INTRODUCTION.

Background

In 2009 the rail industry, through the Sustainable Rail Programme, published the Sustainable Development Principles (SD Principles). Ten principles that are fundamental to the role rail can play in a sustainable transport system, and fundamental to the sustainability of rail itself.

Two years on this report outlines the industry’s performance and challenges against the SD Principles, using official and independent data. It also lays out a set of case studies which highlight some of the activity behind the statistics. Lastly, the report outlines the KPIs against which the industry will monitor sustainable development performance going forward, and how the industry has performed against the commitments it made in The case for rail 2007.

At the very end there is a commentary from sustainability experts at Forum for the Future.

The challenge today

Britain’s railway faces an unprecedented challenge in the coming years. The need to deliver a step-change in the cost of the railway has been laid out in the recent Rail Value for Money (RVfM) study. This is perhaps the most urgent challenge to the sustainability of the industry, meeting the needs of both government funders and its customers for lower costs.

But at a time of significant change and economic austerity, to see sustainability purely in cost terms would be a major error with serious long-term consequences.

Rail prides itself on being a low-carbon transport solution, but advances being made by the car industry are eroding rail’s advantage. At the same time energy prices are forecast to rise, potentially strongly, over both the short and medium term. The industry needs to maintain a focus on energy efficiency and carbon reduction to be sustainable.

Rail is, by its nature, only one part of any door-to-door journey, and like any industry, it needs to meet the needs and desires of its customers. A continued focus on providing accessibility and a convenient, competitive and reliable end to end journey are key elements in encouraging modal shift from more polluting modes and of rail’s role in supporting the country’s economic recovery.

These are just two examples of the need to maintain a wider focus.

Rail can sit at the centre of a sustainable transport system for Great Britain, to do so, sustainability has to sit at the centre of the GB rail system.
RAIL INDUSTRY SUSTAINABLE DEVELOPMENT PRINCIPLES.

1. CUSTOMER DRIVEN
2. PUTTING RAIL IN REACH OF PEOPLE
3. PROVIDING AN END TO END JOURNEY
4. BEING AN EMPLOYER OF CHOICE
5. REDUCING OUR ENVIRONMENTAL IMPACT
6. CARBON SMART
7. ENERGY WISE
8. SUPPORTING THE ECONOMY
9. OPTIMISING THE RAILWAY
10. BEING TRANSPARENT

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EXECUTIVE SUMMARY.

Britain’s railways are a success. There are more passengers, a growing freight business, and record levels of punctuality and customer satisfaction. Rail is at the heart of the GB public transport system, connecting our communities and underpinning our economy.

Despite that record of achievement however, much still needs to be done to maximise the economic, social and environmental potential of the GB rail network. The industry’s vision for the future, set out in 2010’s Long Term Planning Framework, identified a number of key long-term objectives to be delivered by 2035.

Britain’s passenger and freight operating companies, and infrastructure manager Network Rail, want to see a rail system with:

- At least 90% of people satisfied with their journey, covering all major elements of performance, quality and price
- Sufficient capacity to accommodate twice as many customers as today, and an increased share of all passenger and freight movement
- Safety, punctuality and reliability amongst the highest in Europe
- Improved efficiency, better value for taxpayers and a more financially self-sufficient base
- 50% lower carbon emissions in the long-term and a major role in reducing transport’s overall carbon footprint

Taken together, these individual goals can deliver a railway that sits at the heart of a sustainable transport system, delivering exceptional value for customers and taxpayers, as well as being central to the UK’s low-carbon economy.

Right now, an effective and efficient transport system is central to our economic recovery and there is Government recognition that rail should be at the forefront of any strategy for transport, economic growth and carbon reduction.

But the next few years will be critical - and busy - for Britain’s railway, with major changes in the operation and structure of the industry.

The devolution of Network Rail, to bring route operations and other key parts of the business closer to customers, has already started. Crossrail and Thameslink together will deliver a major change in the infrastructure and service in the south-east of the country.

There will be longer franchises. The electrification of the Great Western line to Cardiff, alongside new trains, will lead to a step change in services and carbon emissions. And planning will continue around the potential development of a new high speed rail link between Birmingham and London.

At the same time, the rail industry and government must agree outputs and funding for the next five year control period from 2014-2019. A settlement must be achieved which delivers value for farepayers and taxpayers, while maintaining investment in the rail network that helps support economic recovery and improve the sustainability of transport.

Crucially, the rail industry, including its workforce, suppliers and Government, must respond to the challenge laid out in the Rail Value for Money (RVfM) study and deliver a new lower-cost model.

All of this is happening within the most difficult economic climate the country has faced for a long time. How rail responds to these challenges will determine whether it can take advantage of the clear growth opportunities.

By working together and choosing the right track to sustainable growth, we can come through this period of challenge and change, and deliver a better railway.
A central role in the economy

Rail plays a key role in GB plc.

For goods, an effective logistics chain is similarly critical to business efficiency. Rail freight directly contributes £870 million to the economy and supports an output of £5.9 billion. Over the last ten years rail freight has responded to changing business needs, becoming a core element of the logistics chain, as supermarkets and logistics providers look for lower carbon alternatives to road transport. Rail increasingly transports consumer goods like wine, groceries and white goods and the rail freight industry predicts its market share will more than double by 2030.

