Department for Transport

Delivering a Sustainable Railway



July 2007



Delivering a Sustainable Railway

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With certain exceptions, such as safety, rail policy is a devolved matter in Scotland, so the geographical scope of the strategy is primarily limited to England and Wales, recognising the powers of the Welsh Assembly Government in relation to Welsh and cross-border services.

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Foreword

This is a White Paper that plans for the growth and development of our railways.

For too much of the past decade, policy on rail has been about repairing the problems of a flawed privatisation. The Government rightly focused on reversing decades of under-investment and putting the industry on a stable footing.

Challenges remain, but fundamentally this White Paper is optimistic about the future. More passengers than ever are using the railways – 40 per cent more over the last decade. More freight is being shipped by rail. And while we recognise that there is more to do, safety has improved and passengers are giving the railway credit for better reliability.

Our challenge now is to build on this success – to develop a modern, sustainable railway system that is accessible and easy for passengers to use. That is why our proposals in this White Paper are measured against the key tests of capacity, quality of service, value for money and the environment.

And it is passengers, and their priorities, which are at the heart of this White Paper.

Increasing capacity, particularly in those places suffering from the worst overcrowding, is central. But greater reliability and increased capacity are not passengers' only concerns. They also want safer, more modern stations, simpler and easier-to-use ticketing information and sales. The White Paper delivers these and sets these plans in the context of a long-term strategy for the next 30 years.

Our ambitions are for a reliable network capable of handling double the number of passengers we have today; that can cater for a more diverse population that demands still more from its public services; and that delivers its environmental potential. A rail industry that is flexible in its planning to adapt and deliver in a changing world.

For the first time in a long time, we have a railway that is getting the basics right. It is delivering growth. This White Paper now seeks to unlock its potential.





Rt Hon. Ruth Kelly MP
Secretary of State for Transport

July 2007

Executive summary

Present achievement, future challenge

Britain now has a railway which carries more people and more freight than it has in over 50 years. It is safer than ever before. Reliability, which declined sharply after the appalling accident at Hatfield is now good and improving on most lines. And the finances of the industry are stable and improving. Network Rail is on course to improve efficiency by nearly one-third in five years, and strong growth in demand means that passenger services require less subsidy.

These are substantial achievements. The story of the railway used to be about managing decline. Now it is about enabling growth.

Passengers want a railway that is reliable, value for money, comfortable, accessible and easy to use. The public as a whole wants a railway that contributes to economic growth and helps Britain meet the environmental challenges ahead.

The railway can only meet these goals if it has the capacity to carry the passengers who want to use it. Rail has seen record levels of growth – over 40 per cent in the last decade – and in response the railway is running more services than before, and has provided more trains. But capacity has not kept pace with record demand across the network, and crowding on some of the busiest services has got worse. The priority for this White Paper is to tackle these trends. It is the first plan for major growth since the 1950s.

The Government is committing significant investment now. And the long-term ambition is for a railway that:

- Can handle double today's level of freight and passenger traffic;
- Is even safer, more reliable and more efficient than now;
- Can cater for a more diverse, affluent and demanding population; and
- Has reduced its own carbon footprint and improved its broader environmental performance.

Over £10 billion will be invested in enhancing capacity between 2009 and 2014, with overall Government support for the railway totalling over £15 billion. This represents a higher level of investment than in 2004–09 with a lower level of public expenditure. This improvement reflects growing passenger demand and improved efficiency, especially by Network Rail. Such trends allow more of the money invested by Government to be directed towards increases in carrying capacity. Fares policy remains as today at RPI + 1 per cent, allowing more money to be invested to improve the service for passengers. The Government believes this strikes a fair balance between taxpayers and passengers; between the cost imposed, and the ability to fund the improvements passengers and the public say they want to see. And this White Paper will deliver substantial investment.

In the wake of Railtrack's collapse it was taxpayers who stepped in to provide the additional funding necessary to support the railway and put it back on course. It is right that subsidy levels should now start to return to closer to the

historic norm. At the same time, the Government is delivering improvements without imposing new burdens on passengers, about 80 per cent of whom travel on regulated or discounted tickets.

Tackling the legacy, delivering stability

Today it is possible to frame an ambitious and deliverable strategy for growth. It was not possible to do so even three years ago, at the time of the last Government spending review. The challenge in 2004 was to deal with the legacy of a privatisation that had brought many benefits to rail users, but also had serious flaws.

Railtrack had lost control of costs. In 2003, the then regulator presented the Government with the bill – a £1¼ billion a year increase in funding until 2009. This led to the creation of Network Rail and the delivery of efficiency gains that will bring infrastructure costs back closer to an acceptable level by 2009. The regulator has indicated that further improvement should be secured by 2014. This creates the headroom for investment to increase the capacity of the railway.

In 2004, after the last review of Network Rail funding, the Government had to increase expenditure on the railway but freeze new investment. Network Rail's renewals programme was protected, targeting the backlog of neglect of basic infrastructure (such as replacement of rails) that had occurred in the last years of British Rail and the first years of Railtrack. Also protected were committed projects, such as the Channel Tunnel Rail Link, West Coast Route Modernisation and the implementation of the Train Protection and Warning System. These are all worthwhile investments, but they do not of themselves deliver a significant increase in capacity.

The architects of privatisation made no provision for any single body to define the railway's strategic priorities and the level of public expenditure required. In this White Paper, the Government discharges the statutory duty it gave itself in 2005 to set out a strategy and budget for delivering an environmentally and financially sustainable railway.

The formal specification and long-term strategy

The formal communication to the Office of Rail Regulation (ORR) appended to this White Paper sets out:

- The High Level Output Specification (HLOS) for the improvements in safety, reliability and capacity the Government wants to buy to 2014;
- Specific programmes of investment to be undertaken between now and 2014, which deliver benefits in the slightly longer term, or benefits (such as station improvements) that cannot be captured in the HLOS; and
- The funding available to secure these improvements.

The Government is satisfied that the improvements it wants to buy are affordable within the funds available. The ORR will determine whether this deal is a fair one, and then ensure it is delivered.

These firm and costed plans for 2014 have been drawn up alongside considerations of the 30-year challenges that the railway may face. This is essential because trains ordered now will still be in service in 30 years' time, and other assets will last even longer. But while the Government must plan 30 years ahead, it recognises that it is impossible accurately to forecast demand that far into the future. Some cities and regions will grow faster than others. People and firms are likely to respond to the challenge of cutting carbon emissions by changing travel patterns and re-engineering supply chains. The pace of technological change is equally unpredictable.

Forecasts have been wrong before, and any strategy that tried to build a rigid investment programme based on fixed long-term forecasts would inevitably be wrong again. Such an approach could well deliver additional capacity in the wrong place.

To overcome this challenge, the guiding principles in this strategy are:

- To invest where there are challenges now, in ways which offer the flexibility to cope with an uncertain future; and
- To put in hand the right preparatory work so that, as the future becomes clearer, the necessary investments can be made at the right time.

These principles are consistent with the recommendations of the recent Eddington Transport Study, and are illustrated by the preparatory work on a new Intercity Express train, with a design that will give flexibility on power supply and train formation. They are also evident in proposals to prepare for the next generation of signalling that will make a difference in the middle part of the next decade. The Government is investing over £⅓ billion in these preparatory projects alone. But it would not be prudent to commit now to 'all-or-nothing' projects, such as network-wide electrification or a high-speed line, for which the longer-term benefits are currently uncertain and which could delay tackling the current strategic priorities such as capacity.

Improvements to be delivered between now and 2014

The railway is safe and getting safer. But the recent accident at Grayrigg demonstrated that the railway can never afford to take safety for granted. The industry has not identified a need for major safety-related investment or new regulation in the near future, but it must maintain momentum by constantly improving its safety management. The Government is therefore specifying a 3 per cent reduction in the risk of death or injury to passengers and employees.

Reliability has improved steadily since 2001, despite the railway getting busier. Passengers give the railway credit for this improvement. But there are still lines on which reliability is unacceptable. And there are still too many delays caused by basic problems with track and signals. Reliability currently stands at 88 per cent. The Government wants to secure an improvement to 92.6 per cent by 2014. The Government also wants to see a 25 per cent reduction in the number of delays over 30 minutes, which inconvenience passengers most.

The investment priority for the period to 2014 is increased capacity. The Government wants the industry to be able to accommodate a 22½ per cent increase in passenger demand by 2014. It also wants average load factors – one measure of overcrowding – in major cities to reduce during the morning peak period, with the biggest improvements targeted on the busiest routes. To deliver this, the Government will fund an additional 1,300 new carriages, the procurement process for which will start now. Over 300 of these will address the rapid growth in demand seen in cities such as Birmingham, Cardiff, Leeds and Manchester. They will enable the railway to accommodate a further seven years of growth and will start to tackle crowding, bringing improvement to some of the busiest services. For regional and rural lines, the focus is also on growth, and in order to retain flexibility for the future there will be no line closures.

On some lines, provision of additional capacity will require new infrastructure. This ranges from the £5½ billion Thameslink Programme, through the £600 million to tackle congestion at Reading station and Birmingham New Street, to a large number of relatively modest individual schemes to lengthen platforms, upgrade electricity supply and provide sufficient depots. The ability of the rail industry and its suppliers to deliver such a large and complex investment programme is a real constraint on the rate at which capacity can be increased.

Capacity is the investment priority for the period to 2014, and momentum must be maintained on safety and reliability. But the Government will also make progress on the wider passenger and environmental agendas.

Delivering a better service for passengers

The fares system will be simplified, so passengers have greater confidence that they are being sold the right ticket for them. Smartcards will be usable in all major cities and inter-city fares will be purchasable on mobile phones. This will cut queues at ticket offices and free staff to assist passengers and enhance their sense of security. Indeed, both personal and counter-terrorist security remain active elements of future planning.

£150 million is earmarked to modernise 150 stations across the country. The Government now looks to the rail industry to come up with a robust delivery plan, working with local authorities and harnessing developer contributions. This investment will focus on medium-sized stations that are run-down or lack basic facilities, and addresses an area which the railway has neglected for too long. It will be backed up by ‘travel plans’ to improve access to stations, and better provision for cyclists.

Delivering rail’s environmental potential

Rail’s biggest contribution to tackling global warming comes from increasing its capacity, so that it can accommodate demand growth as people and firms factor carbon costs into their travel and transport decisions and make greener travel choices. In addition to the passenger capacity improvements, the Government is also allowing for an additional £200 million within Network Rail’s regulatory asset base to enable work to start on a strategic freight network, to accommodate freight growth.

Rail must also reduce its own carbon footprint. Next year the industry will set itself targets for reducing CO_2 emissions per passenger-kilometre and per tonne-kilometre. The Government will encourage progress by funding research and writing environmental objectives into passenger franchises. But the Government will not subsidise train operators to undertake efficiency measures, such as on-train metering, that pay for themselves via reduced fuel bills. Train operators must take greater responsibility.

The case for network-wide electrification will be kept under review; it is not made yet. The right long-term solution for rail will be the one that minimises its carbon footprint and energy bill. That depends on the relative rates at which the carbon footprint of electricity generation declines and the rate at which options become available for low-carbon, self-powered trains, neither of which can be forecast at present. Additionally, the Government noted that it would generally be more cost-effective to implement electrification after the migration to cab-based signalling, rather than before.

The plans beyond 2014

Investments that start before 2014 will deliver their full benefits in later years.

The Thameslink Programme will be completed by the end of 2015. It will deliver 12-carriage trains, running through central London at a frequency of 24 trains per hour. It represents a step-change in capacity. The Channel Tunnel Rail Link and the West Coast modernisation combined deliver 4,900 additional seats into London per peak hour. Thameslink will deliver 14,500 additional seats. Subject to Parliamentary approval and decisions on financing, Crossrail has the potential to make as big a difference to east–west travel in London as Thameslink does on the north–south corridor.

In other cities, continuing demand growth can continue to be met primarily by train lengthening. Infrastructure bottlenecks will be tackled and modern signalling introduced to improve reliability. The cities and regions will need increasingly to take their own view on the role of rail in delivering local economic development priorities alongside other modes.

Having completed the West Coast modernisation, there will be a need for modernisation and enhancement of other main lines, the East Coast and Great Western main lines in particular.

The flagship Intercity Express trains will enter full passenger service from 2015, starting on the East Coast and Great Western main lines. They will be lighter and more environmentally friendly than current long-distance trains. They will also be longer and capable of carrying significantly more passengers. Between now and 2014, Network Rail will have undertaken the investment necessary to accommodate the new trains. Intercity Express has demonstrated the value of the industry sitting down with its customers and suppliers to frame challenging specifications for new trains. A similar approach is now being adopted to the design of the next generation of ‘go-anywhere’ trains that will replace diesel and electric multiple units.

By the second half of the next decade and continuing thereafter, cab-based signalling will be implemented on a greater proportion of the network. This will increase capacity by allowing a higher frequency of train service, while maintaining safety. Trains will 'know' the position and speed of the trains in front of them, and will not require the 7½ mile gaps between services that are standard on inter-city routes today.

Stations and customer services will continue to improve. Within 10 years, rail travel and tickets could be combining with other services in the use of 'e-money'. The £370 million 'Access for All' programme, to provide a network of stations with step-free access, will be completed in 2015. By 2020, all trains will be fully accessible for disabled people and others with mobility problems.

By the time of the next HLOS, the Government aims to have enough data on performance and costs to set a robust environmental output for rail, with the same status as those for safety, capacity and reliability. As the network is renewed, it will incorporate new severe-weather standards, improving its resilience to climate change.

Anticipating the very long term

On the basis of recent demand trends, if the investment committed in this HLOS is maintained through future control periods, in accordance with the capacity and funding projections set out in this White Paper, than the measures described would be sufficient to meet growth on all routes until about 2030. The first areas where demand growth might require additional interventions are on the London–Birmingham–Manchester corridor and on London's busiest commuter routes. It would not be prudent to invest today to address capacity issues that are unlikely to materialise until two decades hence, and may not materialise at all. But a need exists to start planning work ahead of the next HLOS in 2012, to cover the possibility that demand growth accelerates.

For London, work with Network Rail suggests that extra-long trains (of up to 16 carriages) would provide a greater increase in capacity than double-deck trains at a similar cost. On inter-urban routes, current evidence suggests that maglevs and dedicated freight-lines are not appropriate solutions – both are too inflexible, and maglevs are too expensive to provide value for money. At present the balance of advantage would appear to favour new services running at conventional speeds and operating on an existing disused alignment. But this is not a decision that need or should be taken now. Further assessment of the options will be undertaken to inform the next HLOS. Any schemes will need to be considered alongside other modes and judged against the key criteria of capacity, value for money and environmental benefit.

Just as future growth rates are uncertain, so is the way in which people will use rail. In future, where people have double today's income and half today's carbon footprint, behaviour patterns may change significantly. Land-use, housing and education policies will all have impacts on where people live and work. This could result in moves toward a '24/7' society with more dispersed patterns of life and travel. That is why rail must plan now against the future need for it to

operate more consistently throughout the day and week, one reason why the Government is supporting the development of regional and local services.

A sustainable future railway

Sustainability is at the heart of the Government's commitments to 2014 and this future strategy. Sustainability demands a broader look at priorities for the railway alongside other modes, to find the best balance between the needs of the economy, society and the environment. Safety, reliability and cost are permanent priorities for the railway. But increasing capacity is the most urgent investment need – to accommodate record passenger numbers, allow rail to contribute to low-carbon economic growth, and move towards the service quality that more exacting consumers increasingly demand.

Delivering such a railway involves ensuring that investments are targeted and sustained, to deliver steady and efficient improvement against a long-term sense of direction, based on the best evidence available today. This will provide the rail industry with the flexibility to react to longer-term challenges, while not getting ahead of the realistic ability to predict.

This is the Government's strategy: to deliver a sustainable, modern railway.

1. Context

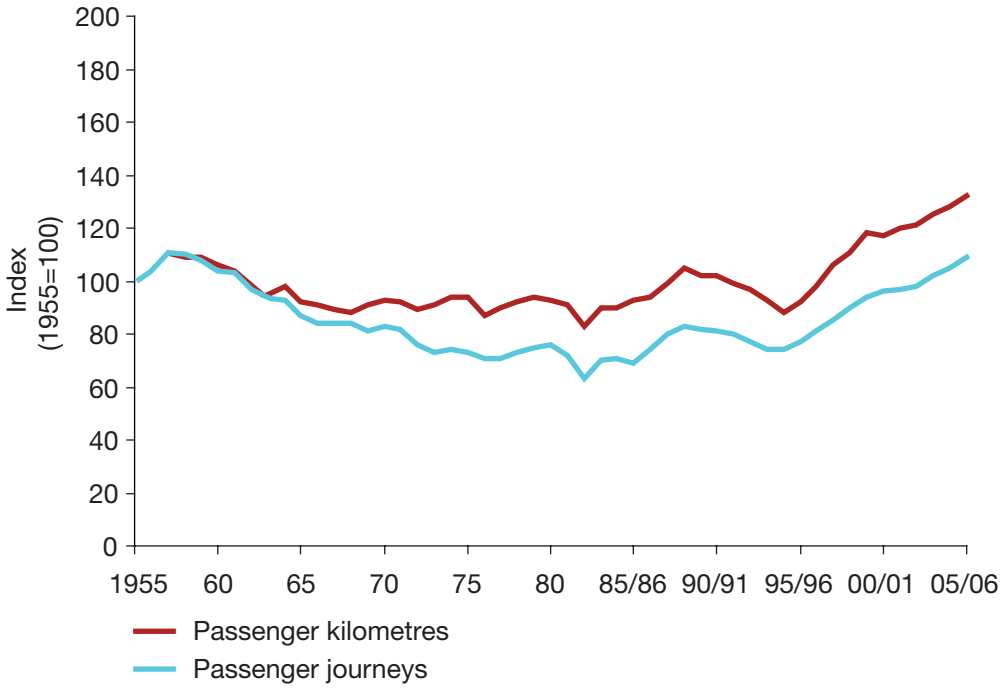
The starting point

1.1 The prospects for Britain's railways are better now than at any time for a generation.

1.2 For most of the post-war period, the railway was in decline. The railway's share of freight and passenger markets went down and the industry's financial position was always tight.[1] Investment was difficult to justify, rarely long-term and was always subject to changes in the annual public expenditure rounds.

1.3 But, from the mid-1990s, the railway's fortunes began to change dramatically.[2] Over the last ten years, freight and passenger traffic has grown by 40 per cent (Figures 1.1 and 1.2). This reflects sustained economic growth. It also reflects the more successful aspects of privatisation, which gave freight and passenger operators the means and incentive to attract new business, and created greater financial certainty.

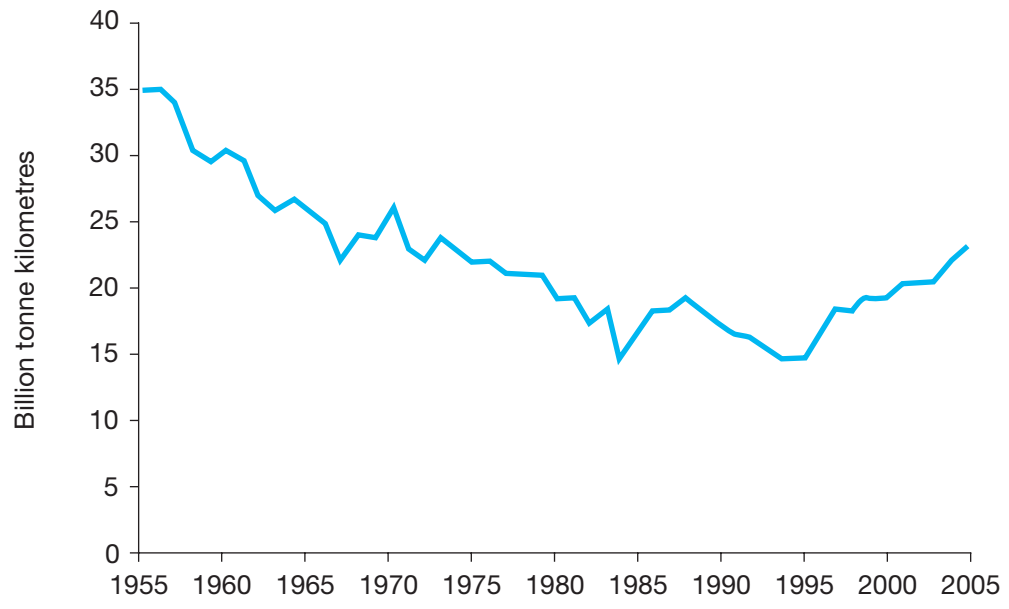
Figure 1.1: **National rail passenger journeys, kilometres (1955–2005)**



Note: From 1986 figures include an element of double counting as a journey involving more than one operator is scored against each operator; change of methodology in 1999; data is for financial years from 1984/85 onwards.
Source: *Transport Statistics Great Britain* 2006 edition (DS00010)

1 Slides TPH3 and FRT17b, Summary of Key Research and Analysis, July 2007.
2 Slide TPH5, Summary of Key Research and Analysis, July 2007.

Figure 1.2: **Domestic UK goods moved by rail (1955–05)**



Source: *Transport Statistics Great Britain* 2006 edition (DS00010)

1.4 Privatisation brought some real benefits, but it imposed an institutional structure that was seriously flawed, something which was exposed by the Hatfield accident in 2000. Although the statistics show that rail safety continued to improve under privatisation, public confidence in rail safety was undermined by a series of major accidents.

1.5 Railtrack's response to Hatfield precipitated a downturn in reliability on the network from which the rail industry has only recovered recently. Train operators and Railtrack blamed one another for the poor performance of the railway, instead of working in partnership to solve the problem. The costs of major infrastructure projects (such as the West Coast route modernisation) rose sharply, as did the routine costs of operating and maintaining the basic infrastructure. Railtrack went into administration in 2001, but the company's shareholders were not the only victims of its failures. In 2002, the Rail Regulator presented taxpayers with a bill for an additional £1¼ billion a year of increased infrastructure costs, which largely resulted from historic under-investment and Railtrack's loss of control of its business.

1.6 Since then, the rail industry has turned a corner. The Government established Network Rail as a not-for-dividend private company to manage the railway infrastructure, and then addressed the remaining organisational problems of the railway. These changes were set out in the 2004 White Paper *The Future of Rail* and implemented in the Railways Act 2005. The key reforms were: to make the Secretary of State for Transport responsible for setting the strategy and budget for the railway in England and Wales; further rail devolution for Scotland and Wales; integration of safety and economic regulation; and changes to the industry structure to promote stronger partnership-working between Network Rail and train operators.

1.7 Today, rail demand continues to grow strongly. This is good news for the rail industry and the country as a whole, because rail makes an important economic contribution and is an environmentally friendly transport mode. However, this rapid expansion of demand has created pressures of its own for those rail users on the busiest services who find they are standing on long journeys, travelling in overcrowded carriages or simply unable to get onto a train because it is too full.

1.8 This rate of growth was not foreseen at the time of privatisation. The industry has responded with more trains and some additional capacity. But rising costs and the mismanagement of the Railtrack period reduced the return of the investments that were made. As a result, capacity has not kept pace with increased demand.

1.9 With the new structure proving stable, performance improving, and costs back under control, the industry is now well placed to respond to these challenges and deliver the necessary investment. But, in doing so, it is essential that the right choices are made based on an assessment of the long-term challenges ahead and the broader context in which the railway operates. Delivering a better railway or a better overall transport system is not a goal in its own right, but a means to delivering wider economic, environmental and social goals.

Economic, environmental and social goals

1.10 The Eddington Transport Study,[3] published in December 2006, confirmed that 'transport can impact on the performance of the economy and will ultimately impact on overall output'. The Study found that Britain's geography and existing transport networks already provided good connectivity (Figure 1.3). The priority, therefore, is not to create new connections, but to improve the performance of existing networks. The focus should be on enhancing the capacity and reliability of routes where crowding or congestion problems indicate that the transport system is already coming under strain.

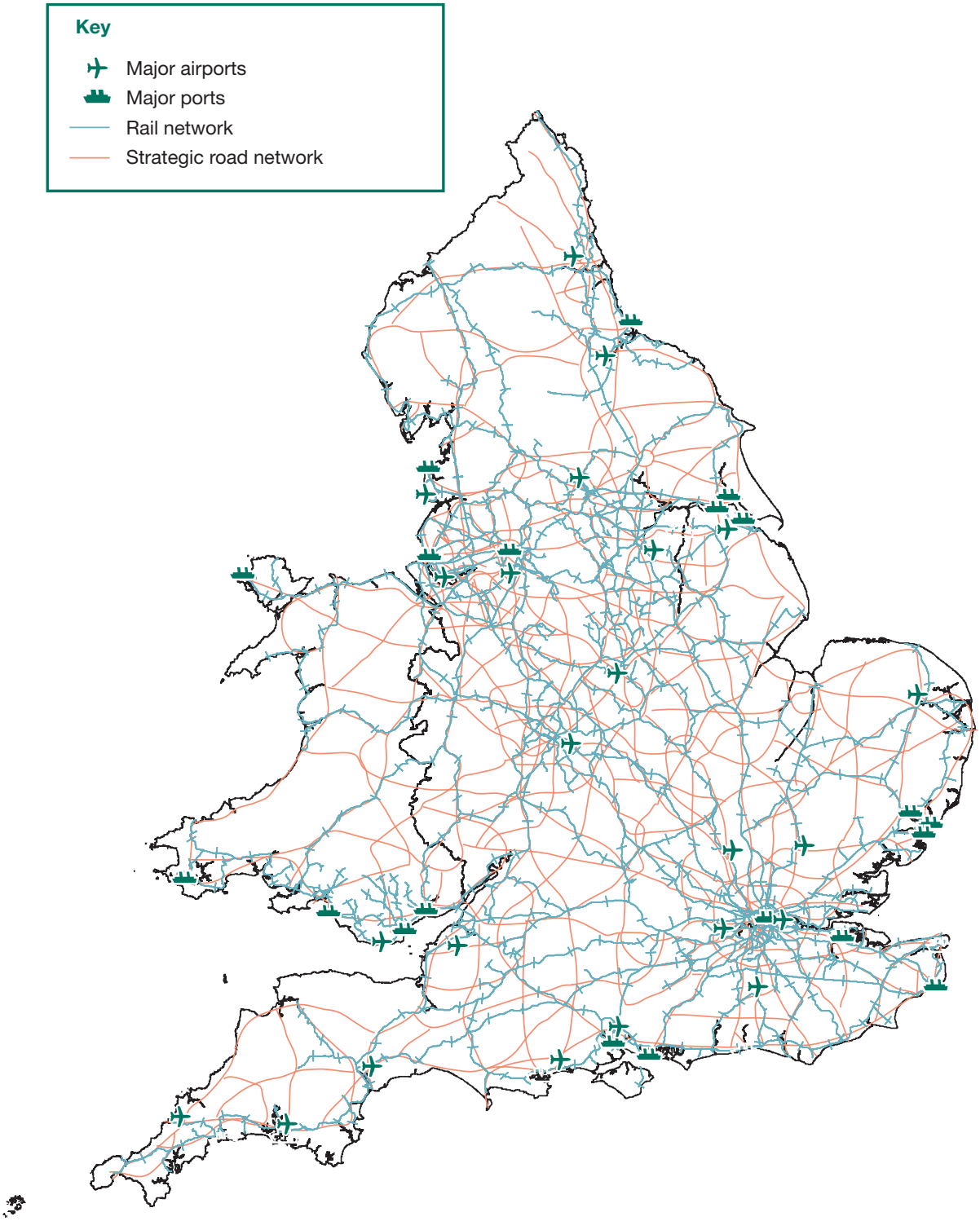
1.11 The Eddington Study also identified three key transport markets that are crucial to the productivity and competitiveness of the economy:

- Urban areas and their catchments;
- Inter-urban corridors showing signs of congestion and unreliability; and
- International links via ports and airports showing signs of congestion and unreliability.

1.12 The railway is well placed to serve such markets, but it is a minority mode and cannot be planned in isolation. The Eddington Study argued for a 'sophisticated policy mix', appraising options across modes to reflect their market strengths and taking full account of pricing options.

3 The Eddington Transport Study, Main report: Transport's role in sustaining the UK's productivity and competitiveness, Sir Rod Eddington, December 2006.

Figure 1.3: **England and Wales have a well-developed network of strategic roads and rail links**



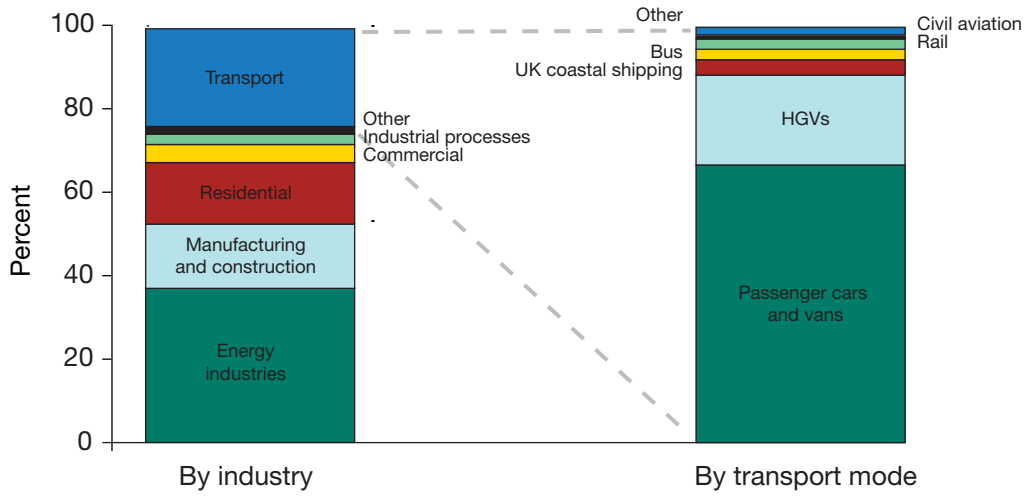
Source: Eddington Report volume 2 2006 (DS00109)

1.13 This White Paper proposes a strategy for the railway in the context of this wider transport agenda. It focuses investments on those markets where rail offers a particular advantage over other modes and within the three key markets identified by the Eddington Study. Hence, a key aim of this 2007 White Paper is to enable rail to adapt and respond to any future decisions on road investment, air travel, logistics or local road pricing schemes.

1.14 Sir Nicholas Stern's review,[4] published in October 2006, demonstrated the relationship between the economy and climate change. It stated that 'on current trends, average global temperatures will rise by 2–3°C within the next fifty years or so' and estimated that this could result in a permanent loss of up to 3 per cent of world economic output. The review concluded that there was a robust economic case for reducing CO_2 emissions, and that the developed countries needed to secure reductions of at least 60 per cent by 2050.

1.15 While transport as a whole accounts for around 23 per cent of the UK's CO_2 emissions, rail travel accounts for less than 1 per cent (Figure 1.4). As a result, the contribution of the railway cannot be decisive, but it will be important. The rail industry can make a significant contribution by accommodating the increasing demand for this 'greener' travel choice, offering an attractive quality of service and reducing its own carbon footprint. Maximising that contribution must, clearly, be a key strand in any long-term strategy for the railway.

Figure 1.4: **Sources of UK carbon dioxide emissions**



Source: DEFRA Transport and rail carbon emissions (DS00135)

1.16 Climate change is the most important environmental issue confronting Britain, but it is not the only one. Transport impacts on air quality and thereby on health. It impacts on wildlife habitats and thereby on biodiversity. It generates noise and vibration, and thereby impacts on people's quality of life.

4 The Stern Review on the Economics of Climate Change, October 2006.

1.17 In general, the rail industry's performance in all these areas is good. But, as environmental sensitivity increases, it is likely to come under increased regulatory and public pressure to improve its performance further. This would pose particular challenges for an industry that uses assets with a relatively long life, increasing the lead times for the introduction of new technologies. It is important that assessments of the impact of any new environmental requirements take a comprehensive view of all the consequences, including the effect on CO_2 emissions, of making the railway more costly or less convenient. But it is also important that the rail industry integrates the wide-ranging environmental agenda into its own planning.

1.18 Social goals cannot be as simply encapsulated as economic or environmental goals. At the broadest level, the key challenge for transport is to support social inclusion by improving personal mobility. The aim must be to ensure that people are not prevented from securing jobs or a better quality of life because they lack access to transport. To ensure this in the longer term, rail planning must co-ordinate still more closely with national and regional spatial plans. It must respond to a developing metropolitan and regional agenda and it must cater for people with reduced mobility.

1.19 The rail industry must also position itself to respond to the challenges and opportunities of an ever-more diverse society – a society whose patterns of work and leisure are constantly evolving – and whose citizens increasingly demand higher standards quality and convenience in the provision of services.

Short, medium and long-term planning

1.20 Once every five years the Secretary of State for Transport must set out the rail improvements he or she wants to secure for the coming five-year 'Control Period'. This is a new requirement of the Railways Act 2005. It gives the Secretary of State the power to set the strategic direction for the rail industry. It also means the Government must specify with clarity what it wishes the railway to deliver and the funding available to do so. It is then the job of the independent Office of Rail Regulation to ensure that the specifications and the budget balance.

1.21 The letter annexed to this White Paper discharges that remit for the next 'Control Period', which will start in April 2009 and run until March 2014.[5] The improvements being purchased by the Secretary of State are set out in Appendix A and are formally termed the Railways Act 2005 Statement. This comprises a High Level Output Specification and various other requirements. For simplicity these are referred to collectively in the White Paper as HLOS. The budget is termed the Statement of Funds Available.

1.22 However, rail investments made in the coming years will have a very long life. New trains should still be in operation 30 years from now. New infrastructure will last even longer. This means that the Government and rail industry need to think 30 years ahead.

5 Elsewhere in this White Paper this is referred to as '2009–2014' for ease of reading.

1.23 This is challenging. Economic models and rail forecasting tools are essential to project appraisal and can assist forward planning. But the further into the future they attempt to predict, the wider the error-margin.

1.24 Rather than base its strategy around a prescribed response to any one forecast, the Government has assessed a range of ways in which the future might develop, considering the potential implications for the rail industry and how it might respond. The most challenging of such planning scenarios is one that combines high average per capita GDP with a high sensitivity to CO_2, and the risk of climate change, alongside a diverse society. This is the scenario which is the most likely to see success in tackling climate change but is also the most demanding future for the railway. It therefore forms the 'base case' for this White Paper, since a strategy that enables the railway to thrive in this future scenario will be well placed to adapt to less demanding outcomes. And it would clearly not be right to plan for economic or environmental failure.

1.25 Such a scenario produces a cash-rich but carbon-poor society, compared with today. Higher average incomes imply that people will have higher values-of-time and will be less tolerant of delay and unproductive uses of time. They will be more concerned about risks to their personal safety or health. They will expect higher standards of service and quality of life.

1.26 Nothing in this 'base-case scenario' suggests that the rail industry can afford to relax its vigilance on safety, reliability and cost. These are permanent priorities for the railway. But this White Paper establishes three further goals for the rail industry if it is to address today's challenges and contribute to the sort of planning scenario described above:

- It must increase its carrying capacity and ease crowding, focusing first on the routes which have the worst crowding problems;
- It must constantly improve the quality of its service to meet the increased demands of current passengers and attract new users; and
- It must reduce its carbon footprint in terms of CO_2 emissions per passenger and tonne of goods moved, and maintain its advantage on these and other environmental issues.

1.27 This White Paper sets out how these three goals are to be achieved over three time-horizons, which could be summarised as 'commit, plan and anticipate':

- For the period to 2014, the Government has made the most robust demand forecasts possible and specified levels of improvement to be delivered in safety, reliability and capacity. These are commitments;
- In the period to 2024, the White Paper assumes demand growth is broadly in line with that experienced in recent years. This is merely an assumption, and its robustness varies considerably from market to market. Demand, particularly at individual route level, could be very substantially higher or lower. It is, therefore, important to build in flexibility to allow plans to adapt over time as impacts become more certain; and

- Finally, the validity of this strategy has been tested against a range of other challenges that might materialise beyond 2024. For instance:
  - Could the capacity investment programme be accelerated or reprioritised if demand were significantly higher or lower than the 'base case' on individual routes? This could arise because the economy as a whole grows faster or more slowly than in recent years, or because the pattern of economic growth changes. It could also reflect the inter-modal choices the Government itself must make in implementing the Eddington Study's conclusions;
  - Will the future railway have the capability to respond if patterns of housing and employment become more dispersed in future? This could arise in response to changes in attitudes (for example, to work–life balance) or technology (for example, tele-presencing) or to the carbon agenda and rising energy costs; and
  - Is the rail industry robust enough to accommodate technological change? The key challenge here may be the development of commercially viable low-carbon energy sources.

1.28 The most valuable options and strategies are those that enable the railway to adapt successfully to the widest range of plausible futures. As a result, the Government favours solutions that can be introduced incrementally (and therefore adjusted in the light of emerging knowledge) and seeks opportunities to support investments that will improve flexibility, even if these entail some additional initial expenditure.

1.29 The Intercity Express train, which will replace the current InterCity 125 fleet, illustrates this approach. It provides a significant increase in capacity with only modest infrastructure cost. It will be readily deployable on different lines, with different service patterns. It can be lengthened if demand on a route grows faster than forecast or shortened if demand grows more slowly. And it can be readily adapted to different sources of power. In essence, the approach is about 'buying flexibility' while developing the capability of the existing network.

The scope of the White Paper

1.30 With certain exceptions, such as safety, rail policy is a devolved matter in Scotland, so the geographical scope of the strategy is primarily limited to England and Wales, recognising the powers of the Welsh Assembly Government in relation to Welsh and cross-border services.

1.31 The Government believes that the issues and trends raised in this strategy have important linkages with Scotland, Northern Ireland and the EU and intends to work closely with the devolved administrations to ensure as consistent an approach as possible.

2. Safety and security

Summary

The provision of safe and reliable services is a fundamental requirement of the railway. Passengers are entitled to expect to travel in safety and on time. Staff are entitled to work in safe conditions.

