The case for rail 2007
The first sustainable development review of the mainline railways of Great Britain
Our First

Introduction
The Sustainable Development Steering Group presents the first sustainable development review of the mainline railways of Great Britain as part of the industry’s Sustainable Rail Programme. Hereafter, the mainline railways of England, Scotland and Wales are referred to as ‘the industry’.

This document, The case for rail 2007:
- Explores sustainability in the context of rail
- Summarises our current sustainability performance
- Illustrates the industry’s response to the sustainability challenges and opportunities.

It is supported by the many individual company sustainability and corporate social responsibility reports that detail the initiatives being taken by the individual companies within the industry.

The abbreviations and key technical terms used within this publication are detailed in the Glossary included on the flap attached to the back cover.

Foreword
Britain’s railway is a vital part of our transport infrastructure. It supports our economy by getting people to and from work, and through the movement of goods, both nationally and internationally. It provides access to shops and leisure facilities, and plays an important social role by linking communities and providing transport for people without access to a car.

Looking ahead, however, all transport modes will have to operate in an increasingly carbon- and resource-conscious world. Passengers of the future will also be more demanding and expect increasingly high levels of service and quality of information. Transport modes that do not respond to these challenges will undoubtedly lose customers.

That’s why this document is such an important milestone for the railway. For the first time, the industry has taken an open look at its sustainability performance, identified where its strengths and weaknesses lie, and set out a plan for ongoing improvement. Perhaps most importantly, this has been achieved by all parts of the industry working together.

This document demonstrates that rail currently performs well compared with other modes across a range of sustainability measures. Indeed, the biggest contribution rail can play to support our twin goals of economic growth and carbon reduction is to carry more passengers and freight. But the railway cannot afford to be complacent, given both the ever-increasing pressure on transport to improve its environmental performance and the improvements taking place in other modes. For these reasons, I welcome the industry’s intention to develop challenging carbon efficiency targets.

In July, I expect to publish the High Level Output Specification and a long-term strategy for rail. These will confirm that the most pressing challenges facing rail are: responding to increasing demand, improving its environmental performance and meeting higher passenger expectations. If the industry – with the support and assistance of Government – can meet these challenges, as well as continuing to improve its cost-effectiveness, then our railway will be well on the way to long-term sustainability.

Douglas Alexander MP Secretary of State for Transport
At a glance
The railway has a key role to play in contributing to a sustainable and integrated national transport system.

Towards improved sustainability
Rail is an impressively sustainable form of transport and will continue to maintain and build upon its advantages by further reducing its impacts with respect to climate change, air quality and noise, while improving train service performance, capacity, affordability and accessibility.

GB rail’s sustainability performance
Rail provides a sustainable transport solution that minimises environmental impacts and contributes to social inclusion and economic development.

Performance for seven sustainable development issues, identified as priority, is presented below:

Air quality
Rail’s overall contribution to local air emissions is low. However, some discrete locations where diesel-powered trains are stationary, such as enclosed stations, do present a challenge.

For the same journey, passenger trains are comparable to cars on emissions of particulates, but under-perform on emissions of sulphur dioxide and nitrogen oxides.

For the same journey, freight trains outperform HGVs on emissions of nitrogen oxides and particulates, but under-perform on emissions of sulphur dioxide.

Train service performance
Train punctuality is 86.4% – the highest level for six years.

In autumn 2006, 81% of passengers were very or fairly satisfied with their journey, the highest level ever recorded.

Capacity
In 2006/07, Network Rail set aside £4.5bn for maintaining and renewing the network infrastructure and approximately £0.5bn for enhancing the capacity and reducing journey times on the network.

Affordability and accessibility
Rail prices for both passengers and freight are much closer to the additional cost (including external societal and environmental) associated with each extra journey than tends to be the case for competing modes of transport.

Major improvements in information quality are improving passengers’ experience, eg TrainTracker™.

The Department for Transport has allocated £370 million to upgrade physical accessibility at stations.

Safety and personal security
Rail is 23 times safer than passenger cars and is broadly comparable with air travel on a passenger kilometre basis. The industry has a secure station accreditation programme in which 252 stations are now accredited.

Voice and vibration
The industry’s new passenger trains are among the quietest in Europe and our new freight trains are ahead of the field in utilising low-noise technology.

Climate change
The average carbon dioxide emission for the same passenger rail journey is about half that of an equivalent car journey and about one-quarter of an equivalent journey by air.

The average carbon dioxide emission for rail freight is currently being analysed. It is anticipated that the absolute and relative carbon dioxide emission for moving freight by rail and road will be available during summer 2007.

Regenerative braking on the a.c. overhead electrified network is reducing the energy use of electric passenger trains by 15–20%.

GB rail’s development strategy
Developing a 30-year rail sustainable development strategy.

1. Investing £10.6 billion to maintain and renew the network infrastructure and to deliver increased capacity throughout the remainder of Control Period 3 (until 2009).

