



# Capacity Strategy 2025

TTR Scandinavian Pilot



Co-financed by the Connecting Europe  
Facility of the European Union

**BANENOR**



**TRAFIKVERKET**



**BANEDANMARK**

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## Document presentation

This is the final version of the Scandinavian TTR pilot project Alnabru (Oslo - Gothenburg - Malmö - Copenhagen - Padborg) Capacity Strategy document, written according to RNE's Capacity Strategy Handbook, version 1.0 (RailNetEurope, 2021). The document is valid for the timetable year 2025 ("TT2025"). The geographical scope of this document is described in the Pilot Introduction. An overview of the planned available infrastructure capacity is provided on the line sections specified below, including expected improvements and major temporary restrictions.

The document has five main chapters: Pilot Introduction, Expected capacity of infrastructure, Temporary Capacity Restrictions, Traffic planning principles, and Reference documents, followed by Appendices focusing on specific topics. Each chapter is divided into Norwegian (Bane NOR), Swedish (Trafikverket) and Danish (Banedanmark and A/S Storebælt) sub-chapters, where the national information on the chapter topic is given. The Swedish-Danish cross-border section, managed by Øresundsbro Konsortiet, is included in the Danish chapters for simplicity.

The target groups for this document include Railway Undertakings, Non-Railway-Undertaking customers, political decision makers and other stakeholders. Other Infrastructure Managers and service facility and terminal operators can use this document as a coordination tool for long term planning at international level.

## Legal ground

A basic principle of directive 2012/34/EU establishing a single European railway area (SERA), and the national legislation implementing it, is to meet the market demand for rail capacity as far as possible. This shall be the aim of infrastructure managing and capacity allocation.

According to Article 83 of SERA, the infrastructure manager shall adopt a business plan designed to ensure optimal and efficient use, provision, and development of the infrastructure. The infrastructure managers are also obliged to assess the need for different types of transport services and to plan for meeting such need.

This capacity strategy is connected to the TTR-project, aiming at achieving a new planning and allocation process but the purpose of this document, to roughly indicate potential future usage of the infrastructure concerned, is thus also considered as compliant with current railway legislation. This strategy is a mere assessment of possible future scenarios under evolving market demand and the real outcome of the planning and allocation process may differ from this strategy.

## Timeline

The final Capacity Strategy document was prepared in two main steps. The work on Capacity Strategy started with input collection in July 2021 to create a first draft document for September 2021, where input from all the

stakeholders is collected continuously. The input collected was integrated in the final document to be published and validated by June 2022, after harmonization of the different requests and needs from the neighboring IMs.

- July 2021: Start of the Capacity Strategy phase for TT2025
- July 2021 – April 2022: Input collection and creation of draft Capacity Strategy 2025
- April 2022 - May 2022: Harmonization of Capacity Strategy 2025
- June 2022: Validation and publication of Capacity Strategy 2025

A Capacity Strategy document for TT2026 will be elaborated between January and December 2022. The elaboration times of the document for different years are not aligned due to the initial transitional period, which is expected to impact Timetable Years up to TT2028.

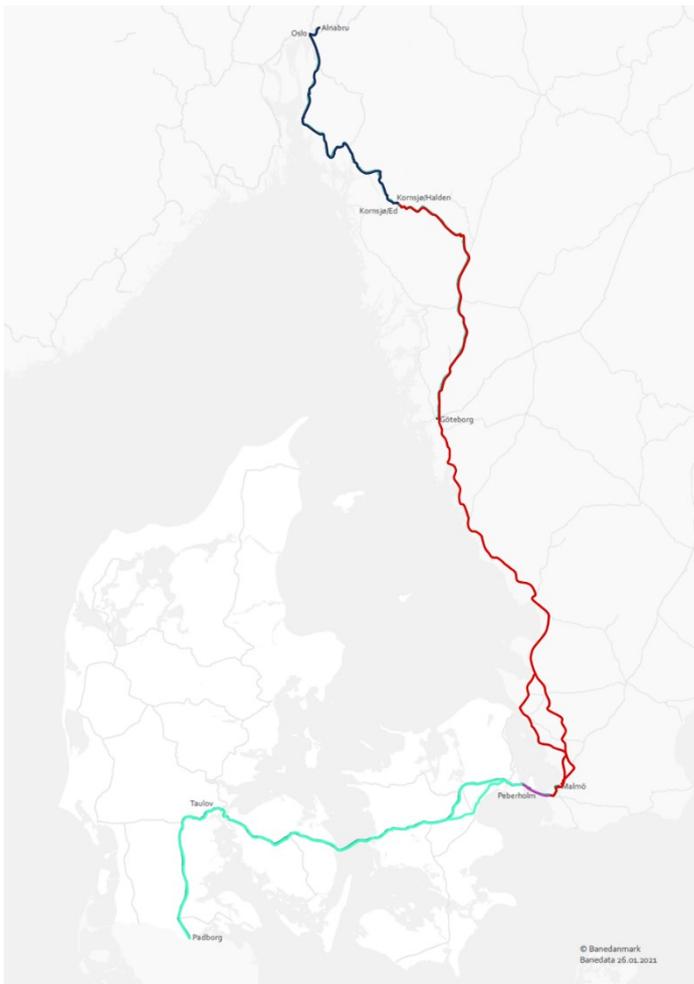
## 0 Pilot Introduction

This Capacity Strategy document covers the Timetable Year 2025 (TT2025) for the whole pilot line. During 2022 and 2023, a Capacity Model for TT2025 will be created and presented in a dedicated document.

The following line sections are included in the Scandinavian TTR pilot project for TT2025:

- Norway (Bane NOR): Alnabru (Oslo) - Kornsjø
- Sweden (Trafikverket): Kornsjö - Gothenburg - Malmö - Peberholm
- Øresund fixed link: Malmö – Peberholm – Copenhagen airport (Øresundsbro Konsortiet)
- Denmark (Banedanmark): Copenhagen airport – Padborg

The pilot scope will be extended every year to eventually cover the whole national networks in the Capacity Strategy document for TT2027. The pilot document will be divided into single national documents when the TTR project is fully implemented in all the participating countries, expectedly for TT2027. Illustration 0.1 provides an overview of the pilot line extension for TT2025 across borders and IMs.



**Illustration 0.1 - Overview of the Scandinavian Pilot Line**

Color coding shows the different infrastructure managers. Blue: Bane NOR; Red: Trafikverket; Purple: Øresundsbro Konsortiet; Light Green: Banedanmark.

A detailed description of the individual national sections, covering the different IMs involved, is provided below.