Rail also has a role in supporting growth and regeneration, underpinning interactions between cities, allowing businesses to grow. Many of the new jobs required in the private sector to support recovery are likely to be in high-tech, knowledge services in cities, and these will rely on transport links like rail.

Rail has been the only transport mode to see continued growth throughout the recession, both as a result of modal shift from air and road and from increasing growth in underlying demand. Accommodating this growth requires investment. But the benefits both direct, in improving passenger access, and indirect, through generating benefits in employment and growth, will produce a good return.

For more detail see pages 19-20 on Supporting the economy and pages 13-14 on Being an employer of choice.

A transport system that is an engine for economic growth; is cleaner and greener and improves the quality of life in our communities.

A system in which rail has a key role to play.

With a safe, customer-focused, rail system that supports a growing economy, by improving capacity, connectivity, performance, and productivity.

Philip Hammond, Secretary of State for Transport, 2011.

Rail promotes economic growth and efficiency and helps development spread across the cities of our country to rebalance our economy. It connects people with employment and leisure opportunities; providing access, helping business interaction and boosting competition.

There are three quarters of a million people commuting by train every day into Britain’s eight largest cities. Of the 1.3 billion rail journeys made in 2010, 1 billion were for work purposes.
Delivering sustainably

Rail can be a core element of the country’s sustainable transport system, but to do so sustainability needs to be a core element of GB rail.

Of the major transport modes, rail is generally the one with the lowest carbon impact, so sits naturally at the centre of a sustainable integrated transport system. But the bar is being raised and the industry needs to increase its focus on reducing carbon further, as well as addressing key challenges around cost, fares and end-to-end journeys.

A better service

Passenger numbers are at record levels, up nearly 40% in ten years. Punctuality, as measured by the Passenger Performance Metric, over the last year averaged over 90%, and passenger satisfaction 84%. Freight has seen marked growth in relatively new sectors such as container traffic.

The GB railway is one of the safest in the world. Customers are among the most satisfied in Europe. Both of these are in part due to the significant investment over recent years that has produced improvements in safety, faster journeys, greater punctuality and better stations.
But key challenges remain. Information provision at times of disruption has been poor. Fares are 30% higher than in Europe, according to the RVfM study. Integration with other modes needs improvement, and is a key disincentive to modal shift. The industry recognises these issues and is working to address them.

Station travel plans, through-ticketing and better quality of information to passengers, allied to increasing accessibility on many stations and routes and easier onward journeys, mean more people being able to access rail services, bringing potential sustainability benefits.

Meeting the fundamental challenge on reducing industry costs will be core to reducing pressure on fares.

For more detail, see pages 7-8 on being Customer driven, 9-10 on Putting rail in reach of people and 11-12 on Providing an end to end journey.

**Lower carbon**

Despite rail already being among the lowest carbon modes of transport, emissions per passenger kilometre fell by over 10% between 2005-2010. There was however a slight rise from 2008/9 to 2009/10 due to significant increases in overall capacity.

For the same reason, total traction carbon emissions increased in 2009/10 back to the level seen in 2007/8, having fallen the year before. Over the last five years emissions have been broadly level, at around 3.4 million tonnes CO₂.

Looking forward, the industry will seek to harness the potential of engineering and technological improvements to lower its carbon footprint, as well as understand how to overcome some of the main barriers to improvement.

To support this, the industry is developing a carbon management framework, which will be outlined in the Initial Industry Plan (IIP) to be published shortly and feature in franchise agreements going forward.

For more detail see pages 17-18 on being Carbon smart, Energy wise and pages 15-16 on Reducing our environmental impact.

**Reducing costs**

The industry is already strongly focused on achieving greater efficiency. Network Rail has agreed to 23% efficiency savings over the funding period from 2009-2014. This follows 27% already achieved in the preceding five year period.

However, as has been highlighted in the recent RVfM study, more needs to be done and this will involve some significant changes to the way the industry is managed. RVfM has suggested that a 30% reduction in unit costs is possible by 2018/19. Delivering a reduction of this scale, to a lower-cost model, while maintaining the balance with operational and safety performance, is the most significant challenge faced by the industry.

The establishment of the Rail Delivery Group, bringing key industry leaders together, will provide focus in meeting this challenge.

For more detail see pages 21-22 on Optimising the railway.

**SD metrics**

Understanding and measuring industry’s performance against the SD Principles is fundamental to being able to assess the impact of actions being taken in support of sustainable development. The industry now reports on specific carbon indicators through ORR’s National Rail Trends, with an indicator on air emissions due to be added in 2012.

For more detail, see pages 23-24 on Being transparent.
CUSTOMER DRIVEN

Embed a culture where dialogue with customers puts them at the very heart of the railway, and where they are able to make optimal travel and logistics choices.

Customer satisfaction

The rail industry invests significant amounts in delivering a service that meets its customers’ expectations, and with overall customer satisfaction consistently over 80% for the last four years, 84% in the Spring 2011 National Passenger Survey (NPS), there is much to be proud of. Rail freight shows similarly high levels of customer satisfaction - 74% in 2010.

