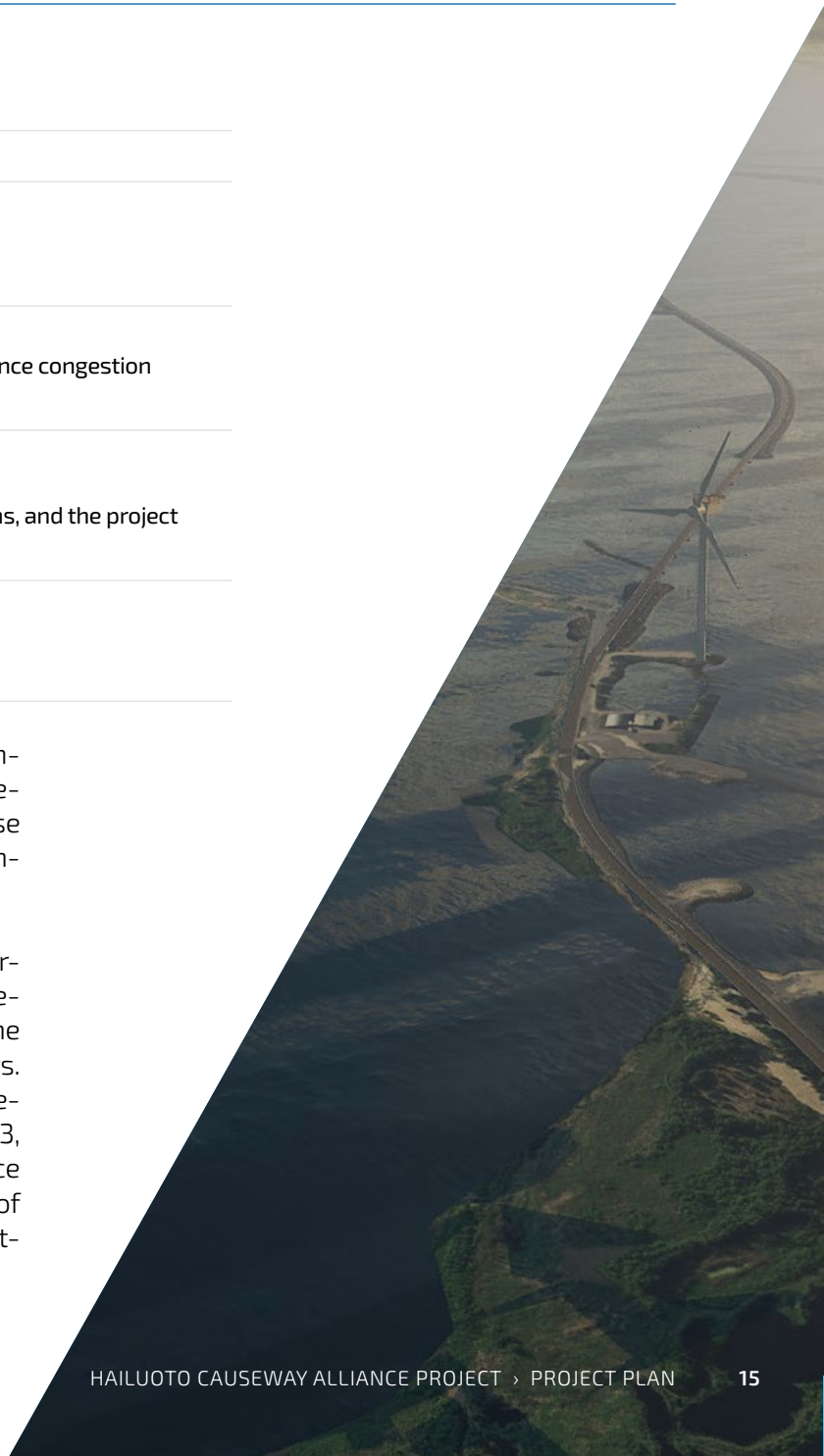
Key objective	The project's objectives
Schedule and cost effectiveness	› The implementation phase has an optimal duration and is on schedule › Project planning and implementation takes lifecycle costs into account › Construction costs remain within budget
Minimising disruption to traffic	› The project does not cause any unplanned interruptions in ferry and other vessel traffic › The project causes minimal inconvenience to local residents, and road users do not experience congestion › Crushed rock is transported efficiently and without causing a disturbance
Safety and the environment	› No work-related accidents occur during the project › No traffic accidents are caused by the project › Environmental issues are taken into account in accordance with permit terms and conditions, and the project does not cause any environmental damage
Efficient working methods	› The project maintains high quality standards › Excellent collaboration between parties › Real-time reporting that includes underwater structures

ent decided to proceed contractually to the implementation phase in April 2024. The target outturn cost and implementation schedule were defined on the basis of thorough analyses, plans and risk management.

The project's development phase started in April 2022, and included some Big Room work in Oulu. At the beginning of the development phase, the Alliance defined its organisation, common working methods and tools. These included a shared calendar, meeting practices, project bank, situational awareness, and planning and risk management processes.

When the development phase began, the project's water permit had not yet come into effect due to a pending appeal process at Vaasa Administrative Court. The project could not make the decision to proceed to the implementation phase until the water permit came into effect, as construction could not begin without a valid permit.

The development phase was therefore considerably longer than originally expected due to the legal processes surrounding the water permit. The development phase lasted a total of two years. Actual construction planning could therefore begin during the development phase, in April 2023, and experimental structures were built to reduce risks. This led to an exceptionally high level of preparedness for both calculating the target outturn cost and launching construction.



The results of the development phase were utilised as source material for the implementation phase, and included the following documents:

- Plans that were sufficient for proceeding to the implementation phase
- An approved target outturn cost
- A general schedule for the implementation phase
- Identified risks and opportunities, and assigned responsibilities for them
- A project plan for the implementation phase
- A commercial model and key result areas for the implementation phase, including metrics
- A management system for the implementation and warranty phases

The development phase ended in April 2024 when the phase's objectives were achieved.

2.4 Technical and functional objectives

Design solutions focus on high end-product quality and a long and cost-effective service life. During the development phase, it was the Alliance's task to design solutions that met the owner's objectives and criteria.

The objectives, design criteria and quality requirements guided design and decision-making processes. The technical and functional objectives and quality level are defined and described in both the design criteria and the construction plans and specifications of works. Construction will be carried out in accordance with InfraRYL 2023/2 (14 August 2023) and the Finnish Transport Infrastructure Agency's instructions. At the end of the warranty phase, the project as a whole must at least meet the minimum quality level for design-build contracts commissioned by the Finnish Transport Infrastructure Agency, and must not exhibit wear and tear that is faster than normal ageing or less than the estimated planned service life. Background material and reports from the road planning phase have been used as source material.

2.5 Implementation phase objectives and tasks

The objective of the implementation phase is to open the causeway to traffic in late 2026. The ferry connection can then be suspended.

The implementation phase will be steered by the terms and conditions of the water permit, the project's objectives, the plans drawn up during the development phase, schedules, KRA metrics and the target outturn cost.

The project is now moving to the implementation phase, and preparatory work for launching construction will begin in April 2024. The implementation phase includes not only construction itself, but also the completion of construction planning.

Construction work will begin with the establishment of the construction site and traffic arrangements in spring 2024. The construction of an embankment from the Oulunsalo ferry port to Hailuoto will then begin. This embankment will be built of crushed rock that will be transported by road.

Bridge construction will start in Riuttu once a works access embankment has been built in summer 2024, and is scheduled for completion in summer 2025. Bridge construction work in Huikku will start in summer 2024 with the construction of an embankment road and works access bridge.

The Hailuoto Causeway will reach its final elevation in several stages. The first stage will be to build the lower section of causeway to provide construction site traffic with quick road access to Huikku Bridge. It is currently estimated that both bridges and the embankment road can be opened to traffic in autumn 2026, after which the final intersection layouts can be implemented at the ferry ports. Works access bridges and quay structures for out-of-service ferries will be demolished, and other finishing work will be carried out.

2.6 Commissioning

An acceptance inspection will be carried out before the new section of road is opened to traffic. An informative campaign for road users will also be conducted before the causeway is opened. The necessary traffic management plans will be prepared before the causeway is opened. The causeway will be opened to all traffic at the same time. Once the causeway is open to traffic, the final intersection layouts can be implemented at the ferry ports, ferry traffic can be suspended, and quay structures can be demolished. The ferry operator must be notified six months before the intended suspension of ferry traffic.

The causeway project will be handed over in its entirety. In order for the project to be accepted,

the built structure must correspond to the plans in terms of quality and functionality, and a self-inspection handover must have been carried out. An acceptance inspection will be carried out to verify that the project meets the criteria for acceptance.

2.7 Warranty phase

The warranty phase begins when all bridges and roads have been completed (except for any minor defects) and opened to traffic. The Alliance Leadership Team will decide to proceed to the warranty phase when the Alliance has achieved the objectives set for the implementation phase. The warranty phase will last for five (5) years with the following exceptions:

- Road markings, 2 years.

During the warranty period, the Alliance will be responsible for repairing structures to the extent that the damage exceeds the level of normal wear and tear. The Alliance is not responsible for damage caused by exceptional ice conditions, such as ice floes damaging railings or other structures.

A provision has been made in the target outturn cost for any potential costs incurred during the warranty period.

An annual inspection will be carried out by the Alliance during the warranty period. An independent, external bridge inspector will also be commissioned to perform an extended general inspection of both bridges (to the applicable extent) before the end of the warranty period.

Figure 6. Visualisation from under Riuttu Bridge (S2) looking towards Hailuoto.

3 The Alliance's commercial model

3.1 Principles

The principles of the Alliance's commercial model are:

- All of the contractual parties either succeed or fail together.
- The actual costs are openly disclosed, and there is full cost and operational transparency.
- The agreement states that bonuses and penalties will be distributed fairly and equally.
- Each service provider's total financial risk is agreed on in the Alliance's commercial terms and conditions.
- The amount paid out in bonuses will be dependent on achieving key objectives and how much the project undercut the target outturn cost.
- Any penalties that are incurred will be dependent on failure to achieve key objectives and how much the project exceeds the target outturn cost.

In accordance with the Alliance's commercial terms and conditions, the contractual parties will bear the risks and opportunities associated with the implementation of the project in accordance with the jointly agreed distribution ratios. The contractual parties will therefore share a common interest in the success of the entire project rather than focusing solely on the success of their own work.

3.2 Compensation model

One of the Alliance's basic principles is that service providers are paid for direct costs incurred by the project and project-specific overheads under all circumstances. The amount of compensation to be paid on top of these is based on the Alliance's performance in different areas of the gainshare/painshare regime.

'Reimbursable costs' are actual or otherwise mutually agreed on costs incurred by a service provider for the service provider's own work and alliance procurements, as well as administrative and project management costs, and any other costs that are directly allocated to the project. These reimbursable costs also include the costs incurred during the warranty phase and the costs of any errors and corrections.

In addition to the reimbursable costs allocated to the project, service providers will be paid the Alliance fee that was set at the procurement phase, which covers the service provider's corporate overheads and margin. The Alliance fee is defined and calculated separately for the development phase and for the implementation and warranty phases. Together, the Alliance fee for the development phase and the Alliance fee for the implementation and warranty phases form the service provider's total Alliance fee.

Service providers will receive a bonus if the project undercuts the target outturn cost or exceeds the requirements set for key objectives. A deduction will be made to the fees paid to service providers if the project exceeds the target outturn cost, if the Alliance does not achieve the minimum targets set for key target areas, or if a major event modifier occurs during the project.

The principles for paying compensation are shown in Figure 7.

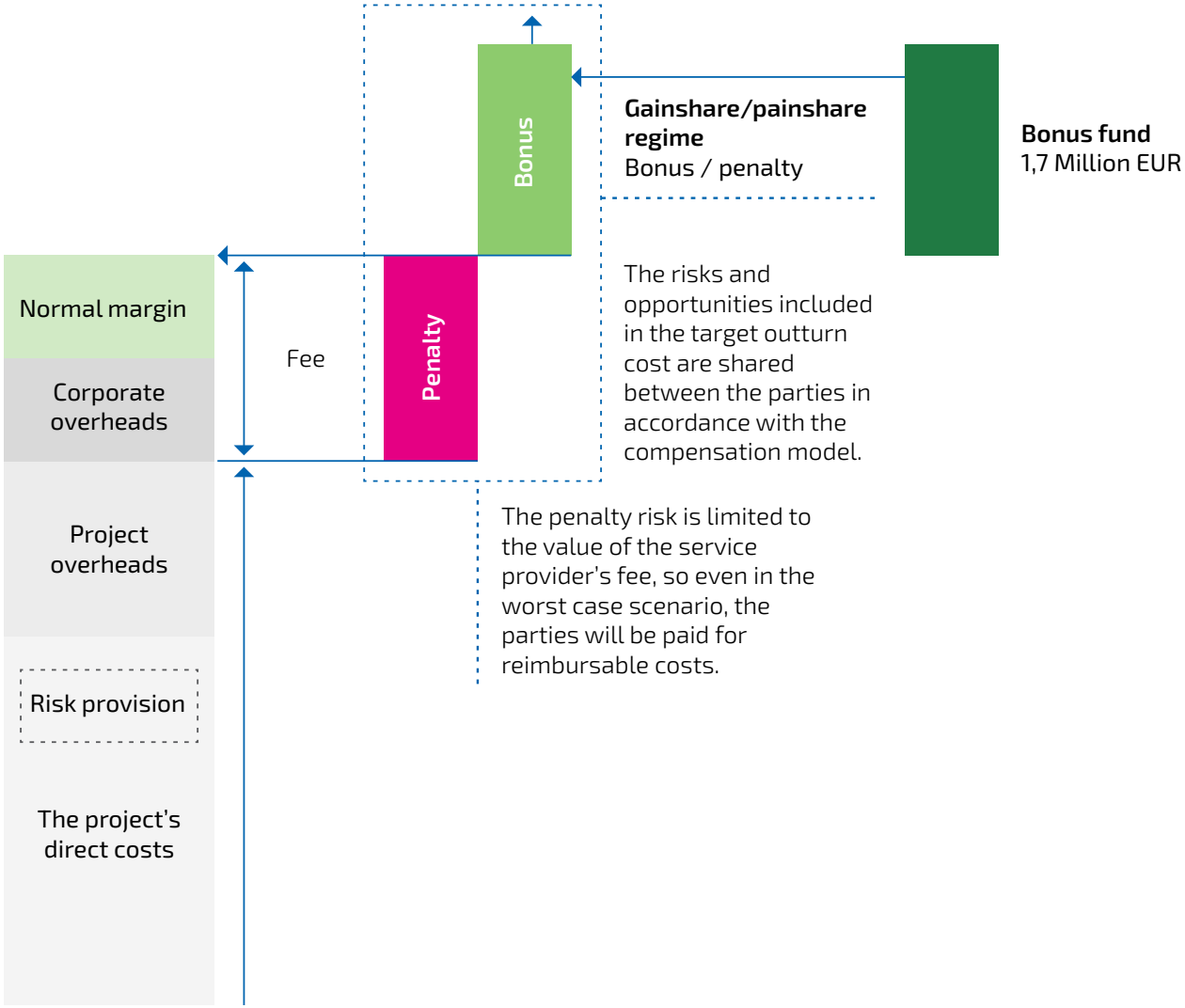


Figure 7. Alliance contract compensation model.

3.3 Gainshare/painshare regime

The project's gainshare/painshare regime consists of a cost incentive (that is, the target outturn cost) plus metrics to measure the Alliance's performance in key result areas. The bonuses or penalties resulting from undercutting or exceeding the target outturn cost will be distributed between the owner and the service providers depending on the size of the undercut/excess (Figure 7). The initial capital for the bonus fund, plus any additional funds provided by undercutting the target outturn cost, will together constitute the final bonus fund.

The bonus fund is a provision made by the owner and is separate from the target outturn cost. Service providers may receive a bonus from this fund for success in key result areas. Similarly, failure in key result areas will trigger penalties for service providers.

The gainshare/painshare regime also contains major event modifiers. A major event modifier is defined an event that is unacceptable to all parties in the Alliance. If realised, such an event will have a major negative impact on service providers' fees. If a major event modifier occurs, this will result in a deduction of 25 per cent of the Alliance fee and 100 per cent of any bonuses paid under the gainshare/painshare regime.

Penalties resulting from the gainshare/painshare regime may not exceed the service provider's fee.

The bonuses or penalties resulting from undercutting or exceeding the target outturn cost will be distributed in accordance with the following criteria:

Undercutting the target outturn cost by less than 5%:

- The owner receives 30% of the undercut
- Service providers receive 50% of the undercut
- 20% of the undercut will be transferred to the bonus fund.

If the target outturn cost is undercut by 5% or more, the exceeding amount will be divided as follows:

- The owner receives 40% of the amount exceeding 5%
- Service providers receive 30% of the amount exceeding 5%
- 30% of the amount exceeding 5% will be transferred to the bonus fund.

Liabilities for exceeding the target outturn cost will be divided between the contractual parties as follows:

- The owner's liability for the excess is 50%
- Service providers' liability for the excess is 50%, which is deducted from their fee.

3.4 Key objectives

The aim of the gainshare/painshare regime is to get the Alliance to commit to common goals. The system is, above all, a management tool. It helps to clarify the key factors in the success of the project, not only for all employees within the Alliance, but also for subcontractors. The main principle behind the gainshare/painshare regime is that good performance in key result areas entitles service providers to a bonus, while underperforming results in penalties .

The default baseline for key result areas (that is, zero level) is more demanding than the default for traditionally implemented projects.

The members of the Alliance jointly determine the key result areas and their metrics. They are based on the objectives presented by the owner in the tender documents and other factors that are jointly-developed during the development phase. The owner has made a total initial provision of EUR 1,700,000 for the bonus fund for the development and implementation phases.