## 0.1 Norway

### 0.1.1 Railway Infrastructure Managers

The Norwegian line section between Alnabru – Oslo – Kornsjø is managed by Bane NOR. The only neighboring IM is Trafikverket, sharing the border at Kornsjø.

### 0.1.2 List of involved stakeholders

The list of service facilities currently operating and relevant contact information can be retrieved on Bane NOR's Network Statement document (§7), available at [Network Statement 2023 kapittel 7](#)

Stakeholder	Roles and involvement
Involved Infrastructure managers	Trafikverket
Terminals	<ul style="list-style-type: none"> <li>· Alnabru</li> </ul>
Service facilities	Depot tracks: <ul style="list-style-type: none"> <li>· Lodalen</li> <li>· Loenga</li> </ul>
	<ul style="list-style-type: none"> <li>· Haven</li> </ul>
	<ul style="list-style-type: none"> <li>· Alnabru</li> </ul>
	<ul style="list-style-type: none"> <li>· Sjursøya</li> </ul>
	<ul style="list-style-type: none"> <li>· Halden</li> </ul>

**Table 0.1 – List of involved stakeholders in Norway**

## 0.2 Sweden

### 0.2.1 Railway Infrastructure Managers

The Swedish line section between Kornsjø – Gothenburg – Malmö is managed by Trafikverket. Neighboring IMs are Bane NOR and Øresundsbro Konsortiet, at the borders Kornsjø, and Lernacken, respectively. Due to the limited extension of the Øresund fixed link and the natural extension of the traffic beyond Copenhagen Airport Kastrup, Banedanmark is also considered as a neighboring IM and is invited to provide input to this document. Trafikverket is in charge of traffic planning over the whole line between Peberholm and Kornsjø.

### 0.2.2 Terminals and service facilities

The list of service facilities currently operating and relevant contact information can be retrieved on Trafikverket's [Network Statement](#).

### 0.2.3 Railway Infrastructure Managers

The Danish line section from Copenhagen Airport to Padborg is managed by two IMs: Banedanmark and A/S Øresund. Both are owned 100% by the Danish state. A/S Øresund manages the sections from Copenhagen Airport Kastrup to Copenhagen Central Station and Vigerslev. The Øresund Link itself from Copenhagen Airport Kastrup to Lernacken is managed by Øresundsbro Konsortiet I/S, owned by the Danish state and the Swedish state through A/S Øresund (50%) and SVEDAB AB (50%), respectively. 50% of Sund & Belt (Danish state) owns the Great Belt Link through its subsidiary A/S Storebælt. Both Korsør and Nyborg stations are included. Ownership covers infrastructure development and maintenance. The rest of the line is managed by Banedanmark. Banedanmark is in charge of traffic planning and management over the whole line between Peberholm and Padborg. Neighboring IMs are DB Netz and Øresundsbro Konsortiet, sharing the borders at Padborg and Copenhagen Airport Kastrup stations, respectively. Due to the limited extension of the Øresund fixed link and the natural extension of the traffic beyond Lernacken, Trafikverket is also considered as a neighboring IM and is invited to provide input to this document.

### 0.2.4 List of involved stakeholders

Stakeholder	Roles and involvement
Involved Infrastructure managers	Trafikverket, DB Netz, Øresundsbro Konsortiet
Terminals	<ul style="list-style-type: none"> <li>· Høje Taastrup Kombiterminal (Banedanmark)</li> <li>· Taulov Kombiterminal (Banedanmark)</li> <li>· Padborg Kombiterminal (TX Logistik)</li> <li>· Esbjerg Havn (Port of Esbjerg)</li> <li>· Aarhus Havn (APM Terminals)</li> <li>· Aalborg Havn Terminal (Port of Aalborg)</li> <li>· Hirtshals Havn Terminal (Municipality of Hjørring)</li> </ul>
Service facilities	Depot tracks: <ul style="list-style-type: none"> <li>· Copenhagen Airport Kastrup</li> <li>· Copenhagen Central Station</li> <li>· Roskilde</li> <li>· Ringsted</li> <li>· Odense</li> <li>· Fredericia</li> <li>· Padborg</li> </ul>

**Table 0.2 – List of involved stakeholders in Denmark**

# 1 Expected capacity of infrastructure

In this chapter, an overview of the different railway infrastructure projects affecting capacity on the Scandinavian TTR pilot line sections is given. The list includes project expected completed by TT2025 which will increase/decrease the infrastructure capacity, compared to the current state (TT2022).

## 1.1 Norway

### 1.1.1 Additional available capacity

Project name	Project proposal defined	Project approved by the IM's management	Financing secured	Comments
Follobanen	Yes	Yes	Yes	Expected commissioning by 12.12.2022. Double track line in tunnel between Oslo S and Ski. Full effect of Follobanen will be achieved after the TCR period in the summer of 2023. Travel time between Oslo S and Ski will be reduced from 22 minutes to approx. 11 minutes and the train capacity on the line will be doubled.
Hensetting Ski stasjon	Yes	Yes	Yes	Expected commissioning by 01.11.2022. Two storage spaces for single train sets (110m). From 8 to 10 storage spaces

**Table 1.1 – Overview of Norwegian projects for capacity expansion expected active by TT2025.**

### 1.1.2 Reduced available capacity

No known reductions.

## 1.2 Sweden

### 1.2.1 Additional available capacity

Project name	Project proposal defined	Project approved by the IM's management	Financing secured	Comments
Varberg-Hamra	Yes	Yes	Yes	Approved by the government to start
Gothenburg harbor line	Yes	Yes	Yes	Project is started

**Table 1.2 - Overview of Swedish projects for capacity expansion expected active by TT2025.**

### Varberg-Hamra, double track (1)

There will be a new freight yard at Varberg station and there will be two 780-meter long side-tracks. South of the platforms a new double track will connect to existing double track in Hamra. Varberg station will have four tracks for trains running on Väst kustbanan and an extra track for trains going to Viskadalsbanan, which will make for a much better capacity on the station. By the combined effects of the projects, four tracks Malmö-Lund, double track Ängelholm-Maria and new platforms in Helsingborg station there is a probable gain of increased traffic levels and a possibility for shorter running times of up to 15 minutes Gothenburg-Malmö for passenger trains. The increased speed on the part Gothenburg-Halmstad may have some negative consequences for slow moving trains with increased running times as a result.

### Gothenburg harbour line, double track (2)

When Gothenburg harbour railway gets a new double track on the section Sannegården-Pölsebo, the capacity will increase by an extra train per hour and direction. The biggest shortage of capacity afterwards will be the arrival tracks at Gothenburg Skandia Harbour.



**Illustration 1.1 - Expected changes in infrastructure capacity for TT2025**

1), 2) New double tracks  
3) New siding for freight trains

## 1.2.2 Reduced available capacity

No known reductions.

