On track

09

A BRIEF LOOK AT THE ACTIVITIES OF JERNBANEVERKET

Our objective is to be a reliable provider of rail services

Jernbaneverket, the Norwegian National Rail Administration, is currently implementing a number of measures which will significantly improve the punctuality of train services.

Jernbaneverket

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156 years of Norwegian railway history

1854 Norway's first railway line (Kristiania - Eidsvoll) opens.

1890–1910 Railway lines totalling 1 419 km are built in Norway.

1909 **The Bergen line** is completed at a cost equivalent to the entire national budget.

1938 **The Sørland line** to Kristiansand opens.

1940–1945 **The German occupation forces take control of NSB, Norwegian State Railway.** Restrictions on fuel consumption give the railway a near monopoly on transport. The railway network is extended by 450 km using prisoners of war as forced labour.

1952 Funds are allocated for **electrification of the railway network** under the motto "Away with steam".

1969–1970 The 1952 electrification plan is completed.

1996 Norwegian State Railway (NSB) is split into NSB BA (train operating company) and Jernbaneverket (infrastructure manager)

1999 **The Gardermoen line** Norway's first high-speed line, from Oslo to Gardermoen airport, enters service with great success.

2000 The tragedy at **Åsta**, Norway's third largest rail accident in 50 years, leaves its mark on the railways at the start of the new millennium.

2004 NSB AS and Jernbaneverket jointly celebrate **150 years** of Norwegian railways.

2005 **Norway's largest onshore construction project**, the new double track line between Sandvika and Asker, opens to traffic.

2006 The railway enjoys **growth in both freight and passenger traffic**, and increases its market share.

2007 The **Ganddal freight terminal** at Sandnes in Jæren is completed in December. In all, around 100 different construction projects valued at NOK 2.2 billion are under way.

2008 Project Oslo to renew the railway network through Oslo starts in the spring. Introduction of a **new travel guarantee scheme** is approved.

2009 The National Transport Plan for 2010-2019 is presented. According to the plan, NOK **92 billion** will be invested in the railways over the next 10 years.

EDITORIAL

"Our main objective is to improve punctuality and customer satisfaction!"

An eventful year

Jernbaneverket was subject to strong criticism in 2009, from the media and commuters alike. Modernising the national railway system is a laborious and time-consuming task, despite the extra allocation of funding.

2009 was a milestone year for Jernbaneverket and for the development of the national rail network. In June, the National Transport Plan (NTP) was adopted by the Norwegian Parliament, the Storting. We achieved breakthrough in the Bærum tunnel and Lysaker station opened. The new double track between Sandnes and Stavanger opened to traffic. These measures will help increase capacity for both passengers and freight, and contribute to a more robust railway.

Moreover, Jernbaneverket stepped up its maintenance and renewal efforts significantly in 2009. Therefore, it was particularly unfortunate that the year should end with poor operational stability.

Towards the end of the year, travellers were faced with major disruptions due to severe cold spells and heavy snow, which resulted in strong criticism from commuters and the media alike. One positive side effect of it all, however, is that the need for updates and modernisation of the national railways is now on the political agenda and there seems to be a political will across party lines to work for a more future-oriented railway in Norway.

We have been allocated the funds we need to carry out maintenance in the Oslo area. Our next challenge will be to find enough qualified people to embark on the many tasks and projects at hand. We are building and renewing as fast as we can these days. According to the NTP, as much as NOK 92 billion will be invested in the national railways over the next decade. This means that we are recruiting at a record pace. We need engineers, installation technicians and skilled workers.

Jernbaneverket is building and renewing for our customers. This means that, in time, both passengers and train companies will benefit from our increased efforts. It will take some time to catch up with years of insufficient maintenance, but we will improve customer satisfaction! We will do our utmost to improve punctuality. We will improve passenger information – particularly in the event of major disruptions. We will continue our efforts to further strengthen and develop our safety culture, and we aim to complete our development projects in the shortest time possible.

Maintaining and building railways is both complicated and time-consuming. Most of the work has to be done while trains are operating. To ensure that our projects are completed as quickly as possible, a higher number of commuters than ever before will be faced with cancelled services due to closed railway sections. In the summer of 2009, the Drammen line was closed for 16 days. The Jæren line was closed for as much as six months while the new double track was completed. This summer, there will be no train services on the Oslo Central Station – Drammen section for four weeks. We are aware of the inconvenience this causes to a great number of people, but this work is essential in order to ensure that we can provide a reliable railway service!

Elisabeth Enger
DIRECTOR GENERAL

3 102 The number of permanent employees in 2009 was 3 102

For more figures,
please see our 2009 Annual Report
on www.jernbaneverket.no

Rail plays a key role in Society

With more than 56 million passenger journeys in 2009 and considerable volumes of freight being transported over long distances, the railway helps meet society's transport challenges in an efficient and environmentally friendly manner.

Jernbaneverket provides Norway's train companies with a safe and efficient transport system.

We plan, construct and maintain the railway network, including stations and terminals.

We are also responsible for day-to-day traffic management. Our employees have expertise in a range of specialist fields such as civil and electrical engineering, telecommunications, social planning, scheduling and traffic management.

Jernbaneverket is a government agency reporting to the Ministry of Transport and Communications. The Norwegian parliament, the Storting, sets out long-term plans for developing the rail network in the National Transport Plan (NTP), as well as approving Jernbaneverket's annual budget.

Organisational structure

Jernbaneverket comprises the following main divisions:
The Director General and her staff, Traffic Management, Infrastructure Management and Infrastructure Construction.

Targets for the rail sector

The Ministry of Transport and Communications sets specific requirements for how Jernbaneverket should manage the resources it is allocated. Our achievement of performance targets for the 2009 fiscal year in the following focus areas is detailed in the Annual Report for 2009 at www.jernbaneverket.no.

FACTS

Focus areas 2010

- Safety, punctuality and customer satisfaction
- Productivity and quality
- Competence and culture

Financial highlights for Jernbaneverket (NOK million)

	2009	2008	2007
Restructuring funds	0.0	0.4	10.6
Operations and maintenance	4 575.5	3 616.4	3 302.9
Operation and maintenance of the Airport line	91.9	76.3	67.2
Investment in new infrastructure	3 134.0	2 364.9	2 290.8
Grant-funded expenditure	**7 801.3**	**6 058.0**	**5 671.5**
Track access charges	86.7	94.1	100.1
Sale of electricity for train operations	224.8	240.3	181.2
Other revenue	338.8	251.5	215.0
Revenue to state accounts	**650.3**	**585.9**	**496.3**
Total operating revenue	4 360.0	4 132.6	3 526.1
Total operating expenses	4 475.6	4 112.7	3 814.4
Total interest and other items	2.4	4.4	(1.2)
Result for the year	**(118.0)**	**15.4**	**(287.1)**
Grant coverage (as %)	84.9	83.5	84.9
Payroll as % of operating expenses	22.5	24.8	25.2
Full-time equivalent employees in Jernbaneverket	3 066	2 941	2 855

The state accounts are based on cash accounting and follow the classifications in the national budget. The result for the year is in accordance with the accrual principle.

09

January

The Ministry of Transport and Communication's letter of allocation for 2009 confirmed an allocation of NOK 7.073 billion to Jernbaneverket. This is an increase of approximately NOK 1.2 billion compared with the previous year. The Ministry called for efficient efforts to reduce the number of delays and other cancellations that Jernbaneverket is responsible for, that we improve the punctuality of our service and express our goal achievement more openly.

February

1 "The great maintenance boost" was launched. The level of renewal and maintenance of the railway network will be significantly strengthened due to a historically high maintenance budget and funds from the Norwegian government job creation package.

2 Heavy snowfall in Eastern Norway required massive efforts from the line-clearing crew. Also administrative personnel were asked to contribute.

March

Jernbaneverket introduced a new system for punctuality reporting. From now on, updated train punctuality figures are released weekly and monthly on Jernbaneverket's web pages.

3 On 13 March, the Minister for Transport and Communications Liv Signe Navarsete, the Minister of Finance Kristin Halvorsen and Prime Minister Jens Stoltenberg travelled by train from Oslo Central Station (Oslo S) to Ski to present the National Transport Plan. The ministers stated that the plan will be implemented regardless of the economic situation.

April

4 A new double-width extended platform at Flåm Station opened on 15 April. Flåm utvikling AS and Jernbaneverket contributed approximately NOK 2 million each. This is the first of a total of 18 stations to have extended platforms, which will allow for easier boarding and disembarking in 2009.

May

Large-scale maintenance and renewal work was carried out on the important 32-kilometre long Roa-Hønefoss line this spring. The line is frequently used by freight trains on their way to and from Oslo and Bergen. Around 11 000 worn out sleepers were replaced and the track is all-welded. The line is an important diversion route during construction work or disruptions on the Drammen line.

June

5 The centennial of the Bergen line was celebrated with an old-fashioned steam train journey from Oslo to Bergen stopping along the way for local festivities.

The work that has been ongoing for years to increase the load limit of the Ofoten line was completed this summer. Taller carriages may now pass through the tunnels.

July

The Drammen line closed on 17 July. The line remained closed for 16 days due to maintenance work.

August

A new platform at Lysaker station opened on 3 August.

September

The junction Nye Lysaker station was officially opened on 1 September.

6 The Airport Express Train service to Drammen was officially opened on 2 September. Managing Director of the Airport Express Train Linda Bernander Silseth (left), Minister for Transport and Communications Liv Signe Navarsete and Director General Elisabeth Enger are very pleased with the new service extension.

Passenger traffic information was improved. Almost 100 new monitors were installed this autumn and 130 stations received new loud speaker systems.


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October

7 During the weekend of 10-11 October, Jernbaneverket completed major construction and maintenance work at several points along the Bergen line. A bus replacement service operated during the line closure, during which three new underpasses and a new bridge were constructed, rails replaced and ballast cleaned. At the same time, rocks were removed from the mountainsides to prevent rockslides.

The result of the extensive maintenance work on the railway network became visible towards the end of the month. The number of faults in the signalling system and railway safety installations have been reduced by 20 per cent and the number of hours of delay caused by infrastructure faults has been reduced by 10 – 15 per cent.

A new method was adopted to analyse the causes of delays. The objective is to reveal the underlying causes of why some trains are more often delayed than others. The analysis tool is called PIMS, and the method has been developed under the direction of SINTEF in collaboration with Jernbaneverket and the train companies.

November

8 Jernbaneverket set a new record for ballast cleaning in 2009. A 85-kilometre stretch of the railway network was cleaned and another 53-kilometre stretch made ready for cleaning by the end of the year. The high activity level will continue in 2010, ensuring optimal track quality for many years to come.

The opening of the Bergen line on 27 November 1909 was celebrated with a gala performance in Grieghallen on 20 November. The performance will mark the end of the centennial celebrations that have been ongoing throughout the whole of 2009. One of the highlights of the celebrations was a steam train journey from Oslo to Bergen in June.

December

New traffic regulations were introduced on 13 December for the state railway network. Before the new regulations came into force, all operative personnel received the necessary training.

9 On 14 December, the Minister for Transport and Communications Magnhild Meltveit Kleppa officially opened the new double track between Sandnes and Stavanger.

Several faults on the infrastructure in the Oslo area significantly disrupted train services. Moreover, major maintenance work on the track caused speed reductions and further delays – in order to improve the services in the long run. A prolonged cold spell intensified the problems with the train services as well as the infrastructure. Director General Elisabeth Enger apologised for the disruptions and assured travellers that the situation is being addressed.

