



# Freight transport by rail

The National Rail Administration's strategy

*SHORT VERSION*

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# Foreword

## Freight transport by rail brings new challenges and new opportunities



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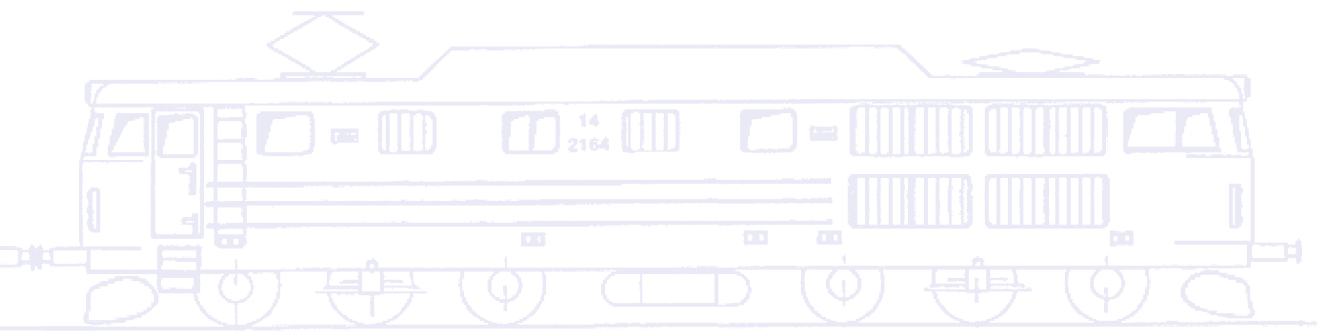
*Rail freight transport has undergone a period of strong, very pleasing growth in recent years. This has brought new challenges for railway infrastructure. As part of its work on a new National Transport Plan (2010 – 2019), the National Rail Administration has therefore developed a strategy that describes necessary infrastructure-related and organisational moves in the years to come, making it possible for rail freight transport to continue growing.*

*In its work to develop the strategy, the National Rail Administration has held discussions with both railway undertakings and other interested parties.*

*Implementation of the strategy will be included as part of the transport departments' planning proposals for the National Transport Plan [NTP] in December 2007 and, obviously, is otherwise dependent on the annual budgets. The departments' NTP proposals will be sent out for a wide consultation in parallel with the transmission of the proposal to Norway's Ministry of Transport and Communications.*

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## **Background – development**

**Combi-load.** The preparations undertaken in recent years for combi-transport between the largest towns have been an unqualified success, and now the demand for transport capacity is considerably greater than the freight operators and the infrastructure are able to offer. In the short and long term, it is important therefore to further develop a freight strategy which guarantees good levels of capacity and prepares for efficient terminals.

The demand for consumer goods is growing strongly, in line with financial development. Consumer goods are being imported to a greater extent and are organised by major co-load operators. Combi-transport (container, semitrailer, swap bodies) has proven to be a competitive transport concept from Oslo to the largest towns, where they are reloaded for distribution in the local area.

In Norway, combi-transport accounts for approximately 85 % of rail freight transport, measured in tonnes (excluding ore transport on the Ofofbanen line) and approximately 90% measured in tonnekm. Wagonload, timber and other system cargo transport account for the remaining 15% of the tonnage. CargoNet is the dominant carrier today. In recent years, several new carriers have started operating on the railway within the wagonload and system cargo product field, but in terms of volume-share these transports are still marginal. However, there has been a high level of growth in wagonload transports in the last few years.

Developments in rail transport have been moving in the direction of fewer combi-terminals which are handling increasing amounts of freight, and on an increasing amount of freight being concentrated on the busy freight corridors of Oslo – Trondheim – Bodø, Oslo – Bergen, Oslo – Kristiansand - Stavanger and the Østfoldbanen line. This development coincides with that which is being seen in the co-load operator market and road transport. This is not unexpected, since co-load operators are the most important customers for combi-transport by rail. In the aforementioned corridors, transport has improved constantly with the increased frequency of train departures, and in the last 5 years there has been a strong increase in the volume of combi-transports, approximately 10% - 15% per year, measured in the number of TEUs. (Twenty feet Equivalent Units)

This development has led to capacity problems, particularly at the terminals but also on the lines between terminals. The carrier wishes to offer considerably increased frequency on all main lines with one train every two hours, 24-hours a day.

