

Bane NOR's R26 Capacity Strategy



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Version history

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Introduction

This document constitutes Bane NOR's capacity strategy for the R26 timetable period.

As the infrastructure manager, Bane NOR is the owner and manager of the capacity allocation process.

RailNetEurope (RNE) is leading a project for the harmonisation of the European capacity allocation process. This project is called TTR (Timetabling and Capacity Redesign). TTR will change the capacity allocation process in order to better meet the market's need for predictability and efficiency. Early planning is a key element in delivering on this.

The first process element of the harmonised capacity allocation process, which is scheduled to be fully implemented by the R28 timetable period, is the capacity strategy. This strategy document is based on the RNE minimum requirements relating to scope for the R26 timetable period, including information relating to cross-border services, and has been harmonised with the Swedish Transport Administration. The entire national rail network, including cross-border services, will not be documented until the strategy document for the R28 timetable period. The implementation of the harmonised capacity allocation process entails a need for regulatory amendments and IT solutions, which is why pilot projects are being planned for selected routes during the R26 timetable period. Further information about these pilot projects will be published at a later date.

The capacity strategy is the first of several deliverables linked to the planning of the R26 timetable period. The purpose of the capacity strategy is to collect and compile information linked to available infrastructure capacity and temporary capacity restrictions and to document general principles for service composition and planning. The elements set out in chapter 3 of this strategy will form the basis and framework for the later stages of the new capacity allocation process.

The work on the capacity strategy begins 60 months before the start of the timetable period in question. This deadline is referred to as X-60. The final strategy will be published 36 months before the start of the timetable period in question (X-36). The strategy has been harmonised with the Swedish Transport Administration to ensure the coordination of both temporary capacity restrictions and future services affecting both infrastructure managers.

Railway infrastructure capacity is limited and its further development is both expensive and time-consuming. It is therefore essential that the existing infrastructure capacity is utilised in order to support the needs of society. Early planning, involvement and transparency relating to planned use are all important instruments in utilising the available infrastructure capacity in the best possible manner.

0 Geographical area

The scope of this capacity strategy has been limited to cover cross-border services and subsequent strategies will gradually be expanded to include services in the entire national rail network.

The capacity strategy describes the available infrastructure capacity for a specific timetable period. The available infrastructure capacity is the result of the interaction between:

1. railway infrastructure
2. rolling stock
3. timetable (driving pattern)

In order to present the available infrastructure capacity in the necessary degree of detail, it is pertinent to divide the rail network into smaller elements, referred to as sections. A section is a part of a line bounded by stations at which the service changes. A section can also be bounded by a starting station/terminal station and an agreed boundary point for capacity allocation between two neighbouring infrastructure managers. The agreed boundary points for capacity allocation between the Swedish Transport Administration and Bane NOR are the border crossings at Bjørnfjell, Storlien, Charlottenberg and Kornsjø. In order to support different work processes, the line sections can be divided into sectional groups. The sectional groups used in this strategy are shown in the bullet points below. These sectional groups are used consistently throughout this capacity strategy and belong to the following four border crossings:

Kornsjø border crossing (NO)

Freight track

- Alnabru – Loenga

Østfold Line

- Oslo Central Station – Halden
- Halden – Kornsjø border crossing

Charlottenberg border crossing (SE)

Dovre Line

- Kvam – Lillehammer
- Hamar – Lillehammer
- Sørli – Hamar

Røros Line

- Hamar – Elverum
- Elverum – Koppang

Solør Line

- Elverum – Kongsvinger

Hoved Line

- Oslo Central Station – Lillestrøm

Kongsvinger Line

- Lillestrøm – Kongsvinger
- Kongsvinger – Charlottenberg

Storlien border crossing (SE)

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Nordland Line

- Trondheim Central Station – Hell

Meråker Line

- Hell – Storlien

Bjørnfjell border crossing (NO)

Ofoten Line

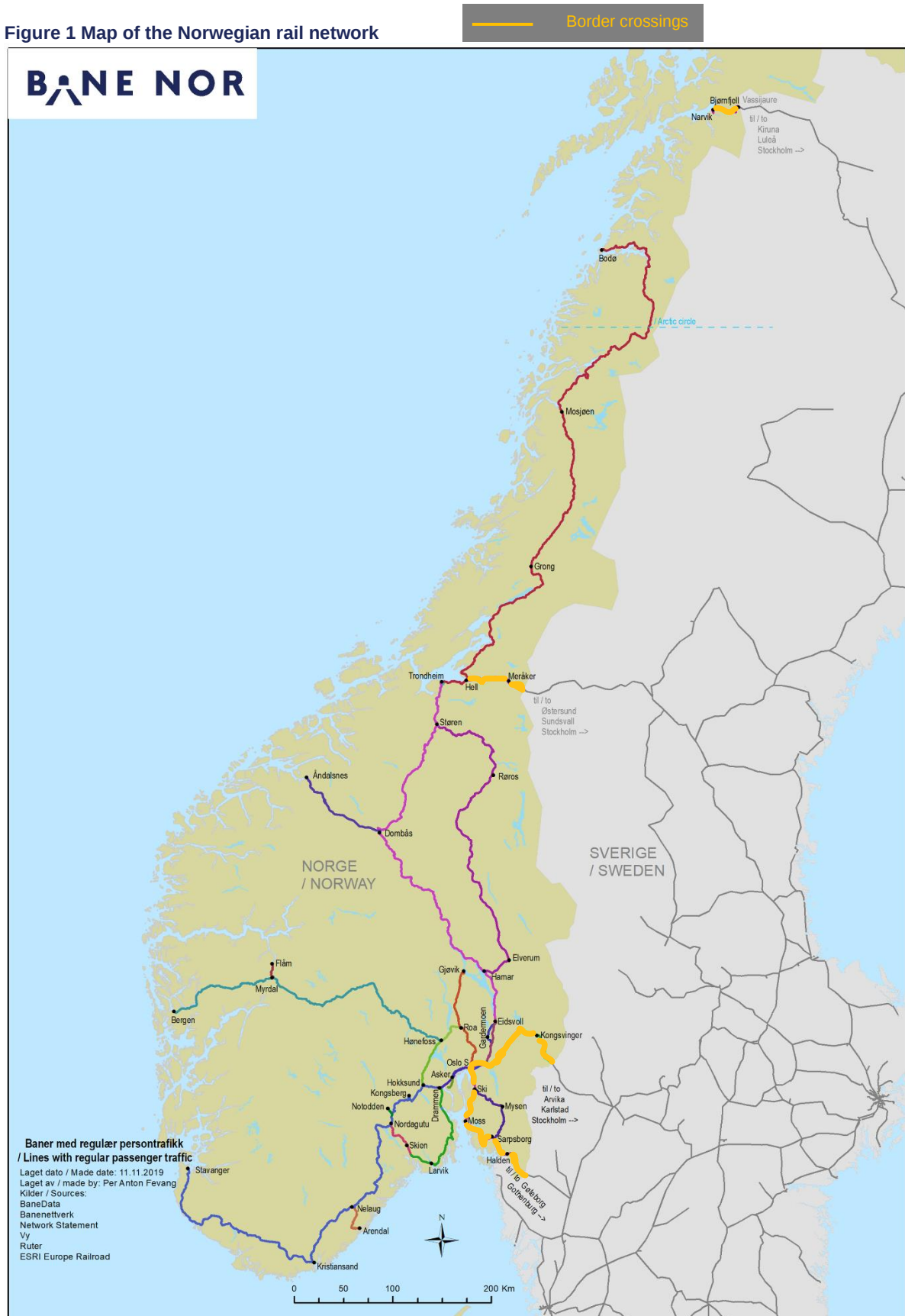
- Narvik – Bjørnfjell border crossing

For a complete overview of the sections in the Norwegian rail network, please see Appendix B