“Our objective is to be a reliable provider of rail services. We are therefore putting all our efforts into providing a better service.”

3 000

The Director General invited the 3 000 or so employees to a development programme on customer satisfaction.

Focus on customer satisfaction

Over the next four years, Jernbaneverket will reduce the number of delays, increase capacity of the railway network and focus on customer satisfaction. In 2009, Jernbaneverket launched a comprehensive internal development programme which will set a new course for a more reliable railway.

With employees spread across the entire country, all having different responsibilities, education and work experience, there are many different ways of doing things. Variation and diversity is positive. However, some things should also be the same: Safety must always be priority number one. Jernbaneverket shall be characterised by professionalism and precision. Everyone has a duty to deliver the results they have committed to. Moreover, there should be a focus on totality and collaboration across boundaries and disciplines.

Corporate culture and values
Jernbaneverket's corporate culture shall be based on a common set of values. Our corporate values are openness, commitment and professionalism. To develop our corporate culture further, it is important that a good example is set by all members of the management. Consequently, a management platform has been developed for all management staff. Our management shall be characterised by managers with a clear vision, who provide a scope for action and who are responsible and inspiring! Jernbaneverket has also introduced a code of conduct which shall ensure that all employees adhere to an ethical practice, that all train companies and other players are treated in a fair way and that Jernbaneverket manages society's resources in a professional manner.

Management training. In December 2009, the first group of managers will embark on Jernbaneverket's management training programme. The objective of the programme is to develop managers with an ability and desire for change. The first stage of the programme involves 120 managers divided into three groups. The groups will have five training session over a two-day period. Between sessions, individual follow-up will be offered to the participants. The groups will complete the programme in 2010.

The Director General and the senior management will play an active role in the development and implementation of the programme, and will participate in the training themselves.

In addition to the 14 train companies operating on Norwegian tracks, Jernbaneverket's customers include train passengers, freight operators and the business sector.

In thirty year's time. Developing the railway requires patience. The results will show over time. Consequently, Jernbaneverket has a vision for 2040:

2040

In Norway, rail is the preferred means of transport for passenger and freight operators. The railway's market share has increased in the period leading up to 2040. Trains run on time and travel times have been significantly reduced. Train travel competes with air travel on long distance sections, and in suburban areas train travel has been the strongest factor in public transport, absorbing all traffic growth. The market share of transportation of freight by rail has increased more than transportation by road. We have contributed to a safer and more environmentally friendly way of travelling in Norway.

Elisabeth Enger, Director General

Improving our reputation

Poor maintenance, frequent delays and upset passengers.
Negative media coverage was rife in 2009.
This is about to change!

90 Jernbaneverket's objective is to achieve a punctuality target of 90 per cent for passenger traffic in general. The punctuality target for the Airport Express Train is 95 per cent.

What can we do to achieve punctuality?

Significant measures have been implemented to improve maintenance and renew the infrastructure. However, punctuality depends on a number of factors, and the work will take time.

Figures from 2006 to 2008 showed that punctuality had deteriorated. Jernbaneverket intensified its efforts to improve maintenance and renewal work at the end of 2008. This produced results in the first six months of 2009. However, the negative trend continued towards the end of the year. Jenbaneverket's objective is to achieve a punctuality level of 90 per cent for passenger services. The target for the Airport Express Train is 95 per cent. The 2009 average was 87 and 93 percent respectively. However, the figures vary greatly for the various railway sections.

Freight transport was also affected. Freight transport services also experienced a deterioration in punctuality in 2009. At the beginning of 2009, eight out of ten trains arrived on schedule, whereas a year later the figure had dropped to seven out of 10 trains.

In the National Transport Plan, the Norwegian authorities express a clear wish to transfer more freight from the roads to the railway. To do this, it is important to significantly reduce freight traffic delays.

What caused the delays? The delays towards the end of the year were partly due to a prolonged cold spell combined with the formation of snow and ice on the track switches and under the trains. The hours of delay were distributed almost equally between the train companies (34.9 pr cent) and Jernbaneverket's areas of responsibility (35.3 per cent). The remaining 30 per cent were mainly consequential delays caused by the said incidents, as well as force majeure.

A run-down and strained infrastructure is particularly vulnerable, thus resulting in more frequent signalling faults, rail breakages and power outages in difficult operating conditions. The railway is largely being improved without affecting services. However, increased maintenance and renewal will in itself cause disruptions.

What was done? To mitigate the effects of the financial crisis which started in the autumn of 2008, the Norwegian government launched a number of measures, including a job creation package. One of the measures implemented to sustain employment was to increase maintenance and renewal allocations for the railway infrastructure. The funding was spent where it was most needed; on worn-down facilities and to remove traditional bottlenecks.

One of the biggest problems facing the train traffic was the Oslo tunnel. This has now been improved significantly, as have the Dovre and Bergen lines. The total effect of these efforts is now starting to show, and delays due to faults on the infrastructure are now occurring less frequently.

New tools. Jernbaneverket is now testing the new method system PIMS (Punctuality Improvement Method System) against delays. PIMS was developed as a joint collaboration project between Jernbaneverket, Norwegian State Railways (NSB), the Airport Express Train, CargoNet, SINTEF and the Norwegian University of Science and Technology (NTNU).

The method involves tracing the production line as far back as necessary to find the root cause of the problem. By focusing on and improving the departures most prone to delay, the general punctuality will also be improved.

A long process. Delays will still occur even if the infrastructure is perfect. The quality of the trains, high capacity utilisation, human errors, unforeseen incidents and weather conditions are just some of the factors that affect punctuality.

Unfortunately, perfect punctuality is not likely to be achieved in the short term. One cannot simply decide to fix punctuality once and for all. It is a result of intense work. This means that we will continue to work hard also in the years ahead.

FACTS
Definitions

PUNCTUALITY
Percentage of trains arriving at their destination on time.

ON TIME
Arrival at the destination within a margin of three minutes and 59 seconds. The margin for long distance trains is five minutes and 59 seconds. The objective is for 90 per cent of passenger trains to arrive at their destinations on time, whereas for the Airport Express Train the objective is 95 per cent.

REGULARITY
Percentage of scheduled train services that operate as planned. Trains scheduled to be cancelled a long time in advance due to work on the tracks are not included.

INFRASTRUCTURE CAPACITY
Time-specified access to a track that can be used to operate trains.

A run-down and strained infrastructure is particularly vulnerable in difficult operating conditions, resulting in more faults and delays than would otherwise be the case.

In the event of an operating incident or accident, or if there is a risk of such incidents, it is the traffic controller's responsibility to immediately take the necessary action.

Who does what when problems occur?

"The most important thing in this job is to not be stressed, but to remain calm no matter what happens," says traffic controller Gry Rogne. She resembles a church organ player the way she sits in front of a whole battery of computer monitors at the traffic control centre located on the ninth floor of the Oslo Central Station.

On the long wall at the front of the room is a giant screen of flashing lights indicating where all trains in the Oslo region are at any given time. Seated on podiums, as in an auditorium, an impressive orchestra of traffic controllers, information officers and electricians perform a symphony of harmonised tasks.

"The main task of a traffic controller is to supervise the train traffic at all times on the sections or stations areas that we are responsible for on a rotating basis," says Gry.

It is the traffic controller who give the orders to run or cancel train services. He or she will allocate stretches for maintenance and make the decisions necessary to monitor and direct the train services. In the event of an operating incident or accident, or if there is a risk of such incidents, it is the traffic controller's responsibility to immediately take the necessary action. It will be the controller's responsibility to mitigate any injuries to people or damage to equipment, to clear the line and maintain regular services whenever possible.

"We use three different operating systems depending on our area of responsibility. If everything runs smoothly, the job consists mainly of monitoring, and our days can be quite quiet. But, as you have probably noticed, things often happen.

The activity level often varies from section to section. Whereas the Oslo traffic is busiest in rush hour, other sections can be busy in the middle of the day due to maintenance work.

To become a traffic controller you first need to qualify as a dispatcher. With the same safety service, dispatchers have much of the same qualifications as a traffic controller. Their functions are also closely related.

"A dispatcher is responsible for a single station or shunting yard, whereas a traffic controller is usually responsible for a larger area.

100 In the autumn of 2009, new monitors were installed at more than 100 stations, and 130 stations received new public announcement systems.

You will be informed!

"We will provide quality information about the status of the traffic flow to minimise the inconvenience to our customers in the event of disruptions." This is one of Jernbaneverket's main objectives for the period 2010-2013.

One challenge has been that the information systems function as intended during normal operating conditions, whereas when customers need it the most, such as in the event of incidents or delays, the system has not functioned satisfactorily.

During normal circumstances, passengers only need confirmation that their service is running as scheduled. If a traffic problem occurs, the passengers need more detailed information about what has happened, how they can get to their destination and when normal services will resume. This is when communication becomes a challenge.

Improved collaboration. The passenger train company NSB and the Airport Express Train are responsible for providing traffic information on their respective trains. Jernbaneverket is responsible for providing information about the train traffic at the stations.

To ensure efficient information, the involved parties need to collaborate closely. Consequently, Jernbaneverket has entered into a collaboration agreement and joint action plan with NSB to be able to meet the customers' basic needs for information, also when problems occur.

Regular drills. One specific measure is to introduce action cards. These are predefined actions that will be implemented in the event of disrupted services. The different operators have agreed in advance what services should be cancelled, and what other changes should be implemented in the different situations.

In this way, all parties involved will know what will happen and are thus quickly able to inform their customers. The concept will be extended to include standard announcements about, for instance, alternative transport. Moreover, the cards would provide traffic controllers with an important basis for making decisions in the event of a major incident.

More new monitors. The main stations have a main information board, announcement systems, information signs and monitors. However, the quality varies a lot, and smaller stations have announcement systems at best.

In the autumn of 2009, new monitors were installed at more than 100 stations, and 130 stations received new public announcement systems. A number of train information boards displaying information about new departures have been installed in several places along the platforms. Hourly-based timetables have been introduced displaying train departures in chronological order by departure/arrival time for each individual station.

This work will continue in the years ahead. NOK 80 million has been allocated to traffic information measures in 2010. In the long term, investments of several hundred million will be made.

More information on the Internet. In the spring of 2009, Jernbaneverket started looking into how train information could be displayed on our Internet pages in "real time". In this way, passengers would be able to access information about the current location of all trains. This service will be upgraded and improved in line with the development of the railway systems.

On the Internet, interested parties will also be able to access monthly punctuality and regularity overviews (the number of trains running as scheduled).

And should our customers still not be satisfied, the opportunity to make complaints has now been extended to include automatic answer machines, text messaging and e-mail. As part of Jernbaneverket's service declaration, information about how to use these services has been displayed in all stations. A feedback form is available at www.jernbaneverket.no.

