

APPENDIX 1 – ATTACHMENT 4

OPTION RAIL REPLACEMENT BUS PLANNING

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1. BACKGROUND

This Attachment describes Vy's needs and includes both technical and functional requirements for a voluntary option regarding rail replacement bus planning functionality, which supports the planning and management of rail replacement bus services for passengers. This option does not form part of the mandatory scope of delivery.

Suppliers intending to offer functionality supporting rail replacement bus planning services are requested to respond to the functional description and requirements specification set out in this Appendix.

2. ABOUT THE VOLUNTARY OPTION "RAIL REPLACEMENT BUS PLANNING"

2.1 THE PURPOSE AND SCOPE OF VY'S NEEDS AND REQUIREMENTS

Rail Replacement Bus Planning functionality supports planning and management of replacement services for passengers during planned disruptions to passenger rail services. The functionality enables Vy to plan, coordinate, and manage replacement transport in situations where train services cannot operate as scheduled, ensuring continuity of passenger transport.

The functionality is part of the planning domain for passenger rail services and is closely related to existing and future planning solutions, including the OneTrack Solution. It is intended to support high-level planning, operational coordination, and alignment between rail services and rail replacement bus services arrangements.

Rail Replacement Bus Planning represents a potential future capability and is therefore included as a voluntary option. Vy sees potential benefits in enabling integration of this functionality with the OneTrack solution at a later stage.

2.2 APPLICABILITY OF THE ONETRACK AGREEMENT

If the option is exercised, the Rail Replacement Bus Planning functionality shall be a fully integrated part of the OneTrack Solution.

The General functional requirements specified in Appendix 1 - Attachment 2 - Functional requirements, shall apply to the Rail Replacement Bus Planning option. All other functional and technical requirements shall apply only to the extent expressly stated in this attachment.

All other provisions in the Agreement are applicable for the option regarding Rail Replacement Bus Planning.

3. THE CURRENT FUNCTIONAL AND TECHNICAL LANDSCAPE

3.1 CURRENT FUNCTIONAL LANDSCAPE

The Rail Replacement Bus Planning services at Vy is initiated based on planned disruptions such as planned infrastructure maintenance or deviations in the production plan.

In Norway, the process is handled by a team consisting of three planners and one subject matter expert. Planning is supported by the external system Hastus, complemented by communication tools and coordination across systems and stakeholders. The process involves coordination across multiple roles and stakeholders, including disruption management, regional planning and external providers. The bus planner identifies affected train services, prepares an initial plan and initiates requests for bus services.

Role	Norway	Sweden
Main users of the system	3	-
System matter expert	1	1

Table 1: Types of users

In Sweden, the train planning services for planned disruptions is outsourced to an external supplier.

The development and execution of bus plans is iterative and supported by established tools and practices. The bus planner defines routes, stop locations, capacity needs and operational setup, and performs dimensioning, and adjustments based on available capacity and constraints. Hastus provides important support for planning and optimization activities. At the same time, updates to underlying train or rolling stock plans are not fully integrated, requiring manual follow-up and coordination. Final plans are distributed through exports and communication to relevant stakeholders. Overall, the process is well-established and functional, but involves a degree of manual coordination, which can impact efficiency and responsiveness in more complex or changing situations.

3.2 CURRENT TECHNICAL LANDSCAPE

The Rail Replacement Bus Planning services at Vy is currently planned in a Commercial of the Shelf (CotS) system.

This system does not have any integrations consuming train plan data from the timetabling and rolling stock system but relies on manual work for building plans for handling planned disruptions and rail replacement bus services.

Planned disruption plans for rail replacement buses in the CotS are mainly consumed by three consumers:

- NeTEx Integrator; for supplying EnTur and other national travel search engines with the complete journey details
- BussForTog; for publishing available bus shifts to bus suppliers for bidding
- Alternative Transport Service; an aggregation service feeding downstream consumers with alternative transport data and operational changes regarding these.