The safety of the railway has improved steadily over several decades, and there have been some significant improvements in recent years. The introduction of the Train Protection and Warning System (TPWS) has greatly reduced the risk of trains passing red signals, Network Rail has invested heavily in renewing infrastructure, and older trains have been replaced by modern designs with better crashworthiness.

The rail industry must maintain this momentum. The Government is requiring a further improvement by 2014 of at least a 3 per cent reduction in the risk of death or injury to passengers and employees.

In addition to these improvements to operational safety, the rail industry must maintain its focus, and will continue to work with Government on issues of personal and counter-terrorist security, while maintaining the fundamentally 'open' nature of the rail network.

The Government is committed to protecting passengers, employees and infrastructure from acts of terrorism. Rail networks have historically been a target and more recent attacks in Madrid (2004), London (2005) and Mumbai (2006) demonstrate the continued threat. Government–industry structures are in place and work in close co-operation with the police and security services to ensure that appropriate security regimes are in place; they will continue to respond and adapt to any changes in threat.

At the same time, passengers are sensitive to concerns of personal security on the railway. Such concerns need to be factored into future planning decisions, for instance in the refurbishment of stations and the design of trains. Over time, passengers are likely to attach more, rather than less, importance to all facets of personal risk.

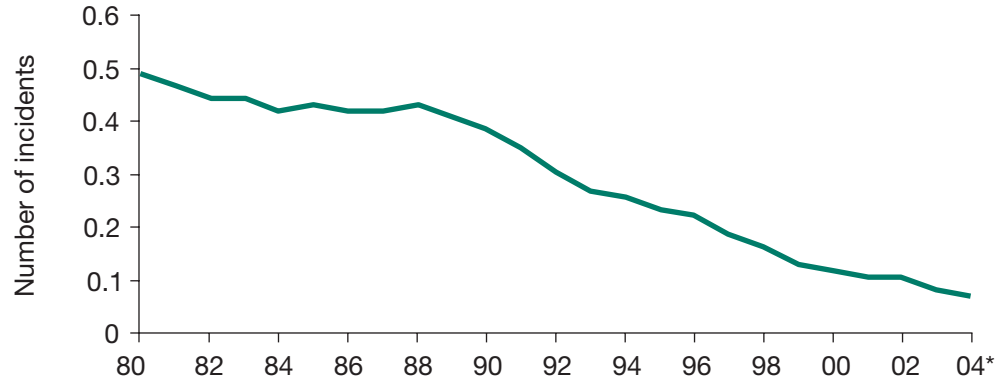
Context and recent trends

2.1 Safety on Britain's railway system compares well with other modes. It has a comparable safety record to bus and coach, and travel by rail is roughly seven times safer than travel by car.[1] Over the last 30 years, there has been a strong downward trend in the number of train accidents and fatalities (Figures 2.1 and 2.2).[2]

1 Derived from Transport Statistics GB 2005, table 1.7 (1994–2003 average).

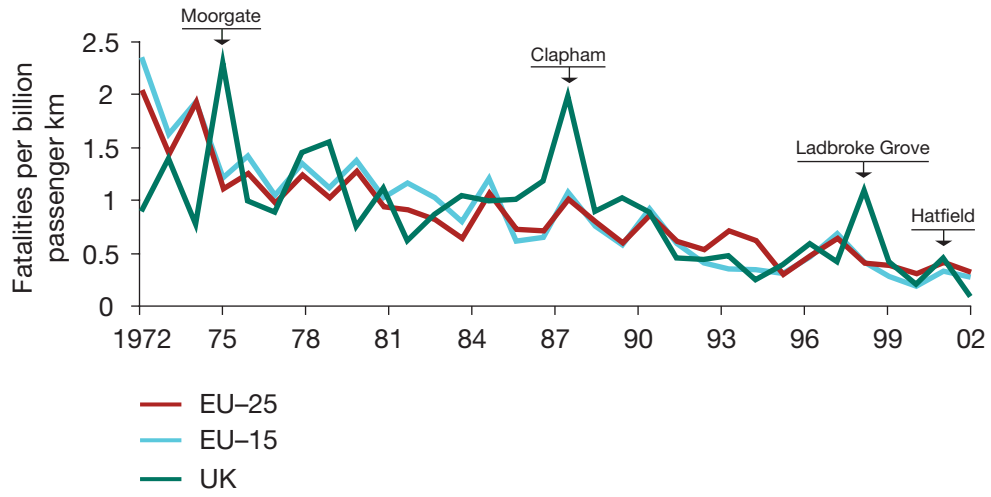
2 Slide SAF3, Summary of Key Research and Analysis, July 2007.

Figure 2.1: **Significant UK train accidents per million train km (5 year rolling average)**



Note:* 2004 is the 9 month period from 1 April 2004 to 31 Dec 2004
Source: HSE's Annual Report on Railway Safety 2004 (DS00025)

Figure 2.2: **UK and EU rail fatalities per billion passenger kilometres (actuals)**



Source: HSE's Annual Report on Railway Safety 2004 (DS00025)

2.2 In recent years, the safety of the railways has improved significantly. But it can never be taken for granted. Even against a backdrop of general improvement, the fatal accident at Grayrigg in early 2007 demonstrated – as others have done before – the potential consequences of any lapses in safety management.

2.3 That such accidents have become less frequent over time is welcome. The frequency of fatal accidents fell from six over the five-year period 1992–96, to four between 1997 and 2001, and then to two between 2002 and 2006.[3] This is reflected in improved passenger and public perception. Work by Passenger Focus confirms that the risk of rail accidents is one

3 RSSB's Annual Safety Performance Report data (excludes public fatalities at level crossings).

that does not register highly with passengers, who take it as read that they are using an inherently safe mode of transport.

2.4 A number of factors have contributed to this improvement. The introduction of in-cab warning systems[4] has reduced by over 90 per cent the risk of a train passing a signal at danger,[5] previously one of the major sources of risk on the railway. Network Rail has invested heavily in renewing the basic infrastructure of the railway and has introduced new ways of monitoring the condition of the track. As a result, rail assets are in better condition and the industry has improved its ability to detect and remedy small defects before they create a material safety risk. The replacement of older rolling stock with a modern fleet of trains has also helped improve safety. Last, but not least, improved safety will continue to require good management, a strong safety culture and constant attention to detail.

2.5 It is essential to maintain this momentum. But there are also other aspects of safety that need to be addressed.

2.6 Historically, the rail industry's record on employee safety has been less satisfactory. It has improved considerably in recent years – from 15–20 fatalities per year in the late 1980s to an average of about six in the early 2000s.[6] The fatality rate is some 45 per cent lower for rail track workers than for road construction staff.[7] Yet staff safety remains a key concern for the railway.

Measuring safety

2.7 Rail accidents statistics of the kind cited above provide one measure of safety. They are also what drives media coverage and public perception. However, they do not tell the whole story. That is because the fewer accidents there are, the more difficult it is statistically to infer actual underlying safety performance by counting the number of accidents over any given period. A single fatal accident does not mean that the railway has become less safe, and a long period without fatal accidents does not necessarily mean that the railway has become safer.

2.8 The Government wants to use a comprehensive means of measuring safety performance, one that considers the underlying risk and not just the frequency of accidents.

2.9 The two measures are different. Just because a hairline crack in a rail or an over-run signal did not cause an accident, it does not mean it is not a problem. The industry has worked effectively and collaboratively to develop a Safety Risk Model,[8] which assigns weightings to all the different factors that could cause an accident and monitors trends in them. The Government supports this work and will use this measurement of risk as its principal means of measuring the safety of the railways.

4 Principally, the Train Protection Warning System, or TPWS.
5 The ORR's Quarterly SPAD report April 2007 (against March 2001 benchmark).
6 The RSSB's Annual Safety Performance Reports 2004 and 2005.
7 The RSSB 'Overview of the workforce' safety performance report, November 2006.
8 www.rssb.co.uk/srmodel.asp

Improvements in the period to 2014

2.10 The Government wants to see further and continual improvement in the safety of the railway. Given the high levels of safety to which the industry already operates, the Government recognises that delivery is more likely to be incremental, through the development of existing management and working practices. Nevertheless such improvements are essential to maintain momentum, not least because increased demand for rail travel and changing demographics will increase some safety risks.

2.11 The Government also wants to include both passengers and employees within its specification of safety. The rail industry has a duty to transport its customers safely and to provide a safe working environment for its staff. These responsibilities should remain the industry's primary focus.

2.12 On this basis, the safety output that the Government is specifying for the rail industry is a reduction of at least 3 per cent in the risk of death or injury to passengers and employees for the period between 2009 and 2014. This represents an important, incremental improvement in safety risk on what is an already safe mode of transport.

2.13 This reduction in risk is broadly in line with the industry's own assessment of the improvement it can deliver by 2014, having regard to the increase in freight and passenger numbers that it will be expected to accommodate. Clearly the rail industry's aim will be to exceed these if possible.

2.14 The Government believes that this output requirement, which supplements the industry's ongoing legal obligations and responsibilities, will provide a yardstick to assess whether individual safety decisions are delivering real improvement across the industry. It will also encourage a more system-based approach to safety, targeting efforts where the greatest reduction in risk can be secured most cost-effectively.

Safety – risks to third parties

2.15 Risk to passengers and employees is an important focus, but the majority of deaths on the railway involve third parties, with suicide, trespass and incursion onto level crossings being the major causes.[9]

2.16 These risks cannot be neglected, and in recent years the rail industry has improved safety in this area, with a 16 per cent reduction in the average number of deaths in 1996–2005 compared to 1986–1995.[10]

2.17 Delivering improvement is a challenge. Of all third-party fatalities, 95 per cent are suicides.[11] The rail industry has identified and targeted locations where there is a high risk of suicide attempts, but due to the open nature of the railway there are obvious limits to the preventative measures that can be taken when people are intent on taking their own lives.

9 Slide SAF7, Summary of Key Research and Analysis, July 2007.

10 Overview of RSSB's Annual Safety Performance Report, 2005.

11 Including suspected suicides.

2.18 There are many other incursions onto the railway – by vandals, by children who are unaware of the dangers, or by people who are crossing the railway as a short-cut. The rail industry seeks to respond through publicity, policing and prevention. In many countries it is normal for busy urban railway lines to be unfenced, and there is a clear presumption that it is the responsibility of the public to keep off the railway. In Britain, the law imposes on the rail industry a duty of care to third parties.

2.19 The Government believes that this principle should be retained, but it must be supported by robust cost–benefit analysis of preventative measures balanced by a vigorous policy of prosecution of trespassers.

2.20 The misuse of level crossings has been a particular focus of attention, because it poses a risk to both road and rail users, with the greater risk to road users. As other rail safety risks have declined, misuse of level crossings has become a more significant source of risk to rail passengers, and the rail industry is devoting more attention to it. As well as the number of level crossings being reduced, they can also be better protected using CCTV or radar-based obstacle detection equipment.

2.21 Many of the most appropriate remedies are available to highway authorities. The Road Safety Act 2006 introduced measures to improve level-crossing safety by allowing controls to be introduced at level crossings to manage better the behaviour of motorists. For example, using 'rumble strips', implementing built-out kerbs, and better signage designed both to slow the motorist and reduce cases of 'zig-zagging' around barriers.

2.22 However, highway authorities have the same responsibility as their rail counterparts to make decisions on their safety priorities, and level crossings accounted for less than 1 per cent[12] of the 32,000[13] deaths and serious injuries on Britain's roads in 2005. This points to the need for co-ordinated approaches between rail and highway authorities, as has been piloted in Lincolnshire with its road-rail partnership between Network Rail and the County Council. This is a model which Network Rail and local authorities may wish to build on in other areas where there are large numbers of level crossings.

Safety and security – crime, terrorism and health risks

2.23 Work by Passenger Focus has confirmed that the risk of rail accidents is not seen as an issue by passengers, but that some passengers are seriously concerned about personal security. Passenger Focus advise that this issue now ranks, along with increasing the capacity of the railway, as one of the top priorities for rail users. Awareness of the risks from terrorism is high, and public health risks may feature as a matter of future concern.

2.24 An RSSB research report in 2004[14] examined the issues of personal security in some detail. Despite a significant mismatch between perception and reality, there is a substantive issue that needs to be addressed. Doing so can also have commercial benefits. Research has

12 There were four fatalities of road vehicle drivers at level crossings in 2005.

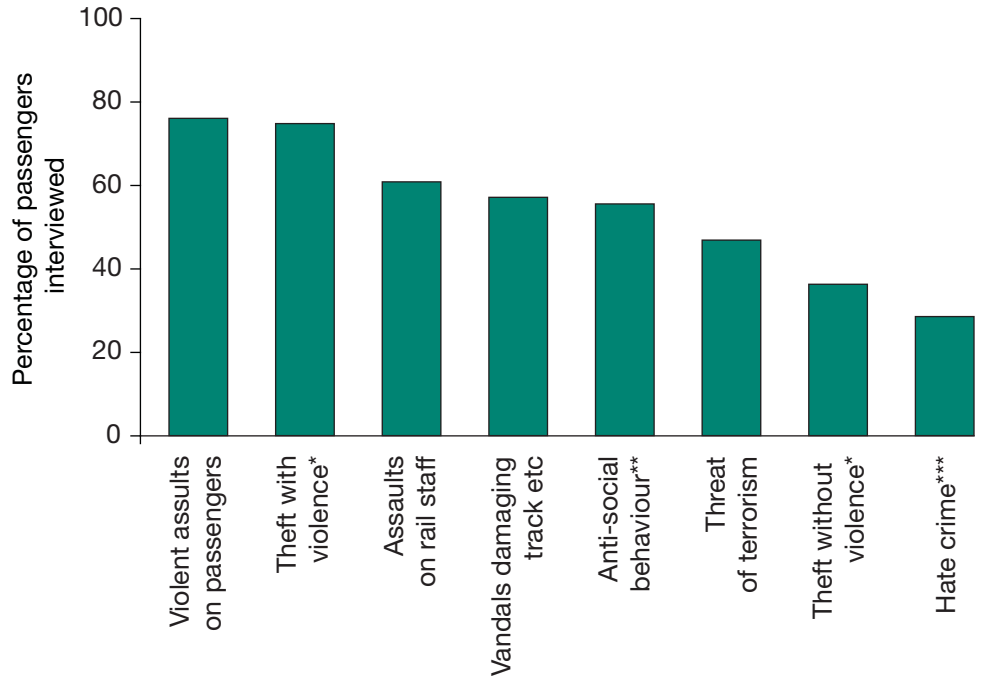
13 Road Casualties Great Britain, 2005. Precise figure 32,155.

14 There were four fatalities of road vehicle drivers at level crossings in 2005.

shown the potential for increased patronage (particularly at off-peak times) if passengers' personal security concerns are addressed.[15]

2.25 Through the efforts of the rail industry, British Transport Police (BTP), local police forces and central and local government, significant improvements have been made in personal security. The biggest overall impact on crime has come from targeting crime hotspots on the busiest services and stations. On more lightly-used services and stations, there are low-cost measures to reduce crime and the fear of crime (Figure 2.3), such as good lighting and signage, a well-maintained environment, up-to-date information, and clear sightlines.

Figure 2.3: **Passengers' top eight priorities for the BTP**



Note: * Includes threat of violence; ** e.g. ticket touts, drunkenness; *** Crime motivated by race, gender, sexuality etc;
Source: NPS (DS00158); LEK Analysis

2.26 In addition, Network Rail and most Train Operating Companies are participating in the Secure Stations Scheme, which is designed to improve security standards at rail stations. The Government will continue with its recent policy of asking franchise bidders to achieve Secure Stations Scheme accreditation covering 80 per cent of passenger usage[16] and to have a priced option to achieve a higher level of coverage if it is value for money and affordable.

2.27 A more visible staff presence on trains and platforms reassures passengers. There is greater scope for this as ticket retailing becomes less labour-intensive. But passenger security has to be balanced against the risk of assaults on staff, which is a serious issue for the industry.

15 People's perceptions of personal security and their concerns about crime on public transport, Department for Transport, 2004.

16 Excluding major stations, which are provided for separately.

2.28 The rail industry also has to manage various health risks from infectious and contagious diseases, which are brought into sharpest focus by the threat of pandemics.

2.29 In relation to crime, terrorism and health, there are four main strands to the Government's approach to rail security. First, crime, and security risks, should be factored into the design of stations and carriages, in precisely the same way as accident risk. Second, staff must be effectively deployed and will need proper training, support and a clear understanding of their remit and powers. Third, the *Rail Technical Strategy* that is published alongside this White Paper identifies other options and approaches, such as automatic behaviour recognition systems drawing on experience from other countries. Fourth, the reduction of non-accident risks should be a key focus of the industry Research Strategy to be published later this year.

2.30 A further element to improving the security of staff and the travelling public is the need to protect people and infrastructure from acts of terrorism. The UK Government's Counter-Terrorism Strategy has four elements to it:

- **Prevent:** tackling the radicalisation of individuals, both in the UK and elsewhere, which sustains the international terrorist threat;
- **Pursue:** reducing the terrorist threat to the UK and to UK interests overseas by disrupting terrorists and their operations;
- **Protect:** reducing the vulnerability of people and assets to terrorist attack; and
- **Prepare:** ensuring that the UK is as ready as it can be for the consequences of a terrorist attack.[17]

2.31 The Department for Transport works closely with colleagues in Whitehall, the Police, the Security Service and the rail industry to develop and maintain effective and proportionate measures to manage the risk of terrorist attacks on the railway, including:

- Developing security regimes for stations and trains in the light of the assessment of the threat;
- Monitoring, and where necessary, enforcing those regimes;
- Supporting and advising industry; and
- Promoting the need for appropriate contingency planning for a wide range of incidents and possible emergencies.

2.32 The open nature of the railway network means it is not possible to completely eliminate the risk of a terrorist attack. The measures outlined above, supported by the co-operation and vigilance of railway staff and the travelling public, seek to reduce this risk to a minimum, while enabling the rail industry to provide a good service to the travelling public.

17 More detail on the UK Government's Counter Terrorism strategy can be found at http://security.homeoffice.gov.uk/counter-terrorism-strategy/about-the-strategy/

Future trends

2.33 Over time, the public is likely to attach even greater importance to all facets of personal risk. As people become more affluent, they become more risk-averse. In addition, public perceptions of risk may change as the population ages, leading to a greater emphasis on the safety and security of the passenger environment. Passengers and the public will care about more aspects of safety and to greater degrees. The rail industry needs to monitor and influence attitudes, as well as being prepared to adjust its agenda to anticipate and take account of change.

2.34 Technological trends will contribute to that response as newer rolling-stock fleets and infrastructure enhancements are introduced, incorporating the latest safety features. Changes in technology are also likely to reduce risk to staff, as less line-side equipment is required and self-monitoring equipment is built into trains and signalling systems, which reduce the need for staff to work near the operational railway.

2.35 In short, a key objective for the rail industry over the period of this strategy is to recognise safety, passenger security and well-being as a single agenda and to deliver continual improvement. The longer-term trends in public expectations and concern are challenging, but, with good monitoring, can be readily anticipated. The industry is therefore well positioned to plan accordingly.

3. Reliability

Summary

Reliability matters to the railway's customers and to the economy at large. The reliability of the railway improved a little after privatisation, but declined sharply in the wake of the Hatfield accident in 2000. Rail reliability is now back above pre-Hatfield levels. This is a significant achievement against a backdrop of strong demand growth, and passengers give the rail industry credit for it.

The Government believes the rail industry can go further. It will specify an overall improvement in train reliability from 88 per cent today to 92.6 per cent by 2014. The Government will also specify a 25 per cent reduction in delays of more than 30 minutes. It believes that these are realistic but challenging requirements. They take account of the plans to increase the capacity of the railway, which are critical to improving reliability.

Train reliability is crucial, but it is not the whole of the picture. The Government commissioned work from Passenger Focus that identified other causes of delay for passengers, such as the time taken to purchase a ticket. These issues are addressed in chapter 10 of this White Paper, and the Government will monitor improvements throughout the next control period.

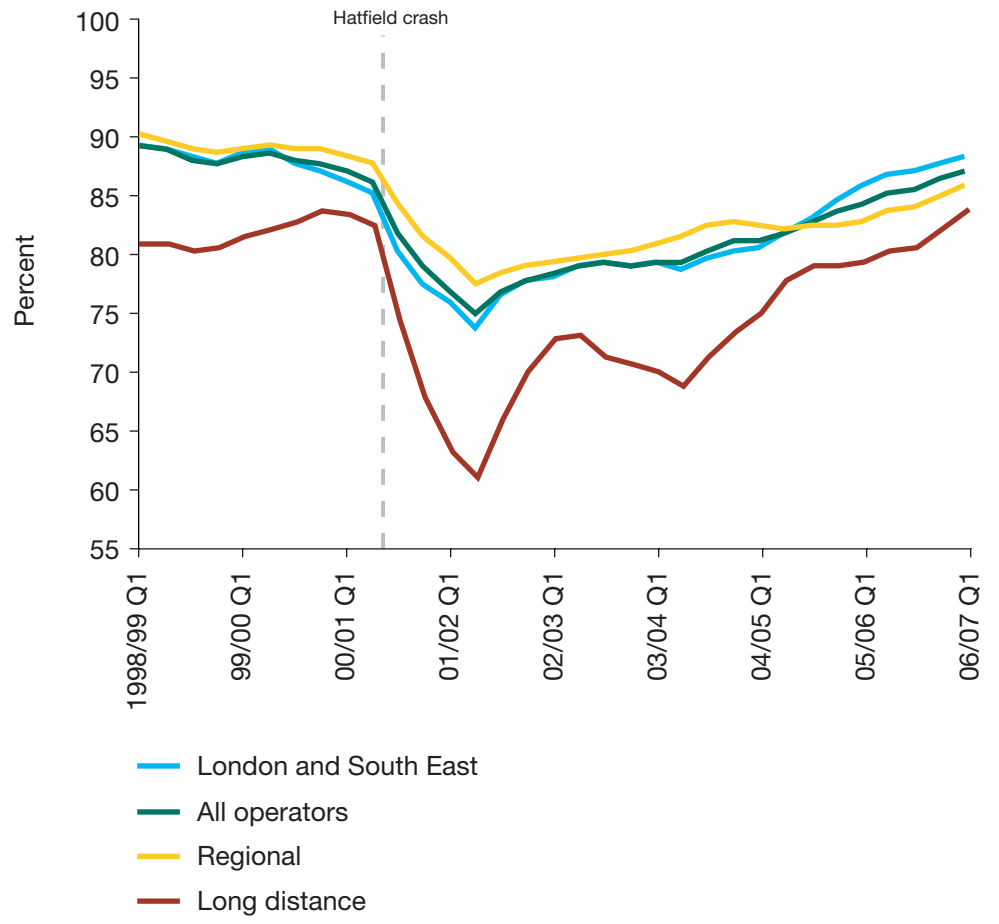
In the longer term, demand-growth and climate change will add to the challenge of meeting rising passenger expectations of reliability. To reflect this, there will be a need for capacity enhancements, investment in the resilience of the network, improved train design and radio-based signalling.

Context and recent trends

3.1 A reliable railway is the single most important requirement of passengers. Delays are an unproductive use of people's time, and serious delays disrupt their travel plans. The Eddington Transport Study confirmed that unreliability has an economic cost. Business interests who contributed during the preparation of this White Paper confirmed that reliability and frequency of service both have an impact on business-location decisions.

3.2 The rail industry's record on reliability has fluctuated. There was some improvement after privatisation, but it then deteriorated by nearly 9 per cent in a single year, after the Hatfield accident in October 2000. Since then, performance has steadily improved. Reliability currently stands at 88 per cent, which is back to the pre-Hatfield level. Figure 3.1 shows the recent trends.

Figure 3.1: **Public Performance Measure – 1998/9 to 2005/6**[1]



Note: Long-distance operators shows the percentage of trains arriving within 10 minutes of timetabled arrival at final destination, London and South East, and regional operators shows the percentage of trains arriving within 5 minutes of the timetabled arrival; Data have in some quarters been calculated against temporary timetables
Source: National Rail Trends 2001Q2 (DS00019); National Rail Trends Yearbook 2005/6 (DS00013)

3.3 As reliability has improved, so has overall customer satisfaction.[2] The close correlation confirms that reliability is the key factor in passengers' judgement of quality of service. Because reliability has improved, passengers now identify other issues – such as capacity and security – as top concerns. But this does not mean that reliability has ceased to matter or can be taken for granted.

3.4 In focus groups, passengers give the rail industry credit for its improved performance. They recognise that rail travel now compares well with other modes (Tables 3.1 and 3.2). Like-for-like comparisons between road and rail are not possible, but increased congestion has undoubtedly affected predictability of journey times by road. And the reliability of long-distance rail operations is better than most domestic air services.

1 Slide REL5, Summary of Key Research and Analysis, July 2007.
2 Slide PAX3, Summary of Key Research and Analysis, July 2007.

Table 3.1: **Punctuality of domestic flights between major UK airports, including arrivals and departures (December 2006)**[3]

Airport	On time-15 mins late (%)	16-30 mins late (%)	On time-30 mins (%)	Average mins delay
Birmingham	75	9	84	17
Edinburgh	68	13	81	20
Gatwick	61	15	76	26
Glasgow	73	11	84	17
Heathrow	61	15	76	25
London City	63	19	82	20
Luton	69	14	83	19
Manchester	72	11	83	18
Newcastle	72	12	84	19
Stansted	69	13	82	19

Table 3.2: **Punctuality of intercity rail services, including arrival times only (July–September 2006)**[3]

Long distance route	On time-10 mins (%)
Great Western	72.7
East Coast	81.9
Midland Main Line	90.6
Greater Anglia (Norwich–London)	81.1
Trans-Pennine	88.2
Cross-Country	80.9
West Coast	86.0

3.5 Improving reliability against the backdrop of steep growth in demand is a significant achievement. Increased numbers of passengers on trains require longer stops at stations to get on and off. Increased numbers of trains on the network mean that lines become congested. Pushing reliability up in these circumstances has required close co-operation between Network Rail and train operators to timetable train movements and get services running normally again as quickly as possible after an incident. Joint performance improvement plans and integrated control centres are critical. The 2004 White Paper facilitated these changes. It gave Network Rail the lead responsibility for improving reliability, promoted

3 Slide REL16, Summary of Key Research and Analysis, July 2007.

local partnership working and committed the Government to align rail franchises more closely with Network Rail's operational boundaries.

3.6 Although the overall improvement in reliability is good, performance varies from route to route and by time of year. It is no consolation to users of an unreliable service to know that performance has improved dramatically in another part of the country. Railways across northern Europe experience operational problems during autumn leaf-fall, and no transport mode is immune from the most extreme weather conditions, but passengers are rightly less forgiving when services are disrupted by light snowfalls or modest increases in summer temperatures.

3.7 The reliability of freight services has also improved. Freight movements are not quite as time-critical as passenger journeys, but freight customers do rely on goods arriving within a prearranged delivery window. They identify improved reliability as one of the key reasons for switching to rail. Unreliable freight services also have an impact on passenger services and vice versa. The broken-down freight train used to be a common cause of passenger delays, but new, very reliable freight engines have considerably reduced this problem.

Causes of delay

3.8 The initial cause of a delay can be:

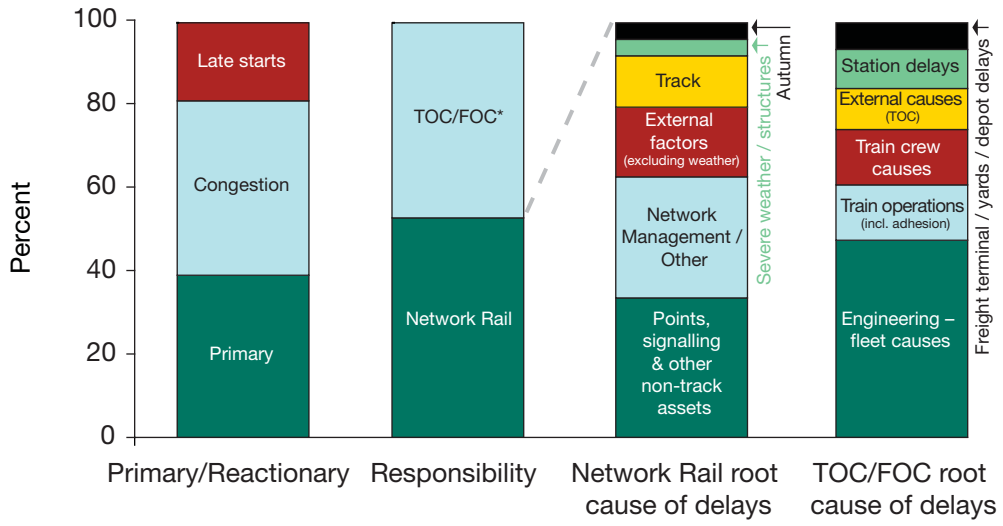
- An infrastructure problem for which Network Rail is responsible (for example, a signalling problem or a speed restriction imposed in response to a track defect);
- An operational problem for which a train operator is responsible (for example, the breakdown of a train or a shortage of drivers); and
- An incident that is largely beyond the railway's control (for example, a suicide or a fire in a line-side property).

About 40 per cent of delay is directly attributable to these initial causes (Figure 3.2). Congestion and knock-on delays from an initial incident account for the remaining 60 per cent. This is why co-ordinated recovery plans, implemented by control centres where Network Rail and train operators' staff work closely alongside one another, are so critical to improving reliability.

3.9 Delays that are initially caused by infrastructure problems are attributed to Network Rail, as are delays caused by bad weather or factors beyond the industry's control. The proportion of total delay minutes attributable to Network Rail has risen from 45.7 per cent in 1999/2000 to 54.3 per cent in 2006/07.[4] This is partly because some of the delays attributed to Network Rail are inherently more difficult to manage, but it also suggests that the heavy investment in renewals is not delivering as rapid an improvement as it should in the reliability of the basic infrastructure of the railway. Network Rail has recognised that there are aspects of its performance, including preparedness for bad weather, that it must improve.

4 Slide REL13, Summary of Key Research and Analysis, July 2007.

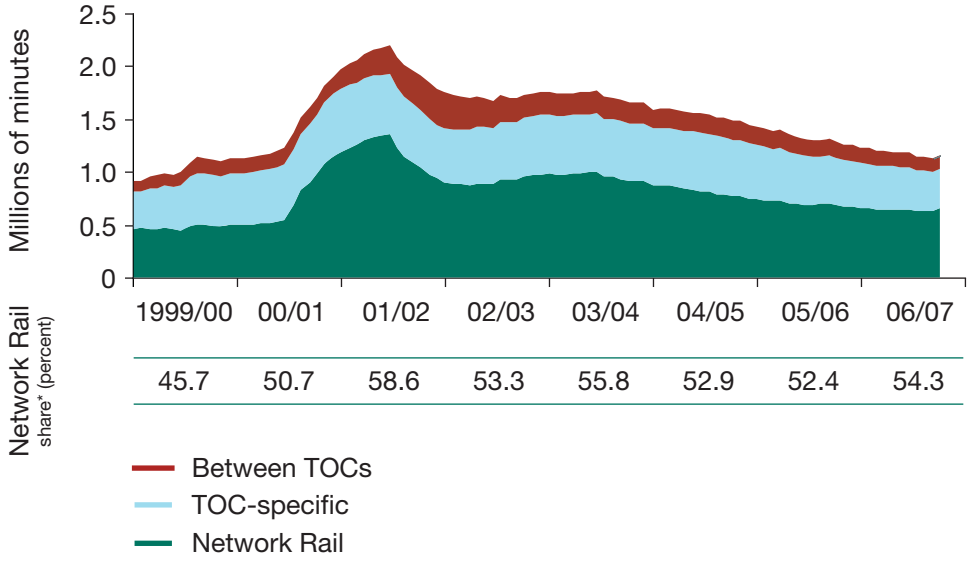
Figure 3.2: **Analysis of delay minutes**[5]



Note: TOC/FOC – Train operating company/freight operating company
Source: Network Rail (DS00089)

3.10 The most common causes of train operator delays are engineering failures. Even a minor defect can mean that a train cannot leave a depot. As train designs become more complicated, there are more on-board systems (for example, visual information displays and electronic doors) that can go wrong. New train designs are particularly prone to such problems. The reduction in delay minutes attributable to train operators (Figure 3.3) reflects the elimination of these 'teething problems' with new trains and the sharing of best practice on fleet reliability among operators.

Figure 3.3: **Breakdown of overall delay by responsible party**[6]



Note:* Network Rail share is the percentage of the total over the whole year
Source: DfT Rail Performance (DS00168)

5 Slide REL9, Summary of Key Research and Analysis, July 2007.
6 Slide REL13, Summary of Key Research and Analysis, July 2007.

Improvement sought to 2014

3.11 As with safety, the Government is seeking to maintain the momentum of recent improvements up to 2014.

3.12 The Secretary of State is therefore specifying an overall improvement in reliability from 88 per cent today to 92.6 per cent by 2014. This is to be achieved by securing reliability of 92 per cent on inter-urban services, 93 per cent on London & South-East services and 92 per cent for services elsewhere. The biggest improvement will be in the inter-urban services, where current performance is most variable.

3.13 The Government has also specified a 25 per cent reduction in the proportion of services that arrive more than 30 minutes late or are cancelled. This focuses on the delays that most inconvenience passengers and have the most serious impacts on productivity as well as on public perceptions of the railway. It requires Network Rail and train operators to reduce excessive delays and improve their recovery plans. The biggest improvements will be to inter-urban and regional services.

3.14 In specifying these improvements, the Government has had regard to the following considerations:

- 80 per cent of rail passengers believe that current reliability levels are good or satisfactory,[7] but expectations will inevitably rise;
- As Network Rail has stressed, a more reliable railway makes more efficient use of scarce network capacity than an unreliable one;
- Delivering further improvements in reliability becomes more challenging as rail usage grows; and
- Nevertheless, disparities between the best and poorest-performing lines and between the infrastructure and train operators' performance indicate scope for improvement, which is borne out by advice from the ORR.

Measuring reliability

3.15 Rail reliability is currently measured by the Public Performance Measure (PPM). The PPM is not met if a scheduled train service is cancelled or arrives at its final destination more than 5 minutes late (or 10 minutes for inter-urban services). The Government is using PPM to specify the improvement in reliability, because it is a well-established measure, with a time-series against which future improvements can be gauged. However, PPM only measures the reliability of train services and will not reflect other factors that might delay passengers.

3.16 The Government therefore asked Passenger Focus[8] to insert additional questions about delays into the spring 2007 National Passenger Survey (NPS). The results (Table 3.2) give a less robust picture of delay than PPM, because they depend on passengers' subjective views of lateness, but

7 Slide PAX2, Summary of Key Research and Analysis, July 2007.

8 Passenger Focus, *Passenger Experience of Delay,* May 2007.

they identify a number of factors that can cause a passenger to be delayed, even though the train arrives within 5 or 10 minutes of its scheduled time. It is important to note that the survey asked a sample of passengers who had experienced delay, rather than being a sample of all passngers.

Table 3.3: **Reasons given for the delay in NPS**

	Total	London and South East	Long Distance	Regional
Sample size	5,921	3,648	1,263	1,010
	%	%	%	%
The train was late departing at the beginning of my journey	59	59	56	61
The train was late arriving at the destination	49	50	53	45
The train I had planned to catch was cancelled	12	12	7	14
Could not get on train as it was overcrowded	3	4	1	2
It took longer than expected to buy train ticket	2	2	1	1
Train I took to this station was late and I missed my connection	3	3	3	3
Crowding at station meant it took me a long time to reach platform and I missed my train	1	1	0	1
Lack of/poor information caused a delay to my journey	3	3	1	3
Other	12	11	13	12
Don't know/no answer	1	1	1	1

Slide REL16, Summary of Key Research and Analysis, July 2007.

3.17 The key conclusion the Government draws from this is the importance of focusing on the end-to-end journey (see chapter 10). This view is reinforced by recommendations of the Eddington Study.[9] Passengers can be delayed by queues at ticket offices, station congestion, inability to get on a crowded train, or missed connections. And they will perceive themselves to be delayed by a cancellation, if they are unaware that a service has been temporarily withdrawn or a timetable changed. The Government will therefore continue to monitor this passenger perspective over the next

9 Paragraph 1.152, The Eddington Transport Study, The Case for Action, 2006.

control period, alongside PPM, to ensure that the understanding of the passenger experience of delay is as comprehensive as possible.

Longer-term challenges and opportunities

3.18 Continuing growth in passenger numbers will add to the challenge of improving reliability. Without enhancements to capacity, performance would begin to decline. Increasing rail capacity is therefore critical to delivering better reliability, as well as being an important goal in its own right. The new Strategic Freight Network (see chapter 9) will have a particularly significant role here, because the speeds and patterns of freight and passenger services are so different. Separating different service types will enhance overall capacity.

3.19 Improved reliability can also help increase capacity. More services can be run on a given line if all trains run precisely to their allotted timetables. This will be facilitated by new radio-based signalling technology, which has the additional benefit of reducing the disruption caused by maintenance work.

3.20 The *Rail Technical Strategy,* published alongside this White Paper, identifies many other ways in which the railway can improve reliability by exploiting technology more effectively. The approach to the Intercity Express programme reflects this thinking. The specification for the trains will improve their reliability by engineering complexity out of the design, and they will be tested in service for 15 months so that 'teething problems' are solved before the trains come into full operation.

3.21 As noted in chapter 1, passenger expectations of reliability are likely to increase as incomes grow and people value their time more. The rail industry must plan for a future in which people are less tolerant of delays and unproductive use of their time. This will place even more importance on the end-to-end journey, interchange at stations, ease of ticket purchase and quality of information.

3.22 At the same time, climate change presents a future risk to reliability. Experts do not forecast steep increases in average temperature by 2037, but they warn that severe weather incidents could become much more frequent. Network Rail is already planning for this and designing increased resilience into its renewals work. A more ambitious programme of investment, for example to strengthen earthworks and improve drainage, is likely to be needed in 2014–24.

3.23 In summary, the goal of continuous improvement that Government is setting for 2014 is one that the rail industry will have to continue to pursue in the period to 2024 and beyond.