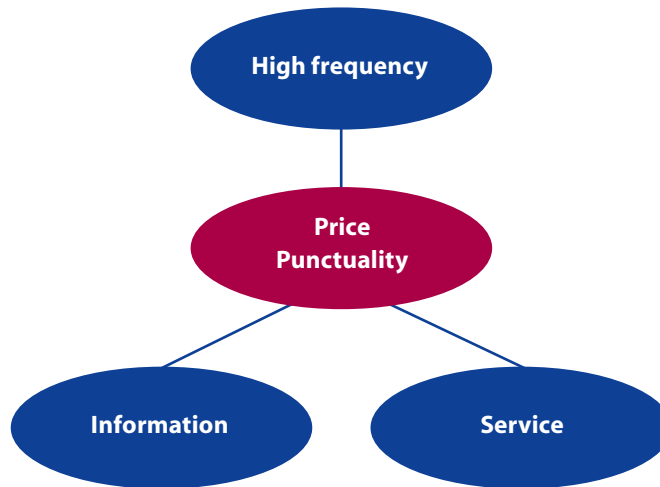
Based on major trends in the market, such as:

- considerable growth in transport volumes
- steadily increasing containerisation of goods transport
- increasing “hubbing” of the cargo into major hubs and busy transport corridors
- growing challenges for road transport (resting /driving time regulations, lack of drivers)
- focusing on safe, sustainable transport

combi-transport by rail stands out as a more and more robust transport option. It is estimated to be fairly certain that the demand for combi-transport by rail will be increasing in the years to come, and the profitability and market competitiveness of the transport may increase considerably both by planned measures in the infrastructure and measures that will be implemented by the carriers themselves.

**Wagonload and system cargo**

constitute a small part of transport on the railway, in the region of 5% - 8%, depending on whether the transport is measured in tonnes or tonnekm and whether it is compared with local Norwegian transport or by the sum of all transport, including interoperation with foreign countries. Wagonload today runs between Sweden and Norway, to terminals in Drammen, Rolvsøy and Trondheim. Wagonload traffic today is very different from the previous traditional wagonload product. Today, fixed unit trains with wagonload run from terminal to terminal. No servicing of individual customers on branch lines is offered. Wagonload transport has also increased considerably in recent years. However, it is difficult to get reliable statistics. System cargo, apart from timber, comprises car and paper transport. A small part of the system cargo is made up of "closed" transports for one or more industrial customers. The transports are operated as whole trains and the cargo comprises aircraft fuel, chemicals, calcium and ore. The largest, and highest number of, timber transports by rail are in Østlandet and Trøndelag.



*Price and punctuality are generally ranked highest, but high frequency is also evaluated as extremely important.*

The average transport distance for pulp timber is 160 – 170 km, for woodchips approximately 140 – 150 km and for saw timber approximately 50 km. Here too, there has been a marked increase in demand in recent years. Transport volume on the railway, however, has been limited by factors including a lack of wagon rolling stock. The companies' expectations of future income from freight and freight costs will be deciding factors for the investment and procurement decisions which will be taken as regards wagons.

The dominant loads carried on the Ofofbanen line are ore transports. Approximately 15 million tonnes of ore and approximately 0.5 million tonnes with additives are carried per year on the Ofofbanen line.

**Challenges and critical parameters**

**Combi-transport** is unquestionably the largest and most important form of transport on the railways in Norway. Several analyses and, perhaps most importantly, signals from trade and industry have pointed out 4 – 5 central parameters according to which the carriers have to deliver. (See the figure above.)

Punctuality on the railway is affected by a number of conditions such as efficient, high capacity terminals, total capacity utilisation, sufficient capacity on the lines between the terminals, good access to the terminals from public roads, ICT equipment for effective administration and depot management, maintenance of technical equipment and emergency preparedness for rescue and repair works.

High frequency transport is in great demand in the market, and can only be given in transport corridors with large volumes of goods. That is why it is important in the long term to facilitate efficient rail transport between a few large main terminals, and that these are guaranteed capacity and efficiency.