2. Completing noise mapping to prioritise noise-reduction measures where necessary.


4. Making reductions in local air pollutants on a per passenger kilometre basis.

5. Reaching a train punctuality target of 89.5% by March 2008.

6. Reducing freight delays by approximately 20% over the next two years.


8. Continuing to implement programmes to improve accessibility.

9. Continuing to make significant improvements in passenger information provision.

10. Maintaining the strong safety performance and improving where reasonably practicable.

11. Delivering a measurable reduction in the rate of workforce accidents.

12. Developing a 30-year rail sustainable development strategy.

13. Completing the implementation of regenerative braking to reduce the energy used by electric trains.

1. The performance data presented is the most up-to-date and accurate data possible (mostly reflecting the 2005/06 period).

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Rail's contribution to society
The rail industry supports the GB economy through facilitation of the country's production, commercial, financial and administrative activities. Passenger rail takes millions of people to and from work, business and leisure activities daily. Rail freight services distribute a wide variety of goods to and from ports, major industries and distribution centres, avoiding additional traffic to the already congested road system. Rail provides travel opportunities for a diverse mix of social groups and connects many remote and rural areas that would otherwise be marginalised. Rail contributes to community wellbeing and prosperity, improving standards of living by catalysing regeneration, regional economic development and agglomeration. Rail is an essential part of an integrated transport network.

Being part of the solution, not part of the problem
Delivery of a sustainable railway is critical, especially in light of the dramatic increase in demand for transport experienced in recent years. The industry’s vision of a sustainable railway is explored in Figure 1.

Managing the impacts
Sustainability can be illustrated under the three pillars of environment, economy and society as presented in Figure 2. The relationship between these pillars can be complex as the issues can have more than one impact. Therefore, issues discussed within this review are presented in terms of their primary impact. Delivery of sustainability has multiple dimensions. This document focuses on seven issues identified as priority, by the industry and affected parties, as follows:

- Climate change
- Air quality
- Train service performance
- Capacity
- Affordability and accessibility
- Safety and personal security
- Noise and vibration.

The current performance and steps to improvement are presented in the following sections with commitments shown in blue text.

1. The performance data presented is the most up-to-date and accurate data possible (mostly reflecting the 2005/06 period).

Growth of Rail by David Begg – Publisher, Transport Times. David Begg is Director of the Portobello Partnership, which provides strategic advice on transport. He is also the publisher of Transport Times.

John Prescott has been criticised for saying back in 1999 that he would have ‘failed’ if in five years’ time there were not more people travelling by public transport and road by only 15%. This is the only time in recent history when the growth in rail patronage has substantially outpaced road.

But to make this rail growth sustainable, in all senses of the word, the sector needs to focus on three areas. First, it should lobby for new pricing regimes to internalise the full external costs of transport across all modes. If this happens, then the carbon inefficient modes of transport – air and road – will become more expensive compared to rail. This will give rail an advantage over its main competitors.

Second, the planning system must ensure that we build sustainable travel into our communities. The Barker review of the planning system favours low-density housing on green-field sites, locking in car dependency. The rail industry – through individual companies and the Sustainable Rail Programme – needs to make its voice heard in this debate, making the case for high density city centre regeneration served by high-capacity rail lines.

Finally, the sector must ensure it plans for a low-carbon railway. Today's decisions on rolling stock will still be in use in 30 or 40 years’ time. Capital programmes and franchise bids must therefore be subjected to rigorous sustainability appraisals.

Just think: in 2015, when someone is weighing up which transport option is going to draw down the fewest points from their personal carbon account, rail will need to stand out as the natural low-carbon (and therefore lower cost) option.
Climate change

The principal greenhouse gas contributing to climate change is carbon dioxide (CO₂). Transport is a significant contributor and the fastest-growing source of CO₂ emissions in GB. The breakdown of CO₂ emissions by sector for the GB economy is illustrated in Figure 3. Rail contributes only 0.4% to GB’s overall CO₂ emissions.

Rail transport has the lowest carbon dioxide emissions when compared to passenger cars, road freight and air transport.

Setting the scene

Based upon current performance, the industry has a significant role to play in delivering sustainable transport, particularly through a modal shift to rail from less-sustainable transport modes. The average CO₂ emissions for the same passenger rail journey is about half that of an equivalent car journey and about one-quarter of an equivalent journey by air.

The CO₂ emissions presented are based upon the total fuel and electricity consumed and the total number of passenger kilometres or freight tonne kilometres travelled.

Figure 4: Average CO₂ emissions by transport mode (grams per passenger/freight tonne kilometre)

While the railway currently contracts a significant portion of electricity from nuclear sources, the industry has taken the grid energy mix as the basis for calculating the carbon footprint of electric trains because the current contracting arrangements could change.

Estimates of the change in CO₂ emissions per passenger kilometre by mode for the past 10 years, expressed as a percentage change from the base year 1995/96, are presented in Figure 5 below.

A significant proportion of the reduction in carbon emissions achieved by the rail sector has been through favourable increases in the load factor.