The current system does not consume data on cancelled train departures. As a result, manual effort is required to link specific train departures with their corresponding rail replacement bus transport. This introduces a range of issues for downstream consumers—particularly the NeTEx Integrator.

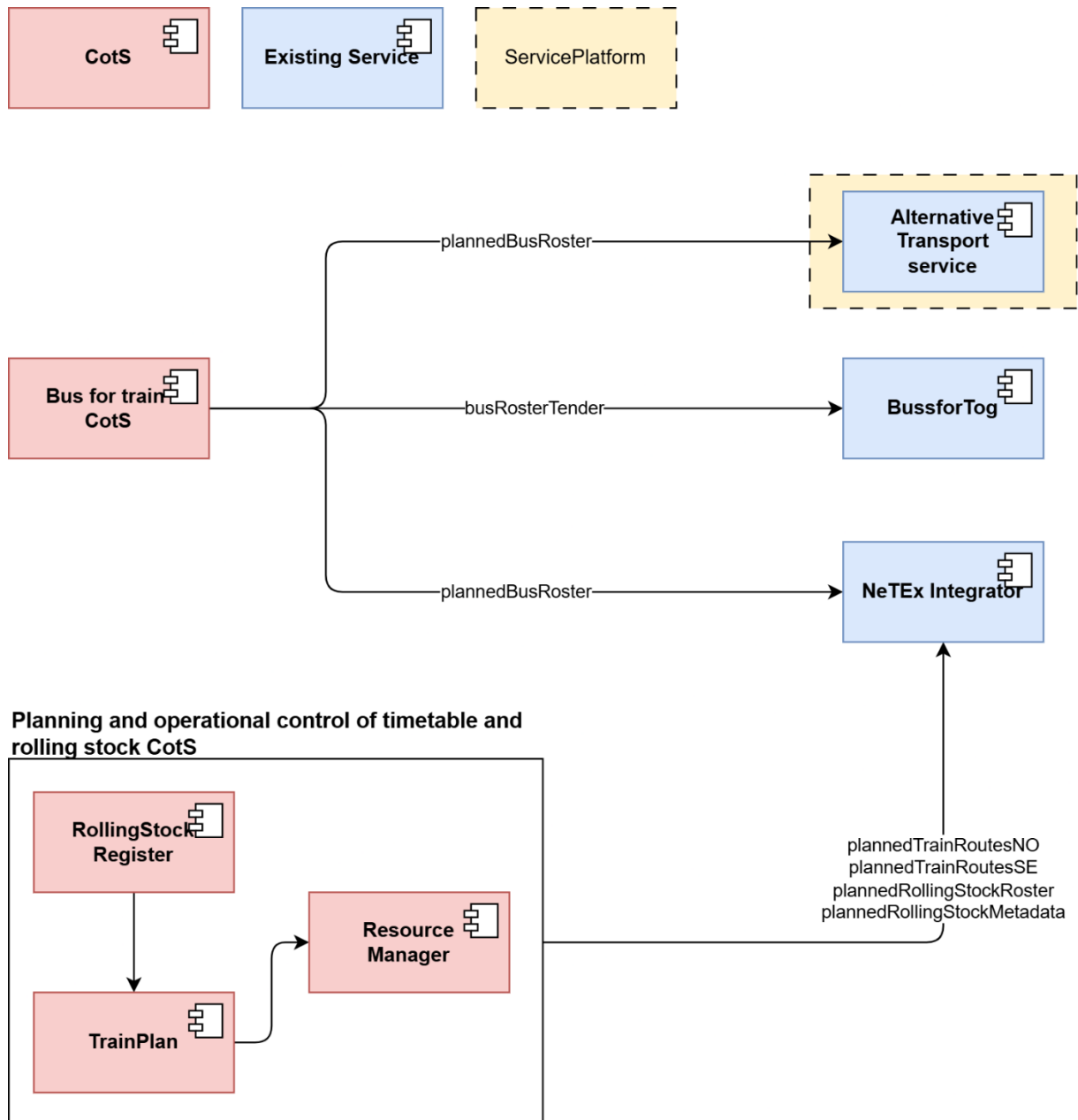


Figure 1: Overview of the technical Landscape for Rail Replacement Buses

4. FUNCTIONAL AND TECHNICAL NEEDS

This chapter provides a high-level introduction to the functional and technical needs for Rail Replacement Bus Planning.

