

Railway in Norway 150 years, 1854–2004

Jernbaneverket  
Biblioteket



## Contents

Director General's review .....	3
What is Jernbaneverket? .....	4
Organisational structure .....	5
Safety .....	6
Finance and efficiency .....	10
Operations	
Maintenance	
Capital expenditure – rail network development	
State Accounts for 2003	
Human resources .....	16
Personnel and working environment	
Competitiveness .....	18
The Norwegian railway network	
Key figures for the national rail network	
Traffic volumes on the national rail network	
Punctuality .....	22
Environmental protection.....	24
International activities.....	26

*Cover: Historic photographs: Norsk Jernbanemuseum. Photo: Rune Fossum  
Photo: Rune Fossum, Øystein Grue, Arvid Larsen/Jernbaneverket.*





Director General Steinar Killi

## Director General's review

An efficient, modern National Rail Administration is essential if we are to turn our vision of increased rail traffic into reality. In 2003 we introduced important organisational changes, and our project to establish a lean, modern organisation has dominated the daily life of most employees over the past year. One way or another, everyone is directly or indirectly affected by this process, but our determination to make it work has been a strong motivating force. The results of all this work will become increasingly apparent over the years ahead. The aim is to get more railway for our money.

The battle for rail funding is an ongoing process. In 2003, Norway's four government agencies in the transport sector – Kystverket (coastal shipping), Avinor (civil aviation), Statens Vegvesen (roads) and Jernbaneverket (rail) – agreed on a common platform for their submissions to government regarding the National Transport Plan 2006–15. The proposals were based on the budgetary framework set by the government. The government's draft National Transport Plan, presented in March, will go before the Norwegian Parliament in June 2004. For Jernbaneverket's part, we have made it clear that it is time for Norwegian railways to change track. Our socioeconomic calculations have shown that building

railways pays off. Europe as a whole is investing in rail, as are our neighbouring countries. I would strongly advise that we in Norway declare a ten-year period of investment in rail, with annual capital expenditure rising by NOK 1 billion and targeted at those areas where rail enjoys the strongest competitive advantages. That will enable rail to regain its effectiveness as an efficient, environmentally friendly mode of transport.

Safety is a key word on the railway. Every minute of every day, round the clock, safety is our top priority. 2003 was one of the best years on record for rail safety in Norway. The government's go-ahead for installation of the GSM-R radio system on the Nordland, Røros and Rauma lines will further enhance safety. However, it is vital that GSM-R coverage is not confined to these lines, but extended to the entire Norwegian rail network over the years ahead. Safety is something we have to create – and recreate every single day.

The railway continues to account for the largest onshore construction project in Norway, with substantial capital expenditure and construction work now under way between Sandvika and Asker. Jernbaneverket has accelerated the project and reduced costs through efficient use of resources and working methods. The new line is scheduled to

open to traffic in 2005 and will be the first step towards a modern and efficient suburban rail system for the Oslo region.

Our priorities in other parts of the country have included increasing the loading gauge in tunnels. As a result, the entire mainline network was cleared for piggyback traffic during 2003, and piggyback services have already proved very successful on the Oslo–Bergen route. Freight traffic was deregulated with effect from 15 March 2003. A number of freight operators are now running services in Norway, and demand for rail freight is growing. This is very encouraging. It will be interesting to see whether passenger services follow the same trend when they are opened up to competition in the near future.

At 31 December 2003, Jernbaneverket had 3 444 employees, 92 fewer than at the previous year-end. I should like to thank them all for their hard work in the course of the year.

Steinar Killi





# What is Jernbaneverket?

Jernbaneverket reports to the Ministry of Transport and Communications. The Ministry monitors the activities of Jernbaneverket through regular departmental meetings and periodic reports from Jernbaneverket. The Director General is the chief executive of Jernbaneverket.

## Jernbaneverket is responsible for:

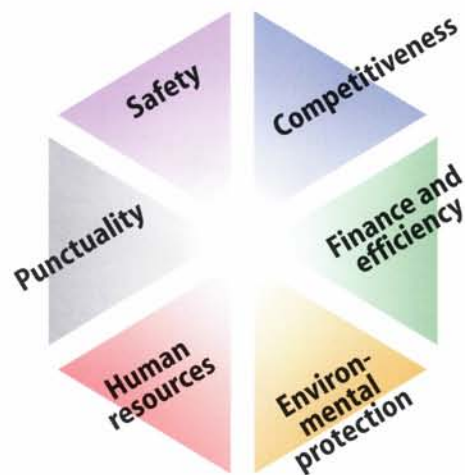
- Developing and operating a rail network that meets the requirements of society and the market in terms of safety and quality (punctuality, train frequency, public information, etc.)
- Railway stations and terminals, including public spaces, information facilities, access, car parks and other public facilities necessary for users of rail services
- Entering into track access agreements with train operators running services on the national rail network
- Scheduling and allocation of train paths to operators
- Managing train traffic on the rail network
- Studies and planning in the rail sector

The national rail network, with its stations and terminals, is a vital part of the infrastructure of society. Development and operation of the network is therefore a socioeconomic task, which has to be viewed in the same context as other socioeconomic activities.

Jernbaneverket aims to help the country achieve its transport policy objectives and to promote rail as a safe, competitive form of transport, forming part of an integrated network.

In 2001, Jernbaneverket drew up strategies and principal objectives for the following six core areas:

These objectives are intended to provide direction for the internal management of the business. Each core area has a separate chapter in this Annual Report.



# Organisational structure

Since 2002, Jernbaneverket has been systematically working to turn itself into a more efficient and effective railway administration.

In short, the objective has been to develop a structure that:

- Increases Jernbaneverket's presence on the ground
- Reduces the costs of administrative and technical support functions by 25% over three years
- Ensures that know-how within the organisation is better utilised
- Ensures that Jernbaneverket presents itself as a single entity to customers, users, staff and other interested parties

The process has taken place in stages, in close cooperation with staff organisations. With effect from 1 May 2003, the Directorate (formerly known as the Head Office) was reorganised, and two line organisations/divisions were set up: the Infrastructure Division (Infrastructure Management) and the Traffic Division (Traffic Management).

The Infrastructure Division is responsible for coordinating all activities relating to infrastructure operations, maintenance and construction. Since 1 January 2004, the division has comprised three

regions instead of the previous four. The new regional headquarters are located in Oslo, Bergen and Trondheim. The regions play the role of owner in running, maintaining and managing the national rail network. Jernbaneverket Operations (formerly Railway Production) forms part of the Infrastructure Division and since 1 January 2004 has comprised three operational units, one for each region. The Infrastructure Division also includes Infrastructure Construction, which acts as developer for railway construction projects, from the detailed planning stage through to completion of the new infrastructure. The project services department is part of Infrastructure Construction, providing technical support to all parts of Jernbaneverket in respect of planning, project development and project management.

The Traffic Division comprises four traffic areas, based in Oslo, Drammen, Bergen and Trondheim, and is responsible for traffic management on the rail network. Its main tasks are as follows:

- Train control, dispatching, and control of traction current
- Passenger information systems
- Monitoring punctuality

BaneEnergi, Jernbaneverket's electricity supplier, has been part of the Traffic Division since the new structure took effect on 1 May 2003.

The Directorate is responsible for formulating overall strategy and monitoring the performance of the organisation. Operational tasks and technical and administrative support functions are being transferred to the line organisations and/or a new Shared Administrative Services unit based in Hamar.

BaneService provides rail-related contracting services using specialised equipment and heavy machinery, and is an arm's-length business with an internal board appointed by Jernbaneverket.

The Norwegian Railway Museum, part of the marketing and communications department, is in charge of historical documentation and promoting Norwegian railway history.





# Safety

2003 was one of the best years on record for rail safety in Norway. Nevertheless, safety is not something we can take for granted. Safety is something we have to create – and recreate every single day.

Jernbaneverket's safety philosophy is that rail transport must not result in loss of human life, serious human injury, or serious damage to rolling-stock or the environment (the zero objective). Our overall safety objective is to maintain existing levels of safety, and all changes must be geared towards improving safety.

Transport contributes to society's wealth creation. The value of rail transport is created in a value chain consisting of infrastructure, traffic management and train operations. The risk of harm to people, the environment and rolling-stock is the sum of the risk factors from each of these three components and the interaction between them. It is this sum of the risk factors in the rail system that we must control if we are to create and maintain a railway with acceptable levels of safety.