4. The capacity challenge

Summary

For most of the post-war period the number of people using the railway fell and the size of the network shrank. The rapid growth in demand since the mid-1990s has caused load factors on many trains to increase. A full train is a good thing, but an overcrowded train is not. Investment targeted at overcrowding is a priority for the first HLOS, underpinned by steps toward longer-term increases in capacity needed for rail to contribute to sustainable economic growth.

The main challenge on the capacity agenda is the sheer scale of works needed to deal with the 40 per cent demand growth of the last decade and the 30 per cent projected for the decade ahead. By prioritising the quickest and most effective capacity-increasing measures, this level of growth can be accommodated, while containing, or even improving levels of crowding in major cities and most London termini. The biggest benefits will be seen on some of the most overcrowded services.

This requires over 1,300 additional carriages, the Thameslink upgrade, major station works at Birmingham and Reading and an ambitious programme of platform lengthening, power-supply upgrades and depot facilities. All these will be provided. In addition, there are significant investments in the current specification that are designed to enable the industry to deliver further capacity improvements beyond 2014, and which the longer-term plans set out in this chapter would sustain.

Context and recent trends

4.1 For most of the post-war period, the railway was in almost continual decline. Between 1955 and 1994/95, the number of journeys made by rail each year fell by nearly 400 million, and rail's share of the passenger market dropped from 16 per cent to five per cent.[1]

4.2 Over the past decade, these trends have been reversed. Between 1996 and 2006, the railway regained all the passenger journeys it had lost in the previous 40 years. Despite increasing car ownership, rail has actually regained 2 per cent of market share.[2] Growth has occurred in all sectors, but has been exceptionally strong on commuting services into cities such as Birmingham, Leeds and Manchester.

4.3 This increased demand is being accommodated on a 14,300 kilometre network that is substantially smaller than the network of 1955, before Beeching's cuts. More significantly, the speed and mix of traffic that the network can handle has also remained largely unchanged from the late 1980s – with a few key exceptions, such as on the West Coast Main Line.

1 Slide TPH3, Summary of Key Research and Analysis, July 2007.
2 Slide TPH3, Summary of Key Research and Analysis, July 2007.

4.4 Over the past ten years, the rolling-stock fleet has been modernised, with significant safety and passenger benefits. While the overall size of the fleet has increased by only 9 per cent, by using trains more efficiently the rail industry increased timetabled train-kilometres by 17 per cent between 1997/98 and 2005/06.[3]

4.5 Despite the increases in the size of the fleet and in train-kilometres run, the unprecedented growth of the last decade means that average load factors have increased. In some cases, this is a welcome development, since a full train is more cost and energy-efficient than a half-empty one. However, some services, in particular on key commuter and inter-urban routes, are facing capacity challenges that need to be addressed.

The capacity challenge

4.6 Capacity needs to increase so that rail can continue to contribute to sustainable economic growth. There is an alignment here between the Government's environmental, economic and social objectives. The Eddington Transport Study concluded that Government should tackle first those routes where existing crowding and congestion problems are evidence that capacity does not match demand. The CBI has stressed the impact of crowding on productivity and its influence on inward investment decisions. Research by Passenger Focus confirms that capacity is now high on the list of rail-user concerns.

4.7 However, the magnitude of the challenge should not be under-estimated. Rail has seen demand grow by 40 per cent in the last ten years, and a further 30 per cent growth is projected for the next ten years on the base scenario. Taking the two decades together, demand will have grown by over 80 per cent. Such an increase will take time to accommodate. With the improvement in rail's finances (discussed more fully in chapter 12), affordability is no longer the overriding constraint as it was in the last Government spending review, when the taxpayer had to meet the bill for Railtrack's loss of financial control. Value for money remains essential but with the level of investments now being committed, it is also increasingly important to consider the length of time it takes to deliver complex engineering projects, and the number of schemes that can be taken forward simultaneously without overloading rail industry management, making demands that suppliers cannot meet, or causing undue disruption to existing rail services.

4.8 It is therefore necessary to have a plan for each route that provides the best solution available to address capacity challenges in the short to medium term, with clearly identified options for addressing continued growth in demand in the long term. The production of detailed route plans is the responsibility of Network Rail. But the Government must decide what increase in capacity it wants to purchase in the period to 2014, what projects it wants Network Rail to embark on before 2014 in order to deliver increased capacity in the next five-year control period, between 2014 and 2019, and what steer to give the rail industry on its preferred options for meeting further growth in demand in the longer term.

3 Page 21, National Rail Trends Yearbook 2005–06.

4.9 To do this, the Government has looked at a hierarchy of solutions. The starting point for each route is to seek ways of increasing capacity that are straightforward to implement, low-cost and uncontentious, in order to bring prompt increases in capacity. Where these solutions are inadequate, the search moves on to alternative approaches that have longer lead times, or are more costly or more contentious. In more detail, the sequence in which options have been tested in framing the proposals in the following chapters of this White Paper is as follows:

- Maximise the efficient use of existing rail assets by increasing service frequency. The scope for this is limited. But Network Rail's route utilisation strategies, including the recently published draft strategy for the East Coast Main Line, confirm that additional services can sometimes be accommodated;
- Lengthen existing train services. Eight or ten carriage trains are the norm for suburban services in London and three or four carriage services in other cities, even during morning peaks. Trains can generally be lengthened without any change to infrastructure or with incremental improvements only – for example, platform-lengthening, power-supply upgrades and increased depot capacity;
- Enhance infrastructure to improve both frequency and capacity. This requires a package of measures, such as radio-based signalling, major station redevelopment, higher-capacity trains, elimination of pinch-points on lines and provision of diversionary routes;
- Simplify service patterns. Considerable increases in capacity could be achieved by these means on some routes, for example by thinning out stopping train services, but at the obvious cost of making rail travel much less convenient for some users;
- Make step-changes in infrastructure. Options include multi-tracking existing lines, upgrading them to take extra-long trains or building new lines. Such projects typically have costs measured in many billions of pounds, long lead times and unavoidable associated disbenefits, such as land-take and disruption during construction.

4.10 The right solution varies from route to route, because their starting positions and demand-growth prospects differ. In London, for example, Thameslink capacity can only be increased by a major upgrade, while there are adjacent lines where early relief of overcrowding can be secured by train-lengthening alone. On inter-urban routes, train-lengthening or increased frequencies can deliver most of the increases required before 2014, with new Intercity Express trains and radio-based signalling delivering further increases beyond that, and the possible need for additional tracks towards the end of CP6 (2024) in a high-growth scenario and where that growth occurs. In major cities beyond London, train-lengthening can address most capacity problems without additional infrastructure, but action is needed to increase the passenger handling capacity of Birmingham New Street. Growth in the demand for rail in these cities beyond 2014 will depend on their overall strategy for

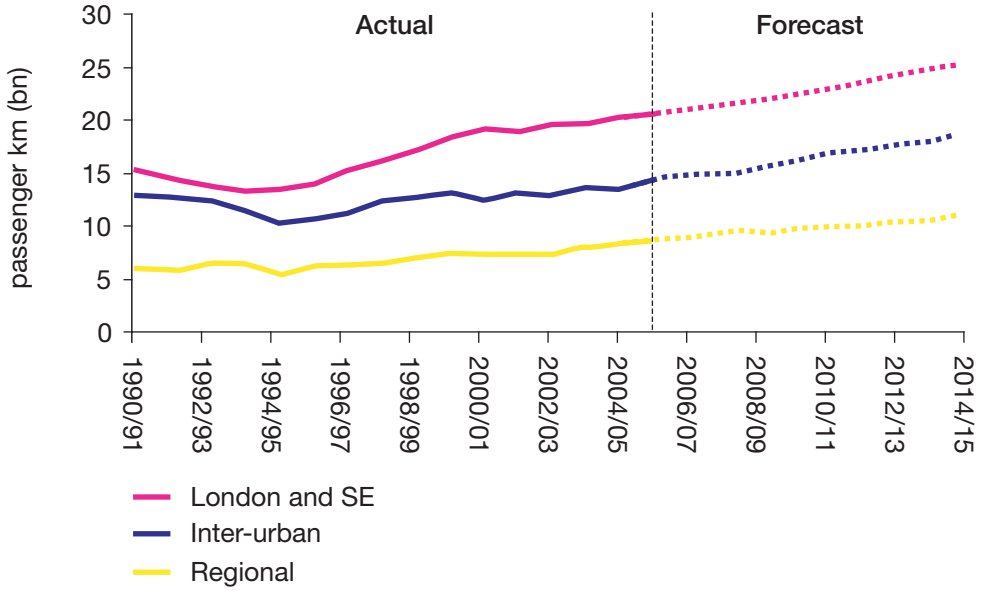
transport, including choices about the role of rail and other public transport alongside measures to manage congestion on the highway network (for example road pricing).

4.11 In short, 'one-size-fits-all' solutions are inappropriate. But an appropriate way forward for each route has been identified by applying the same hierarchy of solutions, as well as using a consistent approach to demand forecasting and to defining acceptable load factors.

Demand forecasting

4.12 In order to decide what increase in capacity it wants the railway to deliver by 2014, the Government must forecast demand growth for each of Network Rail's 23 routes and decide what load factor it wants to achieve. Forecasts were produced using the industry Passenger Demand Forecasting Handbook. These results were then compared with recent growth-rates and with forecasts from independent consultants and Transport for London. These approaches produce a consistent picture for demand on inter-urban corridors, in London and the South East and for regional travel other than commuting into major cities (Figure 4.1).

Figure 4.1: **National rail passenger kilometres actual and forecast (1990/91–2014/15)**



Note: NMF = Network Modelling Framework; The NMF calibrates well for all services running over a particular route. However, when NMF results are disaggregated by TOC, the NMF is known to underestimate the loadings of fast non-stop services and overestimate the loading of some stopping services. All these values should therefore be treated as indicative. The baseline timetable that these forecasts are built from include current franchise commitments but do not include any HLOS commitments
Details of a range of demand forecasts collated in the development of this strategy are contained in the Summary of Key Research and Analysis published electronically alongside this White Paper,
Source: NMF v1.3 Rail Passenger Kilometres forecast (DS00201); National Rail Trends Yearbook (DS00013)

4.13 In the major cities, this method produced forecasts much lower than the 5 per cent per annum seen in recent years. This is not surprising, given the changes in their economic structure in recent years, including, for example, the migration of jobs to city-centre based service industries and the accompanying regeneration of city-centre areas. After discussion of growth prospects with the PTEs and the Welsh Assembly Government, the HLOS specifies a higher level of demand to be accommodated in these cities than forecast by these traditional methods.

4.14 In finalising the High Level Output Specification, the Government also considered the passenger demand figures for 2006, which were published by the Association of Train Operating Companies in February this year. These showed a 6.7 per cent increase in demand, which is significantly above the recent trend. However, analysis commissioned by ATOC from independent consultants confirmed that, when 2005 and 2006 are considered together, average growth over the two years was in line with what the model would have predicted. Demand grew more slowly in 2005 and faster in 2006, probably reflecting factors such as the temporary reduction in leisure travel to London in the wake of the July 2005 bombings.

4.15 The Government is therefore satisfied that it is making the most robust demand forecasts possible up to 2014. This does not mean, however, that demand growth can be forecast on each route with a high degree of accuracy, even over a seven-year time horizon. It is almost certain that demand will grow faster on some routes and more slowly on others. This is why a key element of the Government's approach is to retain some flexibility in the way the HLOS is implemented, as set out in chapter 13.

4.16 The demand forecasts are built on historical relationships between demand, price and level of economic activity. But these relationships can and will change. Hence, as explained in chapter 1, this White Paper does not attempt to make long-term forecasts of rail demand. Instead, it sets out a base case with sufficient options to deal with the continuation of current growth, plus additional options to accommodate faster growth.

Load factors

4.17 The established rail industry planning standard for inter-urban services is a seat for every passenger. For commuter services, these planning standards provide that passengers should have 0.45 square metres of space, equivalent to just under 5 square feet, and that passengers should not normally have to stand for more than 20 minutes. The planning standard for inter-urban trains is pitched at a higher level than commuter trains because journeys are typically longer, while London Underground works to a planning standard of 0.25 square metres per passenger (nearly twice as high an occupancy as rail) because its journeys are typically shorter.

4.18 Passengers measure their experience in terms of how full the train is and how comfortable their journey is. Rail planning works in terms of load factors, which relate the actual number of passengers in a carriage to the number of people it was designed to accommodate. If a carriage is designed to carry up to 120 seated passengers and 80 standing

passengers, it would have a load factor of 60 per cent if it was carrying 120 passengers, whether seated or standing.

4.19 Inter-urban modes, such as airlines and coach operators, aim for 100 per cent load factors on all services, but such services generally have to be pre-booked. In theory, rail would also be operating at the most economically and environmentally efficient level at 100 per cent load factors, with every carriage full and no carriage overcrowded. In reality, of course, rail does not work like this, given that one of its key advantages is the 'turn-up-and-go' service it can provide. Passenger Focus has stressed the importance that rail users attach to this principle, and the Government agrees with them. If an urgent business meeting comes up or a relative is taken seriously ill, people want to know that rail will be able to get them there.

4.20 The consequence of this flexibility and the individual choices made by passengers is that uniform 100 per cent load factors are unachievable. In practice, when the average peak period load factor reaches about 70 per cent, some passengers will be travelling in conditions that are crowded. For this HLOS, therefore, the Government has had three main goals. The first is to move average peak-hour load factors down towards 70 per cent where they are currently higher than that. The second is to avoid increases in average peak-hour load factor in any major city or London terminus. The third is to target capacity increases at the services with the most serious crowding.

The Government's capacity specification for 2013/14

4.21 Details of the capacity increase that the Government wants to secure by 2014 are set out in the following chapters and in Appendix A.

4.22 The summary position is as follows:

- Average load factors (over both the three-hour morning peak and the 8:00 to 9:00 high peak) are stabilised and, in some cases, reduced for major cities and for all London termini other than Moorgate[4] (which benefits from Underground enhancements);
- Routes on which average high-peak load factors remain above 70 per cent in 2013/14 will benefit from the second phase of Thameslink and, potentially, Crossrail;
- About 1,300 additional carriages will be provided to deliver the capacity increase required by 2014, with associated platform-lengthening, power upgrades and additional depot facilities;
- Financial approval is being given for Thameslink, and provision is made for major works at Birmingham New Street and Reading, for the development and implementation of radio-based signalling, for the infrastructure works necessary to accommodate Intercity Express trains and for the start of work on a strategic freight network to reduce conflicts between freight and passenger movements (see chapter 9);

4 First Capital Connect Great Northern Route Services.

- The proposals deliver substantial benefit to passengers and the economy, and a significant increase to rail's carrying capacity, with a modest 5 per cent increase in rail's overall CO_2 emissions.

4.23 These measures deliver significant capacity increases for 2014 and beyond. They constitute an ambitious investment programme, which will be a challenge for the rail industry to deliver. It is a challenge that must be met.

4.24 And these measures are not the end of the story, because rail planning is an ongoing process. In 2012, the next HLOS will be published, bringing forward further rail capacity enhancements, based on the inter-modal analysis of options that the Eddington Study recommended.

5. Services for urban areas

Summary

The economic success of the nation will depend increasingly on service-sector earnings from companies based in the major cities. London's economy has long relied on rail commuting, and has seen 32 per cent growth in passengers in the last decade. Rail commuting has traditionally been less important in cities such as Birmingham, Leeds and Manchester, but has increased by over 60 per cent in the last 10 years as their economies have become more service-focused.

The resulting crowding problems are most acute in London, which also has the longest peak period. But crowding is a cause of passenger dissatisfaction and an obstacle to economic growth for several other urban areas. The Government's overall aim is to provide sufficient capacity to accommodate the high levels of forecast demand, while starting to tackle levels of crowding. We will continue to prioritise the busiest services and routes.

The principal solution now and into the medium term is longer trains. Of the more than 1,300 additional carriages committed over the next control period, about 1,200 additional carriages will be provided for urban services.

This will be backed by an extensive programme of investment to lengthen platforms, provide more depot space and strengthen power supplies. The infrastructure requirements will vary from line to line. On some lines, trains can be lengthened without any infrastructure works. At the other end of the spectrum, Thameslink requires a £5½ billion upgrade programme.

Train-lengthening will continue beyond 2014. Crossrail would relieve pressure on London's tube network and on rail services into Liverpool Street and Paddington. In other major cities the strategy for public transport will need to include choices about the role of rail and other public transport alongside measures to manage congestion on the highway network.

In the very long term, London may need either extra-long (16-carriage) trains or double-deckers. They probably have similar costs, but extra-long trains appear to offer a greater increase in capacity. However, the industry must also plan for a more '24/7' future, where accommodating peak demand becomes less of a challenge than doing essential maintenance work on a constantly busy railway.

Context and recent trends

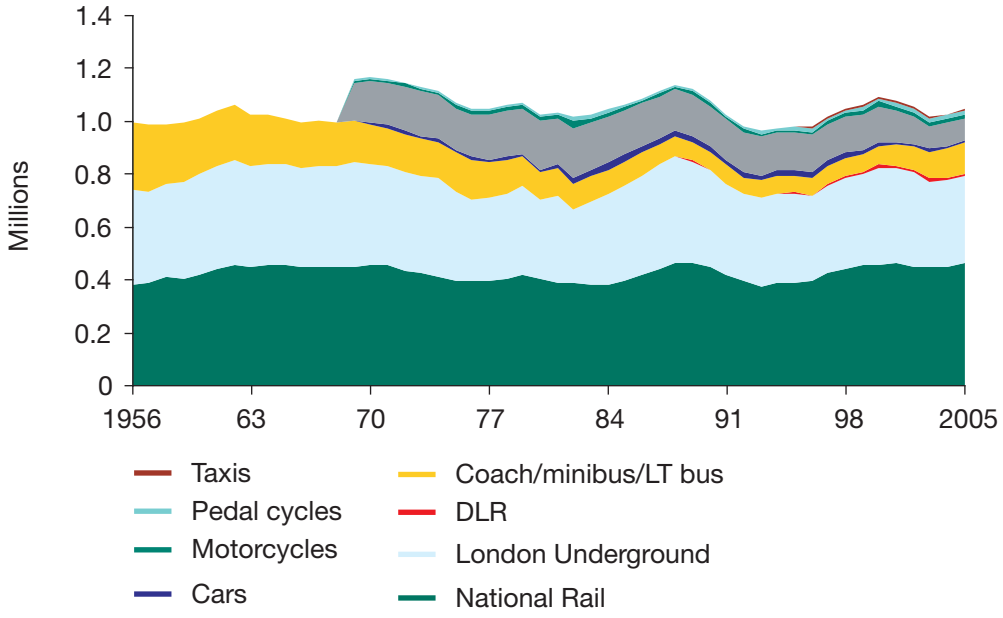
5.1 The urban networks are the largest and busiest rail markets and are the most important for economic prosperity.

5.2 Accommodating growth while improving the quality of the journey in urban areas will be the most demanding challenge rail faces. While the railway provides for a variety of travel needs, it is the commuting market that dominates the planning of urban railway services. It is the provision of enough trains in the peak that drives the cost of the railway, and the peak periods are when crowding is most acute.

5.3 London has been at the hub of the national rail network since Victorian times. Over half of all rail journeys start or finish in London.[1]

5.4 London has long had a strong focus on service jobs in a 'central business district'. As its population and economy expanded, rail played an increasingly important part in travel to work in the City and Westminster from the suburbs and beyond. Today, 44 per cent of commuters arriving in central London during the morning rush-hour do so by train (Figure 5.1).[2] London's road, rail, tube and bus networks evolved in parallel, all with a strong radial focus, moving people to and from the centre.

Figure 5.1: **People entering central London in the morning peak* (1956–05)**



Note: * 0700–1000 hours; Cars, motorcycles and pedal cycles were not recorded as a specific category until 1969. Taxis were not recorded prior to 1996
Source: DfT and *Transport Statistics Great Britain* (DS00211)

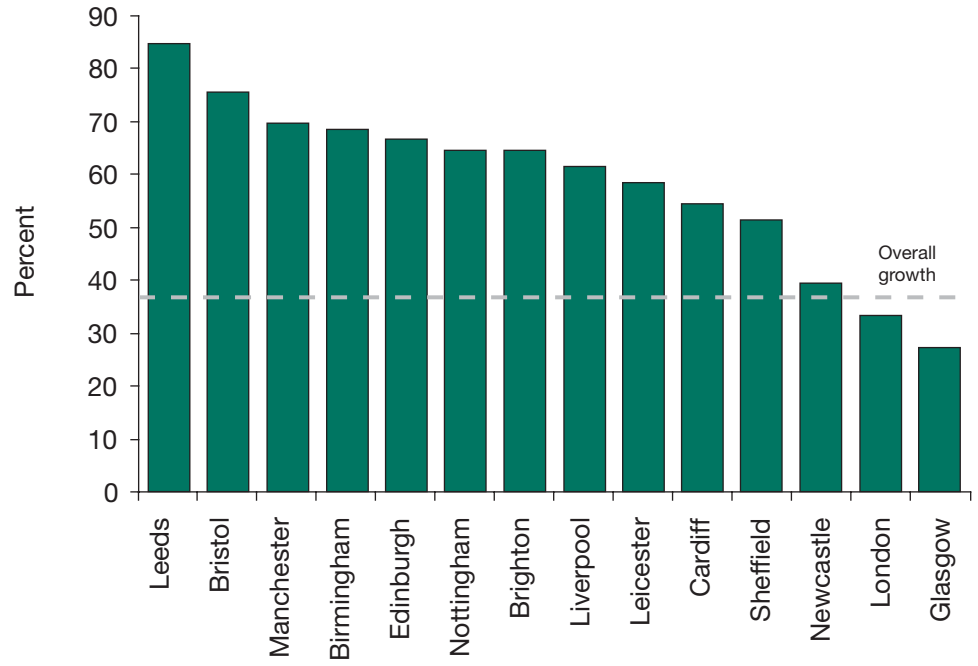
5.5 Other major cities also support commuter networks, though these are less dense than London, reflecting economies that have been more dispersed and that lent themselves better to travel by bus or car. The principal stations in cities outside London are typically closer to the city centre and have a mix of local, long-distance and freight traffic passing through, with a particular focus on long-distance traffic. There are advantages to this, but also some obvious tensions. Historically, rail's primary contribution to the economies of these cities was to provide

1 National Rail Trends Yearbook 2005–06.
2 Transport Statistics GB, Table 1.6 and Slide TPH 11 Summary of Key Research and Analysis.

inter-urban links. These fast, long-distance journeys are important, but there are growing conflicts with the rising demand for commuter services.

5.6 In the last decade, the economies of Birmingham, Leeds and Manchester and other cities have changed dramatically. Service sector jobs in city centres have increased, while light manufacturing jobs outside the centre have declined. Planning policies that focus development on brown-field sites reinforce the trend. The result has been a rapid growth in rail demand (Figure 5.2), as well as increased pressure on radial road networks. Rail passenger demand growth of 60 per cent over the last decade is the norm for these cities, compared with 32 per cent in London.

Figure 5.2: **Percentage increase in total rail passenger journeys by city* (1995/96– 2004/05)**



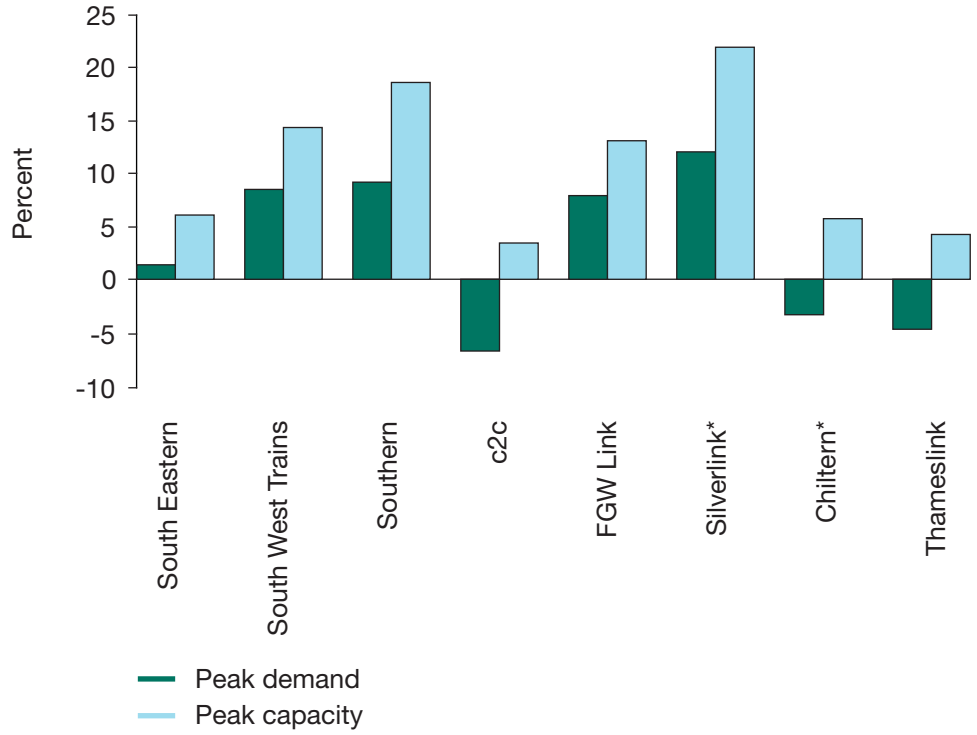
Note: * Journeys to, from and within each unitary authority
Source: National Rail Trends Yearbook 2005/6 (DS00013)

5.7 The general consequences of this demand-growth have been discussed in the previous chapter, but the specific implications vary greatly from city to city and route to route.

5.8 Around London there is evidence to suggest that conditions eased between 2001 and 2005 on many routes (Figure 5.3), such as Silverlink and Southern,[3] as a result, in particular, of more services being run and the introduction of new trains. However, on some other routes capacity did not keep pace with demand and the general perception is that crowding has got worse, although the available evidence is mixed. The level of additional demand now forecast would certainly result in a substantial deterioration in conditions if no mitigating action was taken.

3 Slide CAP13, Summary of Key Research and Analysis, July 2007.

Figure 5.3: **Percentage change in peak demand and capacity (2001–05)**



Note: * Percentage change from 2002-05;
Source: Historical counts data (DS00197)

5.9 In other cities, the increase in average load factors has been greater, but from a significantly lower starting point. The nature of crowding also differs. Some of the busiest services in cities outside London can be every bit as crowded as those in the capital. However, the pressure is not sustained over so long a peak period. As a result overall load factors are lower: the average 2007 load factor for London is 76 per cent, compared to Birmingham at 56 per cent.

Future prospects

5.10 The key challenge for the urban areas is to tackle growth in peak-period demand in the largest cities. But there are two other recent trends to factor into long-term rail-planning.

5.11 First, towns and cities such as Brighton, Cambridge and Milton Keynes are becoming significant peak-period destinations in their own right. Housing growth area proposals and initiatives such as the Northern Way are likely to see other such locations develop. There are environmental and financial benefits from this. More evenly balanced flows into and out of major cities generate more revenue and less CO_2 per passenger-kilometre.

5.12 Second, the ways in which people work and use their leisure time are changing. Peak periods are becoming longer, partly because people are trying to avoid the most congested transport conditions, but also because financial dealing rooms and offices open earlier and shops and pubs close later. Telecommuting[4] has only recently begun to make any noticeable impact on public transport demand. Sundays have become key shopping days, drawing more people into city centres.

5.13 All urban areas therefore need to plan flexibly for the future. There is a scenario in which work patterns change little and economic growth drives an increase in peak-period commuting. There are also alternative scenarios in which cities operate more on a '24/7' basis, with an increase in flexible working and further changes in leisure patterns. At one level, this could ease pressure on the peaks by spreading demand. However, it is also possible that moves toward '24/7' operations become a necessary requirement irrespective of significant shifts in the pattern of the peaks.

5.14 London forecasts produced by both the Department for Transport and Transport for London suggest an increase in London of 30 per cent in peak period demand by the mid-2020s. This is the base-case planning assumption for this White Paper and is consistent with the growth forecasts used within the Crossrail and Thameslink projects. London has seen significant fluctuations in population and transport demand before. So, even though it is possible to be relatively confident about trends over the next decade, longer-term planning needs to be flexible.

5.15 In other cities, demand forecasting is even more difficult. There is less precise information on passenger numbers, and the relationship between economic growth and rail demand is less well understood. For the period to 2014, the HLOS is based on forecasts discussed with PTEs and the Welsh Assembly Government that begin higher than those forecast by traditional methods (reflecting actual recent growth) but which progressively revert toward more traditional rates of growth by 2014.

5.16 Potential policy changes such as any road pricing schemes could alter the way people use the railway. It is too early to start to plan for the impact of any schemes, since their timing and progression depends on local choices and circumstances. The effect that any scheme would have on rail travel depends on the precise nature of the scheme and of the local rail market. Each city needs to plan its transport across all modes, shaping provision in a way that supports economic development and best takes account of local housing and planning.

4 Also known as teleworking, e-commuting, e-work or working from home in which employees enjoy flexibility in working location and hours.

Delivering improvements for London and the South East

5.17 In London, the Government has worked closely with Transport for London in the development of the HLOS and longer-term strategy so as to reflect the aims set out in Transport 2025[5] and the Mayor's London Plan. TfL is well placed to integrate transport planning evidence with London's wider economic and spatial planning.

5.18 All parties recognise that the scope for running more services into London is limited, but must be exploited where it exists. For instance Network Rail's draft Greater Anglia Route Utilisation Strategy highlights the potential to run additional peak-hour services into Liverpool Street.

5.19 Additional capacity is already planned in the South East. High-speed domestic services will run on the Channel Tunnel Rail Link from 2009 and South West Trains and First Capital Connect are contractually committed to lengthen trains on their routes. Over and above these commitments, the Government plans a substantial programme of train-lengthening, starting in the HLOS period but continuing over the next 10–15 years. Large parts of the network are already capable of accommodating 12-carriage trains, and others can be readily adapted to do so. By the early 2020s much of London's railway should be operating 10- or 12-carriage trains.

5.20 The enhancements to deliver train-lengthening will need to be progressed alongside two major infrastructure improvements.

5.21 The first of these, the Thameslink Programme, will start immediately. It will enhance frequencies and capacity on cross-London services, provide crowding relief for the Underground and improve a number of key interchange stations.

The Thameslink Programme

The Thameslink Programme will enhance the frequency and capacity of services that operate north–south through central London. It will provide a step change in capacity by allowing 12-carriage operations and 24 trains per hour in both directions through the centre of London. The enhanced Thameslink route will serve a greater number of stations north and south of London and will provide significant congestion relief (both on national rail and London Underground) while providing capacity for growth in future. The scheme provides significant economic benefits to London and the wider South East.

The total cost will be around £5½ billion and the Government is committing to the implementation of the programme, with the full scheme delivered by the end of 2015. Significant interim outputs will be delivered by the end of 2011, including the ability to run 12-car trains along the Midland Main Line and through central London. The new Thameslink platforms at St Pancras will open later this year.

5 Transport 2025, Transport Vision for a Growing City, TfL, November 2006

5.22 Crossrail is designed to enhance capacity on the main east–west corridor and ease crowding on services into Paddington and Liverpool Street, as well as providing some crowding relief from south-east London. An enabling Bill for Crossrail is currently before Parliament.

Crossrail

Crossrail is a important part of the future strategy to deliver additional rail capacity in London. The scheme promoted by the Government would provide significant crowding relief for several London Underground lines, relieve national rail services into Liverpool Street and Paddington, provide some additional capacity from south-east London, and provide important connections to the east and west, including Heathrow. It is designed to be an important contributor to London's long-term economic prospects and also to play an important role with regard to the distribution of passengers across central London.

5.23 Improvements to the rail network can relieve pressure on tube or light rail lines, and vice versa. Schemes funded by Transport for London, supported by substantial Government grant over five years, include the East London Line project, extensions to Docklands Light Railway, improvements on the North London Line, and the development of London Overground alongside London Underground's major programme of upgrades. These schemes will relieve crowding on parallel national rail services (such those into London Bridge) and allow more orbital journeys to occur. They will also improve the capability of the main London stations to handle the onward journeys of many more passengers.

5.24 In the medium term, further capacity enhancements will be required. To achieve this, a number of different initiatives need to be considered together. Cab-based signalling is likely to be critical, especially on longer-distance commuter routes. It will enable trains to run more reliably, while also increasing service frequency. New types of rolling stock will be required on a number of routes to allow faster loading and unloading as well as quicker acceleration. Anticipating this need, the Government will begin to consider the design requirements for such a train, which will be procured in a similar way to the Intercity Express Programme.

5.25 Major stations will need to be re-developed to permit higher frequencies of service and handle greater numbers of passengers safely. In the longer term additional capacity could be created by simplifying service patterns. Overall capacity could be increased by focusing particular routes on a single terminus, standardising stopping patterns and/or reducing the number of services that run from the smaller branch lines directly through onto the main line.

5.26 Planning for some of these changes has already begun. The next generation of commuter trains could form part of the Thameslink Programme. Network Rail has already set out plans for the development of many of the main London stations linked to capacity improvements. And provision is made within this White Paper to fund preparations for cab-based signalling.

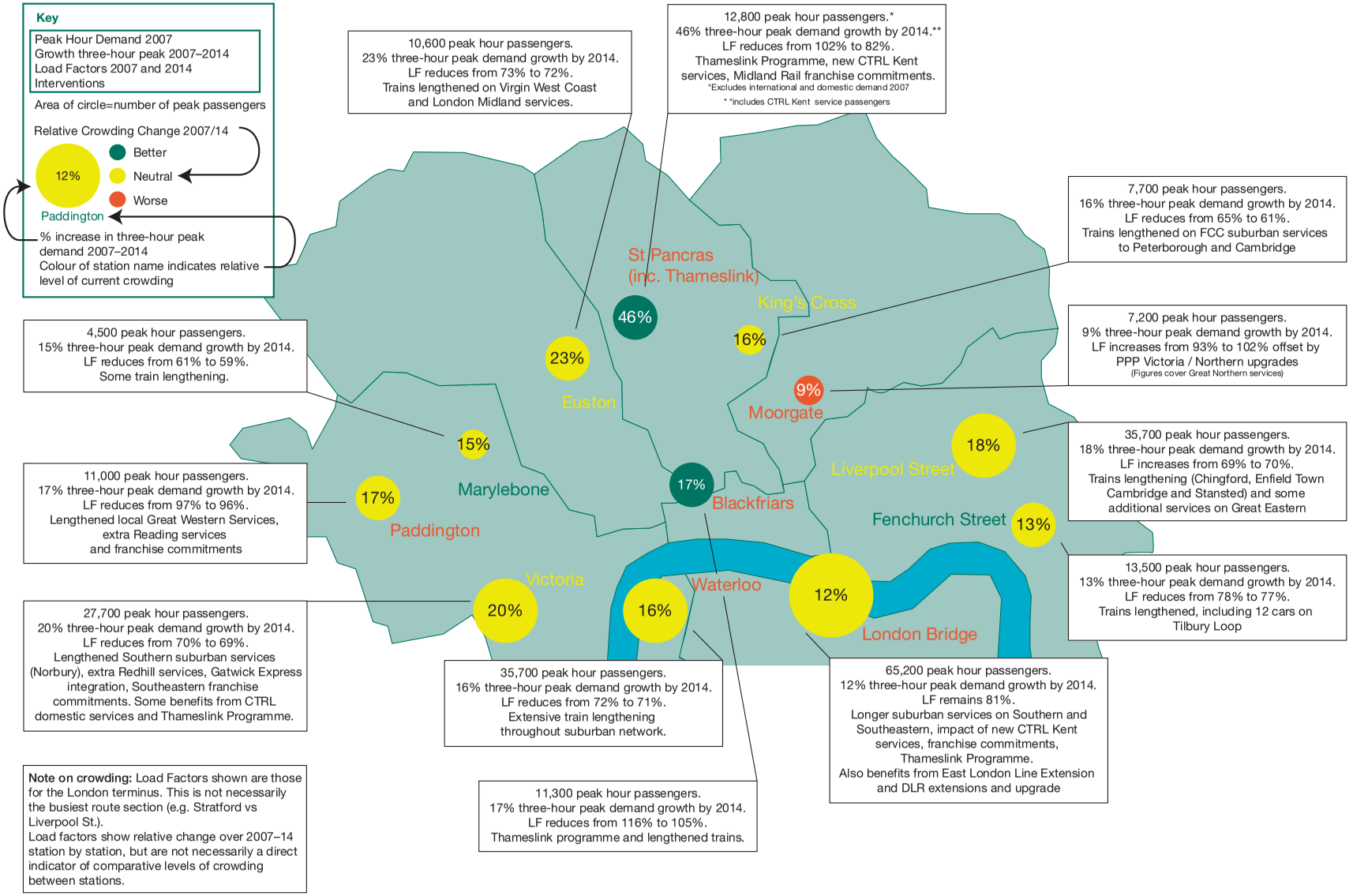
5.27 However, if very strong growth continues to be focused on the peak periods, then it is possible that, over the period of this strategy, further interventions may be needed.

5.28 The Government has therefore worked with Network Rail to consider the feasibility of further, long-term interventions aimed at delivering, if necessary, a step change in the carrying capacity of the railway. This would allow more passengers to be carried in reasonable comfort and support the development of the wider London economy. This work has focused on two options: double-deck trains similar to those seen in Europe, and extra-long trains of up to 16 carriages. The work concludes that both solutions are feasible, but disruptive and expensive. Each could deliver an increase in capacity, but increases are likely to be larger with extra-long trains, despite comparable implementation costs. Extra-long trains also offer increased flexibility, and lower levels of disruption as routes are adapted. Further information about these assessments will be published on the Department for Transport web site.[6]

5.29 Figure 5.4 shows the improvements that the High Level Output Specification contained within this White Paper is forecast to deliver in London by 2014. It shows current average load factors at each of London's main termini, together with the load factor to be delivered in 2014. It shows where the additional carriages are likely to be required and briefly notes other relevant projects. It is important to note that this is a snapshot of the position on 31 March 2014.