Figure 5: Percentage change in CO₂ emissions of different transport modes for the last 15 years

The industry is actively supporting the GB Government’s carbon reduction targets. A strategy to reduce carbon emissions from energy use (including setting targets and a reporting mechanism) is being developed. In addition, carbon footprinting by each rail company is being encouraged.

Non-traction energy

Non-traction energy is also being reduced by individual companies, with reductions in depot consumption of up to 17%.

The industry is currently assessing how it uses non-traction energy to identify options for efficiency improvements.

Research and development

Extensive research on mitigating the effects of climate change and adapting to a changing climate is under way. This includes collaboration with the Union Internationale Ceranne de Fer (UIC) [International Union of Railways].

A 10% reduction in traction energy demand is considered to be achievable in the short term by initiatives such as reducing the stabling load of electric trains and energy-efficient driving, along with energy monitoring and optimisation of off-peak train length.

The industry has commenced in-service trials of biofuel for the passenger and freight train fleets.

Energy storage and fuel conversion technologies for portable fuels on board trains, such as fuel cells, are being investigated and could potentially deliver substantial reductions in CO₂ emissions.

Future fuels technologies

Energy storage and fuel conversion technologies for portable fuels on board trains, such as fuel cells, are being investigated and could potentially deliver substantial reductions in CO₂ emissions.

The industry is participating in fuel cell research and its application to rail.

Steps to improvement

The industry is pursuing improvements through the following activities:

Energy efficiency initiatives

Typically, a 15–25% reduction in the energy required to move electric passenger trains is being achieved through regenerative braking on the overhead a.c. electrified network.

Infrastructure system upgrades, which will allow the use of regenerative braking across the entire overhead a.c. electrified network, are forecast to be complete by the end of 2008.

The industry regenerative braking working group is carrying out regenerative braking tests and trials on the d.c. electrified network with a view to its future implementation across the entire d.c. network.

Re-arranging the current high-speed train (HST) fleet with modern engines has reduced fuel consumption by 17%.

Operators of diesel freight locomotives have achieved a 3–5% reduction in fuel consumption by shutting down engines when stationary for more than 15 minutes.

Other initiatives to reduce fuel consumption are being pursued, including an automatic shutdown device and re-arranging of fuel injection systems.

Freight train lengthening and higher, constant and passenger train-compatible running speeds are also being considered.

CO₂ is released through the burning of fuel in diesel locomotives and in the production of electricity consumed by electric trains and other railway operations.

By attracting passengers and freight customers to rail from other transport modes, GB’s overall CO₂ emissions will be substantially reduced.

Steps to improve energy efficiency could reduce CO₂ emissions, deliver cost savings and other sustainability benefits, such as reduced local air pollution.

Climate change will increase the incidence of extreme weather events; this has implications for the railway infrastructure.

The industry is able to elect to use a fuel source that is less carbon intensive.

A significant proportion of electricity from nuclear sources.

The contribution of biofuels should be considered within the context of wider sustainability implications.

The industry is committed to developing a tool to assess the viability of further electrification, which considers effects upon CO₂ emissions.

The industry is proactively supporting the GB Government’s carbon reduction targets.
Air quality

Rail’s total contribution to air pollution is relatively small.

Setting the scene
Poor air quality has negative implications for human health and biodiversity. As a user of internal combustion engines, the industry contributes to air pollution.

Improvements from the transport sectors are being encouraged through the following European Union (EU) Directives:

- Use of biofuels or other renewable fuels for transport [2003/30/EC]
- Sulphur Content of Certain Liquid Fuels [1999/32/EC]
- Non-road Mobile Machinery [2004/36/EC]
- Fuel Quality (2003/17/EC)

During January 2007, amendments to the Fuel Quality Directive proposed a reduction in emissions limits of sulphur dioxide (SO₂). These are now being considered.

Actions to reduce emissions of local air pollutants can result in increases in CO₂, energy use and cost. Therefore, reduction strategies should be analysed with consideration to potential trade-offs.

Current performance
Rail’s total contribution to air pollution is relatively small when compared to the total for all transport. The total pollutant emissions of different transport modes (measured in kilotonnes) is illustrated in Figure 6.

The pollutant emissions measured in grams per passenger kilometre or freight tonne kilometre of different transport modes are illustrated in Figure 7. This illustrates that:

- Passenger trains are comparable to cars on emissions of particulates (PM10) but under-perform on SO₂ and nitrogen oxides (NOx) on a normalised per passenger kilometre basis.
- Rail freight outperforms HGVs on emissions of NOx and PM10 but under-performs on SO₂ on a normalised per freight kilometre basis. Based upon current performance, the industry has a significant role to play in delivering sustainable transport, particularly through modal shift to rail from less sustainable transport modes.

The role of electrification

The key determinant of the level of local air pollutants is the choice of diesel or electric traction. Currently, 45% of the mainline network is electrified (3,062 miles or 4,928 kilometres) and 62% of all passenger journeys are by electric traction.

The industry is committed to developing a tool to assess the viability of further electrification. In the future, we should be aiming to maximise the number of electrically powered services on the electrified network by using fewer diesel-powered trains on these routes.