Jernbaneverket is responsible for infrastructure and traffic management, and the train companies for train operations. By virtue of its responsibility for capacity allocation on the network, Jernbaneverket is in a position to monitor the overall risk on a continuous basis. Jernbaneverket itself controls the risk factors in infrastructure and traffic management. Through the timetabling process, the train operators provide an overview of the risk factors in train operations.

In 2003, five people died in accidents on the Norwegian rail network – two more than in the previous year, but five fewer than the average for the past 20 years. Three of the fatalities were run over by trains at barrier-equipped level crossings which were in full working order (Sandesund, Moss, Dale). The fourth fatality was in a broken-down car that was hit by a train at an unprotected level crossing (albeit with good visibility) on the Røros line. The fifth fatality was run over at Kolbotn station when he fell between the platform and a moving train.

## Operational accidents in 2003

Type of accident	Incidents	Fatalities	Serious injuries <sup>1</sup>
<b>Collisions</b>	<b>34</b>	<b>0</b>	<b>0</b>
• Train operations <sup>2</sup>	18	-	-
• Shunting	16	-	-
<b>Derailments</b>	<b>18</b>	<b>0</b>	<b>0</b>
• Train operations	6	-	-
• Shunting	12	-	-
<b>Level-crossing accidents <sup>3</sup></b>	<b>18</b>	<b>4*</b>	<b>0</b>
• Crossings with barriers, lights and claxons	7	3	-
• Crossings with gates	11	1	-
<b>Rolling-stock fires</b>	<b>3</b>	<b>0</b>	<b>0</b>
<b>Other accidents <sup>4</sup></b>	<b>1</b>	<b>1</b>	<b>0</b>
<b>Total <sup>5</sup></b>	<b>74</b>	<b>5</b>	<b>0</b>

\* Including one pedestrian.

<sup>1</sup> Serious injuries are defined as people deemed unfit to work for more than 14 days after the accident.

<sup>2</sup> Including six collisions between trains and landslides/avalanches.

<sup>3</sup> Collisions between road vehicles and railway rolling-stock.

<sup>4</sup> Other accidents resulting in death or serious injury.

<sup>5</sup> Owing to a change in the definition of an accident, whereby less serious incidents are also counted, the figures for 2003 are not directly comparable with those for previous years.

Jernbaneverket sets out the risk profile for the national rail network by conducting line-by-line risk surveys, supplemented by specific risk analysis of any modifications that may affect network safety. These surveys indicate that efforts should focus in particular on preventing major accidents and on reducing the scope for collisions with road vehicles and pedestrians at level crossings and along the line. In the light of this, we have reviewed our priorities regarding the plans to introduce centralised traffic control (CTC) and automatic train control (ATC) on the Nordland line, while introduction of the new GSM-R communications system has commenced, initially on those lines that currently lack such systems. We have also pursued some important initiatives concerning level crossings and trespassers on the line.

Jernbaneverket stages an ongoing campaign entitled "Tougher than the Train" to highlight the dangers of trespassing on the railway. The campaign is primarily aimed at children and young

people, and targets schools close to the railway.

## Level crossings

Level crossings have traditionally presented one of the largest risk factors associated with the rail network in Norway, so this has long been a priority area.

In 2003, Jernbaneverket made around 300 major and minor safety improvements at level crossings. A total of 96 crossings were eliminated during the year, but 4 319 crossings remain on the network. The majority of these are disused, or very lightly used, and therefore have little effect on the overall risk profile.

As well as eliminating crossings with a high accident risk, Jernbaneverket is committed to devising and implementing a range of measures to improve safety at level crossings, including:

- Improving visibility and road geometry
- Improving road signage in keep-

ing with guidelines formulated in consultation with the Directorate of Public Roads

- Regulations to reduce road traffic
- Fencing, locking and temporary closure
- Establishing procedures for use of level crossings
- Installing simple warning lights at farm crossings
- Developing a simplified interlocking for level crossings on minor roads

At level crossings on private roads, the focus has been on making minor improvements to ensure the crossings are as safe as possible.

The most important improvement has been to ensure optimum visibility of the railway line from road vehicles. Where vegetation blocked the line of sight, this has been cleared. Other visual obstacles have also been removed at some locations. By agreement with the landowners concerned, a number of private crossings have now been closed to the public. On the Bergen line, a trial scheme is under way where vehicle drivers have to telephone train control before crossing the line. This is being tried at crossings where traffic levels are very low and the gates are usually locked.

Signs instructing vehicle drivers to "STOP, look and listen for trains" have been erected at level crossings on all roads in daily use. Under an agreement with the Public Roads Administration, official regulatory signs have also been erected at a number of crossings on private roads.

### Signals passed at danger (SPAD)

A signal passed at danger (SPAD) is an incident where a train passes a red signal without permission, as opposed to those cases where train control instructs the driver to proceed beyond the red signal. In 2003, 365 SPAD incidents were reported, compared with 248 in 2002.

In most cases, the SPAD incident is caused by a technical fault in the signalling system. The signal changes to red just as the train approaches, so it is unable to stop in time. A typical technical failure is a weakness in the insulators separating track circuits, which sporadically causes the section beyond the signal to appear occupied when in fact it is clear. However, the track circuits erroneously sense a train and switch the signal to red. Jernbaneverket commenced a major project in 2003 to identify solutions that can reduce the extent of such faults.

A minority of SPAD incidents are due to driver error or misunderstanding. In these cases, it is important for Jernbaneverket to review why the signals were overlooked or misinterpreted and to try to address the reasons. Improvements are prioritised according to the frequency of incidents and the possible consequences at the signals in question. Locations where improvements were made in 2003 included Skøyen and Oslo central station.

The seriousness of a SPAD incident depends on various factors, including the type of signal, the line speed and the number of barriers on the section. The most effective barrier is Automatic Train Control (ATC), a system of track-mounted beacons at each signal that communicate with passing trains and activate the emergency brake if a train passes a red signal.

### Safety culture

Employees on the operational side of the business increasingly expect to take part in skills development initiatives where they can learn more about the safety-critical aspects of their various duties. The challenge for Jernbaneverket is to meet these expectations and establish a culture where procedures, rules and standards are understood and complied with (preferably more than mere compliance).

In the transition to a process-oriented business, sharper focus on developing modern leadership skills, teamwork and corporate culture will be a key success factor, along with motivation and an ability to see the bigger picture.

In 2003/04, Jernbaneverket is pursuing a comprehensive programme, known as PULS, to develop leadership skills and teamwork. Development of this kind will be one of the key activities in building a shared corporate culture with a sharper focus on safety.









Installation of GSM-R, a new safety and communications system for railway operations, began in July 2003.

*Photo: Arvid Larsen/Jernbaneverket*





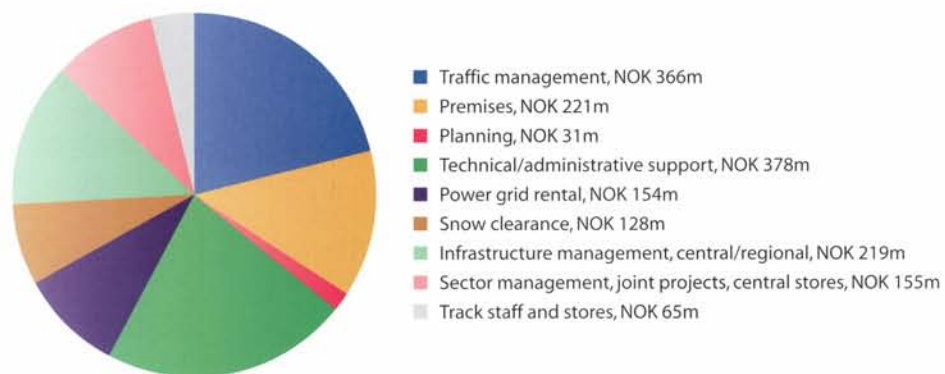
# Finance and efficiency

Jernbaneverket's principal objective in the core area of finance and efficiency is to make better use of resources in exercising its responsibilities and conducting its operations.

## Operations

Railway operations comprise administration, traffic management and infrastructure operations. Traffic management involves capacity allocation, timetabling and operational traffic management (train control, dispatching and public information). Infrastructure operations include tasks which are vital to maintaining safe and reliable train services. Figure 1 shows a breakdown of Jernbaneverket's costs for operations.