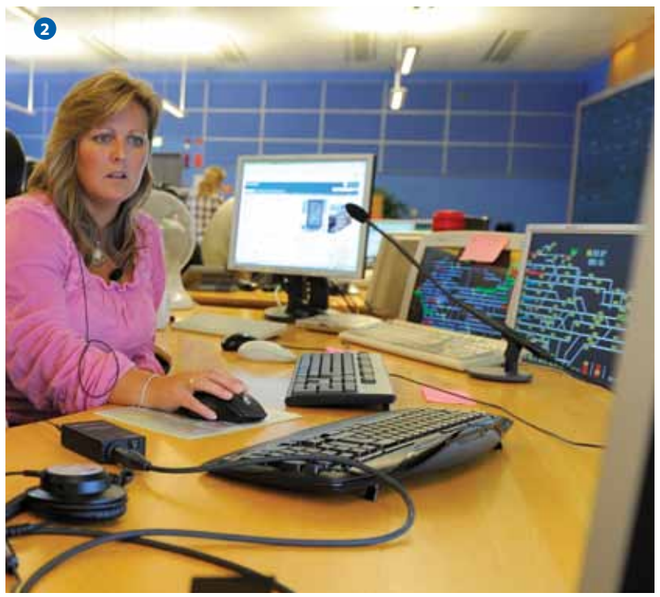
09

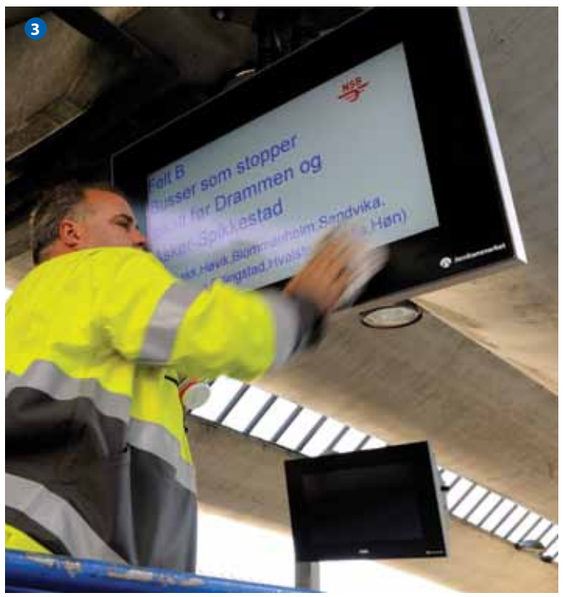
Updated punctuality figures are published weekly and monthly at www.jernbaneverket.no

1 Better traffic information for train passengers at train stations is a priority task for Jernbaneverket.

2 The voice on the loudspeaker: Train information officer Kari Hammersten at the Traffic Control Centre in Oslo needs a high quality, precise flow of information into the system to be able to provide passengers with the information they need.

3 In the autumn of 2009, new monitors were installed at more than 100 stations.





800 Oslo S is the largest and busiest station with 800 trains arriving and departing every day.

The great maintenance boost

Palmafoss, October 2009: On the track to Moss is a yellow work train. It is a ballast-scarifier and screening machine, digging up old crushed stone under and along the track, conveying it onto a conveyor belt and into the ballast cleaning unit.

Crushed stone which can be re-used is returned to the track, whereas the discarded ballast is transported to a designated disposal site. Ballast carriages will replace the old ballast with new ballast before a tamping machine packs and adjusts the track. The whole operation is performed by a huge "threshing" machine which is able to clean 100 metres of track in one hour.

Jernbaneverket's maintenance budget was increased by 25 per cent in 2009. In addition came the Norwegian government's job creation package of NOK 800 million. This meant a real boost to maintenance work on the railway. Ballast cleaning is an important part of the maintenance work and 2009 saw a new record for ballast cleaning. The maintenance work provides a more robust railway with better punctuality and higher comfort.

Project Oslo. By the end of 2015, NOK 2 billion will have been invested in the renewal of the railway network around Oslo, from Lysaker to Etterstad (2012), to Asker/Spikkestad (2014), to Lillestrøm (2013) and to Ski (2015). Work commenced on the network in 2008, and much of it has already been completed at Oslo S and the railway tunnel between Oslo S and Skøyen. The work included replacement of as much as 47 kilometres of signal cable, as well as a number of old track switches. Despite this, only one-tenth of the total project budget had been spent at the end of 2009.

Project Oslo will replace worn-out tracks and sleepers, switches and signalling systems, and upgrade the electricity supply. This will take place without interrupting services more than absolutely necessary. Oslo S is the largest and busiest station in the country with more than 800 trains arriving and departing every day. The Oslo Tunnel is at times operating at full capacity, which poses a challenge to the maintenance work. In the summer of 2009, an extended traffic-free period was introduced to carry out necessary maintenance work. A smooth flow of traffic through the Oslo area is a prerequisite for railway services in the rest of the country.

The Bergen line. Major work has been carried out on the Bergen line involving replacement of tracks and sleepers, ballast cleaning, and drainage. Ballast cleaning has been conducted on a 9-kilometre section between Kløve and Voss and on a 3-kilometre section between Voss and Geilo. On the Roa-Hønefoss section, 11 000 sleepers have been replaced. Sleepers and tracks have also been replaced on the Voss line, in addition to major drainage and water protection work between Lågheller and Myrdal. Avalanche protection has been installed in exposed areas, and on the Randsfjord line several catenary supports were replaced.

Speed restrictions lifted. There are sections on the entire railway network where, after inspections, speed restrictions have been deemed necessary until repairs are carried out. In these areas, speed restrictions are necessary for safety reasons. This does, however, affect punctuality. Many of the sections have had speed restrictions for years whilst waiting for increased maintenance funding. However, in 2009, NOK 100 million was allocated to maintenance and the faults are now systematically being repaired.

And much, much more... Similar work has been conducted all over the country. The entire section between Dombås and Fokstua on the Dovre line has been upgraded with new sleepers, tracks and ballast. Major ballast cleaning work has also been conducted on the Nordland line. Steel bridges and other bridges have received extra attention along this line. On the Røros line, 13 000 sleepers have been replaced, and on the Sørland line new overhead contact lines have been installed between Egersund and Sandnes.

1 Cleaning of ballast is necessary for a more robust railway, better punctuality and higher comfort. In the years ahead, approximately 80 kilometres of ballast will be cleaned annually. In 2009, a new record of 85 kilometres was set.

Project Oslo will replace worn-out tracks and sleepers, switches and signalling systems, and update the supply of electricity. This will take place without disrupting services more than absolutely necessary.

Platforms for everyone!

In April 2009, Flåm station was fitted with a new platform twice the size of the old one, leaving enough room for boarding and disembarking from two trains at the same time. The installation of the new platform marked the beginning of this year's upgrades of a number of stations and platforms across the country.

In the course of 2009, 18 stations were upgraded in the same way; four in the Northern region, six in the Western region and eight in the Eastern region. 143 platforms will be extended in the next decade and adapted for boarding/alighting from all doors on the train. The upgrades were carried out to comply with the Norwegian Railway Inspectorate's Safety Regulation adopted in 2006, which states that the length of the platforms must be adjusted to the length and equipment of passenger trains authorised to stop there. In addition to making the platforms safer and more accessible to passengers, the measures are also essential for maintaining a punctual service.

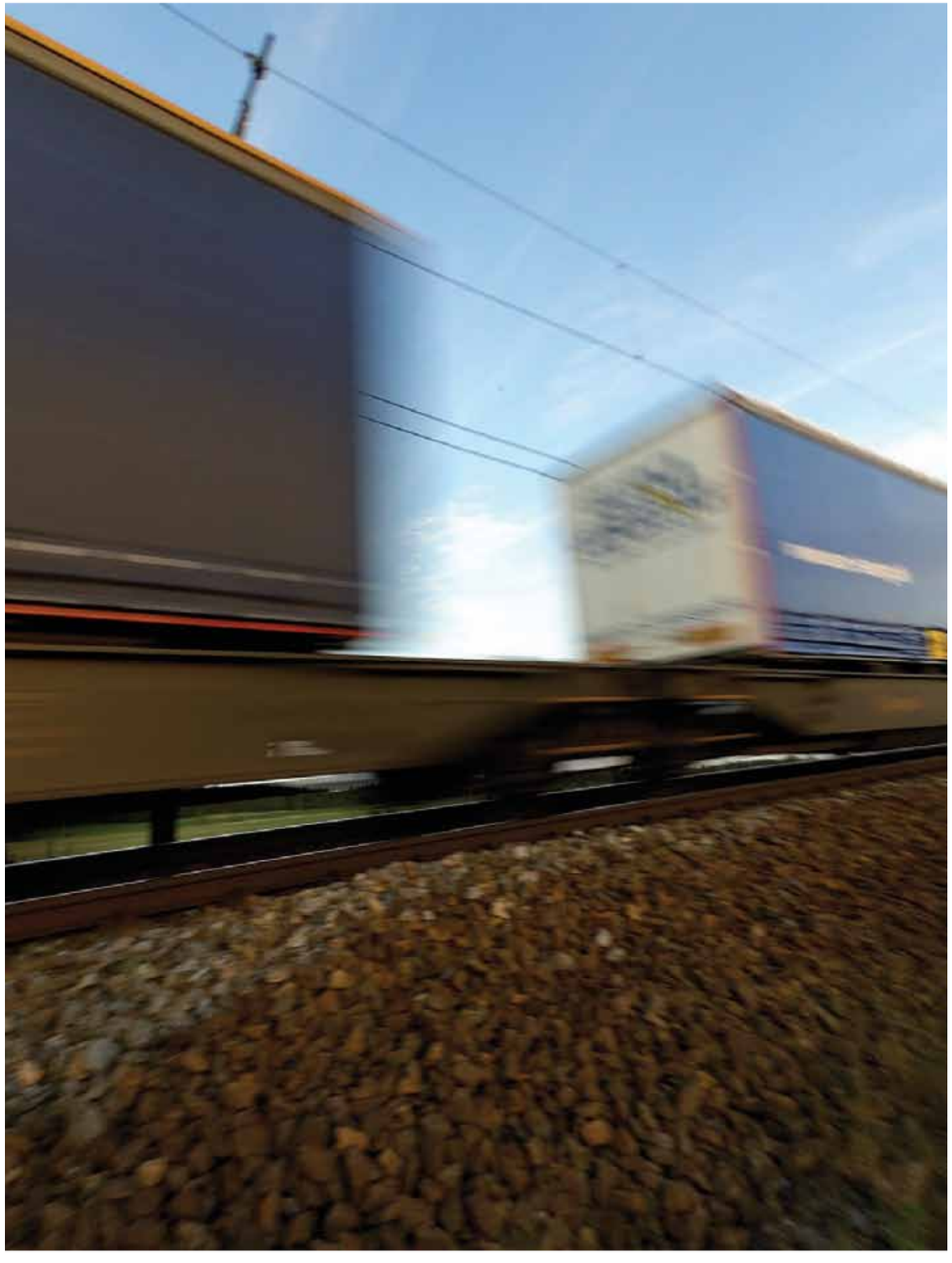
Order of priority. Following a risk analysis in 2007, Jernbaneverket concluded that 143 platforms were too short to comply with the Safety Regulation. After a while it emerged that not only was the length of the platform critical, but also the height, width and distance between the platform and the train. The distance is particularly wide if the track is on a curve. The station upgrades will take place in prioritised sequence.

2009 was also the year when Jernbaneverket, together with affected municipalities and county municipalities, launched the nationwide work to assess the future network of stations.

Universal design. In recent years, requirements for universal design have been introduced. Universal design is defined as the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design. The principle is contained in both Norwegian legislation and EU directives.

In 2007, Jernbaneverket prepared a strategy plan for universal design. The plan comprises all areas accessible to passengers at a station: real time information, shelters, benches and that the boarding height corresponds to the station platforms.

Station upgrades. The total cost of the station upgrades will be in the NOK billion region. The investments will provide improved, safer and more accessible stations, and the number of passengers is likely to increase. A survey conducted by the Institute of Transport Economics (TØI) showed that people with full as well as reduced mobility perceived a universal design to be of a higher quality. Furthermore, they believed that they would travel more.



Strained track capacity

Each year when schedules change, Jernbaneverket receives more than 2 000 route requests – or requests to access the tracks to operate trains. However, track capacity is stretched to the limit on a number of sections, and complying with all the route requests for more rush-hour departures has proven quite a challenge.