0.1 Map of the Norwegian rail network

The map in Figure 1 shows the Norwegian rail network, with geographical locations for the lines that have been included in the capacity strategy for the R26 timetable period. The included lines are the four border crossings highlighted in yellow on the map.

Figure 1 Map of the Norwegian rail network



0.2 Stakeholders

Table 1 shows infrastructure managers, terminals, service facilities, sidings and various services that may be included in infrastructure capacity applications for the R26 timetable period. For a complete overview of stakeholders, i.e. suppliers and operators of terminals, sidings, service facilities and various services therein, please see [Chapter 7 of the Network Statement 2024](#). The Swedish Transport Administration is Bane NOR's involved infrastructure manager.

For an overview of all stakeholders, please see Appendix E.

Table 2 Stakeholders

Border crossing	Line	Sectional groups	Stakeholder category		Location
Kornsjø border crossing (NO)	Freight track	Alnabru – Loenga	Terminals	Freight terminals	Alnabru
			Service facilities	Rail yards and storage sidings	Oslo – Lodalen Oslo – Loenga Oslo – Haven
				Maintenance facilities/workshops	Oslo – Lodalen Oslo – Alnabru
				Refuelling facilities	Alnabru
Kornsjø border crossing (NO)	Østfold Line	Oslo Central Station – Halden	Service facilities	Rail yards and storage sidings	Oslo – Lodalen Oslo – Loenga Oslo – Haven
				Port facilities	Oslo, Sjursøya Halden
Kornsjø border crossing (NO)	Østfold Line	Halden – Kornsjø border crossing	Involved infrastructure manager	Swedish Transport Administration	
			Service facilities	Port facilities	Halden
Charlottenberg border crossing (SE)	Dovre Line	Eidsvoll – Sørli			
Charlottenberg border crossing (SE)	Dovre Line	Sørli – Hamar			
Charlottenberg border crossing (SE)	Dovre Line	Kvam – Lillehammer	Terminals	Timber terminals	Kvam, Hove
			Service facilities	Rail yards and storage sidings	Lillehammer
				Relief facilities	Kvam
Charlottenberg border crossing (SE)	Dovre Line	Hamar – Lillehammer	Service facilities	Rail yards and storage sidings	Lillehammer
				Maintenance facilities/workshops	Hamar
				Refuelling facilities	Hamar
Charlottenberg border crossing (SE)	Dovre Line	Sørli – Hamar	Terminals	Timber terminals	Sørli
			Service facilities	Maintenance facilities/workshops	Hamar
				Refuelling facilities	Hamar
			Sidings	Hamar	Ideal sidings
Charlottenberg border crossing (SE)	Røros Line	Hamar – Elverum	Service facilities	Maintenance facilities/workshops	Hamar
Charlottenberg border crossing (SE)	Røros Line	Elverum – Koppang	Terminals	Timber terminals	Koppang, Hovdmoen
			Service facilities	Rail yards and storage sidings	Elverum

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Border crossing	Line	Sectional groups	Stakeholder category		Location
Charlottenberg border crossing (SE)	Solør Line	Elverum – Kongsvinger	Terminals	Timber terminals	Vestmo, Braskereidfoss
			Service facilities	Rail yards and storage sidings	Elverum
				Maintenance facilities/workshops	Kongsvinger
			Sidings		
Charlottenberg border crossing (SE)	Gardermoen Line	Oslo Central Station – Lillestrøm			
Charlottenberg border crossing (SE)	Hoved Line	Oslo Central Station – Lillestrøm	Terminals	Freight terminals	Alnabru
			Service facilities	Maintenance facilities/workshops	Grorud Alnabru
Charlottenberg border crossing (SE)	Hoved Line	Lillestrøm – Kløfta			
Charlottenberg border crossing (SE)	Hoved Line	Kløfta – Langeland			
Charlottenberg border crossing (SE)	Hoved Line	Langeland – Jessheim			
Charlottenberg border crossing (SE)	Hoved Line	Jessheim – Dal			
Charlottenberg border crossing (SE)	Hoved Line	Dal – Eidsvoll			
Charlottenberg border crossing (SE)	Kongsvinger Line	Lillestrøm – Kongsvinger	Terminals	Timber terminals	Norsenga
			Service facilities	Rail yards and storage sidings	Årnes (stabling sidings), Kongsvinger
			Sidings		
Charlottenberg border crossing (SE)	Kongsvinger Line	Kongsvinger – Charlottenberg border crossing	Involved infrastructure manager	Swedish Transport Administration	
			Sidings	Kongsvinger	Gropa sidings
Storlien border crossing (SE)	Nordland Line	Trondheim Central Station – Hell	Terminals	Freight terminals	Brattøra
			Service facilities	Maintenance facilities/workshops	Marienburg, Brattøra
				Refuelling facilities	Marienburg
Storlien border crossing (SE)	Meråker Line	Hell – Storlien border crossing	Involved infrastructure manager	Swedish Transport Administration	

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Border crossing	Line	Sectional groups	Stakeholder category		Location
Bjørnfjell border crossing (NO)	Ofoten Line	Narvik – Bjørnfjell border crossing	Involved infrastructure manager	Swedish Transport Administration	
			Terminals	Freight terminals	Narvik freight terminal, Fagernes
			Service facilities	Maintenance facilities/workshops	Narvik – Trekanten Narvik – Fagernes
				Port facilities	Narvik freight terminal, Fagernes
			Sidings		Djupvik station, track 3

1 Expected permanent capacity changes relevant to R26

This chapter describes the permanent changes to infrastructure capacity that are expected to be available for all or parts of the R26 timetable period. This expected permanent infrastructure capacity is the sum of:

- expected permanent capacity improvements (improvements in provision)
- expected permanent capacity restrictions (reductions in provision)

1.1 Expected permanent improvements in provision

Table 32 shows the projects that will provide new infrastructure capacity (improvements in provision) and that will influence service flow before or during the R26 timetable period. The “Expected improvements in provision” column describes the changes to provision expected for each sectional group covered in this document.