## 1.3 Denmark

This section refers directly to information available in the documents "Banedanmarks Anlægsplan 2030 – Opdatering 2021" (Banedanmark, 2021), "Beslutningsgrundlag Øresundsperroner på Ny Ellebjerg Station" (Banedanmark, 2021), and "Forundersøgelse af Ny Kastrup Lufthavn Station" (Sund & Bælt, 2019)", published by the Danish Ministry of Transport. The Danish railway network is undergoing major projects for capacity increase, which mainly consists of the Signaling Programme ("SP"), the Electrification Programme ("EP") and individual line upgrades towards 2025 and beyond.

The main principle for planning and coordinating these major programs is to rollout SP before EP on non-electrified lines, when possible, thereby reducing the need for immunization of the legacy signaling system against traction current and its interferences. This is not directly affecting the pilot line Peberholm-Padborg, which is already completely electrified, but it has an impact on the overall project plan through the interdependencies with other lines out of scope. In some cases, the individual project plans for SP and EP rollout are heavily constrained by the coordination with other projects. In principle, the project commissioning for SP, EP and line upgrades is scheduled every year to take place either in December together with the timetable change, or in June.

Table 1.3 summarizes the projects for improving the railway capacity expectedly completed by TT2025. Illustration 1.2 provides a graphical representation of the same information.

Project name	Project proposal defined	Project approved by the IM's management	Financing secured	Comments
SP Vigerslev – Køge Nord – Ringsted*	Yes	Yes	Yes	Commissioning completed. Switch scheduled in December 2022 (TT2023)



**Vigerslev – Køge Nord – Ringsted line**

The line is already equipped with ETCS signalling, which will be activated in December 2022 with the timetable change TT2023. The final activation entails the commissioning of the 750 m passing siding in Lellinge towards Ringsted and of the full functionality at Køge Nord station. At Køge Nord station, both the junction to the line Køge Nord – Køge – Næstved and a 750 m passing siding towards Vigerslev will be taken into use for regular operation.

**Table 1.3 - Overview of Danish projects for capacity expansion expected active by TT2025.**

SP: Signalling Programme; EP: Electrification

**N.B.:**

\* The activation of SP on this line is combined with the opening of the connection between Køge Nord station and the line Roskilde – Køge – Næstved. New passenger services will therefore be possible between Copenhagen and Næstved via Køge Nord. Passing sidings will also be activated at Lellinge in the direction Copenhagen → Ringsted and at Køge Nord station in the direction Ringsted → Copenhagen, allowing slow freight trains to be passed along the line.

**Illustration 1.2 - Expected changes in infrastructure capacity for TT2025.**

Pink – SP rollout; Green – New passing siding; Yellow – New connection.

## 2 Temporary Capacity Restrictions

### 2.1 Norway

Bane NOR uses principles for TCR planning in order to maximize the utilisation of TCR's thus leading to the consequences for traffic being minimized. The principles are listed in the paragraphs below.

#### 2.1.1.1 Total closures

Bane NOR is not planning any total closures with major impact in TT2025.

#### 2.1.1.2 Single-track closures

Bane NOR is not planning any single-track closures with major impact in TT2025.

### 2.1.2 Projects planned in 2025

Bane NOR is not planning any projects with major impact in TT2025.

## 2.2 Sweden

### 2.2.1 Principles for TCR planning

The principles for TCR planning are based on rerouting experience and dialogues with RUs and non-RU applicants.

#### For long distance trains/high speed passenger trains

- The freight route through Skåne (via Åstorp) is the primary reroute for traffic on the section Ängelholm - Helsingborg.
- No more than one disruption on the section Malmö-Oslo at the same time (at times it can be accepted north and south of Gotenburg at the same time)
- The aim is to avoid closures on Friday and Sunday afternoon on weekend closings

#### For freight trains

- The route through the Kongsvinger line / Värmlands line / Jönköpings line (via Laxå-Falköping) is the primary reroute for traffic on the section Oslo - Skånebol.
- The Western Main Line / Älvsborg line / Viskadal line(via Herrljunga – Borås) is the primary reroute for freight traffic on the section

Gothenburg - Varberg. An alternativ is Western Main Line / Älvsborg line / Coast-to-coast line towards Alvesta.

- Markaryd line / Southern main line (via Hässleholm) is the primary reroute for freight traffic on the section Åstorp - Teckomatorp.
- Southern main line / Råå line (via Eslöv – Teckomatorp) is the primary reroute for freight traffic on the section Arlööv – Kävlinge.

**For regional and local trains**

- Consecutive closures are preferred
- The aim is to avoid closures on weekdays

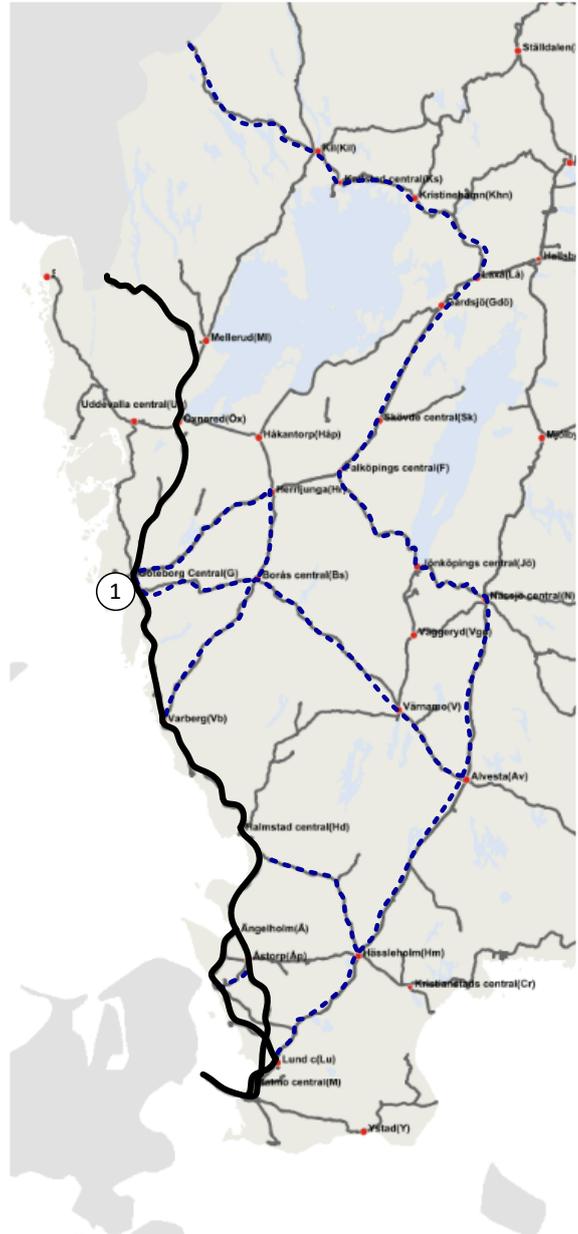
**Maintenance windows**

Network Statement Annex 2 E – Other availability impacts (Trafikverket, 2021)

**2.2.2 Expected Major impact TCRs**

Some of the projects with major consequences for the traffic are expected to be finished by 2025 e.g., Varberg-Hamra double track, Ängelholm-Maria double track, Malmö-Lund four tracks, The harbor line double track. However, many other TCR's are planned to take place in 2025 and some of these can be found in Trafikverket's Implementation plan (Genomförandeplan, only in Swedish) (Trafikverket, 2021)

The following table consist of the projects that are expected to have Major impact TCR's in 2025.