6 Network Rail Evaluation Report for Double-Deck and Extra Long Trains.

Figure 5.4: **Forecast changes to demand and load factors in London between 2007 and 2014**



Delivering improvements for other urban areas

5.30 Outside London, the same options of train-lengthening and making better use of existing capacity will be pursued between now and 2014.

5.31 The key differences compared with London are:

- Most services are run by trains with fewer than six carriages. Some services use as few as two. Adding one or two more carriages to such services will both remove existing crowding and accommodate further growth. In most locations, the existing infrastructure can already accommodate longer trains, or can easily be altered to do so.
- Network Rail's Route Utilisation Strategies have identified more opportunities for running additional services on existing track than are available around London. These will be adopted where possible.
- Network Rail have also identified 'bottlenecks' in places such as Birmingham, Leeds and Manchester where a predominantly two-track railway is used by a mixture of commuter, regional, inter-urban and freight services. Network Rail's renewal programme is expected to tackle some of these in the period up to 2014.

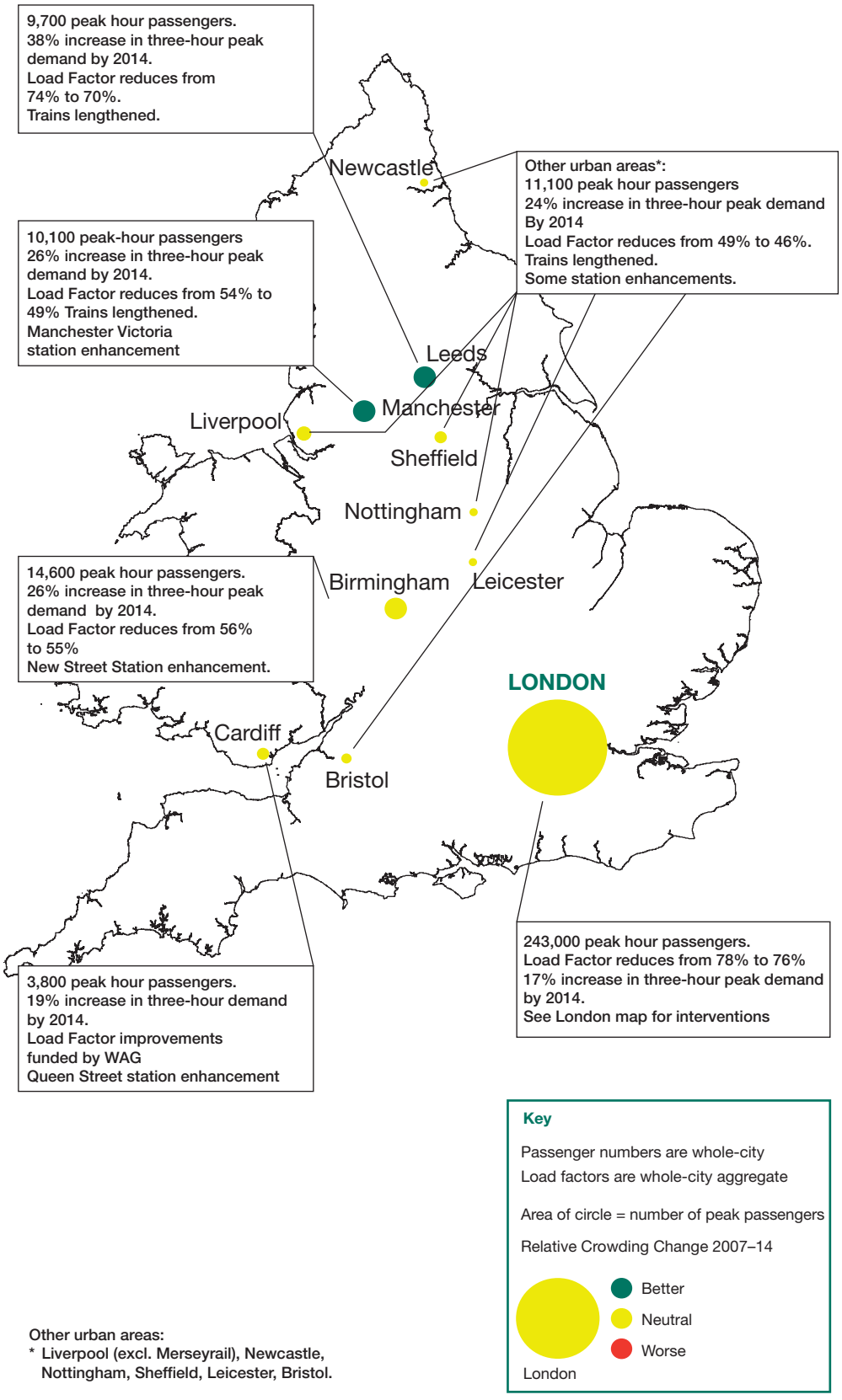
5.32 In general, there is therefore less need for investment in infrastructure to accommodate demand growth in these cities to 2014, and there is more headroom to accommodate further growth beyond 2014. Birmingham New Street is the principal exception. Birmingham New Street suffers from significant passenger congestion and an unattractive environment for a major city. A number of proposals have been put forward, including linking the station redevelopment with a wider redevelopment of that part of the city centre. The Government has agreed to contribute to improvements in passenger capacity and station environment. These will get under way before 2014, and funding is committed as part of the HLOS.

5.33 Beyond 2014, cab-based signalling, initially associated with main line enhancements, will provide more capacity on some routes and improve reliability for passengers.

5.34 In meeting the twin challenges of accommodating growth while improving conditions for passengers, it is likely that rolling stock will need to be moved from some areas to others. The Government has set aside £30 million for trains to be refurbished as they are redeployed, so that they meet passenger expectations. Older trains will be the first to be replaced, and the Government has already started to assess a programme for the replacement of Sprinter and Pacer trains, which provide the commuting and regional fleet in many areas.

5.35 Figure 5.5 shows the improvements that the HLOS is forecast to deliver by 2014 in those cities in England and Wales for which additional investment is being committed. It shows current aggregate average load factors for each metropolitan area together with the load-factor to be delivered in 2014. Once again, it is important to note that this is a snap-shot of the position on 31 March 2014.

Figure 5.5: **Forecast changes to crowding in selected cities (England and Wales) between 2007 and 2014**



Planning and greater devolved responsibility

5.36 The Eddington Study emphasised the importance of planning on a multi-modal basis, as well as the links between transport, economic and land-use planning. The Government has sought to support this through its programme of Regional Planning Assessments for the railways (RPAs). Developed in close consultation with regional partners, RPAs analyse how the rail network might best develop in order to maximise its contribution to regional economic and spatial strategies.

5.37 This co-ordination of economic, land-use and transport planning is of particular importance within cities and their travel-to-work area. It is here, too, that the ability to plan on a multi-modal basis is, perhaps, most vital. The Government believes that such planning is best undertaken within the cities themselves. The draft Local Transport Bill, currently undergoing pre-legislative scrutiny, is a significant first step in supporting cities outside London to develop further their transport governance and expertise. The Bill will require major cities, and enable other areas, to review and propose changes to their existing governance arrangements. In keeping with the principle that devolution requires stronger local and sub-regional accountability, there is potential for cities and city regions to have greater say in how rail is planned and delivered in their areas. The operators of the railway must reflect such developments and progressively allow for greater city or city-region interests.

5.38 The Government will not be revisiting the structure of the railway that was established in *The Future of Rail* White Paper in 2004, in particular, the issue of PTE co-signatures for franchise agreements. The Government believes that the contractual responsibility for specifying rail services should not be separated from the responsibility for paying for them.

5.39 However, the Government will look for opportunities to work more closely with cities on rail matters within the current framework. The 'increment and decrement' process[6] whereby Government specifies the franchise baseline, while local authorities can add services (and pay extra) or subtract services (and receive savings to use on other priorities) is the start of a process of further regional and metropolitan engagement. This gives local authorities an influence over the specification of franchises in their area.

5.40 Further devolution in England is possible within the current framework. In London, the Government will continue to examine ways in which the aspirations and requirements of the Mayor can be accommodated within the current franchise structure, including aspirations regarding frequency, hours of operation, service quality and branding. Initial consideration is being given to a revised franchising concept for London that could be extended to other metropolitan areas. This will maintain the existing franchise structure, and would not require co-signatory status, but would give relevant transport bodies a bigger influence over franchise specifications.

6 *The New System for the Role of English PTEs in the Rail Franchising Process*, DfT, July 2006.

Future trends in patterns of travel

5.41 Changes in the way people live and work will also affect how and when they wish to use the railway. The Government will work with the rail industry to plan for this, with a particular emphasis on the railway's potential to lengthen the operating day and provide a more consistent pattern of service across the whole week.

5.42 Network Rail and the ORR are scrutinising the efficiency of maintenance work, which is critical to the operating hours of the railway. Network Rail accepts that progress can be made and the delivery of such enhanced capability is a central part of its own business planning.

5.43 More can also be done with train operators to help spot changes in patterns of use. In future, the Government will require train operators to begin monitoring crowding levels across all services, with the aim of better aligning supply with demand. This will be supported by the introduction of new technology that is able to record passenger numbers at all times of the day.

5.44 Finally, it is important that the products offered by the railway reflect and support how people want to travel. In future, smartcard ticketing will enable more flexible fares to be introduced, which will assist and encourage passengers to tailor their travel. Products could include season tickets with different numbers of days in the week (such as three- or four-day tickets), fares that reward travel outside the busiest times, or pay-as-you-go type fares. Chapter 10 discusses the Government's plans to encourage and enable such innovation.

6. Inter-urban services

Summary

The growth in the economies of major cities has put pressure on the air, rail and road links between them. The Eddington Transport Study stressed the economic importance of the key inter-urban corridors and the need to develop transport solutions for them on a cross-modal basis.

The Government's priority for inter-urban rail is to increase capacity in order to start to tackle overcrowding and secure the railway's contribution to sustainable economic growth. To achieve this on the inter-urban network, the Government is buying increased capacity on the Midland and East Coast main lines and Cross-Country services. West Coast and Trans-Pennine trains will be lengthened. Key congestion pinch-points, such as Reading, will be alleviated. The new generation of Intercity Express trains will enter initial passenger service in 2012 and start coming into full service in 2015. Network Rail will deliver the infrastructure works necessary to accommodate these new trains during Control Period 4. It will also develop and start implementing radio-based signalling, which has the potential to deliver further significant capacity increases.

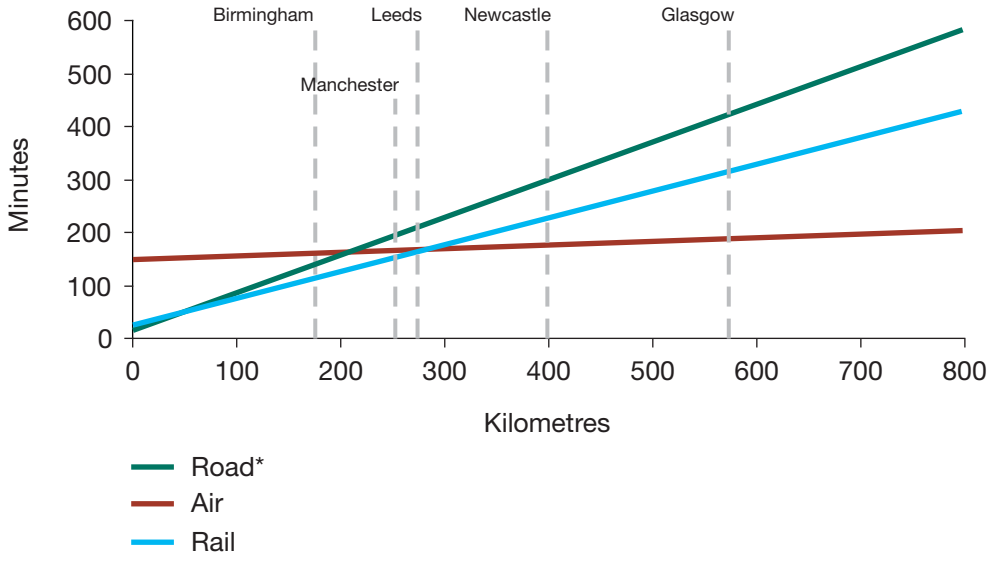
On the basis of recent demand trends, if the investment committed in this HLOS is maintained through future control periods, in accordance with the capacity and funding projections set out in this White Paper, then the measures described would be sufficient to meet growth on all routes until about 2030. But long-term demand forecasts are uncertain. There is a need to ensure that feasible options exist which could meet a faster growth demand. At present, the balance of advantage would appear to favour new services running at conventional speeds and operating on an existing disused alignment between London and Birmingham. But this is not a decision that need, or should, be taken now. Further assessment of the options will be taken to inform the next HLOS. Any schemes will need to be considered alongside other modes and judged against the key criteria of capacity, value for money and environmental benefit.

Context and recent trends

6.1 The railway is a natural choice for journeys between city centres. The fastest door-to-door journey-time between central Manchester and central London, for example, is around 2 hours by train, 3 hours by air and 4 hours by car (Figure 6.1). The railway performs well in terms of predictability of journey time and has the important advantage that people can work or relax during a train journey in a way that is not possible when flying or driving. Even during the post-war decades of decline, the railway retained a strong share in this market, which was enhanced by British Rail's very successful promotion of the InterCity brand in the 1970s.

6.2 As the economies of London and other major cities have grown, so has the demand for travel between them. The result is that air, rail and road links are all coming under greater pressure. In the ten years since 1995, inter-urban rail demand has grown by 35 per cent[1] (measured in passenger kilometres), road travel by 17 per cent[2] and domestic air travel by 43 per cent.[3]

Figure 6.1: **Door-to-door journey time versus distance by mode**



Note: * Figure for road is obtained from journey time planners – mode of transport is not specified
Source: Eddington analysis time between London and other UK and European cities by mode (DS00062)

6.3 The Eddington Study stressed the critical importance of good inter-urban links to the competitiveness of the UK economy. Consultation carried out with the CBI and research provided by the British Chambers of Commerce in developing this White Paper highlighted the influence that a reliable and frequent rail service has on business-location decisions. Firms need to be confident that their key staff will be able to get to urgent meetings with their parent company or with major customers at short notice.

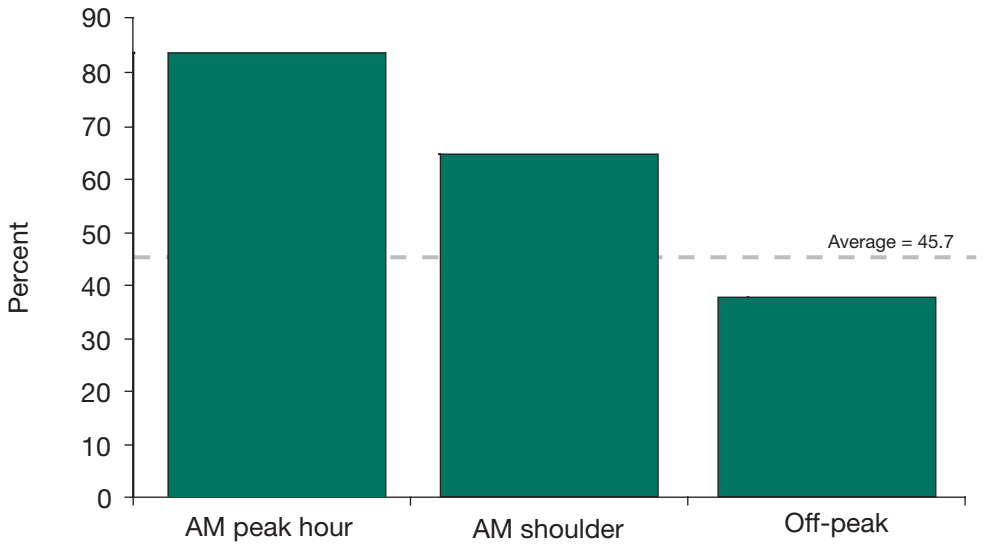
6.4 However, despite its economic significance, business travel between city centres accounts for only a small proportion of traffic on inter-urban corridors. Motorways and inter-urban railway lines are also key freight corridors. Most passenger movements have an origin or destination beyond a city centre, for which the rail network is a less attractive choice.

6.5 Inter-urban rail routes also play an important role in accommodating the rapid growth in commuting over the last decade. Service patterns have changed to reflect this, and the average distance travelled on inter urban services has declined by 25 km[4] since 1999. In the morning peak, two-thirds of passengers on Midland Main Line and Great Western inter-city services are commuters.[5] Average load factors across the day are only

1 National Rail Trends Yearbook 2005–06, Table 1.16.
2 Table 7.3 Transport Statistics Great Britain.
3 Table 2.2 Transport Statistics Great Britain.
4 Slide TPH 10, Summary of Key Research and Analysis, July 2007.
5 Atkins Inter-Urban Rail Forecasts for the Eddington Transport Study and the DfT (2006).

45 per cent, indicating that the network has considerable spare capacity (Figure 6.2). But crowding is now a serious issue on the approaches to London and on those sections of the Cross-Country and Trans-Pennine routes where commuter and longer-distance journeys overlap. The problem is compounded by the fact that inter-city trains (unlike commuter trains) are not intended or designed to accommodate a mix of seated and standing passengers.

Figure 6.2: **Average seat utilisation on inter-urban services by period* (2006 modelled)**



Notes: * AM peak hour covers arrivals during 8–9am, shoulder peak during7–8am and 9–10am. Off-peak refers to all other times. Load factors are defined for arrivals into London, apart from TPE and VXC, which are arrivals into Manchester and Birmingham respectively. The NMF calibrates well for all services running over a particular route. However, when NMF results are disaggregated by TOC, the NMF is known to underestimate the loadings of fast non-stop services and overestimate the loading of some stopping services. This inaccuracy is most apparent on the MML route with too many passengers allocated to Midland Mainline services and too few to FCC Thameslink. All these values should therefore be treated as indicative. The baseline timetable that these forecasts are built from include current franchise commitments but do not include any HLOS commitments.
Source: NMF v1.3 Rail Passenger Km forecast (DS00201)

Future prospects

6.6 For the period to 2014, the DfT forecasts that long-distance all-day passenger demand will grow by around 2.5 per cent a year. Over the period to 2030, demand is projected to grow by 73 per cent. The impacts of this are shown in Figure 6.3. If no action were taken, peak-period crowding would become acute on the following routes: Bedford–London, Birmingham–Leeds, Birmingham–London, Manchester–Leeds, Reading–London and York–London.

6.7 However, rail demand cannot be predicted with any confidence over a 20-year time horizon. Achievement of the Government's targets to reduce carbon emissions will have implications for business and leisure travel. It could encourage greater use of the railway, but also prompt businesses and individuals to think harder about the need to travel. It could have particularly significant implications for long-distance commuter travel. The fact that

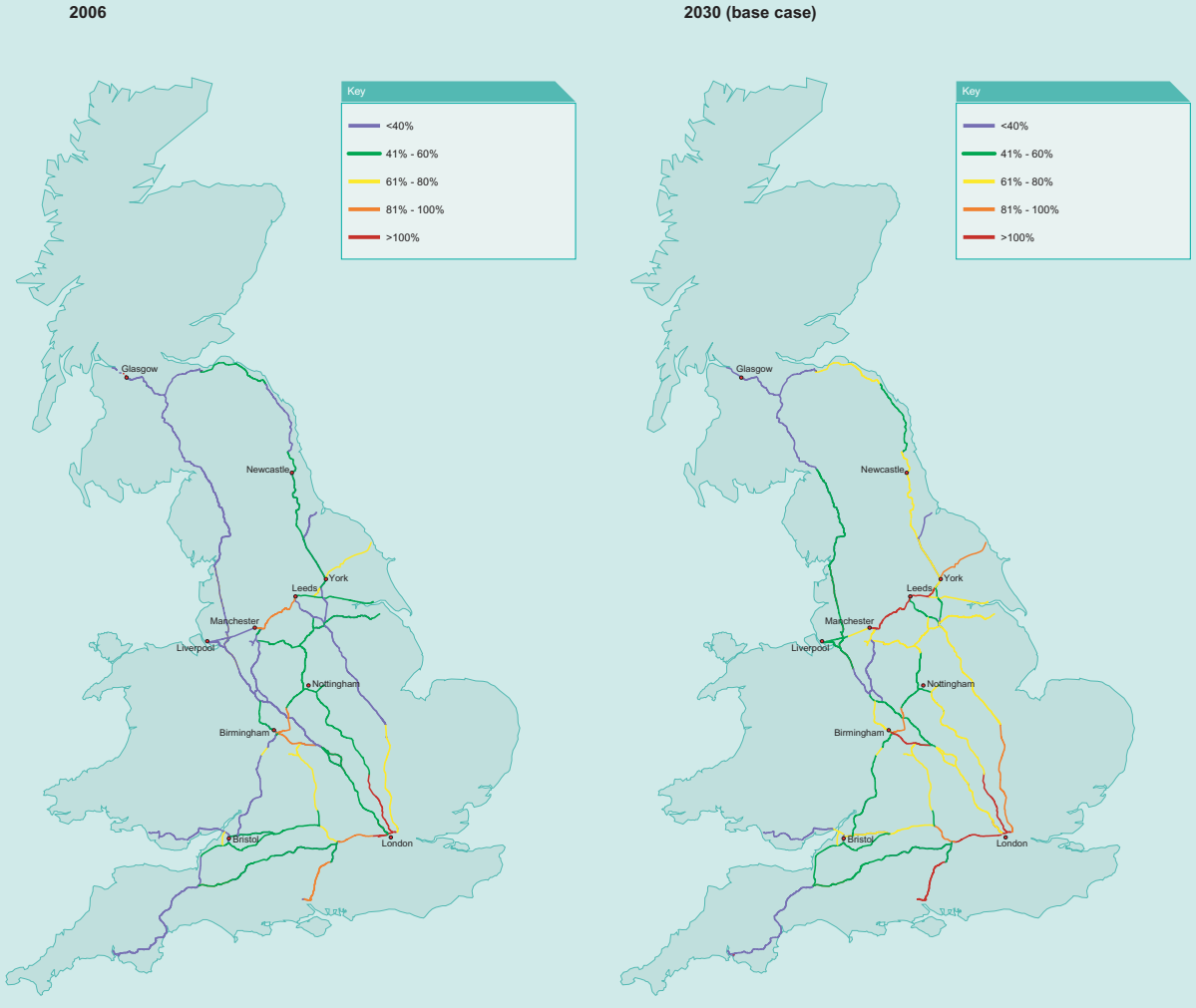
London is about one hour by train from towns like Peterborough and Swindon has made long-distance commuting very attractive, but at a high carbon cost.

6.8 Rail demand will be heavily influenced by developments on other modes. The Eddington Study indicated that highway demand could grow by 30 per cent on 2003 levels by 2025.[6] Remedial action to tackle inter-urban road congestion – whether by road widening, traffic management or other measures – will inevitably impact on the demand for rail travel, as will developments in domestic aviation.

6.9 Lastly, even if aggregate inter-urban rail demand could be forecast with confidence, that would not help with route-level planning. Some cities will grow faster than others, because they have inherent competitive advantages or because they plan or market themselves better.

6.10 It is therefore necessary to have a flexible inter-urban rail strategy that can be adapted if long-term demand actually grows significantly faster or more slowly than currently forecast.

Figure 6.3: **Loading levels on inter-urban services by 2030, AM three-hour peak**



Source: NMF 3.1 (DS00206 and DS00207)

6 Eddington Transport Study, paragraph 3.12.

Strategy and delivery

6.11 The public debate about inter-urban rail is easily dominated by discussion of the merits of high-speed lines or maglevs. The debate tends to conflate two very different issues – the need for additional capacity to accommodate demand growth, and the case for shorter journey times.

6.12 As stressed elsewhere in this White Paper, the Government's priority for the railway is to increase capacity. This is necessary to respond to today's crowding problems. It is also necessary to create 'headroom' for rail to grow further, so that it can contribute to sustainable economic growth.

6.13 Where a capacity increase can also deliver a journey-time reduction, this is an additional benefit that should be taken into account. However, one of the key messages from the Eddington Study is that the UK benefits from well-established transport networks and from its relatively compact geography. Journey times by rail between major UK cities compare favourably with those achieved in other European countries (Figure 6.4). Scheduled air services link the six largest urban areas that are more than 200 km apart. Together, rail and air already meet the business traveller's requirement to be able to get 'there and back' in a day. The CBI confirms that frequency and reliability of rail services matter more than journey time. Passenger Focus research confirms that cutting journey time is not a high priority for passengers either. Reduced journey time will often be an incidental benefit of measures to increase capacity, but prioritising on them in this rail strategy would divert resources from the real priority of improving capacity and reliability.

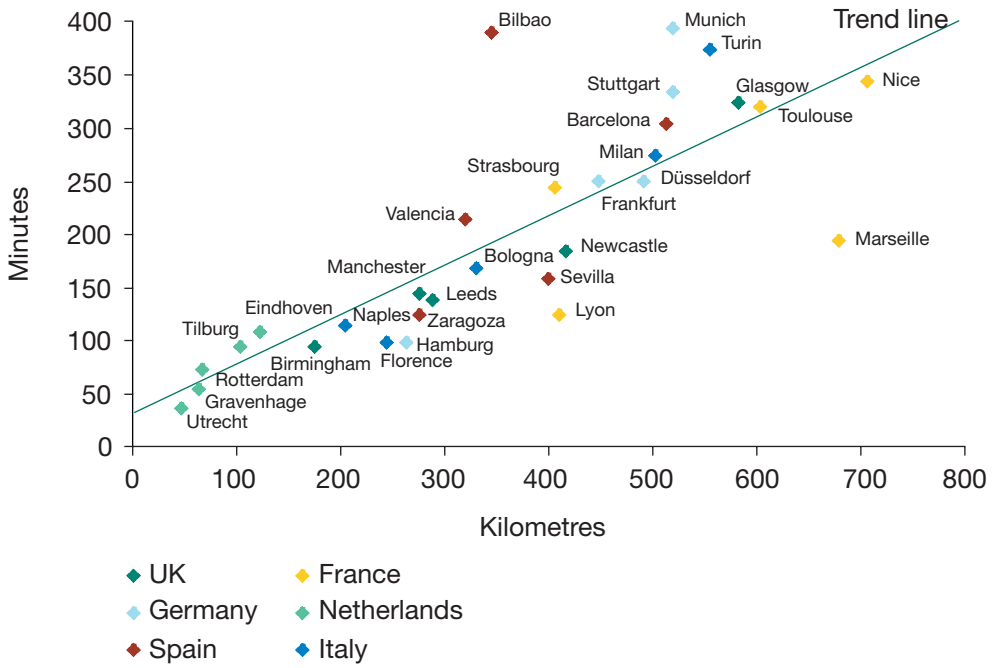
6.14 Higher speed is not the only or best way of cutting journey times. Nor is it without cost. Increasing the maximum speed of a train from 200 km/h to 350 km/h means a 90 per cent increase in energy consumption. In exchange, it cuts station-to-station journey time by less than 25 per cent and door-to-door journey-time by even less.[7]

6.15 The argument that high-speed rail travel is a 'green option' does not stand up to close inspection on the basis of the present electricity generation mix. The Government estimates that carbon emissions per passenger for a journey between London and Edinburgh will be approximately 7 kg of carbon for conventional-speed rail, 14 kg for high-speed rail, and 26 kg for aviation. Passenger carbon emissions are likely to be similar between Glasgow and London.[8]

6.16 This significantly dilutes the carbon saving available, given the cost of infrastructure and the further carbon and wider environmental impacts of construction. It serves to raise serious questions about whether this is the most effective way to maximise environmental benefits from any available public investment.

7 Slide JT8, Summary of Key Research and Analysis, July 2007.
8 Slide JT9, Summary of Key Research and Analysis, July 2007.

Figure 6.4: **Door-to-door journey time versus distance for rail journeys from capital city by country**



Source: Eddington analysis time between London and other UK and European cities by mode (DS00062)

6.17 If the carbon-footprint of electricity generation reduces substantially or zero-carbon self-powered trains become available, the case for 350 km/h trains will look very different. But the key considerations of capacity, cost, journey-time benefits and carbon efficiencies must be an essential part of longer-term considerations of other options.

6.18 Although passengers are not prioritising speed and journey time, there are other facets of inter-urban rail quality that do concern them. Inter-urban reliability is variable. The requirement on the railway to reduce delays of more than 30 minutes (see chapter 3) will particularly benefit inter-urban rail users. Timetables and engineering closures have not adjusted to reflect increases in weekend leisure travel. Sunday services are often slower, less frequent and more subject to disruption caused by engineering works. As a result, passengers find alternative ways of travelling or choose not to travel. The challenge here is for Network Rail to increase the availability of the network to allow a near-seven-day railway to operate to satisfy the demand of passengers and freight operators.

6.19 The Government's strategy is to improve the quality of inter-urban rail services, and to make the best use of existing networks by:

- Lengthening existing trains, increasing service frequencies and tackling key congestion pinch points (including Reading and Birmingham New Street);
- Bringing the new generation of Intercity Express trains into full service from 2015; and

- Funding the development and implementation of radio-based cab signalling, which could allow a substantial further increase in train frequencies, while maintaining safety standards.

6.20 In March 2007, the Government began the process to procure the next generation of Intercity Express trains, which will be the core element of inter-urban rail strategy from 2015 onwards. The new trains will deliver between 20 and 40 per cent more capacity than existing InterCity 125s. They will have the ability to be lengthened (without loss of performance) or shortened to respond to changes in patterns of demand. They will be readily adaptable to run on whatever future power sources prove most efficient. Their acceleration, deceleration and boarding characteristics will cut journey times and improve reliability. They will be lighter and more environmentally friendly. And they will be designed to accommodate cab-based signalling in future.

6.21 The new Intercity Express trains will be trialled in 2012 and will start to enter passenger service from 2015. The Government envisages these replacing InterCity 125s on the East Coast and Great Western Main Lines, but then extending progressively to other main lines. In advance of that, Network Rail will be re-engineering the track over which the new trains will run, to provide the greater precision that lighter-weight trains need and to provide passengers with a smoother ride. This work will start in the next seven years and is covered within the HLOS.

6.22 Alongside the introduction of Intercity Express trains, other increases in capacity will be made before, during and after CP4. The highlights are as follows:

- **Great Western Main Line:** Up to double the current peak capacity could be provided as a result of the remodelling of the Reading station area, the deployment of the new Intercity Express train and re-modelling the tracks approaching Paddington station. The route would also benefit from Crossrail services from Maidenhead.
- **West Coast Main Line:** 50 per cent additional peak capacity is available from completion of West Coast Route Modernisation, lengthening of Pendolinos and addressing the remaining capacity pinch points, including a significant increase in network capability in the Stafford area. Additional capacity is also provided within the HLOS by lengthening suburban services from Northampton and Milton Keynes.
- **Midland Main Line:** The successful Stagecoach bid for the new East Midlands franchise will deliver a 9 per cent increase in peak capacity by 2010 and 12-minute journey time reductions from a fast London–Sheffield service. Up to 50 per cent additional peak capacity is possible from deployment of new and fully-formed Intercity Express trains. Seventy per cent additional capacity will be delivered south of Bedford as a result of the Thameslink Programme.
- **East Coast Main Line:** The recently published draft route utilisation strategy for this line confirms that additional train paths are available to run increased service frequency specified in the invitation to tender

for the Intercity East Coast franchise. Around 70 per cent additional peak capacity could be provided from new Intercity Express train deployment; timetable simplification; and major works to address the bottlenecks along the route. A further increase in capacity may be possible from a major redevelopment of the approaches to Kings Cross. Capacity enhancements can be delivered on the south of the route as a result of longer suburban trains and completion of the Thameslink Programme.

- **Cross-Country:** The Arriva bid for the new Cross-Country franchise will deliver a 35 per cent increase in capacity on the busiest parts of the route by 2009. The route will also benefit from capacity increases on parallel inter-urban and urban services.
- **Trans-Pennine:** Additional capacity will be provided by lengthening the trains operated by Trans-Pennine Express. Journey times between Liverpool and Manchester will be reduced to 40 minutes and fast services between Manchester and Leeds cut to 43 minutes. The HLOS will deliver a 30 per cent increase in capacity on the north Trans-Pennine route.

6.23 Signalling technology will change fundamentally over the next 20 years. Radio-based cab signalling will allow trains to operate more frequently and more safely. Each train will be constantly updated on the position and speed of the train in front, and can adjust its own speed accordingly. The capacity benefits will vary from route to route, but initial analysis indicates that it may be possible to increase the number of train paths on the West Coast Main Line from 14 to 20 trains per hour. To maximise the capacity benefits, additional station capacity will be required and timetables will need to be redrafted. The potential benefits of radio-based signalling are substantial and are explored further in the *Rail Technical Strategy* which accompanies this White Paper. The industry will press ahead with preparations for such a future conversion through the implementation of the European Rail Traffic Management System over the next seven years.

Planning for flexibility

6.24 On the basis of recent demand trends, if the investment committed in this HLOS is maintained through future control periods, in accordance with the capacity and funding projections set out in this White Paper, then the measures described would be sufficient to meet growth on all routes until about 2030. This strategy is robust. Even without new signalling, options exist to accommodate high and sustained growth in passenger numbers for at least two decades. However, it is important that a genuinely long-term strategy for the railway should look at the options for further increases in capacity if demand grows significantly faster than currently projected.

6.25 There are four rail-enhancement options that could make a future contribution to inter-urban capacity: a new dedicated freight line, a maglev, multi-tracking an existing line or a new all-purpose line.

6.26 A freight-only line is, at best, an indirect way of addressing projected demand growth. It relies on removing freight trains from the existing network to allow more passenger trains to run. In practice, very few freight trains run on the busy sections of the main-line corridors during the peak hours, which means that removing freight mainly benefits off-peak capacity. For this reason the Government concludes that this is not an effective and efficient way to address a peak-period passenger problem. The Strategic Freight Network set out in chapter 9 would provide greater benefit to freight operators and would do much more to relieve tensions between freight and passenger operations across the railway.

6.27 Maglev systems offer a step change in speed, but costs and levels of technical risk are also likely to be significantly greater than high-speed rail. Travelling at 500–550 km/h, a maglev would be sufficiently fast to provide a London–Glasgow service that could compete with air on journey time, whilst providing intermediate stops at Birmingham, Manchester, Leeds, Newcastle and Edinburgh. Its promoters, UK Ultraspeed, have estimated a cost of £29 billion (excluding land-take) for such a network, However, the only operational maglev system in the world (the Shanghai airport link) had costs three times higher than their equivalent high-speed rail lines. This suggests that the figure could be very significantly greater in the UK (of the order of £60 billion). The maglev technology is proven over relatively short point-to-point stretches of line, but scaling it up to a national network introduces a further level of technical risk. The higher speed of maglev inherently involves higher levels of aerodynamic noise and energy consumption. The capacity of maglev would be substantial, but it offers less potential operational flexibility than a conventional railway, which could provide diversionary routes or be switched to mixed use if demand patterns change. The Government's view, shared by the Eddington Study, is that speed is not of itself a strategic priority. Given the balance of these considerations, the Government does not favour further development of maglev options.

6.28 The remaining alternatives of multi-tracking or building a new line are more finely balanced. However, the clear view of railway professionals with experience of the Channel Tunnel Rail Link and West Coast Main Line projects is that the disadvantages of undertaking major new construction work alongside a working railway outweigh the advantages. In addition to the operational complexity of working alongside a live railway, the technical problems with interfacing between new technologies and old, often obsolete, technologies can be considerable. And over the years conurbations have grown around the UK's transport arteries. To widen an existing main line could impose a great deal of disruption and would be intrusive to the communities along the route.

6.29 For this reason the Government believes that any future planning should focus on new line options. The question of whether, where and when new lines might be needed is one that can only be answered in the context of a proper multi-modal assessment of the passenger and freight demand on each inter-urban corridor. As stressed in chapter 4, long-term rail demand

cannot be forecast with any accuracy, and rail provision cannot be planned in isolation. On the inter-urban corridors, rail options will have to be assessed alongside road-widening, road-pricing and traffic management measures. This analysis will have to look at east–west corridors (including the South Wales – London and Trans-Pennine) links, as well as the north–south corridors on which the debate has tended to focus thus far.

6.30 In relation to the north–south corridors, a number of options have been proposed to date. These include proposals for high-speed lines, as well as more capacity-focused schemes that offer new services running at conventional speeds. Clearly, each has its particular strengths. And all of them would represent a substantial financial commitment of between £10 billion and £30 billion – the equivalent of the total enhancement budget available to the railway for between five and ten years.

6.31 As discussed earlier on the basis of the present carbon footprint of electricity generation, the balance of advantage would appear to favour services running at conventional speeds on reopened alignments between London and Birmingham. But the Government believes that it would not be prudent to commit to a preferred route or alignment at this stage. The need has not currently been established. The environmental trade-offs remain uncertain. And the funding is not available.

6.32 Further analysis will be undertaken, and the results delivered in time to inform the next HLOS in 2012. This, in turn, leaves sufficient time for the planning and construction of a line before the benefits of other capacity measures are exhausted. Within the context of a multi-modal analysis, the Government believes that any rail options would need to satisfy three main criteria:

- To deliver, on key routes, the benefits of providing capacity and tackling congestion that are, and are likely to remain, the strategic priority;
- To be affordable and represent good value for money; and
- To be environmentally sustainable and deliver a good environmental return for the scale of investment committed.

6.33 In the meantime, the focus of the Government and the industry will be on delivering a strategy based on network-wide investment, through the commitments funded in the HLOS, and the preparations set out above for longer-term, flexible responses to future demand.

7. Regional and rural services

Summary

Regional and rural lines vary considerably. They range from short single-track branch lines to double-track routes between larger towns and cities. They serve rural communities, local commuter markets and tourist destinations.

One thing these routes have in common is that they have suffered in the past from low or declining demand and the threat of closure. Their fortunes have improved dramatically in recent years, and growth has been particularly impressive on some lines, particularly those covered by Community Rail Partnerships.