New passing loops and the annual timetable adjustments increased capacity somewhat in 2009. A new main route plan will be introduced at the end of 2012, and the train companies' requests for routes for the "2012 Route Plan" will entail a significant increase in the number of trains– particularly on the Oslo S –Skøyen-Lysaker section. Measures, such as moving signals and switches and changing operating procedures will allow a 20 per cent increase in the number of trains passing through the Oslo Tunnel.

More departures in 2009. Both NSB and the Airport Express Train increased the number of departures compared with 2008:

- Seven new departures per day Monday to Friday between Skøyen and Mysen
- Four new departures between Oslo S and Halden; two of which are per day Monday-Friday and two new daily departures Sunday-Friday.
- Two new daily departures between Oslo S and Lillehammer
- Two new departures per day Monday-Friday between Bodø and Rognan.

After the time table adjustments were introduced on 14 June, the Airport Express Train was allocated a route all the way to Drammen. The first Airport Express Train arrived in Drammen on 30 August and from January 2010 regular services will be operated to and from Drammen three times an hour.

Freight transport. There was an increase in both combi-transport and transport for the forest industry in 2009.

To optimise the use of their rolling stock, CargoNet made changes to the combi train routes between Alnabru Freight Terminal in Oslo and the main freight terminals in Norway. The changes involved running more daytime freight trains than previously and increasing the number of departures on the Alnabru-Bergen and Alnabru-Trondheim sections.

One of the new train companies, Peterson Rail AB, operates transportation services for the forest industry to Moss. Some of this traffic is new, whereas some services have been operated by extra trains provided by Peterson Rail or other train companies.

After the new schedules were introduced on 14 June, the new freight company Cargolink was allocated a route to operate a permanent freight service on the sections Drammen-Arna, Drammen-Åndalsnes/Trondheim and Heimdal-Bodø.

1: Jernbaneverket and our customers
2: Development projects
3: A modern railway
4: Corporate social responsibility, environment and safety

The train to Drammen passes the mouth of the new tunnel by Lake Engervannet east of Sandvika Station on temporary tracks.

Major construction work underway

Jernbaneverket is making good headway in its efforts to provide a more robust railway service for passenger and freight transporters.

09

The double track in Jæren was awarded the title "Best Construction 2009".

1 Jernbaneverket has built a new footpath between the sea and the new double track on the Sandnes-Stavanger section.

2 The new Lysaker station has become a modern public transport hub in an area of strong growth. Approximately 1.6 million passengers board and disembark at the station each year, making it one of the largest stations in the country, in terms of number of passengers.

In 2009, members of the Norwegian government had the pleasure of marking the occasion of three milestones in the development of a modern railway.

Double track in Jæren. On 14 December 2009, the new double track Sandnes-Stavanger was officially opened at the new Paradis station by the Minister for Transport and Communications Magnhild Meltveit Kleppa. The new double track will allow for train services between Sandnes and Stavanger every 15 minutes.

The section is the first comprehensive railway development in Norway since the construction of the Gardermoen line. The new double track took three years to complete. The track covers 15 kilometres and four new stops have been constructed. The project had a price tag of NOK 2.2 billion.

At the annual industry trade fair Byggedagene 2010, the double track won the prize for "Best Construction" in Norway in 2009. The jury stated in its citation that: "The jury has emphasised that the Best Construction should serve a clear social purpose. The project has been completed in close collaboration with the principal, and the principal pointed out that the developer has contributed good solutions. The relationship with neighbours and municipalities has been very good throughout the long construction period. The construction has been completed without major disruptions to the landscape and with very positive HSE results."

Lysaker station. On Tuesday 1 September 2009, the new station at Lysaker was officially opened by Prime Minister Jens Stoltenberg. The station is an important public transport hub with 25 000 jobs in the surrounding areas. The station is accessible for all, has four tracks, its own bus terminal, a taxi rank and a car park.

Construction has been ongoing for about three years, costing a total of NOK 1.2 billion. Lysaker station comprises more than just the station area. A new 4.4-kilometre track has been constructed, as well as a new road and railway bridges, road diversions and a new bus terminal facilitating easy transfer between bus and rail.

The construction of the new station is the second milestone in the work on a new double track in Oslo's western corridor. The first step was the opening of the Sandvika-Asker section in the autumn of 2005, and the third step will be the completion of the new track from Lysaker to Sandvika.

Breakthrough in the Bærum Tunnel. Another important milestone in the construction of a double track for the entire western corridor was the completion of a new tunnel between Lysaker and Sandvika. On Friday 26 June, Minister for Transport and Communications Liv Signe Navarsete had the honour of detonating the final blast in the Bærum Tunnel, two years to the day after she detonated the first blast. The tunnel has been completed in record time, six months ahead of schedule.

"I would like to thank all of you, particularly those of you who have worked so hard to make it possible for us to celebrate this breakthrough today, but also those of you who maintain and renew the current railway every day to make sure that our customers arrive at their destinations on time," Navarsete said.

Much work still remaining. New tracks and sleepers will be laid and a signalling system and power line will be installed. In the summer of 2011, the new track between Lysaker and Sandvika will be ready.

Nydalen stop. Several stations and stops were renovated in 2009, including Nydalen stop on the Gjøvik line. The old, run-down stop from 1946 has now been replaced by a new and modern stop in one of Oslo's prime development areas. The area is currently experiencing strong growth in the number of jobs. In three years, the traffic at the stop has doubled, and the growth is expected to continue.

Upgrades in Vestfold. The construction of a new double track from Barkåker to Tønsberg commenced in March 2009. The track will cover a distance of 7.8 kilometres and include the 1.75-kilometre long tunnel through Frodeåsen. The new double track is scheduled for completion in the autumn of 2011.

The development plans for a double track between Holm and Nykirke near Holmestrand were approved by the affected municipalities in the spring of 2009. The work will commence in the summer of 2010. The route will be 14.1 kilometres long, of which 12.3 kilometres will be tunnel. The new double track will replace the old route which had many curves, 26 level crossings will be closed and the travel time between Tønsberg and Oslo reduced. The solution entails moving Holmestrand station into the mountain and engineering the section for high-speed rail services.

A new double track is being planned for the section between Farriseidet near Larvik and Porsgrunn. The new line will reduce travelling times between the two towns by 22 minutes. The new line will be 23 kilometres long. This is 12 kilometres shorter than the current twisting and avalanche-prone route. Construction is scheduled to start in 2011.

Rock material from tunnel to airport. In May, construction commenced on the Gjevingåsen tunnel on the Trondheim line. The tunnel is located close to Trondheim Airport Værnes and Jernbaneverket has entered into an agreement with the Norwegian airport operator Avinor to use the rock material from the tunnel excavation for work connected with the airport. The tunnel will replace a twisting and avalanche-prone route section.

Road and railway along Mjøsa. Work on the new double track along Lake Mjøsa from Eidsvoll to Hamar has only just started, by filling in mass from the new E6 project by Minnesund. However, construction of the new double track is not scheduled to start until 2012. The section between Eidsvoll and Lillehammer is currently one of the busiest single-track sections in Norway.

The Follo line. One of the most urgent railway projects in Norway is the expansion to four tracks on the 22-kilometre long section between Oslo and Ski. The current Østfold line is a bottleneck for passenger and freight traffic into Oslo, and capacity on the line is stretched to the limit. A new double track is necessary to improve train services locally, regionally and internationally.

Jernbaneverket now recommends that the new double track should be a direct link between Ski and Oslo, without stops on the way. The shortest travel time would then be 11 minutes. Construction is scheduled to commence in 2013.

Upgrades on the old Oslo railway section. In 2009, Jernbaneverket spent more than NOK 200 million on upgrades of one of the busiest sections in Norway: the Oslo S-Skøyen section. This year, Jernbaneverket will step up its efforts and invest NOK 470 million in maintenance and upgrades of the technical systems, beginning with the Etterstad-Lysaker section. The work will involve installation of axle counters. This is a new system displaying where on the line the trains are at any given time. The old system is prone to faults and signalling faults are often the cause of delays in the Oslo area.

Following replacement of the old systems between Etterstad and Lysaker, extensive renewal work will start on the old suburban sections around Oslo. The project, which has a total budget of NOK 2 billion, will be completed in 2012.

The railway tunnel Romeriksporten is the longest railway tunnel in Norway, covering 14.58 kilometres, a record soon to be challenged by the Follo line. 14.58 km

Our good neighbours

"My work as neighbourhood contact is very pleasant. People are generally very interested in the railway and show great understanding for our development projects," says Trude Isaksen, Information Manager and neighbourhood contact for the major development projects Oslo-Ski and Eidsvoll-Hamar.

Of course it is scary to have a railway track constructed in your garden or your neighbourhood. I can understand if people are frustrated by major construction plans and noisy machines".

Low threshold. Isaksen defines herself as a point of contact for people living in the neighbourhoods, someone people who are affected by our development projects can come to with questions. In that way, people do not have to deal with a big monster with many heads. The threshold for contact with Jernbaneverket should be as low as possible.

Our neighbourhood contacts also prepare information material and profile projects through meetings and other activities.

Many people are affected. A major process such as this means that we have to organise many meetings

where we present our projects before taking questions from the audience. At the meetings, we often encounter debaters who are well informed about our development plans. However, it is just as much of a challenge to reach those who are not as active. In connection with the Oslo-Ski project, we sent out 17 000 notifications, and that was just to those living in the immediate vicinity. In total, there are many people who will be directly affected by the project.

We currently have 11 neighbourhood contacts working in four different areas: the Vestfold line, Greater Oslo and other minor projects throughout the country, and the sections Oslo-Ski and Eidsvoll-Hamar.

All kinds of people. "The number of inquiries varies in step with the projects' activity levels. Up till now, my projects have been in the planning stage. I am sure things will liven up a bit once the construction work starts in Ski in May 2010."

"It is only natural that many people find it a bit scary when construction machines start rolling into their neighbourhood. However, most people get used to it after a while," says Isaksen.

"I have a very rewarding job where I meet all kinds of people, for better or for worse. As neighbourhood contacts we certainly get to use our communication skills."

Planning a new railway

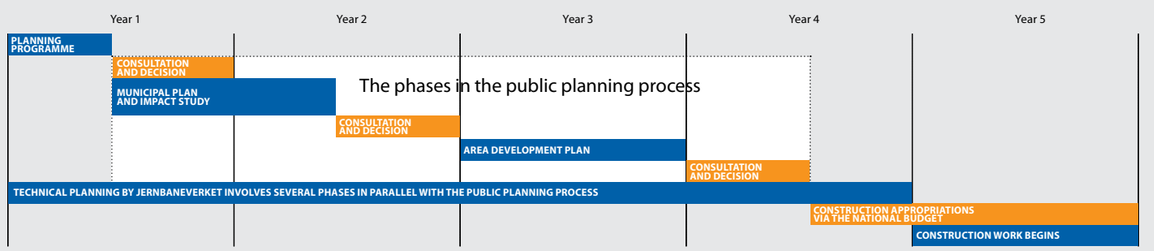
Planning a new railway construction is a long process, involving central and local authorities and many different stakeholders. The process takes place both within Jernbaneverket and through close collaboration with other players.

First of all, Jernbaneverket considers where the need to build new railway infrastructure is greatest. Various construction concepts are considered before Jernbaneverket selects the one on which it will proceed.