Today, the rush hour problems in the terminals constitute the greatest challenge to combi-transports. There is considerable pressure on capacity at certain times of day (evening and early morning) which do not coincide with passenger traffic. In the longer term, this can be changed to ensure that freight traffic will also request capacity during the day to a greater extent.



Southbound combi-express en route down the Gudbrandsdalen line. Photo: Njål Svingheim

Another important condition is that central players such as co-loaders, who are the most important customers in railway transport, are located in and beside the terminals. In addition, a gradually increasing requirement is emerging in the market for capacity, in area terms, being available to allow miscellaneous supplementary services to be performed at the terminal, such as final processing of products before they go out to the customer. It is thus important to have areas available in the vicinity of a terminal, which can be used when required for activities that sustain and support railway transports.

**Wagonload transports** constitute a small proportion (approximately 4% of all tonnage) of total transport on the railways in Norway and interoperation with foreign countries. Wagonload is currently operated by two carriers. Over the last few years, there has been strong market demand for wagonload transport. It is important therefore to make preparations to ensure that this type of transport can be developed, so that freight volumes do not transfer to road transport.

An important part of terminal operations consists of storing / "buffering" goods for suppliers outside Norway, so that the customer/recipient in Norway has the goods delivered in the right quantities and at the right time. The most important challenges for wagonload transport thus

lie in the terminal area. Sufficiently large areas must be guaranteed for storage, as well as areas for some of the wagons that have to be under cover during loading/unloading. One significant challenge is ensuring that areas that are designated for railway purposes are not redesignated and broken up for urban development and housing purposes.

Critical parameters are: cost/price, expected running time and logistics/info about the freight. Of the aforementioned conditions, cost/price and expected running time are the ones that might be affected by infrastructure. Here, sufficient capacity must be guaranteed both on the track and in the terminals.

**Timber transport** by rail is a system cargo product and is characterised by short (300m - 350m long) but heavy trains. The challenges for timber transport are of an administrative and an organisational nature, as well as being dependent on infrastructure. However, the challenges are linked to specific parts of the rail network that do not have a heavy load of other traffic.

### Goals for rail freight transport

Based on the current situation, with a high demand for rail freight transport, major short- and long-term lack of capacity in the infrastructure, considerable challenges in relation to punctuality and assumed considerable growth rates from

2010 – 2020, the following goals have been established for the development of rail freight transport:

#### Combi-transport:

- transport capacity shall be offered for combi-transports by rail to cover market demand in the short and long term – this means a doubling of current capacity up to 2020 – and a trebling of current capacity up to 2040
- a punctuality target of 90% for the transports shall be facilitated

It is assumed this will be achieved by taking action on infrastructure and in the administration and organisation of the carriers.

In relation to capacity, one general long-term goal is to facilitate approximately one freight train every two hours, 24-hours a day, i.e. 12 trains a day, but conceivably with more rapid frequency in "rush hour" morning and evening. In this way, it will be possible to achieve almost "conveyor belt supply" for rail freight transport. There may be little probability of the aforementioned train frequency on the Nordlandsbanen line.

Capacity will also be increased considerably when preparations are made for longer trains, i.e. 600m long. The costs to the carriers per unit transported will therefore be considerably reduced and will contribute to increased competitiveness.

### Wagonload, timber and other system cargo transport:

- The way they operate today, these transports will benefit greatly from the capacity expansion that is being developed for the combi-transports.
- Apart from this, one goal has been to facilitate the increased capacity these transports require, in terminals and on the lines between these.