Customer satisfaction (NPS)

But there is more to do. The industry’s Long Term Planning Framework (2010) sets the ambition of reaching a customer satisfaction level of 90%. With ever increasing customer expectations and a network that is often operating at the limits of its capacity, this is no easy target. Punctuality and reliability, safety, and accurate and timely information all remain critical issues for the industry to deliver customer expectations.

Punctuality and reliability

“Punctuality is of key importance for rail passengers and the main influence on overall journey satisfaction and one of the top three priority areas for further improvement”

Passenger Focus

A train that leaves and arrives on time is a key customer expectation. The Passenger Performance Metric (PPM - see description on p8) is the official measure of punctuality. PPM has been steadily rising since 2000, and now consistently exceeds 90%. The moving annual average for 2010/11 was 90.9% and it has been above 90% since the first quarter of 2008/9. The industry targets for 2014 are 92% for long-distance and regional services and 93% for London and SE.

However, in both of the last two years there have been considerable periods of adverse weather that have disrupted services, as well as a worrying increase in incidents of cable theft, leading to significant delays. The industry is actively working to mitigate the impact on performance of such incidents, as well as to address other causes of delay over which it has more control through the management of railway assets and operations.

Passenger Focus has also questioned whether performance measurement could capture more fully the experience of passengers on the ground (for example, to reflect the punctuality of services calling at intermediate stations). The industry has been considering such issues carefully, and while there might be some scope to refine the current approach, it believes that PPM has proved effective in driving industry commitment and improvement in performance. It remains a good, initial indication of how punctual a railway is, but (like any metric) will only ever provide part of the picture of how satisfied customers are.
PPM Moving annual average (NRT)

PPM combines figures for punctuality and reliability into a single performance measure recording the percentage of trains 'on time', covering all scheduled services, seven days a week. A train is defined as on time if it arrives within five minutes of the planned arrival at final destination time for London and South East and regional operators; or ten minutes for long-distance operators.

(NRT)

Passenger safety

The GB network is one of the safest in the world and the industry maintains extensive data relating to safety risk, accidents and incidents, published every year in the Annual Safety Performance Report (ASPR).

2010 was the third year in succession that there were no passenger fatalities in train accidents. There were 26, potentially higher-risk train accidents (PHRTAs), the lowest figure recorded and a substantial decrease on the 42 for 2009. However, there is no complacency about safety, and industry continues to cooperate closely on matters that affect passengers, especially operational safety matters such as signals passed at danger as well as risks at stations, including the platform-train interface.

The industry’s Long Term Planning Framework (2010) sets the ambition of reaching a customer satisfaction level of 90%. 

Information

Overall passenger satisfaction with information provision on train times and platforms has risen from 76% in Spring 2007 to 79% in Spring 2011; for information provision during the journey this has gone from 64% to 69% over the same period. The industry recognises that it needs to do more to provide clear, accurate and consistent information to customers, particularly at times of disruption.

The poor performance in this respect during the severe weather in late 2010 was generally recognised as not being good enough and the industry is working with the Office of Rail Regulation (ORR) and other stakeholders to address this.

Network Rail and the train operators have jointly sponsored the Approved Code of Practice on Passenger Information During Disruption, to ensure clear information which helps customers make informed travel choices. The Code requires that an initial message is sent to customer-facing staff within 10 minutes of an incident, with updates every 20 minutes when there is major disruption. ORR believe the Code will lead to ‘improved timeliness, quality and consistency of information... from station staff, information screens, on the train and through the internet.’
Fares
Passenger fare levels are closely linked to Government policy. The recent decision to increase the regulated fares cap to RPI+3% reflects the current policy of maintaining investment in rail while reducing the proportion that taxpayers contribute.

Despite the perceived high cost of rail travel, there are many good value tickets available and over 80% of passengers travel on some form of discounted ticket. To help customers choose the best ticket for their journey, ATOC and the franchised passenger train operators introduced a simplified fares structure in 2008 - Anytime, Off-Peak and Advanced.

However, the National Passenger Survey in Spring 2011 showed that only 44% of passengers thought their ticket represented good value for money, while 35% thought it did not (21% were undecided). Research by Passenger Focus indicates that while Advanced fares in Britain are among the lowest in Europe, the price of commuting by rail (especially in London and the South East) is relatively high, so that British passengers are, on average, paying 20-30% more than their European counterparts.

Although recent increases in the price of petrol help explain the continued growth in demand for passenger rail, the industry recognises it cannot be complacent. Action to deliver a lower cost railway (discussed further under Supporting the economy - see page 19-20 and Optimising the railway - see pages 21-22) will be fundamental to rail’s ability to offer attractively priced travel in future. The industry also looks forward to contributing to the Government’s recently-announced fares review.

Accessibility
There are now more than 120,000 Disabled Persons Railcards in use, entitling disabled passengers to a third off the price of most tickets. More than 3 million journeys a year are being made using the railcards and train companies help 1.2 million customers every year through the Assisted Passengers Reservation Service.

In December 2009 ‘Stations Made Easy’ was launched on the National Rail Enquiries website providing a full route planning service that allows passengers to avoid problematic features such as steps.

Since privatisation 5,000 new coaches have been brought into service, all with improved access for disabled passengers. Nearly half of all trains now have improved disabled access facilities, with a target of full coverage by 2020.