The technical and public planning processes then proceed hand in hand. Jernbaneverket cannot expedite the technical project design without a land use planning decision from the municipalities involved, because the technical planning work involves finding the best solution for reconciling local land use preferences and railway engineering requirements. The public planning process takes place in cooperation with the municipalities, and normally takes three to four years (see illustration).

The construction work can then begin if the project is allocated funding by the Storting. The timeframe depends on the scope of the project. First the land must be prepared, either by driving tunnels or by replacing and stabilising masses in open-air zones. This is followed by ballast, rails, telecommunications systems and power installations. Finally, the infrastructure must undergo safety checks before it can be put into service.

The phases of a major construction project



The future is promising

In 2009, Jernbaneverket described a new vision for the future. Our objective is that in 2040 "rail is the preferred method of transport for passengers and freight customers alike".

“We will restore confidence both with the passengers and the business community. To succeed, we must modernise Jernbaneverket and the Norwegian railways. A further study of high-speed railways in Norway will help put forward-looking railway services on the agenda.”

The assessment work assigned to Jernbaneverket in 2009 relating to the National Transport Plan and the study of high-speed passenger services in Norway has proven to be very extensive. A strategy proposal for future railway initiatives in Norway is due to be completed on 1 February 2012.

In the new National Transport Plan for 2010-2019, adopted by the Storting in June 2009, the Minister of Transport and Communications at the time Liv Signe Navarsete indicated that railway investments would double compared with the previous NTP. As a result of the “biggest boost to public transport of all time”, Jernbaneverket was allocated more than NOK 92 billion in the plan period, an increase of 58 per cent. These are ambitious plans, though not unrealistic.

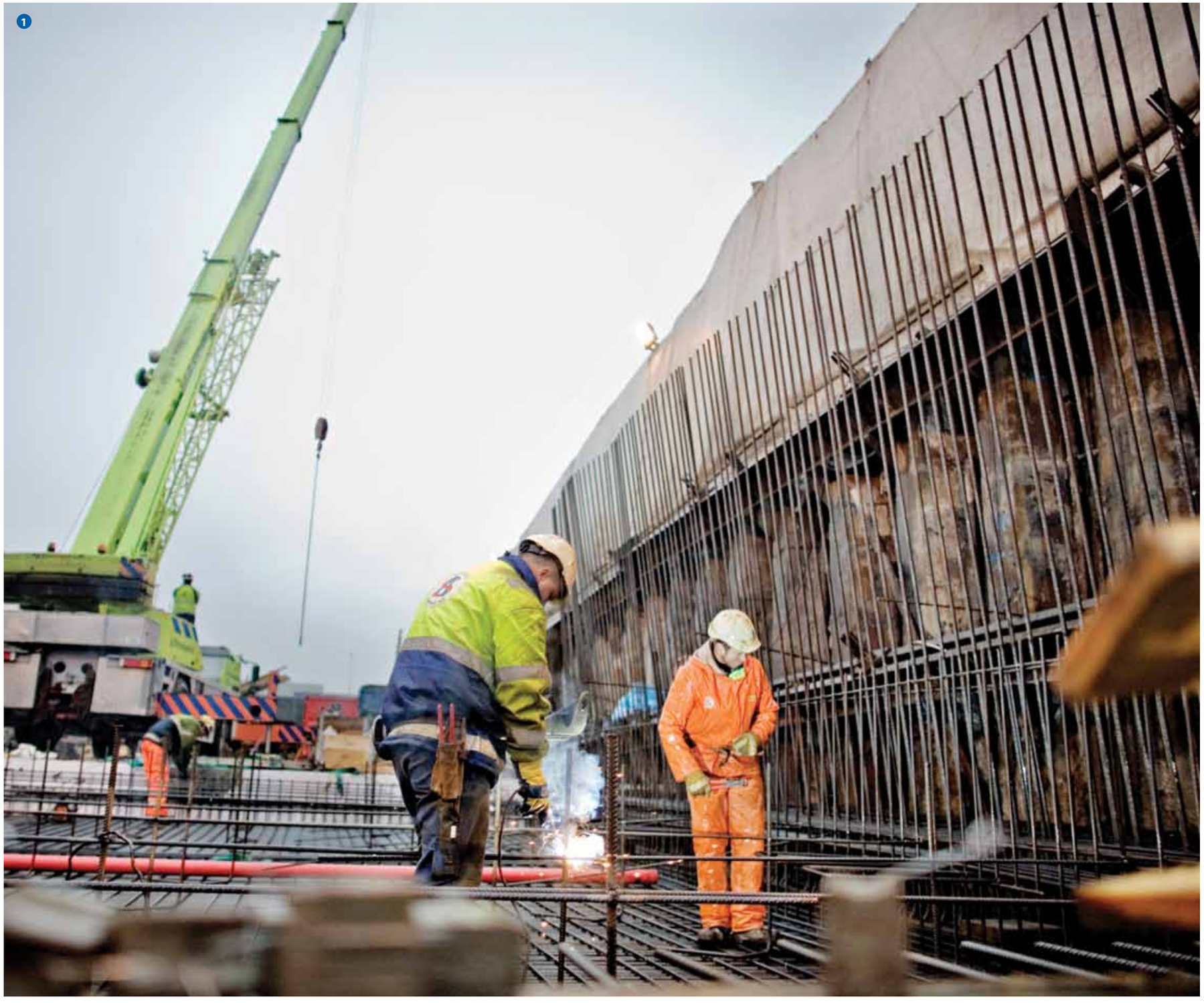
The investments will allow for the construction of more double tracks on the sections from Oslo towards Lillehammer, Skien and Halden, as well as between Oslo and Ski. 144 kilometres of new railway tracks will be built, whereof 16 kilometres will be double tracks. The freight capacity will double through the construction of 45 new passing loops and the redevelopment and modernisation of the freight terminals, such as Alnabru in Oslo.

The main focus of the Norwegian government’s NTP work is to build a high-capacity railway network in the InterCity triangle around Oslo. This would be a prerequisite for future high-speed services. However, the government found that the high-speed alternative had not yet been sufficiently assessed.

Thus, the Minister for Transport and Communications Magnhild Meltveit Kleppa commissioned Jernbaneverket to assess possible solutions for future high-speed services in Norway. The assessments will be completed by 1 February 2012 and will provide important input to the revised NTP due for publication in 2014.

Some critical voices have raised the issue of whether this should be prioritised in the current situation when train services are riddled with disruptions and challenges relating to the existing facilities. To this Director General Elisabeth Enger responds that it must be possible to do two things at the same time.

“I am convinced that together we will manage to restore confidence both with the passengers and the business community. To succeed we must modernise Jernbaneverket and the Norwegian railways. The comprehensive assignment we have been given will help put future-oriented railway services on the agenda,” states Enger.



1 Western Lysaker November 2009: Reinforcement bars are welded together before the base plate of the concrete culvert can be cast.

80 **Figures from abroad indicate that axle counters could reduce signalling faults by up to 80 per cent.**

Next generation railway

We are now able to glimpse the contours of the railway of the future: a better, more cost-efficient and reliable service and a railway adapted to the needs of the next generations.

The Norwegian government believes that, over the next decade, a high-capacity railway network should be constructed in the Inter-City area (the Halden-Skien-Lillehammer triangle). The strong commitment that this represents will be essential if the government decides to build a high-speed railway network at a later stage. Any high-speed sections would have to have their start and end points in Oslo.

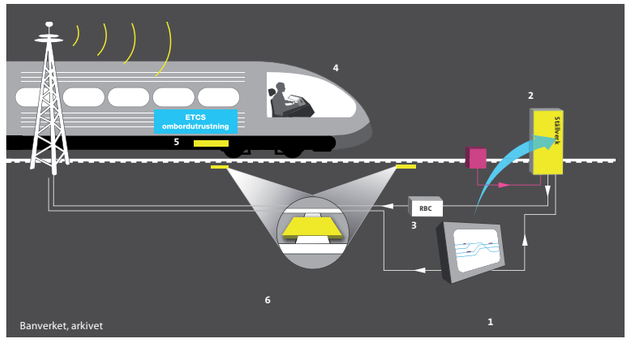
The InterCity strategy is based on the current and future demands for mobility in central parts of Eastern Norway.. Analyses have shown that future needs for passenger and freight transport best can be met through a modern double-track railway serving city areas to the best extent possible. An important goal is to compete with road transport on long, daily commutes.

Light signals to be replaced. From 2014, Jernbaneverket will start phasing in a new signalling system. The new system is based on ETCS[1] level 2, also referred to as ERTMS[2]. As with the current ATC system[3], the system will secure safe train operations, but it will also remove the main cause of the many signalling faults we have today. The current system provides engine drivers with critical traffic information via ordinary light signals. This system is old-fashioned and vulnerable. The introduction of ETCS level 2 entails that external light signals along the railway track can be removed. Many of the delays we experienced in 2009 were a result of faulty signalling systems. The introduction of the new signalling system will reduce the number of delays and cancellations, and have a positive environmental impact. It will also ensure that there are no barrier to trains crossing national borders.

ETCS level 2 sends signals to the driver directly into the cab. By introducing the new signalling system, we will be able to remove most of the signals, signal masts and bases, cables and other components in the infrastructure. Fewer sources of error and a more robust system will have a number of positive effects. After the changeover, we anticipate that train passengers will experience considerably fewer cancellations and delays.

Axle counters. Whilst awaiting the introduction of the ETCS level 2 system, there are other methods to reduce signalling faults. The axle counter system is a digital system which shows the location of the trains by counting wheel axles. Axle counters will gradually replace the old system where the location of the trains is shown as movements in the track circuit. The track circuit system is a safe system, but consists of many components which contributes to faults and delays. The axle counting system is a more robust system which removes many of the components. Experience from Germany, Switzerland and Finland has shown that the number of faults can be reduced by as much as 80 per cent.

The first axle counter system in Norway was installed at Berekvam station on the Flåm line in the summer of 2009. On 14 December, the new double track between Stavanger and Sandnes was officially opened. The entire section has been equipped with axle counters. Installation in the Oslo area will commence at the beginning of 2010.



Banverket, arkivet

A new technology will reduce the number of signalling faults in the future. The introduction of axle counters will reduce signalling faults considerably in the short term.