3.5 Key objectives of the development phase

Two key objectives and their metrics were established during the development phase. The first of these aimed at encouraging ideation and innovation. The key objective was to produce 50+50 new development ideas. The development ideas were recorded in the development phase log. An impact assessment of these ideas was then used to determine which ideas to move forward with.

An idea was deemed to be a development idea if it was significant in financial, qualitative and/or operational terms. The aim was to collect 50 new ideas in the idea log between 22 June and 30 September 2022, and a total of 100 new ideas by the end of the development phase (including the ideas from the first period).

The criteria for meeting this objective included reviewing the ideas in the log and conducting impact assessments to help determine which ideas to move forward with. The objectives were achieved in September 2022 and April 2023, and a total of EUR 150,000 was paid to service providers from the bonus fund.

As the development phase was prolonged while the water permit was being processed, a new key objective and its metrics were established during summer 2023 after the aforementioned objective had been achieved (Table 3). This key objective aimed to ensure that the Alliance was working in a systematic and efficient manner in preparation for the Supreme Court's then as-yet unknown ruling, which would also trigger the end of the development phase. The achievement of this key objective is being measured in five subcategories that the APT will present to the ALT at the end of the development phase. The bonus fund has allocated EUR 30,000 to this key objective.

Table 3. Second KRA metrics for the development phase.

No.	Subcategory
1	Has the planned and confirmed schedule been kept? (approved by the ALT after a ruling was received on the water permit)
2	Has implementation and feasibility been taken into account in planning during the development phase?
2.1	Have all of the parties in the Alliance cooperated well together?
2.2	Are the plans acceptable and jointly produced?
2.3	Can the plans be directly implemented?
3	Has an organisation for the implementation phase been formed and fully integrated into the Alliance?
4	Were Big Room activities utilised in an appropriate and optimal manner during the prolonged development phase?
5	Has the initial stage of the implementation phase and the launch of construction been adequately planned and prepared for?

3.6 Key objectives of the implementation phase

Achieving the key result area objectives for the implementation phase requires the Alliance to work in a manner that highlights safety, construction quality, staying on schedule, efficiency, sustainability, and avoiding incidents. The goal is to continuously improve the Alliance's operations, and this is encouraged through systematic self-assessments, seeking and developing solutions, and working together.

The key result areas for the implementation phase, their metrics, and positive and negative modifiers are presented in Table 5.

3.7 Calculating performance level scores

Bonuses for exceeding key result area objectives, or penalties for underperformance, are calculated as follows:

1. Calculate the scores for performance in each key result area
2. Calculate the total score for key objectives by multiplying the KRA-specific score by the weighting coefficient
3. The result will be the total score for the key objectives (a numerical value in the range -100 … 0 … +100)
4. For their performance in key result areas, service providers will receive
   - a bonus (total score > 0) formula = total score/100 * maximum bonus
   - a penalty (total score < 0) formula = total score/100 * maximum penalty

The scores for positive and negative modifiers are added to the scores for key objectives to reach the final result. The sum of these scores cannot, however, exceed one hundred (100) points.

3.8 A major event modifier

A 'major event modifier' is defined as an interruption in Hailuoto's ferry traffic for at least 48 hours as a result of damage caused by the Alliance.

The impact of a major event modifier on the bonus pool is shown in Table 4.

Table 4. Major event modifier.

No.	Event	Consequence
1	An interruption in Hailuoto's ferry traffic for at least 48 hours as a result of damage caused by the Alliance	The bonus pool decreases by 100% and the fee by 25%

Table 5. Metrics for key result areas during the implementation phase.

Positive or negative modifiers						
No.	**Metrics**	**Key result area**	**Description of the metrics and objective**	**Measurement method**	**Point deduction**	**Point addition**
1	**Safety observations**	Safety	Developing a good workplace safety culture by encouraging people to make and learn from safety observations, by sharing best practices, and by preventing the same deficiencies from recurring.	The number of safety observations made on a monthly basis during implementation-phase project months	No points will be awarded if the observed deficiencies have not been corrected by the deadline.	The monthly goal is 25 or more observations. 0.25 points will be awarded for achieving the target.
2	**Achieving Milestone 1**	Schedule	Milestone 1: Start piling work for Huikku Bridge (S1)	By 13 November 2024	No deductions	+5 points if the milestone is reached either before or in accordance with the project plan's general schedule
3	**Achieving Milestone 2**	Schedule	Milestone 2: The embankment from Oulunsalo has reached Huikku Bridge (S1)	By 1 April 2025	No deductions	+5 points if the milestone is reached either before or in accordance with the project plan's general schedule
4	**Achieving Milestone 3**	Schedule	Ready to begin casting the deck of Riuttu Bridge (S2)	By 23 April 2025	No deductions	+5 points if the milestone is reached either before or in accordance with the project plan's general schedule
5	**Media coverage**	Efficient operating methods, environment, no disturbances	The Finnish Transport Infrastructure Agency's media tracking of the project. A positive public image is being sought.	Media tracking (Retriver) of the amount of negative news coverage		
			5.1: Mediaseuranta toteutusvaiheen 1. vuonna 2024	Media tracking (Retriver) of the amount of negative news coverage	–2 points if negative news coverage exceeds 2.5% and –4 points if more than 5%.	No additions
			5.2: Mediaseuranta toteutusvaiheen 2. vuonna 2025	Media tracking (Retriver) of the amount of negative news coverage	–2 points if negative news coverage exceeds 2.5% and –4 points if more than 5%.	No additions
			5.3: Mediaseuranta toteutusvaiheen 3. vuonna 2026	Media tracking (Retriver) of the amount of negative news coverage	–2 points if negative news coverage exceeds 2.5% and –4 points if more than 5%.	No additions
6	**No disruption of ferry traffic**	Elimination of incidents	Disturbances to ferry traffic will result in the deduction of points	The total duration of the disturbance – the period when traffic has been interrupted due to the project – will be measured from the initial contact.	1–12 h: –3 points 12–24 h: –5 points 24–48 h: –10 points	No additions

Key objectives								
No.	**Metrics**	**Key result area**	**Description of metrics and objective**	**Measurement method**	**–100 failure**	**0 minimum requirement**	**+100 break-through**	**Weight %**
7	**HAIKI Walk**	Efficient working methods / Continual improvement	The project's version of GEMBA Walks, in which the parties involved in the project regularly (about once a month) visit the construction site to learn about, check and enhance operations, and to improve responsiveness and mutual understanding.	The walks and attendees, survey results, observations and any follow-up measures must be documented in an Excel spreadsheet that gives a numerical score between –100 and +100. Measurement results are reviewed annually.				
			7.1: First year of the implementation phase (2024)	The average of the measurements as calculated by the Excel spreadsheet. Intermediate values for bonuses or penalties will be interpolated to an accuracy of two decimal places.	-100	0	+100	10
			7.2: Second year of the implementation phase (2025)	The average of the measurements as calculated by the Excel spreadsheet. Intermediate values for bonuses or penalties will be interpolated to an accuracy of two decimal places.	-100	0	+100	8
			7.3: Third year of the implementation phase (2026)	The average of the measurements as calculated by the Excel spreadsheet. Intermediate values for bonuses or penalties will be interpolated to an accuracy of two decimal places.	-100	0	+100	5
8	**Accident frequency**	Safety	The accident frequency is a measure of occupational safety that is used in national accident statistics. It can be used to measure trends in safety in relation to other projects	An accident leading to an absence of at least one day (the day of the event is not included) for those working on the project; the number of accidents per million hours worked. Replacement labour may be utilised by common agreement.				
			8.1: First year of the implementation phase (5/2024–4/2025)	Measuring accident frequency (≥ 1 day of sickness absence)	40	8–11	0	9
			8.2: Second year of the implementation phase (5/2025–4/2026)	Measuring accident frequency (≥ 1 day of sickness absence)	30	10	0	9
			8.3: Third year of the implementation phase(5/2026–12/2026)	Measuring accident frequency (≥ 1 day of sickness absence)	20	10	0	9
9	**Stakeholder survey**	Environment	An assessment of the project's implementation with respect to the environment and permit terms and conditions.	The assessment form will be sent to the project's steering group for environmental affairs*. The survey will be conducted twice a year throughout the duration of the project. The average of the results will be used to interpolate intermediate values (a numerical score in the range –100 … 0 … + 100) to an accuracy of two decimal places.	A maximum deduction of 100 points with a result of 1.0	Zero points awarded for a result in the range 2.3–3.0	A maximum addition of 100 points with a result of 4	10
10	**Ready to be opened to traffic on schedule**	Schedule	The date when the causeway can be opened to traffic	The actual date when it is opened to traffic. Intermediate values will be interpolated.	Cannot be opened to traffic until 4 January 2027 or later	Can be opened to traffic between 16 and 30 September 2026	Can be opened to traffic by 1 July 2026	25
11	**Metrics to be defined later during the implementation phase**		To be decided by 1 January 2025; or if no new metrics are set, this section will be allocated to other metrics					15

* Water permit supervisor, environmental protection manager, four other representatives (ELY environment), representative (ELY transport), fishing industry representative (ELY economic development), technical director (Municipality of Hailuoto)

4 Technical scope of the project

4.1 General

A road plan, completed in 2018, has been drawn up for the project. The causeway will be approximately 8.4 kilometres long, and will consist of two bridges and a section of road running on top of an embankment.

Huikku Bridge (S1) will be located approximately one kilometre from Hailuoto. The total length of the bridge will be about 767 metres, and its vertical under-clearance will be 18 metres at the point where it crosses the shipping channel (Figure 8).

Riuttu Bridge (S2) will be located to the north of the current ferry port. The total length of the bridge will be about 737 metres, and the vertical under-clearance of its central opening will be five metres (Figure 9).

The plans for structures falling within the scope of the project have been included as appendices to the project plan and implementation phase agreement.

The key solutions in the construction plan that are based on the road plan are:

- The total length of the causeway will be 8.4 kilometres.
- 6.9 kilometres of embankment
- Two bridges
- Huikku Bridge (S1), 767 metres
- Riuttu Bridge (S2), 737 metres
- Approximately one million cubic metres of aggregates will be required
- The road's geometry allows a maximum speed of 80 km/h
- Parking for the new causeway will be available about 2.5 km from the shoreline at Riutunkari
- There will be no road lighting, noise abatement or stops for public transport stops on the new causeway
- Environmental values must be considered and the environment must be respected

Traffic lanes:

- Cross section type 9/6.5 m
- The carriageways for vehicle traffic will be 3.25 m + 3.25 m wide.
- Shoulders (1.25 metres wide) will be built on both sides of the road for pedestrians and bicycles.
- The road surface will be at least 3.5 metres above the mean water level (MW)

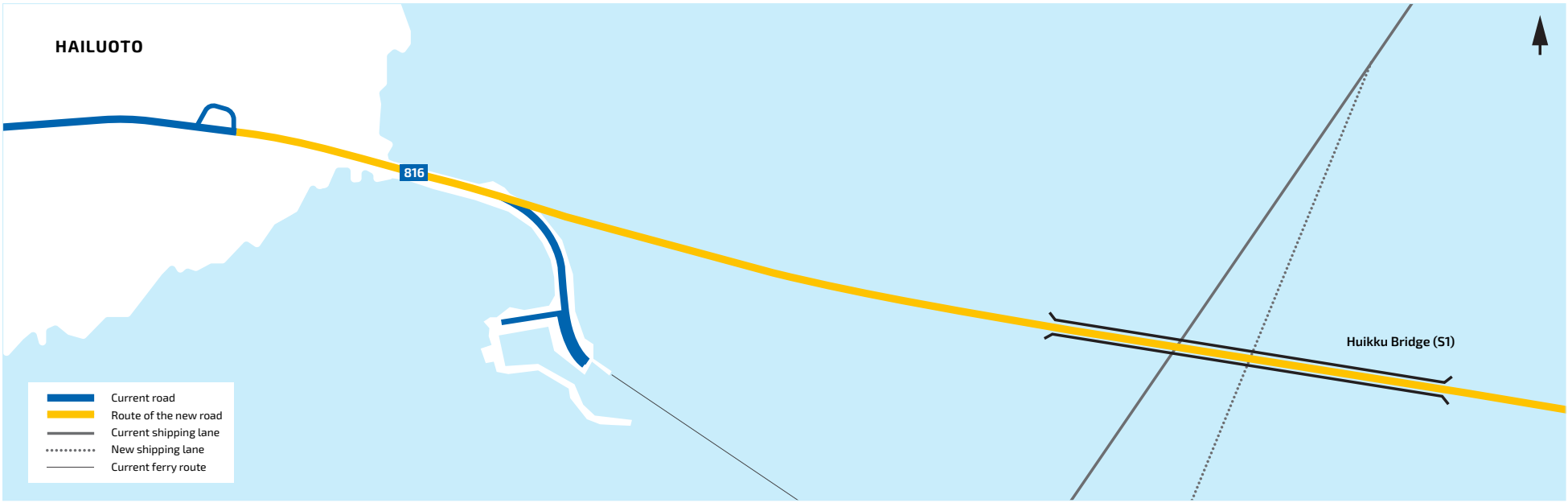


Figure 8. Huikku Bridge (S1) and the route of the new road.

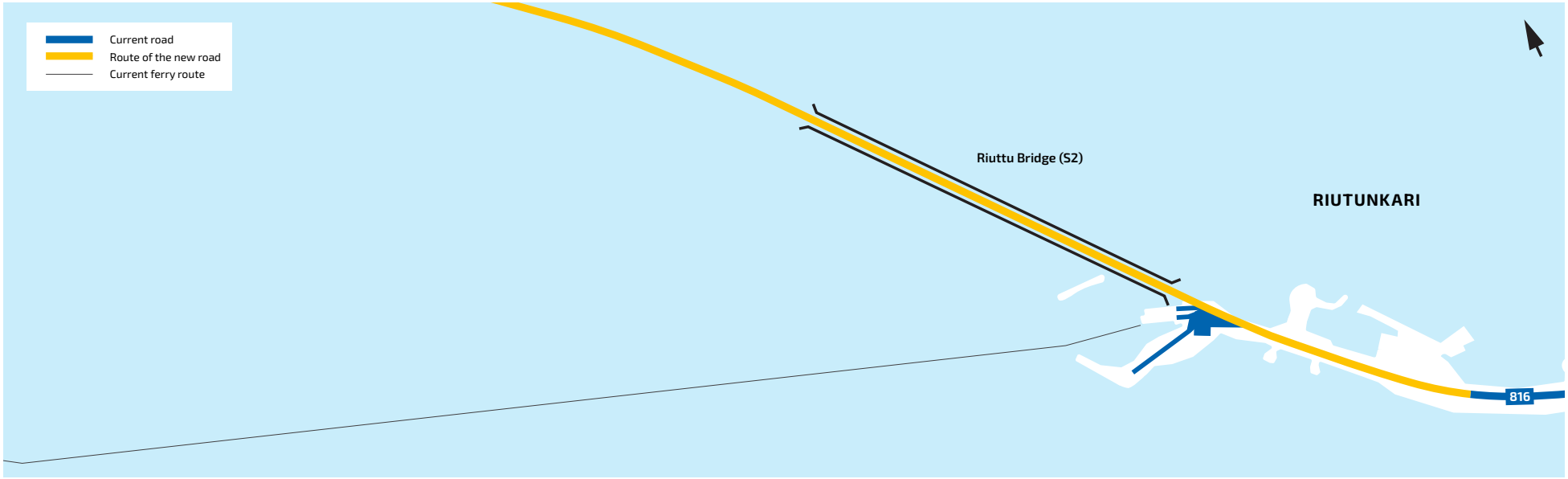


Figure 9. Riuttu Bridge (S2) and the route of the new road.

4.2 Routes

The Hailuoto Causeway (M1) will be built as part of regional road 816 between Huikku and Riutunkari (from the coastline at Hailuoto to the coastline at Oulunsalo) (Figure 10). The road will be connected to the existing causeways leading to the ferry ports, which were built for ferry traffic in 1968. There will be other minor changes to traffic arrangements and intersections at the ferry ports. The other routes being built are shown in Table 6.

Most of the bulk material will be used in the construction of the new causeway. Bulk material for the project's road structures:

- Crushed rock and other aggregates for permanent structures:
- 1,130,000 cubic metres (theoretical volume),
- crushed rock and aggregate for S2 works access structures: 166,000 cubic metres (theoretical volume),
- paving, 2 x AB: 71,000 square metres (theoretical),
- road lanes, double tubular railing: 14,000 m (theoretical).

The ferry lane will be closed after ferry traffic has been suspended. The sea routes leading to it will largely remain as they are, but the navigation marks will be removed. The route of the causeway (estimated at pile 2,000) is located in the 4.6-metre-deep Hailuoto-Oulu sea route (297), which will be moved to pass through the central opening of the new bridge, that is, Huikku Bridge (S1). The new sea route is deep enough not to require dredging. The Finnish Transport Infrastructure Agency is responsible for any costs associated with moving the sea route.