**Figure 1: Breakdown of operational costs in 2003 (NOK million) <sup>1 2</sup>**



### Traffic management

Costs for traffic management in 2003 amounted to NOK 366m. Traffic management involves the following main tasks:

- Train control and dispatching
- Passenger information systems (platform indicators, monitors, signage, information boards, public address systems, online information, etc.)
- Control of the overhead power supply to electric trains
- Safety-related tasks (devising and maintaining safety management systems, safety analysis, etc.)

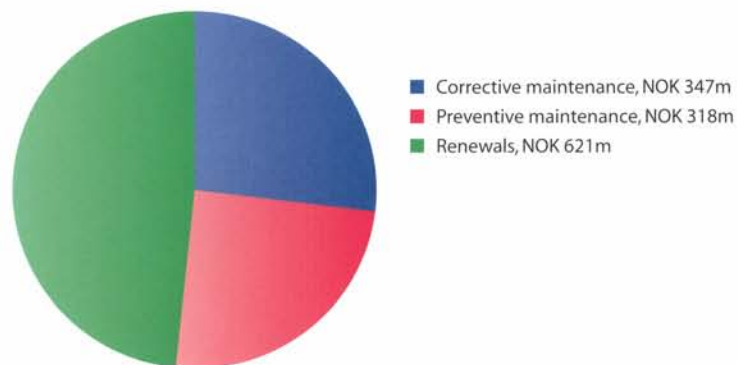
### Technical/administrative support

Costs for technical and administrative support totalled NOK 378m in 2003. Nationwide operations-related projects are also included under this heading.

### Premises

Premises costs, which include the leasing of public spaces at stations, telephone lines, and electricity for light and heating, amounted to NOK 221m in 2003.

**Figure 2: Breakdown of maintenance costs in 2003 (NOK million) <sup>1 2</sup>**



### Power grid rental

Rental payments to BaneEnergi (Jernbaneverket's in-house electricity supplier) for the supply of traction current totalled NOK 154m in 2003.

### Planning

This heading covers planning activities up to the point at which the overall plan for a capital project is approved. On the

basis of plan status and expected capital expenditure, planning costs came to NOK 31m in 2003. This figure excludes some activities relating to municipal and neighbourhood planning.

### Snow clearance

Costs for snow clearance and contingency measures were NOK 128m in 2003.

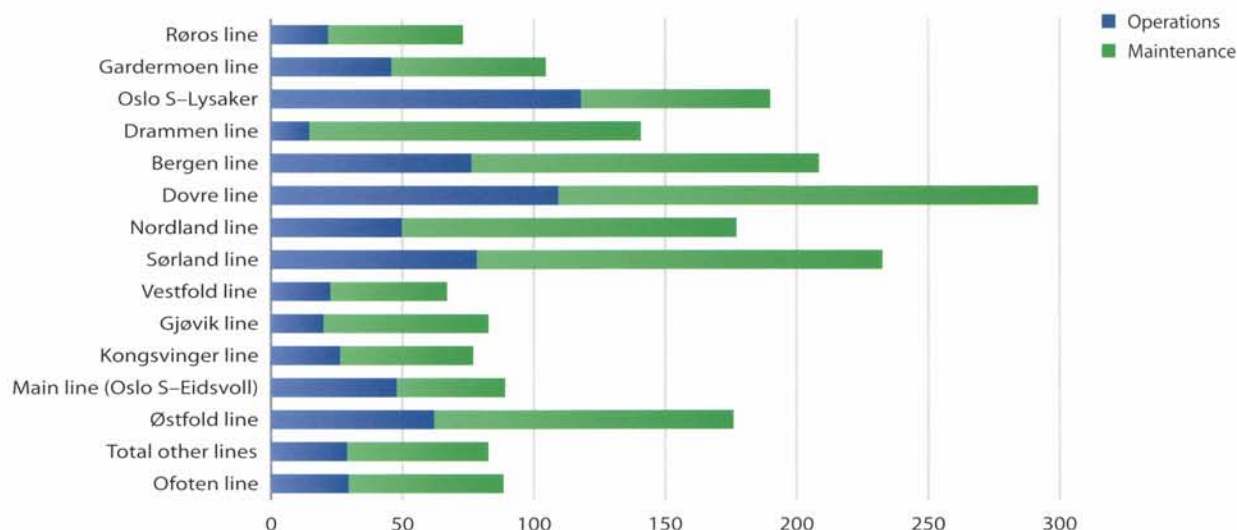
<sup>1</sup> Figures 1, 2 and 3 show an estimated breakdown of costs after calculated allocation of indirect costs. The figures do not reflect Jernbaneverket's cash accounts. In 2003, Jernbaneverket operated on the cash accounting principle, so the accounts reflect spending in the given period, which may differ from costs for the period.

<sup>2</sup> Figures 1, 2 and 4 exclude operations and maintenance of the Gardermoen airport line.



**Figure 3: Operations and maintenance costs by line in 2003 <sup>1</sup>**

(NOK million)



## Maintenance

Maintenance is defined as activities to maintain established levels of safety and operational reliability, and to maintain the value of technical installations and infrastructure.

Maintenance falls into three categories:

- Corrective maintenance: fault repairs and emergency call-outs
- Preventive maintenance: inspections, examinations, checks, scheduled preventive repairs, overhauls, replacement of components
- Infrastructure renewal: replacement of catenary and signalling systems, complete renewal of sleepers and rails, etc.

On 1 July 2002, Jernbaneverket set up a maintenance working group, partly in preparation for an efficiency study of operations and maintenance tasks. Overall maintenance strategies have been formulated, and the process of drawing up maintenance strategies for individual lines is under way. Work on a draft manual for maintenance management, to be adopted in 2004, is now complete. The manual is based partly on the principle of reliability-driven maintenance, which is expected to bring a shift in focus from corrective to preventive maintenance and renewal, while reducing overall maintenance costs.

### Scope of renewals

The following figures are an estimated average for the renewal of core infrastructure components in the years 2002–05:

Replacement of rails	30 km per year
Replacement of sleepers	36 000 sleepers per year
Replacement of points	20 sets per year
Ballast cleaning	65 km per year
Renewal of cabling	60 km per year
Renewal of catenary	40 km per year
Renewal of signalling	2.5 stations per year

Jernbaneverket has 35 transformer stations supplying traction current. The

remaining useful life for vital components in these installations ranges from 15 to 40 years.

The above figures reflect Jernbaneverket's maintenance plans.

### Operations and maintenance costs by line

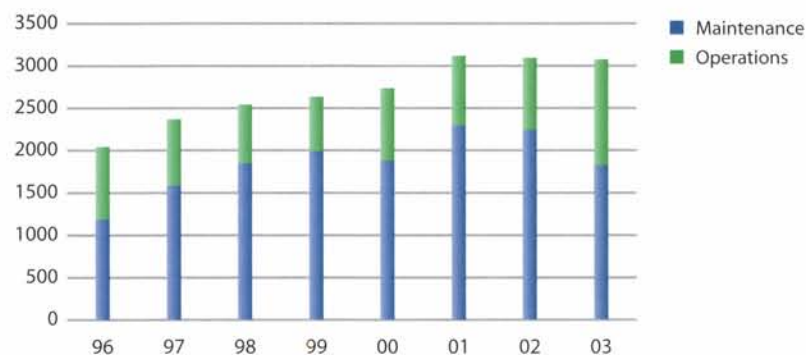
Figure 3 gives a breakdown of operations and maintenance costs by line.

### Operations and maintenance costs 1996–2003

Figure 4 shows Jernbaneverket's operations and maintenance costs from 1996 to 2003, at 2003 prices in NOK million.

**Figure 4: Operations and maintenance costs 1996–2003 <sup>2</sup>**

(2003 prices, NOK million)



## Capital expenditure – rail network development

Table 1 gives a breakdown of Jernbaneverket's spending and budget allocations under section 1350, item 30 "Investment in railway lines", along with the budgeted cost and expected final cost of the projects listed in Parliamentary Bill No. 1 (2002–03). It also covers projects in Jernbaneverket's four focus areas: safety, environmental protection, capacity enhancements, and stations and interchanges.