More generally franchise train kilometres have risen by over 9% between 2007 and 2011, to over 500 million kilometres, giving more people access to more services in more places.
Case study - Access for All

Access for All is a 10-year, £378 million programme of station accessibility enhancements to give greater access to many busy stations that only have step access. Through the programme 40 stations in Britain have been given accessible routes with a further 108 due to be completed by 2015.

Improving accessibility is not an easy task as Britain’s railway network has over 2,500 stations, many of which were built in the Victorian era and were not designed to meet the needs of passengers with reduced mobility.
Transport integration

Integrated transport is fundamental to a sustainable transport system. While rail can provide the core element of many journeys, there will always be a beginning and an end that are non-rail.

In the Spring 2011 National Passenger Survey 73% of people thought that connections with other forms of public transport were either satisfactory or good. This figure, which applies only to current rail users, has remained relatively static for the last 5 years.

If rail is to be at the centre of the transport system, and attract people from other modes, it is equally important to understand the needs of current non-rail travellers. Research by ATOC and Passenger Focus suggests that while price is still the single most important barrier, convenience of and time taken for the whole journey are significant issues to be addressed.

Research commissioned by RSSB for the Sustainable Rail Programme suggests that the best value for money way to address barriers around end-to-end journey time may be through improving access to stations and reducing the interchange time between modes. The former being a key determinant of rail travel and the latter addressing the issue that time spent waiting is weighted disproportionately by travellers.

Satisfaction with connections - (NPS)

Station Travel Plans can be a key element of both increasing the numbers of people who use the train by improving access to stations and the proportion using other sustainable modes of transport to start and complete their journeys. ATOC’s Station Travel Plan pilot programme is a national scheme covering 31 stations, which is helping to identify how station travel plans can be most beneficial to passengers. The initial progress report identified the following elements as important to success:

- Partnerships with local authorities
- Wide stakeholder consultation
- Appropriate resourcing
- Robust data

Research is currently underway to evaluate the results of the pilot programme and provide the industry with guidance on good practice.
**Information and ticketing**

Access to information is crucial to helping passengers plan their journeys. While this is often considered to be a barrier to rail travel, recent research suggests that this is more an issue of perception than a genuine lack of information.

'Most of the respondents... were surprised at how easy it was to obtain quality information at various stages.'

Through ticketing (including all elements of a journey) is another key element of providing an end to end journey. Being able to complete a whole journey on one ticket improves the travel experience and encourages use of more sustainable modes to start and finish a journey. Two key developments have driven a significant improvement in through ticketing - smartcards and Plusbus.

The Oyster smartcard system was originally provided only on London Underground and buses. It has now been extended to all rail services in greater London, leading to an extra million journeys a week being made with the smartcards. Oyster pay-as-you-go almost always offers the cheapest single rail fare.

Plusbus is an arrangement whereby a bus pass can be purchased with a train ticket. It offers bus travel to and from the rail station and around the whole urban area of a town or city at the start and finish of a journey. All of the franchised train operating companies sell Plusbus tickets and across Britain over 200 bus companies accept Plusbus tickets.

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**Case study - Northern Rail, Leeds Cyclepoint**

Based on a proven Dutch concept, Cyclepoint combines secure, staffed cycle storage with the facilities of a bike shop, all based at a major station.

Northern Rail has developed a Cyclepoint facility at Leeds station as part of their contribution to increasing cycle usage. The facility has secure parking for 300 bikes and offers maintenance and repairs on a ‘bring in the morning, take in the evening’ basis. It also offers bike rentals and cycling information and demonstrations.

Leeds was chosen as Northern’s busiest station, with over 100 cyclists a day before the Cyclepoint scheme was developed. Stakeholders have been involved throughout including the city council, national cycling association and the Department for Transport. Leeds itself is also being developed as a cycling city, with new cycle routes and a substantial growth in cycling over the last decade.

**Case study - Leamington Spa Station, Travel Plan**

With average weekday footfall at Leamington Spa station increasing by nearly 25% between 2004 and 2008 a station travel plan has been established to encourage passengers to access the station using more sustainable modes where possible.

Implemented in partnership by Warwickshire County Council, Chiltern Railways and Network Rail, the plan includes improving facilities and promoting sustainable travel options. Highlights include:

- Free car parking if three of more people arrive in the same car
- Additional, secure cycle parking
- Shared taxi scheme
- New bus interchange and the provision of new stops
4. BEING AN EMPLOYER OF CHOICE

Respect, encourage and develop a diverse workforce, support its wellbeing and actively consider and address the challenges of the future global labour market.

Safety

The industry considers the safety of its staff to be of paramount importance and published an Annual Safety Performance Report (ASPR) through RSSB.

The principle measure of workforce safety is fatalities and weighted injuries (FWI - one FWI is equivalent to one fatality, 10 major injuries or 200 minor injuries). This is monitored and reported through the ASPR. Overall workforce FWI in 2010/11 was 22.96, a decrease of 8% compared to the year before and 13% over a five year period.

Since 2007 there have been nine workforce fatalities.

Overall workforce FWI - (ASPR)

Skills

In 2010 the industry established the National Skills Academy for Rail Engineering (NSARE) to ensure that it will have the necessary skills to support the maintenance, development and expansion of a first-class, cost-effective 21st century railway.