For a complete list of all projects with expected improvements in provision, please see Appendix C.

Table 2 Expected permanent improvements in provision

Border crossing	Line	Sectional groups	Project name	Project proposal created	Project approved by the Portfolio Board	Funding secured	Expected date of commissioning	Expected improvements in provision
Kornsjø border crossing (NO)	Østfold Line	Oslo Central Station – Halden	Follo Line	Yes	Yes	Yes	12/12/2022	Double track section in tunnel between Oslo Central Station and Ski. The full effect of the work on the Follo Line is expected after the 2023 summer break. The journey time between Oslo Central Station and Ski will be halved from 22 to around 11 minutes, doubling the train capacity on the line.
Storlien border crossing (SE)	Nordland Line	Trondheim Central Station – Hell	Partial electrification of the Trønder and Meråker Lines	Yes	Yes	Yes	30/12/2024	Electrification of the Trondheim Central Station–Stjørdal, Hell–national border and Stavne–Leangen lines. Newer, more modern and more environmentally friendly trains. Better comfort and greater passenger capacity.
	Meråker Line	Hell–Storlien border	Partial electrification of the Trønder and Meråker Lines	Yes	Yes	Yes	30/12/2024	Electrification of the Trondheim Central Station–Stjørdal, Hell–national border and Stavne–Leangen lines. Newer, more modern and more environmentally friendly trains. Better comfort and greater passenger capacity.
Bjørnfjell border crossing (NO)	Ofoten Line	Narvik – Bjørnfjell border crossing	NA	NA	NA	NA	NA	None

1.2 Expected permanent reductions in provision

There are no permanent restrictions in capacity for R26.

2 Temporary restrictions in capacity

Bane NOR has chosen to follow the RNE guidelines for temporary restrictions in capacity, hereinafter referred to as temporary capacity restrictions, abbreviated to TCR. The RNE guidelines are based on the requirements set down in Directive 2012/34/EU, Annex VII, which has also been incorporated into Norwegian legislation through FOR-2021-06-30-2315 (the Railway Regulations, Appendix IV).

2.1 The principles for the planning of TCRs

Bane NOR applies the principles for the planning of TCRs so that each TCR is fully utilised and the impact on services is minimised. The principles have been grouped under the five subheadings below.

2.1.1 TCR categories and the recommended periods for the implementation thereof

The TCR categories used by Bane NOR correspond to the wording used in RNE's TCR Manual. Additionally, the categories very large/large/moderate and little impact also correspond to Appendix IV of the Railway Regulations and Directive 2012/34/EU, Annex VII.

Table 3 TCR categories and recommended periods for implementation

TCR categories	Duration	Impact on service (estimated service volume interrupted, redirected or replaced by other modes of transport)	First publication deadline (deadline by which ARBIS must be updated)	Recommended periods (for the implementation of TCR)
TCR with very large impact on service	> 30 consecutive days	> 50% of the estimated service volume in the section/station/terminal per day	X-24	Easter, summer
TCR with large impact on service	> 7 consecutive days	> 30% of the estimated service volume in the section/station/terminal per day	X-24	Easter, summer
TCR with moderate impact on service	7 or fewer consecutive days	> 50% of the estimated service volume in the section/station/terminal per day	X-12	Easter, summer and/or other low-service periods
TCR with little impact on service	unspecified	> 10% of the estimated service volume in the section/station/terminal per day	X-4	Weekend and/or other low-service periods
TCR with very little impact on service	unspecified	Maximum 10% of the estimated service volume in the section/station/terminal per day	Passenger services: T-4 Freight services: T-1 T = A deadline referring to the first TCR day (T) and the number of	The duration and time of day must be adapted and defined for each section

TCR categories	Duration	Impact on service (estimated service volume interrupted, redirected or replaced by other modes of transport)	First publication deadline (deadline by which ARBIS must be updated)	Recommended periods (for the implementation of TCR)
			months (n) before this deadline.	

Bane NOR estimates the impact on service volume as follows:

$$\text{TCR impact in \%} = \frac{\text{Number of affected train paths per section in the TCR calculation}}{\text{Number of train paths per section on a representative day}} \times 100$$

2.1.2 Coordination of TCRs in order to minimise impact and duration

Bane NOR coordinates all projects internally and with neighbouring infrastructure managers, including both development and maintenance projects, so that each TCR is fully utilised. Development projects are indicative for the timing and duration of TCRs. At the same time that TCR windows are scheduled for maximum utilisation, efforts are also made to facilitate extensive general and conditional maintenance within the same TCR windows. In order to minimise the duration of the TCRs and the impact on services, the following principles apply:

- Bane NOR will not plan TCRs with a duration exceeding 30 consecutive days. TCRs with a duration exceeding 30 consecutive days must be approved by the Bane NOR Group Management.
- When planning very large and large TCRs, socioeconomic assessments must be carried out as part of the decision-making basis for the necessary priorities.
- Bane NOR will strive to ensure single-track operations in double-track lines rather than total closure.
- Bane NOR will strive to limit the number of TCRs per line per year and will instead attempt to combine these into fewer but larger TCRs.
- Bane NOR will, if possible, allow for openings for trains (primarily freight trains) in the event of TCRs with a long duration.
- Bane NOR will coordinate TCRs and alternative means of transport so that TCRs can be optimised and infrastructure capacity can be utilised in the best possible manner.

2.1.3 Principles for TCRs in adjacent areas

Concurrent scheduling of TCRs that are geographically adjacent can have a negative impact on services. Two principles are applied to reduce such impact:

- For a TCR for which there are alternative line sections (diversions), Bane NOR will conduct a capacity analysis to quality-assure that the alternative train paths have adequate capacity. In the event of a capacity gap, ordinary services must be prioritised ahead of diverted freight services, followed by diverted passenger services.
- TCRs must be planned in such a way that passengers within a transport corridor are not forced to use alternative transport for more than one section.

2.1.4 Periods for scheduled TCR windows

TCR windows can have a negative impact on services. These TCR windows are therefore scheduled during periods with minimal impact. Two principles are applied:

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- Scheduled maintenance windows can be used only for a limited part of the network and documentation must be drawn up showing that the utilisation rate for each maintenance window is 75% or more during the timetable period. The utilisation rate is calculated by looking at the proportion of a scheduled maintenance window for which applications are submitted and/or actually used.
- During particularly low-service times (Sunday night), scheduled maintenance windows can be reserved separately, subject to the same conditions mentioned above.

2.1.5 The TCR allocation process

Bane NOR's TCR allocation process includes activities intended to contribute towards minimising the negative impact on services. The bullet points below provide a simplified description of the process.