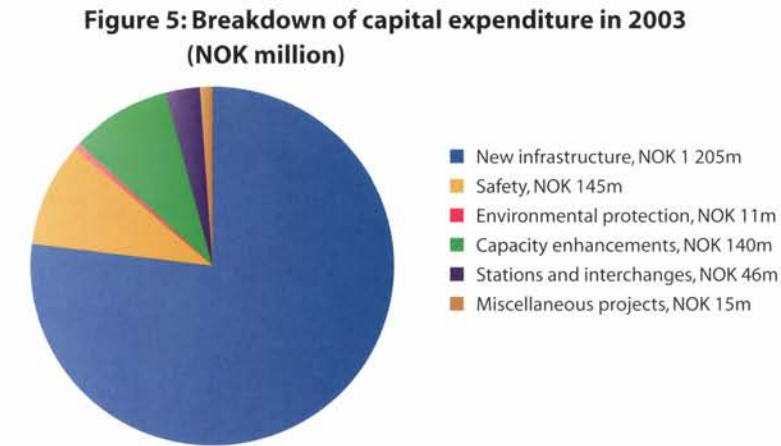
Figure 5 gives a breakdown of Jernbaneverket's capital expenditure in 2003 by focus area.

### New infrastructure

#### Sandvika–Asker

This project forms part of the construction of a new double-track line between Skøyen and Asker. The main objectives of the Skøyen–Asker project are increased capacity, higher train frequencies, improved punctuality and reliability, and shorter journey times. Phase 1 is the Sandvika–Asker section which comprises 11.6 km of new double track between Sandvika and Asker.

To accelerate the project and reduce costs, Jernbaneverket has merged the contracts for the Sandvika–Jong and Jong–Asker sections. We have now



signed a contract that will allow the Sandvika–Asker project to be completed in 2005.

### GSM-R

The GSM-R project involves technology specially developed for voice and data communication in connection with train operations and other railway-related activities. GSM-R will provide a technological basis for cross-border train operation across Europe. The European Union is supporting the development of GSM-R as a pan-European rail technology infrastructure.

GSM-R has to meet the requirements of the Norwegian Railway Inspectorate regarding safe train operation and the licensing requirements of the Norwegian Post and Telecommunications Authority in areas not presently covered by cab

-to-shore radio. As GSM-R coverage is extended, the system is intended to replace the analogue radio systems currently used in train operations. Jernbaneverket and NSB have signed a memorandum of understanding in which they both undertake to base future communications solutions on GSM-R technology.

It is planned to extend GSM-R coverage to around 4 000 km of rail lines. Radio coverage of tracks not in tunnel will require an estimated 500 base stations. The lines included in the project have been grouped into two phases, the first of which is scheduled for completion in 2004. Phase 1 covers those main lines currently without cab-to-shore radio coverage, which are subject to time-limited special dispensation from the Norwegian Railway Inspectorate. The

**Table 1: Capital expenditure in 2003 (NOK million)**

	Total 2003			Accounting cost 2003			Project total		
	Allocated	Budgeted cost	Discrepancy	Budgeted cost	Accounting cost	Discrepancy	Budgeted cost	Expected final cost	Discrepancy
<b>New infrastructure</b>									
Sandvika–Asker	900.0	810.2	-89.8	810.2	813.4	-3.2	3 718.0	3 718.0	0.0
Lieråsen tunnel	40.0	40.0	0.0	40.0	44.2	-4.2	194.0	194.0	0.0
Lysaker station	25.0	16.2	-8.8	16.2	8.0	8.2	660.0	660.0	0.0
Sandnes–Stavanger double track	20.0	19.2	-0.8	19.2	20.0	-0.8	1 030.0	1 030.0	0.0
GSM-R	200.0	217.5	17.5	217.5	217.6	-0.1	1 700.0	1 700.0	0.0
Grong–Mosjøen CTC/ATC		50.9	50.9	50.9	51.2	-0.3	131.0	131.0	0.0
Other projects	-49.2	44.7	93.9	44.7	50.1	-5.4			
<b>Total new infrastructure</b>	<b>1 135.8</b>	<b>1 198.7</b>	<b>62.9</b>	<b>1 198.7</b>	<b>1 204.6</b>	<b>-5.9</b>	<b>7 433.0</b>	<b>7 433.0</b>	<b>0.0</b>
Safety	126.0	222.5	96.5	187.9	145.0	42.9			
Environmental protection	0.0	11.5	11.5	11.5	10.5	1.0			
Capacity enhancements	91.3	184.7	93.4	184.7	140.4	44.3			
Stations and interchanges	73.8	16.2	-57.6	50.8	45.7	5.1			
Miscellaneous projects	40.7	10.6	-30.1	10.6	14.7	-4.1			
<b>Total focus areas</b>	<b>331.8</b>	<b>445.5</b>	<b>113.7</b>	<b>445.5</b>	<b>356.3</b>	<b>89.2</b>			
<b>Net total, item 30</b>	<b>1 467.6</b>	<b>1 644.2</b>	<b>176.6</b>	<b>1 644.2</b>	<b>1 560.9</b>	<b>83.3</b>			
Section 4350, item 37	29.3	29.3	0.0	29.3	29.0	0.3			
Section 4350, items 02–18	0.0	0.0	0.0	0.0	2.2	-2.2			
<b>Gross total, item 30</b>	<b>1 496.9</b>	<b>1 673.5</b>	<b>176.6</b>	<b>1 673.5</b>	<b>1 592.1</b>	<b>-81.4</b>			

\* Budgeted cost 2003 represents Jernbaneverket's internal allocation, including funding transferred following a budget review on 3 June 2003.



lines concerned are the Nordland, Røros and Rauma lines. Phase 2 will cover the rest of the rail network as currently covered (except for a few short sections and tunnels) by analogue cab-to-shore radio.

#### Lieråsen tunnel

The aim of this project is to resecure the rock inside the tunnel, so that the original operating specifications in terms of safety, speed and train frequency between Asker and Lier can be maintained. The bulk of the safety-related upgrade involves essential maintenance of the tunnel roof following many years of wear and tear and deterioration of concrete rendering and structures. Measures will also be taken to improve safety during construction and operation, in line with statutory requirements and modern standards. Extensive preparatory works will be carried out on the railway line before work to secure the rock commences. Minor rock-securing works are being carried out annually as a stopgap measure pending full refurbishment of the tunnel.

#### Focus areas

##### Safety

Jernbaneverket has a responsibility to rail users, third parties, its staff and society at large to ensure that railway operations do not result in loss of human life, serious human injury, or serious damage to rolling-stock or the environment. On the basis of thorough risk assessments, conducted largely on a line-by-line basis, Jernbaneverket's top priorities in this focus area are as follows:

- Signalling systems
- Elimination and upgrading of level crossings
- Securing against landslides and line slippage
- Communication systems, lighting, evacuation routes and marking in tunnels
- Radio communication with trains (GSM-R)
- Measures to ensure passenger safety at and in the vicinity of stations

##### Environmental protection

Jernbaneverket aims to secure rail's position as the most environmentally friendly mode of transport through specific environmental standards concerning railway operations and development that protect the interests of rail users and society. Jernbaneverket's principal environmental objective is to reinforce

the environmental benefits of rail transport through proper use of resources, reduced overall environmental impact, and defined, quantifiable environmental standards for our own operations and our suppliers. Rail's environmental impact can be managed by means of good planning, environmental monitoring of construction projects, and appropriate operating and maintenance procedures. The main environmental problems relate to noise from railway operations and impact on the natural environment and cultural heritage. Railway operations also cause some pollution and a few unfortunate incidents such as animal fatalities and forest fires.

##### Capacity enhancements

Jernbaneverket aims to develop a rail network with a standard and capacity that meets market demand, and to increase rail's market share where rail transport is socioeconomically viable. Jernbaneverket is committed to increasing the capacity of Norway's rail infrastructure where freight transport is concerned. To increase rail's competitiveness in the freight market, it is vital to improve the infrastructure to allow for larger and more frequent freight trains that meet the needs of the market. As well as increasing the loading gauge, we also have to provide sufficient passing loops, electricity supply and terminal capacity to create optimum conditions for intermodal transport (rail/road/sea).

##### Stations and interchanges

One of Jernbaneverket's strategies is to develop user-friendly stations and interchanges with the emphasis on safety, accessibility, information and service. The development of station facilities must form part of a joint product-development process involving train companies, service businesses, highway authorities and planning authorities. The aim is to provide passengers with the standards they expect and are willing to pay for, and to encourage more people to use public transport. Our programme for stations and interchanges involves improving customer facilities at stations, such as access, car parks, platforms and waiting areas, travel information, and other customer services.