A key element of this will be the new Qualification and Credit Framework (QCF), introduced in early 2011. The QCF will underpin a unified industry skills strategy which will promote railway engineering as a career choice, as well as developing new and recognised qualifications.
The QFC will underpin a unified industry skills strategy which will promote railway engineering as a career choice.
Reducing our environmental impact.

Reporting

The rail industry causes significant environmental impact, for example through the waste it generates. These impacts are in the main, quite rightly managed and reported at the individual organisational level, making collating industry-wide data difficult. Waste to landfill data for instance is collected by most, if not all, operators, but often using different measures, timescales etc. Efforts are underway to collate industry level information on two key areas: air emissions and water use.

Sustainable consumption and production

While there is some good work being done with respect to sustainable resource consumption and production (see the Bombardier case study on p16), there is significant scope to embed consideration of whole-life impacts more consistently in decision making.

Investment decisions continue to be dominated by issues of affordability (i.e. initial capital expenditure), often to the detriment of longer term sustainable resource consumption.

However, Network Rail, a key consumer in industry terms, is in the process of introducing an ambitious sustainable resource management programme which should have a positive impact over the coming years.

This is an issue to which the industry needs to devote more attention going forward.

Noise

Passenger trains, freight trains, train horns, track alarms and level crossings can all be noisy. Engineering and maintenance work can also be noisy over short periods of time. Such noise can be unwelcome for the railway’s neighbours.

Most maintenance and engineering work on the tracks takes place at night and weekends so that normal train services can keep running, but Network Rail uses a range of measures to minimise noise including:

• Requiring employees and contractors to behave considerately towards people who live and work near the railway
• Including noise reduction measures in the planning of engineering and maintenance work
• Using silenced equipment where possible.

In 2007, industry agreed changes to the Rule Book which took away the duty to routinely sound train horns during the night at whistle boards.

Network Rail also runs a National Helpline - 08457 11 41 41 - which can provide advice to those impacted by railway-generated noise.

To address strategic noise issues, such as the EU Environmental Noise Directive, the industry has formed the Noise Policy Working Group, which brings together key players from across the rail industry.
Case study - Bombardier’s Design for Environment

Bombardier’s Design for Environment programme aims to factor in the environmental impacts of each product, throughout its life cycle, at the development phase. Design for Environment is based around six key elements:

- Applying a lifecycle perspective
- Maximising recyclability and recoverability
- Eliminating hazardous substances
- Ensuring transparent communication
- Investing in technologies
- Involving suppliers

To integrate this into the product development cycle, Bombardier has a dedicated team of Design for Environment engineers who act as internal consultants. The company has also developed a set of proprietary guidelines and offers Design for Environment training to all employees.
Carbon footprint

As a mode of transport, rail has a comparatively low carbon footprint but understanding better, and reducing further, our emissions remain a priority. In 2010 the industry published a whole system carbon footprint of the GB rail network. The research suggests that in 2008 the sector had an annual footprint of around 5.4 million tonnes of CO\(_2\), of which 63% was from traction, 15% from non-traction and 22% from embodied emissions.

Traction emissions, the largest portion of rail’s total, are publicly reported through the ORR’s National Rail Trends. The most recent figures show that emissions rose marginally over the five years to 2009/10. Given the rise in passengers over the period, this translates into a 10% reduction in carbon emitted per passenger kilometre. The fall in traction emissions between 2007/8 and 2008/9 was principally driven by reduced emissions from freight as the recession reduced demand. While freight figures have remained lower, the rise in 2009/10 is largely driven by the provision of additional capacity.

Absolute traction carbon emissions (ktonnes CO\(_2\)) - (NRT)

The fall in emissions per passenger kilometre is positive, but the industry recognises the need to continue improving in the face of recent and planned improvements in the carbon performance of other modes such as the car.

Further roll-out of energy saving measures such as regenerative braking and adoption of eco-driving techniques may contribute to a reduction in traction carbon emissions over the short-term.

Rail electrification provides a major opportunity to improve the carbon efficiency of rail. Electric train operation produces less carbon than diesel, and with only 40% of the network currently electrified, a key factor in lowering emissions further will be more electrification, alongside the decarbonisation of electricity generation. The electrification of the Great Western line to Cardiff and the schemes in the north-west of England are welcome and will have a significant impact from 2017 onwards.

Research by RSSB for the Sustainable Rail Programme has also identified further scope for progress, through action to:

- Improve understanding of the financial viability of potential carbon initiatives, currently hampered in part by the limited ability to measure energy use
- Raise the status of carbon in industry decision making
- Address the continued focus on capital, rather than whole-life, costs
• Strengthen the level of expertise and resources focussed on carbon management

The industry is currently developing a carbon management framework to address these issues and promote further carbon emissions reduction. This will be outlined in the Initial Industry Plan (IIP) to be published shortly and will feature in guidance to bidders for franchise contracts going forward.

Mode shift

Rail remains among the lowest carbon-emitting means of moving large numbers of goods or people. Direct mode shift, such as from air to rail, has an important role to play in keeping transport’s overall carbon footprint lower than it might be otherwise.

Between 2000 and 2009, there was an overall rise in travel, but rail’s proportion of passenger-kilometres rose from 6% to 8%.