Future fuels technology

Energy storage and fuel conversion technologies on-board trains, eg fuel cells, are being considered. These could potentially deliver substantial improvements in local air quality.

The industry is participating in fuel cells research and its application to rail.

Termini

Terminal stations can contribute to increased concentrations of air pollutants due to engine idling of diesel-powered trains. Further work is recommended to quantify more accurately the contribution of idling at stations and yards to pollutant concentrations.

The industry is committed to minimising the impact of diesel engine idling. Measures have been taken to alter operational procedures to reduce air emissions from idling engines at enclosed stations.

Figure 6: Total air pollutant emissions from diesel powered vehicles by transport mode (kilotonnes)

Source: Transport Statistics Great Britain
Broken bars indicate that the diagram is not to scale.

Figure 7: Specific average air pollutant emissions from diesel powered vehicles by transport mode (grams per passenger/freight tonne kilometres)

Source: Transport Statistics Great Britain
Broken bars indicate that the diagram is not to scale.

Steps to improvement
The industry is pursuing improvements through the following activities:

**DieSEL fuel**

Tests have been carried out to determine the feasibility of using Sulphur Free Diesel on the current diesel train fleet. This project was awarded the Bombardier Transportation Award for Innovation in Sustainable Development. The industry short-term fuel strategy (5–10 years) is being developed.

As well as technical complexities, there are important financial implications to consider including fuel commodity price, quantity required, taxation and the value of environmental benefits.

The industry is committed to ensuring a coordinated approach to reduce traction SO₂, PM10 and NOx emissions. Trade-offs such as increases in CO₂ energy use and cost will be considered.
The reliability and punctuality of train services are key aspects for customers.

Setting the scene
Passenger trains
The principal tool for assessing train service performance is the Public Performance Measure (PPM). Figure 9 shows that train punctuality for 2005/06 was 86.4% - the highest for six years. The results presented are the percentages of passenger trains which arrive at, or within a specified number of minutes of, the advertised arrival time at a given destination.

Figure 9: Public Performance Measure (percentage)

Steps to improvement
Public Performance Measure
Managing and reducing network congestion
To achieve continuing improvement, the industry is focusing on the reliability of the fleet and the network, aiming to minimise the effects of network congestion and maximise the overall customer experience.

Current performance
Passenger trains
Figure 8 indicates that in autumn 2006, 81% of passengers surveyed were very or fairly satisfied with their journey, the highest level ever recorded. In autumn 2006, 75% of all passengers surveyed judged journey time and reliability performance as 'satisfactory' or 'good'.

Figure 8: Overall satisfaction of journey (percentage)

Rail freight
During recent years, the punctuality of freight services has remained constant.

Improving passenger train fleet reliability
The National Rail Reliability Improvement Programme (N-FRIP) has been established through the ATOC Engineering Council to improve train reliability, performance and sharing best practices. N-FRIP aims to achieve long-term benefits in the design, maintenance and operation of the national fleet.

Between April 2004 and February 2007, overall miles per technical casualty (MPTC) for passenger trains improved by almost 10%; fleet delay minutes between April 2006 and March 2007 reduced by over 10%.

Improving Infrastructure reliability
Figure 10 presents the total amount of each asset renewed by Network Rail.

Figure 10: Asset maintenance and renewal data

Broken rails are at the all-time low. This area has been one of Network Rail's maintenance priorities.

Network Rail's maintenance priorities.

Rail freight performance measure
An assessment tool for freight train punctuality is being developed that will recognise the varying nature of freight carried and the appropriate time periods for measurement.

Rail freight


Route Utilisation Strategies (RUSs)
RUSs for each major section of the railway are being developed, to identify constraints and options for network enhancement to reduce delays.

The programme for RUSs is targeted to be complete by 2010.

European Rail Traffic Management System
Network Rail is leading a cross-industry team to develop implementation of the European Rail Traffic Management System (ERTMS). This includes in-cab signalling, which provides signalling information directly to the train driver in the cab and will contribute to improved performance and faster recovery from delay. ERTMS will be brought into service on the Cambrian line by December 2009.

A joint performance improvement plan (JPIP) is delivering improvements for specific routes. For example, Anglia routes are committed to improving PPM to above 90%.

The reliability and punctuality of train services are key aspects of rail services for customers. Delays to passengers and freight have a detrimental impact on the economy.

Congestion on the network impacts on the performance of both passenger and freight services.

Performance in terms of journey time, reliability and punctuality are key aspects of rail services for customers. Delays to passengers and freight have a detrimental impact on the economy.

The issue of train service performance has the following aspects:

1. Performance in terms of journey time, reliability and punctuality are key aspects of rail services for customers. Delays to passengers and freight have a detrimental impact on the economy.
2. Congestion on the network impacts on the performance of both passenger and freight services.

Advanced systems, such as in-cab signalling, will contribute to improved performance.

Providing customers with a positive experience of using the rail network is important for retaining passengers and modal share.

Network Rail's maintenance priorities.

Rail freight performance measure
An assessment tool for freight train punctuality is being developed that will recognise the varying nature of freight carried and the appropriate time periods for measurement.