Project name	Project approves by the IM's management	Project proposal defined	Financing secured	Comment
Västlänken Almedal (1)	Yes	Yes	Yes	Project is started

Table 2.1 - Overview of Swedish projects that will require major TCRs during TT2025.

**2.3 Denmark**

**2.3.1 Principles for TCR Planning**

The information in this section refers directly to the documents "Sporspæringsprincipper: De generelle principper" (Banedanmark, 2021) and "Overblik over spæringsstrukturen" (Banedanmark, 2021). The principles

indicated in the documents will be applied starting from TT2022 and will therefore be in place in the following years, including TT2025.

Due to the typical traffic structure and the lack of rerouting possibilities, the pilot sections Padborg – Ringsted and Copenhagen Central/Vigerslev – Peberholm, any track possession will have expectedly major impact on the traffic. Track possessions on the two sections Copenhagen – Ringsted, via Roskilde or via Køge Nord, respectively, are expected to have medium impact on the traffic mainly because of the rerouting possibility between these two lines.

### **2.3.1.1 Total closures**

Since the pilot line is part of the existing ScanMed-corridor, total track closures will be minimized, clustered, and scheduled during low-demand periods, such as holydays and school breaks. A limit of 8,33 days/year of total closure is defined for the corridor section Padborg – Ringsted.

### **2.3.1.2 Single-track closures**

In case of a single-track closure on double track lines, the track remaining active is always operated at the maximum speed allowed by the type of works on the neighboring closed tracks. In general, the speed limit on the operational tracks should never be lower than 80 km/h in daytime, whereas a speed limit as low as 40 km/h can be introduced during evening and night hours, during the actual execution time of the works.

Table 0.1 in Appendix A lists the specific principles for TCRs on the individual line sections of the pilot line.

## **2.3.2 Projects planned in 2025**

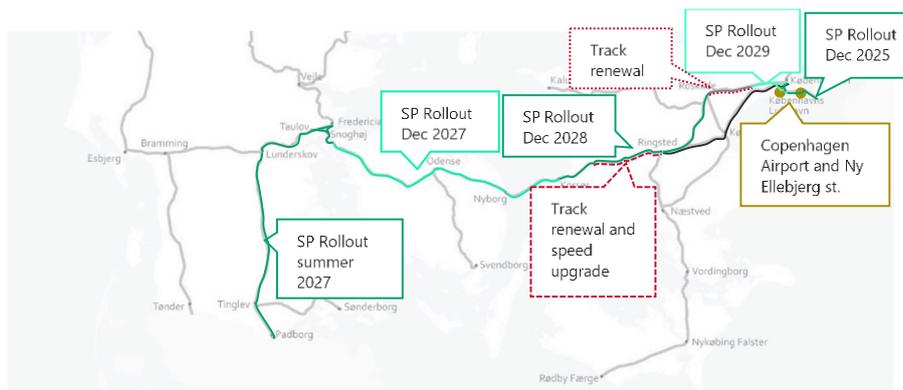
Preparation works for SP are planned on the whole pilot line extension, exception made for the line Copenhagen – Ringsted via Køge Nord. Different rollout dates entail different phases of the project realization and different capacity restriction patterns. Furthermore, two line-sections will undergo track renewal in TT2025 between Copenhagen and Slagelse, and preparation works are expected for the realization/extension of two passenger stations between Copenhagen Airport and Vigerslev.

The projects listed in Table 2.2 are scheduled on the pilot line and will expectedly cause major impact TCRs during TT2025. A graphical representation is provided in Illustration 2.1.

Project name	Project proposal defined	Project approved by the IM's management	Financing secured	Comments/Explanations
SP Padborg – Fredericia/(Middelfart)	Yes	Yes	Yes	Preparation for SP Rollout in summer 2027
SP Middelfart – Korsør	Yes	Yes	Yes	Preparation for SP Rollout in December 2027 (for TT2028)
SP (Korsør) – (Roskilde)	Yes	Yes	Yes	Preparation for SP Rollout in December 2028 (for TT2029)
SP (Copenhagen Central)/Vigerslev - Peberholm	Yes	Yes	Yes	Preparation for SP Rollout in December 2025 (for TT2026)
SP (Copenhagen Central) – Roskilde	Yes	Yes	Yes	Preparation for SP Rollout in December 2029 (for TT2030)
SP Copenhagen central – Helgoland	Yes	Yes	Yes	Preparation for SP Rollout in summer 2030
Track renewal Høje Taastrup – Roskilde	Yes	Yes	Yes	
Track renewal and line speed upgrade Ringsted – Slagelse	Yes	Yes	Yes	
Station upgrade at Copenhagen Airport	Yes	Yes (Sund&Bælt)		Commissioning scheduled in Q3 2026
Station upgrade at Ny Ellebjerg: New platform from/to Copenhagen Airport	No	No		Commissioned at earliest in December 2024, possibly in 2025 depending on the final project.

**Table 2.2 - Overview of Danish projects that will require major TCRs during TT2025.**

SP: Signalling Programme; EP: Electrification Programme.