### Recommended strategy for developing rail freight transport

#### Main strategic moves

It is important for moves relating to organisational and infrastructure conditions, since both will affect the competitiveness of the railway and its ability to take a considerable proportion of growth in the freight transport market. Capacity for freight traffic must be expanded in the short and long term. Three different markets will have to be managed:

- Combi-transports between major towns
- Wagonload transport
- Timber transport and other system cargo transport

This requires a different terminal strategy, but when developing route capacity, future needs for all markets could be covered. There is thus a fundamental requirement initially to double capacity on the main route that is included in the national transport network. The following main strategic actions are therefore proposed over the next 10 years (2010-2019) (see the text below in the frame):

To bring this about requires a different prioritisation of the railway network:

It is based on a national network for freight as defined in the National Rail Administration report: *Mer på skinner fram mot 2040 – Jernbaneverkets stamnettutredning [More on the rails towards 2040 – the National Rail Administration's national rail network report]*. Within this national network, top priority is being given to the National transport network for intermodal freight, where rail terminals and line sections are chosen on the basis of the following selection criteria:

- Corridors and terminals with large intermodal freight volumes today
- Corridors in which the railway has high levels of market share
- Corridors and terminals with great potential for future growth

The following rail terminals and sections are included in the National transport network:

#### Terminals (combi):

Oslo, Drammen, Kristiansand, Stavanger, Bergen, Trondheim, Bodø, Narvik

#### Railway lines:

Oslo – Kristiansand – Stavanger, Oslo – Bergen, Oslo – Trondheim (Dovrebanen line), Trondheim – Bodø, Ofotbanen line and Østfoldbanen line

## Main strategic moves

### ORGANISATIONAL

#### The National Rail Administration shall work to ensure:

- that freight trains can be given increased running-time priority in general and that these can operate in daytime to a greater extent
- that freight trains are given priority to a greater extent in exceptional situations at night
- that the state, via the National Rail Administration, becomes, in the first round, owner of the large intermodal rail terminals in the national transport network
- to establish an operating company at all of the major combi-terminals

#### In combination with the carriers, the National Rail Administration shall:

- work to promote an increased understanding of the importance of modern ICT systems to the efficiency of the terminals, both in relation to administration and production
- stimulate these to procure modern ICT systems

### INFRASTRUCTURE

- Invest in the development of large, "heavy duty" transport corridors for intermodal freight
- Increase the efficiency of the intermodal endpoint terminals for these corridors
- Provide terminals and routes with a boost to capacity and efficiency, thereby:
  - improving the punctuality of the transports
  - restoring predictability for transportation buyers
  - and lowering transport costs for the carriers

**Strategy for terminals in the national transport network**

Actions taken at the terminals shall be of the type that will increase capacity and make operations efficient. A number of conditions affect the capacity and possible operating efficiency of the terminals, and infrastructure owners/ administrators and transport companies/ terminal operators, by taking action, can contribute to increasing both capacity and efficiency.

The following strategy is being established for developing the terminals (see the text below within the frame);

**Strategy for other important terminals in the national network**  
**Combi-transports**

These are terminals with considerably less volume than those that are included in the national transportation network, but where there may be a need for minor preparations and operational efficiency measures. Market trends must be followed carefully over the next 10 years (2010 – 2019). When action is required at the terminals, preparations must be made for doubling capacity up to 2019.

**Wagonload - timber - and other system cargo transport:**

These transports constitute a small proportion in the overall context, approximately 10% - 11% altogether, but constitute approximately 30% of cross-border transport. It is proposed that market

trends should be followed carefully over the next 10 years (2010 – 2019).

When action is required, arrangements must be made to double capacity up to 2019. It is proposed that concentration should be focused in particular on making sufficient areas available for wagonload transports, and guaranteeing that railway areas are not reregulated for other purposes.

**Strategy for developing routes in the national network**

In the immediate 2 – 4 years, the starting point used will be that traction power (the locomotives) will remain approximately the same as today. After this, it is probable that it will increase by between 5% - 50% , depending on the strategies of the various railway undertakings. The extension of passing tracks that are too short for passing with typical current train lengths, or building new passing tracks where the capacity is too small, will therefore be given priority over the next 2 – 3 years. In the case of extending or building new passing tracks, these are designed to handle trains that are 600m long. There is already a number of passing tracks that are long enough to handle 600m long trains .