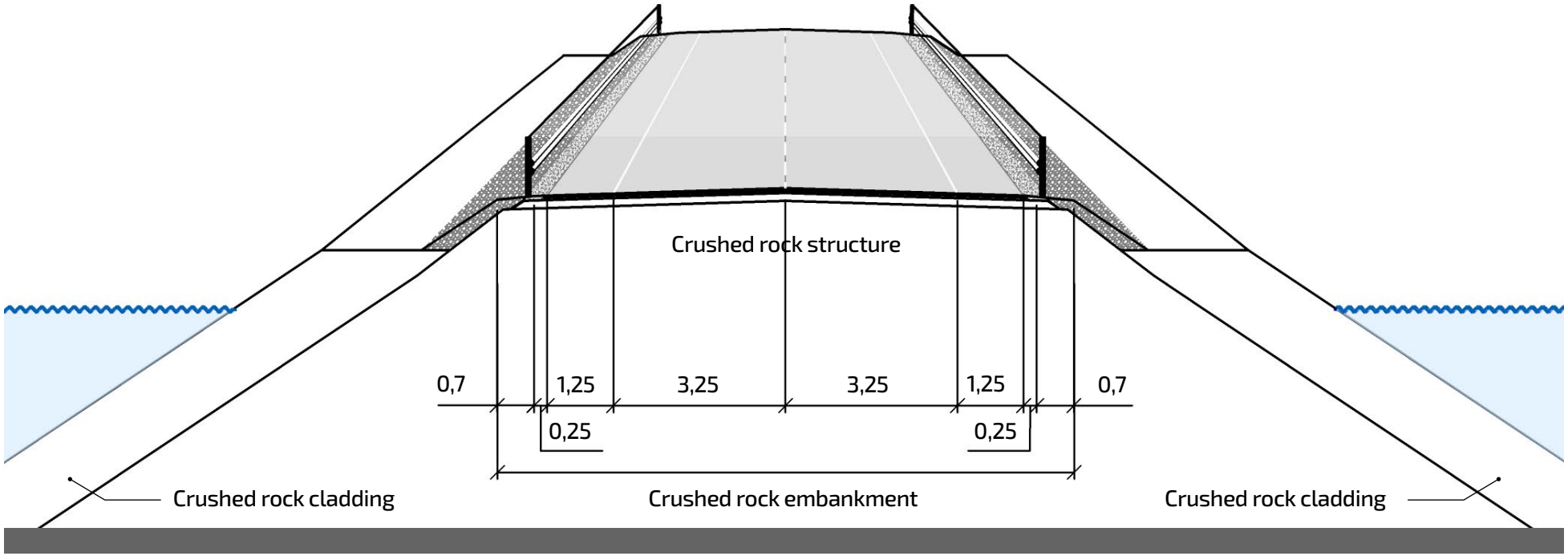


Figure 10. Cross-section of the causeway.

Table 6. List of routes.

Route	Pile interval/location	Administrative class	Traffic engineering cross-section	Planned speed [km/h]	Load index	Road structure class
M1	60–160	Road	6.0/5.5 à 9.0/6.5	80 km/h	0.8 AB	V3
M1	160–8,000	Road	9.0/6.5	80 km/h	0.8 AB	V3
M1	8,000–8,250	Road	9.0/6.5	60 km/h	0.8 AB	V3
M1	8,250–8,450	Road	7.5/6.5	60 km/h	0.8 AB	V3
M1	8,450–8,560	Road	7.5/6.5 à 6.5/6.0	60 km/h	0.8 AB	V3
P1	M1 5,400–5,560 (adjusted)	Parking area	(15 spaces for cars, 3 for heavy vehicles, parking for bicycles)		0.8 AB	V3
M2	3–63	Road/intersection	6.5/6.0		0.3 AB	V5
M3	5–42	Road/intersection	8.0/7.0		0.3 AB	V5
M4	0–35	Road/intersection	7.0/6.5		0.3 AB	V5
M5	3–60	Road/intersection	6.5/6		0.3 AB	V5
J1	0–139	Pedestrian + cycle paths	3.5/3.0			K1
J1	139–288	Pedestrian + cycle paths	3.5/3.0			K2
J1	288–343	Pedestrian + cycle paths	3.5/3.0			K1
Y3E	5–37	Private road/intersection	6.5/6		0.3 AB	V5
Y4	3–200	Private road	6/5.5		0.3 AB	V5
Y5E	M1 pl 8,459 (left)	Intersection			0.3 AB	V5
Y6E	M1 pl 8,339 (left)	Intersection			0.3 AB	V5
Y10	M1 pl 89 (left)	Intersection				
Y11	M1 pl 146 (left)	Intersection				
Y12	42–281 (M3 extension)	Private road	7.5/7.0		0.3 AB	V5
Y13	35–68 (M4 extension)	Private road	7.0/6.5		0.3 AB	V5

Figure 11. Huikku Bridge (S1), visualisation.

4.3 Bridges

Huikku Bridge (S1)

- Total length: 767 metres
- Usable width: 9.5 metres
- Headroom: 18 metres
- A total of 4.4 million kilograms of steel (beams and rebar)
- 8,300 cubic metres of concrete
- 2,400 metres of piling (D600/900)

The new Huikku Bridge (S1) will be a composite bridge with a reinforced concrete deck. It will be built using beams of equal height. The bridge's beams will be made of weather-resistant steel and the visible sections will be painted light blue. The total length of the bridge will be 767 metres, with span dimensions of 60+80+90+95+95+95+90+80+60 metres. The bridge will have a usable width of 9.5 metres. The deck structure will have an elevation of 4.5 metres (Fig. 11).

The bridge's central opening will be located in the shipping lane, and will have a vertical clearance of 18 metres and a horizontal clearance of 75 metres. The bridge will be equipped with H2-grade impact-resistant steel rails whose total height above the paved surface will be 1.4 metres.

The bridge's intermediate supports will be founded on a dense moraine layer using tubular steel pilings. The piles will support slanted icebreaker structures made of reinforced concrete.

The reinforced concrete abutments will be founded on tubular steel pilings. The abutments will be attached to the bridge deck using steel structures and water-tight expansion joints.

Figure 12. Riuttu Bridge (S2), visualisation.

Riuttu Bridge (S2)

- Total length: 737 metres
- Usable width: 9.5 metres
- Headroom: 5 metres
- 2.4 million kilograms of steel (rebar)
- 13,400 cubic metres of concrete
- 1,460 metres of piling (D600/1200)

The new Riuttu Bridge (S2) will be a prestressed concrete beam bridge. It will be built using chamfered beams, that is, the height of the beams is lower in the openings than around the supports (Figure 12).

The total length of the bridge will be 737 metres, with span dimensions of 51.5+71.5+78+80+80+80+80+78+71.5+51.5 metres. The bridge will have a usable width of 9.5 metres. Both of the bridge's central openings will comply with the fairway's permitted headroom (5 metres) and width (58 metres). The consoles for the prestressed concrete's intermediate anchors will be attached to the inner surfaces of the main carrier girders below the baffle plates, so they will not be visible on the bridge façade. The bridge will be equipped with H2-grade impact-resistant steel rails whose total height above the paved surface will be 1.4 metres.

The bridge's intermediate supports will be founded on a dense moraine layer using tubular steel pilings. The piles will support slanted icebreaker structures made of reinforced concrete. The bridge's surface structure will rest on two round pillars and spherical bearings, which will be placed on top of the icebreakers.

The abutments will be traditional reinforced concrete structures founded on tubular steel pilings. The abutments will be attached to the bridge deck using steel structures and water-tight expansion joints. An inspection space for the expansion joints and span anchors will be left in the abutments.

Relocation of cables and equipment (most significant only):

- **Hailuodon Vesihuolto Oy**
  - In Huikku, the pressurised sewer pipeline will be moved and protected due to the construction of the new causeway.
  - In Ruitunkari, the pressurised sewer pipeline will be moved and protected due to the construction of Riuttu Bridge.
- **Oulun Seudun Sähkö Oy**
  - Low- and medium-voltage cables will be protected at Riutunkari ferry port.
  - Riutunkari ferry port's electrical connections will be removed.
- **Elenia Oy**
  - At Hailuoto ferry port, the column transformer will be demolished and a new transformer substation will be built. The medium-voltage line will be converted from an overhead wire to an underground cable.
  - Huikku ferry port's electrical connections will be removed.
- **Telia Oy**
  - Existing cabling will be retained and protected as necessary.
- **DNA Oy**
  - Existing cabling will be retained and protected as necessary.
- **Wind power companies**
  - Existing cabling will be retained and protected as necessary.

4.4 Structures to be demolished

Both ferry ports have structures that will be demolished, such as quay structures and traffic management equipment (including gates, railings and traffic lights). The quays, retaining walls and mooring piles will be demolished after ferry traffic has been suspended. An erosion-resistant slope made of crushed rock will be built where the quay structures are currently located, and a railing will be installed at the end of the road.

4.5 Relocation of cables and equipment

Any cable relocations that are required for the project will be planned and implemented in collaboration with their owners.

4.6 Soil dumping sites

Two land areas for dumping surplus soil have been allocated within the project area. They are located in Hailuoto and Oulunsalo within the existing storage areas.

4.7 Structures that are either wholly or partially excluded from the scope of the project

The following are not included in the scope of the project and their potential procurement will be decided on at a later date:

- Traffic Management Company Fintraffic's
- state-owned technical incident detection systems, excluding casings and spaces reserved in engineering structures.
- Equipment used to close the road (after completion of the causeway),
- Any relocation of navigation marks required by changes made to sea routes is to be carried out by the route's maintenance provider.
- The demolition of structures owned by the ferry operator, Finferries Oy.

4.8 Maintenance and upkeep

Once completed, the Hailuoto Causeway (regional road 816) will become part of the road network and its maintenance and upkeep will be the responsibility of the ELY Centre for North Ostrobothnia. The winter maintenance class for regional road 816 (M1) will be Ib, that is, the road will usually be kept clear, but some relatively flat

strips of hard-packed snow may occur. Road salt and grit will be used to prevent slippery conditions on the road.

The winter maintenance class for the road's turnarounds and parking area (M2, M3, M4 and M5) will be II, which means that the surface will mainly consist of hard-packed snow that will be gritted to prevent slippery conditions. The pedestrian and bicycle path J1 will have a maintenance class of K2, which means that their surfaces will mainly be covered in hard-packed snow during wintery weather.

Private road management associations will be established to handle the maintenance and upkeep of any roads that do not fall within the scope of the delivery, including any private roads that are built. Some private roads will be the sole responsibility of the property owner or occupier, as they will have no other traffic.

Owner-specific user and maintenance instructions will be drawn up for the final area covered by the project. The Alliance has no maintenance and upkeep responsibilities during the warranty phase. Other warranty phase tasks are listed in Section 2.7.

The routes being implemented in the project will be handed over to the maintenance provider at a jointly organised site inspection.

4.9 Ferry traffic and ice road

Until the Hailuoto Causeway is completed, a ferry service will operate to the island between the Riutunkari and Huikku ferry ports. Nationally, it is the ELY Centre for Southwest Finland that commissions ferry services. The Hailuoto ferry service has been tendered out, and is operated by Finferries Oy. The contractual term (including options for yearly extensions) will last until the causeway is completed.

The construction of the causeway will take existing ferry traffic into account, including vehicles queuing for the ferry, and ferry traffic will not be disrupted by construction. Cooperation meetings were held with Finnferries and the ELY Centre for Southwest Finland during the development phase, and these meetings will continue during the implementation phase.

When ice conditions permit, it is also possible to access Hailuoto by means of a weight-restricted ice road that is opened during the winter. The ice road south of the ferry lane is part of the regional road and is maintained by the ELY Centre. The intersections to regional road 816 and the ice road are located outside of the causeway's construction site, which means that the project's implementation phase will have no effect on the ice road.

5 Alliance task description

5.1 Planning

The various alternatives were compared before actual construction planning was launched, and all of the parties in the Alliance were involved. The comparisons used the road plan and supplementary source data to find the most efficient implementation solutions for the project in terms of cost, quality and feasibility in accordance with the "best interests of the project" principle.

Justification memos were drawn up for any significant changes that were made to the road plan. These memos recorded details of the original design solutions, proposed a new solution, and presented a cost comparison. Draft images of the solution were also included to support the argument. The most significant changes were made to the embankment's cladding structures, the bridges' span dimensions, and the size and shape of their beams and icebreakers.

The design process was divided into stages: a comparison of different alternatives at the beginning of the development phase, the drafting of preliminary construction plans and designs, and actual construction planning in accordance with the phasing shown in Figure 13.

Design criteria were drawn up during the development phase in order to steer design and determine the technical level. They were revised throughout the development phase, and any jointly agreed technical solutions were added to them. The design criteria will be revised as necessary throughout the implementation phase. They will also act as job-specific specifications for construction work and plans, and will be used to specify quality requirements.

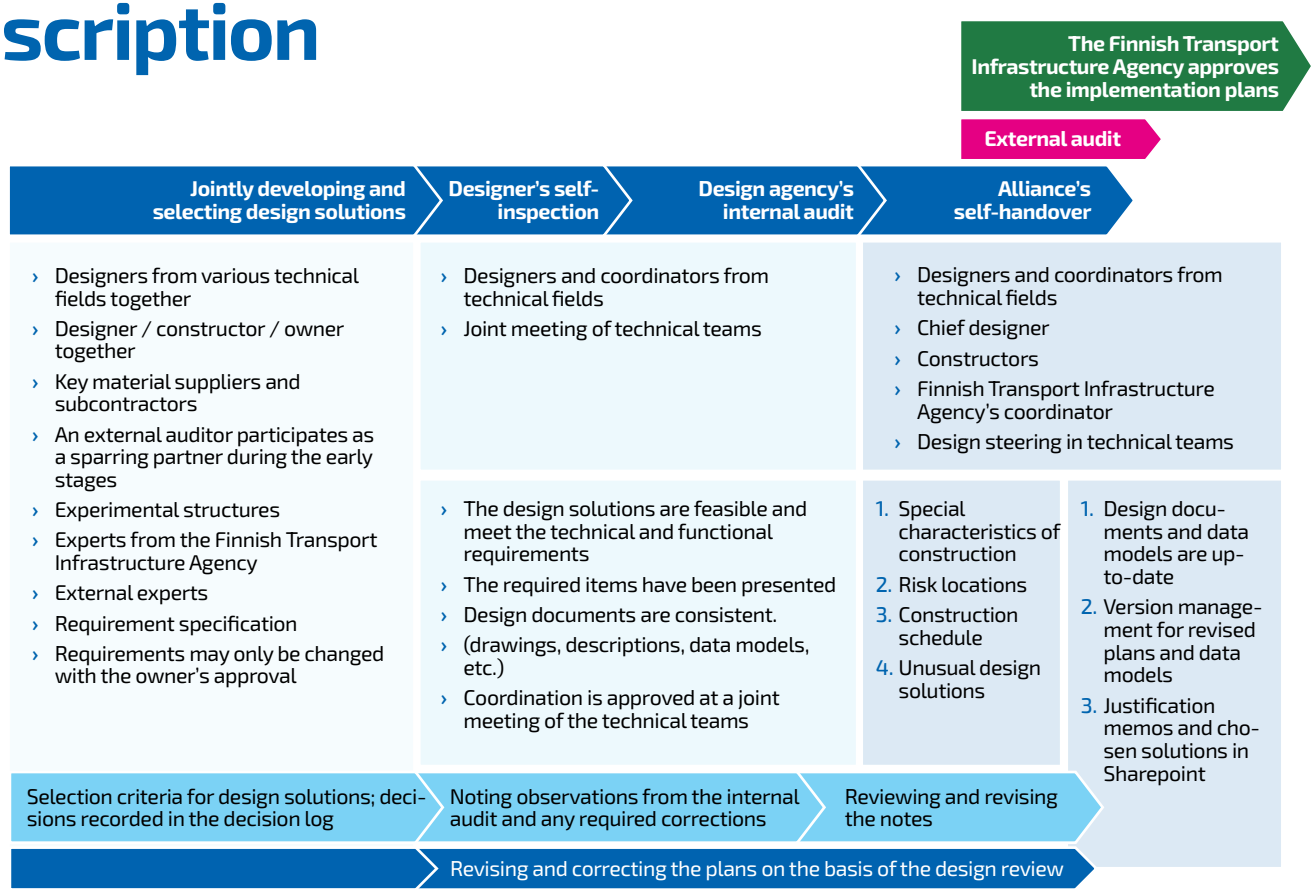


Figure 13. Steps in the design review and approval process.

The source information required for planning was collected during the development phase. This included supplementary data for the terrain model and supplementary information about equipment. Experts were also consulted to determine the ice and wind loads required for dimensioning the bridges. Soil studies were carried out at points where there were planned changes to bridge

support lines. In February–March 2023, test piling was carried out on the Riutunkari shoreline to assess the effectiveness of piling work. The pile penetration level was determined, and the ratio of the pile's end-bearing carrying capacity to its frictional carrying capacity was derived as a function of time.

Planning includes the development and revision of construction plans for routes and structures in accordance with the project's technical scope. During the development phase, planning reached a level of accuracy that enabled the target outturn cost for quantities to be determined in greater detail than usual in an alliance project.

Design work is divided into bridge and embankment design. Both sections include geotechnical design, the design of works access structures, and demolition design. Some of this design work is being carried out by the designer, some by the constructor, and some as a collaboration between the two.

The plans that were drawn up for routes during the development stage were practically complete, and will be finished by the start of the implementation stage. The level of detail in the alternative bridge solutions that were examined at the start of the development phase was such that it was possible to make decisions on them.

Bridge design is divided into two main stages: substructure design and superstructure design. The substructure plans were completed before the bridge's final construction plan. The plans for bridge substructures were completed during the development phase. The bridge superstructure plans are scheduled for completion in October 2024 (for Huikku Bridge) and June 2024 (for Riuttu Bridge).

The design of the causeway's road structures is divided into two main stages. The first stage will be to complete the plan for MW (mean water) + 1.15 metres. These plans will include the embankment and cladding up to the level in question. The second step will be to plan the section above MW + 1.15 m. The plans for the causeway as a whole can then be modelled.

The final stage will be to plan traffic arrangements in Huikku and Riutunkari. Construction in these areas will only be possible once the road and bridges have been opened to traffic. These plans also include changes to the existing section of the causeway.

Traffic control, road markings, lighting and other equipment will be planned as a single unit for the entire section of road. Any changes to traffic control outside of the project area will be planned during the final phase.

At the Riutunkari end, a works access bridge will be built to the embankment, about one kilometre from the mainland shore. This bridge has a boat channel with clearance for small boats only, as it will have headroom of 2.5 metres. The works access bridge will be designed and implemented at the onset of construction work, as it will be required during the first summer of construction. The works access bridge will be demolished once Riuttu Bridge and its boat channel have been completed, and the opening left in the embankment will be filled.

5.2 Implementation

General schedule

The project has been scheduled using takt production to reduce construction lead times. The construction phase of the Hailuoto Causeway project will last about three years. The aim is to open the causeway to traffic in late 2026 (Table 7).