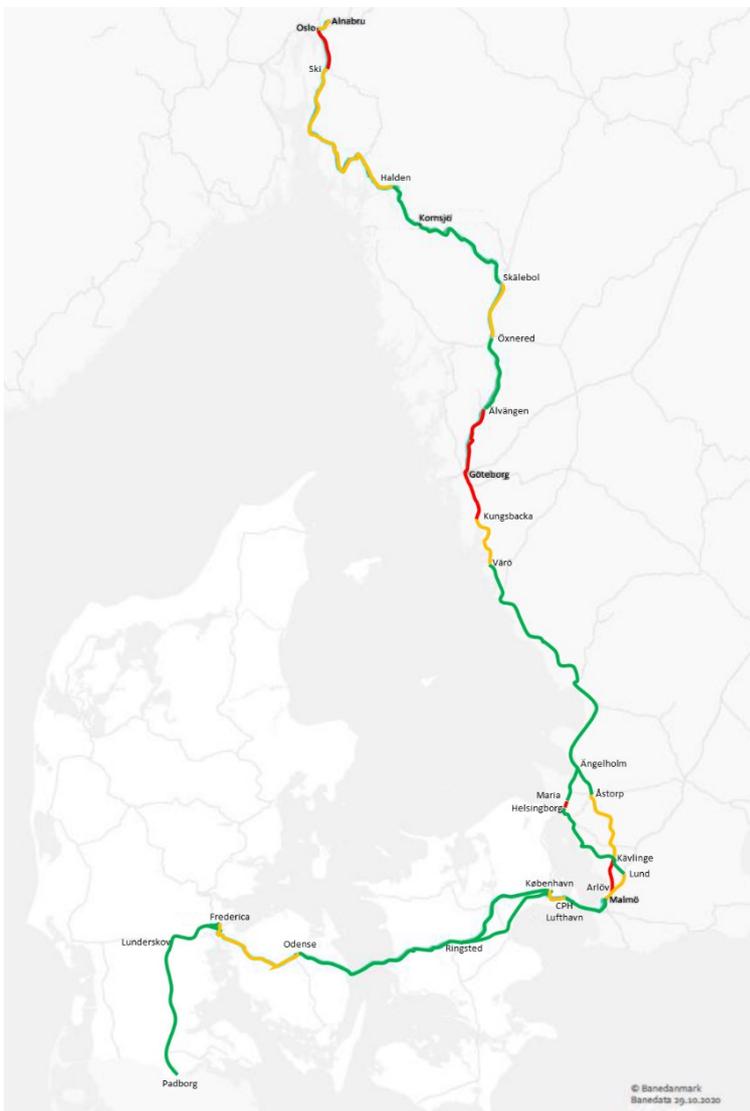
**Illustration 2.1 - Location of Danish projects that will require major TCRs during TT2025.**

SP: Signalling Programme; EP: Electrification Programme

### 3 Traffic planning principles

#### 3.0 Expected capacity requests on the pilot line

Illustration 3.1 shows a map of the expected traffic capacity demand on the Scandinavian TTR Pilot Project line sections. The lines section depicted in red can be characterized as bottlenecks, whereas green sections are expected to withstand all or most of the capacity requests without changes. On the yellow sections, some changes in the paths applied for might be necessary to accommodate all the requests. TCRs are not yet scheduled in detail and are therefore not shown in the figure.



**Illustration 3.1 - Expected capacity utilization on the Scandinavian TTR Pilot line.**

Green – All requests might be met, Yellow – changes might be necessary and Red – High demand expected: possible rejections.

In Norway, Medium/High capacity demand is expected for TT2025 between Alnabru and Halden.

In Sweden, the capacity demand is expected High around the main cities, Gothenburg and Malmö/Lund.

In Denmark, the expected capacity demand for TT2025 is generally low. In the sections Peberholm – Kastrup – Kalvebod – Vigerslev – Høje Taastrup

(the Copenhagen area) and Odense - Snoghøj (Western Funen) the capacity utilization is higher but still in balance.

The principles for traffic planning in the individual countries are listed in the following sections.

## 3.1 Norway

### 3.1.1 Traffic planning principles and Traffic Flows

The following types of traffic can be expected on Bane NOR's part of the freight corridor for timetable 2025 and planning of future timetables. Where possible, expected traffic flows are described for the individual line sections.

IM	Section	Principle and elements
		Freight traffic line with medium level of saturation
Bane NOR	Alnabru – Loenga	Categories for capacity model: <ul style="list-style-type: none"> <li>· International freight trains</li> <li>· National freight trains</li> </ul>
		Mixed traffic international line with high level of saturation Publication of pre-planned paths for international freight trains Categories for capacity model:
Bane NOR	Loenga-Ski	<ul style="list-style-type: none"> <li>· Local passenger trains</li> <li>· Regional passenger trains</li> <li>· Long-distance passenger trains</li> <li>· International freight trains</li> <li>· National freight trains</li> </ul> 4 local passenger trains each hour in both directions 1 freight train each hour in both directions
		Mixed traffic international line. Medium level of saturation Ski-Moss. Low level of saturation Moss-Halden. Publication of pre-planned paths for international freight trains. Categories for capacity model:
Bane NOR	Ski-Halden	<ul style="list-style-type: none"> <li>· Regional passenger trains</li> <li>· Fast regional passenger trains</li> <li>· Long-distance passenger trains</li> <li>· International freight (combined transport)</li> </ul> Ski-Moss: 2 regional passenger trains each hour in both directions Ski-Halden: 1 regional passenger trains each hour in both directions, 2 trains during rush hour in the rush direction 1 freight train each hour in both directions
		Mixed traffic international line with low level of saturation Publication of pre-planned paths for international freight trains Categories for capacity model:
Bane NOR	Halden – Kornsjø grense	<ul style="list-style-type: none"> <li>· Regional passenger trains</li> <li>· International freight</li> </ul> 4 regional passenger trains within 24-hour period in both direction 7 international freight train within 24-hour period in both directions

**Table 3.1 - Traffic planning principles for TT025 in Norway**

## 3.2 Sweden

### 3.2.1 Traffic planning principles

The main principle for capacity allocation in compliance with current law is to base it on applications.

In this time period with no applications available the following types of traffic can be expected on the different sections based on Trafikverket's work on prognosis. The information is used in order to construct the first drafts of the capacity model. In future strategies this section should also include prognosis for ad-hoc and rolling planning segments.