Analysis by ATOC suggests that passengers have been shifting in recent years from air to rail on key intercity routes. On the 10 most popular domestic air routes, rail’s market share versus flying has grown by 50% in five years, from 29% to 44%. In absolute terms, this means an increase of 2 million rail journeys to over 7 million, while journeys by air have reduced by 3.25 million to around 9 million. Recent market research carried out for ATOC also shows that, against a backdrop of rising petrol prices, 1 in 6 rail users said that they have switched from car to train for at least one journey earlier in 2011.

Encouraging a shift of freight traffic from road to rail also offers scope to reduce carbon emissions. Transport currently contributes 21% of carbon emissions of which 7% originates from lorries on the road. Rail freight produces over three-quarters less carbon dioxide than freight by road, which suggests the more goods can make their journey by rail, the better the contribution towards reaching the targets. Customer demand to carry more of its road freight by rail looks likely to increase (see pages 19-20).

gCO$_2$ per passenger/tonne km (source - DEFRA, DfT)

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Case study - Eco-driving in First Group

Eco-driving involves optimising the acceleration and deceleration of a train to minimise fuel and energy consumption whilst maintaining punctuality. Eco-driving can be implemented alongside a driver advisory system, an onboard system which informs drivers of optimum driving techniques.

First Hull trains have had a fully operational driver advisory system since November 2010. Early indications show around 10% reduction in fuel usage, with plans to fit the system on First Great Western trains.

Following tests on simulators, all First ScotRail drivers have been trained in eco-driving techniques, including coasting where it can be carried out without impacting on the timetable. Coasting boards have been installed to identify the points where drivers can shut off power. Indications are that eco-driving has been a key factor in achieving in excess of 2.5% improvements in fuel efficiency. First ScotRail is now also trialling a driver advisory system.

Case study - Reducing diesel emissions at East Midlands Trains

Although less carbon efficient than electric, diesel trains will be running on the GB network for some time to come. It is therefore important that work continues to minimise their carbon emissions. East Midland Trains has recently launched two initiatives aimed at doing just that.

Working in partnership with manufacturer Bombardier and rolling stock company Eversholt Rail, East Midlands Trains have made a £4m investment in an innovative new engine stand-by mode for Meridian trains. This allows the number of engines in use to be matched to power required in the most efficient way.

When it is rolled out across the 27-strong fleet it is expected to save around 800,000 litres of fuel a year, and 2,300 tonnes of CO$_2$. It will also reduce noise and maintenance costs.

East Midlands Trains has also successfully trialled a new fuel additive that will help cut carbon emissions further. When added to diesel during re-fuelling, the additive can improve fuel economy by 4.4%.
Economic impact

In the current economic climate, rail’s role in helping the UK’s economic recovery is significant. Rail contributes to the economy in terms of access to jobs and services, and regeneration, and this remains a key sustainability advantage. However, recent research by the Centre for Cities for ATOC considered the key impacts to be:

- Increasing agglomeration benefits through greater access
- Connecting people to jobs
- Supporting business interactions
- Opening new markets and encouraging competition

Currently, the national GB rail network transports 730,000 commuters to work every day in eight of Britain’s key cities, and there are 266 million business journeys by rail between cities annually.

Long, complicated or unreliable journeys can be costly and bad for business. In 2006, the Eddington Study estimated that time lost to road congestion costs the economy £7-8 billion every year, rising to £22 billion by 2025. More people and businesses recognise this and demand for rail is increasing, with the result that trains are getting busier. More frequent services, greater capacity and shorter journey times can play an important part in improving business efficiency, but substantial improvements to journey times and capacity will require investment.

Rail offers a reliable service and is often the quickest and most efficient way to travel between city centres. Not only is travel by train often faster than by road, but passengers can also use the time effectively, whether to work or relax, especially with the advent of services such as on-train wi-fi.

On the freight side, while the modal share of rail has remained relatively static (8.6% of freight moved in 2008/9) its spread across sectors has changed. Rail is becoming a key part of the logistics chain, with supermarkets and third party logistics providers looking for alternatives to road transport. This has recently seen the introduction of temperature controlled services from Southern Europe, which are up to a day quicker than road haulage, as well as lower carbon. Container traffic also continues to grow. Rail now has a 25% market share in container traffic from the major ports of Southampton and Felixstowe. Overall the rail freight industry predicts its market share will more than double by 2030.

Supporting growth and regeneration

With 60% of jobs, cities are the engine room of the British economy. The transport network underpins this, enabling interactions within and between cities, allowing businesses to grow customer bases, attract employees and ensure efficient supply chains.

As a core element of the economic recovery, the country needs to grow private sector employment. Many new jobs are likely to be in knowledge, high-tech and services sectors, where the country has a comparative advantage. According to the Centre for Cities, these new industries ‘tend to cluster in cities, where they derive ‘agglomeration benefits’ from being located near many other firms and suppliers and can rely on larger pools of labour’.

Transport links are a key factor in how great such agglomeration benefits can be. Rail’s overriding strength in transporting large amounts of goods and numbers of people over long distances or in congested places make it the most effective way for the transport infrastructure to support such growth. Rail already has a significant presence in the long-distance intercity market and has seen significant growth in regional urban commuting. Further modal shift to rail in both markets can bring efficiency gains and reduce carbon emissions.