**Transport capacity**

The following strategy is being used as a starting point for increasing transport capacity in the national transport network and other parts of the national network:

**For terminals with a lack of capacity**

**Increase capacity and efficiency by:**

- building more and longer loading yards
- increasing the size of depot areas
- changing terminal layout to guarantee better traffic flow through the terminal
- changing operating concept from truck-based to crane-based operation (for terminals > 80,000 – 100,000 TEUs))
- Improving port function and ensuring better access to the terminals

**For terminals with sufficient capacity, but a non-optimal operating situation**

**Make the terminals more efficient by:**

- carrying out track relaying/track clearance
- removing poss. unnecessary building stock at the terminals
- increasing depot areas



Freight train en route to Sweden passing the station at Ski. Photo: Njål Svingheim

- Facilitate increased frequency with current train lengths (400m – 450m) spread throughout the 24-hour day, (1 train every 2 hours, to be given priority over the next 2 – 3 years)
- Facilitating 600m long (1200 tonne) combi-trains which, combined with increased frequency (1 train every 2. hours), are expected to double capacity during the period 2010 - 2019
- Facilitating further increased frequency with 600m long (1200 tonne) combi-trains that are expected to treble transport capacity within 2040

#### Energy supply

A long-term goal during further work is that the electricity supply should not appreciably restrict train running times.

- Because the freight traffic will be distributed more evenly throughout the day than it is currently, today's energy supply will provide capacity for more freight trains.
- A major increase on current train weights will require a significant increase in the output of the energy supply.
- The electricity supply must not significantly restrict train running times.

#### Profiles

For combi-transport the starting point is that it should be possible to transport by rail the intermodal units that are being transported by road and sea.

For sections with wagonload trains, timber trains, or industrial trains, profile increases for multipurpose loading gauges, the international wagonload gauge RIV -3.2,UIC-GC (which has been used as a basis for all new lines since 1990), and JBV-L ("large"), may be relevant alternatives on selected lines. Any choices of large profiles for customers with special transport needs, such as the Banverket [the Swedish Rail Administration] C profile, must be dealt with separately. For border routes with Sweden, the goal is to be able to offer loading gauges and loading specifications so that the freight trains do not face gauge-related restrictions when crossing the border.

#### Axle load

Based on the experience gained from the ongoing upgrade of the Østfoldbanen, Kongsvingerbanen, Solørbanen lines and the lower part of the Rørosbanen line for 25 tonne axle loads for new 2-axled timber wagons, an opinion will be formed on whether increasing the axle load to 25 tonnes will be applicable on other lines where extensive timber transports are being carried out or will be carried out. The National Rail Administration will delay somewhat in making a decision on a general increase in the axle load to 25 tonnes until the market requirement for such an increase is evident.

#### Signalling systems

The National Rail Administration has chosen the ERTMS level 2 system as the future technological platform for the signalling systems. This means that the safety systems will be renewed section-by-section while the ERTMS is being built. The renewals will make a significant contribution to increasing uptime for rail traffic, increasing capacity on the double-track section, and the capacity for technical and operational interoperability.



Tanker wagons for industry in Sarpsborg. Photo: Njål Svingheim

### **Prioritisation of measures for increased freight transport**

The following prioritisation of measures will facilitate a doubling of volumes in the national transport network by 2019.

#### **Main actions**

It is recommended that implementation should be subdivided into two phases:

In **phase 1**, one main action will be the completion of the Sørlandsbanen line as regards capacity, in relation to the goal of preparing for running volumes that are twice current amounts (measured in TEUs), and operating 600 m long and 1200 tonne trains. The Ganddal terminal was completed in 2007 and action is being taken to increase capacity at Alnabru. It is thus possible to obtain major effects from the new Ganddal terminal, and from the investments in the Sørlandsbanen line.

In parallel with this, it is recommended that a number of new passing tracks should be built on the Bergensbanen and Dovrebanen lines, and that capacity should be expanded to double volumes at the Bodø and Narvik terminals. In addition, the Nordlandsbanen line will gain a significant boost to capacity on completion of the CTC development.

In **phase 2**, the other sections and terminals, as defined in the National Transport Network (rail), will be given a capacity boost to double the current volumes.

Preparations are being made for the following investments: investments are being made one section at a time, but with the intention of upgrading it in accordance with the capacity target. The route and terminals at both ends will have equal capacity. In this way, it can be guaranteed that the overall effect of the investments can be achieved as quickly as possible.

#### **Prioritised projects**

The actions will include terminal and capacity measures on the main lines for freight transport. In addition, also included will be double track projects on the Østfoldbanen and Dovrebanen lines, on which freight traffic will interoperate with frequent passenger trains.