IM	Section	Principle and elements
		<b>Malmö central - Östervärn – Lockarp</b> Regional passenger trains Freight
Trafikverket	<b>Malmö Närområde</b> Malmö central - Östervärn - Lockarp, Malmö central - Burlöv, (Malmö central) - Hyllie - Lernacken/Svågertorp, (Fosieby)/(Lockarp) - Lernacken	<b>Malmö central - Burlöv, (Malmö central) - Hyllie - Lernacken/Svågertorp</b> Regional passenger trains Long-distance passenger trains High-speed passenger trains Freight <b>(Fosieby)/(Lockarp) – Lernacken</b> Regional passenger trains Freight
Trafikverket	<b>Godsstråket genom Skåne</b> (Ångelholm) - (Åstorp) - (Teckomatorp) - (Kävlinge) - (Arlöv), (Lockarp) - Trelleborg	<b>Godsstråket genom Skåne</b> Regional passenger trains Freight
Trafikverket	<b>Västkostbanan</b> (Almedal) - Halmstads central - Ångelholm - Helsingborgs central - Kävlinge - (Lund c)	<b>Västkostbanan</b> Regional passenger trains Long-distance passenger trains High-speed passenger trains Freight
Trafikverket	<b>Göteborgs närområde</b> Göteborgs central - Partille/Almedal/Göteborg Marieholm/Göteborg Kville, inkl Göteborgs hamnbana; (Göteborg Kville) - Skandiahavnen	<b>Göteborgs närområde</b> Regional passenger trains Long-distance passenger trains High-speed passenger trains Freight <b>Göteborgs hamnbana</b> Freight
Trafikverket	<b>Norge-/Vänerbanan med Nordlänken</b> (Göteborg Marieholm) - Öxnered - (Kil), inkl Skälebol - Kornsjö gränsen	<b>Norge-/Vänerbanan med Nordlänken</b> Regional passenger trains Long-distance passenger trains High-speed passenger trains Freight

Table 3.2 - Traffic planning principles for TT025 in Sweden

### 3.2.2 Traffic flows

The traffic flows in Illustration 3.2 represent the prognosis for the network with the corresponding capacity utilization in the 2 hours with maximum capacity usage.

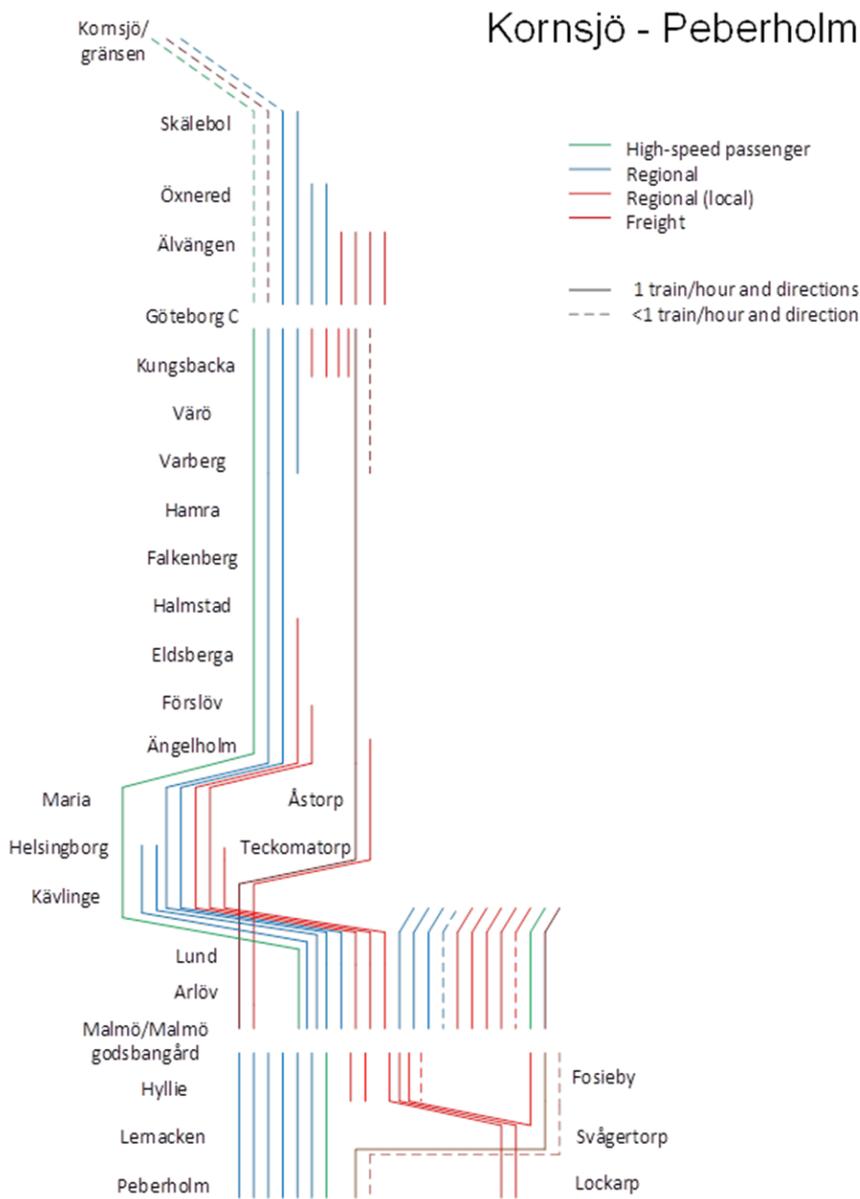


Illustration 3.2 – Expected traffic flows for TT2025 in Sweden

## 3.3 Denmark

### 3.3.1 Traffic planning principles

The following types of traffic can be expected on the different railway sections based on Banedanmark’s work on future timetables. This information is used to construct the first drafts of the capacity model. In

future Capacity strategies, this section will include prognosis for ad-hoc and rolling planning capacity segments as well.

IM	Section	Principle and elements
Øresundsbro Konsortiet	<b>Lernacken – Peberholm – Kastrup Airport</b>	<p>International line with a high Level of capacity saturation.</p> <p>Categories for capacity model:            Regional passenger trains            Long-distance passenger trains            High-speed passenger trains            International freight trains</p>
Banedanmark	<p><b>Copenhagen area</b>            Kastrup Airport – Kalvebod            Kalvebod – Copenhagen Central            Kalvebod – Vigerslev            Copenhagen Central – Vigerslev            Copenhagen Central – Hvidovre Fjern            Vigerslev – Hvidovre Fjern            Hvidovre Fjern - Høje Taastrup            Vigerslev - Køge Nord</p>	<p>International lines with a high Level of capacity saturation.</p> <p><b>Kastrup Airport – Kalvebod – Vigerslev</b>            Categories for capacity model:            Regional passenger trains            Long-distance passenger trains            High-speed passenger trains            International freight trains</p> <p><b>Kalvebod – Copenhagen Central – Vigerslev/Hvidovre Fjern</b>            Categories for capacity model:            Regional passenger trains            Long-distance passenger trains            High-speed passenger trains</p> <p><b>Vigerslev - Hvidovre Fjern - Høje Taastrup</b>            Categories for capacity model:            Regional passenger trains            Long-distance passenger trains            International freight trains</p> <p><b>Vigerslev - Køge Nord</b>            Categories for capacity model:            Regional passenger trains            Long-distance passenger trains            High-speed passenger trains            International freight trains</p>
Banedanmark	<b>Høje Taastrup - Ringsted</b> Høje Taastrup – Roskilde Roskilde - Ringsted	<p>International lines with a low Level of capacity saturation.</p> <p><b>Høje Taastrup – Roskilde</b>            Categories for capacity model:            Regional passenger trains            Long-distance passenger trains            National freight trains            International freight trains</p> <p>International lines with a medium Level of capacity saturation.</p> <p><b>Roskilde - Ringsted</b>            Categories for capacity model:            Regional passenger trains</p>