The Government will not close any regional or rural routes in the period covered by the HLOS. Nor does it envisage reopening lines. In the longer term, the shape of the network may need to change, but the agenda for the period to 2014 should focus on demand growth and cost reduction on the existing network.

The Government has not tried to identify specific regional routes that will require additional carriages in the period to 2014. Instead, provision has been made for a pool of additional carriages to accommodate expected growth in demand on regional routes.

Building on the success of the Community Rail Development Strategy, the Government wishes to see further reductions in operating and infrastructure costs. A more differentiated risk-based approach to railway standards could have a key part to play here. As with urban areas, the Government is keen to explore ways in which locally based institutions can have greater say in the future of their railway lines.

Context and recent trends

7.1 'Regional and rural services' describes the rail network outside the larger urban areas and away from the main inter-urban routes. It accounts for around 12 per cent of the railway by length and 17 per cent of all stations.[1]

7.2 Passenger services on regional and rural routes are typically provided by short trains, operating to a frequency of around one train per hour or less. In most cases, capacity is sufficient to accommodate current levels of demand.

7.3 A key feature of the network is the diversity of routes and markets served. Table 7.1 shows some examples. They range from longer routes carrying a mix of traffic – including longer-distance passengers, freight and local stopping services – through to rural branches that connect smaller towns and villages with a local regional centre or with the main line.

1 House of Commons Transport Committee – Rural Railways Volume 1, 2004/05.

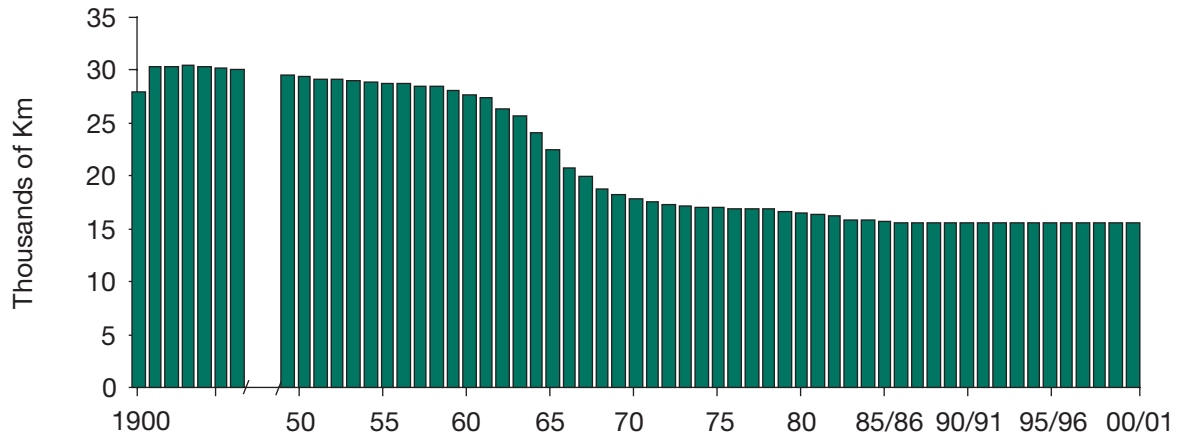
Table 7.1: **Examples of regional and rural lines**	
Route	**Features**
The Cotswold Line (Oxford to Worcester)	• The line is almost 60 miles long, with 12 intermediate stations that serve a range of villages and market towns • It was rationalised in the 1970s, with long sections of single-track and lengthy gaps between signals • Capacity is now fully utilised by the 15 to16 trains a day • Many services continue onwards to London or Hereford • The main journey purposes are commuting (50 per cent) and education, shopping and leisure (10 per cent each)[2] • It serves an area with high incomes and car-ownership levels
Cumbrian Coast line (Barrow to Carlisle)	• The line is 85 miles long, with a mix of single and double track and with 25 intermediate stations • Regional Planning Guidance for the North West (RPG 13) identifies Furness and West Cumbria as priorities for regeneration of the local economy • The majority of passengers commute to Barrow, Carlisle and Sellafield[3] • There is ongoing freight use, including nuclear-related traffic to/from Sellafield
Newquay to Par	• The line is a 20-mile-long single-track route, with five intermediate stations at small villages • It is used by some freight trains serving the china clay industry • There are far higher numbers of passengers in the summer months, when through-trains run to London and other cities

7.4 Just as this network covers a diversity of routes, so it provides for a mix of journey purposes. This diversity also means that traffic levels can vary significantly. A number of routes, particularly those serving seaside resorts, have particularly high levels of demand in summer that can present capacity problems. For example, around half of the annual demand at Paignton station in Devon is during the four summer months.[4]

7.5 As a result of the Beeching programme of the 1960s, many regional and rural services were closed.[5] But, while *The Reshaping of British Railways* heralded a radical number of changes, closures had always occurred on the railway (Figure 7.1). The capacity and capability of the lines that remained were often reduced to lower costs.

2 Cotswolds & Malverns Transport Partnership – Line Enhancement (final report), January 2005.
3 North West Regional Planning Assessment, DfT 2006.
4 South West Regional Planning Assessment, DfT 2007.
5 Slide CAP 67, Summary of Key Research and Analysis, July 2007.

Figure 7.1: **Length of national rail network (1900–00/01)**



Source: Atkins High Speed Line – Milestone 7 (DS00169)

7.6 In contrast to walking, cycling and bus travel, which have often declined in rural areas,[6] the fortune of regional rail services has improved in recent years. Many lines benefited from the introduction of new rolling stock, which has helped improve frequencies and reduce journey times. Regional Planning Assessments have identified the increasing popularity of living in smaller towns and rural areas, which has in turn increased longer-distance commuting. Between 1991 and 2001, there was a net population shift of almost 800,000 from urban to rural areas.[7] Another factor driving increased rail patronage has been the increasing traffic congestion in some towns and villages. These factors also have increased capacity pressures at station car parks (see chapter 10).

7.7 Local communities increasingly value their local rail service. This was demonstrated by the emergence of partnerships between community organisations, local authorities and train operators to promote local lines. In 2004, the Government formally recognised the role of these partnerships and launched the Community Rail Development Strategy.[8] The objectives of the strategy are: to increase passenger numbers, revenue, and freight use; manage costs downwards; increase local involvement; and enable the railway to play a larger role in economic and social regeneration.

7.8 The low density of the network means that rail's market share of travel in regional and rural areas is only 1 per cent[9] and is unlikely to ever become a major mode of transport. However, the rail services that survived the Beeching programme do provide a necessary alternative for those without access to a car. Car ownership is increasing[10] and is often higher in rural areas, but the lack of access to a car has a greater significance, since other public transport provision is often sparse.

6 Rural Transport: An overview of key issues, CfIT 2001.

7 Social and economic change and diversity in rural England, DEFRA 2004.

8 Community Rail Development Strategy, SRA, November 2004

9 Figure represents all passenger journeys in low population density areas. Rail compares to five per cent for bus and 88 per cent for car.

10 The number of households in rural areas without a car fell from 22 to 16% between 1985/6 and 1997/9. Rural Transport: An overview of key issues, CfIT 2001.

7.9 As illustrated by table 7.2, the railway can help combat social exclusion and support local economies by providing access to leisure, education, employment and services.[11] And while the economies of these areas have undergone demographic, social and economic change and seen a general increase in prosperity, areas of rural deprivation remain.[12,13]

Table 7.2: **Employment status of passengers on a sample of regional routes**

% or equivalent	Nottingham to Lincoln	Norwich to Great Yarmouth and Lowestoft	Barnstaple to Exmouth	Barrow to Carlisle
Work full-time	41	54	53	52
Work part-time	11	13	11	13
Unemployed	7	15	6	10
Retired	6	8	14	15
Student	35	9	15	9
Other	–	1	1	1

Future prospects

7.10 The Government believes that regional and rural services have a positive future. Their financial position is improving. Community Rail has enhanced the role of regional services and raised their profile. The Government forecasts continued growth across these services over the next 10 years, although demand on individual lines could obviously grow much faster in some cases, and decline in others.

7.11 However, there are challenges ahead. For example, the carbon footprint of the most lightly used lines is likely to come under increasing scrutiny. At low load factors, the 'green' advantage of rail travel is eroded (Figure 7.2). This reinforces the importance of winning new business.

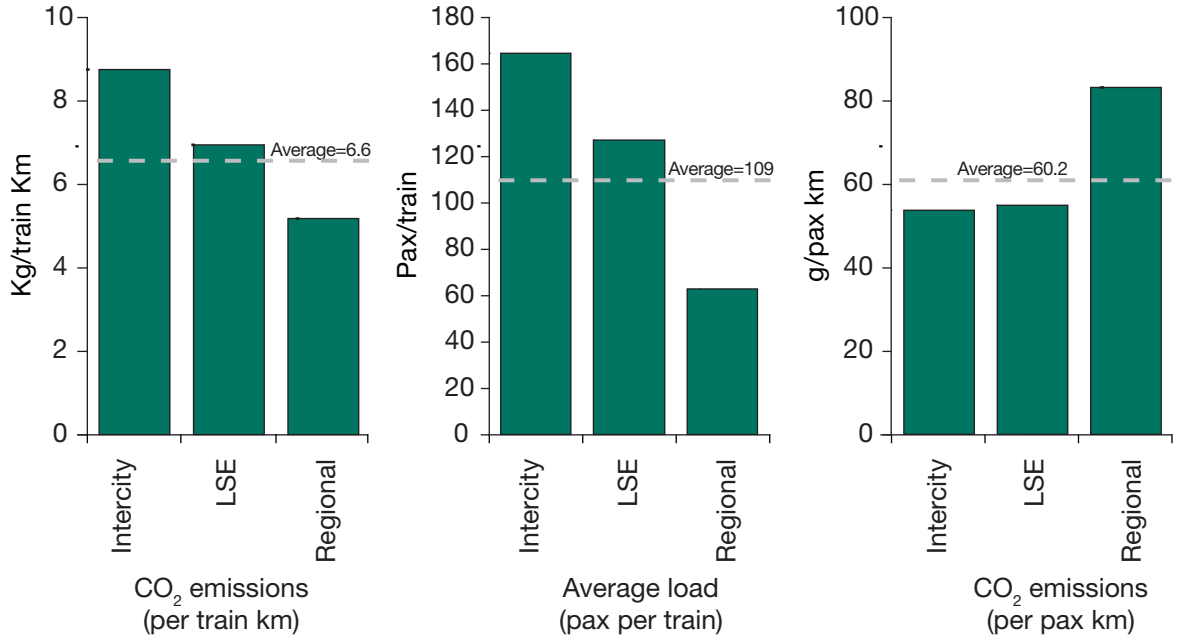
7.12 Like the rest of the network, regional services must also respond to rising customer expectations, as well as meeting future challenges of cost control and changes in demand. This is essential, since the strategy seeks not just to retain regional services, but to develop them.

11 Report on the profile of passengers on regional rail routes in England, SRA 2003.

12 Social and economic change and diversity in rural England, DEFRA 2004.

13 Small and market towns in rural Wales and their hinterlands, Wales Rural Observatory 2007.

Figure 7.2: **Carbon dioxide emissions in relation to train and passenger kilometres**



Source : NMF (DS00194)

Strategy and delivery

7.13 The Government's strategy includes a variety of proposals and policies, which will be applied to regional and rural services as individual opportunities arise, taking account of their very varied circumstances. The policies are based around a consistent objective of improving long-term sustainability by encouraging demand growth, working with Network Rail to reduce costs and improving the environmental performance of these services.

7.14 The first policy is network stability. The Government does not propose any line closures for the period up to 2014, and this is reflected in the budget for the railway published as part of this White Paper. In setting budgets for subsequent control periods, the Government will, of course, first review the position to ensure that such services are continuing to fulfil a justifiable need, at a reasonable price to both farepayer and taxpayer.

7.15 However, the regional railway must be able to plan its services flexibly. Changes to service patterns are always likely to attract criticism, since there will be losers as well as winners. However, if these routes are to accommodate demand changes, and improve their sustainability, there is likely to be a need for services to alter.

7.16 The Government will continue with the successful Community Rail Development Strategy (Figure 7.3). Nineteen have so far been designated.[14]

14 Slide FIN 49, Summary of Key Research and Analysis, July 2007.

Figure 7.3: **Community rail lines and services**



Note : No line or service will be designated without local support.

7.17 In 2007, the Government's Review of Community Rail Development Strategy[15] showed that they had made a positive impact in attracting passengers and revenue. Revenue on some routes has increased by around 25 per cent in two years – approximately 5 per cent higher than on similar non-designated routes. On the route to St Ives demand rose by 50 per cent. Not all demand growth can be attributed to Community Rail, but a greater focus on making these services attractive to passengers and marketing them effectively has clearly generated additional revenue.

7.18 The Government believes the rail industry should further assess the operating and infrastructure costs on more lightly used routes, especially where there is little prospect of freight services operating. Such routes could benefit from risk and usage-based adjustments to engineering approaches and standards so that these are more appropriate for their

15 Department for Transport, March 2007.

particular circumstances while maintaining a safe, good-quality network.[16] Network Rail has a key part to play in this. This is discussed in more detail in the *Rail Technical Strategy*.

7.19 Local involvement beyond Community Rail also forms part of this strategy. The Community Rail Development Strategy has been complemented by local initiatives, such as station adoption schemes. Where implemented, they have improved the attractiveness of the railway and generated additional demand as a result. The Central Stations Initiative[17] is an example, with redundant station buildings in the Midlands transformed into valued community resources.

7.20 The Government recognises that some routes need investment in rolling stock to accommodate passenger growth. The HLOS therefore makes provision for a pool of 30 additional carriages, which will be available to respond to regional opportunities. Regional routes are also likely to benefit from additional capacity provided on services in urban areas since many routes are served by the same rolling stock. While some lines are unlikely ever to justify new trains, the Government will facilitate the cascade to regional routes of more modern rolling stock displaced by new trains elsewhere. There is also provision in the funding up to 2014 to refurbish such trains, to enhance their quality and environmental performance.

7.21 The Government has already started to develop a programme for the replacement of the Sprinter and Pacer fleets, which operate many of the trains on the regional and rural network. Replacement is likely to start in the latter half of the next decade.

7.22 As in urban areas, local transport authorities already have the opportunity to promote changes in services to tailor rail services to local needs. This is particularly important to respond to changes in the location of work and housing. Developer contributions can also be of particular value. Such changes should form part of the normal evolution of the railway.

7.23 While stations can be developed relatively rapidly (some 40 new stations have been opened in the last 10 years),[18] the Government does not envisage changes in the pattern or level of demand large enough in the HLOS period to justify developing or opening new regional lines. Individual proposals will of course be subject to consideration on their merits. The Government recognises the role that rail can play in facilitating growth, evidenced by the recent agreement to re-introduce passenger services to Corby.[19] However, the Government does not propose a blanket approach to safeguarding all potential alignments or disused lines. This would be disproportionate and blight homes and properties. Strict controls are already in place for the development of railway land, and local authorities can use local planning processes to protect sites or alignments if they deem this appropriate.

16 Such an approach has been adopted by Deutsche Bahn Netz Regional Networks in Germany.

17 Central Stations Initiative (Adopt a Station) managed by ACoRP.

18 Slide STA10, Summary of Key Research and Analysis, July 2007.

19 Subject to securing third party contributions to capital costs.

8. International

Summary

Britain is a trade-dependent island. The economy depends increasingly on exporting services to pay for imported goods. The quality of international transport links is therefore vital.

Rail provides an important means of access to and from ports and airports. It is also, via the Channel Tunnel, an international transport mode in its own right.

Continuing growth in international movements has to be managed alongside the domestic passenger market. The South East and East of England represent a particular challenge, with three of the UK's busiest airports and two of the UK's busiest ports operating alongside commuting flows to London. But the opening of the Channel Tunnel Rail Link in November 2007 will bring London to within around two hours of Paris and Brussels, and investment from the Transport Innovation Fund will improve rail links to key ports.

At the same time, the Government is at the forefront of European Union proposals to increase competition on rail networks across Europe. The Government believes rail performs best when its operations are open to competition, and will support European Union Directives that facilitate this.

Rail freight delivers significant environmental benefits over other modes, especially over the longer distances that operate across Europe.

Context

8.1 Britain has long been a trade-dependent island. Its openness to international trade was a key factor in its rapid economic growth in the late eighteenth and early nineteenth centuries. Today, international trade contributes about 30 per cent of total GDP.[1]

8.2 The nature of Britain's trading relationship with the rest of the world is changing. Globalisation integrates national economies more closely, but also reinforces the tendency for them to become more specialised in the goods and services they produce. As a result, service industries and high-value manufacturing are ever more important to the British economy, and there is an increasing reliance on imported food, raw materials and lower-value manufactured goods. Every day around 750,000 tonnes of goods are imported.[2] In an increasingly competitive global market, Britain's economic viability depends critically on the quality of its international connections. Poor links would add to the cost of Britain's imports and exports, and reduce its attractiveness as a business location.

1 Ports Policy Review, DfT 2006.

2 Eddington Transport Study, December 2006.

8.3 The Eddington Transport Study therefore identified international gateways – and especially those showing signs of congestion and unreliability – as one of the three strategic transport priorities.

8.4 The primary role for rail, in this context, is to contribute to getting people to and from airports and goods to and from ports where flows are dense enough to make rail a viable option. Both markets are expected to grow. The challenge is to accommodate these movements of people and goods as efficiently as possible and in an environmentally sustainable manner.

8.5 This is a particular challenge in the South East. The concentration of major international airports and deep-sea ports generates rail demand that has to be accommodated alongside the already crowded commuter flows into London.

Access to airports

8.6 Air is the dominant mode for international passenger movements. It also accounts for 30 per cent by value of UK visible exports. The 2004 White Paper, *The Future of Air Transport,* noted that there had been a five-fold increase in air travel over the preceding 30 years. The Government's most recent forecast is for a further doubling of demand by 2030.[3]

8.7 As the number of people using airports increases, so does the challenge of providing efficient and environmentally friendly connections, particularly between the major airports and the cities they serve. The larger airports are also significant travel-to-work destinations, with an estimated 70,000 people working at Heathrow, for example.

8.8 It is the Government's view that any proposals for new airport capacity must provide surface access options that minimise environmental, congestion and local impacts. Rail is not always the best way of providing such access. It is only likely to make a significant contribution in the case of the larger airports, where the passenger volumes are large enough to justify the sort of high-frequency service that air travellers require.

8.9 The proximity of airports to major cities and their wide catchment areas creates tensions between the needs of commuters and air travellers. Airport operators and airlines have an understandable preference for fast, dedicated services to city centres. But, as noted in chapters 4 and 5, the urban rail networks are already under pressure from increases in commuter travel, and need to use capacity as effectively as possible. As a result, new dedicated airport services are unlikely on congested parts of the network.

8.10 The Route Utilisation Study for the Brighton Main Line demonstrated that it is not possible to provide trains exclusively for the use of Gatwick passengers in the peak hours, without a significant detrimental impact on other customers. The solution in this case is to deploy high-capacity trains that can contribute to the commuter service from a small number of stations in peak hours, while still leaving adequate seats and space available to accommodate airport passengers and their luggage. This

3 The Future of Air Transport Progress Report, DfT 2006.

was reflected in the recently announced decision to merge the Gatwick Express service into the Southern franchise. However, in letting this franchise, the Department for Transport will ensure that operators have a proper understanding of the needs of airport users and take account of this in the service they provide.

8.11 The funding of any airport-specific rail improvements will inevitably require careful consideration on a case-by-case basis. But the principle which the Government will apply is that the 'beneficiary pays'. This means that costs of any enhancements should be apportioned according to those that benefit. It is likely, therefore, that airport operators and developers will have to bear a proportion of such costs. This underpins the ORR's developing policy in this area[4] and the charging policy of the Civil Aviation Authority. The benefits of such schemes to other users would be funded through normal rail funding processes.

International rail passenger services

8.12 The southern third of Britain lies at the north-west corner of one of the most densely populated regions in the world, comparable with the north-eastern seaboard of the USA or the Pacific coast of Honshu, Japan. Approximately 100 million people live within the area covered by the map in Figure 8.1, which also contains five capital cities and the administrative centres of the European Union, as well as major commercial and industrial centres and ports.

8.13 It is a region in which mobility is facilitated by the increase in the range of international travel options available between the UK and the Continent. Traditional ferry services have been supplemented by a rapid expansion in air services and a reduction in the price of air travel, and by the Channel Tunnel, which provides a quicker crossing for cars and lorries as well as direct freight and passenger services between Britain and mainland European destinations. The Eurostar services and other onward services can provide more convenient connections than air in linking British and other European city centres.

8.14 The key constraint on growth of international rail passenger traffic is that there is well-established evidence that people will not use it for time-critical journeys of more than about three hours. That is why the provision of the Channel Tunnel Rail Link has been so important. Britain's geography already provides competitive journey times between London and our major cities without further need for high-speed infrastructure. The Channel Tunnel Rail Link puts London within comparable rail journey times for some of the major cities in North West Europe as well.

8.15 The completion of the Channel Tunnel Rail Link and commencement of international services from St Pancras in November this year will cut London–Brussels journey-time from 2 hrs 15 mins to 1 hr 51 mins and the London–Paris time from 2 hrs 35 mins to 2 hrs 15 mins (Figure 8.2). It also facilitates interchange with domestic rail services to the North

4 The ORR is currently consulting on the Policy Framework for Investments. The ORR also published draft conclusions on a Rebate System for Investment for Large Scale Enhancements in December 2006.

and the Midlands. The completion of the Dutch HSL Zuid (currently forecast for 2008) will cut London–Amsterdam journey times to 3 hrs 40 mins. By 2037, cross-Channel rail passenger numbers could double from the present eight million a year,[5] although such predictions are susceptible to a wide range of external factors. A greater recognition of the comparative carbon costs of air and rail travel and concentration on rail's quality of service may push this boundary-line up to four hours. But, beyond a certain distance, rail cannot compete with air.

Figure 8.1: **South-eastern England in relation to its nearest neighbours**

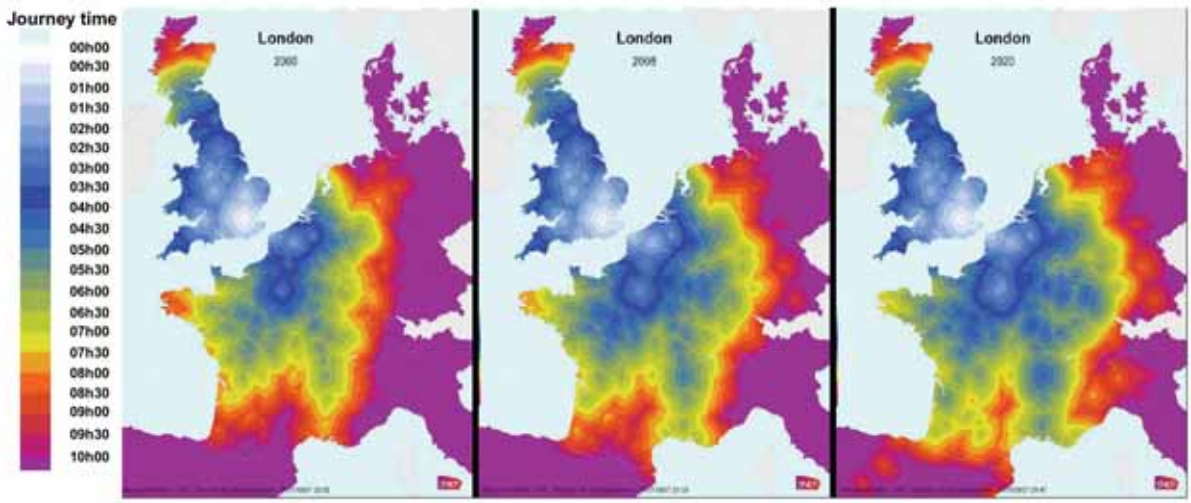


Key

- Capital city
- EU administrative centre
- Major port
- Major commercial or industrial centre

5 Eurostar 2006.

Figure 8.2: **Journey time isochrones by rail from London**



Source: SNCF (DS00190)

Freight

8.16 2007 is the European Year of Rail Freight. The Government believes the railway is well suited to the longer-distance and high-volume flows that increasingly characterise freight movements across the EU. It also believes that rail can play its part in minimising the environmental impact of the projected increase in freight traffic. In the US, where flows are often over similar distances, rail accounts for 40 per cent of the freight market.

8.17 However, the rail freight market in the EU faces significant legal and institutional barriers, which mean that rail freight cannot compete effectively with road. Reliability is the most important customer priority.[6] Rail has lagged behind road in this respect. The historical legacy of EU member states can mean that locomotives and crew must swap at international borders, which adds to journey times and unpredictability. Restrictions also exist on which companies can operate. Operating procedures, such as the requirement to check the safety of every rail vehicle at the border – rather than have cross-border 'class clearance' – can significantly increase transit times. This compares starkly with road haulage. The Government will support greater liberalisation and cross-acceptance of rolling stock throughout the EU, so that rail freight can be an effective choice for shippers.

8.18 The Channel Tunnel provides the British network's physical connection with the continental network. The Tunnel has significant spare capacity and could comfortably accommodate the passenger demand growth predicted, as well as a substantial increase in freight. But this depends critically on a commercial charging regime being established for Channel Tunnel freight between the operator and freight companies. The Government plans to ensure that the British network can interface

6 Information interchange in rail freight, Community of European Railways 2005.

with the European Union planned freight network, which operates to a considerably larger gauge.

8.19 The movement of goods to and from ports needs to be planned as an integrated part of the overall growth in freight and passenger demand. More detail is set out in the next chapter, but the key conclusion is that, in addition to good direct links to ports, there is a need for a Strategic Freight Network linking key freight destinations (see chapter 9). The funding of upgrades to railway lines to facilitate freight movement from ports is also subject to the same 'beneficiary pays' principle that applies to airport links.

The EU role

8.20 Through the opening of the Channel Tunnel and the role of the EU in developing a common transport policy, the British transport system is increasingly integrated with that of the rest of Europe. The EU is also taking an increasingly important role in establishing common standards and environmental regulations,[7] and in the direction of overall transport policy, especially regarding market liberalisation.

8.21 The Government supports the European Commission's transport policy objective of a modern and sustainable transport system. The Government believes that rail's contribution to this is most effective when it follows a competitive model. Britain has the most open and competitive rail market in Europe,[8] which has been an important factor in stimulating rising demand.

8.22 The EU also made important policy advances through the First and Second Rail Packages, aimed at better integrating European rail systems and removing the technical barriers to the supply of equipment and the through running of trains. The Government supports such moves. They offer long-term cost efficiencies by standardising products and increasing competitiveness between suppliers. British train operators already have a significant presence in passenger services across Europe, where these have been deregulated.

8.23 The Government will implement the Third Rail Package, which will include provisions to increase competition in the provision of international passenger services. The Government supports further moves to protect the rights of passengers, but believes that effective competition is fundamental to the interests of rail-users.

8.24 The Government also supports greater liberalisation throughout the EU. Recent moves with regard to cabotage (the right to operate passenger services across the European Union) are welcome. Even though the direct impact on the UK will be small, this is an important step toward greater liberalisation and the development of a more efficient market.

7 Chapter 11 stresses the importance of testing new standards and regulations against their carbon cost as well as economic cost.

8 Rail Liberalisation Index 2004, IBM 2004.

9. Freight

Summary

After a long period of decline, the amount of freight carried by the railway started to grow in the mid-1990s at the same time as passenger numbers began to rise. Significant private sector investment in new equipment and rolling stock, along with competition between private sector operators, has improved the quality of service to freight customers.

The Government is confident that rail freight will continue to grow over the next 10 years. This growth, coupled with rising passenger numbers, will increase the competition for space on the network.

Although long-term demand is not forecastable, the Government welcomes the long-term charges regime established by the ORR and supports the long term stability of freight access contracts. However, it is the responsibility of freight operators to use railway capacity as efficiently as possible, and the principle of 'use it or lose it' for space held in the timetable by freight operators will need to be rigorously applied.

Network Rail's Freight Route Utilisation Strategy (March 2007) set out a detailed analysis of freight issues, requirements and proposals for accommodating growth. The productivity element of the Transport Innovation Fund also provides a potential funding stream to enhance the network and a number of major freight enhancement schemes are under consideration.

The Government sees these developments as the first steps towards the development of a Strategic Freight Network. This would provide an enhanced core freight trunk network, optimised to freight requirements, and providing greater capability, reliability and availability. This will benefit passengers, as well as freight services. The Government will work with the industry to develop and facilitate the delivery of the Strategic Freight Network, for which £200 million of Network Rail investment has been identified in the period to 2014.

The need to plan for rail freight

9.1 Virtually all domestic passenger rail services are publicly specified and privately delivered.[1] The freight railway works differently. Competition between freight operating companies and road hauliers decides which goods are moved by which company and mode. Competition between road and rail has always been strong, and competition within the rail industry between different operators has intensified. Such competition is beneficial, since it ensures that goods are moved as efficiently as possible. The Government does not wish to undermine or distort this market and as a result has made clear that freight requirements would not be specified in the High Level Output Specification.

1 The current exceptions are Heathrow Express and Hull trains.

9.2 However, Britain has a mixed-traffic railway, where freight and passenger trains operate on the same lines. Strong recent growth in both freight and passenger markets has put increased pressure on network capacity. In future, this pressure is likely to increase.

9.3 The position is further complicated by the nature of the freight market, where service providers need flexibility to respond to customer demand, which can vary at short notice. This means that Network Rail's timetable planning must allocate more space for freight than is actually used on a day-to-day basis.

9.4 This White Paper has already noted the important contribution that passenger services make to Government's economic, social and environmental goals. Rail freight also contributes to these. In 2005/06, it saved 6.74 million lorry journeys, equivalent to 122 billion lorry kilometres over a year.[2] This helps to reduce road congestion, make the roads safer and reduce overall CO_2 emissions.

9.5 It is not in the nation's environmental or economic interests that passenger traffic should grow at the expense of freight traffic or vice versa. As a result, the Government has made it clear that it will ensure that policies and regulations do not put unnecessary obstacles in the way of future freight growth and that, in specifying passenger services, the needs of the rail freight industry are considered.[3]

9.6 In order to understand the likely level of future rail freight demand, it is important to look at the history of the sector and to understand the context in which rail freight operates.

Rail freight's history

9.7 The 1955 plan following the report *The Modernisation and Re-equipment of British Railways*[4] included ambitious proposals for relocating and modernising marshalling yards, building dedicated 'goods stations' and replacing freight wagons. Much of the recommended investment was duly undertaken. However, it did not deliver the anticipated benefits and is now seen as a poor investment decision, because the environment in which rail freight operated was changing rapidly at that time.

9.8 The move away from the domestic burning of coal was accelerated by the Clean Air Act 1956, which was also the year in which Britain's first nuclear power station opened at Calder Hall. Combined with the decline in heavy industry, these factors deprived rail of its strongest traditional freight markets. The opening of the M6 Preston Bypass in 1958 and the first section of the M1 in 1959 marked the beginning of the motorway era, which changed dramatically the terms of competition between rail and road for goods traffic.

9.9 Such factors led to a long-term decline in rail freight, which the 1955 modernisation plan did nothing to stem. In fact, 1955 was the first year in

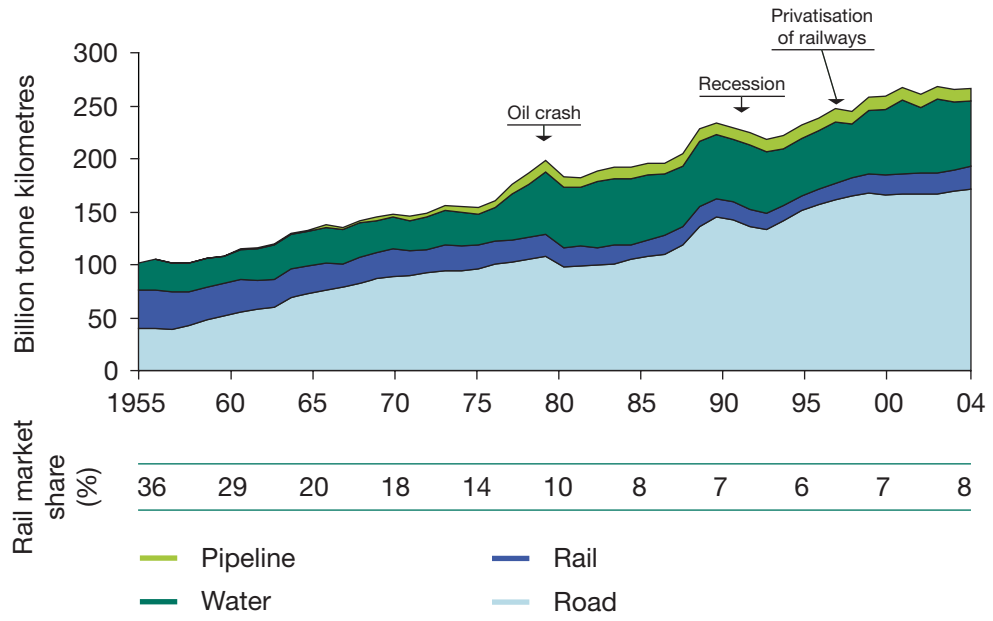
2 Table 3.3c, National Rail Trends Yearbook 2005–06.

3 Secretary of State for Transport's Rail Freight Policy Statement July 2005.

4 British Transport Commission report, *The Modernisation and Re-equipment of British Railways,* December 1954.

which more freight was moved by road (38 billion tonne kilometres – tkm) than by rail (35 billion tkm).[5] By 1995, road freight had grown to 150 billion tkm and rail freight had shrunk to 13 billion tkm.

Figure 9.1: **Domestic UK goods moved by mode (1955–04)**



Note: Figures pre 1972 are rescaled based on 1971/72 ratios of the other modes due to lack of comparability in the raw data; from 1972 Water includes all UK coastal and one-port freight movements by sea and inland waterway traffic
Source: Transport Statistics Great Britain 2006 edition (DS00010)

9.10 Today, however, rail freight carries 22 billion tonne km,[6] equivalent to around 800 freight trains a day. There are several reasons for this recent revival. Strong growth has occurred in some sectors, such as coal, which rail is particularly well placed to carry. Road congestion has increased and rail's quality of service has improved, driven by competition and investment. Costs have been reduced, reliability improved and assets better utilised as a result of the £1½ billion of private-sector investment since 1995.[7]

9.11 Despite this growth, rail freight remains a minority mode, accounting for around 5 per cent of surface tonnes lifted and 11.7 per cent of surface tonne kilometres moved.[8] Rail is most competitive for high-volume flows over longer distances, and tends to become markedly less attractive as volume and distance decline.

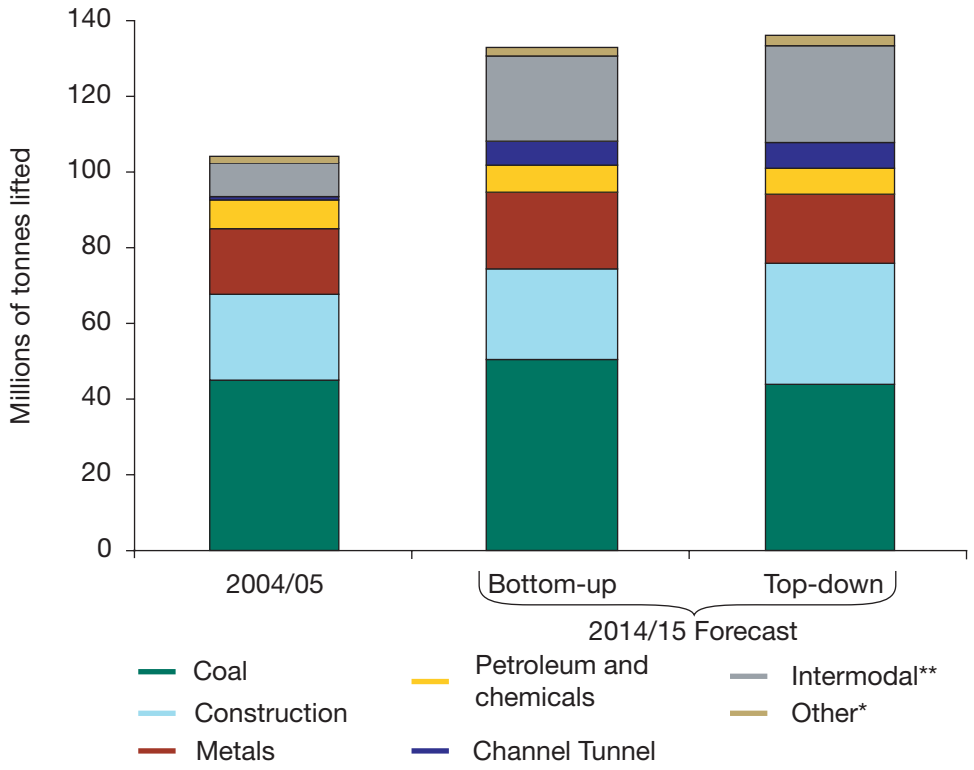
Rail freight's prospects

9.12 In preparing this White Paper, the Government drew on 10-year demand forecasts produced by rail freight operators and the Rail Freight Group (RFG) and the Freight Transport Association (FTA) for Network Rail's Freight Route Utilisation Strategy. These forecasts were produced independently,

5 Transport Statistics Great Britain 2006, DfT 2006.
6 Transport Statistics Great Britain 2006, DfT 2006. 2006 figures not available at the time of writing.
7 *The Future of Rail,* DfT 2004.
8 National Rail Trends Yearbook 2005/06, ORR 2006.

using different approaches – the RFG/FTA using modelling and the freight operators building up a picture based on an analysis of individual market sectors. The results (Figure 9.2) provide a consistent picture of projected growth in freight carried by rail of 30 per cent[9] over the next 10 years.