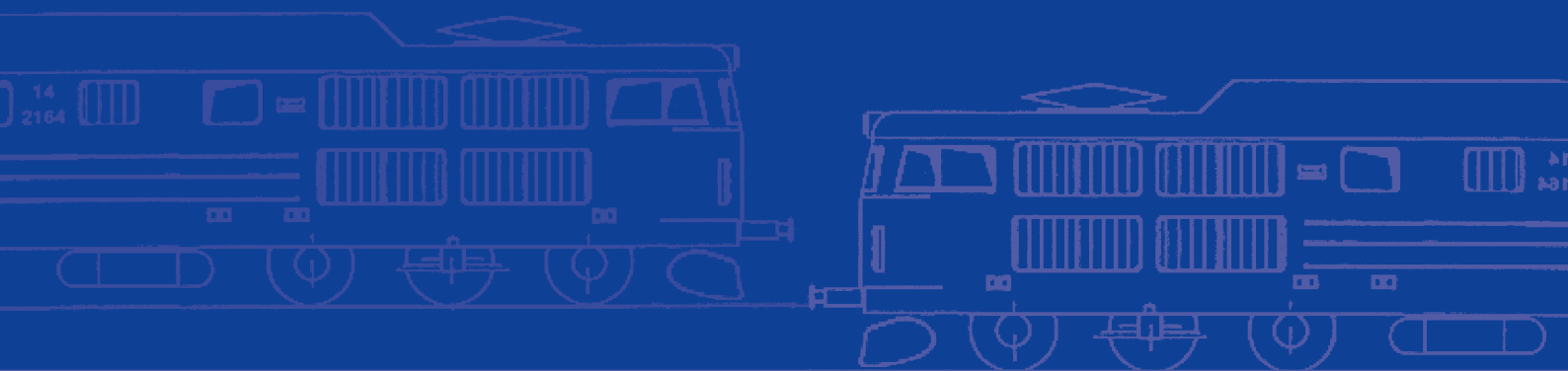
In addition to capacity measures such as building new passing tracks, or extending existing ones, the upgrading and renewal of the energy supply will have to be run in parallel across the investment, maintenance and renewal budgets.

**Recommended projects and investment costs for freight traffic to achieve a doubling of current capacity up to 2019::**

<i>Line</i>	<i>Action</i>	<i>Cost (MNOK)</i>
<b>Phase 1</b>		
Sørlandsbanen	7 – 9 passing tracks, energy supply	420 – 900
Bergensbanen and Gjøvikbanen	3 – 5 passing tracks	180 – 300
Dovrebanen	3 passing tracks	180 – 300
<b>Terminals:</b>		
Bodø	Extension of freight track 6	60 – 60
Narvik	Moving of track and clearance of buildings	25 – 25
<b>Total Phase 1</b>		<b>865 – 1585</b>
<b>Phase 2</b>		
Bergensbanen	5 – 9 passing tracks, energy supply	360 – 1100
Dovrebanen	5 – 9 passing tracks, energy supply	300 – 900
Nordlandsbanen	4 – 5 passing tracks	240 – 500
Østfoldbanen	2 – 3 passing tracks	120 – 300
Oftobanen	1 passing track	60 – 100
<b>Terminals:</b>		
Bergen	Capacity measures	70 – 70
Trondheim	Capacity measures	120 – 120
Drammen (Nybyen)	Capacity measures (New terminal poss. after 2019)	50 – 50
<b>Total Phase 2</b>		<b>1320 – 3140</b>
<b>Total Phases 1 and 2</b>		<b>2185 – 4725</b>

The measures undertaken on the routes will also benefit passenger traffic. Expenditure figures for Phases 1 and 2 are based on planning bases at different levels and are burdened with a great deal of uncertainty. To compensate for the great uncertainty in the cost figures, these have been indicated by a range from “low” to “high”. For all lines, more detailed planning must be carried out to clarify the location of the individual passing track.

In addition to measures that are included in the national transport network, it may also be relevant to carry out minor measures at other terminals and/or on other sections of line in parallel with this if market trends so indicate.



## Contact us

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