4.1 FUNCTIONAL NEEDS

The system is expected to support increased flexibility, resilience, and coordination across planned rail operations and rail replacement bus services arrangements. Rail Replacement Bus Planning represents a complementary planning capability that enables effective management of planned disruptions.

The goal is a more integrated planning environment in which rail services and Rail Replacement Bus services can be planned and managed in a coherent and consistent manner. This has the potential to improve overall planning efficiency, data consistency, and decision support across passenger transport services. The functionality shall support

planning, coordination, and management of Rail Replacement Bus services, and is closely aligned with core planning processes.

4.2 TECHNICAL NEEDS AND SYSTEM PRINCIPLES

The solution shall interact with the technical landscape as described in Appendix 3 with attachment.

4.3 ESTABLISHMENT SERVICES

Vy seeks the supplier's response to the proposed approach for the establishment and project execution of the solution. The purpose of this input is to gain a high-level understanding of the supplier's recommended approach to implementing the solution, and to support Vy's overall assessment of feasibility and maturity.

The described approach is intended to be indicative and non-binding. The final scope, structure, and execution of any Establishment project related to Rail Replacement Bus Planning will be subject to further agreement between the Parties and governed by the applicable contractual framework.

BP.01: *The supplier shall provide a description of the proposed approach for the Establishment and project execution of the solution.*

	The supplier's description should be high level and may include, but is not limited to, the following elements: • Proposed timeline and key milestones • Project phases and overall delivery model • Approach to testing, verification, and acceptance • Handover to management phase • Roles, responsibilities, and involvement of Vy and other stakeholders • Key resources from the supplier • Training
Supplier Response:	Description (approx. 3 A4 pages)

5. REQUIREMENTS SPECIFICATION

5.1 INTRODUCTION TO THE REQUIREMENTS SPECIFICATION

The Requirement Specification set out in chapter 5.2 below defines the functional and technical requirements applicable to the rail replacement bus planning solution.

All requirements for the option listed in chapter 5.2 must be fulfilled.

5.2 REQUIREMENT TABLE

ID	Requirement description	Response
BP.02	The solution shall support integrated workflows for rail replacement bus planning across timetable, rolling stock and personnel planning.	Answer Yes/No and describe how workflows for rail replacement bus planning are integrated across timetable, rolling stock and personnel planning, including data flow and process steps.
BP.03	The solution shall provide the bus planner with an up-to-date and consistent overview of rolling stock plans and planned disruptions used as input to bus planning.	Answer Yes/No and provide a description of how rolling stock plans and planned disruptions are presented to the bus planner.
BP.04	The solution shall provide an up-to-date and consistent overview of affected train services used as input to bus planning.	Answer Yes/No and provide screenshots showing how affected train services are visualized and accessed by the bus planner.
BP.04	The solution shall automatically notify the bus planner when changes in rolling stock plans or planned disruptions impact existing bus plans.	Answer Yes/No.
BP.05	The solution shall support creation and maintenance of bus plans.	Answer Yes/No and provide a high-level description of how bus plans are created and maintained.
BP.06	The solution shall support creation and maintenance of bus plans based on train services to be replaced, including train number, route/section and time period.	Answer Yes/No.
BP.07	The solution shall support versioning, history tracking and recovery of deleted bus plans.	Answer Yes/No and describe how versioning and recovery are implemented, including screenshots.
BP.08	The solution shall support reuse and adaptation of previously created bus replacement plans in new planning contexts.	Answer Yes/No and describe how existing bus plans can be reused and adapted.
BP.09	The solution shall support dynamic transfer of incremental changes to bus plans, ensuring that only changes (not full plans) are distributed.	Answer Yes/No and describe how incremental updates are handled and distributed.
BP.10	The solution shall allow the bus planner to add structured notes describing assumptions, routing choices and operational setup for each bus plan.	Answer Yes/No.