##### National Transport Plan 2006–15: Rail investment pays off

Along with other government agencies in the transport sector, Jernbaneverket has presented proposals for a new

National Transport Plan covering the years 2006–15. The proposals were submitted to the Ministry of Transport and Communications and the Ministry of Fisheries (responsible for harbours) on 1 June 2003. During the intervening months up to the year-end, all the agencies submitted supporting studies. Socioeconomic calculations show that investment in developing the rail network pays dividends.

The submissions by the transport-sector agencies emphasise the following points:

- A coordinated approach, with heavy use of policy instruments, is necessary in order to meet transport policy objectives.
- Capital expenditure to be focused on areas where both road and rail traffic is heavy.
- In the conurbations, a coordinated land-use and transport strategy could yield almost zero growth in road traffic.

## State Accounts for 2003

Jernbaneverket's budget allocations for 2003 under section 1350, Expenditure, and section 4350, Income, were NOK 4604.1m and NOK 479.9m respectively.

Jernbaneverket's accounts reconcile the actual expenditure and income figures for the year with the budget allocations under section 1350, Expenditure, and section 4350, Income. The budget allocations are based on:

- The "Blue Book" for 2003<sup>1</sup>
- Letter from the Ministry of Transport and Communications dated 12 March 2003 regarding the carry-forward of unused budget allocations under section 1350, item 30 "Investment in railway lines," from 2002 to 2003
- Letter from the Ministry of Transport and Communications dated 2 July 2003 regarding various revisions to the 2003 national budget [Parliamentary Bill No. 65 and No. 75 (2002–03)]
- Letter dated 19 December 2003 concerning revised budget allocations for 2003 in the transport and communications sector [Parliamentary Bill No. 29 / Recommendation to Parliament No. 90 (2003–04)]

<sup>1</sup> The final budget approved and published by the Norwegian Parliament for the coming fiscal year is known as the "Blue Book". It sets out the national budget, including social security expenditure, and also specifies financial parameters for government.

**Authorisation to offset excess expenditure against excess income**

In the "Blue Book" for 2003, Jernbaneverket was authorised to use excess income under section 4350 to cover excess expenditure under section 1350 as follows:

May exceed budget allocation under	By amount equivalent to excess income under
Section 1350, items 23 and 30	Section 4350, items 02 and 06
Section 1350, item 25	Section 4350, item 07
Section 1350, item 30	Section 4350, item 37

In addition to the authorisations outlined above, Jernbaneverket is authorised to increase expenditure under section 1350, items 23 and 30, if this can be offset against income under section 4350, items 15–18. Please refer to the State Budgeting Guidelines, Part II, section 6.6, regarding the changeover to direct reimbursement of sick pay.

Section 1350:	Expenditure (NOK million)			Approved budget	Accounts
Item	Description	"Blue Book" for 2003	Adjustments		
23	Operations and maintenance	3 001.6	-52.0	2 949.6	3 075.6
25	Operations and maintenance, airport line	90.7	-10.0	80.7	85.7
30	Investment in railway lines	1 346.1	227.7	1 573.8	1 600.8
	<b>Total, section 1350</b>	<b>4 438.4</b>	<b>165.7</b>	<b>4 604.1</b>	<b>4 762.1</b>

Section 4350:	Income (NOK million)			Approved budget	Accounts
Item	Description	"Blue Book" for 2003	Adjustments		
1	Track charges	40	0	40	27.3
2	Sale of equipment, services, etc.	177.9	0	177.9	149.5
6	Resale of electricity for train operations	162	0	162	254.5
7	Payment for use of airport line	90.7	-20	70.7	73.9
15	Reimbursement for employment creation schemes	0	0	0	0.1
16.11	Reimbursement of salaries	0	0	0	5.7
16.12	Reimbursement of employer contributions	0	0	0	0.8
17	Reimbursement for apprentices	0	0	0	1.3
18.11	Reimbursement of sick pay	0	0	0	41.9
18.12	Reimbursement of employer contributions on sick pay	0	0	0	5.7
37	Contribution to infrastructure works	29.3	0	29.3	29.1
	<b>Total, section 4350</b>	<b>499.9</b>	<b>-20</b>	<b>479.9</b>	<b>589.7</b>







# Human resources

Jernbaneverket's principal objective in the core area of human resources is to be an attractive workplace. This means a good working environment with good opportunities for career development, meaningful duties, and responsible and inspirational colleagues and managers.

## Personnel and working environment

### Permanent workforce

At 31 December 2003, Jernbaneverket had 3 444 permanent employees, 92 fewer than at the previous year-end.

### Overtime

Overtime payments in 2003 accounted for 9.9% of permanent salaries, down from 10.9% the previous year.

### Sick leave

The proportion of working days lost through illness in 2003 was 6.8%, a reduction from 7.2% in 2002 and 6.9% in 2001. Jernbaneverket has adopted an "inclusive workplace" scheme, giving new impetus and focus to our efforts to manage absenteeism. As part of the scheme, managers with personnel responsibilities have received accountability training. The training programme focused on monitoring absenteeism and the remedies available in an inclusive workplace. A dedicated support system for managers was also put in place under the scheme in 2003. Fifteen inclusive-workplace coordinators have been trained to provide motivation and support for managers. Local inclusive-workplace action plans have also been formulated, with specific targets for reducing sick leave.

### Injuries leading to absence

The number of injuries leading to absence fell from 52 in 2002 to 45 in 2003.

### Skills development

The Norwegian Railway Inspectorate introduced new training regulations in 2003, leading to new training programmes for several categories of staff. Jernbaneverket has introduced a new tool for skills management, collating all the skills requirements that were previously spread across several manuals. Skills requirements for safety-related posts have been restructured and updated to make them more accessible to users. At the end of the year, Jernbaneverket was commissioned by the Ministry of Transport and Communications to set up an operator-independent training regime for locomotive drivers and other rail staff, which is scheduled to be in place by 1 January 2005.

### Personnel policy

The personnel policy was revised in early 2003, and the changes implemented during the first half of the year. A sharper focus on personnel policy and on creating a more inclusive workplace have been key elements in looking after the interests of staff during the ongoing

restructuring process. Towards the end of the year, Jernbaneverket signed a contract with a company to provide employment action packages for staff affected by restructuring. These packages provide those who are interested with a personalised programme of jobseeking courses, career guidance, advice on how to sell their skills, and contacts with potential employers.

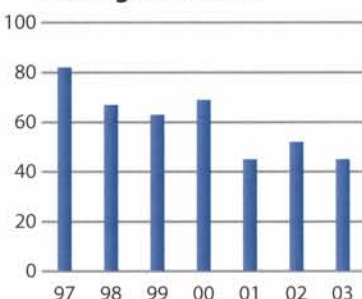
### Equal opportunities

Jernbaneverket aims to increase the number of female managers. One of the five executive directors and one of the three regional directors is female. In addition, the new Shared Administrative Services unit is headed by a woman. Jernbaneverket also has several female track managers, bringing the proportion of female managers to 25% compared with 9% in 2002.

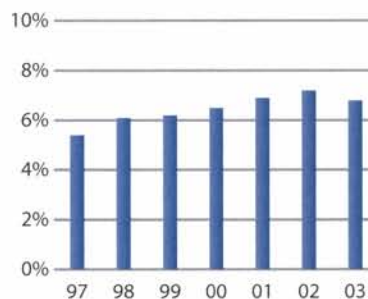
### Staff suggestions programme

The staff suggestions programme saw a fairly low level of activity in 2003. As part of Jernbaneverket's restructuring into a leaner, more modern organisation, we have decided to work towards a simplified structure for the suggestions programme, in order to streamline the handling of suggestions and revitalise the scheme.

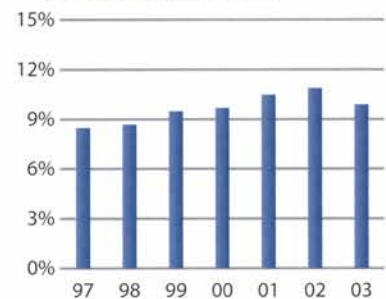
**Number of injuries leading to absence**



**Days lost through illness**



**Overtime as % of permanent salaries**









# Competitiveness

Jernbaneverket's principal objective in the core area of competitiveness is to work to increase rail's market share where rail transport is socioeconomically viable.