The industry is committed to measuring rail freight performance and to reducing delays by approximately 20% over the next two years.

The industry is committed to concentrating MPTC improvements on the mid-life fleets and to reduce fleet delay minutes by at least 5%.

Improving passenger train fleet reliability
It is the industry’s ambition to concentrate MPTC improvements on the mid-life fleets and to reduce fleet delay minutes by at least 5%.

Rail freight

Source: Network Rail Corporate Responsibility Report

Public Performance Measure (PPM)
Britain has the fastest-growing railway in Europe, with passenger and freight services both increasing their market share.

**Setting the scene**

Over the last decade, passenger kilometres and freight tonne kilometres have grown by around 50%. With continuing growth, one of the key challenges the industry faces is capacity and network congestion.

Rail passenger growth (measured by passenger kilometres) is predicted to grow by 33% in the next 10 years. Freight is predicted to grow by 26–28% over the decade 2005–2015 (in terms of freight tonne kilometres). This very positive picture highlights the need to go on increasing capacity on the rail system.

**Current performance**

**Passenger services**

Figure 11 presents the annual total passenger kilometres travelled measured in billions. In 2005/06, there were more than 40 billion passenger kilometres – the highest for 40 years.

Figure 12 presents the annual total vehicle kilometres travelled, measured in billions, and shows that the industry is operating more and longer trains.

**Freight services**

Figure 13 shows the freight moved for the different rail freight markets presented in billions of freight tonne kilometres.

**Increasing utilisation of existing capacity**

The industry is providing increases in service levels by utilizing existing capacity more effectively. For passenger trains, new and upgraded rolling stock and new timetable structures have been introduced. Since 2003, Britain’s rail freight operating companies have brought over 400 brand new locomotives and over 3,000 new wagons. There are now eight rail freight operating companies competing vigorously to deliver the best service for customers.

In 2006/07, Network Rail is investing £4.5bn to maintain and renew the network infrastructure and approximately £0.5bn to enhance capacity and reduce journey times. Projects identified for implementation include Airdrie-Bathgate new line, additional platforms at Bristol Parkway and King’s Cross, a new station at East Midlands Parkway, Edinburgh Waverley capacity enhancement, Great Eastern overhead line rebuild and gauge clearance between Peterborough and Nuneaton.

**Steps to improvement**

Increases in service levels are being provided through increased utilisation and additional infrastructure, which enhances customer experience, thus enabling further growth. The rail network forms a key part of the overall GB transport network, connecting communities, enabling people to travel for both leisure and work, and serving to underpin the economy.

**The issue of capacity has the following aspects:**

1. Both passenger and freight demand on rail is increasing dramatically.
2. Crowding occurs on passenger trains and at stations during peak travel times.
3. The rail network forms a key part of the overall GB transport network, connecting communities, enabling people to travel for both leisure and work, and serving to underpin the economy.
4. Increasing in service levels are being provided through increased utilisation of existing assets and additional infrastructure, which enhances customer experience, thus enabling further growth.
5. Major railway stations are usually also transport interchanges. These interchanges support economic growth in their environs and facilitate agglomeration.

To help ensure that investment decisions deliver the widest benefits to society, Network Rail assesses investments on the basis of whole-system whole-life cost, taking into account sustainability issues at the macro level.

Network Rail is investing £10.6bn for the rest of control period 3 (until 2009) to maintain and renew the network infrastructure and to deliver increased capacity. Major upgrades or new lines, whether conventional, high-speed or dedicated to freight, are also being considered. This includes such schemes as Crossrail and the Thameslink upgrade.

**Crowding**

Crowding can occur at stations and on trains during peak travel periods, causing service disruptions and passenger discomfort. It is an inevitable consequence of significant passenger growth without an equivalent increase in capacity.

The industry has a number of targeted initiatives to lengthen trains and platforms.

Crowd management at stations. A ‘good practice guide’ has been produced to provide advice on effective crowd management at stations due to major events and service disruptions.

The industry is committed to developing a good practice guide for on-train crowding.

There is considerable scope to smooth peak demand by encouraging travel off-peak and during the peak ‘shoulders’.

1 National Rail Trends 2005–06 Yearbook, published by ORR.
4 Research and development project: T307 http://www.rssb.co.uk/r_and_d.asp.
5 Research and development project: T605 http://www.rssb.co.uk/r_and_d.asp.
Affordability and accessibility

Rail is an essential part of an integrated public transport network.

Setting the scene
Affordability and accessibility to transport are two important aspects of social inclusion.

People who are socially excluded face problems such as unemployment, discrimination, poor skills, low incomes, poor housing and high crime levels. Evidence suggests that transport is both a contributory factor to deprivation and also one of the solutions.

Affordability
Affordability refers to the availability of railway transport to potential passengers from different sectors of society, based on their ability to pay. Cost, or the perceptions of cost, can limit the likelihood that certain demographic groups will choose to travel by rail.