- X-11: Input data for the annual capacity allocation constitutes the planned TCRs with “very large”, “large” and “moderate” impact on service that the infrastructure manager intends to apply for. During the planning phase (X-60 – X-11), Bane NOR has conducted dialogue meetings with affected applicants, the Swedish Transport Administration and coordinating roles internally in accordance with the schedule set down in national legislation.
- X-11 – X-5.5 Bane NOR coordinates all planned TCRs with the service applications as part of the annual capacity allocation. Only TCRs with little or very little impact will be added as new or adjusted in connection with the development of train paths. Bane NOR will consult with affected stakeholders as needed.
- X-4: Bane NOR will publish an updated overview of all planned TCRs (with very large, large, moderate and little impact, as well as the TCR windows)
- X – X+12: Bane NOR will continuously publish updated overviews of TCRs with very little impact in accordance with the deadlines set out in the Railway Regulations, as well as coordinating applications with ad-hoc allocation applications. Bane NOR will consult with affected stakeholders as needed.
-

2.2 Expected TCRs with very large impact

No TCRs with very large impact on services during R26 are planned within the geographical scope of this strategy.

3 Service planning principles and service flow

3.1 Service planning principles

This chapter describes the service planning principles relevant to each part of the sections defined in Table 6. Later, these will be used to draw up capacity models that will be used in service planning and visualisation of service flow.

Principles:

Bane NOR has chosen to apply the RailNetEurope (RNE) service planning principles, with the exception of rolling planning, which will not be implemented in Bane NOR for the R26 timetable period.

- Bane NOR describes the overall expected service flow and volume for the timetable period in question for the sections covered by the capacity strategy.
- In order to detect differences in expected service flow on either side of the border crossings at an early stage, Bane NOR will harmonise the expected service flow with the Swedish Transport Administration.
- The Swedish Transport Administration's harmonisation has only included border points at Bjørnfjell and Kornsjø for the time table period of 2026. For the upcoming strategy (R27), other border points will also be included in the strategy.
- In the event that information is identified that could help optimise infrastructure capacity, Bane NOR will communicate such information to affected stakeholders.
- Bane NOR defines the degree of capacity utilisation for each section. Three degrees are used here: low capacity utilisation is < 70% of practical capacity, moderate capacity utilisation is between 70% and 100% of practical capacity and high capacity utilisation is > 100% of practical capacity. The difference between theoretical and practical capacity utilisation is that a slightly longer practical running time is calculated than the theoretical running time in order to make the timetable more resilient.
- Bane NOR calculates the prognosis for expected service flow by:
 - Calculating the existing service flow based on average calculations of historical service data presented using train categories, i.e. passenger and freight trains. This provides an objective overview of the current service flow.
 - In order to indicate a forecast for future service flow, existing service flow is used and combined with both permanent capacity changes (in Chapter 1) and the TCRs (in Chapter 2).
- Bane NOR prioritises creating capacity models for sections on which there are capacity conflicts.
- Each year, Bane NOR publishes the timetable for passenger and freight trains, as well as TCR plans.
- Bane NOR publishes pre-planned routes for cross-border freight transport for corridor C03 across Kornsjø.

Elements:

The train categories below are in accordance with the RNE definitions, with the following exceptions: RNE operates with the category *high-speed trains*. This category is not applicable to Bane NOR. Bane NOR has added the category *local trains*, which is not mentioned by RNE

Passenger train categories:

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Long-distance trains – Trains that are operated to transport passengers between urban regions and other regions in Norway, as well as between Norway and abroad. Long-distance trains stop at stations outside of the area covered by regional train services.

Regional express trains – Trains that are operated to transport passengers within a region and that run with a reduced stop pattern.

Regional trains – Trains that are operated to transport passengers within a region.

Local trains – Trains that are operated to transport passengers between the city centre and suburbs in urban areas and that stop at all stations.

Freight train categories:

Wagonload trains – Trains that are operated to transport freight and in which different wagons carry different products and for which the smallest consignment is one freight wagon.

System trains – Trains that are operated to transport freight at regular intervals and usually carry only a single product group without any market-related stops during the journey.

Combination trains – Trains that are operated to transport containers, semi-trailers and trailer and railway containers as part of an intermodal transport chain.

Capacity utilisation:

The overview from “Norwegian Railway Directorate, capacity monitoring and service capacity, capacity situation and capacity utilisation in the Norwegian rail network during 2019” (Jernbanedirektoratet, kapasitetsmonitorering og trafikk kapasitet, kapasitetssituasjon og kapasitetsutnyttelse på det norske jernbanenettet i året 2019.pdf) has been used as the basis for describing capacity utilisation in the sections. In 2023, Bane NOR intends to take over the work of preparing an overview showing possible capacity utilisation.

Table 5 Service planning principles

Border crossing	Line	Sectional groups	Section	Principles and elements
Kornsjø border crossing (NO)	Freight track	Alnabru – Loenga	Alnabru – Loenga	Moderate capacity utilisation International and national freight trains.
	Follo Line	Oslo – Ski	Oslo – Ski	Regional trains, 6 trains per hour in both directions
	Østfold Line	Oslo Central Station – Halden	Oslo – Ski	High capacity utilisation Local trains, regional trains, long-distance trains, national and international freight trains. Local trains, 4 trains per hour in both directions. Freight trains, 1 train per hour in both directions.
			Ski – Halden	Moderate capacity utilisation Local trains, regional trains, long-distance trains, national and international freight trains. Regional trains, Ski–Moss, 2 trains per hour in both directions. Regional trains, Ski–Halden, 1 train per hour in both directions, 2 trains in the peak direction. Freight trains, 1 train per hour in both directions
		Halden – Kornsjø border crossing	Halden – Kornsjø border crossing	Low capacity utilisation

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Border crossing	Line	Sectional groups	Section	Principles and elements
				Regional trains and international freight trains. Regional trains, 4 trains per day in both directions. 7 freight trains per day in both directions. One of the regional trains continues as a High-speed train when crossing the border to Sweden.
Border crossing	Line	Sectional groups	Section	Principles and elements
Charlottenberg border crossing (SE)	Dovre Line	Kvam – Lillehammer	Hove – Kvam	High capacity utilisation Regional trains, long-distance trains, national and international freight trains.
			Hove – Lillehammer	High capacity utilisation Regional trains, long-distance trains, national and international freight trains.
		Hamar – Lillehammer	Hamar – Lillehammer	Moderate capacity utilisation Regional trains, long-distance trains, national and international freight trains. Regional trains, 1 train per hour/direction Long-distance trains, 6 trains per direction/day Freight trains, up to 2 trains per hour/direction
		Sørli – Hamar	Sørli – Åkersvika	Moderate capacity utilisation double track will not be completed until 2025. Regional trains, long-distance trains, national and international freight trains. Regional trains, 1 train per hour/direction, 2 trains in the morning and afternoon in the peak direction. Long-distance trains, 6 trains per direction/day Freight trains, up to 2 trains per hour/direction
			Hamar – Åkersvika	Moderate capacity utilisation double track will not be completed until 2025. Regional trains, long-distance trains, national and international