One special feature of the project is the need to quickly build land connections at the planned bridge locations. This will be done by building the causeway in several stages. Aggregates will mostly be transported by road. Scheduling the beginning of the implementation phase during the open water season will enable the Huikku (S1) works access bridge to be built on schedule with the aid of a pontoon. The existing road ferry will be used to transport crushed rock and other materials by water in order to build an embankment from Hailuoto to the bridge site.

The casting of both bridges' decks has been scheduled for late winter/early spring, which will provide the best conditions for drying the concrete for waterproofing.

The completion of Riuttu Bridge (S2) will be scheduled so that the crushed rock used in its works access embankment can be freed up and utilised in the causeway's final structures. Some of Riutunkari's road connections can only be implemented after road traffic has been completely transferred to the new causeway and ferry traf-

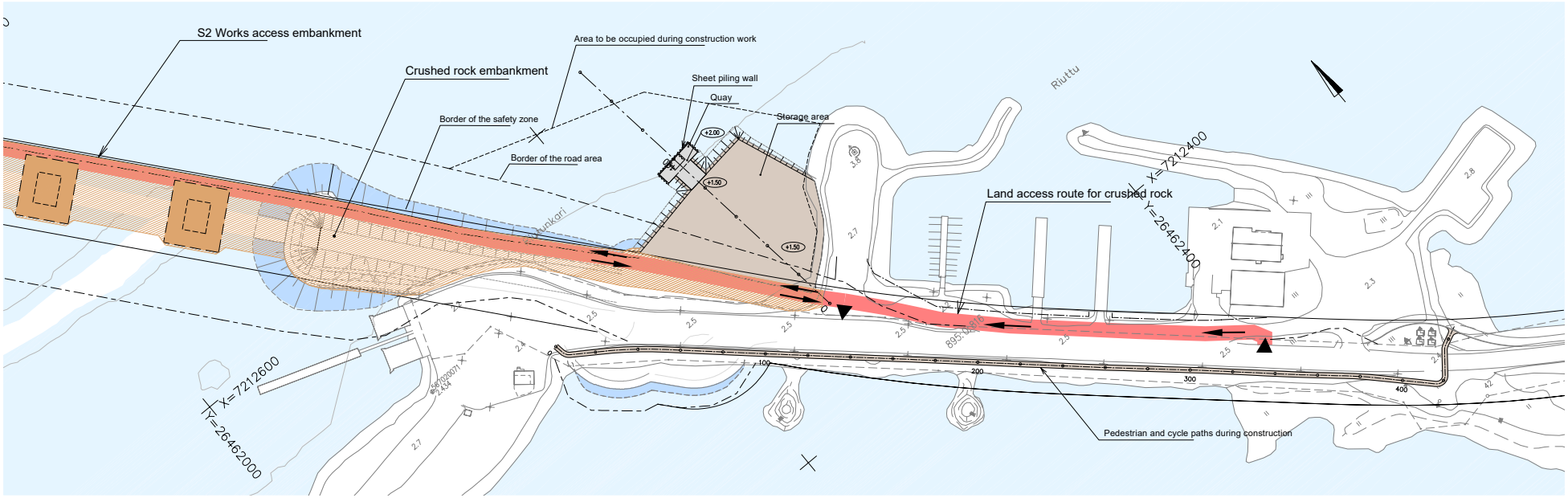


Figure 14. Traffic arrangements at the construction site in Riutunkari.

fic has been suspended. The quay structures at both ferry ports will also be demolished after ferry traffic has been suspended.

Weekly ERP meetings will be held to ensure that schedule monitoring and management is being properly carried out. Any obstacles that may compromise the schedule will be logged in the issues log and personnel will be assigned to resolving these issues.

Schedule-critical points

1. Bypassing the Riutunkari breakwater and the completion of protective structures
2. The pressurised sewer pipeline has been moved
3. S1 works access bridge ready
4. Bridge caissons ready
5. Piling work completed
6. The crushed rock land connection (embankment) to S1 is usable
7. Installation of S1 steel structures
8. The casting dates for bridge decks
9. Demolition of the S2 works access embankment begins
10. Opening the causeway to traffic/suspending ferry traffic

Logistics

The piles for the bridges and the materials used to build the works access structures will be transported by water. Crushed rock and other construction materials will be transported by road along regional road 816 to the storage areas at Riutunkari ferry port and directly to the construction sites. This transportation will take place in two shifts, starting in spring 2024 and continuing until autumn 2025.

The Vektor.io BIM application will be used to support logistics and work planning, as it displays AIS (Automatic Identification System) data on real-time vessel locations alongside the composite model. This AIS data will, for example, show ferry traffic between Oulunsalo and Hailuoto in real time.

Traffic arrangements during construction

The aim is to plan and implement clear and reliable traffic arrangements during construction. These arrangements seek to enable smooth-running traffic that meets the needs of both ferry passengers and the construction site. Plans will be drawn up and approved in the traffic arrangements team, which will have representatives from the construction site, the designer, the Finnish Transport Infrastructure Agency and (as necessary) the ELY Centre.

Traffic arrangements during construction will be planned in accordance with the Finnish Transport Infrastructure Agency's guidelines. These arrangements will be reviewed and documented on a weekly basis. Any changes will be communicated in good time. In Riutunkari, there will be separate lanes for traffic queuing for the ferry, traffic transporting crushed rock to the construction site, and pedestrians and bicycles (Figure 14).

Construction of the embankment

During the first phase, the embankment will be built to a height of mean water (MW) + 1.15 m, including erosion protection at both edges. Construction of the embankment will then continue by raising the structure to its final height. Construction of the bridge approach embankments will be scheduled in accordance with the construction schedule and the requirements for launching bridge construction.

Other structures

Ferry-related structures can only be demolished once the causeway has been completed and ferry traffic has been suspended. Changes will be made to road traffic signage after ferry traffic has been suspended. These changes will also include areas outside the actual construction area.

Bridge construction

Step-by-step construction (S1)

1. Building a works access bridge using a work pontoon
2. Building caissons for intermediate supports as the works access bridge progresses
3. Piling work for intermediate supports; concreting and rebar for piles
4. Concreting the caisson floor and drying the caisson
5. Timber cladding, rebar and concreting for intermediate supports and icebreakers, including any demolition work
6. Assembling steel structures; deck formwork and installation from the abutment's ten directions
7. Bearing installation
8. Deck formwork and rebar
9. Casting the deck
10. Bridge rails before mould disassembly
11. Installation of expanse joints
12. Surface structures, including waterproofing

Step-by-step construction (S2)

1. Works access embankment made from crushed rock
2. Pile locations filled with crushed rock
3. Piling work for intermediate supports
4. Sheeting and construction of the caissons for intermediate supports
5. Timber cladding, rebar and concreting for piles, icebreakers and pillars, including any demolition work
6. Bearing installation
7. Deck mould, rebar and span installation
8. Casting the deck
9. Deck tensioning and injection; concreting the ends
10. Bridge rails before mould and scaffolding disassembly
11. Installation of expanse joints
12. Surface structures, including waterproofing

Table 7. Overall project schedule.

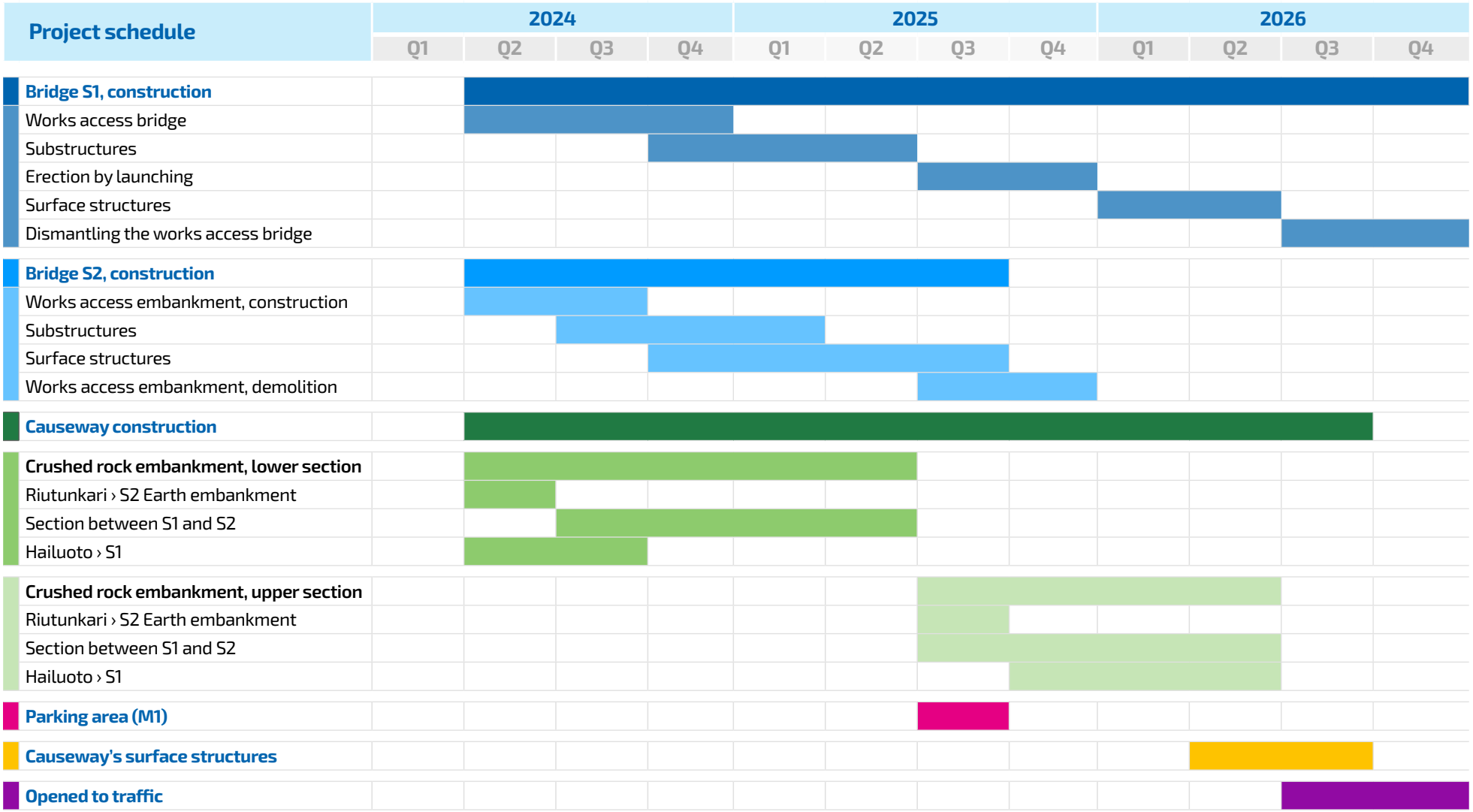


Figure 15. Visualisation of Riuttu Bridge (S2) looking towards Oulunsalo.

6 Target outturn cost

6.1 Financing

Parliament allocated EUR 96 million to the Hailuoto Causeway project in its seventh supplementary budget of 2020. Due to increased construction costs, this was raised by EUR 10 million in the fourth supplementary budget of 2022 and by EUR 15 million in the second supplementary budget of 2023. The allocation for the entire project is therefore EUR 121 million. In addition to the Alliance project, this allocation includes costs incurred by the owner, the largest of which relate to environmental monitoring for the water permit.

6.2 Principles for setting the target outturn cost

The target outturn cost was updated at the beginning of the development phase on the basis of preliminary tenders at the then cost level. The Alliance created a cost calculation table that enabled labour and material prices to be varied in order to gain an understanding of how cost fluctuations for different items would affect the project's overall cost. The current status of costs with respect to the target outturn cost was reviewed every week during weekly briefings, and any changes were monitored (Figure 16).

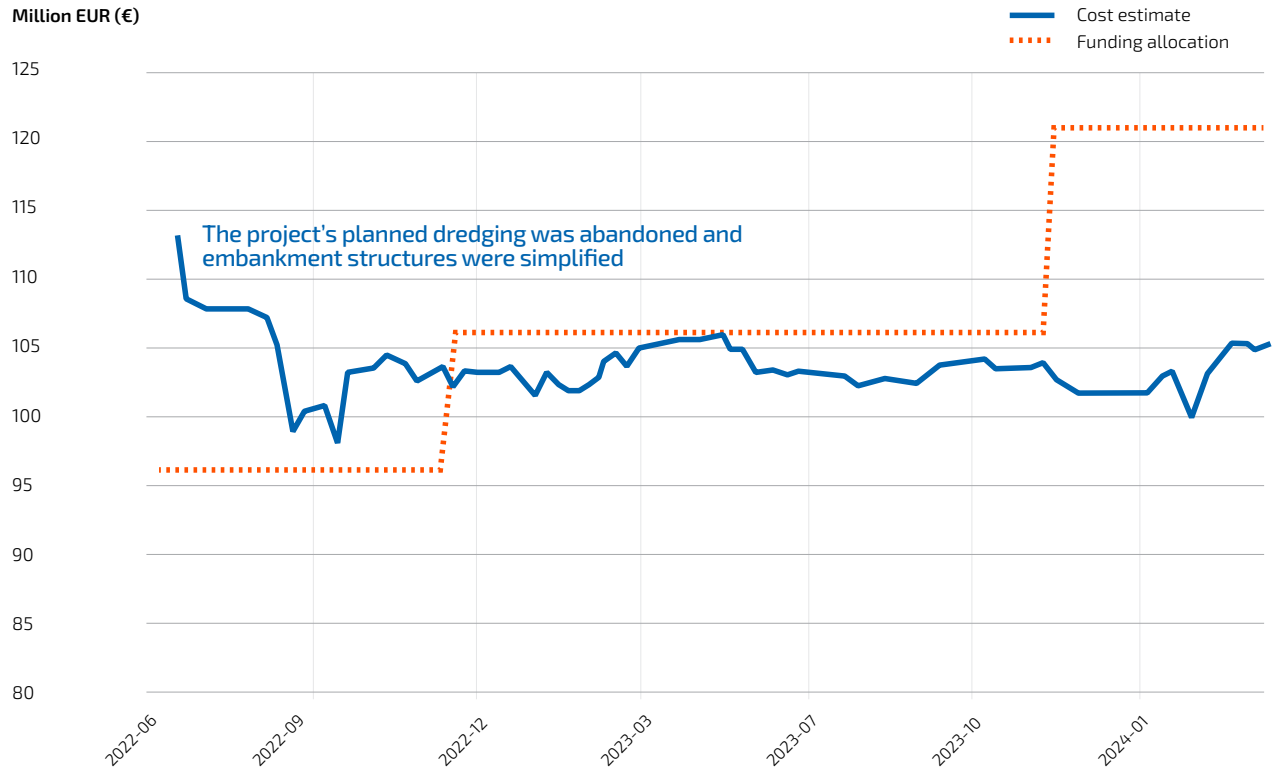


Figure 16. Trends in the target outturn cost.

In spring 2023, a decision was made to calculate the target outturn cost on the basis of the current schedule, plans and prices, even though the date of the Supreme Court's ruling on the water permit was as yet unknown. This calculation provided information about construction costs and the adequacy of the project's funding. On the basis of this calculation, index monitoring was used to gain an understanding of how the market situation would impact the target outturn cost while the water permit was being processed in the period 1/2023–1/2024.

Once the water permit had come into force, target outturn cost calculations recommenced in February 2024 and were completed in April 2024.

6.3 The target outturn cost process

The target cost process was based on the cost-effective implementation of the owner's objectives. The collaborative design and implementation process involved the owner, designers, constructors and their cost controllers, and some key subcontractors. The process aimed to collaboratively design and implement solutions that would ensure the best possible outcome for both the owner and end users.

A target outturn cost tool was used to establish the target outturn cost. It provided a reliable, real-time overview of the content, pricing and development of the cost estimate.

The Alliance priced design and implementation solutions on a market-driven basis during the development phase. The main means of optimising costs were comparing alternative solutions, further developing design solutions, ideation and innovation, lead-time optimisation, efficient logistics, the efficient handling of crushed rock, procurement planning, accurate pricing, and pricing the risks of transitioning to the implementation phase.

Bridges

At the road plan stage, Bridge S1 was designed as a composite girder structure and Bridge S2 as a prestressed concrete girder structure. There was a large increase in steel prices in spring 2022 as a result of the Ukraine war, and this led to the proposal of an alternative plan for Bridge S1 as a prestressed concrete girder structure. However, based on the plans drawn up in September 2022 and current cost data, the Alliance decided to continue with the bridge type given in the road plan, as it was the most economical option taking into account safety issues, technical construction issues and the cost savings that had been identified for the composite girder structure.

Routes and geo

During the cross-section design of the causeway, decisions were made to reduce construction volumes and costs, and to make the work stages easier to implement. The slopes and embankment will be clad with the same crushed rock, and no separate base ditch will be required. The grain size of the embankment and crushed rock structure was standardised with the road plan solution. Soil exchanges were abandoned around the bridge approach embankments after more detailed stability surveys.

6.4 Target outturn cost

The target outturn cost that was drawn up on the basis of the cost estimate during the development phase covers the various stages in the project's implementation: the planning, construction, commissioning and warranty phases. The target outturn cost includes the project's reimbursable costs and Alliance fees, approved costs related to the project's implementation, and a risk provision mutually agreed on by all members of the Alliance.

The distribution of project risks and technical risks has been simulated to help set a provision for the target outturn cost risk. Risk realisation scenarios have been simulated 20,000 times per risk (Monte Carlo). The risk provision uses the median, that is, the P50 value. The median is the middle value in the simulation results: 10,000 of the simulation results are the greater than the median and 10,000 are less than the median. With justification, it is possible to use other values for the risk provision.

The final target outturn cost was EUR 105,407,807, of which EUR 96,784,015 are reimbursable costs. The target outturn cost is shown in Table 8.

Table 8. Estimated target outturn cost.