## The Norwegian railway network

### Train companies on the national network

In 2003, the following train companies held licences to operate on Norway's national rail network:

- CargoNet AS
- Connex Tog AS
- Flytoget AS
- GM-gruppen
- Green Cargo AB (from 12 December 2003)
- Malmtrafikk AS
- NSB AS
- Linx AB (operates under NSB's licence)
- Flåm Utvikling AS (operates under NSB's licence)
- Ofotbanen AS
- Valdresbanen AS

In the case of most train companies, the licence is restricted to specified parts of the network.

In addition to the above, a number of potential operators were in contact with Jernbaneverket during the year. We therefore expect to see more train companies in Norway in the year ahead.

### Network capacity

Capacity is an expression of the number of units of a particular type that can pass through a specific line section over a unit of time. In order to have a clear understanding of the network's capacity and the variable factors that influence this, we make a distinction between two types of capacity:

- Traffic capacity, which is concerned with the number of trains (in this case we only consider the actual train traffic)
- Transport capacity, which is concerned with the quantities in terms of tonnes, cubic metres and passenger seats that can pass through a line section

### Traffic capacity varies depending on the following factors:

#### On single-track lines:

- Longest distance in terms of time between passing loops (most important)
- Multiple approaches to stations (less important)
- Variations in train speeds (less important)
- Variations in distance between passing loops (less important)

#### On double-track lines:

- Variations in train speeds (most important)
- Fixed or moving block sections (less important)
- Overtaking loops (important on lengthy sections)
- Sidings for moving trains into and out of service

**Transport capacity** is influenced by a number of variable infrastructure-related factors in addition to the number of trains. These factors, which limit the length, gross weight and profile of trains, are as follows:

- Length of passing loops (determines maximum train length)
- Permitted axleload (often linked to train's permitted speed)
- Power supply (for electric trains)
- Gradients
- Loading gauge (determines maximum wagon height, width and length)

The above deals with the capacity of individual line sections. If this approach is extended to the entire line, we can talk about line capacity or potential transport

### Network Statement

Jernbaneverket has produced its first product description. Known as the Network Statement, this catalogue contains information on the type of infrastructure available to companies wishing to run train services on the national network, the terms and conditions of access, charging principles and rates, planned changes to track charges, and the principles and criteria for capacity allocation.

The first edition of the Network Statement, published on 15 March 2003, covers the period from December 2003 to December 2004. The second edition, published in mid-December 2003, covers the period from December 2004 to December 2005.

The Network Statement is available on Jernbaneverket's website at [www.jernbaneverket.no/marked](http://www.jernbaneverket.no/marked).

### Track access agreement

In consultation with the train companies, Jernbaneverket has drawn up a new standard agreement on access to the national rail infrastructure. The agreement is available on Jernbaneverket's website.



work expressed as a new set of parameters such as potential tonne-kilometres or seat-kilometres. At this point, a new variable is introduced: train speed.

### Capacity of stations, freight terminals, yards and workshops

Capacity for moving trains is just part of the equation. In addition, we have to consider the capacity of facilities where locomotives and rolling-stock are stationary for the following reasons:

- Loading/unloading of passengers and goods (stations and freight terminals)
- Marshalling
- Parking and positioning
- Maintenance

At such facilities, adequate track lengths are the crucial factor for capacity. The facility must also be designed in such a way that the relevant tasks can be carried out in a timely, cost-effective manner.

### Importance of capacity to rail's competitiveness

Along with high infrastructure availability (high uptime on the technical systems), capacity is the most important contribution Jernbaneverket can make to improving the competitiveness of freight and passenger train operators. High fixed costs are characteristic of rail transport. Unit costs will fall if the means of production (locomotives, rolling-stock and personnel) can be used more cost-effectively. Train companies do not make money while their trains are idle.

**Gauge code:** A specified standard loading gauge, indicating the maximum height and width for particular cargo types. UIC P403 and UIC P407 are two examples of international gauge codes. For instance, UIC P407 is equivalent to a semitrailer 4.07 metres in height and no more than 2.6 metres wide transported on open wagons with the wagon floor 0.33 metres above the rail-head.

### Current capacity situation on Norway's railways

As in previous years, there were a number of temporary capacity reductions (speed restrictions, line closures and train cancellations) owing mainly to scheduled infrastructure works. Jernbaneverket makes constant efforts to reduce the extent and duration of these temporary restrictions and to improve track availability.

Oslo central station (Oslo S) and the Skøyen–Asker, Oslo S–Ski and Bergen–Arna sections are already operating at full capacity for long periods in the rush hour. This means we are unable to accommodate the demands of train companies for more train paths. Accordingly, Jernbaneverket has declared these sections to be overloaded.<sup>1</sup>

Capacity is well utilised at certain times of day on most lines in eastern Norway and on local lines around Stavanger and Trondheim. Jernbaneverket is considering whether these sections too should be declared overloaded.

### Loading gauge

The loading gauge for each line indicates the maximum permissible height and width of loaded or unloaded rolling-stock on that line. Loading gauge is one of the key capacity parameters for freight traffic.

Work on loading-gauge modifications has, over the years, been a high priority for Jernbaneverket, in part to bring Norway into line with international standards and to match popular load for-

mats used in road transport. This applies in particular to loading gauge UIC P407, which allows higher loads and greater capacity for container traffic and, above all, piggyback transport of semitrailers.

Piggyback traffic, which has shown enormous potential on national and especially international routes, is a growth segment. To a large extent, this involves temperature-controlled consignments with a high goods value, a segment in which rail offers a competitive transport option. What is more, such traffic is largely won over from the roads, through the use of wagons designed for intermodal traffic.

Loading gauge UIC P407 was introduced on the Bergen and Vestfold lines during 2003 and now applies to the entire national rail network apart from the Ofoten line (Narvik–Vassijaure) and the Solør line (Elverum–Kongsvinger). For the time being, the Ofoten line is cleared for UIC P403 traffic.

The northern section of the Gjøvik line (Roa–Gjøvik) and a number of branch lines (Grong–Namsos, Kongsberg–Rollag, Asker–Spikkestad, Hjuksebø–Tinnoset, Nelaug–Arendal, Eina–Dokka) are not yet cleared for UIC P407 traffic, but nor has there been any market demand for it.

For international traffic, the priority is to adapt parts of the network to the international loading gauge RIV-3.2, which allows the use of larger, more modern wagons. In effect, RIV-3.2 is a standard loading gauge for the European rail network north of the Alps. At present, this loading gauge is permitted only on the Kongsvinger line.

<sup>1</sup> Under the regulations on capacity allocation, declaring a section of line to be overloaded requires Jernbaneverket to complete a capacity analysis of that section within six months. Within a further six months, Jernbaneverket must have produced a capacity enhancement plan.

## Key figures for the national rail network

Line	Route-km	Double track km	Passing loops >600m	Bridges	Tunnels	Level crossings
● Nordland line (Trondheim–Bodo)	729	–	24	361	156	891
■ Sørland line (Drammen–Stavanger)	545	–	17	495	190	152
■ Dovre line (Eidsvoll–Trondheim)	485	–	36	384	42	398
● Røros line (Hamar–Støren)	383	–	7	291	6	512
■ Bergen line (Hønefoss–Bergen)	372	–	18	192	155	295
■ Østfold line, west	170	63	8	190	16	89
■ Vestfold line (Drammen–Skien)	148	23	–	117	16	156
■ Gjøvik line (Oslo S–Gjøvik)	124	3	2	102	7	158
■ Kongsvinger line	115	–	7	49	–	92
● Rauma line	114	–	1	100	6	244
● Solør line	94	–	–	31	–	232
■ Østfold line, east	80	–	1	42	2	116
● Meråker line (Hell–Storlien)	71	–	–	64	1	62
■ Main line (Oslo S–Eidsvoll)	68	21	6	62	2	11
■ Gardermoen line (Etterstad–Eidsvoll)	64	60	–	37	3	–
■ Randsfjord line (Hokksund–Hønefoss)	54	–	–	27	–	108
■ Bratsberg line (Skien–Notodden, excl. Nordagutu–Hjuksebø)	44	–	–	57	24	56
■ Drammen line (Oslo S–Drammen)	42	42	–	58	11	2
■ Ofoten line	42	–	1	6	20	43
■ Arendal line	37	–	–	16	3	48
■ Roa–Hønefoss line	32	–	–	25	3	47
■ Flåm line	20	–	–	2	21	41
■ Spikkestad line	14	–	–	12	–	8
■ Brevik line (Eidanger–Brevik)	10	–	–	–	1	13
■ Alnabru–Loenga	7	–	–	3	–	–
● Stavne–Leangen	6	–	–	2	1	–
■ Alnabru–Grefsen	5	–	–	5	–	9
■ Skøyen–Filipstad	2	2	–	4	–	–
■ Dalane–Suldal	1	–	–	–	–	–
<b>Total, lines with regular traffic</b>	<b>3878</b>	<b>214</b>	<b>128</b>	<b>2734</b>	<b>686</b>	<b>3783</b>
Branch lines without regular traffic	199	–	–	70	16	536
<b>Total</b>	<b>4077</b>	<b>214</b>	<b>128</b>	<b>2804</b>	<b>702</b>	<b>4319</b>