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Border crossing	Line	Sectional groups	Section	Principles and elements
				freight trains. Regional trains, 1 train per hour/direction, 2 trains in the morning and afternoon in the peak direction. Long-distance trains, 6 trains per direction/day Freight trains, up to 2 trains per hour/direction
	Røros Line	Hamar – Elverum	Elverum – Hamar	Low capacity utilisation Regional trains, national and international freight trains. Regional trains, 1 train every other hour per direction.
			Elverum – Hovdmoen	Moderate capacity utilisation Regional trains, national and international freight trains. Regional trains, 1 train every other hour per direction.
		Elverum – Koppang	Hovdmoen – Koppang	Moderate capacity utilisation Regional trains, national and international freight trains. Regional trains, 1 train every other hour per direction.
	Solør Line	Elverum – Kongsvinger	Braskereidfoss – Elverum	Low capacity utilisation National and international freight trains.
			Braskereidfoss – Kongsvinger	Moderate capacity utilisation National and international freight trains.
	Gardermoen Line	Oslo Central Station – Lillestrøm	Lillestrøm – Oslo Central Station	High capacity utilisation Regional trains and long-distance trains. Regional trains, 12 trains (including the airport express train) in each direction per hour. Long-distance trains (Charlottenberg) Lillestrøm – Oslo, 2 trains per day in both directions. Long-distance trains (Trondheim) Lillestrøm – Oslo, 6 trains per day in both directions.
	Hoved Line		Alnabru – Lillestrøm	Moderate capacity utilisation

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Border crossing	Line	Sectional groups	Section	Principles and elements
	Kongsvinger Line	Lillestrøm – Kongsvinger	Kongsvinger – Lillestrøm	Local trains, national and international freight trains. Local trains, 4 trains in each direction per hour.
				High capacity utilisation Local trains, regional trains, long-distance trains, national and international freight trains. Regional trains, Asker – Kongsvinger, 1 train per hour in both directions. Long-distance trains, Charlottenberg – Oslo, 5 trains per day in both directions.
		Kongsvinger – Charlottenberg border crossing	Kongsvinger – Charlottenberg border crossing	High capacity utilisation Regional trains, long-distance trains and international freight trains. Long-distance trains, Charlottenberg – Kongsvinger, 2 trains per day in both directions. Long-distance trains, Charlottenberg – Oslo, 5 trains per day in both directions.
Border crossing	Line	Sectional groups	Section	Principles and elements
Storlien border crossing (SE)	Nordland Line	Trondheim Central Station – Hell	Trondheim Central Station – Leangen	Moderate capacity utilisation Local trains, regional trains, long-distance trains and national freight trains. Regional trains, 1 train per hour/direction, 2 additional trains per day in the peak direction. Meråker Line, regional trains, 3 trains per day/direction. Long-distance trains, 3 trains per day/direction Freight trains, 6–7 trains per day/direction
			Leangen – Hell	Moderate capacity utilisation Local trains, regional trains, long-distance trains and national freight trains. Regional trains, 1 train per hour/direction, 2 additional trains per day in the peak direction. Meråker Line, regional trains, 3 trains per day/direction. Long-distance trains, 3 trains per day/direction

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Border crossing	Line	Sectional groups	Section	Principles and elements
				Freight trains, 6–7 trains per day/direction
	Meråker Line	Hell–Storlien border	Hell – Storlien border crossing	Low capacity utilisation Regional trains, 3 trains per day/direction
Bjørnfjell border crossing (NO)	Ofoten Line	Narvik – Bjørnfjell border crossing	Narvik – Bjørnfjell border crossing	Moderate capacity utilisation Regional trains and international freight trains.

3.2 Service flow

This chapter provides an overall description of the service flow and volume that can be expected for the timetable period in question in the sectional groups covered by the capacity strategy. For border crossings, this will be viewed in relation to the Swedish Transport Administration's expected service flow, in order to highlight any differences in expected services across the borders at an early stage. In the event that useful information that can help optimise information capacity is identified, such information should be communicated to the affected stakeholders.

The expected service flow picture is based on average calculations performed using historical service data presented using transport service categories, e.g. passenger and freight trains. This provides an objective overview of the current service flow. By viewing this in line with the planned changes, as presented in chapter 1 and 2 of the capacity strategy, this provides an indication of where in the rail network and to what degree the service picture may change.

This insight will be used and further detailed continuously in the ongoing planning and harmonisation work on the capacity model until a complete pre-planned timetable (capacity offering) has been created.

Bane NOR will facilitate the calculation of historical data at the same time as the capacity model is developed. The expected service flow for the R26 timetable period will therefore not be based on historical data. The ambition is for this to be described in the R27 capacity strategy.

Table 7 Expected service flow at border crossings

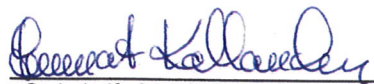
Bane NOR's rail network	The Swedish Transport Administration's rail network
Kornsjø/Ed	
• 4 regional trains per day in both directions. • 7 freight trains per day in both directions (7 freight trains per day were requested for R23 and this expectation is therefore considered realistic) Greater flexibility, with two new stabling spaces for single train sets (110 m) at Ski station. The Follo Line will not provide more capacity for cross-border services, only relief between Oslo and Ski. May lead to better reliability for cross-border freight services.	One of the regional trains continues as a High-speed train when crossing the border to Sweden.
Kongsvinger/Charlottenberg	
• 2 regional trains per day in both directions (Charlottenberg – Kongsvinger) • 5 long-distance trains per day in both directions (Charlottenberg – Oslo). • 6 freight trains (container trains) per day in both directions • 6 freight trains (timber trains) per day in both directions Two new side platforms at Skarnes station, accommodating 220 metre long trains (double train sets). New level crossing-free access to side platforms will reduce the risk of collisions. Improvements to safety and flexibility, passing trains can maintain higher speeds.	This bordercrossing is not included in the strategy for R26. <i>(For the upcoming strategy (R27), other border points will also be included)</i>
Hell/Storlien	
• 3 regional trains per day in both directions • 1 long-distance train per day in both directions (Stockholm – Trondheim) • 1 freight train per day in both directions Electrification will provide the opportunity to run more passenger train types. This will also provide the opportunity to run freight trains.	This bordercrossing is not included in the strategy for R26. <i>(For the upcoming strategy (R27), other border points will also be included)</i>
Bjørnfjell/Vassijaure	
• 4 long-distance trains per day in both directions (2 Stockholm–Narvik and 2 Narvik–Luleå) • 4 regional trains per day in both directions (charter trains) • 15 freight trains per day in both directions (ore trains) • 13 freight trains per week in both directions (container trains)	

If the service flows are not identical, the cause must be identified and explained, e.g. by a service flow being a national service only, the destination of which is at the border.

4 Validation

Here, high-level representatives of the infrastructure manager and all involved infrastructure managers (e.g. heads of capacity management departments) will sign to confirm that the final capacity strategy will be taken into account.