TYPE OF COST	Target outturn cost
Technical construction costs	**EUR 74,044,703**
Huikku Bridge (S1)	EUR 28,131,509
Riuttu Bridge (S2)	EUR 17,635,949
Causeway roads	EUR 28,277,244
Planning costs for the implementation phase	**EUR 1,098,597**
Development phase costs, designer	**EUR 1,151,446**
Development phase costs, constructor	**EUR 2,174,375**
Risks and opportunities	**EUR 4,827,900**
Total costs	**EUR 13,186,023**
Warranty period provision	**EUR 300,973**
TOTAL REIMBURSABLE COSTS	**EUR 96,784,015**
Construction fee	**EUR 6,643,354**
Design fee	**EUR 1,980,438**
TARGET OUTTURN COST	**EUR 105,407,807**

Figure 17. Visualisation of the causeway looking towards Hailuoto with Huikku Bridge (S1) in the background.

6.5 Ensuring a tight target outturn cost

Tamrap Oy, an impartial external cost expert, has written a report on the process for calculating the estimated target outturn cost during the development stage. The first report was written on the basis of the spring 2023 calculation and the final report on the basis of the spring 2024 calculation. In the analysis, the cost expert paid attention to labour costs, scheduling costs, the handling of risks and opportunities, subcontractor and material procurement costs, the formation of project and shared costs, and design costs.

6.6 Third-party costs and liabilities

The distribution principle for costs incurred by the relocation of cables and equipment has been agreed on in negotiations conducted during the road plan and development phases. The Alliance is responsible for any temporary relocation of cables during construction. The distribution of traffic control cost liabilities between Fintraffic and the Finnish Transport Infrastructure Agency has changed during the project. In a deviation from the road plan, Fintraffic's cost liability includes all traffic control costs, excluding pipework and other potential space reservations in engineering structures.

6.7 Cost estimate report

On the basis of reviews and inspections conducted during the development phase, an independent external cost expert concluded that the datasets used in the project are line with industry practices, and that input prices, performance and component prices are at the correct level in relation to the conditions and economic situation, and that the persons performing the calculations have gained the required level of experience through calculations in similar projects.

7 Value for Money report for the development phase

7.1 General

Generating value for the owner is a key component of the Alliance model. The key objectives and target outturn cost steer the Alliance's activities in accordance with the 'value for money' principle. Considerable cost savings and innovation can be achieved when this 'value for money' mindset is employed in project management. However, the ultimate goal of the Alliance model is not to reach the lowest possible cost, but rather to achieve good functionality and a high level of quality within the budget allocated by the owner.

7.2 Procurement phase

The Hailuoto Causeway project was originally intended to be tendered out as a lifecycle-funded PPP (Private Public Partnership) project inclusive of financing and maintenance. When tendering out PPP projects, there must be no uncertainties concerning permits, so the appeal lodged against the water permit meant that preparations for a PPP project had to be halted. In late 2020, the Government changed the financing model from a lifecycle-funded project to a standard development project, which enabled the procurement method to be changed to an alliance model. By using an alliance model, it was possible to use the time taken to process the appeal against the water permit to complete the development phase.

Table 9. Scores for the first round.

No.	Tenderer	Laatupisteet
1	Pooki (Destia Oy and WSP Finland Oy)	55.25
2	Kreate Oy, YIT Suomi Oy, SItowise Oy, Ramboll Finland Oy	53.50
3	Hailuodon GAP (GRK Infra Oy, AFRY Finland Oy, Plaana Oy, Ponvia Oy)	47.13
4	Ässähai (NRC Group Finland Oy, Metrostav, Sweco Rakennetekniikka Oy, Sweco Infra & Rail Oy)	39.38

During the Alliance's procurement phase, the owner aimed to obtain the best professional skills and organisation to implement the Hailuoto Causeway project in the best possible way. The Alliance's competitive tendering for service providers was launched in October 2021 as a restricted procedure. After the close of the application period, tendering was carried out as a two-stage negotiated procedure. Four consortiums of bidders submitted an application and all of them met the minimum requirements. Preliminary bids were requested from these four providers. The service provider consortiums are presented in Table 9.

Based on their initial bids and the outputs from the first-round workshops, the three top-scoring bidders were selected to move on to the second round. The first-round workshops were held remotely over Teams due to the coronavirus pandemic.

Two-day workshops for bidders were held during the second round to assess their workshop outputs and alliance capability. The second-round workshops were held as hybrid sessions due to the pandemic, that is, some participants participated in person and others via Teams. After the workshops, the bidders submitted their quotes.

The scores were calculated (taking into account the weighting coefficients) and the best-performing provider consortium, Hailuodon GAP, was selected as an alliance partner. The scores are summarised in Table 10.

Table 10. Summary of scores.

Phase 2 quality		**Kreate Oy, YIT Suomi Oy, Sitowise Oy, Ramboll Finland Oy**		**Hailuodon GAP (GRK Infra Oy, AFRY Finland Oy, Plaana Oy, Ponvia Oy)**		**Pooki (Destia Oy and WSP Finland Oy)**	
A1–A4 Phase 1 quality offer (total of the previous)		**Score**		**Score**		**Score**	
Score for Phase 1		53.50		47.13		55.25	
Scaled score		96.83		85.30		100	
	15 %	**14.52**		**12.80**		**15**	
Phase 2 Written assignments							
Score for written assignments		45		50		35	
Scaled score		90		100		70	
	25 %	**22.5**		**25**		**17.5**	
Workshop participation							
Alliance capability: Assesses the group's leadership, trust building, and ability to work using an alliance model	50%	35	17.5	75	37.5	60	30
Problem solving ability: Assesses the effectiveness of the group's problem solving and decision-making	50%	50	25	75	37.5	55	27.5
Workshop participation, total		42.5		75		57.5	
Scaled score		56.67		100		76.67	
	30 %	**17**		**30**		**23**	
Total		**54.02**		**67.80**		**55.50**	

Pricing score		**Kreate Oy, YIT Suomi Oy, Sitowise Oy, Ramboll Finland Oy**		**Hailuodon GAP (GRK Infra Oy, AFRY Finland Oy, Plaana Oy, Ponvia Oy)**		**Pooki (Destia Oy and WSP Finland Oy)**	
		%	**Score**	**%**	**Score**	**%**	**Score**
	30 %	10.61%	11.95	8.56%	22.2	9.69%	16.55
Kokonaispisteet		**65.97**		**90.00**		**72.05**	

7.3 Alliance activities during the development phase

Ideation

Almost 350 innovations were proposed during the project's development phase. Their effectiveness was assessed in terms of safety, cost and the schedule (Figure 18). The most significant innovations during the project's development phase were optimising embankment structures and eliminating the need for dredging.

Results of the development phase

The development phase eventually lasted 25 months due to prolonged processing of the water permit. This can be considered an exceptionally long period for an alliance contract. The time spent on ideation and comparing various solutions before moving on to construction planning ensured that the right solutions were selected.

Construction planning started a year before construction work began, and this laid good foundations for launching and continuing production. Planning was steered and regularly monitored at both technical team meetings and separate planning meetings. This ensured that the design solutions were both feasible and cost-effective.

External expertise was procured to manage wind and ice conditions. External experts were similarly consulted in the field of concrete technology. The Alliance also commissioned an external inspection of the bridges from a third party. The inspection process and the Finnish Transport Infrastructure Agency's approval procedure were more comprehensively integrated into the Alliance's operations in order to find the best solutions and speed up the inspection.

Several experimental structures were used to reduce the risks and uncertainties that had been identified in relation to scheduling and setting the target outturn cost. These included test piling on the Riuttu coastline in early spring 2023, an embankment test structure at Kiiminki Quarry in autumn 2023, and a test structure for concrete temperature control in spring 2024. Preliminary contracts were drawn up for aggregate deliveries and the delivery and installation of Huikku Bridge's composite girder, so that construction could be quickly launched when a ruling on the water permit was received.

During the development phase, the project drew up several alternative implementation schedules to maintain preparedness for both a spring and autumn kick-off. The use of takt production shortened the time taken to build the bridges, and thereby the project's overall lead time. The workshop-style approach to scheduling also in-

Table 11. Identified cost savings that were added to planning and implementation.

Engineering field	Innovation	Justification	Cost impact
Geotechnical engineering	Exclusion of mass changes and replacement of weight embankment	As a result of more detailed planning, mass changes were not necessary. The dredging masses were to be placed on an artificial island to be built, the extent of which could therefore be reduced. However, resting and parking spaces were built on the site.	EUR -6,230,000
Geotechnical engineering	Exclusion the filter fabric under erosion protection	The filter fabric of the embankment was excluded based on flow modelling.	EUR -425,000
Embankment	Exclusion the root ditch of the embankment	The root ditch could be excluded based on flow modelling.	EUR -425,000
Embankment	Erosion protection optimisation	The structure was harmonised and the building of laying erosion protection was simplified.	EUR -1,335,000
Bridge design	Exclusion the granite stone cladding of the icebreakers	The granite stone cladding of the icebreakers could be excluded by thickening the concrete cover.	EUR -968,000
Bridge design	Optimisation of the S2 bridge superstructure	Beveled beams made it possible to exclude one intermediate support and lower the level of the road.	EUR -380,000

creased the parties' shared understanding of the work stages and their duration.

The calculation of the target outturn cost was begun as soon as the development phase started, on the basis of the information contained in the road plan. As the plans, quantity calculations, implementation alternatives and schedule options progressed, preliminary offers (and to an extent also the Alliance's own pricing) were utilised in the calculations. The target outturn cost calculation and the impact of changes in the market situation and amendments to the plans were monitored weekly during the development phase. Project funding was increased on two occasions on the basis of the target outturn cost calculation. Once a ruling on the water permit had been received, determination of the final target outturn cost was launched and then approved at the end of the development phase.

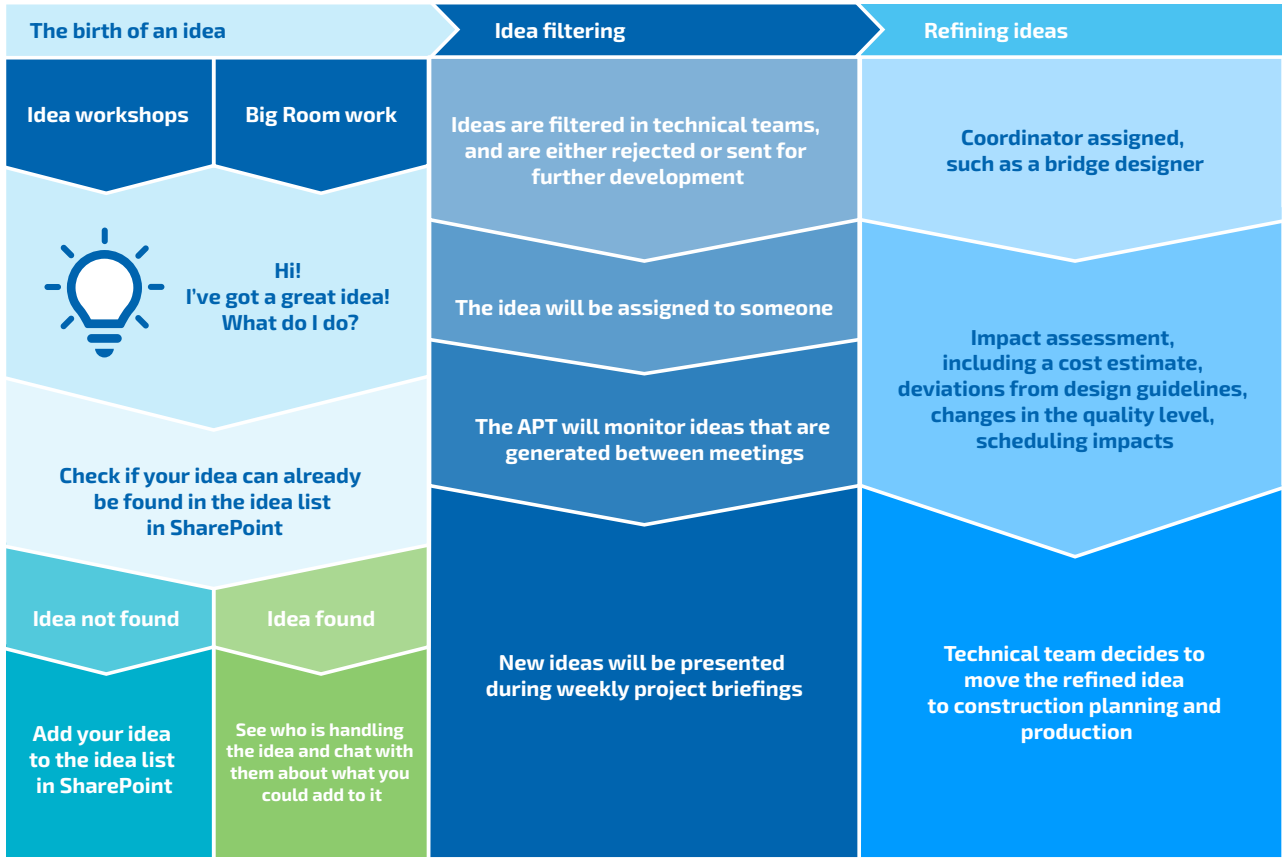


Figure 18. The ideation process.

7.4 An assessment of the success of the procurement and development phase

According to an impartial observer, the procurement arrangements and schedules were fair to all bidders during the procurement phase. The process was transparent, impartial, equitable and non-discriminatory to all parties who submitted tenders. All of the procurement stages were specified in the invitation to tender documents and post-tender supplementary documents as communicated in advance. A sufficient number of tenders were received. The quotes were of the same magnitude. The procurement phase can be considered a success.

The development stage can be considered successful. The collaborative contract model enabled the project to utilise the water permit appeal period to prepare for the construction phase and further develop solutions identified in earlier design phases. This resulted in the cost-effective updating of both plans and implementation, whilst also reducing environmental impacts and risks.

An impartial cost expert has assessed the outcome of the development phase (that is, the target outturn cost, including all cost items and packages to be implemented) and has proposed that the target outturn cost be approved. According to the cost expert's assessment, the members of the Alliance have not been placed in unequal positions with respect to the target outturn cost. Achieving the objectives of the development phase means that the project can now move on to the implementation phase.

8 Sustainability and the environment

8.1 Principles for handling the road environment

The road environment has been designed to be natural and minimalist. The sea views are considered to be the principal landscape element in the road environment, and no competing elements will be introduced. The area surrounding the car park will be built in accordance with the natural environment.

8.2 Environmental management

The environmental impact of the project has been evaluated in an Environmental Impact Assessment Report (ELY Centre 2010) and during the water permit phase. The most significant impacts of the project during construction are noisy work stages and water turbidity caused by work stages. Once completed, the causeway's impacts relate to a change in ice conditions and thereby to the Natura areas in the vicinity of the project. These impacts will, however, be mitigated by the means presented in the terms and conditions of the water permit.

During the preparatory phase of the project, an environmental steering group was established to act as a liaison to promote dialogue between the Alliance and a variety of authorities. Decisions relating to the water permit and practical monitoring will be made by each authority independently.

Any detrimental impacts on the environment caused by construction will be prevented and mitigated using, among other things, the following measures:

- Minimise environmental risks from construction with systematic environmental risk management.
- The risk assessment also takes environmental issues into account.
- The stage-specific work and quality plans also include environmental instructions for each work stage, and these are reviewed with employees both during onboarding and before the start of each work phase.
- The construction site complies with the terms and conditions of its water permit and special permissions, and working hours adhere to noise notifications.
- General arrangements on the construction site have been designed with the environment in mind. All employees are responsible for cleanliness and tidiness, which are monitored using weekly measurements.
- Comprehensive communications are issued about each work stage.

The steering group includes representatives of the owner, authorities, stakeholders and the Alliance.

The project schedule was designed on the basis of noise modelling so as to cause as little disturbance as possible. A noise notification was made describing the impacts of any potentially noisy and disruptive work stages.

The terms and conditions of the water permit and other decisions

The project and its construction work are governed by its water permit (No. 6/2020, Record No. PSAVI/1049/2018, 11 February 2020) and the associated clarifications issued during legal proceedings.

The project is also governed by two separate exemptions; permission to deviate from regulations governing the protection of the Baltic water-plantain, a species protected under Appendices II and IV of the Nature Conservation Act, in order to build the Hailuoto Causeway (POPELY/626/2018, 30 April 2018) and an exemption pursuant to Section 49(3) of the Nature Conservation Act concerning the disturbance of protected bird species (VARELY/776/2018, 22 November 2018).The project's construction work is also governed by the terms

and conditions of a noise notification (POPELY/881/2024, 10 April 2024).

The terms and conditions of the water permit, the special permissions and noise notification have been used as a basis for planning and construction design.

All construction is carried out so as to minimise environmental impacts. The project's impact has been successfully reduced by, for example, eliminating the need for dredging (which would have caused water turbidity) and by adjusting the project's schedule. A person has been appointed to ensure compliance with the project's water permit.

8.3 Sustainability

Sustainability is a major aspect of the project's objectives and a separate sustainability plan has been drawn up for the project. The sustainability objectives cover the project's entire lifecycle.

The sustainability plan includes concrete measures on how to take sustainability into account in planning, construction, operations and procurement. The project team monitors its realisation twice a year.

8.4 Environmental monitoring

The project's environmental monitoring has been specified in the water permit, and monitoring is being carried out in accordance with a separate monitoring plan approved by the ELY Centre for Lapland (for fisheries) and the environment and

The water permit applies to the following:

- Building an embankment in the water,
- Construction of Huikku Bridge (S1),
- Construction of Riuttu Bridge (S2),
- Construction of a car park for the causeway
- Arrangements during construction:
  - Construction of a quay and works access embankment for Riuttu Bridge.
  - Construction of a works access bridge for Huikku Bridge,
  - Dismantling the aforementioned work structures and re-landscaping the area.
- Dismantling the existing quay structures for ferries in Riutunkari and Huikku.
- Relocating Hailuodon Vesihuolto Oy's wastewater sewer at Huikku on Hailuoto and Riutunkari in Oulu.

natural resources division of the ELY Centre for North Ostrobothnia (for other aspects). This plan includes not only the monitoring of turbidity while the construction site is operational, but also the monitoring of water quality and biological elements at the locations shown in Figure 19 (benthos, fish, coastal erosion and vegetation, nesting birds). The Finnish Transport Infrastructure Agency began monitoring in accordance with the monitoring programme in the years before construction was launched, and will continue to do so both during and after construction as per the schedule in Table 12.