Rail prices for both passengers and freight are much closer to the additional cost (including external societal and environmental) associated with each extra journey than tends to be the case for competing modes of transport. As the industry succeeds in reducing its internal costs and continues to reduce its already low external costs, rail prices should become more and more affordable.

There is also the issue of railway’s affordability to society, the more attractive it becomes as an investment opportunity for both the Government and the private sector.

Accessibility
Accessibility is concerned with the ability of people to access railway services and use the system. It covers physical barriers, which are challenging for people with reduced mobility (such as disabled and elderly), and information provision (predominantly on rail vehicles and in stations). The disabled are particularly dependent on public transport, with 60% having no car in the household, compared to 27% of the general population. However, the rail network can be a challenging environment from a disabled person’s perspective.

The industry is actively working to improve accessibility. These efforts are in line with the DfT’s Railways for All Accessibility Strategy for Great Britain (March 2006), and will be reflected in the provisions of reduced mobility technical specification for interoperability (TSI) during 2007.

Current performance
Affordability
In autumn 2006, 43% of passengers thought ticket prices were ‘satisfactory’ or ‘good’.

Breakdown of passenger journeys
Rail’s market share, when measured on a journey basis, is highest among the 17–29 and 30–39-year-old age group.

Road market share, however, is never less than 85% in any age group, while road public transport becomes increasingly popular among those aged 50 and above.

Figure 14 illustrates the breakdown of the relative number of passenger journeys by age group using rail and road transport expressed as a percentage.

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Figure 14: Passenger journeys by mode and by age group for 2005

Disabled persons railcard sales
Railcard discounts significantly improve the affordability of rail travel.

Currently, there are 85,000 disabled persons railcards in circulation, a number which has been growing steadily during the last four years.

Figure 15 shows disabled persons railcard sales.

Figure 15: Disabled persons railcard sales

Improving quality of information
In autumn 2006, 78% of passengers considered the information on stations either ‘satisfactory’ or ‘good’, the equivalent figure for trains being 64%.

Personalised information systems, such as TrainTracker™, have been developed to improve the quality of information provided. TrainTracker™ attracts over 5 million calls a year.

A map for people with reduced mobility, detailing accessible stations on the rail network, and a booklet, Rail travel for disabled passengers, have also been produced.

The quality of passenger information provision has raised the reputation of the railway. The National Rail Enquiries (NRE) team has received a number of awards. 90% of passengers would recommend NRE services to family and friends.

Source: ATOC

Accessibility
The industry is pursuing improvements through the following activities:

Steps to improvement
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Improving quality of information
Providing the right information for all passengers both before and during the journey is an industry priority.

The NRE website has undergone significant development. In June 2007, it will provide truly customised electronic pocket timetables for passengers to print out.

Improving station and train access
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The NRE website has undergone significant development. In June 2007, it will provide truly customised electronic pocket timetables for passengers to print out.
Safety and personal security

The railway is a remarkably safe form of transport, which has progressively become even safer in recent years.

Setting the scene
A form of public transport, the railway impacts upon the safety and security of passengers, workers and members of the general public who are affected by its operation and activities.

The key principles that underpin the industry’s approach to safety management is the requirement of transport operators to reduce risk to a level that is as low as reasonably practicable, as embodied in both the Health and Safety at Work Act (1974) and the European Railway Safety Directive (2004/49/EC). This latter has led to the introduction of the Railways and Other Guided Transport Systems (Safety) Regulations (ROGS) 2006.

During recent years, improvements in safety performance have been through effective safety management and the adoption of modern train technology, which have been achieved against a challenging background of increasing service levels and legislative change.

Current performance
System safety

Figure 16: Comparison of fatality risk between rail and other transport modes

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The number of fatalities per billion passenger kilometres for the mainline railways within GB and those within Europe. The risk on the GB railway is at its lowest-ever level and is lower than that of our European partners. The data presented for Europe includes data from GB.

Figure 17 shows the passenger fatalities per billion passenger kilometres for the mainline railways within GB and those within Europe. The risk on the GB railway is at its lowest-ever level and is lower than that of our European partners. The data presented for Europe includes data from GB.

Table 1 shows the passenger fatalities per billion passenger kilometres for the mainline railways within GB and those within Europe. The risk on the GB railway is at its lowest-ever level and is lower than that of our European partners. The data presented for Europe includes data from GB.

Figure 17: Comparison of GB and European rail safety

The industry is pursuing improvements through the following activities:

- Introducing more engineered solutions, such as upgraded warning systems, better lighting at maintenance locations and improved railway access points.
- Improving work planning processes
- Introducing more engineered solutions, such as upgraded warning systems
- Better lighting at maintenance locations
- Improved railway access points

Steps to improvement
The industry is committed to delivering a measurable reduction in the rate of workforce accidents through:

- The ‘Safety 355 initiative’ – embedding safety performance into business processes
- Improving work planning processes
- Introducing more engineered solutions, such as upgraded warning systems, better lighting at maintenance locations and improved railway access points

Level crossings
Level crossings are now the largest single source of train accident risk on the railway.

In 2006, there were only 11 collisions between road and rail vehicles, compared to an average of about 19 collisions per year over the previous decade.