Figure 9.2: **Industry forecasts of rail freight lifted (2004/05, 2014/15)**



Note: * Other includes auto and waste traffic, which are separated in the forecast but are amalgamated here for consistency with the 2004/05 data; ** 2004/05 inter-modal includes container weight and cargo weight. Inter-modal forecasts include container as well as cargo weight. Forecasts are a guide and comparisons with 2004/05 data is indicative only.
Source: Network Rail Freight RUS (DS00118)

Two sets of forecasts exist for growth of rail freight lifted – a 'bottom-up' forecast and a 'top-down' forecast. The 'bottom-up' forecasting process is split into two stages:

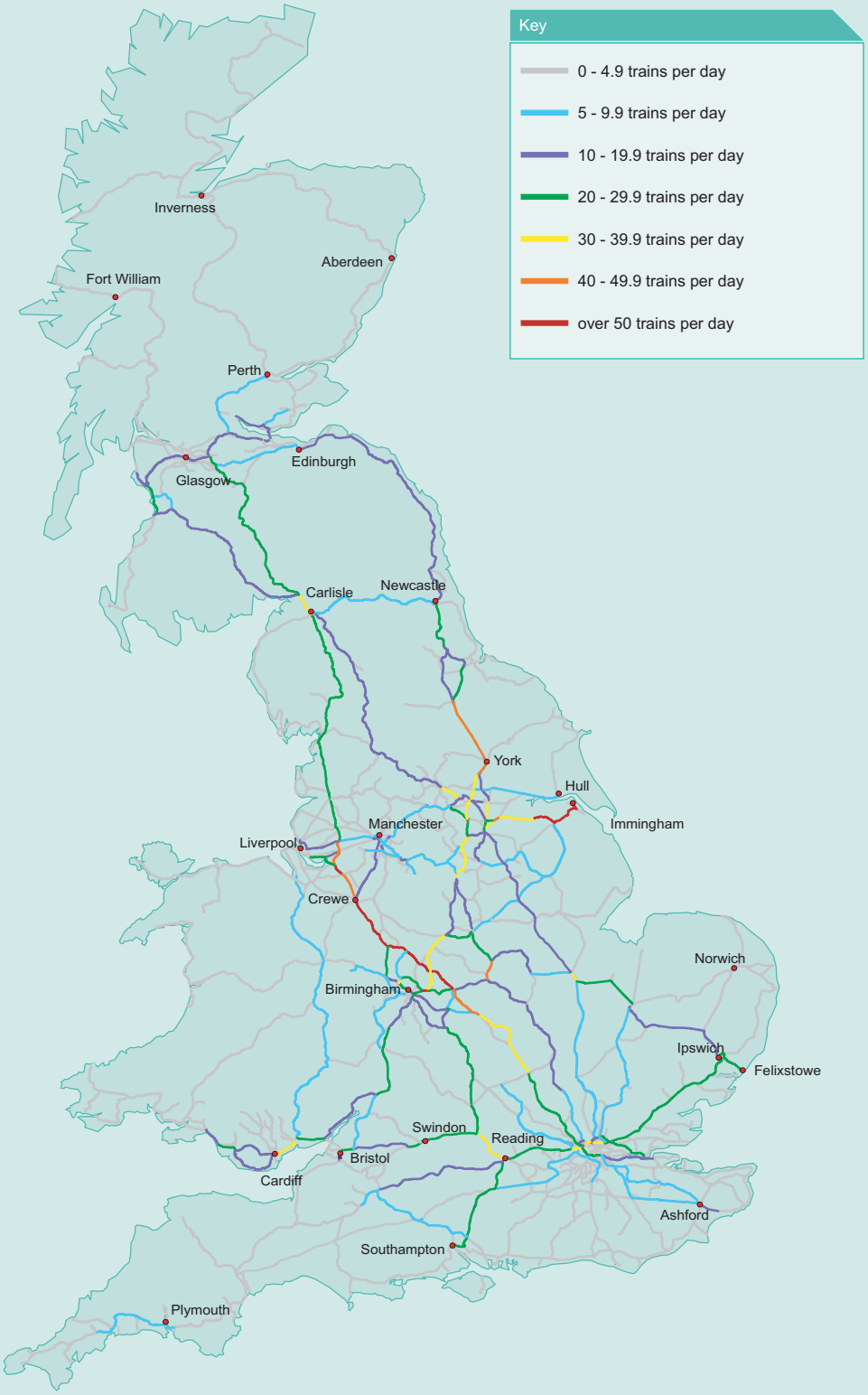
- Stage 1 involved developing a matrix of all current rail freight services between each origin and destination in the 2004/05 base year; and
- In Stage 2 the forecasting process was then carried out separately for those flows with specific current market intelligence and those without. Where specific market intelligence existed (e.g. flows with known expiry dates) it was used to predict changes to the base year flows. Where no specific market intelligence existed, the particular drivers and growth factors for the sector were applied to generate the forecast.

The 'top-down' forecast is based on outputs from the GB Freight Model, a modelling tool used by the DfT to forecast freight growth. The model forecasts on the basis of relative transport costs, trends and econometric analysis of the drivers behind freight market growth. The base-year matrices are derived from a wide range of data sources.

9 2005 to 2014, Freight RUS, Network Rail 2006. Slide FRT12, Summary of Key Research and Analysis, July 2007.

9.13 Table 9.1 shows the breakdown of the existing rail freight market and Figure 9.3 shows how freight uses the network.

Figure 9.3: **Average daily freight trains in a single direction (2004/05)**



Note: Busiest weekday average used (Thursday), highest direction shown.
Source: Network Rail Freight RUS (DS000118)

Table 9.1: **Rail freight's markets by sector and train movements (2004/05)**

Sector	Net tonnes lifted (millions)	Net tonne kilometres moved (billions)	Approximate share of movements (%)
Coal	45.5	7.0	33
Metals	17.4	2.6	19
Construction	22.8	2.8	16
Petroleum	7.6	1.2	4
Channel Tunnel	1.2	0.5	3
Intermodal	8.7	4.0	14
Other	1.8	2.5	11
Total	105	20.6	100

9.14 Moving **coal for power stations** is rail's biggest freight market, with a modal share of nearly 80 per cent.[10] Coal accounts for almost 40 per cent of the 22.1 billion tonne kilometres of freight moved by rail in 2005/06. Coal-fired power stations are likely to remain a key part of the UK's future energy mix.[11] The main coal-fired stations are being fitted with equipment to reduce harmful emissions, an investment which supports the view that coal-fired power stations are likely to remain a part of the UK's future energy mix.[12] Coal imports, to similar locations as today, are therefore likely to continue.

9.15 The main ports for **container traffic** are located in South and East England, closest to the shipping routes from the Far East to Europe. More capacity is already planned, and forecasts suggest that container traffic passing through the UK ports could double by 2030.[13]

9.16 Felixstowe and Southampton together handled around three-quarters of the 7.75 million TEU[14] deep sea containers in 2004/5. Freight movement by rail is particularly strong for longer distance movements from these ports with each having a rail modal share of up to one third. Felixstowe, for example, is served by 25 trains a day.[15] Rail's contribution is likely to rise, given expansion plans there and at Bathside Bay and London Gateway.

9.17 Some of the UK's leading retailers are now assessing the potential of using rail for domestic containerised goods movement. The successful Tesco/Eddie Stobart/DRS operation, launched in 2006, has attracted

10 Freight Utilisation Strategy, Network Rail 2007.

11 Energy White Paper: Meeting the Energy Challenge, DTI 2007.

12 Energy White Paper: Meeting the Energy Challenge, DTI 2007.

13 Six per cent per annum to 2010 and 3 per cent thereafter, DfT Ports Policy Review 2006.

14 Twenty feet equivalent units, data from the Freight Route Utilisation Strategy, Network Rail 2007; and Maritime Statistics 2001–05, DfT 2006.

15 Hutchison Ports 2007

considerable attention. It is estimated that this could save 3 million road miles a year, replacing 39,000 lorry journeys, the equivalent of taking the entire Stobart fleet of lorries off the road for three weeks per year.[16]

9.18 While freight operations via the Channel Tunnel have declined in recent years, there continues to be growth in goods movements across the EU. As noted in chapter 8, rail could become important for these longer distance flows, particularly were Channel Tunnel charges to become more competitive and member states implement EU Directives to improve cross-border operations and increase competition.

9.19 The **aggregates** market has been one of the main drivers of growth in recent years, and there is potential for a 25 per cent increase in the number of trains run by 2014.[17] Government targets to increase the use of recycled materials could also affect demand,[18] as could the need to handle raw materials for large construction projects such as Thameslink and the Olympics. It is likely that the main concentrations of quarries in Somerset, Derbyshire and the East Midlands will continue to serve key markets in London and the main cities, and that rail will retain a key role in supporting the construction sector.

9.20 Rail serves a number of **other markets**, including movement of raw materials and finished products for the steel industry, movement of cars between ports, factories and distribution centres, and movement of petroleum from refineries to bulk distribution centres. While the volumes involved are more modest, these flows are economically and geographically significant and must be included in longer-term planning.

9.21 As with passenger growth, it is not possible to forecast with confidence the amount of freight moved by rail over 30 years. There has been a consistent downward trend since the mid-1990s in the relationship between GDP and tonne-kilometres of goods moved. Rail freight has grown rapidly over the same period, but is particularly sensitive to changes in specific markets. For example, achievement of the Government's target of a 60 per cent reduction in CO_2 emissions by 2050 will involve fundamental changes in electricity generation and in the construction industry, with potential consequences for freight. However, analysis of the elements that currently make up the rail freight market and trends in these sectors provides the Government with confidence that the industry's 10-year demand forecasts are realistic. The prospects for rail freight over at least the medium term appear strong.

Network constraints

9.22 The current rail network imposes a number of limitations on freight traffic. One significant constraint is the relatively tight loading gauge, which restricts the rolling stock that can operate. This is most pronounced in the container market, since only a small part of the rail network can accommodate the taller containers[19] that are increasingly used in world

16 Sustainable Transport; Rail Freight, British Chambers of Commerce, April 2007.

17 Network Rail Freight Route Utilisation Strategy 2007.

18 Minerals Policy Statement 1, DCLG 2006.

19 Often referred to as 9ft 6" 'high cube' containers. 'W10' gauge can accommodate them on conventional flat wagons.

trade. Nor does the existing infrastructure readily lend itself to the operation of longer trains, a problem made worse by the configuration of many freight terminals. Weight and speed limitations further constrain freight capacity.

9.23 Network Rail has identified areas of the rail network where there are particularly high levels of interaction between passenger services and freight.[20] Some of these are listed in Table 9.2. While many are around major cities, others are found on main lines, cross-country routes and at key junctions. For example, immediately west of Leeds station, around 20 freight trains per day must cross the path of passenger services on five of the seven corridors that serve the city. Such conflicting train movements have an impact on both network capacity and reliability.

Table 9.2: **Freight hotspots**

Route section	Area	Trains per day		Main commodities
		Average	Maximum	
Immingham – Barnetby	South Humberside	54	70	Metals, petroleum, coal
Stafford – Crewe	West Coast	52	67	Intermodal
Water Orton	West Midlands	51	65	Intermodal, metals, coal
Doncaster	East Coast	50	86	Coals, metals
Colton Jn – Holgate	East Coast	44	55	Coals, metals
Rugby – Brinklow	West Coast	42	52	Intermodal
Thorne Jn – Scunthorpe	Trans-Pennine	40	57	Metals
Camden Road	North London	38	52	Intermodal
Gretna – Carlisle	West Coast	36	46	Coal, intermodal
Burton-on-Trent	Midland Main Line	36	51	Construction, metals, petroleum
Ealing	Great Western	36	52	Construction

Source: Network Rail Freight RUS

20 Freight Route Utilisation Strategy, Network Rail 2007 and Business Plan, Network Rail 2006.

9.24 A high level of reliability is crucial to freight customers, and many increasingly want a seven-day-a-week service, requiring freight operators to have seven-day access to the network. Maintenance closures are necessary. But the present pattern of engineering access can be extremely disruptive, often affecting multiple routes on a number of nights in the week and extensively at weekends. This impacts particularly on freight movements.

9.25 It is clearly important to make the best use of existing network capacity. The Government wishes to see the rigorous application of the Network Code 'use it or lose it' principle to space held in the timetable by freight operators. This should help to minimise the number of unused train paths which take up network capacity that other operators could use for freight or passenger services.

Strategy – the Strategic Freight Network

9.26 The growing demand for rail freight plus increasing passenger demand will increase competition for network capacity. The resulting impact on the wider economy was recognised by the Eddington Study[21] and has been recognised by the Government, which has introduced the Transport Innovation Fund (TIF) to support schemes that benefit national productivity.

9.27 The schemes currently under consideration for funding would relieve restrictions on key routes to and from the major ports in England (see box). Final decisions on these schemes will be taken on a case-by-case basis in 2007.

9.28 The HLOS specifies the passenger outputs that the Government wants to buy from the railway, but in planning for these outputs the Government has taken into consideration the needs of freight operators. Alongside this, and building on the potential TIF schemes above, the Government is proposing to work with the industry in developing a Strategic Freight Network (SFN).

Transport Innovation Fund enhancements being considered

- Gauge enhancement between Southampton and the West Coast Main Line;
- Gauge and capacity enhancement between Nuneaton and Peterborough, providing Felixstowe with a new link to the West Coast Main Line;
- Gauge and capacity enhancement on the cross-London route between Gospel Oak and Barking;
- Capacity and capability enhancement on rail routes serving the Humber ports of Hull and Immingham;
- Gauge clearance and reopening of the Olive Mount chord on the route between the port of Liverpool and the West Coast Main Line.

21 Eddington Transport Study, The Case for Action, December 2006.

9.29 The Government envisages that the SFN would both complement, and be integrated with, the existing rail network. It would provide an enhanced core trunk network capable of accommodating more and longer freight trains, with a selective ability to handle wagons with higher axle loads and greater loading gauge.

9.30 With the provision of appropriate diversionary routes, such a network would deliver not only greater capacity and reliability, but also improved seven-day and year-round availability. It would also allow the network to accommodate disruption more easily.

9.31 The development of the SFN will benefit all users by identifying and agreeing acceptable freight routeings to help freight trains avoid congested parts of the network. This could involve exploiting and/or developing capability and capacity on alternative routes, as well as investment in enhancements to minimise passenger-freight conflicts. It could also involve the identification and selective safeguarding of disused alignments to facilitate potential future increases in freight capacity.

9.32 The SFN will give rail freight operators, customers and port or terminal developers a more stable environment for planning for increased use of rail. It will also deliver national productivity gains through better connecting international gateways to the UK's main transport links.

9.33 There may be a case for further enhancing gauge clearance on some routes to accommodate containers from Europe, which tend to be wider than those on deep-sea flows to the US and Asia.[22] And in the longer term, the SFN may need to include a route capable of accommodating European-sized rolling stock running directly from the Continent to the main conurbations outside London.

9.34 Enhancements required to deliver these SFN capability benefits will therefore range from small-scale incremental enhancements to major infrastructure schemes.

9.35 The Government will work with the industry and other interested parties, to develop and facilitate the delivery of the SFN. Network Rail's Freight Route Utilisation Strategy, published in March 2007, provides a detailed analysis of freight issues, requirements and proposals for accommodating growth and changes in current demand on the network. The Rail Freight Operators' Association has also produced a prioritised list of freight enhancement schemes, required to meet present and future operational and logistical requirements. Network Rail's 'Seven Day Railway' proposal for a radically revised approach to engineering access to the network is also potentially of key significance in optimising freight routeings and network capacity. And the SFN will need to be developed within the wider framework set out in the Technical Strategy, which accompanies this White Paper, and in the context of Network Rail's Network RUS. The Government expects the SFN will continue to evolve over time to meet the emerging demands of the freight market and the economic sectors it serves.

22 This is referred to as W12 gauge.

Funding

9.36 The SFN is an enhancement of the freight network. As such, the conventional funding approach would be for Network Rail to fund the work, adding the cost to their Regulatory Asset Base (RAB) and recovering it from users over time. The SoFA makes provision for £200 million of Network Rail investment in the SFN up to 2014. This is in addition to any TIF funding that may be agreed.

9.37 The SFN will improve the performance of passenger as well as freight services. In accordance with the principle that freight operators bear only the incremental costs they impose, the Government would expect the ORR first to attribute to passenger access charges the benefits that SFN delivers to the passenger railway. Then it would use established charging principles to recover the balance of the cost from freight operators.

10. Delivering for passengers

Summary

Reliability and capacity are amongst top passengers' concerns, and they are the priorities for the rail industry and this White Paper. But passengers are also interested in the quality of service provision and value for money.

Almost every aspect of the way rail delivers for passengers is, quite rightly, now subject to increasing levels of expectation. This includes the quality of the environment at stations and on-board trains; the standard of facilities and sense of security; provision for cyclists; and ease of access to stations and across the rail system, in particular for disabled passengers.

Cheap book-ahead fares and innovation have been welcomed but many find fare structures complicated. Passengers want to make the most of the opportunities that new technologies provide to enable them to access information and buy tickets in ways and places that suit them, rather than at the end of a queue.

The Government's strategy includes proposals for simpler fares, modernised ticketing and information, improved access to stations, new money to improve stations, and plans for the refurbishment, replacement and improved accessibility to rolling stock. Operators must seize these opportunities to demonstrate their capacity to deliver for passengers.

Context and recent trends

10.1 Under the current framework, companies compete for the right to run passenger services. Government specifies the service pattern to be operated for the 7-10 year duration of a franchise. Companies bid on the basis of the amount of subsidy they would require (or premium they would pay) to provide this service. Since they are on essentially fixed-price contracts, franchisees are incentivised to maximise revenue and minimise cost. This was expected to encourage a more responsive and commercial approach to providing passenger services than under British Rail, because train operators' profitability and survival depend on winning and retaining customers.[1]

10.2 There are two main constraints on train operators. First, they must provide the service-pattern and meet the minimum standards specified in their contracts. Second, fares are regulated by the Secretary of State for those markets (for example travel to work on standard class season-tickets) where users have no realistic alternative to the train.

10.3 Train operators have used the commercial freedom available to them to pursue a more customer-focused approach to services and a more

1 A Guide to the Railway Franchise Procurement Process, DfT, June 2006.

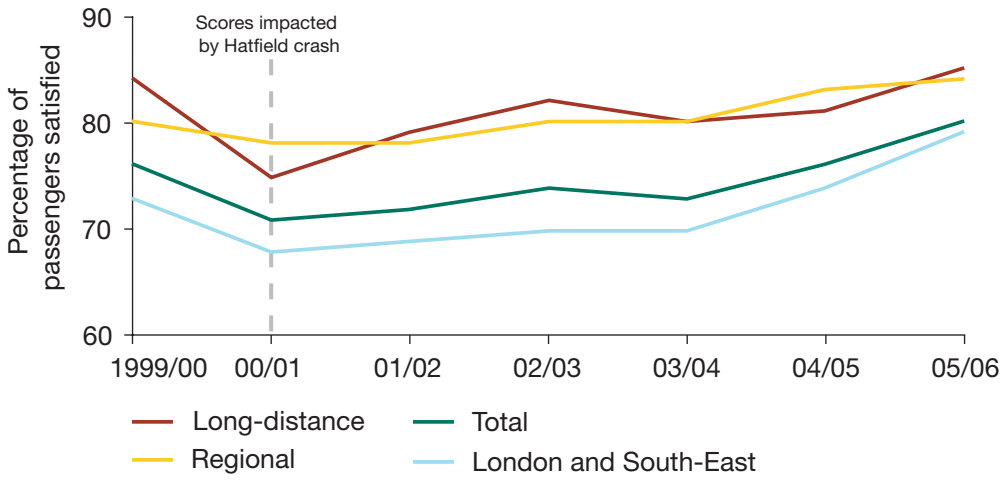
market-based approach to pricing. This has contributed to the growth in passenger demand and produced a generally positive trend in customer satisfaction (Figure 10.1).

10.4 Passenger operators run more services than British Rail on newer trains. But the comfort of the new trains is in contrast with conditions at some stations. There is increasing customer dissatisfaction with stations, and local authority and community frustration at the difficulty of securing improvements that are critical to their regeneration efforts.

10.5 Call centres provide a faster and more accurate service than British Rail did, and a wider range of information.[2] Real-time journey information can now be accessed by internet or mobile phone. The Government's Transport Direct website allows door-to-door planning of journeys by different modes, including risks of delay from roadworks or rail maintenance.[3] Passengers rate the railway's provision of information highly, but Passenger Focus has expressed concern that it can deteriorate during disruption.

10.6 There are good examples of train operators exploiting new technology, such as 'txt2mobile' on Chiltern Railways or WiFi coverage on East Coast and Brighton main line services. But the industry has been slow to harness new ticketing technology, falling behind London's Oyster card or Japan's Suica project.

Figure 10.1: **Overall opinion of rail journey (annual averages, 1999/00–05/06)**



Note : Passengers responding "good" or "satisfied"
Source: National Passenger Survey, Passenger Focus (DS00024)

10.7 On average, the cost to passengers[4] of rail travel has increased by less than 3 per cent over the last decade, while average disposable income has risen by 30 per cent[5]. Behind this average figure, premium fares for

2 National Rail Trends Year Book 2006/07 and 2003/04. ORR and SRA.

3 Transport Direct offers door-to-door travel information for public transport and car journeys in Britain. www.Transportdirect.info

4 Cost to passengers is the price per kilometre paid by passengers, derived from ORR data.

5 Derived from ONS data.

business travel have increased substantially, while products such as 'megatrain'[6] offer far cheaper travel than was ever available under British Rail. An increased choice of fares, better targeted to different markets, is good for consumers. But the proliferation of brand names has made the ticketing structure harder to understand. This has been criticised by Passenger Focus and the Transport Select Committee.[7] It undermines passenger trust, and may discourage non-users of the railway.

10.8 Privatisation has generally sharpened the customer focus of the rail industry, but customer expectations have risen in parallel. There remain aspects of service quality for today's passengers that are not as good as they should be. And, in the decades ahead, passengers could be much more demanding.

Future prospects

10.9 If GDP continues to increase by 2–2½ per cent a year, average incomes will double over the next 30 years; and passengers will be much less tolerant of delay at any stage in their journey. They will expect to be able to work or relax on trains. They will expect accurate and constantly updated real-time information. Passengers will be used to getting a higher standard of service and a more personalised approach to their needs from other service-providers and will demand the same from rail.

10.10 By 2037, the proportion of the population over 65 will have increased by eight per cent and there will be twice as many people aged over 85.[8] The correlation between age and increasing physical infirmity will increase the importance of improvements to physical accessibility. And the ratio of leisure-travel to business-travel could increase.

10.11 Average heights are not increasing, but average weights are.[9] The mean adult Body Mass Index for males increased from 26 kg/metre in 1993 to 27 in 2005. Physical trends such as these need to be monitored and factored into the design of trains and stations.

10.12 There have been important advances in technology in recent years, which rail needs to exploit effectively. Already, over 80 per cent of the population use mobile phones and in excess of 60 per cent have internet access.[10] Increasingly, the public expects to be able to access information, services, and goods at a place and time of their choice. The pace of technological change is unlikely to slow. The railway faces the twin challenges of adapting faster to new technologies, while maintaining alternative means of catering for those who are unwilling or unable to use them.

6 'megatrain' is the brand name of book-ahead, internet and telesales-only fares on selected South West Trains and Virgin Trains services. It offers tickets from £1.

7 Slide EST 13, Summary of Key Research and Analysis, July 2007.

8 Transport Select Committee, March 2006, How fair are the fares.

9 Slide PAX 43, Summary of Key Research and Analysis, July 2007.

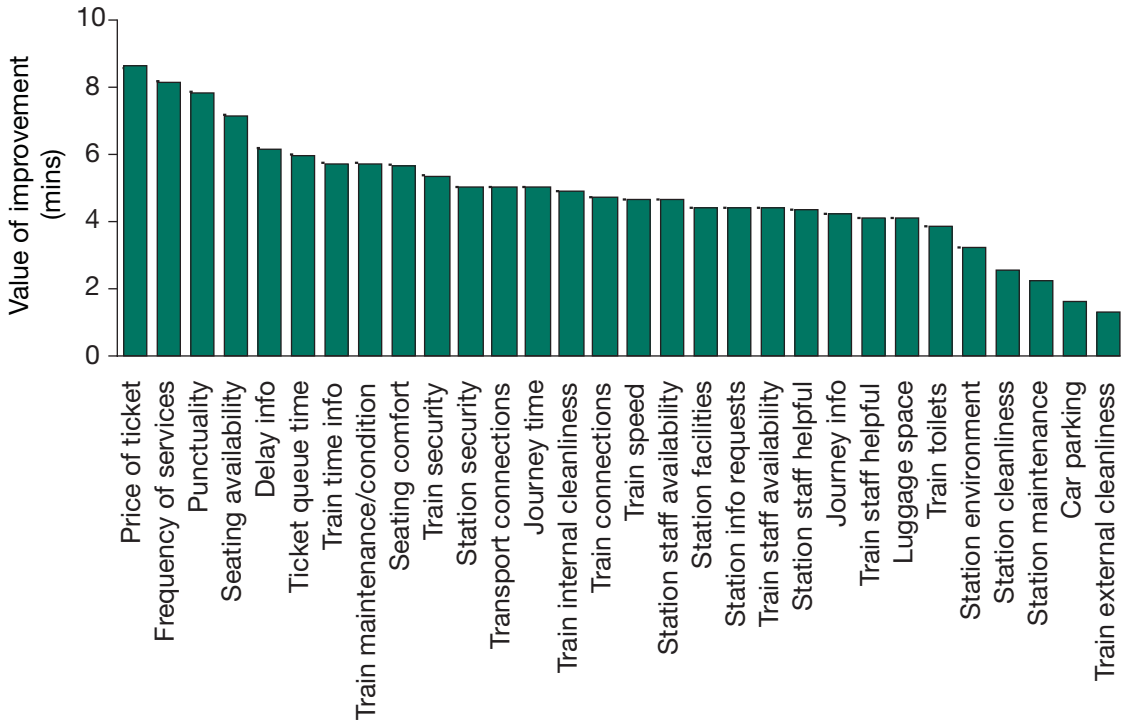
10 Slides PAX 20 and 21, Summary of Key Research and Analysis, July 2007.

Developing a passenger strategy

10.13 The Government's passenger strategy for rail is based on the views of passengers themselves. Research by Passenger Focus confirms that reliability and capacity are amongst the top passenger priorities,[11] and previous chapters have dealt extensively with these issues.

10.14 However, there are other important emerging concerns (Figure 10.2). Value for money is a key issue, encompassing quality and ease of use, as well as price. Passengers are also concerned about personal security, real-time information, adequacy of station facilities and ease of ticket purchase.

Figure 10.2: **Value of improvement to passengers (2007)**



Source: Passenger research undertaken by MVA for Passenger Focus (DS00199)

10.15 The Government also has to consider the factors that discourage people from using rail. This is necessary to enable rail to contribute to tackling global warming and towards creating a more inclusive society, including addressing the findings of the Social Exclusion Unit's 2003 report 'Making the Connections'.[12] Physical disabilities, lack of access to a car, limited understanding of English and unfamiliarity with the railway can all be powerful obstacles to its wider use.

10.16 The passenger strategy therefore has the following main strands:

- a fares structure that people can understand and which builds passenger confidence;

11 Passenger Focus: Priorities for Rail Improvements – April 2007.

12 http://archive.cabinetoffice.gov.uk/seu/docs/mtc_transport_se2003.pdf

- making it easier to buy tickets;
- providing fast, accurate and helpful information;
- meeting the specific needs of disabled passengers;
- better access to stations;
- improving conditions at stations; and
- better travelling conditions on trains.

Fare levels

10.17 Customers for any goods or services want the confidence that they are getting a fair price. In the case of rail, passengers do not always feel that confidence. There are three main reasons:

- The complexity of the fares structure and the proliferation of brand-names specific to individual train operators;
- The dependence of passengers (particularly those unfamiliar with the railway) on a train operator's staff or internet site to help them find the right ticket for their journey; and
- The fact that some train operators have made very steep increases to some unregulated fares shortly after winning a franchise.

10.18 The Government regulates fares where operators are likely to have a high degree of market power. Regulated fares account for over half the use of the railway. Increases were initially capped at RPI, with regulation moving to RPI – 1 per cent from 1999 to 2003, and then to RPI + 1 per cent subsequently. The result is that regulated fares have fallen in real terms by 1.6 per cent in a decade. This policy of RPI + 1 per cent caps fares increases, while generating revenue that is re-invested in improving the railway.

10.19 The Government has concluded that regulated fares should remain capped at RPI + 1 for the period covered by the HLOS, that is, until 2014. There is no justification for setting the cap at a higher level. This would increase revenue, but at the cost of an additional financial burden on passengers. And the Government's judgement is that such revenue could not be re-invested without risking the value-for-money of the HLOS proposals as a whole, and the capability of the industry to deliver an already substantial programme of works, while maintaining and improving daily operational performance. On the other hand, setting the cap at a lower level would reduce the funds available to increase rail capacity, or present taxpayers with a further and very significant subsidy requirement.

10.20 Where rail is one of several travel options for passengers, fares are unregulated. Operators have matched fares to the requirements of the different markets they serve, producing a wider range of prices than under British Rail. At one end of the spectrum, the fully-flexible First and Standard Open tickets, used substantially by business customers, have increased in real terms by 46 per cent and 18 per cent respectively in ten years. They generate nearly a quarter of the railway's revenue, but account for only one in ten of passenger journeys. The majority of

journeys (other than those for which fares are regulated) are made on discounted tickets, where the cheapest fares are lower in cash terms than they were a decade ago.

10.21 The Government will continue to listen to the representations of Passenger Focus and is inviting them to take a greater role in commenting on the specification of future franchises. But restricting the revenue raised from unregulated fares would have one or more of the following consequences – lower rail investment, higher taxpayer subsidy, or less generous deals on other fares. At present about 80 per cent of all journeys a made on either a regulated or discounted ticket.

Fares structure

10.22 Price is not the only determinant of value. The Government wants to ensure that the fares system is simplified to make the railway easier to use and to improve the confidence of passengers in the system.

10.23 A simpler fares structure will make it much easier for passengers to know that they have the right ticket for their journey at the best possible price. It makes it easier for staff to advise on ticket choices and for train operators to present accurate and straightforward advice online. The Government is also working with the industry to use this new simplified structure to make it easier for passengers to understand which tickets are valid for which services.

10.24 The Government believes that it is essential that operators use this new structure to build the trust of passengers; that they are striving to find them the best possible deal and not just trying to sell the highest priced ticket from each transaction. The Government will therefore ask the industry to back the new structure with a 'Price Promise'. That is to say, if passengers were pointed to one deal when there was a better deal on offer, they will be refunded the difference. Where passengers have accidentally boarded the wrong train for their ticket type, fair credit should be given against at least part of the cost of the original ticket when paying for the upgrade. Train operators also need to make clear whether tickets are available for purchase on the train.

10.25 In future, rail fares will be simpler (Table 10.1). The names of fare types will be common across the network, regardless of operator. They will be used at all official sales points: station ticket offices, station ticket machines, websites, telephone, and travel agents.

10.26 The new system will make it easier for passengers to decide which fare is the right one for the journey, to get a sense of price, and to work out whether or not there is a cheaper option available. The National Rail Enquiries (NRES) website already incorporates some of these requirements.

10.27 This new structure makes the pricing of fares easier to understand. Passengers will know that 'Anytime' will always be most expensive, 'Off Peak' cheaper, and 'Super Off Peak' cheaper still.

Table 10.1: **Simplified fares structure**

Fare name	Validity	When bought
(Day) Anytime	Any train	Pre-book or 'turn up and go'
(Day) Off-Peak	Any train outside of the peak times for travel	Pre-book or 'turn up and go'
(Day) Super Off-Peak	Any train at less busy times of day	Pre-book or 'turn up and go'
Advance	One specific train	Pre-book up to 18:00 the night before

10.28 'Advance' will always be cheaper than the equivalent ticket bought on the day. The further ahead tickets are bought the better the price. But an Advance option should always be available up to 18:00 the night before travel, countering the perception that these tickets have to be bought long before.

10.29 The structure also preserves the 'walk up railway', with 'Off Peak' fares available on all but the busiest trains across the rail network.

10.30 Season tickets will continue as before.[13] And operators will always be able to offer additional promotional fares so passengers can take advantage of cheaper, special deals. But the new fares structure will offer a point of reference for all those who use rail, or are thinking of travelling by rail. This will let passengers know in an easy way what basic ticket they need, and the likely cost.

10.31 The Government would like to see simplification extended still further. It will promote and encourage the introduction of zonal pricing in other major cities, as has proved successful in London.

10.32 The Government has also reviewed the case for changing the regulation of 'Saver' return fares. These fares were regulated at privatisation, even though there was no particular justification on grounds of competition. The consequence is that passengers can be faced with a 'Saver' single fare of £69 and a 'Saver' return of £70, neither of which is actually the ideal fare for the journey they want to make. Focus groups show that most long-distance passengers would prefer an approach more in line with airlines' practice of quoting 'single-leg' fares for the outward and return legs of a journey.

10.33 The Government believes that the case in principle for such a reform is strong, but customer support and confidence in such a move is essential. Customers need to be convinced that change is to their benefit and that any new regulations would produce an attractive mix of fares that deliver more straightforward and flexible choices, while not increasing prices overall. The first step towards building this confidence is the implementation of the fares simplification package set out in this

13 As do specialist period products, like Rover and multi-journey tickets.

chapter. The Government is not therefore altering 'Saver' regulation now and would only do so in future on a franchise-specific basis, when the train operator can demonstrate that it would replace the 'Savers' with a single-leg ticketing structure which enjoys customer support and complements the new national fares structure.

10.34 Disabled people and those aged over 60 currently have a right to free off-peak bus travel within their own local authority area. The Concessionary Bus Travel Act extends this right to cover local bus services which cross local authority boundaries. It neither creates nor removes any right to concessionary travel by rail. The Government recognises that there will be people, particularly in rural areas, who have better access to a rail service than to a bus service. It remains open to local authorities to provide free travel by rail in such circumstances.

Making it easier to buy tickets

10.35 Purchasing a rail ticket has traditionally involved purchasing a piece of cardboard from a ticket office and producing it for inspection during the journey. But the demands of passengers are changing, and technology is opening up new possibilities. People have found bankcards more flexible and convenient than paper money – now travel is changing too.

10.36 Smartcards allow people to pay for travel and collect their tickets in different ways. A season ticket, travelcard or ticket can be 'registered' to the card (allowing it to be used like its paper predecessor), but passengers can also store 'credit', allowing travel to be pre-paid and then used 'as-they-go', just like phone cards. Passengers do not need to queue to pay. Smartcards transactions can be done by phone or on-line – and potentially, in future, on the train itself.

10.37 In London, Oyster cards now account for 63 per cent of all underground journeys.[14] The Government is consulting on proposals to require Travel Concession Authorities to issue ITSO smartcards to up to 11 million people eligible for national concessionary bus travel from April 2008[15] and the Government will require ITSO smartcards to be accepted on all new rail franchises.

10.38 Purchasers of long-distance tickets often want to be able to see what they have booked and paid. In these cases, smartcards are currently less appropriate than tickets that can be printed out at home or at work, or tickets that can be sent to a mobile phone and scanned by the guard or a machine. The latter can allow passengers to use their phone to get information about the journey, purchase the ticket and store it all in one transaction, wherever they are and whenever they like.

10.39 The rail industry needs to facilitate both smartcard and mobile phone technologies progressively across the network. It also needs to prepare for the possibility that they merge, with smartcards becoming embedded in mobile phones to allow their contents to be viewed.

14 Slide PAX 48, Summary of Key Research and Analysis, July 2007.

15 ITSO is a technical standard for smartcards that enable a variety of suppliers to provide the relevant technology and allow cards to be used across modes and operators.

10.40 Embracing both technologies on a consistent network basis will cut queues and speed up passengers' journey through the station. It will cut the currently excessive £½ billion transaction cost of selling £5 billion worth of tickets. It will also free-up staff to be out on the concourse or the platform, helping passengers and improving their sense of personal security.

10.41 The Government and industry have therefore jointly embarked on an ambitious seven-year programme of modernisation, which will involve:

- The introduction of ITSO smartcards on rail in the major cities allowing facilities like 'pre-pay' that have proved popular in London;
- The integration of the new ITSO ticketing with TfL's Oyster product in London, so that Oyster (including pay as you go) is accepted for rail travel in London, and ITSO smartcards are accepted for bus and Underground travel;
- The roll-out of ITSO smartcards more widely across the network; and
- The ability to purchase tickets that can be sent to mobiles, or printed out remotely, for long distance routes.

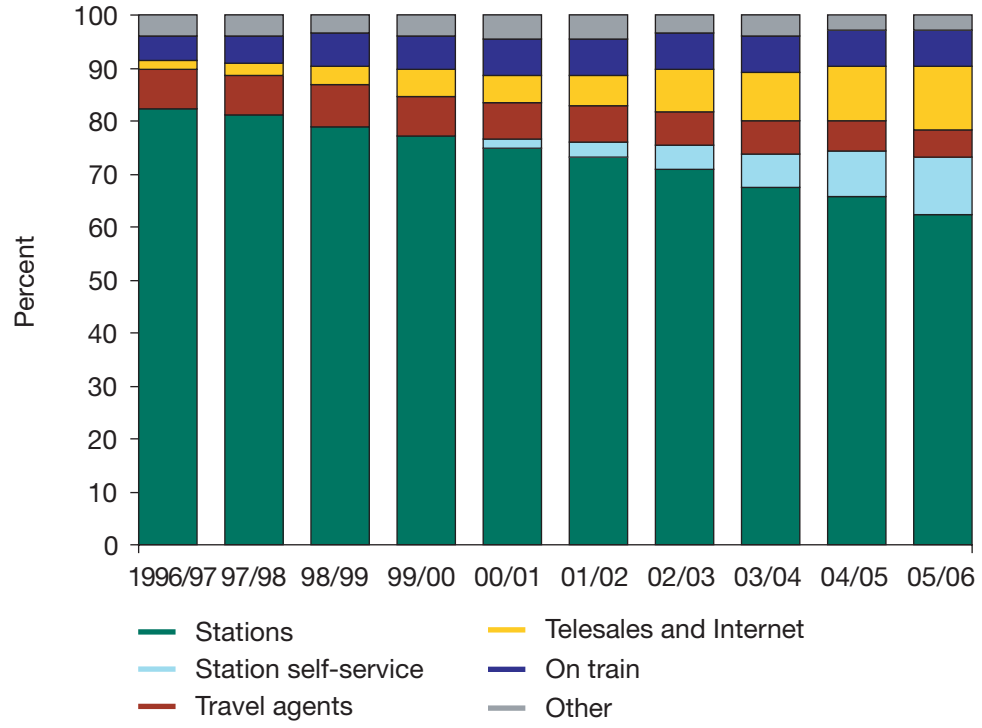
10.42 The Government will now allow operators to sell fares that are exclusive to the internet. Sales through single channels, such as the internet, have lower overheads and consistently deliver lower prices; and access to the internet is now extensive enough to justify this change. All such tickets will, however, need to be identified on the National Rail Enquiry Service website to ensure passengers can find out about all tickets in just one place.