The Alliance's environmental monitoring

Construction work will seek to minimise environmental disturbances, such as water turbidity and noise. The turbidity caused by the construction site will be monitored in accordance with official guidelines, with the aid of drone imaging and weekly (or less frequent) visual inspections. Water quality will also be monitored in accordance with the monitoring programme and official guidelines, and a certified sampler will take samples in the vicinity of the construction site. The sample results will be reported to the authorities as soon as the results arrive, and an annual interim report will be made on the monitoring of site-induced turbidity. After noisy work commences, a noise measurement will be carried out in accordance with the terms and conditions governing noise, and the results will be reported to the authorities. During the project, there will be frequent dialogue with the authorities as described in Section 8.2.

Table 12. The scheduling of follow-up measures during the monitoring period (2019–2029).

Follow-up measure	Before Construction					During construction			After commissioning		
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Water quality	■	■	■	■	■	■	■	■	■	■	■
Fisheries	■		■			■	■	■		■	
Benthos (pelagic zone)	■	■					■			■	
Benthos (littoral zone)			■					■			■
Coastal erosion	■	■				■	■	■	■	■	■
Plant communities	■	■				■		■		■	
Macroplea pubipennis beetle	■		■		■	■		■		■	
Elachista vonschantzi moth	■	■			■	■		■		■	
Baltic water-plantain	■		■		■	■		■		■	■
Four-leaf mare's tail	■	■				■		■		■	
Nesting birdlife	■		■			■			■		■
Black-headed gull and common tern colonies	■		■	■		■	■	■	■	■	■
Steering group	■	■	■	■	■	■	■	■	■	■	■

Table 13. Environmental monitoring.

Environmental monitoring	
Monitoring	**Implemented by**
Turbidity caused by the construction site	Alliance
Water quality during construction	Alliance
General monitoring of water quality off the coast of Oulu	Owner
Benthos monitoring	Owner
Fish monitoring	Owner
Coastal erosion and monitoring the structural properties of plant communities	Owner
Species-specific monitoring	Owner
Birdlife	Owner

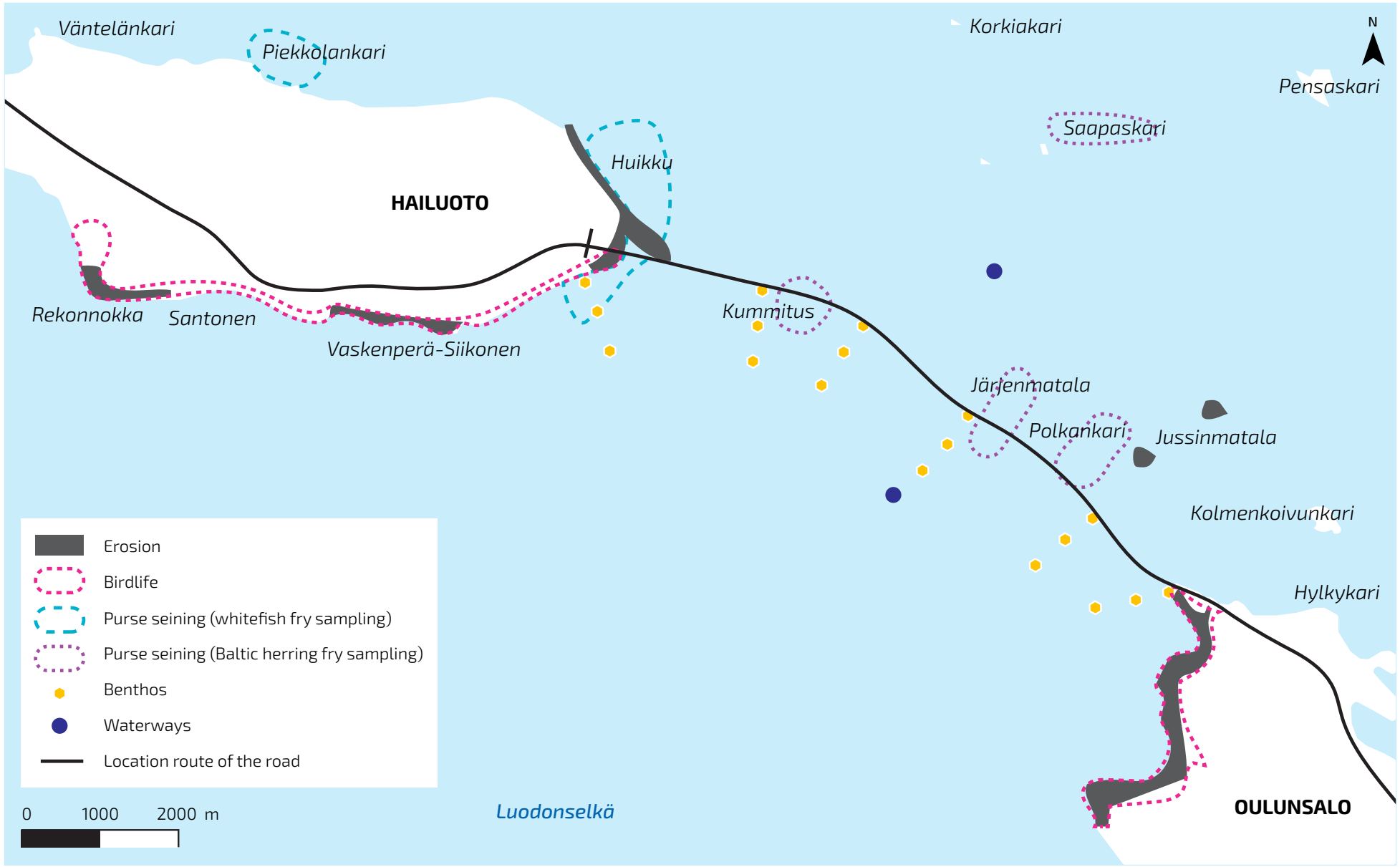


Figure 19. Subjects of the monitoring programme.

9 Communications

9.1 Communications objectives and procedures

Communications about the Hailuoto Causeway project aim to support the project's success by communicating openly and taking the information needs of various stakeholders into account. Communications should by default be timely and provide sufficient information about the project's progress, its benefits and its impacts on stakeholders in accordance with the Finnish Transport Infrastructure Agency's communications policy. Proactive communications will create a favourable image of the project. Engaging, fact-based communications will also help the project to progress as planned. Communications will be designed to provide all relevant target groups with correct, adequate, preemptive and up-to-date information about the project, its impacts and its progress.

Progress will be actively communicated in the media. Stakeholder communications will be proactively managed. Communications will be designed to provide all relevant target groups with correct, adequate, preemptive and up-to-date information about the project, its impacts and its progress. External communications will comply with the Finnish Transport Infrastructure Agency's guidelines and visual image.

An Alliance logo and separate visual image have been designed for internal communications, and visual guidelines have been developed for internal use. Internal communications aim to ensure integration, information flow, common practices and close collaboration between the members of the Alliance.

9.2 Core messages

The core messages of project communications include:

- The causeway will improve the safety of Hailuoto residents by enabling emergency vehicles and medical units to travel more quickly. 24-hour access to the island will make everyday life easier.
- A new road from the mainland to Hailuoto will replace the ferry service, thereby improving both passenger and cargo connections. This will create new opportunities for local businesses and employment.
- An alliance model is being used to expertly implement the project to high standards and with respect for nature values.
- The causeway will be cheaper than maintaining and developing the ferry service.

Table 14. Target groups and channels for communications.

Target group	Channels
Local residents, tourists, the general public	Media communications Websites Social media Newsletters Briefings
Surrounding municipalities and cities	Experts (via their own work)
Trade and commerce	Media communications Websites Newsletters Events
Regional and national stakeholders	Media communications Websites Newsletters with customised content
Members of the Alliance project	Leadership, guidelines and culture Meetings, briefings Newsletter with customised content Websites

9.3 Communications plan, responsibilities and target groups

A communications plan has been drawn up for the project and will be updated by the project's communications team. The communications team consists of the Alliance Project Manager, the owner's project managers (who are responsible for exter-

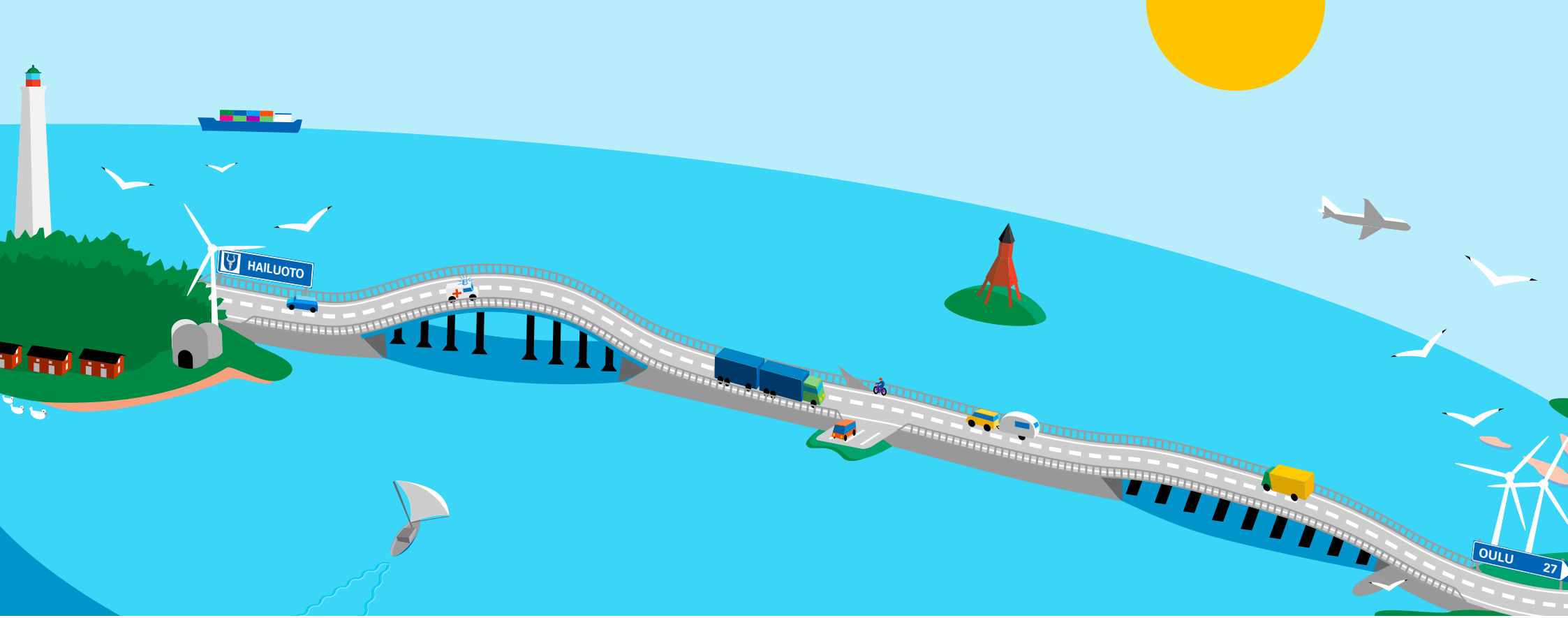


Figure 20. The project in a nutshell (Viestintätoimisto Selander & Co Oy).

nal communications), and communications specialists from both the Alliance and an external contractual partner. Communications will be issued in close cooperation with the Municipality of Hailuoto and the ELY Centre. The target groups and channels for communications are shown in Table 14.

9.4 Communication channels

The project's communication channels mainly include its website, social media, newsletters and media releases. Use will also be made of the Municipality of Hailuoto's communication channels in

- ***https://vayla.fi/hailuoto***
- ***https://www.facebook.com/hailuotokiintea***
- ***https://twitter.com/Hailuotokiintea***

accordance with mutually agreed practices. Public events and construction site tours for the media will also be arranged whenever possible. The traffic arrangements in place during construction will be actively communicated using whatever channel will best reach the target group.

9.5 Crisis communications

Separate guidelines for crisis communications have been drawn up for the project. They provide instructions on issuing communications in the event of a crisis in order to ensure rapid and clear communications. The goal is to minimise any additional damage and ensure open communications and the internal flow of information.

10 Alliance management system

10.1 Fundamental principles of the management system

The project's management system was created during the development phase to steer collaboration and help the project achieve its objectives. The project's decision-making levels are described in Table 15.

The HAIKI Alliance's management system is based on the Alliance's key principles:

- **Openness, honesty and trust:** the management system aims to ensure that the project's objectives are achieved by developing a culture of openness, honesty and trust
- **Unanimous solutions in the best interests of the project:** unanimous consensus in the Alliance's decision-making aims to forge a common interest in achieving the project's objectives.

10.2 Development phase organisation

The Alliance organisation (Figure 21) consists of the Leadership Team (ALT), Project Team (APT) and technical teams. The following significant tasks have also been assigned their own experts:

- safety,
- calculating the target outturn cost,
- communications,
- risks, ideas and opportunities,
- information management and BIM,
- the environment and permits.

Several changes in personnel occurred during the development phase as a result of retirements and transfers.

Table 15. Decision-making levels.

Decision-making levels	
ALT	› Changes in scope › Purchases over EUR 5 million and exceeding the target price › Major risks › Quality level › Approving the target outturn cost › Resourcing
APT	› Project steering decisions › Schedule, costs, procurement, quality and safety, communications
Technical / construction teams	› Decisions on design, planning and implementation › Coordination › Goal attainment steering
Small teams	› Expertise, deeper interpretation of the guidelines and requirements, and the formation of a shared position

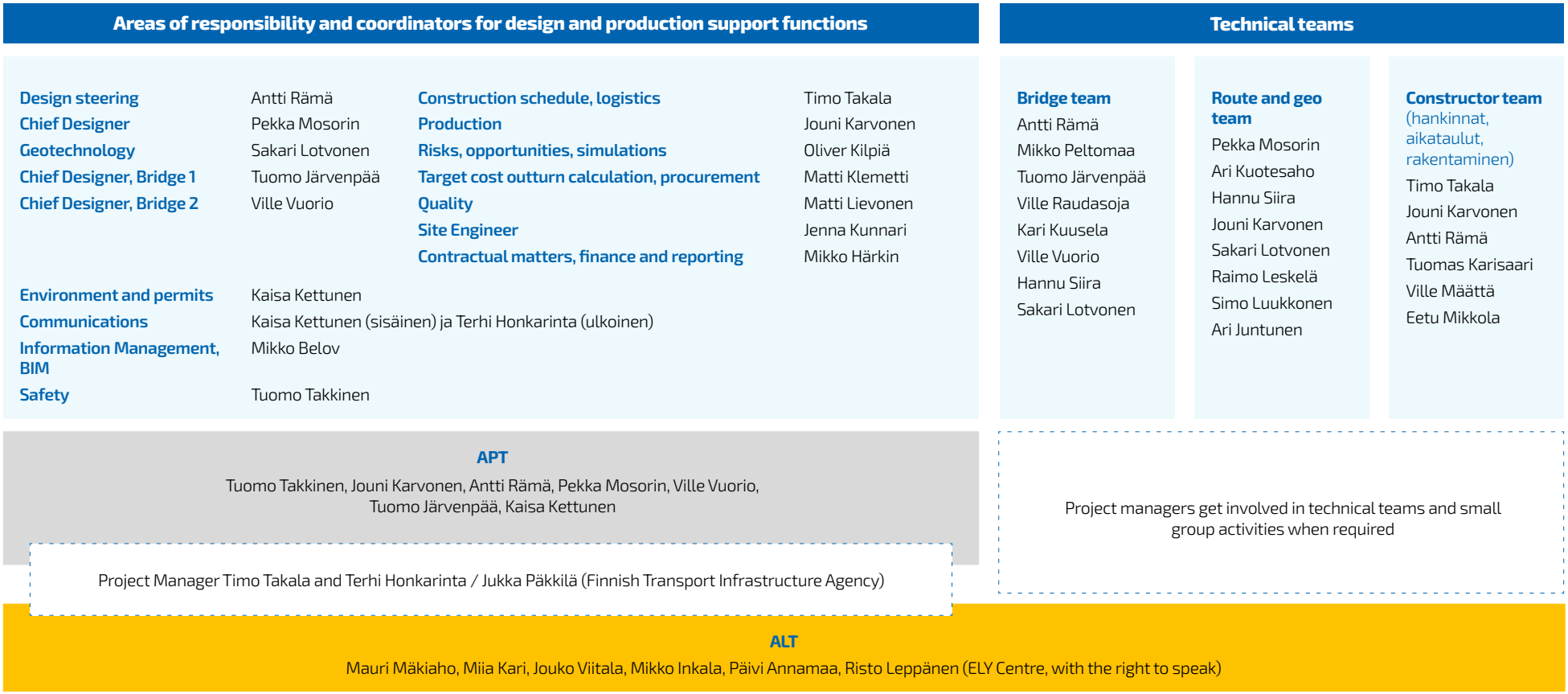


Figure 21. Developmental phase organisation in spring 2024.

10.3 ALT

The Alliance Leadership Team (ALT) is the Alliance's highest decision-making body. The ALT meets once a month on average. The Alliance Project Manager presents matters at these meetings. The project manager has the right to attend and speak at meetings, but does not participate in the leadership team's decision-making.

10.4 Alliance Project Manager

The Alliance Project Manager leads the Alliance Project Team (APT). The project manager is responsible for reporting to the Alliance Leadership Team (ALT).