Personal security

Personal security is a significant issue for passengers and employees. Improvements in this area encourage more passengers to use the railway. However, the likelihood of a passenger being a victim of violent crime is low.

The Secure Stations Scheme provides an incentive to station operators to improve security, demonstrate their desire to reduce crime, and provide reassurance to passengers and staff. There are currently 252 accredited stations under this scheme.

Network Rail spends £8 million during 2005/06 on removing it, targeting hotspots.

Steps to improvement
The industry is improving through the following activities:

- System safety
- Personal security

System safety

The rail industry influenced the development of the Road Safety Act 2006 in relation to the responsibility placed on highway authorities to manage interfaces with the railway at level crossings.

The National Level Crossing Safety Group is committed to working with the Driving Standards Agency to improve the education of road users.

Workforce safety

The number of workforce accidents is of great concern to the rail industry.

The industry is committed to delivering a measurable reduction in the rate of workforce accidents through:

- The ‘Safety 355 initiative’ – embedding safety performance into business processes
- Improving work planning processes
- Introducing more engineered solutions, such as upgraded warning systems

Professional security

The Community Safety Steering Group has been established to agree national priorities and strategies aimed at reducing the risks and costs posed by crime, disorder and other forms of inappropriate public behaviour – including trespass, vandalism, graffiti, assaults, suicides and level crossing misuse.

Industry-wide Rail Personal Security Group has been established to raise awareness and reduce assaults on both passengers and staff.

There are currently 252 accredited stations under this scheme established to raise awareness and reduce assaults on both passengers and staff.

1. GB is 23 times safer than passenger cars and is broadly comparable with air travel on a distance travelled basis.

2. Network Rail is running a programme to upgrade and replace level crossings where reasonably practicable.

3. The National Level Crossing Safety Group is committed to working with the Driving Standards Agency to improve the education of road users.

4. The rail industry influenced the development of the Road Safety Act 2006 in relation to the responsibility placed on highway authorities to manage interfaces with the railway at level crossings.

5. Network Rail is also conducting a national level crossings awareness campaign, aimed at increasing public awareness of the risks and changing behaviours.

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9. The rail industry influenced the development of the Road Safety Act 2006 in relation to the responsibility placed on highway authorities to manage interfaces with the railway at level crossings.
The industry's new passenger trains are among the quietest in Europe and our new freight trains are ahead of the field in utilising low-noise technology.

Setting the scene
Transport – road traffic, rail traffic, air traffic – and sites of industrial activity are significant contributors to environmental noise. The European Commission Green Paper on environmental noise estimated that 20% of EU citizens were exposed to noise levels that scientists and health experts considered to be unacceptable. Railways produce environmental noise (wheel and rail, traction equipment and operational noise). Noise surveys show that railways are relatively low when compared to other noise sources. Recent legislation on the assessment and management of environmental noise for road, rail and air traffic is contained in the EU Environmental Noise Directive (2002/49/EC).

Current performance
National noise performance
National noise performance data for GB railways is not yet available. The picture will be clearer when noise maps have been compiled (see below).

Reducing noise from trains
A significant proportion of the GB freight wagon fleet is fitted with disc brakes or tread brakes made of composite...
The Sustainable Rail Programme

Data gathering and background research
1. Develop Sustainable Development (SD) metrics
2. Populate table summarising the current and potential actions to improve sustainability performance
3. Review existing research relating to rail, transport and sustainability
4. Benchmark rail against other modes of transport

Analysis
1. Develop the case for rail
2. Forensic research to understand rail’s sustainability potential and external drivers of change
3. Development of future sustainability scenarios for rail

Strategy development and refinement
1. Understand strategic implications of scenario to be addressed in the SD strategy
2. Agree the rail SD strategy for 20 years and beyond
3. Develop the future cases for rail over the next 10, 20 and 30 years

Implementation
11. Develop business cases for specific SD initiatives
12. Develop business case for modifying business incentives

The need for cooperation
To optimise rail’s contribution to a sustainable transport system, the industry recognises the importance of working together and in partnership with the Office of Rail Regulation (ORR) and the DfT. The interdependent nature of the industry creates the need for cooperation to deliver sustainability improvements, as capital investment in one part of the industry often delivers benefits in a different part of the industry or society. While the rail industry has undeniably good sustainability credentials, cooperation will ensure its sustainability performance is optimised.

Making it happen
The industry has risen to the challenge to define what sustainability means for railways and the role it has to play in it. The cross-industry Sustainable Development Steering Group (SDSG), comprising industry and Government executive support by the Rail Sustainable Development Group (RSDG), has been established. Its members comprise:

- Chief Executive, Network Rail
- Chief Executive, RSSB
- Director, Corporate Planning & Regulatory Affairs, Network Rail
- Chief Executive, Transport Scotland
- Director General, RIA
- Director, London/Rail Development, TL
- Chief Executive, ORR
- Chief Executive, EWS
- Chief Executive, Trains Divisions, National Express
- Director, Rail Technical & Professional, DfT
- Director, Rail Strategy & Finance, DfT
- Engineering Director, Porterbrook
- Director General, The Railway Forum
- Managing Director, Rail Division, First Group
- Director General, ATDC
- Chief Executive Officer, Virgin Trains.