- Electrified lines
- Non-electrified lines

### Line priority

The rail network is classified on a scale of five priorities, based primarily on:

- current use of the network
- expected traffic growth
- socioeconomic benefit





# Traffic volumes on the national rail network

The train companies have supplied the following data:

## Freight traffic

### Tonnes transported by rail (1000)

	1996	1997	1998	1999	2000	2001	2002	2003
<b>Norwegian domestic traffic</b>	<b>4 947</b>	<b>5 038</b>	<b>5 802</b>	<b>6 024</b>	<b>5 890</b>	<b>6 300</b>	<b>5 894</b>	<b>4 589</b>
Including:								
NSB AS	4 947	5 038	5 802	6 024	5 890	6 300	.	.
CargoNet AS <sup>1</sup>	.	.	.	.	.	.	5 894	4 589
<b>Cross-border traffic</b>	<b>14 612</b>	<b>16 709</b>	<b>15 533</b>	<b>13 599</b>	<b>15 745</b>	<b>14 081</b>	<b>14 534</b>	<b>16 556</b>
Including:								
NSB AS	1 521	1 538	1 656	2 075	2 069	1 891	.	.
Cargo Net AS <sup>1</sup>	.	.	.	.	.	.	1 760	2 826
Malmtrafikk AS	13 091	15 171	13 877	11 524	13 676	12 190	12 774	13 730
Other operators	.	.	.	.	.	.	.	**
<b>Total</b>	<b>19 559</b>	<b>21 747</b>	<b>21 335</b>	<b>19 623</b>	<b>21 635</b>	<b>20 381</b>	<b>20 428</b>	<b>21 145</b>

### Tonne-kilometres (million)

<b>Norwegian domestic traffic</b>	<b>1 835</b>	<b>1 949</b>	<b>1 934</b>	<b>1 817</b>	<b>1 775</b>	<b>1 933</b>	<b>1 686</b>	<b>1 559</b>
Including:								
NSB AS	1 835	1 949	1 934	1 817	1 775	1 933	.	.
CargoNet AS <sup>1</sup>	.	.	.	.	.	.	1 686	1 559
<b>Cross-border traffic *</b>	<b>969</b>	<b>1 026</b>	<b>1 014</b>	<b>1 077</b>	<b>1 180</b>	<b>954</b>	<b>1 002</b>	<b>1 068</b>
Including:								
NSB AS	472	450	487	639	623	479	.	.
CargoNet AS <sup>1</sup>	.	.	.	.	.	.	504	533
Malmtrafikk AS	497	576	527	438	557	475	498	535
Other operators	.	.	.	.	.	.	.	**
<b>Total</b>	<b>2 804</b>	<b>2 975</b>	<b>2 948</b>	<b>2 894</b>	<b>2 955</b>	<b>2 887</b>	<b>2 688</b>	<b>2 627</b>

## Passenger traffic

### Passenger journeys (1000)

	1996	1997	1998	1999	2000	2001	2002	2003
<b>Norwegian domestic traffic</b>	<b>40 571</b>	<b>44 634</b>	<b>48 207</b>	<b>54 268</b>	<b>55 141</b>	<b>54 032</b>	<b>50 314</b>	<b>49 201</b>
Including:								
NSB AS	40 571	44 634	46 856	49 780	50 600	49 330	45 806	44 783
Flytoget AS	.	.	1 000	4 118	4 166	4 085	3 961	3 870
Flåm Utvikling AS	.	.	351	370	375	398	415	417
Linx AB	.	.	.	.	.	219	132	131
<b>Cross-border traffic</b>	<b>130</b>	<b>110</b>	<b>116</b>	<b>120</b>	<b>200</b>	<b>294</b>	<b>398</b>	<b>420</b>
Including:								
NSB AS	130	110	116	120	200	70	0	25
Linx AB	.	.	.	.	.	224	398	356
Other operators	.	.	.	.	.	.	.	39
<b>Total</b>	<b>40 701</b>	<b>44 744</b>	<b>48 323</b>	<b>54 388</b>	<b>55 341</b>	<b>54 326</b>	<b>50 712</b>	<b>49 621</b>

### Passenger-kilometres (million)

<b>Norwegian domestic traffic</b>	<b>2 384</b>	<b>2 514</b>	<b>2 602</b>	<b>2 845</b>	<b>2 781</b>	<b>2 739</b>	<b>2 509</b>	<b>2 436</b>
Including:								
NSB AS	2 384	2 514	2 540	2 610	2 558	2 491	2 264	2 196
Flytoget AS	.	.	55	228	216	220	219	214
Flåm Utvikling AS	.	.	7	7	7	8	8	8
Linx AB	.	.	.	.	.	20	18	18
<b>Cross-border traffic **</b>	<b>65</b>	<b>47</b>	<b>50</b>	<b>64</b>	<b>76</b>	<b>66</b>	<b>55</b>	<b>51</b>
Including:								
NSB AS	65	47	50	64	76	45	0	1
Linx AB	.	.	.	.	.	21	55	48
Other operators	.	.	.	.	.	.	.	2
<b>Total</b>	<b>2 449</b>	<b>2 561</b>	<b>2 652</b>	<b>2 909</b>	<b>2 857</b>	<b>2 805</b>	<b>2 564</b>	<b>2 487</b>

\* Total tonne-km for Norwegian part of route.

\*\* Total passenger-km for Norwegian part of route.

<sup>1</sup> CargoNet AS was hived off from NSB AS with effect from 1 January 2002. Since that date, NSB has operated passenger services only.

. = Not applicable

- = Zero

\*\* = Figures not available

0 = Less than 0.5

# Punctuality

Jernbaneverket's principal objective for punctuality is that at least 90% of all trains must run on time.

Punctuality improved in 2003 on long-distance services (all products and lines) and Intercity services (particularly on the Lillehammer route). On local passenger services, Bergen-Voss and Trondheim area services showed some improvement, but elsewhere punctuality was consistently poorer than in 2002. Local services in the Stavanger area showed the greatest deterioration. This drop in punctuality was chiefly due to teething troubles with the new Class Bm72 multiple units.

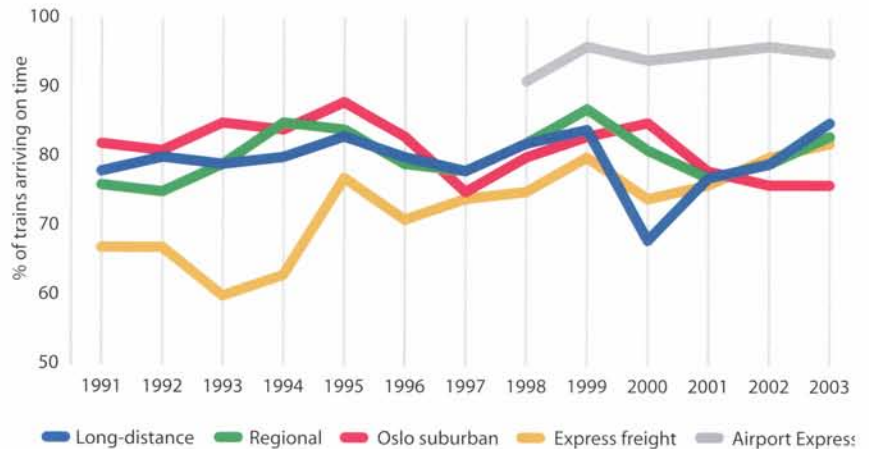
However, the number of train delays directly attributable to infrastructure faults fell by as much as 27% on a nationwide basis from 2002 to 2003.

## Faults affecting punctuality

Punctuality statistics for 2003 are available (in Norwegian) at [www.jernbaneverket.no](http://www.jernbaneverket.no) under "Om jernbaneverket".