[1]ETCS: European Train Control System

[2]ERTMS: European Rail Traffic Management System

[3]ATC: Automatic Train Control

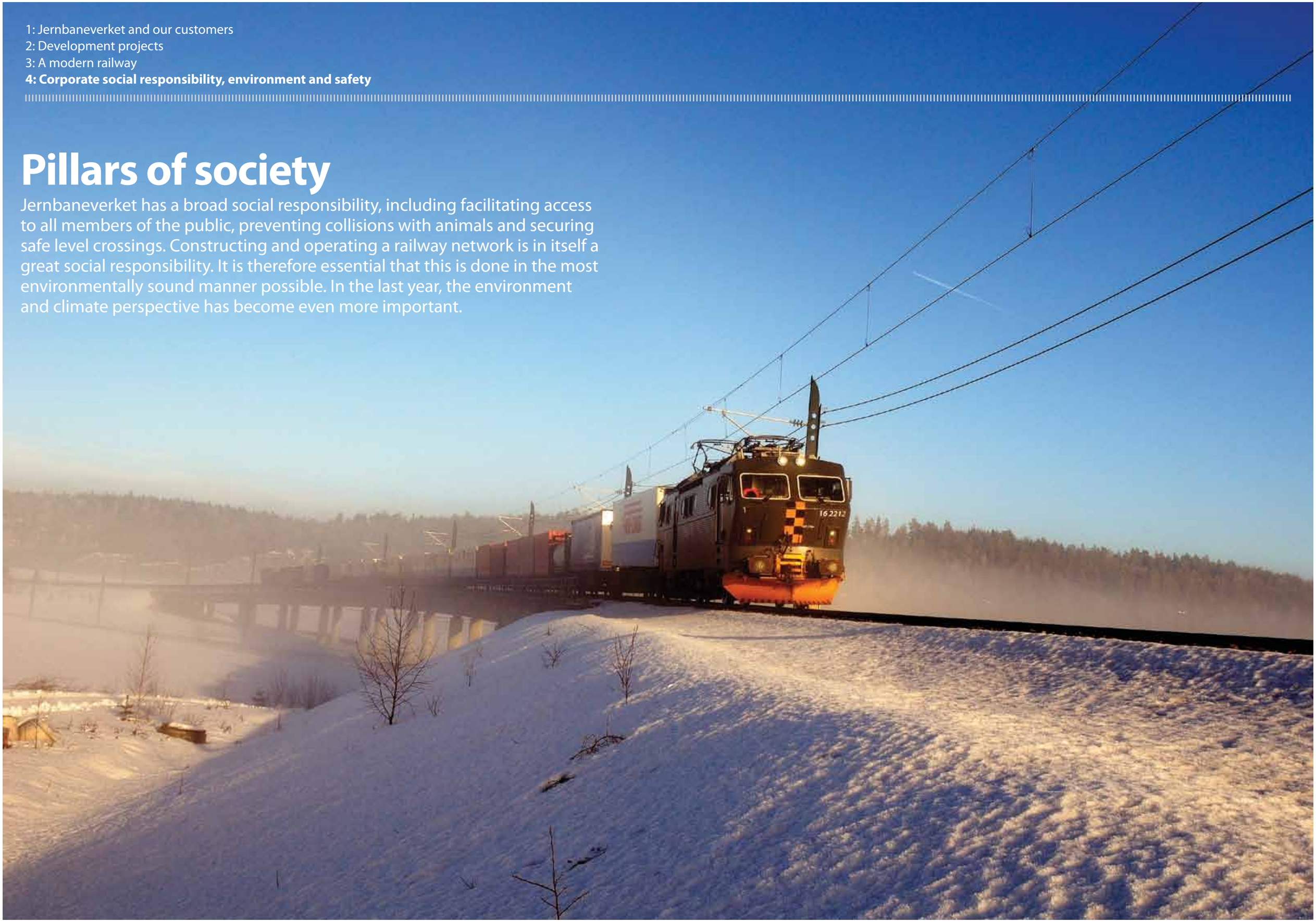
09

Axle counters were first introduced at Berekvam station in the summer of 2009. Next up was the double track in Jæren.

Analyses have shown that future needs for passenger and freight transport best can be met through a modern double-track railway serving city areas to the best extent possible. An important goal is to compete with road transport on long-distance, daily commutes.

Pillars of society

Jernbaneverket has a broad social responsibility, including facilitating access to all members of the public, preventing collisions with animals and securing safe level crossings. Constructing and operating a railway network is in itself a great social responsibility. It is therefore essential that this is done in the most environmentally sound manner possible. In the last year, the environment and climate perspective has become even more important.



2 000 A doubling of the freight capacity at Alnabru will remove 2 000 heavy goods vehicles from Norwegian roads every day.

Rail travel is a very environmentally friendly way of travelling. The Norwegian State has defined investments in the railway as part of its environment policy. Consequently, Jernbaneverket has a particular responsibility to promote and introduce solutions that will develop and increase its market share, whilst at the same time protecting our environment.

One of the principal objectives of Jernbaneverket's strategy for the period 2010-2013 is to ensure that the company's environmental commitment forms an integral part of all its activities and that the activities are subject to an external audit. Environmental accounts shall be prepared for all major investment projects. Moreover, Jernbaneverket will take an active part in national environmental work and communicate the railway's contribution.

Climate Agreement and NTP.
In 2008, the Norwegian Storting adopted the co-called Klimaforliket (parliamentary climate agreement). One of the main objectives of the agreement is for Norway to become climate-neutral by 2030. Furthermore, the Agreement stipulates that a budget for greenhouse gas emissions must be prepared for all major public transport projects.

The National Transport Plan for 2010-2019 has taken it one step further and stipulated that all major transport investments must account for any changes in emissions of greenhouse gases. The various transport agencies have agreed on a common method for complying with these requirements.

Climate budget Oslo-Ski
Jernbaneverket has organised the work as a pilot project under "New double track Oslo – Ski". The pilot project is preparing a climate budget where greenhouse gas emissions arising as a result of the construction and the use of new railways are highlighted. The climate budget will then form the basis of future climate accounts.

Climate cure launched In 2009, Jernbaneverket took part, together with other transport agencies, in the drafting of a strategy and compilation of a list of measures aimed at reducing greenhouse gas emissions. The climate cure report was launched in February 2010. By increasing its market share, Jernbaneverket can contribute to reducing the more polluting means of transport. We have studied a doubling and tripling in freight capacity, an increase in the InterCity capacity, high-speed railways and electrification of the current diesel sections. The potential for greenhouse gas reductions from these measures amounts to approximately 334 000 tonnes in 2020 and 639 000 tonnes in 2030. Combined with strong policy instruments to increase the market share of public transport, a much higher reduction could be achieved.

Good reputation. A good example of the spirit of the Climate Cure is the direct train link established in November 2009 between Oslo and Rotterdam by Norway Post's logistics company Bring. The trains, which depart from the Alnabru freight terminal every Saturday, mainly transport fresh food to and from the Continent. Amongst the southbound customers are several major salmon exporters, whilst the northbound customers include the fruit and vegetable wholesaler Bama.

The Bring train equals 32 heavy freight vehicles on the road. In the course of one year this means four million fewer kilometres driven and 4000 fewer tonnes of CO_2 emissions. For 2010, the plan is to increase the service to three trains per week between Norway and the Netherlands.

Alnabru freight terminal. The Alnabru freight terminal is the hub of the Norwegian freight transport system, but the terminal is reaching its capacity. In the autumn of 2009, a major modernisation project was initiated to increase capacity in the goods reception area, as well as the capacity for intermediate freight carrier storage in the terminal area.

Jernbaneverket is currently considering a comprehensive concept for a gradual capacity increase at Alnabru, comprising four construction phases. The development rate can be adjusted to the development in the market. Doubling Alnabru's capacity will remove 2000 heavy freight vehicles from Norwegian roads every day.

Energy efficiency. Seven years ago, Jernbaneverket initiated an energy efficiency and -saving project. Since then, Jernbaneverket has reduced its energy consumption by 23.5 Gwh. The goal for the 2010-2013 period is to reduce energy consumption by five per cent compared with 2008 levels.

Energy auditing is an important part of this effort. Some analyses show that by implementing certain measures, we could reduce energy consumption by 25 per cent or more. The Infrastructure Management conducted a major energy efficiency analysis in the north of Norway in 2009 to ensure correct prioritisation of measures. Both large and small measures yield effects, and several measures were introduced nationwide.

An automatic point heating system has been installed, which contributes to reducing energy consumption by as much as two-thirds. This system is now being installed at more and more switches all over the railway network. Other measures introduced in 2009 included replacing electric heaters. Several waiting rooms, including on the Sørland and Røros lines, are now heated by heat pumps. At several stations, doors and windows have also been replaced.

Important tool. Running the trains is the main source of energy consumption, which means that the biggest potential savings can be found in managing the electric power supply for trains. In order to pinpoint maximum savings, we need to know how much electricity the trains use when run normally, during acceleration and during braking.

Together with Danish and Swedish partners, Jernbaneverket has developed a standardised metering tool called ERESS (European Railway Energy Settlement System). ERESS is now in use in Norway, Sweden, Denmark and Belgium, and ensures an efficient, correct and flexible process for metering and settling energy for trains, including cross-border traffic. Several countries have shown an interest in the system.

So far, new and advanced energy metres have been installed on about 500 trains. Engine drivers receive training in energy efficient driving and receive feedback through the system. These measures have resulted in a significant reduction in energy consumption.

Noise reduction. The most important source of railway noise is the contact between the wheel and the track. Jernbaneverket has financed a research project to investigate possible noise reduction effects from track grinding in connection with maintenance. A final report is expected in 2010.

Jernbaneverket has carried out a project to see if "smooth" operation and handling of goods at the terminals can reduce noise. Measurements at Alnabru in 2009 concluded that smooth operation could reduce noise, but at the expense of the time it takes to carry out the tasks.

Ground pollution. In 2009, Jernbaneverket implemented measures at a total of 21 localities with polluted ground. Measures have included cleaning up waste disposal sites and cleaning and upgrading oily discharges from engine sheds and diesel refuelling facilities. In 2007, Jernbaneverket mapped the number of localities with polluted ground and the number has been reduced from 112 in 2007 to 76 at the end of 2009.

Animal collisions. In 2009, 1 778 animals were hit by trains. Moose, deer, reindeer and sheep top the statistics of animals involved in collisions. The goal of a maximum of 1 440 animal collisions in 2009 was not reached. Beyond measures such as clearing vegetation, feeding and fencing along the rail lines to reduce the number of animal collisions, Jernbaneverket implemented a research project together with Bioforsk in 2009 to see if the use of olfactory agents can repel moose and prevent them from walking on the track and being hit by trains. The project is being carried out on the Nordland line in the winter of 2009-2010.

Environmentally friendly procurements. Jernbaneverket is legally obligated to consider life-cycle costs and environmental consequences when planning procurements. In 2009, Jernbaneverket's supply department focused on information sharing and internal training of Jernbaneverket's procurement staff to provide guidance in the process of setting appropriate environmental requirements for procurement. This was done as it is a major challenge to set environmental requirements which also ensure that Jernbaneverket acquires the best suppliers in the market. The work continues in 2010.

Cultural heritage and the Bergen Line. 2009 was the UN Cultural Heritage Year, and Jernbaneverket participated in a number of ways, including restoring the Tinnos line from Notodden to Tinnoset so that trains could operate on the line once again. The century-old line was once a necessity for Norsk Hydro's industries at Rjukan, which the Directorate for Cultural Heritage has nominated for the UNESCO world heritage list. Still, the most important cultural heritage event in Norway in 2009 was the centennial celebration of the Bergen line. The opening of the Bergen line on 27 November 1909 was a revolution and a feat of Norwegian communication; the first major step in reducing the distance between the nation's two largest cities.

To this day, every fifth traveller between Oslo and Bergen travels by train, and the Bergen line is the most important carrier of freight and goods to the Bergen region. The anniversary was properly celebrated with festive events, exhibitions, films, concerts and museum trains. The anniversary generated wide media coverage, and a separate anniversary booklet was produced.

1 A good working environment is important. Here we see an HSE inspection round being carried out on one of Jernbaneverket's construction sites.

2 Jernbaneverket's freight strategy has been to facilitate the transfer of freight from road to rail. The goal is a doubling of freight traffic by rail by 2020 and a tripling by 2040.

3 The Alnabru freight terminal needs investments in the billions to meet these ambitions.

Safe travel by train!

Railways represent one of the safest means of transport, and Jernbaneverket works continuously to improve safety. Several billion Norwegian kroner have been spent over the past decade on safety measures in the rail sector.

Safety must always be the number one priority and the foundation of all our activities. The safety culture entails systematic safety work to ensure that the activities do not cause harm to people, the environment or property. Safety always takes the front seat, risk must be understood and assessed.

System and learning.
Jernbaneverket's vision is zero fatalities due to rail activity, and to reduce the number of incidents involving serious harm to persons, the environment or property by at least 20 per cent by 2013.