10.5 APT

The Alliance Project Team (APT) is responsible for the Alliance's operational management and prepares matters to be discussed by the ALT. The APT is chaired by the Alliance Project Manager. The APT meets every one or two weeks.

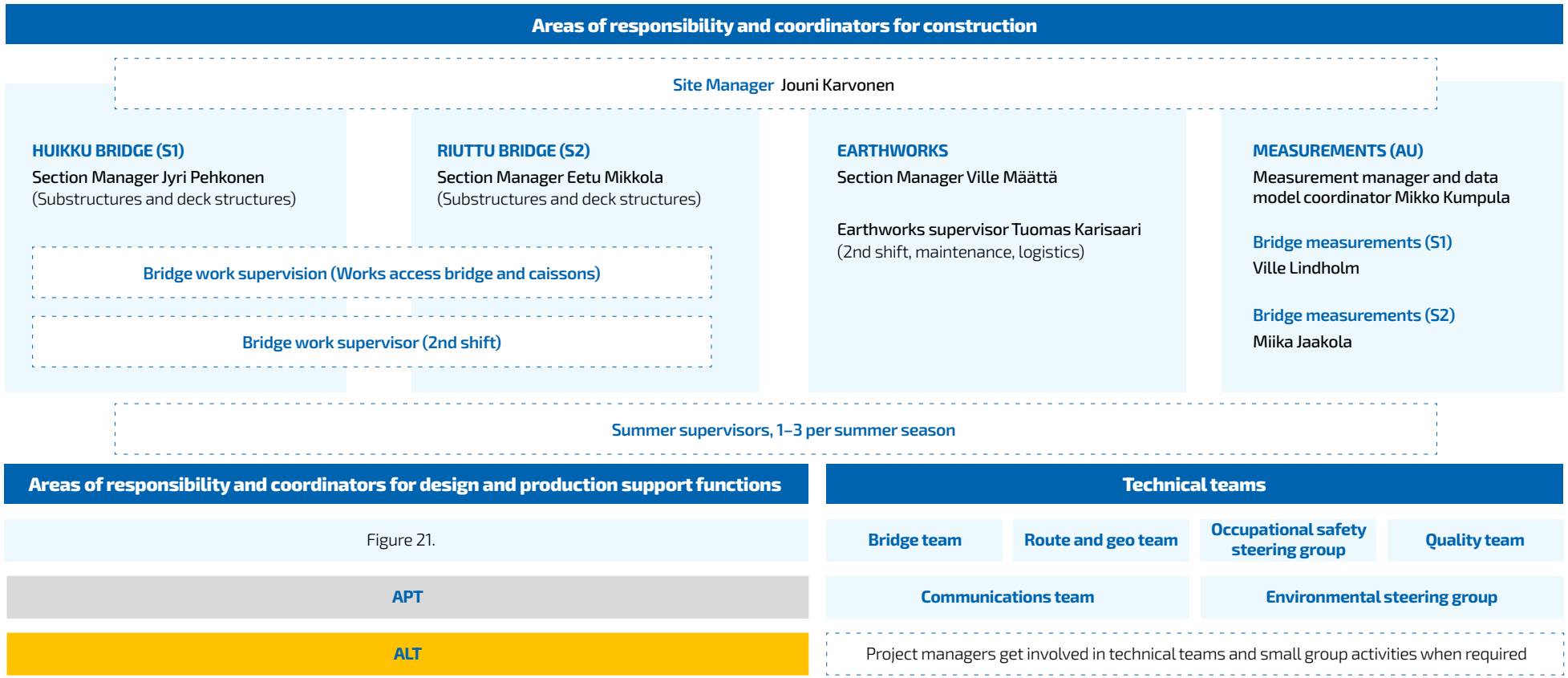


Figure 22. Implementation phase organisation.

10.6 Technical teams

The Alliance's technical teams were established during the development phase to develop design and implementation solutions and effectively solve problems in various fields of design. A coordinator was appointed to lead each technical team. The teams also include representatives of the designer, contractor and owner, and experts from the Finnish Transport Infrastructure Agency.

Technical teams met regularly to update the current status of design. The technical teams include a bridge team, a route and geo team, and a constructor team. These technical teams also contain smaller technical teams, such as teams for concrete structures, steel structures and superstructures, that only meet when required or to address a specific challenge.

10.7 Implementation phase organisation

When the project moves to the implementation phase, the organisational structure will remain similar to how it was during the developmental phase (Figure 22). The main changes will be the addition of resources for constructors in the technical and construction teams, and appointments for construction-related roles and responsibili-

ties. The configuration of the Alliance's Leadership Team and Project Team will remain unchanged.

10.8 Safety

A safe construction site is one of the project's common goals Tuomo Takkinen from Boost Brothers Oy is the safety coordinator. The safety coordinator handles the developer's statutory obligations. The Alliance will help the safety coordinator to perform their duties. The Site Manager, who is also the Alliance's production manager, is the person from the main contractor who is responsible for safety. Each employer on the construction site must also appoint a qualified and responsible person to manage and supervise the work they carry out.

The safety plan was drawn up during the development phase, and was updated when the project entered the implementation phase. The plan goes through the project's safety guidelines, hazardous work and work stages, the principles for creating a safe construction site, and the key risks identified in the project's risk management plan. The safety plan is supplemented by stage-specific safety plans for hazardous work in accordance with at least VNA 205/2009. Hazardous work in this project includes work that involves the danger of falling and drowning, diving, excavation work, hoisting, work done in the road area, and demolition work. The plans are drawn up before each work stage commences.

The safety of the construction site will be monitored using weekly MVR measurements. Any errors or deficiencies observed in the measurements will be immediately corrected whenever possible, and will be acknowledged as corrected once the correction has been completed. If it is not possible to correct an error immediately, a person will be appointed to ensure that the error is corrected as soon as possible. The project's safety coordinator will conduct regular site 'audit rounds' to enhance the site's safety culture and MVR measurements. Project management will also be present on these rounds at least once a month.

One of the project's key objectives is to make safety observations. Everyone involved in the project is encouraged to make safety observations. These observations can also be positive observations of things that are being well-managed. The observations, including any required corrective measures, will be processed and responsibilities assigned. The observations will be brought to the attention of site personnel, who will pay attention to the observations, avoid similar deficiencies, and promote the spread of best practices.

All safety-related deviations (accidents and near misses) will be processed in the Finnish Transport Infrastructure Agency's safety deviations and risk management system (TUTKA). The observations entered into TUTKA are also discussed at production control meetings, APT meetings and (as necessary) ALT meetings.

The project requires each role in the Alliance to be filled in accordance with the "best interests of the project" principle. The person assigned to the role must be qualified for the task in question.

The qualifications required for this project include:

- Qualifications for the installation of steel structures;
- qualifications for erecting and using cranes,
- qualifications for installing and monitoring waterproofing,
- qualifications for concreting,
- vessel traffic qualifications,
- diving qualifications,
- Occupational Safety Card,
- Road Safety Card 1 (when working in areas open to public traffic),
- design qualifications.

The required qualifications can be specified and revised on a per-stage basis. The construction site must ensure that a minimum of one person working in each team has first aid qualifications (at least emergency first aid).

The project invests in construction site and task-specific onboarding that takes the special characteristics of the construction site into account. Another onboarding goal is to ensure and maintain employees' awareness of the project's objectives, as well as their own role, significance and impact on achieving them.

10.9 Risks and opportunities

The objectives of risk management

The risks and opportunities associated with achieving the project's objectives have been systematically identified and managed since the procurement phase. The objective of risk management has been to address all of the main uncer-

tainties surrounding the project, and to reduce their adverse effects and the likelihood of their realisation with the aid of planned measures and monitoring.

A further goal is to create an adequate, transparent and justified risk provision for the project, which is included in the target outturn cost. Risk assessment is based on the principle that the Alliance collectively bears the risks and opportunities associated with the project. The risk provision included in the target outturn cost is intended to cover the cost impacts of any risks that are realised during the project with a 50 per cent probability.

Risk management tools

The project's two key risk management tools have been a risk log in spreadsheet format and cost calculation tool.

The risk log contains the identified and described risks and opportunities (project risks) whose status, controls and assessments have been regularly updated throughout the development phase by the Alliance's core team. In order to determine the risk provision, some of the risks in the risk log have been assessed for probability and cost impact. Particular attention has been paid to the management of risks with significant cost impacts.

The cost tool has been used to assess the unit prices, quantities and material types for items whose pricing is subject to the most uncertainty. The estimates, and particularly those for costs containing the most uncertainty, have been revised on the basis of the range of variation in each row.

The cost tool has also been used to assess the distribution of costs over time for each material type during the implementation phase, and to monitor trends in the cost levels of key materials. Monitoring has sought to gain an understanding of the risks inherent in changes in the cost level during the implementation phase. It has also provided insight into, for example, how the timing of steel product purchases can impact the project's cost level risk.

Risk management process

The project's risk management is primarily carried out as a continuous process that is part of overall project management. The project's risk management tools, workshops and other procedures help project management to succeed in its task. The project's risks have been addressed through both targeted procedures carried out by a few people and joint workshops attended by a broader group of participants from the project management team. The key events of the development phase are described in Figure 23.

The Alliance recognises that not all risks could be identified and reduced to an insignificant level during the development phase. A risk log will therefore be maintained throughout the implementation phase.

Risk sharing between the owner and the Alliance

It has been agreed that the Alliance will shoulder responsibly for all cost-related risks that were identified during the development phase, as well as any unidentified ones. However, a partial exception to this is the risk of changes in the cost level for steel and aggregates: significant increases or falls in the overall cost level will be borne by the owner.

The pricing of risks and opportunities for the target outturn cost

The risk provision for the project's target outturn cost consists of three parts:

- Named project risks recorded in the risk log,
- Unit-price and quantity risks,
- The risk of changes in the cost level.

The first two parts of the risk provision have been separately simulated using Monte Carlo simulations. Their median results correspond to the sums used in the target outturn cost. The assessment of risks associated with changes in the cost level is similar to the scenario in which the recent change in cost levels continues to increase linearly from the date when the target outturn cost is locked. The average cost of materials for the project is expected to follow this trend.

Opportunities, ideas and innovation

Ideas and innovations are logged to facilitate their organisation and management for further processing. Ideas and innovations are also KRAs for the development phase. Innovation will continue throughout the project's lifecycle until the end of the warranty phase.

The HAIKI Alliance's risks may be reduced:

- By long-term planning (final quantities for the bridges have been set and will not change),
- By comprehensively locking procurements when the target outturn cost is locked,
- Because uncertainties have been managed using experimental structures:
- Because test piling has been used to confirm soil conditions and the effectiveness of piling work
- Because test structures have been used to verify the construction technique for embankments, the required aggregates, and the quality level.
- Because concrete temperature management has been verified: the recipe has been verified, cooling has been dimensioned, and equipment and techniques have been tested.

The HAIKI Alliance's risks may be increased:

- By environmental conditions: ice, wind, temperature, water levels, swell, seabed conditions, underwater construction and sensitive environments,
- By logistics to and within the construction site, taking into account vessel and other traffic in particular,
- By the large number of works access structures:
  - By the schedule: construction of the final structures can only begin after works access structures have been completed,
  - By materials: opportunities for re-use,
  - By dimensioning: exceptional ice conditions.

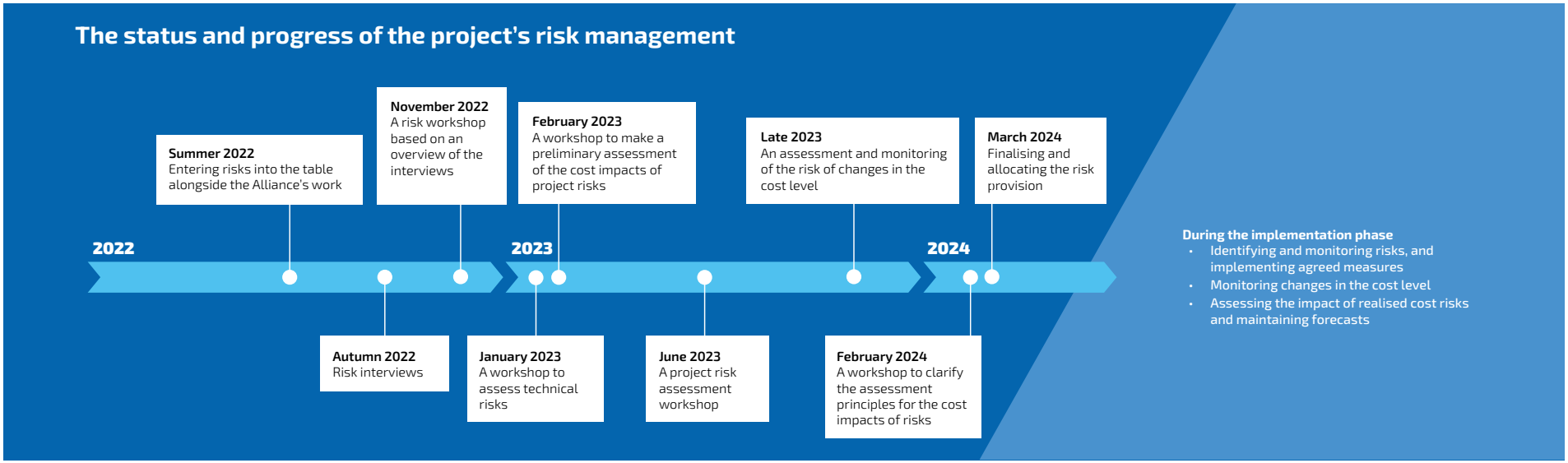


Figure 23. The status and progress of the project's risk management.

The target outturn cost includes the risk provision, the provision for cost increases, and opportunities

The target outturn cost of the project includes:

- Project risks, including opportunities: EUR 1,085,209,
- Technical risk: EUR 553,530,
- A provision for cost level increases: EUR 3,189,161.

10.10 Procurement

Procurement plan and authorisations

A procurement plan was drawn up during the development phase. It defines the procurement packages, complete with their schedules and costs, and the persons responsible for them. Invitations to tender were sent, queries were answered, and the person in charge of procurement comparisons and negotiations made a proposal to the APT, which can approve purchases up to EUR 5 million. Any purchases that exceed or otherwise raise the Alliance's costs unexpectedly must be approved by the ALT. Agreements are signed by both the project manager and production manager (Figure 24).

GRK's annual and/or seasonal agreements may, with the APT's approval and within separately specified limits, be used for low-value purchases, such as purchases from hardware stores. Invitations to tender, the bids received, any appendices to the bids, contract negotiation documents and the rationale behind supplier selections are documented in the Alliance's project bank, SharePoint.

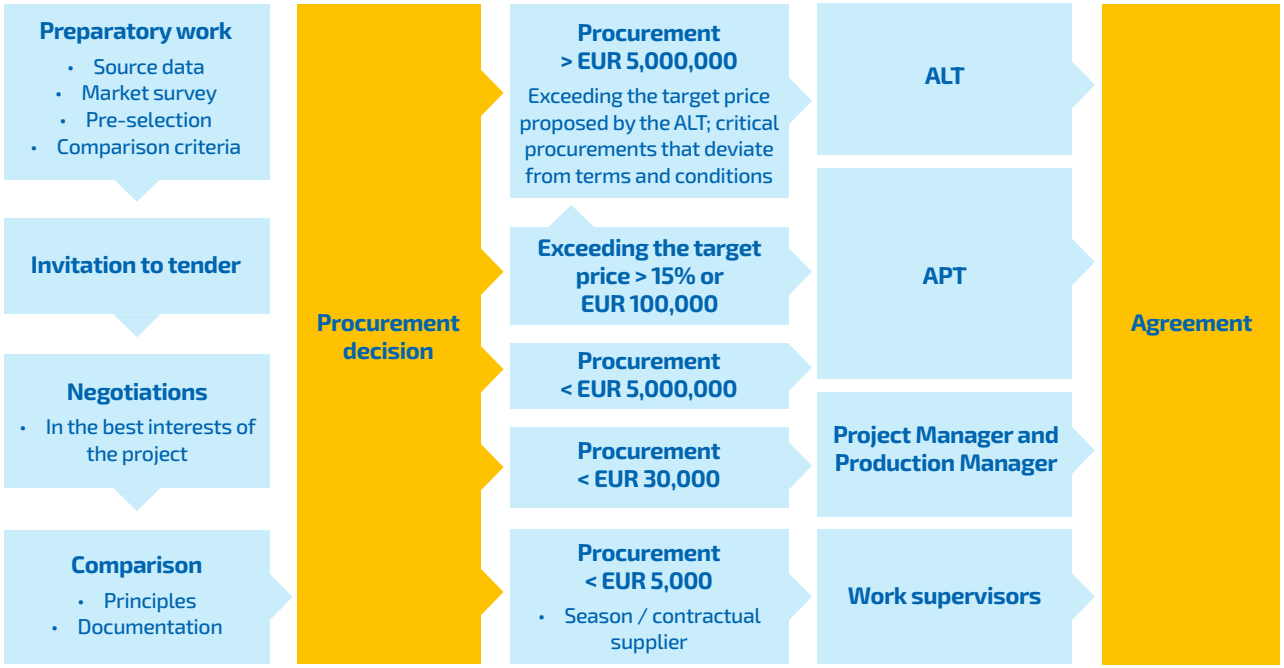


Figure 24. The procurement process.

The most significant procurement packages are:

- Composite girder structure
- Piling work
- Concrete deliveries
- Rebar
- Aggregate
- Maritime transport
- Paving
- Steel procurement
- Timber procurement

Principles for subcontracting agreements

By allowing alternative tenders to be submitted, the invitation to tender documents encouraged operators to be innovative and come up with new implementation ideas. The procurements of both aggregates and the composite girder structure were tendered out, and preliminary agreements were drawn up during 2023. Contracts for other significant procurements were also signed at the end of the development phase.