Need for investment

Its importance to growth and efficiency helps to explain why better transport links are consistently a key priority for business. Rail has been the only transport mode to see continued growth throughout the recession, both as a result of modal shift from air and road and from increasing growth in underlying demand. As a result, many parts of the rail network are busy, and getting busier. Population growth, congestion, petrol prices, and the potential employment changes described above, are all likely to drive continued growth in rail demand.
Accommodating this growth requires investment. But the benefits both direct, in improving passenger access, and indirect, through generating benefits in employment and growth, will produce a good return.

New and longer trains, better timetabling and improved transport integration can all reduce crowding, enable a more reliable and accessible service and encourage modal shift from more carbon-intensive modes. Further electrification of the network offers a proven technology to reduce transport carbon emissions.

The balance to be struck between fare-paying passengers and public funding needs to recognise these wider economic, social and environmental benefits.

Case study - Freight upgrade Southampton to Nuneaton

Upgrading the railway from Southampton to the West Coast Main Line at Nuneaton to allow for larger freight containers will take an estimated 50,000 lorries off the road every year and boost the UK economy by £374m, helping to keep down the cost of everyday goods in shops across Britain.

The scheme allows freight trains to move goods, including food, clothing, electronics and other consumer products, around Britain in a quicker, cheaper, greener and more practical way using the larger, modern containers preferred by many global shipping firms.

The project involved rebuilding 16 bridges, lowering the track in 22 places, adjusting 11 station canopies and two station platforms, and setting the track through Southampton Tunnel in concrete to create more space for the larger containers to pass through on standard freight wagons. The project was delivered more than £11.5m under the original £71m budget.

Case study - Manchester-Liverpool electrification

Nearly one million journeys were made between Manchester and Liverpool in 2009 and trips have been growing at 7% per year between 2002 and 2009. Better links between the two will make it easier for firms to collaborate and give Manchester businesses access to a wider consumer market. They will also enable Liverpudlians to access jobs in Manchester, which has created almost three times as many private sector jobs over the past decade as Liverpool.

The improvements programme on this line will enable some services to be lengthened by between two and six carriages, reducing overcrowding and making the service more reliable. Electrification of the line will reduce carbon emissions and operating cost. Electrification is also expected to result in a journey time saving of nearly a third.

Centre for Cities research found that there are over 1.2 million people in Manchester and Liverpool that could benefit from improved rail transport infrastructure. And that 73.4% of local businesses could potentially benefit from improved rail transport infrastructure, through access to a deeper pool of labour with the right skill levels or a wider range of suppliers.

This case study has been sourced from the Centre for Cities report On Track: Why Rail Matters
Value for money

Rail is an industry that has wide societal benefits, which is why governments around the world invest in their respective country’s rail services. Over the period 2005-2009 the average annual GB public investment in rail has been just under £5bn. This peaked in 2006/7 and is scheduled to keep falling both through greater efficiency and as government policy is for passengers to bear a larger share of costs.

This, however is only part of the story. Since 2005/6 railway schemes have, on average achieved a ‘high’ value for money rating according to the Department for Transport’s appraisal scheme, meaning that for every pound spent at least two pounds of benefit are generated. Recent investment has led to significant increases in capacity, such as on the West Coast Main Line (see case study on p22).

The industry is strongly focused on achieving greater efficiency. Network Rail has agreed to 23% efficiency savings over the funding period from 2009-2014. This follows 27% already achieved in the preceding five year period.

However, as has been highlighted in the recent RVfM study, more needs to be done and this will involve some significant changes to the way the industry is managed. RVfM suggests that a further 30% reduction in unit costs is possible by 2018/19. Delivering a reduction of this scale, to a lower-cost model, while maintaining the balance with operational and safety performance, is the most significant challenge faced by the industry.

Capacity

In the last decade the GB network has been Europe’s fastest growing railway in terms of patronage, with passenger numbers up by 43% and freight by almost 60%, creating one of the busiest mixed traffic railways in the world. More than 1.3 billion passenger journeys were made in 2010, covering over 33 billion miles.

In some areas this has meant that the network is at the limit of its capacity. Between 2009 and 2014 £12bn will be invested on projects designed to relieve crowding, such as lengthening platforms and enabling more trains to run.

The introduction of European Rail Traffic Management System (ERTMS), which has been trialled in mid-Wales, will also be a major part of enhancing network capacity in the coming decades.

Looking further ahead the Technology Strategy Leadership Group has built on initial conclusions by industry experts that traffic and disruption management could contribute significantly towards the challenge of doubling network capacity. Research areas include how to safely reduce the distances between trains, the relationship between capacity enhancement and reliability and how to address bottlenecks.
Case study - Network Rail Route Utilisation Strategies

Network Rail and train operators are working with industry partners and stakeholders to identify how extra capacity can be delivered through 19 Route Utilisation Strategies (RUSs) and four Network RUSs. London and metropolitan areas like Birmingham, Manchester and Leeds are a particular concern.

The RUSs look to establish the most effective and efficient ways to use capacity across the network, while seeking to balance capacity, passenger and freight demand, operational performance and cost, to address the requirements of funders and stakeholders, looking forward over a thirty year period.

Case study - West Coast Main Line upgrade

Upgrading the West Coast Main Line was one of Europe’s biggest recent civil engineering projects and has heralded a step-change in the frequency and speed of train services with a 30%+ increase in services - over 1,000 new services each week - and up to a 30% cut in journey times. Freight users will enjoy a 70% increase in capacity. Passenger numbers were up 15% in the first year of operation.