IM	Section	Principle and elements
		Long-distance passenger trains National freight trains International freight trains International line with a medium Level of capacity saturation.
Banedanmark	<b>Køge Nord - Ringsted</b>	Categories for capacity model: Regional passenger trains Long-distance passenger trains High-speed passenger trains International freight trains International line with a medium Level of capacity saturation.
Banedanmark	<b>Ringsted - Korsør</b>	Categories for capacity model: Regional passenger trains Long-distance passenger trains High-speed passenger trains National freight trains International freight trains International line with a high Level of capacity saturation.
Banedanmark	<b>Korsør - Nyborg</b>	Categories for capacity model: Regional passenger trains Long-distance passenger trains High-speed passenger trains National freight trains International freight trains International line with a medium Level of capacity saturation.
Banedanmark	<b>Nyborg - Odense</b>	Categories for capacity model: Regional passenger trains Long-distance passenger trains High-speed passenger trains National freight trains International freight trains International line with a high Level of capacity saturation.
Banedanmark	<b>Odense - Snoghøj</b>	Categories for capacity model: Regional passenger trains Long-distance passenger trains High-speed passenger trains National freight trains International freight trains
		<b>Snoghøj - Fredericia</b> International line with a medium Level of capacity saturation.
Banedanmark	<b>Snoghøj – Fredericia/Taulov</b>	Categories for capacity model: Regional passenger trains Long-distance passenger trains High-speed passenger trains National freight trains
		<b>Snoghøj – Taulov</b>

IM	Section	Principle and elements
		International line with a low Level of capacity saturation.
		Categories for capacity model: Long-distance passenger trains High-speed passenger trains National freight trains International freight trains
		International line with a low Level of capacity saturation.
Banedanmark	<b>Taulov - Tinglev</b>	Categories for capacity model: Regional passenger trains Long-distance passenger trains High-speed passenger trains National freight trains International freight trains
		International single-tracked line with a medium Level of capacity saturation.
Banedanmark	<b>Tinglev - Padborg</b>	Categories for capacity model: Regional passenger trains Long-distance passenger trains High-speed passenger trains National freight trains International freight trains

**Table 3.3 - Traffic planning principles for TT025 in Denmark**

The Danish railway timetable is typically planned as a clock-faced symmetric timetable with an hourly pattern. The pattern differs between rush, daytime, evening, and night hours.

In general, two transit freight train paths per direction per hour are planned between Peberholm (Swedish-Danish border) and Padborg (Danish-German border). During rush hours in the Copenhagen area only one train path per direction per hour is available. The freight train paths are planned according to the longest and heaviest model train allowed on the Danish rail network (worst case), allowing any rolling stock to run, and providing punctuality margins in case of better actual performance than planned.

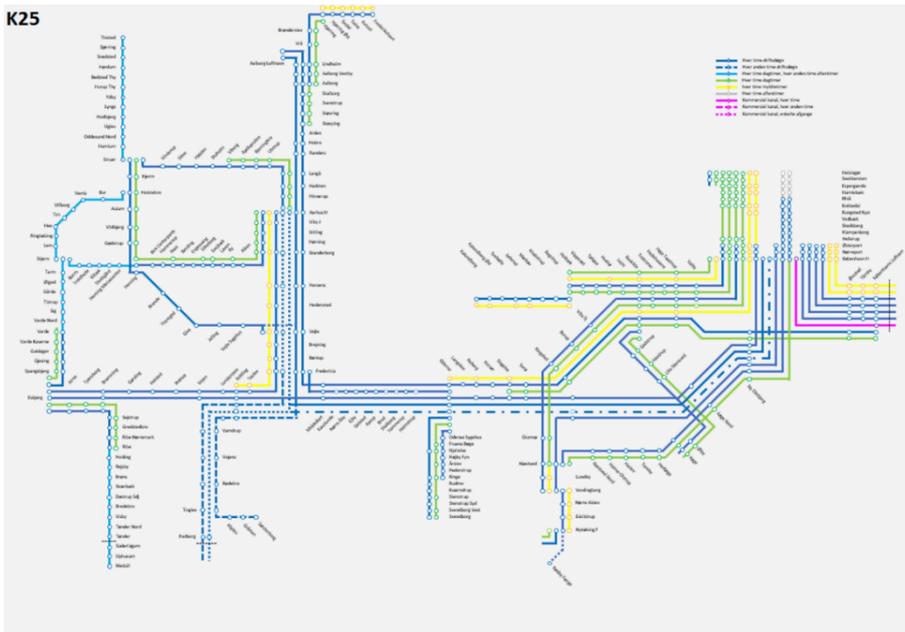
Freight trains are normally planned to run via Høje Taastrup between Copenhagen and Ringsted. However, the new line via Køge Nord can also be used. In case of divergencies from the timetable, temporary capacity restrictions or line closures the use of the lines will be adjusted accordingly. Fast passenger trains (InterCity Express and InterCity) are mainly scheduled to run via Køge Nord between Copenhagen and Ringsted, separating them from slower freight and regional trains on the line via Høje Taastrup.

Passenger trains are not bundled according to their travelling speed but are planned to provide a regular service frequency e.g., half hourly. This gives a traffic mix of fast and slow trains on the mainlines. Fast passenger trains can be planned to overtake slower passenger trains at traffic hubs e.g., Odense station. Overtaking of freight trains is planned to take place regularly at given stations due to the traffic mix of trains.

The volume and structure of future railway traffic in Denmark is discussed within the "Trafikplan"-working group chaired by the Danish Ministry of Transport. Members are the major stakeholders within the Danish railway

sector. Illustration 3.3 shows the expected volume of passenger trains in the TT2025. The plan entails two freight trains per hour per direction outside rush hours.

In case of a line closure between Lunderskov and Padborg it is possible to reroute trains via Bramming and Tønder towards Germany (Hamburg). This entails several restrictions such as reduced allowed meter weight (7,2ton/m vs 8ton/m) and not electrified line from Bramming to the German border. See more details in Banedanmark’s Network Statement.



**Illustration 3.3 - Expected line diagram for passenger trains for timetable year 2025**

Dark blue: Every hour during operational day.  
 Dark blue dotted: Every second hour during operational day. Light blue: Every hour during daytime hours, every second hour during evening hours.  
 Green: Every hour during daytime hours. Yellow: Every hour during rush hours. Grey: Every hour during evening hours.  
 Purple: Commercial train every hour. Pink dotted: Commercial train every second hour. Pink spaced dotted: Few daily trains.