These bodies lead the Sustainable Rail Programme (SRP), which is developing a 30-year sustainable development strategy. The plan outlined in Figure 18 above sets out the process through which the industry will develop this strategy. The strategy will promote rail’s contribution to delivering a sustainable transport solution for GB. It will also ensure the industry is well prepared for the future by highlighting areas where our performance is good and where we need to improve. The first stage was to collect data to enable the industry to understand and report on GB rail’s sustainability performance, which is now complete.

Figure 18: Engagement and communication

Source: RSSB research and development project: T438. http://www.rssb.co.uk/r_and_d.asp

Going forward, the industry will:

- Define the 30-year sustainable development strategy and associated action plans
- Refine sustainability reporting to include quantified performance targets
- Influence development of policy, legislation and regulation with the EU and GB to enable improvements in sustainable performance and encourage modal shift to rail

The SRP is also informing the HLOS for Network Rail control period 4 and the Rail White Paper to be published during summer 2007.

Stakeholder engagement
To date, stakeholders such as employees, suppliers and passengers have been consulted in the identification and prioritisation of the sustainable development issues for rail.

Continuous engagement with stakeholders will remain a priority throughout strategy development and implementation.

We invite you, the reader, to provide candid feedback and encourage you to play a part in shaping a sustainable future for the railway and Great Britain.

Please provide feedback to sustainablerailprogramme@rssb.co.uk

Assurance statement

The assurance statement for The case for rail 2007 has been prepared by Stephen Joseph, Executive Director of Transport 2000

This is a welcome document. The aviation and motor industries have produced sustainability reviews, and it is important that rail does too. (Remember: the bus and road freight industries have yet to do anything like this).

In fact, this report compares favourably with others: it is more cohesive and conveys clearer messages and, despite the large number of players involved, it is not afraid to acknowledge shortcomings (for example on sulphur emissions). And in many cases, it has a clear action plan for improvement.

That said, there are some areas for improvement that might be considered for future editions. First, the report gives broad averages, and this can be misleading. Sometimes averages actually give a worse picture for rail than is actually the case: for example, cars or airport used for business travel tend to have lower occupancy than the average, so, for business use, rail may be better than the average figures quoted here. Some operators now have flow-specific comparisons, which I would be worth illustrating in future. Indeed, developing further comparisons, independently audited, would also encourage maximum public confidence. On the other hand, broad statements such as ‘the likelihood of a passenger being a victim of violent crime is low’ may be generally true, but tend to mask real problem areas in some cities. Therefore, digging below the averages might be helpful.

Second, rail is part of a door-to-door, not just a station-to-station, journey. How people get to and from stations will have a huge impact on the industry’s sustainability record. Simply building more and more station car parks is unsustainable in all senses. Some acknowledgement of this and some real attention to station access is important.

Third, the next issue needs to have Government policy and commitments built into it. At present, this document is purely about action by the rail industry itself – but rail services are specified and partly-funded by Government and the industry can achieve little in many areas without active Government support. The Government is expected to publish a long-term strategic framework for the railways during this summer including Government action to improve rail’s sustainability, which will need to be factored into the Sustainable Rail Programme.

In all, then, a good first effort. But the industry will need more detail, more targets and more commitments in future editions – along with real Government support.

Stephen Joseph Transport 2000
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Stephen Joseph  Transport 2000
Glossary
Definition of key technical terms.
The meanings of the key technical terms used within this publication are presented below:

Agglomeration Where the presence, in close proximity, of a large number of specialist firms creates an enhanced business environment that stimulates greater productivity, through either collaboration or competition.

Control period Consecutive periods of five years used for the CPR to regulate Network Rail.

Delay minutes An industry measure of train delay used in the RPM.

Eco-driving Driving in a way that optimises fuel or energy consumption while achieving journey time requirements, eg making best use of gradients and coasting.

External costs Where consumption of a product or service by one user causes associated costs to be incurred by third parties, eg a car driver creates noise and air pollution for the inhabitants of the local environment and creates the risk of accidents to pedestrians and other road users.

Industry The mainline railways of England, Scotland and Wales.

Load factor The average proportion of the available train capacity that is utilised (expressed as a percentage).


Miles per Technical Casualty A measure of train reliability that represents the distance travelled in miles between failures caused by on-train defects, which result in delays of more than five minutes.

Non-traction energy Energy used by the infrastructure to provide a railway service, eg signaling, communications and passenger stations.

Particulates (PM10) Airborne particulates, less than 10µm in diameter, that present a health hazard.

Regenerative braking Allows electric trains to generate electricity when braking, which can be used by other electric trains or returned to the National Grid as re-usable energy.

Route Utilisation Strategies Documents that seek to balance capacity, passenger and freight demand, operational performance and cost, to address the requirements of funders and stakeholders.

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Traction energy Energy used to move trains.
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