The project involved:
• Changes to all 13 major junctions on the route, including a significant bottleneck at Rugby, enabling trains to travel at up to 125mph
• Laying more than 36 kilometres of new track
• 174 new or altered bridges
• 53 new or extended platforms at places like Milton Keynes and Manchester Airport
• Replacing over 800 points
• Putting up over 11,000 structures
• Laying over three million yards of rail, ballast and sleepers
SD metrics

Understanding and measuring industry’s performance against the SD Principles is fundamental to being able to assess the impact of actions being taken in support of sustainable development. The industry now reports on specific carbon indicators through ORR’s National Rail Trends, with an indicator on air emissions due to be added in 2012.

SD KPIs

<table>
<thead>
<tr>
<th>KPI</th>
<th>07/08</th>
<th>08/09</th>
<th>09/10</th>
<th>10/11</th>
<th>Source</th>
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<tbody>
<tr>
<td>Passenger Performance Metric (PPM)</td>
<td>89.9%</td>
<td>90.6%</td>
<td>91.5%</td>
<td>90.8%</td>
<td>National Rail Trends</td>
</tr>
<tr>
<td>Freight Performance Metric (FPM)</td>
<td>68.7%</td>
<td>71.1%</td>
<td>74.6%</td>
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<td>National Rail Trends</td>
</tr>
<tr>
<td>Overall customer satisfaction - TOC</td>
<td>80%</td>
<td>81%</td>
<td>83%</td>
<td>84%</td>
<td>National Passenger Survey (Spring)</td>
</tr>
<tr>
<td>Change in real cost of fares over time since 1995</td>
<td>13.6%</td>
<td>22.7%</td>
<td>19.1%</td>
<td>tbc</td>
<td>DfT Transport Trends</td>
</tr>
<tr>
<td>Satisfaction with connections with other forms of public transport</td>
<td>72%</td>
<td>73%</td>
<td>74%</td>
<td>73%</td>
<td>National Passenger Survey (Spring)</td>
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<tr>
<td>Traction carbon absolute (ktonnes)</td>
<td>3424.2</td>
<td>3363.7</td>
<td>3424.6</td>
<td>tbc</td>
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<tr>
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<tr>
<td>Traction carbon normalised - freight (gCO₂/freight tonne km)</td>
<td>28.5</td>
<td>26.4</td>
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In *The case for rail 2007* the industry made a set of commitments. Below we update progress against these.

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Back in 2007 when it developed the Case for Rail, the UK rail industry confirmed that it was not going to be complacent on sustainability. While rail starts with inherent sustainability advantages, these could be outweighed by the scale of change required by all modes in the shift to a low-carbon economy.

And change is already happening. As this report acknowledges, the car industry has recently stepped up its pace on emissions. Aided by economic and energy price pressures on consumers, the UK car sector can point to an unprecedented 13% cut in new car CO₂ emissions since 2007, and vehicles now entering the market that compare with diesel rail on CO₂ emissions per passenger km.

So that rails ends up where it belongs, as the backbone of a low carbon transport system, it not only has to drive down its own impacts to maintain its low carbon advantage, but also deliver services and prices that compare favourably with cars. This means making progress on a broad sustainability front.

Defining and tracking that progress, which is the purpose of the ten Rail Industry Sustainable Development Principles and of this report, is a key first step. We therefore welcome this report, and in particular the following advances:

• Improved customer satisfaction and staff safety measures
• The development of a whole industry CO₂ measure for the industry, and a 10% reduction in CO₂ per passenger km in the last 5 years – not far short of the car figure above, and maintaining rail’s low carbon advantage;
• Significant mode shift from air to rail.

While the report highlights progress in these and other areas, it is equally important to identify where more effort or different approaches are required. In this respect, the following deserve particular emphasis:

• Is recent CO₂ progress on track to contribute to the UK’s overall targets, given future developments in rail? Industry projections show direct emissions rising in future. To make a continued case for rail, stakeholders need to understand how this contributes to a low carbon economy (for example, through mode shift) and the importance of further measures needed to deliver progress at scale (in particular, electrification and wider grid decarbonisation).

• The high cost base and fares for the industry are both estimated at 30% above comparable European railways by the RVfM study. While this is due to fundamental structural problems and well documented elsewhere, tackling it is vital to achieve a sustainable transport system, to support both investment and customer appeal.

• This report does not seek to look ahead in much detail, for example by making projections or setting out action planned to accelerate progress or turn around problems. But some of this information does exist elsewhere, and new approaches will be confirmed, for example in the Initial Industry Plan. We look forward to more forward looking versions of this report in future which support stakeholder perceptions and decision making by putting progress in the context of the way ahead, including barriers and actions required inside and outside the industry.
Forum for the Future works with the rail industry’s Sustainable Rail Programme, through an ongoing partnership with RSSB.

Forum for the Future is a non-profit organisation working globally with business and government to create a sustainable future. We have 15 years’ experience inspiring new thinking, building creative partnerships and developing practical innovations to change our world. We aim to transform the critical systems that we all depend on, such as food, energy and finance, to make them fit for the challenges of the 21st century.