In principle, subcontracting must not be chained by more than one step. The selected subcontrac-

tors are required to meet the social obligations of the Act on the Contractor's Obligations and Liability when Work is Contracted Out, to be a member of the VastuuGroup, and to comply with sanctions. Subcontractors (including chained subcontractors) must have liability insurance of at least EUR 1,000,000.

10.11 Schedule management

The general schedule has been refined from the basics established during the tendering phase. The general schedule will be locked at the end of the development phase. Any changes to the general schedule must be sent FYI to the ALT. The implementation schedule has been drawn up using a takt schedule.

During the implementation phase, work supervisors will prepare three-week schedules for the various sections on the basis of the general schedule. The production manager will coordinate these schedules by the weekly meeting at the latest. Compliance with the schedule will be monitored on the basis of quantities and completed work. The production manager is responsible for the schedule, its monitoring and associated reporting.

The Alliance Project Manager reports on the schedule and the current situation on site at the monthly Alliance Leadership Team meetings.

10.12 Quality management

The Alliance aims to produce a flawless end product. The minimum quality of the finished product

Table 16. Big Room weekly agenda.

Time		MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
			Big Room day	Big Room day	Big Room day	
8–9	8:00	Onboarding				
	8:15					
	8:30			Weekly review		
	8:45					
9–10	9:00		Technical team meetings	Workshops / BR work	ERP/schedule meeting	
	9:15					
	9:30					
	9:45					
10–11	10:00					
	10:15					
	10:30					
	10:45					
11–12	11:00		*Lunch*	*Lunch*	*Lunch*	
	11:15					
	11:30					
	11:45					
12–13	12:00		Cost meeting, once per month	APT, 2–4 times per month ALT, once per month	Stakeholder meetings/visits	
	12:15					
	12:30		HAIKI Walks, once per month			
	12:45					
13–14	13:00		Safety round			
	13:15					
	13:30					
	13:45					
14–15	14:00		*Coffee break*	*Coffee break*	*Coffee break*	
	14:15			Workshops / BR work		
	14:30					
	14:45					
15–16	15:00					
	15:15					
	15:30					
	15:45					
16–17	16:00					
	16:15					
	16:30					
	16:45					

must comply with the design documentation, InfraRYL and other applicable guidelines. Every Alliance employee has their own role and responsibility in producing – and documenting – good quality.

Quality management and assurance

The project aims to achieve an excellent level of construction quality with timely reporting. Quality management for construction is based on GRK Suomi Oy's certified operating system. Quality demonstration reporting must take compatibility into account, so that data can be exported to the Finnish Transport Infrastructure Agency's VELHO system.

The overall responsibility for the project's quality assurance lies with the quality manager, who is assisted by a quality engineer. Quality management for design is a collaboration between technical team leaders and the chief designers. Together with the data model coordinator, chief designers are responsible for managing quality, information flow, schedules and risks within their areas of responsibility.

The quality engineer is in charge of quality assurance for construction, and is responsible for timely quality assurance procedures and reporting. Quality assurance is monitored at APT meetings with the aid of the situational awareness tool for documentation. The quality engineer, assisted by the production manager, will draw up quality assurance plans for the various structures. These plans should describe how the structure is to be implemented, any tasks related to quality assurance, the relevant tolerance requirements, the materials to be used, and the resulting documentation. Quality assurance tasks will be assigned to work supervisors.

Externally sourced quality assurance will be used to support the project's own quality assurance for any tasks that have been separately defined as critical, such as concrete quality assurance and the external inspection of bridges.

Managing quality incidents

The quality engineer will prepare a deviation report for any discrepancies observed during construction work. This report should describe the incident, the reasons for the deviation, and any corrective measures that have been taken. The quality engineer also maintains a list of deviation reports (to which the deviation reports themselves are appended), and ensures that the corrective measures mentioned in the reports are actually carried out. Advance notification of any deviations must be sent as soon the deviation becomes apparent.

Dealing with changes in value

Quality deviations that do not impact a product's service life and/or maintenance costs, and/or do not significantly affect its visual appearance, will be treated (analysed and corrected) using the aforementioned deviation management process. They will not be treated as changes in value with respect to the target outturn cost. However, if the parties separately agree on processing deviations as changes in value, the target outturn cost will be adjusted accordingly on this basis.

10.13 Design quality assurance

For design work, the inspection of plans is divided into two different types of activities. The Alliance carries out a self-inspection, that is, the design steering organisation carries out an inspection in collaboration with the organisation that is carrying out implementation.

An external inspection must be carried out for engineering structures and their foundation structures. Bridge designers send documents and data models for external inspection, and make any revisions and corrections that arise during the inspection. The Finnish Transport Infrastructure Agency and the experts responsible for design steering participate in the monitoring and steering of any external inspections of changes or additions. The plans are approved by an expert from the Finnish Transport Infrastructure Agency on the basis of a proposal made by an external inspector.

10.14 Project steering

An up-to-date picture of the project's current status is required to form a shared understanding of the situation, support decision-making, and avoid waste. A good flow of information between the various people, technical teams and decision-making levels in the project is required to create this picture. This is ensured by developing and complying with information management policies.

The various levels of decision-making and their configurations have been defined, and these bod-

ies regularly meet and document their work to ensure a good and timely flow of information and a rapid response to any issues. The weekly reviews will highlight any current issues to be discussed, and an understanding of the project's current status will be gained via a joint review of the ALT's monthly report. The weekly newsletter can also be used to share various types of information with everyone working on the project.

Effective use of time during meetings is ensured by sending out meeting invitations in good time, ensuring that the correct people are invited, sending out the agenda in advance, setting targets, and careful documentation. The most important meetings have fixed weekly schedules. Most meetings and daily interactions between project personnel take place in the Alliance's Big Room, which encourages people to meet, interact, come up with ideas and get inspired.

10.15 Design steering

Technical teams develop the project's design and implementation solutions. The teams engage in collaborative activities that involve designers, constructors, the owner's representatives and any required experts.

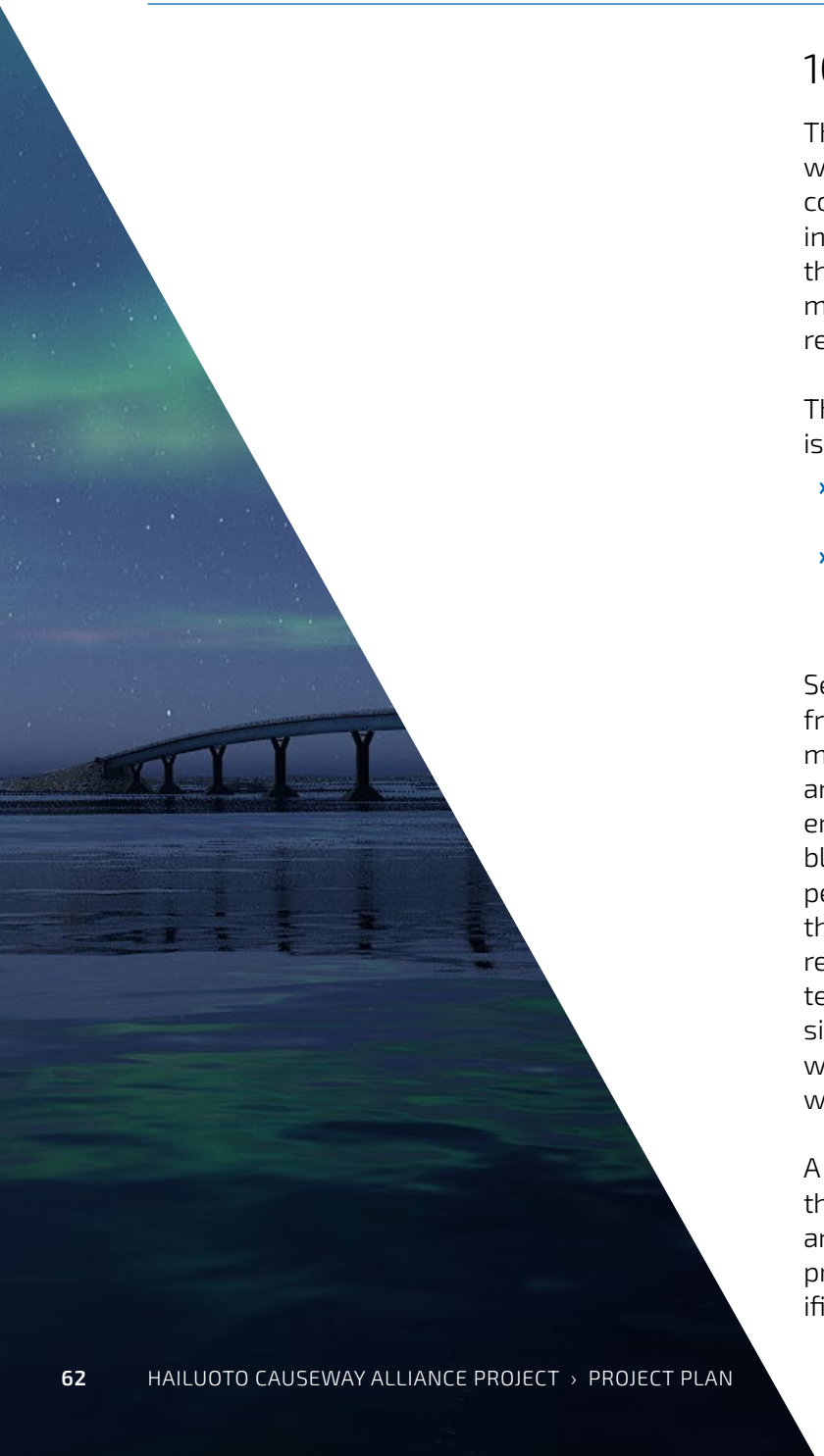
The constructor's most important task during the design process is to ensure the feasibility and cost-effectiveness of the construction plans.

Design steering reconciles the various structures and design components, and coordinates schedule planning on the basis of the construction site's needs schedule. Design steering approves and authorises external inspections, after which plans can be presented for approval.

All construction-related change requests are processed by both the design steering team and the designer before being added to the plans. Change management and approval for implementation will be carried out in the same way as the inspection and approval of the actual plans, as described in Section 5.1, Figure 13.

10.16 Scope and change management

The scope of the project implementation agreement is described in both this document and the plans contained in its appendices. Changes to the project's technical scope or requirements are treated as changes in scope. If a party considers a change in design to also be a change in scope, they must communicate this no later than when approving the change. Changes in scope are discussed by the ALT on the basis of a proposal from the APT, and the owner decides on their implementation. Changes in scope are taken into account in the target outturn cost and key result area objectives.



10.17 Cost management

The costs incurred by members of the Alliance will be reimbursed in accordance with actual costs on the basis of transparent accounting. An independent financial expert commissioned by the owner will inspect the accounts and regularly monitor both costs and the bases for calculating reimbursable costs throughout the project.

The goal of the HAIKI Alliance's cost management is to:

- establish an up-to-date and realistic forecast of the target outturn cost;
- ensure that the project can use cost forecasts to address issues in a timely manner in order to keep the project on budget.

Service providers should not incur financial costs from the project. An implementation-phase payment table for the constructor will be drawn up and approved by the ALT on the basis of the general schedule and a cash flow forecast. This table of payments takes into account the increased percentage of the fee paid to the constructor in the development stage. Actual cash flow will be reviewed quarterly, and if necessary, used to determine any required changes to payments. Designers will send invoices based on the hours worked and any other reimbursable costs that were incurred.

A list of approved costs and profit can be found in the service provider's cost management system, and this data is used to provide an overview of the project's current status. Salary costs must be verifiable with a delay of one salary period. Indirect salary costs will be taken into account as estimated values using the percentage jointly agreed on by the member of the Alliance.

An inspection of the contractor's purchase invoices will be carried out in two predefined cycles (reviewer, approver). If necessary, the inspector may forward the invoice to one or more persons of their choice. The invoice-processing stages are documented in the system and can be viewed later.

The cost management status is reviewed at monthly meetings. This meeting results in an updated forecast of the project costs for the APT and ALT.

Invoicing and payments

The constructor will invoice the Finnish Transport Infrastructure Agency up to twice a month in accordance with a payment schedule approved by the ALT. The instalments should distinguish between fees and reimbursable costs, and the invoices should also include the value-added tax (VAT) rate in effect at the time of invoicing.

Designers invoice on the basis of hours worked and any other reimbursable costs incurred. Monthly invoices should be sent on the basis of the previous month's actual costs.

Any advance payments made by the owner to service providers will be fully protected by guarantees. The payment period for invoices is 21 days from the presentation of a payable invoice to the owner. Separate invoicing guidelines have been drawn up to support invoicing.

Service providers mainly pay subcontracting invoices within 21 days of receiving a payable invoice. If there is a justified reason, shorter payment periods may be agreed upon by the parties involved on a case-by-case basis. Subcontractors should mainly be invoiced directly by the contractual partner.

The guarantee policy for subcontracting will be decided on a case-by-case basis. In principle, the subcontractor must assign a guarantee, or else 10 per cent of the value of the contract will be withheld from the invoice to guarantee completion of the work.

Insurance policies

The Alliance drew up an insurance plan in summer 2023. This plan forms part of the Alliance's risk management strategy and determines which risks will be transferred to the insurer and which will be borne by the Alliance. During the development phase, the Alliance Leadership Team decided that insurance policies in accordance with the insurance plan will come into effect before work commences in the implementation phase. This plan can be amended by the ALT.

The insurance policies aim to ensure uninterrupted operations. The objective is to optimise both the Alliance's insurance premiums and its risk management. Insurance coverage will be reviewed on an annual basis, and any damage that has occurred (including damage covered by the excess) will be analysed. All members of the Alliance are obliged to comply with the insurance plan.

Insurance policies to be obtained by the Alliance

Liability insurance
The purpose of this insurance is to pay compensation for any personal injuries or property damage caused by the Alliance's activities to a member of the Alliance or a third party whom the policyholder is legally obliged to compensate.

Consultant liability insurance
This insurance pays compensation for any personal injuries, material damages or financial damages that are caused to a member of the Alliance or a third party whom the policyholder is legally obliged to compensate as a result of any errors or deficiencies that may occur during consulting activities (the Alliance's planning tasks). For example, liability may be based on an error, omission or deficiency in plans, measuring results, calculations, drawings, advice or instructions.

Insurance for construction and installation work
This insurance covers material damages caused to the insured (project construction), as well as any other costs that are specified separately in the terms and conditions of the insurance policy.

The ALT will select one member of the Alliance (GRK Suomi Oy) to be the policyholder. According to the commercial model, insurance premiums are categorised as reimbursable costs for the policyholder.

All members of the Alliance, their subcontractors and their subcontractors' subcontractors are covered by the insurance policies.

Insurance policies:

- insurance for construction and installation work, amount insured: up to the full value of construction work, EUR 105,000,000 euros,
- consultant liability insurance, amount insured: EUR 5,000,000,
- liability insurance, amount insured: EUR 5,000,000.

10.18 HR management

The goal is to have skilled, satisfied and committed personnel who are enthusiastic and known to each other, and who are motivated to continuously develop their work and achieve the Alliance's key objectives. This is ensured by, for example:

- Defining clear job descriptions,
- providing onboarding for tasks, systems and qualifications (as required by the construction site), and training in alliance activities,
- appointing deputies for key personnel and enabling internal transfers within the project to promote personal development;
- supporting and monitoring how personnel are coping at work;
- paying attention to the special features of posted work, including accommodation and flexibility in working hours,
- continuous improvement in cooperation skills.

The most qualified person will be selected regardless of their organisation. A resourcing plan was drawn up during the development phase to ensure that there are sufficient personnel for the shift schedule required by the construction site, taking into account shift work, sick absences and vacations.

10.19 Information management

The project's information management aims to enable transparent, real-time cooperation. The Alliance selected the SharePoint project bank and Trimble Connect cloud service to meet this objective. The advantage of SharePoint is that it is compatible with Microsoft documentation tools.

Vektor.io is a browser-based application that is used for viewing visual design materials. Figure 25 shows the Alliance's main data management tools. The Alliance may add or remove tools as required.

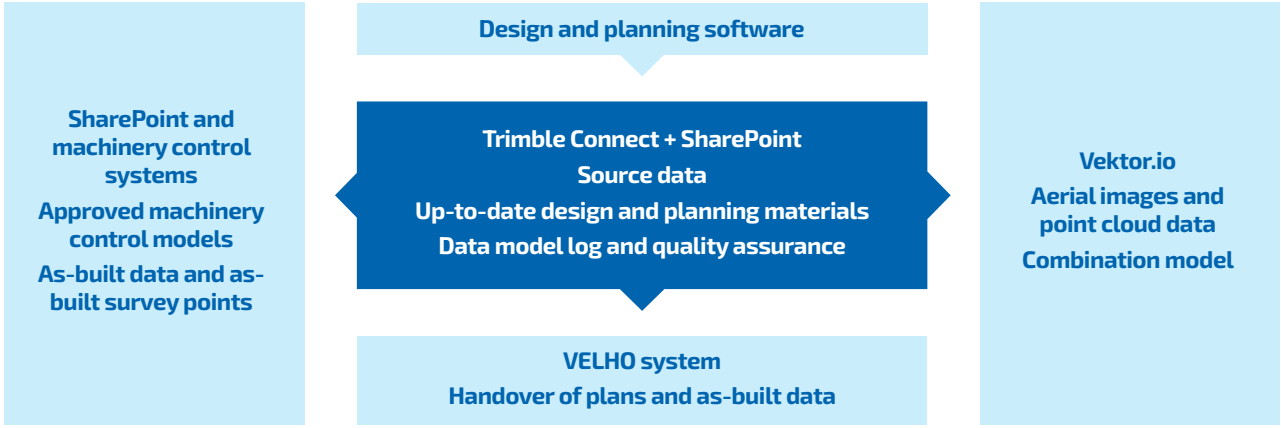


Figure 25. The information management process during the implementation phase.

Figure 26. Visualisation of the parking area with Hailuoto in the background.

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Infrastructure Agency