Date: 25/3-23


On behalf of the Swedish Transport
Administration
Lennart Kalander


On behalf of Bane NOR

5 Reference documents

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Appendix A: Model for infrastructure and topology in the TTR domain

Primary location: Locations in the rail network at which trains can start, stop, cross and pass, as well as agreed boundary points for capacity allocations between two neighbouring infrastructure managers. For example, stations, sidings for loading/unloading and agreed transfer points for capacity allocations between two infrastructure managers.

Secondary location: Locations in the rail network that are not primary locations and where trains may exchange passengers. For example stops.

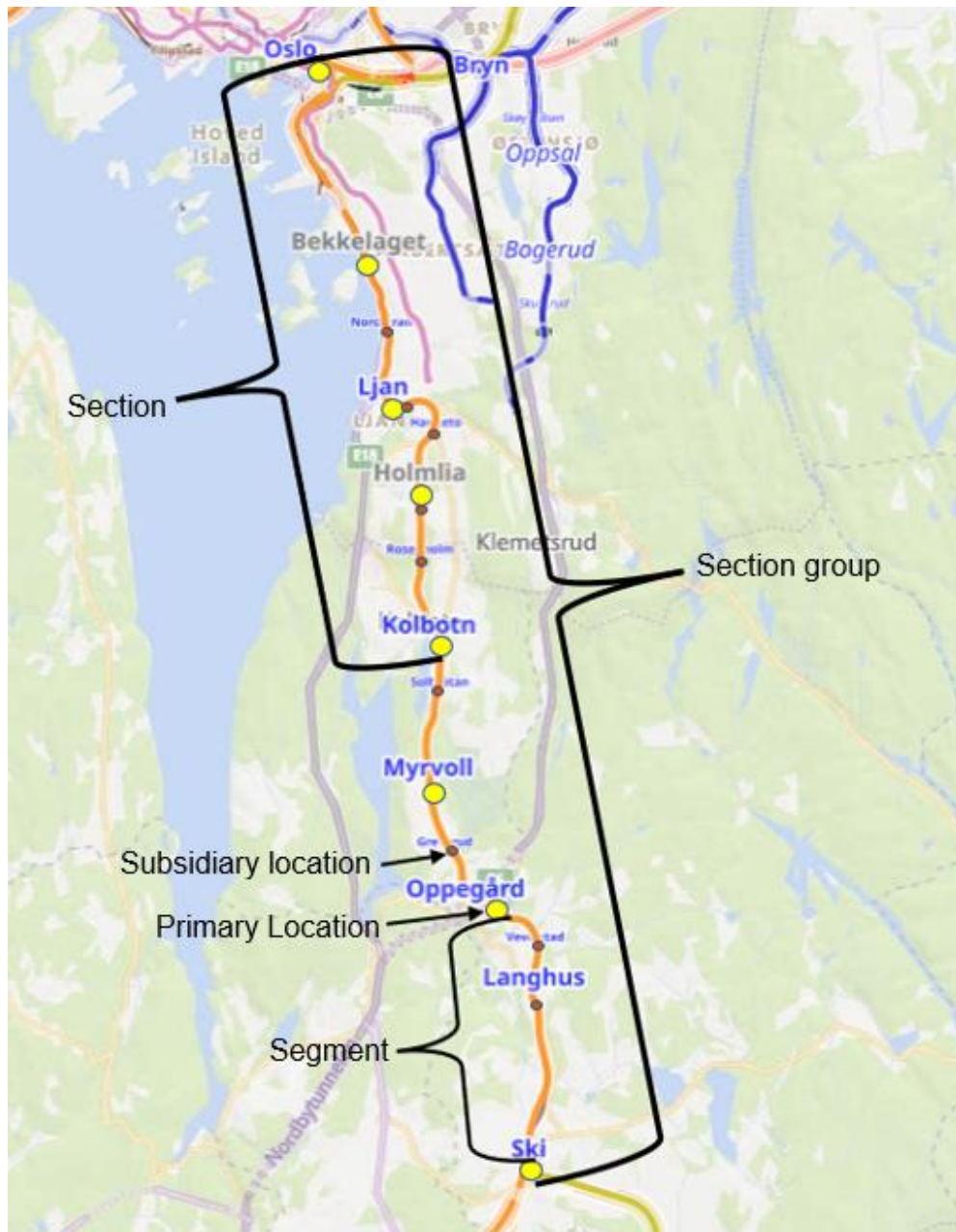
Segment: The link between two neighbouring primary locations.

Section: A section is a part of a line bounded by stations at which the service volume changes. A section can also be bounded by a starting station/terminal station and an agreed boundary point for capacity allocation between two neighbouring infrastructure managers.

Sectional group: A collection of sections that can be used to support different work processes, e.g. for the purpose of defining a line offering.

Topologimodell





Topology contextualised for the Østfold Line

Appendix B: Overview of sections

Sections

Line	Section		Type of siding
Alna Line	Grefsen	Alnabru	Single
Arendal line	Nelaug	Arendal	Single
Asker line	Lysaker	Sandvika	Double
Asker line	Sandvika	Asker	Double
Bergen Line	Hønefoss	Sokna	Single
Bergen Line	Sokna	Myrdal	Single
Bergen Line	Myrdal	Voss	Single
Bergen Line	Voss	Stanghelle	Double
Bergen Line	Stanghelle	Arna	Double
Bergen Line	Arna	Bergen	Single
Bratsberg line	Nordagutu	Skien	Single
Bratsberg line	Skien	Porsgrunn	Single
Brevik Line	Myrane	Ørvik	Single
Dovre Line	Eidsvoll	Sørli	Double
Dovre Line	Sørli	Akersvika	Double
Dovre Line	Akersvika	Hamar	Single
Dovre Line	Hamar	Lillehammer	Single
Dovre Line	Lillehammer	Hove	Single
Dovre Line	Hove	Kvam	Single
Dovre Line	Kvam	Dombås	Single
Dovre Line	Dombås	Støren	Single
Dovre Line	Støren	Melhus	Single
Dovre Line	Melhus	Heimdal	Single
Dovre Line	Heimdal	Marienborg	Single
Drammen Line	Oslo Central Station	Skøyen	Double
Drammen Line	Skøyen	Lysaker	Double
Drammen Line	Lysaker	Høvik	Double
Drammen Line	Høvik	Sandvika	Double
Drammen Line	Sandvika	Asker	Double
Drammen Line	Asker	Drammen	Double
Flåm Line	Myrdal	Flåm	Single
Follo Line	Oslo Central Station	Ski	Double
Gardermoen Line	Oslo Central Station	Lillestrøm	Double
Gardermoen Line	Lillestrøm	Kløfta	Double
Gardermoen Line	Kløfta	Langeland	Double
Gardermoen Line	Langeland	Gardermoen	Double