Jernbaneverket's safety management system entails setting safety goals, and measures are planned to reach these goals.
Risk analyses and learning from undesirable incidents are two key elements in our safety management. Both require sound safety expertise and a safety culture. Risk analyses have been integrated in all work processes over the past decade, which contributes to identifying hazards and dealing with them before they cause accidents. We are continuously doing a better job of reporting problems. In 2009, more than 9000 reported issues were handled.

Good results. In the period from 2005 through 2009, there was one fatal accident in connection with a level crossing. In comparison, 66 persons died in level crossing accidents in Norway during the period from 1967 to 1971.

The working day for our employees has also been made safer through systematic measures for working environment and safety. The number of injured personnel has been significantly reduced, and the number of serious injuries and fatalities is markedly lower. In the past five years, one employee has died due to a work-related accident, while for the decade 1980 to 1990, the average was one fatality per year.

New traffic regulations and safety certification. In 2009, a number of measures involving infrastructure and internal guidelines were implemented to adapt the activities to the new regulations for rail traffic which came into effect on 13 December 2009.

In the summer of 2009, Jernbaneverket received its safety certification as manager of infrastructure from the Norwegian Railway Inspectorate, in accordance with EU requirements.

Better safe than sorry

During the past ten years, the safety work in Jernbaneverket has received increasing attention.

"We are very pleased to see that this work has yielded good results," says safety director Monika Løland Eknes. Since the railways were established in 1854, safety has traditionally been safeguarded through rules for rail traffic management and the design of technical facilities. These rules were usually amended and developed in response to incidents and accidents. Towards the end of the 1990s, proactivity entered the safety work. This work was intensified as a result of the tragic Åsta accident on 4 January 2000.

All phases. "We now carry out risk assessments for all project phases, from concept to the completed railway infrastructure, to ensure compliance with the safety requirements, and the least possible risk of harm to people, the environment and property during the construction phase. During the operations and maintenance phase, we carry out similar risk assessments to ensure that operative personnel have a safe working environment, and while also protecting the external environment," says Eknes.

"We conduct risk assessments in traffic management whenever we change the train tables, when we make changes to our organisation, and many other contexts. We also gather, register and follow up near accidents and undesirable incidents in order to learn and improve. In just a few years, we have seen a massive increase in reported near accidents and undesirable incidents, which has given us more and better information as a basis for prioritisation and improvements."

Every day. This work has yielded results. "We have had a zero vision throughout the decade, and in contrast to ten years ago, at the start of 2010, this vision appeared to be achievable for fatalities in connection with railway activities in Norway. At the same time, safety must be assured every day. This requires us to be vigilant at all levels in the time ahead. I also believe that the great potential in the safety work ahead of us is not in massive investments in safety measures, but rather in smart solutions combined with awareness, learning and continuous improvement as a result of a good culture for safety and precision," Monika Løland Eknes says in conclusion.

Safety director Monika Løland Eknes

1100 Jernbaneverket has removed about 1100 level crossings in the past ten years.

In good hands

At the start of 2010, level crossings, unauthorised traffic along the rails and avalanche and landslides present the greatest safety challenges for Jernbaneverket.

FACTS

GSM-R

GSM-R is a closed, digital mobile phone system (digital radio system) developed for the railway in Europe.

GSM-R has functions which make communication between the train controller and engine driver easier. In an emergency, all trains in an area can be notified at the same time.

Norway was the first European country to adopt the system on all its lines in 2007.

1 The Bergen line, February 2009: Trond Børsting on Jernbaneverket's avalanche committee says the avalanche safety barrier on the spot is directly coupled with the signals and will trigger a stop signal if hit by an avalanche.

2 Precipitation, wind strength, wind direction and barometric readings are monitored through a network of weather stations along the railways.

The worst case safety scenario is a collision between two trains. Fortunately, there are a number of safety systems and routines in place to minimise the risk of this happening. New technology has made an already very safe system even safer:

The closed, digital mobile phone system GSM-R makes communication between the train controller and engine driver easier. Norway was the first European country to adopt the system on all its lines. Traffic control centres are also equipped with alarms which go off if a train should run a stop signal, enabling them to warn all other trains in the area immediately. In addition, most sections have ATC (Automatic Train Control), which automatically stops any train that runs a red light.

Fewer level crossings. Level crossings represent the single largest risk factor in Norwegian railways. Of the existing and registered 3 700 level crossings in Norway, 3 360 are private. The most effective measure is to reduce the number of level crossings and construct underpassages and bridges. Over the course of the past ten years, some 1 100 level crossings have been removed. Large amounts have been spent on underpassages, bridges and collection points for safe crossings. In 2009, a number of minor measures at level crossings, such as improving lines of vision, signposting and construction of barriers, were also implemented. The work to secure level crossings continues.

Extreme weather. In recent years, more extreme weather in the form of increased precipitation and larger temperature fluctuations have presented new challenges in the form of rock slides and land slides from underneath the rails themselves.

Jernbaneverket has identified the risk of rock and land slides for a number of railway sections. This work continues in 2010, and improvement measures will be implemented simultaneously. In 2009, measures to secure the Bergen and Flåm lines were introduced.

Another important measure is the partnership with the Norwegian Meteorological Institute for weather forecasts and establishing weather measurement stations along the rail tracks. Routines have also been established nationwide for regular inspections of sections with significant precipitation. The combination of these measures makes us better prepared to take preventive action in connection with extreme weather.

P**reventive maintenance means safe railways.** When winter has passed, the busy period starts for Jernbaneverket's section managers and keepers. Faults and defects must be reported, work on the tracks is followed up and new inspections are planned. From Easter and until the autumn, a long checklist is consulted to make sure that the entire facility is in good order and fulfils the requirements for accessibility, quality and safety.

An important safety measure is the measurement and inspection vehicle ROGER 1000. This is an advanced locomotive which drives along the railway, measuring the condition of the infrastructure as it goes along

using advanced equipment. ROGER 1000 is one of the most important tools Jernbaneverket has for monitoring safety and quality along the tracks. Another good tool is thermography of the railway's electrical systems using a heat sensitive camera. This tool can reveal faults at an early stage, often before they cause operational problems.

Learning and improving. A new process for handling deviations was introduced at the start of 2009. The new system means that the entire process is documented, from when a deviation is reported until it is solved. Deeper-lying causes are also identified, so that the correct measures can be introduced. The purpose of the new process is for Jernbaneverket to become even better at learning from errors and incidents, improving operations as a result.

Full focus on recruitment and expertise

Media coverage, political and economic prioritisation, environment, climate and high speed are factors that motivate many candidates to apply for a job in the railway sector. This is a good thing, because there is a great need for new hands and heads!

In 2009, Jernbaneverket hired 228 new employees. In addition, we recruited 59 apprentices within traditional railway disciplines. The majority of the new employees work with planning, engineering and construction management in our Construction Management division.

Jernbaneverket's goal is to succeed in safeguarding a competent workforce by adjusting recruitment to the activity levels and age profile, and at the same time be a good employer who retains and attracts employees.

"We will develop and inspire our employees by offering systematic professional development and facilitating contribution and involvement," the strategy states.

The Norwegian Railway School. The Norwegian Railway School at Grorud in Oslo represents the foundation of Norwegian railway education. Here railway apprentices receive their mandatory professional courses and education, future dispatchers and traffic controllers undergo their basic training and 130 engine drivers graduate every year. The school also offers continuing education and training for the entire railway sector. The school is now gearing up to meet the higher demand resulting from increased focus on the railways and growing need for railway personnel. NOK 100 million is being invested and the training area is being tripled.

Active recruitment. Thirty different recruitment drives were carried out in 2009. Company presentations were held at upper secondary schools, colleges and universities, school classes visited Jernbaneverket and students have been invited to intern. Contact with upper secondary schools and follow-up of apprentices is handled by the National Training Office for the Railway Sector.

At the Norwegian University of Science and Technology (NTNU), contact is made with students through a specialised course in Railway technology, as well as projects and master theses. "Experts in teams", an interdisciplinary project topic for all master and professional studies at NTNU, has also become an important venue where students are introduced to subjects related to railways. This has inspired many students to continue to study railway-related topics in 2009. As part of a much needed effort to strengthen expertise, Jernbaneverket has implemented a trainee scheme, a project management school and an extensive manager development programme.

Generational shift. The average age of employees in Jernbaneverket is currently quite high. As a result, Jernbaneverket is facing a generational shift which will present major challenges in terms of transfer of expertise, facilitating new technology and new expectations.

FACTS

Jernbaneverket – a good place to work

- A forward-looking organisation with an extensive and varied professional environment
- Good opportunities for expertise development (project manager school, management training programmes, courses tailored to the company, etc.)
- Good opportunities for specialised development and further training
- Access to company cabins all over Norway
- Beneficial banking and insurance services via Jernbanepersonalets Bank og Forsikring, a specialist banking and insurance service for railway employees
- Beneficial pension conditions via the Norwegian Public Service Pension and payments of pension contributions equivalent to two per cent of salary
- Paid apprenticeship
- Flexible working hours and leave arrangements
- Paid overtime
- Annual season ticket for NSB train services

Vacant positions can be found at www.jernbaneverket.no/jobb

1 Due to an all-party consensus to focus on railways, many young people now believe in a future in the railways. Here we see general manager Harald Eide Galtung from the National Training Office for the Railway Sector together with signal apprentices Hassan Saad (left) and Andreas Grim Falstad.

2 Recruitment manager Bente Tangen in Jernbaneverket (middle) is making a major effort to market railway disciplines in upper secondary schools, colleges and universities. Here she is together with signal apprentices Senad Causevic (left) and Nadeem Hussain.

3 Also this year, Jernbaneverket had a stand at the NTNU Career Day.

FIGURES

Key figures for the Norwegian railway as of 31 December 2009

Infrastructure

Electric	Line	Route-Kms	Double track Kms	Bridges	Tunnels	Level crossings	Stations[1]
●	The Nordland line	734		293	154	747	44
■	The Sørland line	563	14	504	191	124	46
■	The Dovre line	492	4	321	43	326	29
●	The Røros line	382		223	6	476	27
■	The Bergen line	371		205	145	265	38
■	The Østfold line western line	171	64	134	17	85	23
■	The Vestfold line	138	17	99	16	121	12
■	The Gjøvik line	123	2	72	7	104	23
■	The Kongsvinger line	116		62	0	70	16
●	The Rauma line	115		103	5	224	4
●	The Solør line	88		31	1	198	0
■	The main line	84	20	60	4	6	21
●	The Meråker line	70		60	1	50	4
■	The Gardemoen line	64	62	13	1	0	3
■	The Østfold line eastern line Ski-Rakkestad	54		30	0	68	15
■	The Randsfjord line to km 126.718	54		21	1	84	2
■	The Bratsberg line	47		44	20	48	2
■	The Ofoten line	43		5	18	8	6
■	The Drammen line	42	42	28	11	0	16
■	The Arendal line	36		17	3	46	8
■	The Roa-Hønefoss line	34		27	3	47	0
■	The Flåm line	20		2	21	39	9
■	The Asker line	15	15	2	3	0	0
■	The Spikkestad line	12		10	0	8	7
■	The Tinnos line to km146.26	10		18	4	16	2
■	The Brevik line	9		18	0	5	0
●	The Stavne-Leangen line	6		8	2	0	1
■	The Alnabru-Loenge freight line	3		0	0	0	0
■	The Alna line	2		6	1	1	0
■	Skøyen - Filipstad	2	1	0	0	0	0
●	The Randsfjord line north	10		7	0	18	0
	Total lines with regular traffic	**3 910**	**241**	**2 423**	**678**	**3 184**	**358**
	Lines without regular traffic [2]	259	0	83	17	472	0
	Total	**4 169**	**241**	**2 506**	**695**	**3 656**	**358**

■ Electrified
● Not electrified

[1] Stations and stops with passenger traffic.
[2] "Lines without regular traffic" includes the following lines: The Flekkefjord line, the Hardanger line, the Kragerø line, the Valdres line, the Namsos line, the Numedal line, the Nelaug-Simonstad sidetrack, the Ålgård line, the Østfold line eastern line Rakkestad - Sarpsborg, the Randsfjord line Hensmoen - terminus, the Tinnos line Notodden - Tinnoset.