BP.11	The solution shall support scenario planning for rail replacement bus services, enabling testing and comparison of alternative bus plan options before publishing.	Answer Yes/No.
BP.12	The solution shall support flexible export of bus replacement planning data to required external systems and file formats.	Answer Yes/No and describe supported export formats and integration options.
BP.13	The solution shall provide dynamically updated infrastructure data relevant for bus planning, including stops, stop areas and locations.	Answer Yes/No and describe data sources and update frequency for infrastructure data.
BP.14	The solution shall provide map-based planning support for defining and visualising bus routes, including distance and estimated travel time.	Answer Yes/No and provide screenshots showing map-based planning functionality.
BP.15	The solution shall support building and editing bus routes used in rail replacement bus services plans.	Answer Yes/No and provide screenshots demonstrating route creation and editing.
BP.16	The solution shall support dimensioning of bus plans, including selection of bus type based on capacity demand, route characteristics and operational constraints.	Answer Yes/No and describe how capacity and bus types are determined, including examples.
BP.16	The solution shall support optimisation of bus plans to minimise the number of buses required while meeting capacity, routing and regulatory constraints.	Answer Yes/No and describe optimisation logic and constraints used in planning.
BP.17	The solution shall calculate driven kilometres and time consumption per bus plan to support cost control, comparison and reporting.	Answer Yes/No and provide examples or screenshots showing calculation outputs.
BP.18	The solution shall provide historical statistics for executed bus plans to support learning and improved future planning decisions.	Answer Yes/No and describe available historical data and reporting capabilities.
BP.19	The solution shall be integrated with the OneTrack Solution in the	Answer Yes/No and describe the proposed setup and configuration of the requested environment.

	same environment setup as the OneTrack Solution.	
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6. HIGH-LEVEL DESCRIPTION OF THE PROPOSED SOLUTION

Please provide a high-level description of the proposed solution, outlining how the solution addresses Vy's needs:

Description (approx. 3 A4 pages)

7. PRICES

The Supplier shall complete the tables below by providing all prices in NOK, exclude VAT.

7.1 HOURLY RATES

The Supplier shall only fill in this section if there are any deviations from the hourly rates offered in Appendix 7A for the OneTrack Solution. Otherwise, the stated hourly rates in Appendix 7A shall apply.

Role	Hourly rate	Comment
Project Owner		
Project Manager		
Team Leader		
System Expert / Subject Matter Expert		
Solution Architect		
Technical Expert		
Developer		
Offshore Developer		
Test Manager		
Test Resource		
Training Lead		
Other		

7.2 LICENSE MODEL

Suppliers shall specify the annual licence cost and licensing model for the proposed solution.

Describe:

- The offered licence model, and whether the licence is based on a perpetual purchase model, a subscription/rental model, or another licensing structure. If the licence fee consists of a one-time investment cost rather than a recurring annual fee, this shall be clearly stated.
- Metric(s) used for pricing, including but not limited to number of users, named users, concurrent users, vehicles, trains, transactions, locations, assets, or other relevant units.
- The scalability of the licensing model, including the possibility of increasing or decreasing the licence volume during the contract period and the resulting impact on costs. Any minimum commitments, volume thresholds, price breaks, or other conditions affecting pricing adjustments shall be specified.
- If factors other than the licence metric influence the licence fee.

Description (approx. 3 A4 pages)

Costs			
Service	Yearly price	Licence model [perpetual/rental]	Licence metric, scalability and assumptions
Licences			
Operations and maintenance			
Additional Costs			