Line	Section		Type of siding
Gardermoen Line	Gardermoen	Eidsvoll	Double
Gjøvik Line	Oslo Central Station	Grefsen	Double
Gjøvik Line	Grefsen	Hakadal	Single
Gjøvik Line	Hakadal	Roa	Single
Gjøvik Line	Roa	Jaren	Single
Gjøvik Line	Jaren	Gjøvik	Single
Freight track	Loenga (Oslo Central Station)	Alnabru	Single
Hoved Line	Oslo Central Station	Alnabru	Double
Hoved Line	Alnabru	Lillestrøm	Double
Hoved Line	Lillestrøm	Kløfta	Single
Hoved Line	Kløfta	Langeland	Single
Hoved Line	Langeland	Jessheim	Single
Hoved Line	Jessheim	Dal	Single
Hoved Line	Dal	Eidsvoll	Single
Kongsvinger Line	Lillestrøm	Kongsvinger	Single
Kongsvinger Line	Kongsvinger	Charlottenberg border crossing	Single
Meråker Line	Hell	Storlien border crossing	Single
Nordland Line	Trondheim	Leangen	Single
Nordland Line	Leangen	Hell	Single
Nordland Line	Hell	Værnes	Double
Nordland Line	Værnes	Stjørdal	Single
Nordland Line	Stjørdal	Skogn	Single
Nordland Line	Skogn	Steinkjer	Single
Nordland Line	Steinkjer	Mosjøen	Single
Nordland Line	Mosjøen	Mo i Rana	Single
Nordland Line	Mo i Rana	Ørtfjell	Single
Nordland Line	Ørtfjell	Rognan	Single
Nordland Line	Rognan	Fauske	Single
Nordland Line	Fauske	Bodø	Single
Ofoten Line	Narvik	Bjørnfjell border crossing	Single
Randsfjord Line	Hokksund	Hønefoss	Single
Rauma Line	Dombås	Åndalsnes	Single
Ringerike Line	Sandvika	Hønefoss	Double
Roa–Hønefoss Line	Roa	Hønefoss	Single
Røros Line	Hamar	Elverum	Single
Røros Line	Elverum	Hovdmoen	Single
Røros Line	Hovdmoen	Koppang	Single
Røros Line	Koppang	Røros	Single
Røros Line	Røros	Støren	Single
Solør Line	Kongsvinger	Braskereidfoss	Single
Solør Line	Braskereidfoss	Elverum	Single

Line	Section		Type of siding
Spikkestad Line	Asker	Spikkestad	Single
Stavne–Leangen Line	Marienborg	Leangen	Single
Sørland Line	Drammen	Gulskogen	Double
Sørland Line	Gulskogen	Hokksund	Single
Sørland Line	Hokksund	Kongsberg	Single
Sørland Line	Kongsberg	Hjuksebø	Single
Sørland Line	Hjuksebø	Nordagutu	Single
Sørland Line	Nordagutu	Bø	Single
Sørland Line	Bø	Lunde	Single
Sørland Line	Lunde	Nelaug	Single
Sørland Line	Nelaug	Vatnestraum	Single
Sørland Line	Vatnestraum	Langemyr	Single
Sørland Line	Langemyr	Dalane	Single
Sørland Line	Dalane	Kristiansand	Single
Sørland Line	Dalane	Nodeland	Single
Sørland Line	Kristiansand	Nodeland	Single
Sørland Line	Nodeland	Egersund	Single
Sørland Line	Egersund	Nærbø	Single
Sørland Line	Nærbø	Ganddal	Single
Sørland Line	Ganddal	Skeiane	Single
Sørland Line	Skeiane	Stavanger	Double
Tinnos Line	Notodden	Hjuksebø	Single
Vestfold Line	Drammen	Tønsberg	Double
Vestfold Line	Tønsberg	Stokke	Single
Vestfold Line	Stokke	Sandefjord	Double
Vestfold Line	Sandefjord	Martineåsen	Single
Vestfold Line	Martineåsen	Myrane	Double
Vestfold Line	Myrane	Porsgrunn	Single
Østfold Line	Oslo Central Station	Ski	Double
Østfold Line	Ski	Moss	Double
Østfold Line	Moss	Haug	Double
Østfold Line	Haug	Rolvsøy	Single
Østfold Line	Rolvsøy	Sarpsborg	Single
Østfold Line	Sarpsborg	Berg	Single
Østfold Line	Berg	Halden	Single
Østfold Line	Halden	Kornsjø border crossing	Single
Østre Line	Ski	Kråkstad	Double
Østre Line	Kråkstad	Mysen	Single
Østre Line	Mysen	Rakkestad	Single
Østre Line	Rakkestad	Sarpsborg	Single

Appendix C: Project list of expected improvements in provision

Project name	Project proposal created	Project approved by the Portfolio Board	Funding secured	Expected date of commissioning	Expected improvements in provision
Partial electrification of the Trønder and Meråker Lines	Yes	Yes	Yes	30/12/2024	<i>Electrification of the Trondheim Central Station–Stjørdal, Hell–national border and Stavne–Leangen lines. Newer, more modern and more environmentally friendly trains. Better comfort and greater capacity for freight and passenger trains</i>
Venjar–Langset	Yes	Yes	Yes	31/12/2023	<i>Double track through Eidsvoll. Shorter journey time, improved punctuality and greater train capacity</i>
Drammen–Kobbervikdalen	Yes	Yes	Yes	11/08/2025	<i>Double track from Drammen to Kobbervikdalen, functional double track from Drammen to Gulslogen and extensive work at Drammen station. Allows for 4 trains per hour in each direction between Oslo Central Station and Tønsberg</i>
Nykirke–Barkåker	Yes	Yes	Yes	11/08/2025	<i>Double track from Nykirke to the south of Holmestrand to Barkåker to the north of Tønsberg. Allows for 4 trains per hour in each direction between Oslo Central Station and Tønsberg</i>
Entry Barkåker–Tønsberg			No	11/08/2025	<i>Upgrades to Tønsberg station with the completion of the double track to the station (four new tracks into the station), new platform and universal design. Allows for 4 trains per hour in each direction between Oslo Central Station and Tønsberg</i>
Stabling in Drammen			No	25/08/2025	<i>16 stabling spaces for single train sets. There will be 35 stabling spaces at Sundland</i>

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Project name	Project proposal created	Project approved by the Portfolio Board	Funding secured	Expected date of commissioning	Expected improvements in provision
Stabling in Kongsberg	Yes	Yes	Yes	03/10/2023	Six stabling spaces for single train sets. From 7 to 13 stabling spaces
Stabling in Tønsberg	Yes	Yes	Yes	11/08/2025	There will be 14 stabling spaces for single train sets at Barkåker
Stabling in the Eidsvoll/Dal area			No	-	2 at Eidsvoll and none at Dal There will be 12 stabling spaces
Stabling in the Kongsvinger area			No	20/12/2025	+ 3 stabling spaces for single train sets. 2 of the spaces exist as temporary spaces and may become permanent
Platform extension Movatn and Hakadal			No	-	Movatn: two new side platforms for track 1 and 2. Pedestrian bridge, with lift, crossing the tracks Hakadal: two new platforms of 110 metres on each side of the station. Level crossing-free crossing with culvert
Nygårdstangen – Bergen – Fløyen	Yes	Yes	Yes	04/03/2024	New double track between Bergen station and Fløyen. Conversion of the freight terminal at Nygårdstangen. Zero-emission freight terminal, allowing for 4 trains per hour between Arna and Bergen

Appendix D: TCRs with very large impact in R26

This table shows TCRs with very large impact on service in R26 and that fall outside of the geographical scope of this strategy.