## Reference documents

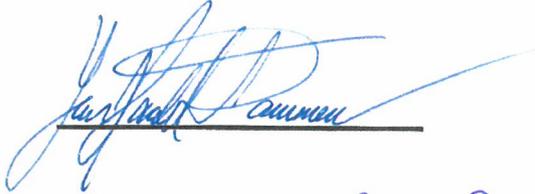
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## Validation

This document has been signed by responsible managers in Bane NOR, Trafikverket, and Banedanmark.

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# Appendices

## Appendix A

Line section	Total closure	Single track operation	Temporary Speed Restriction on neighboring track	Rerouting	Notes	Impact on traffic
Copenhagen - Høje Tåstrup (Høje Tåstrup - Roskilde).	Max 4 weeks during general industrial holydays or max 56 hours during weekends. Only weekend total closure between Roskilde and Høje Tåstrup, or in shade of other closures.	Can be planned during general industrial holydays in June-August, other holydays, or in shade of other closures.  Only one track can be closed at a time between two locations with crossovers. Between Høje Taastrup and Roskilde it is two tracks since the line section has four tracks.	Always at least 80 km/h on neighboring track. In case of a speed restriction of 40km/h this must be planned as a complete line closure, or during week 27-32 or during other holidays.	Trains can alternatively run via Vigerslev-Køge Nord-Ringsted. This requires ETCS-capable rolling stock.	Passengers can be rerouted on suburban trains between Copenhagen and Høje Tåstrup. Total closures will be avoided between Høje Tåstrup and Roskilde. In case of closure, some traffic might be rerouted via Vigerslev-Køge Nord-Ringsted, where closures cannot be planned at the same time. Large events as e.g., Roskilde Festival (end of June) are taken into consideration.	Medium
Roskilde - Ringsted	Max 4 weeks during general industrial holydays or max 56 hours during weekends. Alternatively, in shade of other closures.	Can be planned during general industrial holydays in June-August, other holydays, or in shade of other closures.  Only one track can be closed at a time between two locations with crossovers.	Always at least 80 km/h on neighboring track. In case of a speed restriction of 40km/h this must be planned as a complete line closure, or during week 27-32 or during other holidays.	Trains can alternatively run via Vigerslev-Køge Nord-Ringsted. This requires ETCS-capable rolling stock.	In case of closure, passengers to Viby and Borup are rerouted via bus. Freight traffic rerouted via Køge Nord Large events as e.g., Roskilde Festival (end of June) are taken into consideration.	Medium

Line section	Total closure	Single track operation	Temporary Speed Restriction on neighboring track	Rerouting	Notes	Impact on traffic
Ringsted - Korsør - Nyborg	8 days and 8 hours during general industrial holydays or max 30 hours during weekends.	Can be planned during general industrial holydays in June-August, other holydays, or in shade of other closures.  Only one track can be closed at a time between two locations with crossovers.	Always at least 80 km/h on neighboring track. In case of a speed restriction of 40km/h this must be planned as a complete line closure, or during week 27-32 or during other holidays.	No rerouting possibility	In case of closure, freight traffic is canceled. Bus replacement should be dimensioned according to the particularly high ridership on the line section. Large events as e.g., Roskilde Festival (end of June) are taken into consideration	High
Vigerslev-Køge Nord-Ringsted	Only in the evening or at night.	Only in the evening or at night.	Always at least 80 km/h on neighboring track. In case of a speed restriction of 40km/h this must be planned as a complete line closure, or during week 27-32 or during other holidays.	Trains can alternatively run via Høje Tåstrup - Roskilde	The line was opened recently, and only evening/night maintenance possessions are expected. However, track possessions cannot be planned at the same time as possessions on the line via Roskilde.	Medium
Peberholm - Copenhagen/Vigerslev	8 days and 8 hours during general industrial holydays or max 30 hours during weekends.	Can be planned during general industrial holydays in June-August or in shade of other closures.  Only one track can be closed at a time between two locations with crossovers.	Always at least 80 km/h on neighboring track. In case of a speed restriction of 40km/h this must be planned as a complete line closure, or during week 27-32 or during other holidays.	No alternative route. Total closure of this section closes the ScanMed corridor. No passenger traffic.	In case of closure, freight traffic is canceled. Passengers can be rerouted via Metro between Copenhagen city and airport. Max 8,33 days of closure per year. Large events as e.g., Roskilde Festival (end of June) are taken into consideration	High
Snoghøj - (Fredericia)	8 days and 8 hours during general industrial holydays or max 30-56 hours during weekends.	Single-track operation in the period May-September, or in shade of other closures.	Always at least 80 km/h on neighboring track. In case of a speed restriction of 40km/h	Trains can be rerouted in the triangle-area Snoghøj-	If Fredericia-Snoghøj is closed, trains can run via Taulov after inversion. If Taulov-Snoghøj is closed, trains can run via Fredericia after inversion	High

Line section	Total closure	Single track operation	Temporary Speed Restriction on neighboring track	Rerouting	Notes	Impact on traffic
			this must be planned as a complete line closure, or during week 27-32 or during other holidays.	Taulov-Fredericia.		
Nyborg - (Snoghøj) - Lunderskov	8 days and 8 hours during general industrial holydays or max 30 hours during weekends.	Can be planned during general industrial holydays in June-August or in shade of other closures.  Only one track can be closed at a time between two locations with crossovers.	Always at least 80 km/h on neighboring track. In case of a speed restriction of 40km/h this must be planned as a complete line closure, or during week 27-32 or during other holidays.	No alternative route between Nyborg and Snoghøj and between Taulov and Lunderskov	In case of closure, freight traffic is canceled. Bus replacement should be dimensioned according to the particularly high ridership on the line section. Large events as e.g., Roskilde Festival (end of June) are taken into consideration.	High
Lunderskov - (Tinglev) - Padborg	8 days and 8 hours during general industrial holydays or max 30 hours during weekends.	Single-track operation in the period June-August, or in other holyday periods.	Always at least 80 km/h on neighboring track. In case of a speed restriction of 40km/h this must be planned as a complete line closure, or during week 27-32 or during other holidays.	No alternative route via Padborg. Train can be rerouted via Esbjerg to Tønder/Niebüll.	Rerouting of freight traffic via Tønder/Niebüll is considerably more costly and cannot guarantee the same amount of traffic as Lunderskov-Padborg.	High

Table 0.1 - TCRs principles for individual line sections in Denmark

## **Capacity Strategy 2025**

TTR Scandinavian Pilot

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