10.43 Because ticket-office use is declining (Figure 10.3) as people use more convenient methods of purchasing tickets, operators will be given more freedom to vary ticket office hours or numbers. But not everyone wants or is able to use new technology. Train operators will therefore be required to maintain a strong staffing presence at stations to provide assistance and reassurance.

10.44 Lastly, the Government will review with operators the role of gating across the network. Operators estimate that around five per cent of revenue is lost on the network due to ticket-less travel. The Government considers this to be an underestimate, since every recent survey conducted on individual parts of the rail network has shown losses to be considerably higher.

10.45 As other modes make more use of smartcards, there will be scope for integrating the purchase of bus and rail travel with car-hire, cycle-rental or taxis. Breaking down barriers between modes in this way will make public transport easier and more attractive to use, and creates the long-term potential for fares to be tailored to individuals' preferences and travel patterns. There are major opportunities ahead for train operators to show their capacity for innovation.

Figure 10.3: **Tickets sales by outlet**



Source: ATOC (DS00153)

Fast, accurate, helpful information

10.46 To deliver their full benefit, the simplification of fares and modernisation of ticketing must be supported by the provision of fast, accurate and helpful information. Passengers and potential customers alike want a single, simple point of contact.

10.47 The Government's role here is to ensure consistent minimum network standards of information. The Government intends to focus the standards around the National Rail Enquiry Service (NRES) website and related services to mobile phones. NRES will provide a single source of comprehensive information about timetables, service disruption, real-time train running, fares, and facilities. Operators will be required to participate in it and to provide the necessary information. In particular, passengers will be able to find information about any fare available on the network (including internet only fares or operator-specific offers) via NRES.

10.48 The industry will continue to rationalise and improve its data, and develop its licensing controls, so that passengers receive the best available planning and real-time information. The current £1½ billion GSM-R[16] project is due for completion in 2012. This will improve communication between drivers and controllers, and enable the industry to identify train locations more precisely. This will help the railway recover from service disruption and improve the speed and quality of information for passengers when things go wrong.

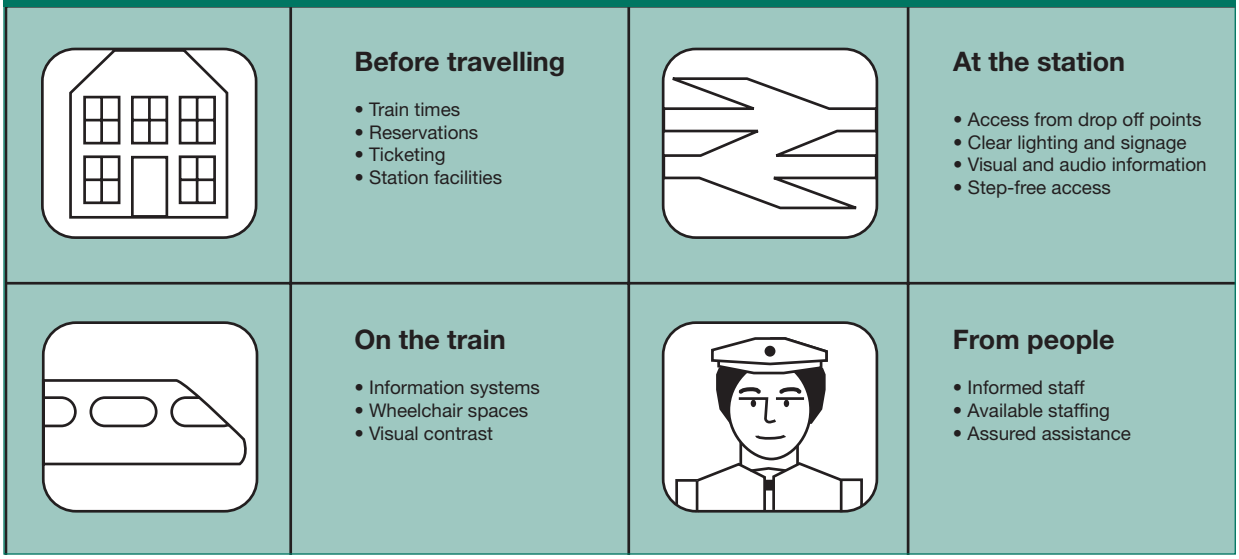
16 GSM (Global System for Mobile Communications) is a system of rail-based cab to control communications.

10.49 Not all improvements are technology-based. The helpfulness of staff is consistently praised by passengers.[17] It will be increasingly important that staff on trains and stations are trained to help people with learning, mobility, sight, hearing or language difficulties. Likewise, operators will need to understand better the concerns of groups of people or communities who do not regularly use the railway. MerseyTravel's initiatives in this area are an example of the good practice that can be disseminated and built on.

Meeting the specific needs of disabled passengers

10.50 Last year, the Government published Railways for All.[18] This identified four main types of requirement of disabled users, summarised in the chart below. It also flagged the opportunity in the HLOS 'to ensure that accessibility is integrated in the future specification of the railway'.

Figure 10.4: **Four main types of requirement for disabled users**



10.51 The Government is committed to comprehensive and enforceable civil rights for disabled people, so that they can participate in society as equal citizens. The recently strengthened Disability Discrimination Act (DDA) requires public bodies to promote equality of opportunity for disabled people and to report annually on progress; it also makes it unlawful for operators of stations or transport vehicles to discriminate against disabled users. If the Government, Network Rail or train operators fail to discharge their duties under the DDA, they can be taken to court.

10.52 Provision for disabled passengers is also in the commercial interests of the rail industry. There are about 10 million people in Britain who are disabled,[19] with an annual purchasing power of £80 billion.[20] In an ageing population, the number of people with disabilities will increase, as will their impact as consumers of goods and services.

17 National Passenger Survey, wave 16, spring 2007.

18 *Access for All: the Accessibility Strategy for Great Britain's Railway*, March 2006.

19 Department for Work and Pensions, User's guide to disability estimates and definitions, March 2004.

20 Disability Rights Commission.

10.53 Integration within mainstream planning is key. Often providing for the needs of disabled users is an opportunity more generally to improve standards of access, space or clarity of information for all. And funding can be combined with other projects to maximise the delivery of both.

10.54 Inevitably, there are also some tensions between the needs of disabled users and the interests of passengers in general, one example being the space required for on-train disabled toilets reducing room for peak hour travel. The Government believes, however, that there are more opportunities than disadvantages in the passenger agenda set out in this White Paper, provided the needs of disabled users are factored into planning at an early stage.

10.55 Commercial incentives sometimes need to be supported by funding (such as that provided by Access for All[21]) and backed by accessibility standards. Guidance can be used to ensure that progressive improvements are made as stations and trains are renewed and replaced. The advantage of standards is that they inject certainty and it is a matter of fact whether a standard has been complied with. However, in the past standards have been tightly defined, so reducing the scope for innovation or creative thinking, with standards coming to be seen as the absolute rather than the minimum level of provision.

10.56 In future, careful formulation of standards, perhaps as performance requirements, should give the flexibility for operators to accomodate technological developments and give scope for innovation in the ways such standards are delivered. An exemption process will allow novel ideas to be trialled.

10.57 The Government's conclusions are that:

- The requirements of disabled passengers 'Before travelling' and 'From people' are matters best left to the rail industry to develop in partnership with users. The Government can play a supporting role by specifying some levels of performance, such as meeting visual standards for websites, assisting with the development of national training curricula, or supporting good practice guidance for rail operators in serving disabled customers. The commercial incentives are strong, and the costs are typically modest; and
- Requirements 'At the station' and 'On the train' should reflect a more joined-up approach. The forthcoming European Standard for Persons with Reduced Mobility (PRM-TSI)[22] will, for the first time, provide standards for both the station and train together in a single document. In covering the issues within a single standard, the interface between the station and the train can be properly addressed. However, disabled users and rail operators must engage with the Government to ensure that standards remain appropriate and to encourage innovation.

21 Access for All is the delivery programme for Railways for All

22 Technical Specification for Interoperability – Persons with Reduced Mobility (PRM-TSI).

Better access to stations

10.58 Rail is only one leg of a journey. People need to get to and from stations by bus, car, cycle, foot, tram, Underground or taxi. Users have to factor these trips into their assessment of how safe, reliable, convenient or environmentally friendly the rail option is. The rail industry must do likewise.

10.59 The way people access stations varies widely from location to location. 50 per cent of passengers in London and the South East arrive at the station on foot and fewer than 15 per cent by car.[23] In remote rural areas, the balance is different. The common challenge is to make all modes of access easier, to encourage the use of modes with the lowest CO_2 emissions, and to support social inclusion by paying particular attention to the needs of disabled people and households without access to a car.

Table 10.2: **Station access mode by journey purpose (for journeys in the London and the wider South East region)**

Access mode	Commute to work (%)	Commute home (%)	Business (%)	Leisure (%)	Total (%)
Walked	56	51	36	43	50
Tube/DLR	5	35	33	25	23
Bus/coach	10	9	6	11	9
Car (parked at/near station)	15	0	10	7	8
Car (dropped off)	10	1	6	6	6
Taxi/minicab	1	1	6	4	2
Cycle	2	1	1	1	1
Other	1	1	2	3	2
Total	100	100	100	100	100

Source: LATS 2001 (DS00020)

10.60 The Government welcomes Transport 2000's idea of station travel plans. Like workplace travel plans, the aim will be to provide the best possible package of environmentally friendly access options. The main difference is that it must also look at the needs of those who are not travelling by train because they cannot conveniently get to the station at all. A good station travel plan should improve access to stations and reduce impacts on the surrounding road network.

10.61 Producing a station travel plan will involve answering three main questions:

- What prevents current passengers from getting to the station by more environmentally friendly means?
- What prevents non-passengers from getting to the station at all?

23 Slide STA4, Summary of Key Research and Analysis, July 2007.

- What is the most cost-effective and environmentally friendly package of measures to improve access?

Underlying a station travel plan should be an analysis of current access to the station as a benchmark against which change can be measured.

10.62 Putting together a station travel plan should not be a lengthy or expensive process. The work should be jointly sponsored by any willing local authority, train operator and Network Rail – in the interests of securing shared ownership of the outcome. Key players within the travel plan process, who should be consulted early, are local bus and taxi companies and user representatives such as cycling groups. It is important to recognise from the outset that implementation of a station travel plan is likely to require engagement from several local partners. For example:

- A train operator providing secure cycle-storage at a station, and a local authority providing a safe and convenient means for cyclists and pedestrians to cross a busy dual-carriageway to get to the station;
- A new bus service, which could not be provided commercially, but is justified by the environmental and mobility improvements to the local area and the additional revenue it generates for the train operator;
- Additional and better managed car-parking at the station, where the train operator and local authority may need to ensure that the spaces are used by rail passengers.

10.63 The Government will encourage train operators to participate with local authorities and Network Rail in about a dozen pilot projects to test the concept at different types of station. The Government confirms that schemes to improve station access are a proper use for Local Transport Plan block grant funding, and Network Rail has confirmed that it has partnership funding available for any necessary rail infrastructure works (for example footbridges). Participation by local authorities in pilot projects will be voluntary – it is for individual authorities to decide whether station access is a priority for them.

10.64 Car park provision can be part of an effective environmental response if it encourages people to make the longer part of the journey by train, rather than simply drive. Evidence from Passenger Focus indicates that station car parks are becoming capacity constrained[24] and future growth will inevitably increase such pressures. The Government believes that adequate car park capacity is a key part of increasing overall capacity and improving access to the network. The Government is concerned at the slow progress in delivering increased car parking provision in cases, such as the West Coast Main Line, where there is a clearly established need. Car parks ought to be one of the easiest facets of station access to improve, because they have a rapid commercial pay-back period, both from the parking fees charged and from the additional passenger business generated. Car parking expansion needs to be managed in the context of the wider parking policies of the area in question so as to ensure that passengers have a range of good quality ways of accessing rail services.

24 Passenger Focus – Getting to the Station, Summary of Research in the East of England, March 2007.

Cycling and rail

There is a strong synergy between cycling and rail. Used in combination, they provide one of the most environmentally friendly options for travel to work. This form of commuting is likely to expand as concern about climate change grows. It is in the railway's commercial and environmental interests to facilitate this.

Action is needed to include cycling provision to, from and at stations, and on board trains. Local authorities already have powers and resources to provide safe cycle routes to any destination and the pilot station travel plans will encourage a more joined-up and environmentally focussed approach to station access. But cycle storage facilities are also important since the priority requirement is to facilitate use of cycles for travel to work, and commuters are those most likely to want to store their bikes, rather than take them onto the busiest trains. The adequacy of cycle storage facilities at stations varies widely, as does the quality of their management. Improving cycle facilities at stations is also the key link in most cycle-plus-rail journeys, which require a distinct focus.

To provide the necessary focus in this area, ATOC, Cycling England, Network Rail and Passenger Focus will be invited to form a Cycle-Rail Task Force, actively supported by the Government. The Task Force's job will be to promote best practice (particularly at stations), to help Government get the detail of the franchising regime right, and to monitor the effectiveness of measures to promote cycle-plus-rail travel.

Future franchises will clarify the position on carriage of cycles on trains:

- Folding bicycles should be able to be carried at all times, free of charge.
- Train operators should be able to exclude non-folding cycles during peak periods. Train operators are best placed to know where such pressure exists. The apparent attractions of a single national set of rules are outweighed by the fact that it would be unduly restrictive, because it would subject lightly used services to the more onerous restrictions necessary on busy commuter routes.
- Train operators should normally require advance reservation where there are limited cycle spaces on trains, so that cyclists do not discover too late that there is no room for their cycle. Where there is pressure on space, operators may consider charging a reasonable fare for that reservation. Not all do or will want to. But all operators should ensure that a passenger-fare and any cycle-reservation can be booked together at the same time.
- Operators must indicate clearly against each service on the timetable whether or not cycles are permitted, whether there is a charge and whether reservations are required; a reservation must guarantee the space. Cyclists should not have to refer to separate guidance.

Improving conditions at stations

10.65 Standards of physical access and facilities vary considerably across the network, reflecting to some extent the level of use. One third of all journeys start or end at one of the 15 largest stations, where provision is often excellent. And lightly-used rural stations are generally fit for purpose. But urban regeneration schemes and investment in new trains only serve to emphasise the comparative lack of progress at some 'intermediate stations'.[25] These are the stations that are the focus of concerns voiced by Passenger Focus, local authorities and the Public Accounts Committee.

10.66 The Government is therefore prepared to provide an additional £150 million to support the modernisation of 150 intermediate stations.[26] These could include:

- Stations which are within the current Railways for All programme and could benefit from additional works at the same time;
- Stations identified by train operators and Passenger Focus as the top priorities on individual routes, in terms of customers' concerns; and
- Stations identified by local authorities as raising concerns about crime or as having a good fit with town centre improvement plans.

10.67 Delivering improvements at 150 stations for £150 million is a deliberately challenging goal. It will require close integration with other works if cost and disruption are to be minimised. It will also require close partnership with local authorities and maximising the contribution from commercial development of stations. Network Rail will lead the production of a joint industry delivery plan by October 2007. The Government has asked the ORR to scrutinise this. If it is satisfactory, the Government will commit the money; if not, it will be applied instead to measures to increase capacity.

10.68 More generally, the Government will continue to monitor the effectiveness with which the industry co-ordinates its management of stations. The delivery by the ORR of the new Stations Code will be an important first step.

10.69 The DDA requires station operators to take reasonable steps to ensure that they do not discriminate against disabled people. A Statutory Code of Practice on the provision and use of transport vehicles issued by the Disability Rights Commission (DRC) sets out a number of factors which might be taken into account when considering what is reasonable.

10.70 Under Access for All, the Government committed £370 million to provide full obstacle-free accessibility at priority stations in England and Wales over the period until 2015. Work is expected to be completed at 25 of the current 92 stations in the programme by March 2008, and a further list will be announced later this year. Although it is ultimately for the courts to determine, the Government believes that the Access for All programme sets a plan for accessibility improvements to infrastructure up to 2014 that are reasonable in terms of the DDA, though they need to be reinforced by measures to improve assistance from staff.

25 Slide STA1, Summary of Key Research and Analysis, July 2007.

26 Defined as being within the 500 busiest stations in terms of passenger arrivals and departures.

10.71 Consideration is already being given to what will happen beyond 2014, since disabled access issues are clearly not all solved by this programme. The Government's goal is to incorporate in the next HLOS in 2012 an output specification for accessibility. This will be informed by a review of the benefits the programme has produced, and whether travel patterns of disabled passengers are changing as a result.

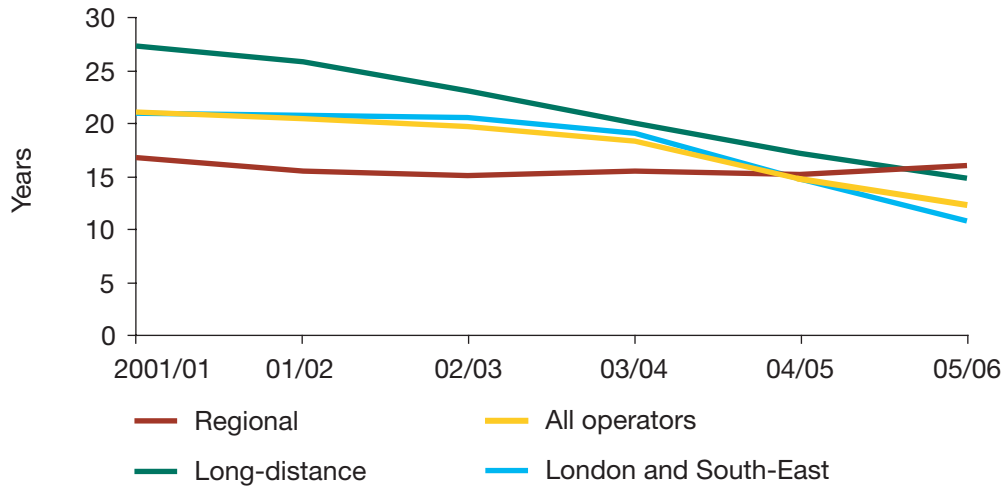
10.72 In addition, the Government is sponsoring the DRC to produce by the end of this year, in cooperation with the industry, guidance on the customer service issues for disabled people. The Government is also reviewing the existing 'Train and Station Services for Disabled Passengers: A Code of Practice' which specifies the physical standards that should be applied when works are carried out at stations. The review will clarify existing standards and will take account of relevant European developments.

Better travelling conditions on trains

10.73 The basic requirement of passengers is that they have sufficient space to travel in comfort. Capacity is therefore the top priority. But other facets of on-train service also matter.

10.74 In the past 10 years the Government and the industry have invested £4½ billion in new vehicles. This has lowered the average age of trains from 23 years in 1995 to 13 years in 2007 (Figure 10.5).[27] Britain now has one of the youngest train fleets in Europe. Significant refurbishment programmes have taken place on many older trains, and the introduction of power points on inter-urban trains and Wi-Fi facilities are making travel times by rail more productive.

Figure 10.5: **Average age of rolling stock (2000/01–05/06)**



Source: National Rail Trends Yearbook 2005–06 (DS00013); DfT (DS00186); NAO analysis of SRA data (DS00145)

27 Slide ROL12, Summary of Key Research and Analysis, July 2007.

10.75 Passenger perceptions have been favourable. New trains are more comfortable, easier to keep clean, and make better provision for the needs of disabled passengers.[28]

10.76 It is important to maintain this recent momentum. Investment in new rolling stock is an important part of improving the customer environment. Although the average age of the rolling stock fleet will vary over time (according to the life-expiry profile[29]) the Government will in future plan to a standard that the average age of the fleet should be held close to 15 years, balancing customer and environmental considerations.

10.77 The Government has already started the process of procuring the new Intercity Express trains. Initial work is underway to develop a new generation of 'go anywhere' trains to replace diesel and electric multiple unit, such as the Pacer and Sprinter fleets. These are approaching the end of their operational lives and the quality of service they provide is not appropriate to a modern, sustainable railway.

10.78 The Government welcomes the introduction of the 'Persons of Reduced Mobility' TSI,[30] because it supports transport liberalisation in Europe, and because the proliferation of bespoke standards adds to cost. The new standards will affect a large proportion of the train fleet. In many ways, the European standards are superior to those that already exist within the domestic Rail Vehicle Accessibility Regulations. The Government is currently considering how best to reconcile European and domestic requirements. It will consult on its proposals to implement these requirements later this year, and will ensure that disabled and other users are engaged in planning for the upgrade or retirement of existing vehicles.

28 RPC – The Virgin Voyager experience, Sep 2004; Passenger Focus – The Pennine Class 185 experience, May 2007.

29 Slide ROL 7 Summary of Key Research and Analysis, July 2007.

30 Technical Specification for Interoperability – Persons with Reduced Mobility (PRM-TSI).

11. Improving environmental performance

Summary

The Government accepted in the 2003 Energy White paper that it should aim for a 60 per cent cut in CO_2 emissions by 2050. Since then, the scientific case for action has strengthened and the Stern Review has made the economic case for tackling climate change. Earlier this year the Government published the Climate Change Bill,[1] which aims to put into legislation the target of at least a 60 per cent reduction in CO_2 emissions by 2050.

Achieving this target will require a significant contribution from transport, which accounts for 23 per cent of UK domestic CO_2 emissions. Rail is a relatively energy-efficient transport mode. While the rail industry needs to reduce its own carbon footprint, its most significant contribution to cutting carbon emissions will be to increase its carrying capacity and so accommodate green choices on travel and freight movement.

Other environmental issues, such as air quality and noise, can also adversely impact on health and quality of life. All transport modes will come under increasing pressure to minimise these impacts. In a more affluent future, people will be less tolerant of such issues. The Government will continue to respect other environmental targets, such as those for air and water quality, which have been agreed to protect human health and the wider environment.

The Government has an important role in many aspects of rail's environmental performance, as well as a decisive role on issues such as capacity and electrification. The Government will therefore increase the carrying capacity of the railway. It will incorporate environmental requirements into passenger franchises and require the fitting of quieter horns and retention toilets when older trains are refurbished. It will also support research on environmental impacts and the technological solutions to mitigate these. It will include an environmental output in the next HLOS in 2012.

But the rail industry must also own this important agenda. There are strong commercial and corporate reasons why it should do so. Its 'green' credentials are a key selling-point for the railway. And there are many energy-saving initiatives that will pay for themselves through lower energy bills. The Government welcomes the initiatives that individual companies have taken and the formation of the cross-industry Sustainable Development Steering Group. Next year the industry will be setting its own carbon reduction targets.

1 Details of the Climate Change Bill can be found on the Defra web site, www.defra.gov.uk.

Context

11.1 The environmental agenda has changed over the decades, becoming broader and more complex.

11.2 In the 1950s, the focus was on the impact of pollution on health, strongly influenced by the Great Smog of 1952, which was estimated to have killed 12,000 people. Essentially local issues of pollution continued to dominate the agenda in the 1960s, and beyond, with growing concern about the cleanliness of rivers and beaches, as well as the impact of lead and other atmospheric pollutants.

11.3 Alongside these issues, there has been a steady increase in people's sensitivity to the impact of transport on their quality of life. The first international standards on aircraft noise (CAN1) were negotiated in the late 1960s. Concern about noise from road and rail traffic has also grown, and the Environmental Noise Directive of 2002 covers rail, road and aircraft noise. Transport has many other impacts on those who live near it, including vibration and visual intrusiveness. Network Rail has estimated that some five million people live within half a mile of the railway and are therefore affected by the railway's activities.

11.4 More fundamental concerns about the impact of human activities began to surface in the 1980s. Loss of biodiversity and climate change do long-lasting and widespread damage to the environment. Today, climate change in particular is recognised as the most important environmental issue, requiring urgent and sustained action.

11.5 The Government accepted in the 2003 Energy White Paper the recommendation from the Royal Commission for Environmental Pollution that the UK should put itself on a path towards a reduction in CO_2 emissions of some 60 per cent from current levels by about 2050. Since then, the scientific consensus that emissions of CO_2 and other gases contribute to climate change has strengthened, and the Stern Review[2] has drawn out the adverse impacts of climate change and set out the economic case for investment to cut emissions. In March this year the Government published the draft Climate Change Bill, which proposes to put into legislation a commitment to at least a 60 per cent reduction in CO_2 emissions by 2050 and a 26–32% reduction by 2020. The recent Energy White Paper[3] sets out an international and domestic strategy to deliver carbon reductions and maintain the reliability of energy supplies.

Making a contribution to the environmental agenda

11.6 Transport is responsible for 23 per cent of UK domestic CO_2 emissions, of which over 90 per cent comes from road traffic. Rail travel accounts for less than 1 per cent of UK domestic CO_2 emissions.[4] Attitude surveys commissioned by the Department for Transport confirm that people are becoming more concerned about climate change and more aware of the

2 Stern Review reports can be found on the HM Treasury web site, www.hm-treasury.gov.uk.

3 *Meeting the Energy Challenge,* Department of Trade and Industry, 2007.

4 Slide ENV 10, Summary of Key Research and Analysis, July 2007.

contribution that transport makes.[5] When asked about solutions, there is increasing recognition of the need to tackle car emissions, but the most strongly supported solution is to increase the availability and capacity of public transport and to reduce its costs.

11.7 The contribution the rail industry can make to the Government's carbon objectives by reducing its own carbon footprint is likely to be smaller than the contribution it can make by providing sufficient capacity to accommodate those that wish to make greener transport choices. But this does not mean that the rail industry can ignore its own carbon efficiency, particularly when other transport sectors are rapidly improving theirs.

11.8 Enabling people to make greener travel choices will be a key element in transport's contribution to delivering the Government's carbon objectives, and the Government recognised this explicitly in the Energy White Paper. The railway has a significant part to play in this, and it remains the Government's aim to see greater use of the rail network for both passenger and freight movements. The critical first step, which is at the heart of this White Paper, is to increase the capacity of the railway so that it can actually accommodate increased demand.

11.9 However, there are inherent limitations to the contribution that the railway can make to tackling climate change. Travel by rail currently accounts for 7 per cent of passenger movement and 12 per cent of surface freight movement. It is plausible that the capacity of the railway could be doubled without the widespread construction of new lines, which would have significant adverse environmental impacts of their own. If this occurred and all the additional traffic transferred from road, this would deliver a reduction of up to 1 per cent in total CO_2 emissions. This would be a worthwhile contribution to the Government's target, but not a decisive one. And, in practice, the scope for the rail industry to increase market share will be limited by the ability of passengers and freight to switch between air, rail and road. For example, travel by rail is generally too slow an option for near-city to near-city travel, and there are obvious limits to the freight movements (such as home deliveries) that the railway can accommodate.

11.10 Overall, the railway performs well from a carbon perspective (Figure 11.1), but the industry cannot be complacent. The recent improvement in its carbon footprint comes primarily from increased load-factors and from changes in electricity-generation. The industry has done less well in areas within its own control. It has been slow to implement regenerative braking[6] and it has commissioned inter-urban trains which weigh more and carry fewer people than those they replace. In contrast, the fuel-efficiency of new cars has improved by over 10 per cent over the last ten years.[7] The issue of train weight is being addressed as part of the Intercity Express Programmme.

5 Environmental Issues – Research Report – Outlook for Passenger Focus, March 2007.

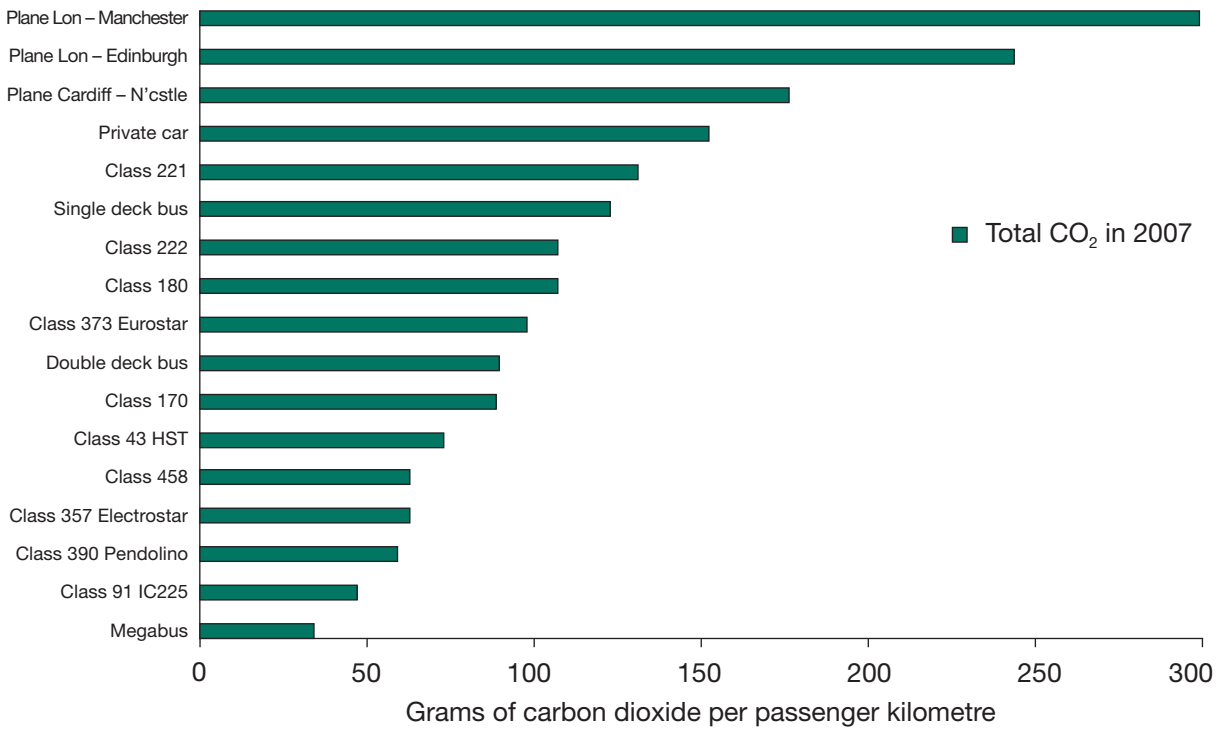
6 The ability of electric trains to use their electric motors as brakes and in turn generate electricity that is returned to the network.

7 Further information on the carbon performance of road vehicles can be found in the Department for Transport's Low Carbon Transport Innovation Strategy on the DfT website, www.dft.gov.uk

11.11 Tackling climate change is the biggest challenge. But the railway has many other impacts on the environment. For example:

- While responsible for only a small proportion of local air-quality pollutants, the railway may have more significant impacts in very localised areas, such as railway stations intensively used by diesel trains;
- The railway's overall contribution to noise is small, but its local impacts can be very significant;
- The railway can impact on biodiversity.[8] For example, it has around 30,000 hectares of line-side vegetation, and Network Rail land crosses over 400 legally protected sites, which are home to a variety of protected species; and
- The railway can also be responsible for land and water contamination through pollution from depot and station operations, toilet discharge, track maintenance and vegetation management.

Figure 11.1: **Relative carbon performance of rail compared to other modes[9]**



Notes: Data assumes the following load factors: urban bus 20%, intercity coach 60%, intercity rail 40%, all other trains 30%, domestic airlines 70%, cars 30%. Road, air and diesel-powered rail vehicle emissions have been increased to take account of refinery losses and electric powered vehicles take into account losses in the grid. The aviation figures include a factor for radiative forcing.
Source: RSSB

11.12 The major challenge for the rail industry, and for regulators, is to ensure that the right balance is struck between broader environmental concerns and climate change. Improvements in all areas are needed, but they

8 Section 40 of the Natural Environment and Rural Communities (NERC) Act 2006 places a biodiversity duty on all public authorities (including Government Departments and statutory undertakers such as Network Rail).

9 Further information can be found in the RSSB research project T618 Traction Energy Metrics available on the RSSB web site, www.rssb.co.uk.

must be tested against their carbon implications. There could be a net environmental loss if local air quality or noise impacts are reduced only at the cost of making rail travel uncompetitive, and forcing freight or passenger traffic onto road.

Future trends

11.13 Department for Transport research[10] shows that currently there is a relatively weak link between awareness of climate change and people's actual travel behaviour. Passenger Focus research[11] found that rail's environmental performance is not a priority for passengers. However, over a 30-year time horizon, this can be expected to change. Achieving the Government's carbon-reduction target implies that people in 2037 will have around half of today's carbon footprint. It is plausible therefore that they will be much more sensitive to the carbon cost of transport and will factor it into their choices about whether and how to travel.

11.14 As incomes grow and society becomes more affluent, people are likely to set a higher value on quality of life. This is likely to lead to demands to go further in areas already of concern and demands to take action on a broader range of environmental impacts than those presently prioritised.

11.15 Other transport modes will continue to improve their environmental performance, driven by regulation, consumer pressure, tax incentives and competition amongst suppliers. So the rail industry will need to respond positively if it is to maintain its 'green credentials'.

11.16 Climate change will have operational consequences for the railway. Climatologists predict only a very gradual increase in average temperatures, but warn of an increased frequency of the sort of severe-weather events (such as high winds or heavy rainfall) that most disrupt transport services. A risk-based approach is needed to balance the cost of reducing the vulnerability of rail against the likelihood and potential impact of weather events. Given the long life of many rail assets, it is advisable for industry to take account of predicted climate change when purchasing new equipment or upgrading infrastructure.

11.17 Network Rail is developing a climate change hazard-map to identify infrastructure that may be particularly vulnerable. This includes lines that may be exposed to flooding or embankments which have a particular landslip risk. Plans are required both to address these 'hotspots' and to ensure that higher standards of resilience are factored into future maintenance and renewal, and, where appropriate, into revised industry standards. The Government is ensuring that the specification of future rolling stock, starting with the Intercity Express train, requires suppliers to take account of these factors in their design.

11.18 Technological change will have a powerful influence on the environmental performance of rail and other modes. There will be incremental changes that improve the energy efficiency of all modes and deliver other environmental benefits. There is also the possibility of a step change,

10 A review of public attitudes to climate change and transport: summary report, July 2006.

11 Environmental Issues – Research Report – Outlook for Passenger Focus, March 2007.

resulting from the development of ultra-low or zero carbon energy sources for motor vehicles or for self-powered trains.

11.19 The most promising technology appears to be the hydrogen fuel cell, but the principal obstacles are cost, storage and the elimination of the high carbon footprint of producing hydrogen, for example through bio-generation. It may be many years before this problem is solved, even in the laboratory, and even longer before a solution is made commercially viable. The Government has assumed that such a technology will not become available within the lifetime of this strategy, but it is a potential development that needs to be factored into rail planning, particularly in relation to electrification. It would fundamentally change attitudes to transport in general and to car travel in particular.

Framing an environmental strategy

11.20 The environmental strategy for the railway focuses on three core themes:

- Developing a better understanding of the environmental footprint of the railway;
- Improving the environmental performance of the existing railway; and
- Ensuring that future investments in railway infrastructure and rolling stock take full account of all environmental impacts.

11.21 Over the last two years, the rail industry has begun to make progress in quantifying some aspects of its environmental performance. It has established a Sustainable Development Steering Group, bringing together rail industry leaders and supported by a cross-industry working group. It published its first sustainability review in June 2007[12] supported by research comparing the performance of rail against a range of other modes. This will be followed next year by a sustainability strategy, which will be supplemented by targets for reducing CO_2 emissions per passenger- and tonne-kilometre.

11.22 Delivering these CO_2 reduction targets will require a combination of:

- **Cultural change.** This means encouraging those working on the railway to identify opportunities for reducing energy consumption, including driver training and timetable planning to reduce signal stops.
- **Pursuing well-established energy-saving measures.** These include fitting low-energy lighting, introducing regenerative braking and turning off the power for electric trains at night. One obstacle to implementing these measures is the fact that the price train operators pay for electricity is not directly linked to their consumption. The industry has taken the first step to remedy this by linking the unit price paid by train operators to Network Rail to the price Network Rail actually pays to generators. The critical next step will be to fit on-train meters to provide train operators with a real incentive to reduce electricity consumption.

12 The Case for Rail 2007, June 2007, Rail Safety and Standards Board.

- **Exploiting innovative technologies.** The industry is trialling the use of biofuels in existing diesel trains. Hybrid diesel-battery trains could deliver significant carbon benefits, and trials of this technology recently commenced in the UK. In the longer term, the development of a low carbon hydrogen supply would enable self-powered fuel-cell trains to operate with very low net carbon emissions.

11.23 The options for cutting carbon emissions and energy bills are a key strand of the *Rail Technical Strategy* accompanying this White Paper.

11.24 In April this year, the ORR published its conclusions outlining how it intends to discharge its statutory sustainable development duties in future.[13] These included a commitment to work with the industry to develop a set of sustainability key performance indicators based on data that is produced and owned by the industry. This work is now being taken forward in close liaison with the Sustainable Development Steering Group. The final set of KPIs, which the ORR intends to publish by the end of 2007, will help the industry to monitor rail's overall sustainability performance and drive improvement where required.

11.25 People use the railway as one stage of a door-to-door journey. Encouraging the use of the train through improved access to stations can provide local environmental and congestion benefits, as well as facilitating rail use. A fuller consideration of these issues, including proposals for station travel plans that will support these measures, is set out in chapter 10.