TCR (TCR ID and brief description)	Project proposal defined		Project approved by Bane NOR	Funding secured	Comments Furthering the maturation of the project	Consequence
DRM02152 VB02154 UDK Drammen station 6 weeks	Yes	R25	Yes	Yes	The project has been funded and approved.	Drammen station and the Vestfold Line to Tønsberg will be closed between 28/06/2025 and 11/08/2025. Trains will be able to turn at Brakerøya, Gulsbogen and Tønsberg. Access to Sundland from Gulsbogen.
DRM02208 UDK Drammen station 8 months	Yes	R25	Yes	Yes	The project has been funded and approved.	Tracks 4-5-6 at Drammen station will be closed from 08/12/2024 to 10/08/2025. Tracks 1-2-3 will remain in operation

Appendix E: List of all stakeholders

Stakeholder type		Stakeholder		
Involved infrastructure manager		Swedish Transport Administration		
Terminals	Freight terminals	Alnabru freight terminal Bodø freight terminal Bergen freight terminal, Nygårdstangen Drammen freight terminal, Holmen Fauske freight terminal	Heggstadmoen Kristiansand freight terminal, Langemyr Lademoen Mo i Rana freight terminal Mosjøen freight terminal	Narvik freight terminal, Fagernes Sandnes freight terminal, Ganddal Trondheim freight terminal, Brattøra Åndalsnes freight terminal
	Timber terminals	Atna Auma Berg Borgestad Borregård Brandval Braskereidfoss Bø Flesberg Follum Formofoss	Hauerseter Hensmoen Hovdmoen Hove/Lillehammer Hønefoss Jevnaker Kasa sidings (Halden) Koppang Kvam Larvik Port	Lierstranda Lunde Nesbyen Norsenga Notodden Otta Simonstad/Nelaug Sokna Sørli/Hamar Vestmo/Elverum
Service facilities	Rail yards and storage sidings	Barkåker stabling, Vestfold Line, opens 2025 Dal Drammen Drammen/Nybyen Drammen/Skamarken Drammen/Sundhaugen Drammen/Sundland Eidsvoll Elverum Gjøvik Hakadal Halden	Hamar Høvik Jaren Kongsberg Kongsvinger Larvik Lillehammer Lillestrøm Moss Mysen Notodden	Oslo/Filipstad Oslo/Lodalen Oslo/Loenga Oslo Central Station/Haven Rakkestad Sarpsborg Ski Skien Skien / Borgestad Spikkestad Årnes
	Maintenance facilities/workshops	Narvik – Trekanten Narvik – Fagernes Bodø Mosjøen Trondheim – Marienborg Trondheim – Brattøra Støren Hamar	Kongsvinger Oslo – Grorud Oslo – Alnabru Oslo – Lodalen Oslo – Filipstad Drammen – Sundland Hokksund	Ål Voss Bergen Flåm Skien Kristiansand – Krossen Stavanger – Kvaleberg

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Stakeholder type		Stakeholder		
	Port facilities	Bodø	Halden	Narvik, Fagernes
		Brevik	Kristiansand Glencore Nikkelverk AS	Oslo, Sjørøya
		Drammen, Holmen	Kristiansand Port	Skien Borgestad
		Drammen, Lier	Larvik Revet	Åndalsnes
		Drammen, Tangen/Strømsø	Mosjøen	
	Relief facilities	Kvam	Støren	Steinkjer
		Palmafoss Voss		
	Refuelling facilities	Alnabru	Marienburg	Steinkjer
		Bodø	Mo i Rana	Åndalsnes
		Hamar	Røros	
Sidings	Bratsberg line	Borgestad	Track 12	
		Skien	Track 7	
		Skien	Track 8	
	Brevik Line	Eidanger	Bjørntvedt sidings, track 12	
		Eidanger	Tangenkaia	
		Eidanger	Ørvik	
	Dovre Line	Fåberg	Fåberg converter	
		Hamar	Ideal sidings	
		Hamar	Martodden Railway Museum	
		Strandlykkja	Kleverud operation track	
	Drammen Line	Brakerøya	Lierstranda	
		Brakerøya	Lier terminal	
		Drammen	Freight terminal, Drammen	
		Drammen	Holmen	
		Drammen	Sidings, Sundland	
	Gardermoen Line	Lillestrøm	Møller track	
	Gjøvik Line	Grefsen	Fundia	
	Hoved Line	Hauersetser	Hauersetser sidings	
	Kongsvinger Line	Kongsvinger	Gropa SS	
		Kongsvinger	Gropa SS private	
		Kongsvinger	Tarven sidings	
		Skarnes	Mangå sidings, sawmill	
	Nordland Line	Hell	Murruvik Port	
		Hell	Murruvik sidings	
		Hell	Murruvik sidings	
		Majavatn	Sefrivatn crushing plant	
		Mo i Rana	Km 499,868 Eka track	
		Mo i Rana	Km 500,728 Track 204	
		Rognan	ROG.Nexans original	
		Rognan	ROG.Nexans latest	
		Ørtfjell	Km 534,649 Ørtfjell sidings	
	Ofoten Line	Narvik	Quay track 1 and 2	
	Røros Line	Auma	Sidings 2 Auma SPV.1 – SPV 2 Stabling length 239 m	
		Auma	Sidings 3 Auma SPV 3 – SST Stabling length 206 m	

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Stakeholder type	Stakeholder	
Solør Line	Auma	Sidings 4 Auma SPV 7 – SST Stabling length 206 m
	Hamar	Illseng sidings Track 2
	Hamar	NKL SSP
	Løten	Imregnor
	Rena	Hovdmoen sidings/Timber terminal (TPS 0087)
	Braskereidfoss	Track 19 SST – SPV 19
	Braskereidfoss	Track 21 butt – SPV 21
	Braskereidfoss	Track 23 butt – SPV 23
	Braskereidfoss	Track 4 Timber track
	Braskereidfoss	Track 5 SPV 6 – SPV 5
Sørland Line	Braskereidfoss	Track 7 Chip track SST – SPV 7
	Flisa	Flisa Grain Silo
	Kirkenær	Industrial track, Kirkenær
	Kongsvinger	Brandv.Sag sidings
Vestfold Line	Hokksund	Teigen loop
	Vatnestrøm	Vatnestrøm
Østfold line, western line	Larvik	Lågen converter
	Larvik	Revet
Østfold line, western line	Moss	Timber track, Höegh Eiendom