This year saw a reduction in the number of catenary faults and a marked reduction in signalling faults compared with 2002, although the number of signalling faults still failed to meet the target for 2003.

## Train punctuality 1991–2003



The punctuality of train services is indicated as the percentage of trains arriving at their destination on time. For regional, suburban and Airport Express services, a margin of three minutes is allowed; for all other trains, the margin is five minutes.

## Temporary speed restrictions (TSRs)

TSRs are imposed for safety reasons owing to the quality of the infrastructure or planned trackworks. Timetables make allowance for planned TSRs, which therefore do not affect the punctuality of train services.

However, delays may ensue from unplanned TSRs imposed in unforeseen circumstances, such as heat-buckling, broken rails or landslides, or as a result of the general condition of the track.

## The main causes of late running in 2003 were:

- adhesion problems due to leaf-fall in the autumn
- a large number of collisions with animals during the winter months
- periodic bad weather, flooding, landslides and danger of landslides
- periodic strong winds and fallen trees
- a cold spell in eastern Norway in January
- infrastructure faults
- trackworks and TSRs
- faults with train companies' motive power







Toaletter  
Toilets



Restaurant  
Restaurant



Billetter  
Tickets



Toginformasjon  
Train information



# Environmental protection

In the core area of environmental protection, Jernbaneverket's principal objective is to reinforce the environmental benefits of rail transport.

## Railways and the environment

The transport sector faces a wide variety of environmental challenges, particularly in the areas of biodiversity, cultural heritage, climate change, air pollution and noise. A commitment to rail and other forms of public transport provides users with an alternative that is less environmentally damaging, and hence helps reduce the adverse environmental impact of the transport sector.

## Environmental management

Environmental management forms an integral part of Jernbaneverket's management system. The system, based on ISO 14001 principles, is regularly reviewed. At the last review, in 2003, environmental indicators were incorporated into the system.

## Environmentally friendly planning, project management and construction

Activities in 2003 centred on the Sandvika-Asker and Fjellhamar station projects, which have an environmental monitoring programme for the construction phase. An environmental monitoring programme for the GSM-R project was drawn up during the year.

## Cultural heritage

Jernbaneverket is working with Riksantikvaren (the Directorate for Cultural Heritage) on a national conservation plan for railway-related cultural heritage. The past year has seen further peer review of the draft plan and conservation portfolio, focusing on value assessment and the selection process. As a result of this additional work, the plan is taking longer to produce than originally expected. The draft plan is scheduled to be sent out for external consultation in March 2004.

## The visual environment

One of Jernbaneverket's strategies for meeting its principal environmental objective is to improve the environment at stations and the lineside.

A priority task in 2003 was to draw up guidelines for signage on Jernbaneverket's premises. A brochure was produced during the year and will be used in the course of training all employees responsible for erecting signs on behalf of Jernbaneverket. The design standard for stations (station design manual) was issued as a separate management document in 2003. Work on a standard specification for platform shelters was completed during the year.

Other efforts in 2003 focused on introducing procedures for recording,

reporting and clearing up untidy stations and sections of line. During the year, indicators for station and lineside tidiness were established. As part of this process, a checklist was produced showing the criteria that must be met if a station or section is to be classed as tidy. Related in-house training was also conducted.

At the request of the Ministry of Transport and Communications, a preliminary study on short-term passenger-focused station improvements in the Eastern Region was carried out in 2003. The objective is to win over more passengers to rail by improving station environments. As part of the study, 143 stations with passenger traffic were assessed. The process has resulted in a prioritised list of potential short-term improvements covering all stations in the Eastern Region, so that it will be easy to identify where to start should funding be made available.

## Waste

A large proportion of the materials removed during upgrading of the rail network are reused elsewhere on the network. Waste metal and wood which cannot be reused are sold for recycling, thereby yielding a source of income. One area on which Jernbaneverket focused in 2003 was implementing new requirements on the handling of life-expired sleepers and waste ballast.



### Energy consumption

Although efficient use of energy is one of rail's environmental advantages, there is potential for further improvement. In 2003, Jernbaneverket commenced a two-year energy conservation project with the goal of reducing energy consumption by 8% from 2002 levels by 2005.

### Biodiversity

In 2000, Jernbaneverket embarked on a project to catalogue valuable natural habitats along the Sørland line, which will continue until the end of 2005. The aim is to test alternative methods for controlling lineside vegetation and cut the use of herbicides, taking esthetic considerations and biodiversity into account without affecting operations.

### Soil pollution

We have begun a survey across the rail network to ascertain how soil pollution comes about. Once this survey is complete, we shall draw up an action plan.

Jernbaneverket was ordered by the Norwegian Pollution Control Authority (SFT) in 2003 to prepare an action plan for cleaning up creosote contamination at the Råde impregnation plant, and to resume monitoring of water quality. A risk assessment has been completed, and the action plan was submitted to SFT in January 2004.

Herbicides are used to control lineside vegetation for safety reasons. Owing to new regulations, the substances now used are less effective per application, necessitating more frequent spraying. Jernbaneverket has begun to examine alternative methods and equipment for dealing with problem vegetation in the track ballast or at the lineside.

### Collisions with animals

A total of 1 810 animals were hit by trains in 2003, the highest number since records began.

### Noise, vibrations and structural disturbance

Noise is the main form of environmental pollution suffered by people living and working beside the railway.

A detailed survey conducted in spring 2003 showed that fewer than 100 homes remained exposed to average indoor noise levels in excess of 42 dB(A). Acoustic rail grinding and other soundproofing measures took place during the year along a number of densely populated line sections. Noise abatement measures for the remaining homes where we have a statutory duty to take action will be implemented in 2004, enabling us to meet the deadline of 1 January 2005 for complying with the statutory requirements.

During 2003, Jernbaneverket joined forces with Statistics Norway, the Norwegian Pollution Control Authority, the Public Roads Administration, Forsvarsbygg (defence estates agency) and Avinor (civil aviation administration) to help develop a model for calculating the effects of noise in Norway. This model will provide data on noise impact (measured as the number of people exposed to various noise levels) and noise pollution (measured as a noise pollution index) in Norway for the years from 1999 onward. Calculations by Statistics Norway show a reduction in noise pollution from the railway.

### Environmental Report for 2003

Details of Jernbaneverket's environmental policies and the status of environmental programmes can be found in the Environmental Report for 2003, available online (in Norwegian) at [www.jernbaneverket.no](http://www.jernbaneverket.no) under "Miljørapport 2003".



# International activities

The past year was dominated by new European directives and increased Nordic cooperation in the rail sector. Jernbaneverket played an active part in these developments.

## European cooperation

The European Union's legislative bodies worked throughout the year on the Second Railway Package. The package, to be approved on 16 March 2004, includes amendments to the directives regarding interoperability on conventional and high-speed lines, full deregulation of national and international freight traffic (including cabotage), a safety directive, and a regulation setting up the European Railway Agency (ERA).

In addition, the European Commission presented a draft of further legislative proposals to be tabled at a later date in the form of a Third Railway Package. This new package will include proposals for Europe-wide driver licensing, full deregulation of international passenger traffic, new rules on passenger rights, and rules on quality standards and compensation in respect of freight traffic.

As a member of the European Rail Infrastructure Managers (EIM), Jernbaneverket actively helped the organisation to prepare position papers on these new proposals. In January 2003, EIM adopted a vision paper setting out

the organisation's objectives and views regarding rail development.

Experts from Jernbaneverket are heavily involved in various expert and project working groups within the International Union of Railways (UIC) and in the expert working groups drafting Technical Specifications for Interoperability (TSIs) under the auspices of the European Association for Rail Interoperability (AEIF).

Europe's rail infrastructure managers, both integrated and independent, set up an organisation called RailNet Europe (RNE) in 2003, with the task of coordinating capacity allocation and utilisation for international traffic through a "one-stop shop" concept. The organisation will hold its first annual general meeting in 2004.

## Nordic cooperation

The project on deregulation of the Nordic railfreight market, commenced in autumn 2001, continued to dominate the work of the Nordic Infrastructure Managers (NIM) in 2003. Progress on the project was outlined at a seminar held in Jönköping, Sweden, in October. The focus

was on identifying barriers to a free market and means of removing them.

One particularly useful contribution to the Nordic rail sector that we should like to highlight is the excellent working relationship that has been established between infrastructure managers and railway inspectorates in the Nordic countries.

During 2003, NIM embarked on an internal review of its organisational structure, which will continue in 2004.





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