Environment

	2007	2008	2009
Clean tracks (%)	83	82	85
Clean stations (%)	87	94	97
Number of locations with ground pollution	112	97	76
Number of animals hit by train	1 885	1 877	1 778
Pesticides (litres)[1]	13 285	13 364	15 376
Electric energy consumption by Jernbaneverket (GWh)	87	87	94

[1] the increase is caused by tree felling

Passenger kilometres – in millions[1]

	2002	2003	2004	2005	2006	2007	2008	2009
Local traffic in Norway	**2 479**	**2 399**	**2 601**	**2 665**	**2 764**	**2 895**	**3 047**	**3 012**
Including:								
NSB AS	2 240	2 178	2 375	2 433	2 485	2 561	2 698	2 670
NSB Gjøvikbanen AS	0	0	0	0	25	55	57	59
Flytoget AS	213	195	209	222	244	268	282	273
Flåm Utvikling AS	8	8	9	10	10	11	10	10
Linx AB	18	18	8	0	0	0	0	0
Others[2]		0	0	0	0	0	0	0
International combined traffic[3]	**64**	**60**	**42**	**35**	**37**	**59**	**63**	**67**
Including:								
NSB AS	9	10	6	29	29	32	33	31
Linx AB	55	48	34					
Others[2]		2	2	6	8	27	30	36
Total	**2 543**	**2 459**	**2 643**	**2 700**	**2 801**	**2 954**	**3 110**	**3 079**

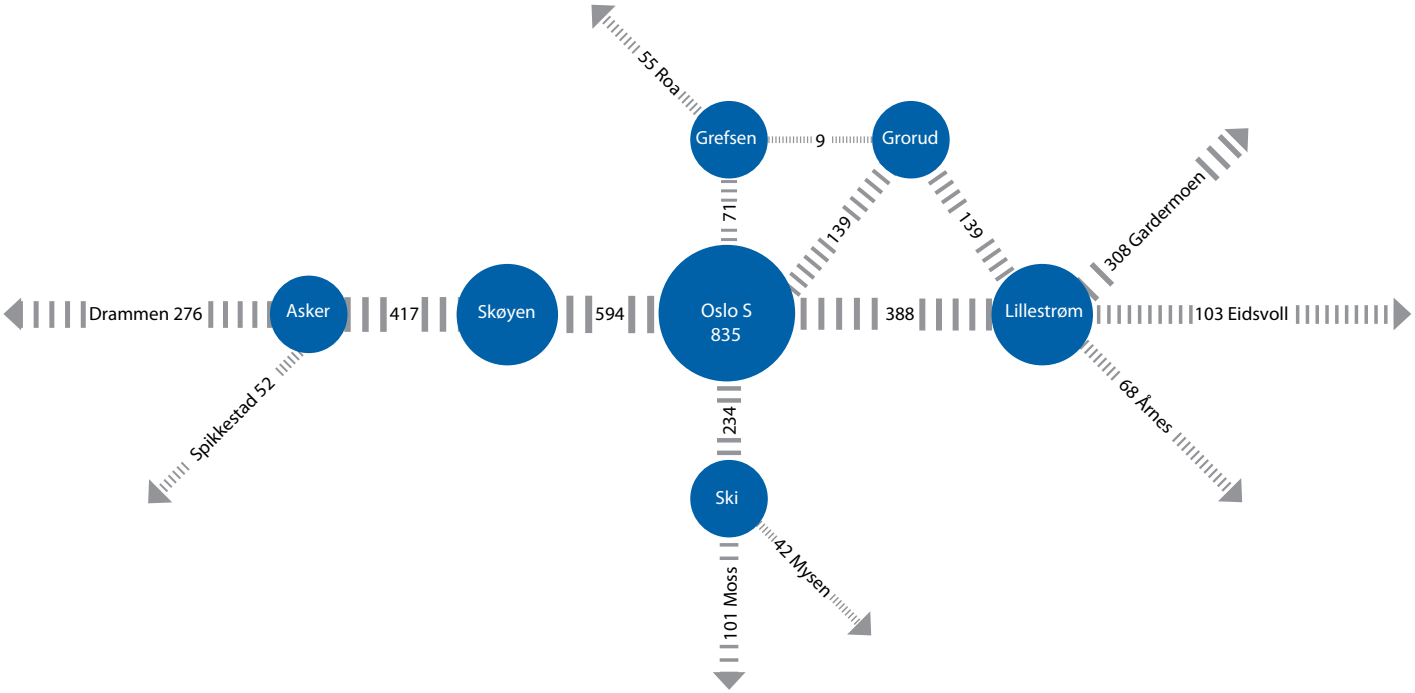
Source: NSB AS, Gjøvikbanen AS, Flytoget AS, SJ
[1]passenger kilometre: Number of passengers multiplied by distance driven.
[2]Figures from Ofotbanen Drift AS were not available.
[3]Passenger kilometres, estimated for Norwegian part of route.

Tonne kilometres – in millions[1]

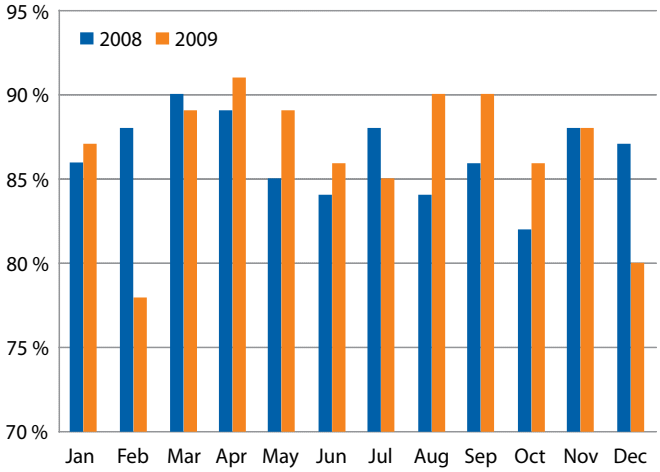
	2002	2003	2004	2005	2006	2007	2008	2009
Domestic traffic	**1 686**	**1 559**	**2 017**	**2 215**	**2 380**	**2 453**	**2 670**	**2 469**
Including:								
CargoNet AS	1 686	1 559	2 013	2 203	2 356	2 430	2 537	2 429
Others[2]	0	0	4	12	24	23	133	40
Cross-border traffic	**1 002**	**1 068**	**828**	**934**	**972**	**1 002**	**956**	**757**
Including:								
CargoNet AS	504	533	185	230	274	283	234	204
Malmtrafikk AS	498	535	592	622	621	633	558	494
Others[3]	0	0	51	82	77	86	164	59
Total	**2 688**	**2 627**	**2 845**	**3 149**	**3 352**	**3 455**	**3 626**	**3 226**

Source: CargoNet AS, Malmtrafikk AS, Tågåkeriet AB, Railcare Tåg AB and Peterson Rail
[1] tonne kilometre: Definition of transport of one tonne of cargo for one kilometre.
[2]Data only from Tågkeriet AB in 2009. Data from Green Cargo AB and Hector Rail lacking for 2007.
[3] Data only from Railcare Tåg AB, Tågåkeriet AB and Peterson Rail in 2009. Data from Green Cargo AB and Hector Rail lacking for 2007.

Total number of trains per day in the Oslo area

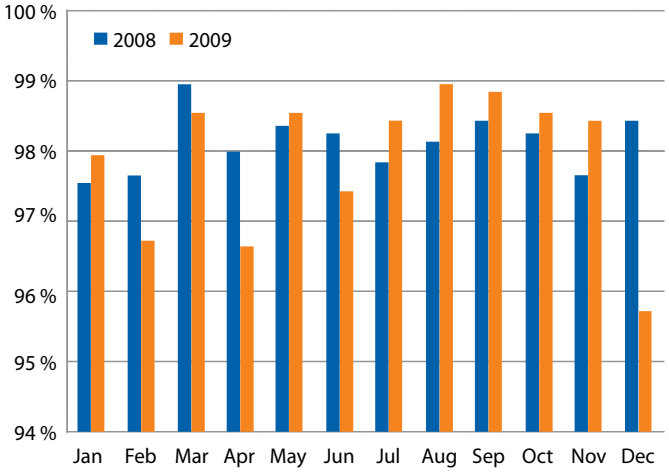


Punctuality passenger trains



See page 12 for definition of punctuality and regularity.

Regularity passenger trains



Average 2008: 98.1 %, 2009: 97.8 %

FIGURES **SAFETY**

Summary of operating accidents 2009[1]

Operating accidents according to definition by the UIC Safety Database with cost per incident > 150 000 EURO, fatality or serious injury. Operational railway

Type of accident	Number	Fatalities	Serious injuries[2]
Collision	**3**	**0**	**0**
- Train operation (train-train)	1	0	0
- Train operation (train-object)	2	0	0
- Shunting	0	0	0
Derailments	**1**	**0**	**0**
- Train operation	0	0	0
- Shunting	1	0	0
Level crossing accidents[3]	**0**	**0**	**0**
- Secured with barrier, sound, light	0	0	0
- Secured with gate	0	0	0
Other level crossing accidents	**3**	**2**	**1**
Fire in rolling stock	**0**	**0**	**0**
Other accidents[4]	**3**	**1**	**2**
Total in 2009	**10**	**3**	**3**

[1]The figures are preliminary, as of April 2010, as three of the incidents are still under investigation by the police.
[2]Serious injury is defined as: person who is injured and who must be hospitalised for more than 24 hours.
[3]Applies to collisions between road vehicles and rolling stock.
[4]Applies to other accidents which resulted in fatalities or serious injuries.

MAINTENANCE

Price level for maintenance and renewals per metre main track

Track section	Operation, corrective and preventive maintenance (NOK per metre)	Renewals (NOK per metre)
The Oslo area	3 865	4 165
The Drammen line	748	186
The main line	1 215	102
The Gardermoen line	831	0
The Kongsvinger line	391	392
The Gjøvik line	456	120
The Østfold line	391	100
The Vestfold line	266	195
The Sørland line	289	363
The Bergen line	316	504
The Dovre line	523	445
The Røros line	187	132
The Nordland line	239	226
The Ofoten line	830	1 433
Other sections	113	44
Unspecified and infrastructure Management staff	53	12
Average in 2009	**431**	**320**

The figures apply to the Infrastructure Management Division and are partially based on estimated distribution.

Some of the maintenance work in 2009

Action	Amount	Unit
Ballast cleaning	85	main line kms
Preparations for ballast cleaning	53	main line kms
Replacing sleepers	74 000	pieces
Replacing tracks	64	main line kms
Replacing switches	24	pieces
Contact line renewal	7	main line kms
Track adjustment, continuous	993	main line kms

Contact details

Jernbaneverket's units are located at several sites throughout the country.
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