11.26 At present, 39 per cent of the UK rail network is electrified.[14] Passenger services on other lines are operated by diesel-powered trains, as are freight services. Electric trains are more energy-efficient than diesel ones. Assessments as to the scale of this advantage vary and are highly dependent on a range of assumptions, but it may be in the order of 18 per cent. High-speed electric trains also have a higher carrying capacity than the equivalent diesel trains, which is an important consideration, given the overall priority attached in this White Paper to the capacity challenge, both for passengers and the environment. The only significant drawback to electric trains is their vulnerability to disruption of power supplies, but this is not sufficient to offset their environmental advantages.

11.27 Against this background, some argue for prioritising network-wide electrification today. There are three main reasons for not pursuing this course:

- Electrification is expensive. If it were pursued in 2009–14, it would be at the cost of more urgently-needed investment in increased carrying capacity, which will deliver a greater level of benefit;
- The future performance of electric and self-powered trains is unpredictable today. Developments in hybrid technology, biofuels and hydrogen fuel cells will improve the carbon performance of self-powered trains, whereas changes in power generation will improve

13 ORR's Sustainable Development and Environmental Duties – Conclusions.
14 Slide CAP68, Summary of Key Research and Analysis, July 2007.

that of electric trains. But there remain considerable uncertainties about the relative pace at which these technologies will develop; and

- Electrification would be more cost-effective if it were implemented following the migration to radio-based cab signalling. One of the most serious practical problems with electrification is to prevent it interfering with the existing wire-based signalling system.

11.28 The Government is clear that the industry needs to take a pragmatic and progressive approach to electrification, determined on a case-by-case basis, driven by business and operational need. In the short term, the key question is whether the benefits of such investment over 10–15 years are greater than its costs, so that it pays for itself regardless of what the optimum longer-term carbon choices turn out to be. But the case for more strategic, or network-wide, electrification will also be kept under review in preparation for future investment programmes as future energy and generation technologies develop, so that rail can position itself to take advantage of the best long-term carbon choices.

11.29 The Government believes that carbon trading will be a key element in the broader strategy to reduce carbon emissions. The long-term goal is to bring more sectors into carbon-trading schemes. This may include all transport modes, including rail, following proper consideration of the implications for both transport and the wider economy. The European Commission has presented a proposal for the inclusion of aviation in the EU Emissions Trading Scheme, and the UK Government has asked the Commission to consider the inclusion of surface transport. In advance of that, the Government is currently consulting on the scope and operation of its domestic Carbon Reduction Commitment Scheme.[15] This consultation proposes that the rail industry's non-traction power (the energy used at stations, depots and offices) will be included in the scheme.

11.30 The Government recognises the rail industry's concern that this could have the perverse consequence of creating modal shift to road by driving up rail industry costs. However, the regulatory impact assessment undertaken by Defra demonstrated that this risk is small, and is outweighed by the broader need to make progress on carbon trading. The consultation seeks views on whether traction energy (the electricity and diesel used to operate trains) should be included or whether an alternative approach would be more effective in reducing rail carbon emissions and improving efficiency.

11.31 Air quality will be enhanced by the delivery of new diesel trains meeting progressively tougher EU emissions standards.[16] In addition, as the existing train fleet is refurbished, cleaner and more efficient engines will be fitted that comply with relevant EU emission standards. The introduction of cleaner low-sulphur fuels, required by EU fuel directives,[17] will deliver

15 Consultation on implementation proposals for the Carbon Reduction Commitment Scheme, June 2007, Defra.

16 Rolling stock emissions are governed by the Non Road Mobile Machinery Directive 97/68/EC as amended.

17 The European Commission has proposed requiring rail vehicles to move to sulphur free fuel by the end of 2009.

some direct emissions benefits and enable the use of exhaust cleaning technologies such as catalytic converters and particulate traps that can significantly reduce emissions of toxic air pollutants.

11.32 The Intercity Express train is being specified to address many of these environmental issues. It will be lighter than existing designs and it can be upgraded to alternative power supplies in future as required. It will also be quieter, cleaner and more fuel-efficient, as well as able to be easily expanded or reduced in size as demand requires, reducing the carbon impact.

11.34 The Government welcomes the rail industry's recommendations to reduce noise nuisance from train horns[18] and will monitor their effectiveness. The Government will also support research into alternative, less intrusive train horns, while recognising that horns must provide an effective warning of approaching trains to people on or near the railway. If this research proves successful, the Government will require such horns to be fitted to all trains when they are refurbished.

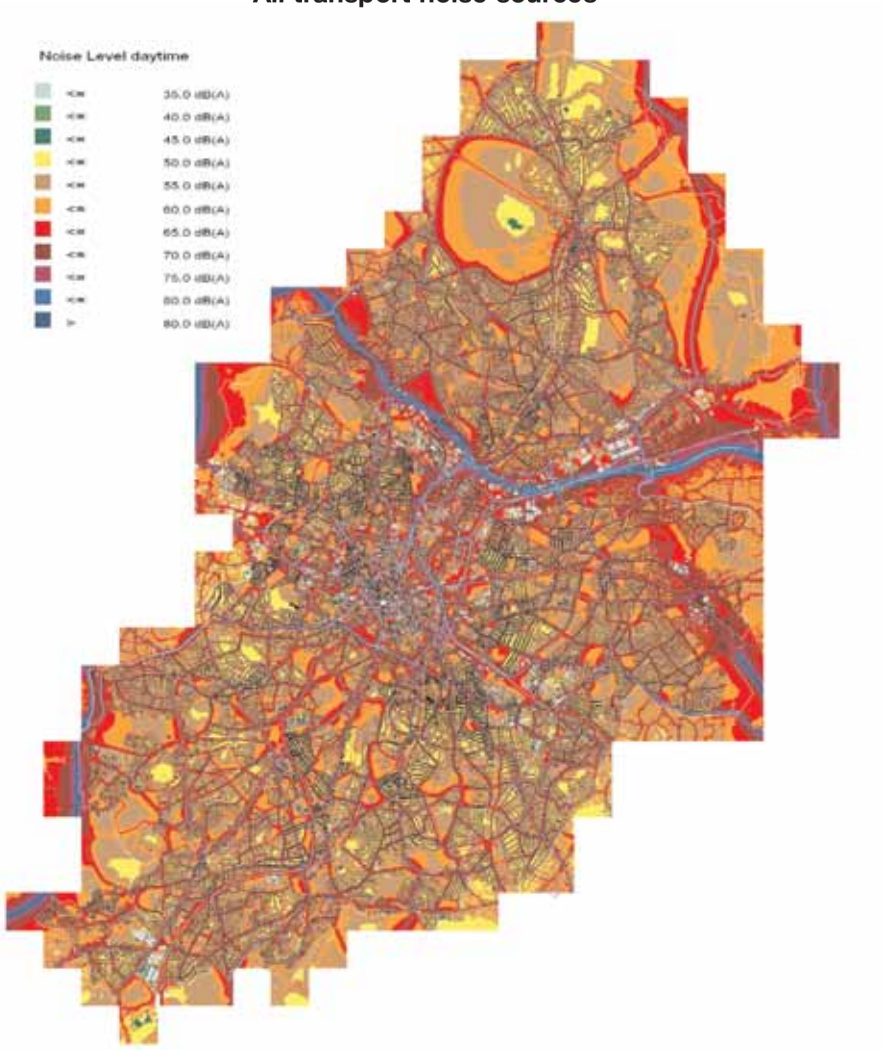
11.35 Noise-mapping (Figure 11.2) and the action plans that follow from it, will require the railway to have a greater focus on other aspects of noise. The Government will work closely with the rail industry to consider how the industry can best respond to concerns about noise and support the development of noise action plans.

11.36 Modern rolling stock has a number of environmental benefits, including being fitted with retention toilets. Where practical, the Government will require toilets on older rolling stock to be replaced with modern retention versions at the time of refurbishment.

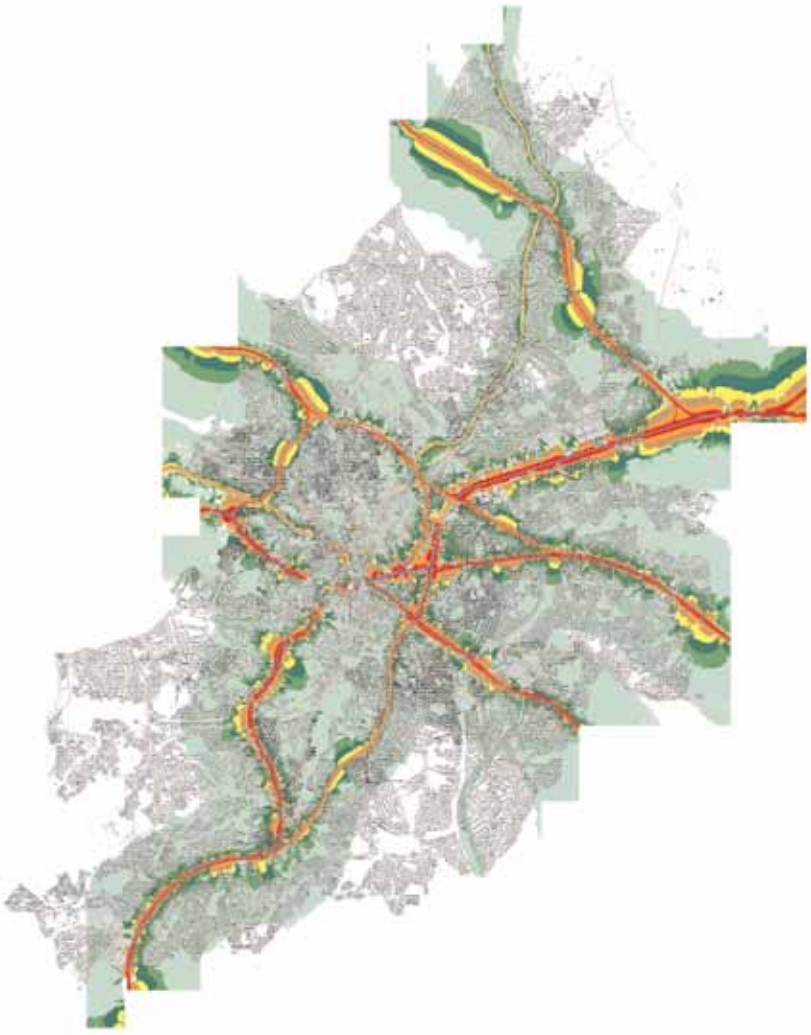
a18 Details of the train horn recommendations are on the RSSB website, www.rssb.co.uk

Figure 11.2: **Indicative noise maps for Birmingham**

All transport noise sources



Rail noise only



Source: Birmingham City Council

Government and industry responsibilities

11.37 An effective strategic response to these environmental challenges requires both Government and industry action.

11.38 The single most important role for Government is to facilitate increases in the carrying capacity of the railway. The rail industry cannot fulfil its potential contribution to carbon targets unless it has the capacity to accommodate those passengers who wish to use it. But the more passengers each train carries, the greater its environmental efficiency. So, for the busiest services, the Government has to strike the right balance between energy efficiency and the need to tackle overcrowding and to create headroom to accommodate future demand growth.

11.39 The Government will also set strategic direction. The Government intends to specify an environmental output for the next HLOS period (2014–19), by when there will be robust information on the rail industry's environmental impacts and on the cost of reducing them. It will include environmental objectives in all future franchise specifications. These will be reviewed and updated as each franchise specification is developed to ensure that they remain relevant and challenging, and take account of industry best practice. It is also for the Government to take the substantive strategic decisions, such as whether or not to commit to network-wide electrification.

11.40 The Government will also support and encourage research to demonstrate the potential of new technologies, such as fuel-cell trains and battery-diesel hybrid vehicles, which could offer significant climate-change and other environmental benefits in the longer term.

11.41 But delivery depends on the rail industry. Other sectors are ahead of the rail industry in framing sustainable development strategies. Rail has some ground to make up here. The key first step has been taken with the establishment of the Sustainable Development Steering Group to review the future challenges, better understand the environmental performance of the railway and develop strategies for improvement.

11.42 It must act on the findings of its own research. Recent industry research has identified a range of energy-saving measures that deliver a relatively quick commercial payback through lower energy bills.[19] The Government expects the industry to implement these measures. In 2006, the total energy bill for the railway was around £300 million, a figure that has progressively increased as a result of rising energy prices. In many cases investing to reduce carbon emissions and energy consumption can pay for itself by cutting rail operating costs and should not require taxpayer subsidies.

11.43 The industry will want to seize the positive opportunity for the railway that greater public environmental awareness will create. This has already started to occur with Eurostar and Virgin Trains now marketing the environmental advantages of their services. Similarly, National Express intends to launch its Carbon Club initiative in 2007, enabling passengers

19 Further information can be found in the RSSB research project T618, available on the RSSB web site, www.rssb.co.uk.

to see how much carbon they can save by travelling by train (or coach) instead of by car. Passengers will also be able to exchange the carbon saved for upgrades and free tickets on the train.

11.44 Environmental performance will be a determinant of future public perception for all businesses, and for the transport sector in particular. It will help determine commercial success or failure. The Government will play its part, but it is vital that the rail industry is seen to take a lead. There are strong commercial reasons for it to do so, reinforced by its corporate social responsibility as suppliers to the public. The rail industry needs to have a collective environmental vision and support this with effective action.

12. Costs and funding

Summary

There has been significant and sustained investment in rail by the Government in order to address the legacy of under-investment in rail infrastructure. In 2006/07 Government and private sector investment on improving the rail network was in excess of £4 billion.

Over the period of the first High Level Output Specification, there will be additional investment to improve the capacity on the rail network and start to tackle overcrowding.

Cost control is an ongoing priority. The financial position of rail is improving, with cost efficiencies of 31 per cent on course to be delivered by Network Rail by 2009. Further targets will be set by the ORR for the period 2009–14.

The increasingly positive financial position, underpinned by growth in passenger numbers, means that rail can sustain a high level of investment with realistic levels of taxpayer support without making changes to current fares policy. Growth is starting to pay for itself. At the same time, now that the maintenance and renewal backlog has largely been addressed, levels of taxpayer subsidy should start to return closer to the historic level of support. Nevertheless, the Government will provide in excess of £15 billion in direct grants to the rail industry in the period 2009-14.

Context

12.1 Britain's railways were built by Victorian engineers and entrepreneurs. However, the returns earned by the railway companies were, at best, low. Inevitably, this limited subsequent investment. The railway was heavily used and under-maintained in the First World War. This pattern was repeated in the Second World War, coupled with an estimated £8 billion (in today's prices) of damage to the network. This left the railway in a position from which the owning companies could not recover. Hence, British Railways was created as a nationalised industry on 1 January 1948.

12.2 The 1955 modernisation plan[1] invested significantly in the railway, but not always effectively. And the nationalised railway continued to struggle financially as it faced greater competition from the motor car, a steady decline in the number of passenger journeys and the loss of key freight markets. Nevertheless, there remained a strong belief that rail ought to be capable of operating profitably. The Beeching plan sought to respond to this. It proposed the closure of the least-used lines, modernisation of

1 Following from the British Transport Commission report, The Modernisation and Re-equipment of British Railways, December 1954.

lines that were better used and provision of an explicit subsidy by Government for lines that met an economic and social need but could not earn a profit. The closures went ahead, but the full extent of the financial support and investment that Beeching had hoped for was not forthcoming.

12.3 By the 1980s, British Rail was widely perceived to be in the business of managing decline. Investments were made in rolling stock on the newly re-branded Network SouthEast and Regional Railways, and in the electrification of the East Coast main line, but the difficulties of high fixed costs set against declining revenues, especially in periods of recession, hampered the progress that could be made. Government had eventually accepted the need for subsidy to reflect rail's 'public-service obligation', but there was an almost permanent gap between the funding BR believed it needed and the funding that governments were willing to provide.

12.4 Today, the rail industry is reversing these financial trends. Record growth in passenger numbers is delivering more revenue. And competitive procurement for franchised services, coupled with Network Rail's improved financial management, is putting costs firmly back under control. The Government is now providing a stable and sustainable long-term funding commitment. In recent years the Government has committed record levels of investment and subsidy support to tackle past under-investment and industry failures. This improving financial position will now enable the Government to maintain that level of investment with no alteration in fares policies, while easing the burden on taxpayers.

Post-privatisation financial trends

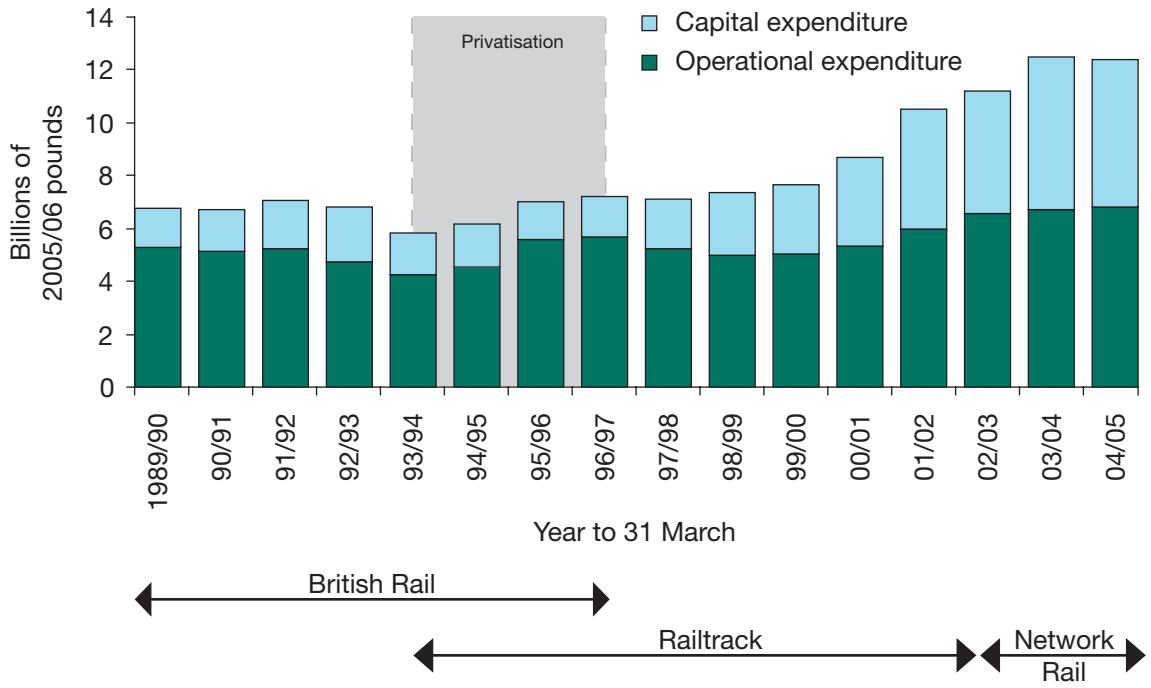
Expenditure and investment

12.5 Between 1994/95 and 2004/05 the annual total 'cost of running the railway' doubled from about £6.6 billion to £12.2 billion (in 2005/06 prices), as shown in Figure 12.1.

12.6 There were a number of reasons for this. One factor was that the number of people using the railway rapidly increased. So the number of services went up, which in turn increased the costs of provision. But this was far from being the biggest factor.

12.7 The single most significant trend has been the increase in capital expenditure. This increased year-on-year between 1997/8 and 2005/6 and accelerated in the period from 2000/01. The investment bought two things: action to tackle a backlog of previous neglect; and enhancements to the capacity of the railway. But the bill for these improvements was inflated by escalating costs.

Figure 12.1: **Cash expenditure over time by the railway industry (post adjustment for accounting changes)**



Source: National Rail Trends Yearbook 2005/6 (DS00013); Network Rail Annual Returns (DS00069-75); LEK Presentation 11 May 2003, Review of Government Support to the Rail Industry (DS00066); GDP Deflator from HM treasury (DS0076); LEK summary analysis for opex (DS0068); FOC Accounts (DS00082); ROSC0 Accounts (DS00081); Network Rail Accounts (DS00083-84); Overview of TOC financial performance, KPMG presentation support model (DS00065); BRB Accounts (DS00085)

12.8 The money committed to tackling the legacy of under-investment has been very substantial. Renewal spend had been very limited under British Rail in the early 1990s and for the majority of Railtrack's tenure. But this pattern reversed following Hatfield and the Government's own interventions from 2000 onwards. It was further stepped up under Network Rail. Total spend on renewals between 2000 and 2005/06 has been £14 billion. The result has been that Network Rail has already exceeded the 2009 target set for it by the Regulator to improve the condition of its assets.

12.9 In Control Period 3 (2004–2009), total enhancement spend in real terms (excluding renewals) is estimated at approximately £5.6bn (11 per cent of total expenditure by the rail industry). This investment has delivered visible and valuable improvements to the rail network.

Efficiency and cost control

12.10 The investment undertaken since privatisation was essential and reflects this Government's commitment to rail. But there were serious deficiencies in planning and cost control under Railtrack. Neither OPRAF[2] nor Railtrack set a strategic direction for the railway, so investment was not always well prioritised or joined up. The replacement of slam-door trains was undertaken with little regard to the impact on rolling stock suppliers (who therefore faced alternating periods of overloaded and empty order-books) and with no regard to the need to upgrade power supplies to accommodate the new trains. The price estimate for modernising the West Coast Main Line escalated from £2 billion to £13½ billion, before being brought back to £8½ billion. There were similar problems in other areas of Railtrack's renewals expenditure as well as its operations and maintenance budget.

12.11 In the 2003 periodic review, the then Rail Regulator concluded that efficiency gains totalling 31 per cent should be delivered by the infrastructure operator by 2009, and Network Rail is broadly on course to meet this challenge. At the same time, the Regulator effectively increased the public expenditure for rail by £1¼ billion a year.

12.12 On passenger operations, competition for franchises holds down the net cost to the taxpayer. It incentivises train operators to balance the increased cost of improving a service against the additional revenue it will generate.

Funding

12.13 Ultimately, the money for the railways comes mainly from two sources – rail customers or taxpayers.[3] Since 1997, the balance between these two sources of funding has changed significantly.

12.14 Since privatisation, rail revenues have actually been growing more slowly than the growth in passenger numbers. This reflects the impact of fares regulation. Regulated fares account for 43 per cent of revenues. Between 1999 and 2004 these fares were capped at RPI – 1 per cent; since then they have been capped at RPI + 1 per cent. The net effect has been a small real-terms decrease of 1.6 per cent in these fares over the last decade (Figure 12.3).[4]

2 The Office of Passenger Rail Franchising – the predecessor to the Strategic Rail Authority.

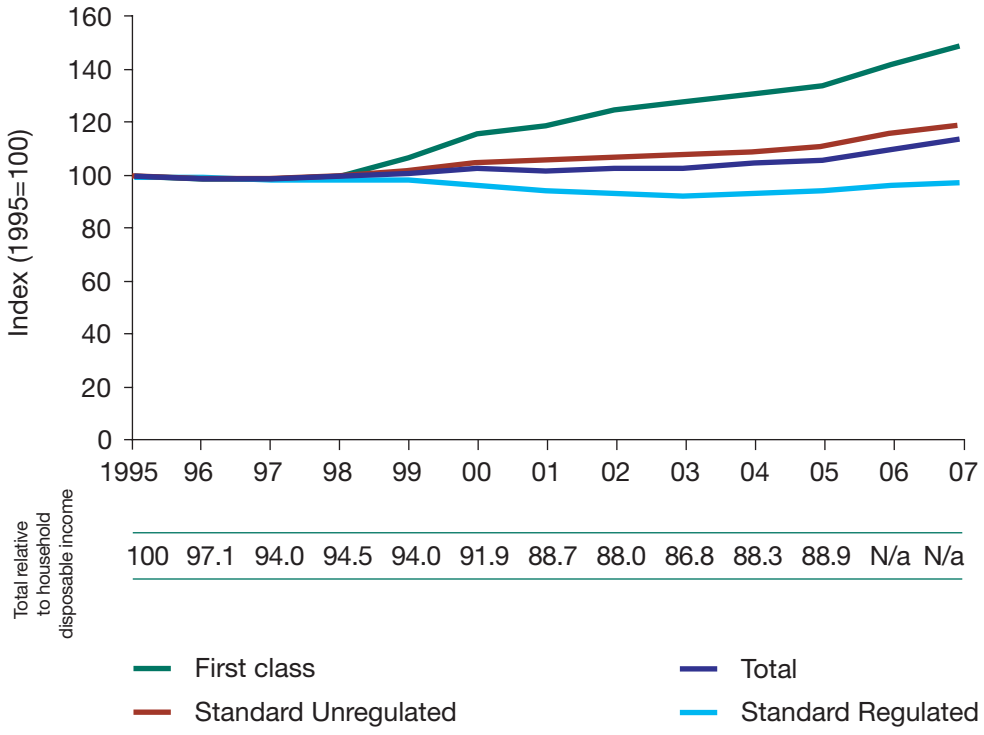
3 In any given year the railway may also supplement its funding by borrowing (hence the difference in some tables and references in this chapter between funding provided and annual expenditure). Borrowing is important, since it enables the industry to fund large projects in a single year but then spread the costs over many years to come. In this way future passengers who will benefit from the investment also help fund it. Nevertheless, since the annual costs of servicing this debt come out of the revenue and grant funding, it remains true to say that, whether now or in the future, it is rail customers and taxpayers who are funding the industry.

4 Slide FIN24, Summary of Key Research and Analysis, July 2007.

12.15 Train operators are free to set unregulated fares, but market forces (as well as the effective ceiling imposed by the price of the regulated season ticket) have imposed constraints. The overall trend for fares (regulated and unregulated together) has been an increase of 1 per cent a year in real terms since privatisation. This is slower than growth in incomes.

12.16 The picture in relation to Government support (that is, taxpayer funding) has been quite different. Historically there has been considerable (and often year-on-year) variation in levels of subsidy, from 50 per cent of rail funding in 1992/93 to just 15 per cent in 1995/96, reflecting the sales of assets as part of the privatisation process. However, since privatisation there has been a consistent increase in the proportion of rail costs funded by the taxpayer, and a pattern of 25–35 per cent subsidy in the second half of the 1990s has become 40–50 per cent since 2000. In 2005/06 taxpayers paid for more of the railway that passengers did (Figure 12.4).[5] This is clearly not sustainable.

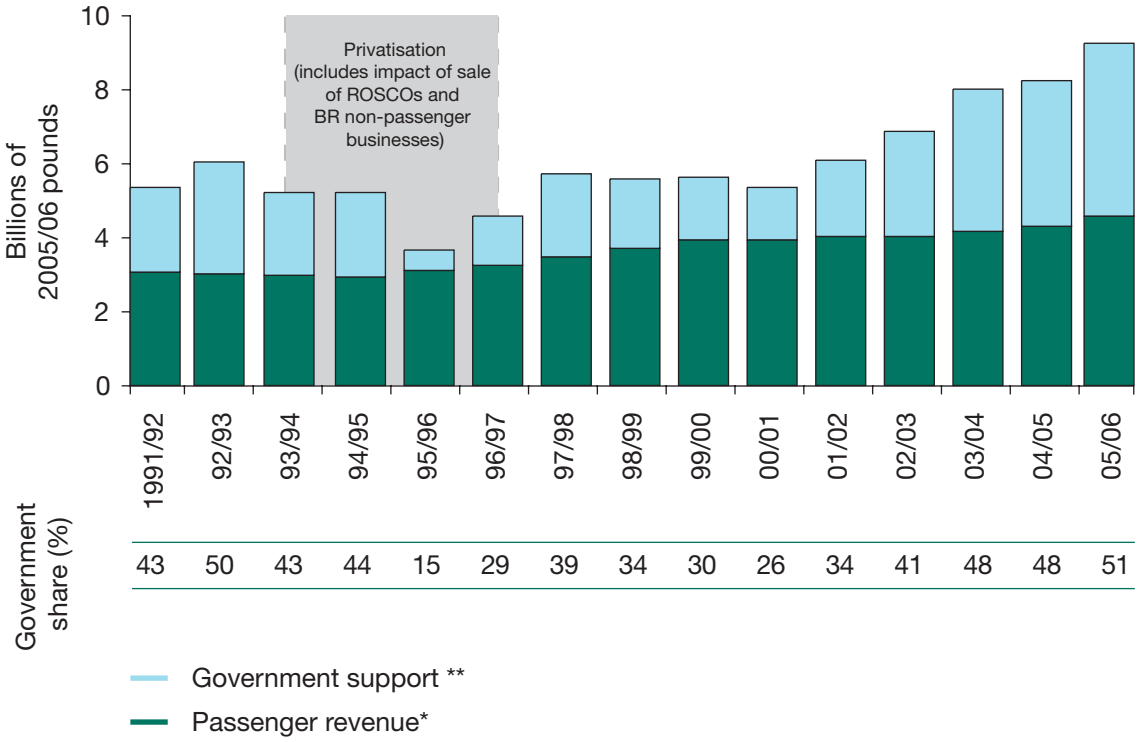
Figure 12.3: **Real price of specific ticket types, excluding mix changes* (1995–06)**



Note: * Deflated using RPI index
Source: National Rail Trends Yearbook 2005/06 (DS00013); ONS (DS00107)

5 Although this makes no allowance for the fact that passengers are also taxpayers, it is worth noting that over 50% of taxpayers do not use the railway at all in any given year.

Figure 12.4: **Funding of the passenger railway^**



Note: ^ Excludes revenue from property, freight and open access. Also excludes Network Rail debt; * Includes all ticket revenue and miscellaneous charges associated with passenger travel on national railways e.g. car parking; ** Includes franchise payments to TOCs, PTE grants, direct grants to Network Rail and CTRL but does not include freight grants
Source: National Rail Trends Yearbook 2005/6 (DS00013); GDP Deflator from HM treasury (DS0076)

Present position and projections for 2009–14

12.17 The railway is now in the most stable financial position in 50 years. Growth is delivering significantly enhanced revenues, while industry cost control continues to improve.

12.18 This is reflected in the source and application of funding that is forecast for the railway for the period between 2009 and 2014. A summary of this is in Table 12.1.

12.19 The net position is that rail income increases by £2.2bn from £10.6bn to £12.8bn while costs increase by only £0.6bn. Within this the railway is able to support a significant enhancement programme in excess of £1½ billion per annum, delivering the increases in capacity, reductions in crowding and other improvements set out in this White Paper. On a like-for-like basis with the figures quoted earlier, total enhancement spend (excluding renewals) is estimated to be at least £6bn (13 per cent of total expenditure by the rail industry). This is the £9bn figure in Table 12.1, net of financing and operating costs.

12.20 At the same time, cost efficiencies allow the subsidy requirement to return closer to historic levels. It has been the taxpayer who for the past several years has funded expenditure increases caused by the loss of control of costs under Railtrack. As Network Rail brings costs back under control, it is right that the demands on taxpayers should also ease.

Table 12.1: **Source and application of funds**

Forecasted Soures and Applications of Funding						
£bn nominal	**2009/10**	**2010/11**	**2011/12**	**2012/13**	**2013/14**	**CP4 Total**
Passenger revenue	6.7	7.3	7.8	8.4	9.0	39.2
SOFA	3.2	3.0	3.1	3.0	3.0	15.3
Other	0.7	0.8	0.8	0.8	0.8	3.1
Total Cash In	**10.6**	**11.0**	**11.7**	**12.2**	**12.8**	**57.6**
Cost of passenger services	5.0	5.2	5.3	5.6	5.7	26.8
Network Rail baseline cost (O,M,R,E)	4.3	4.1	4.1	3.9	3.8	20.2
Network Rail financing payments	1.6	1.6	1.7	1.7	1.8	8.4
Total Cash Out	**10.8**	**10.9**	**11.1**	**11.2**	**11.4**	**55.4**
Headroom	**(0.2)**	**0.1**	**0.6**	**1.0**	**1.4**	**2.9**
Additional borrowing:	**1.6**	**1.7**	**1.5**	**0.7**	**0.5**	**6.1**
HLOS requirements:						
Cost of infrastructure enhancements	1.2	1.5	1.6	1.2	1.4	7.0
Cost of additional rolling stock	0.2	0.2	0.3	0.3	0.3	1.2
Cost of financing HLOS	0.1	0.1	0.2	0.2	0.3	0.8
Total Cash of HLOS	**1.5**	**1.9**	**2.1**	**1.7**	**1.9**	**9.0**

Table based on the following assumptions:
- Based on inflation of 2.75 per cent
- The passenger revenue forecast uses the same demand-growth forecasts on which the HLOS and investment programme are based.
- No change in policy in fares regulation is assumed, i.e. regulated fares continue to be capped at RPI + 1 per cent.
- No allowance is made for additional revenue growth generated by the 1,300 extra carriages to be delivered in CP4 or other train operator initiatives to stimulate passenger demand and revenue.
- Network Rail's baseline cost is as set out in their June 2006 business plan, but revised to reflect an assumed efficiency gain of five per cent a year, which is towards the lower end of the range of possible outcomes published by the ORR.
- Network Rail's cost of capital is assumed to be 4.5 per cent based on a financial framework as provided by the ORR in June 2007.
- The Thameslink major upgrade is budgeted at £5½ billion, including optimism bias.
- The costs of other investments at Appendix A to this White Paper have been subject to bilateral discussion with Network Rail or to collective industry discussion.

12.21 The balance of the investment programme is met from debt funding. Since the costs of servicing this debt will accrue over the entire asset life of the enhancement, there is an element of 'beneficiary pays' to this approach. It would not be appropriate to expect today's taxpayers and fare payers to bear the entirety of the up-front costs of new trains and new infrastructure which will benefit future generations.

Longer-term financial position

12.22 Beyond 2014, the financial prospects for rail remain positive. Rail has a high level of fixed cost (the provision of the infrastructure) and a relatively low level of marginal cost (the cost of carrying extra passengers). This caused serious problems for rail during the periods of static or declining demand, but it works to the railway's advantage when demand is growing.

12.23 Such a projection is, of course, subject to continuing passenger demand growth. But, even if demand slows, the rail industry is in a better position to respond than it has been in the past. Its increasing focus on cost control, and the flexible approach adopted in this strategy, will maximise the opportunity to vary the investment programme accordingly.

12.24 Any longer-term financial guideline budget for rail will be determined following the conclusion of the current Comprehensive Spending Review. Extrapolating the trends in the sources and application of funds statement above, the rail industry should become increasingly self-sufficient in Control Period 5 (2014–19) as rising demand continues to increase revenue, although the cost of servicing the debt used to fund infrastructure enhancements between 2009 and 2014 must be factored in.

12.25 The increasing ability of the rail industry to operate without a high level of dependency on the taxpayer is welcome. However, it is important to note that very few railways in the world operate wholly without subsidy. It is unlikely that Britain's railway will be an exception to this rule.

12.26 In summary, the Government is confident that a stable funding position can be reached, and that the rail's industry's long-term financial prospects are good. The Government does not believe that either radical or rapid change is necessary to secure these objectives. Rather, they can be achieved by:

- Maintaining established fares policies;
- Continuing to harness competition to secure the best price for operating passenger services;
- Addressing capacity constraints;
- Maintaining a rigorous control of infrastructure costs; and
- Ensuring capital investment is incremental and targeted at need.

13. Implementation

Summary

The rail industry has an established five-year planning cycle based around the ORR's Periodic Review of Network Rail funding. The improvements and budget specified by the Secretary of State in this White Paper cover the period of the next of these reviews from 2009 to 2014.

The ORR will now scrutinise those improvements and the budget to ensure they balance. The Government is confident they will do so, but it is ultimately for the independent economic regulator to decide.

Thereafter, the industry, led by Network Rail, will identify the most cost-effective means of delivery. Network Rail will implement the infrastructure elements of these plans, while the Government will negotiate the necessary amendments to franchise agreements to bring in new trains. Separate implementation processes have been established to secure the delivery of the biggest schemes, such as Thameslink and some industry-wide initiatives, such as the modernisation of stations.

But the outputs for the period to 2014 are only part of the strategy in this White Paper. In areas such as improving environmental performance or responding to the needs of passengers, industry leadership will be as important, if not more so, than Government specification.

The periodic review process

13.1 Once every five years the Office of Rail Regulation conducts a review of Network Rail's funding and efficiency. This known as the Periodic Review and establishes a five-year planning cycle for the rail industry. The current Periodic Review is considering the period between 2009 and 2014.

13.2 The 2004 Rail White Paper and the Railways Act 2005 made changes to strengthen and improve the effectiveness of this planning cycle. These changes give the Government new responsibilities to set the strategic direction for the whole industry and to make clear the level of funding available. The key principles are that:

- The Government determines how much public expenditure it wishes to devote to rail and what outputs it wishes the railway to deliver in exchange for this funding (the SoFA and Railways Act 2005 Statement[1]); and
- The ORR, as independent economic regulator, determines whether the outputs sought by the Government are affordable and deliverable within the funding that the Government is providing.

1 For simplicity referred to as the HLOS but includes the specific requirements set out in the Railways Act 2005 Statement enclosed in Appendix A.

13.3 The High Level Output Specification sets outputs to be delivered by the whole industry – Network Rail and the train operators. Similarly, the Statement of Funds Available shows funding available to the whole industry. The delivery of the HLOS will therefore depend on a combination of the efforts of Network Rail, overseen by the ORR, and train operators under contract to the Government.

13.4 This is an important step forward for the rail industry. One of the weaknesses of the pre-privatisation regime was that British Rail could never be wholly certain whether investment plans were fully funded, since resources allocated by Government would change from year to year, making medium to long-term planning difficult. The Government has no wish to return to such a regime.

The role of the ORR

13.5 The first job of the ORR is to say whether or not the outputs sought by the Government from the industry balance the funding the Government has said will be available. If the ORR concludes that the outputs are not affordable within the funding allocated, the Secretary of State will be asked to revise the required outputs or change the funding available.

13.6 To do this, the ORR takes the assumptions provided by the Government about the costs of provision through the franchise regime and the revenues available. It then makes a determination about the balance of outputs to be provided from Network Rail. It decides how much it should cost Network Rail to deliver these outputs, based on an assumption of the extent to which it is reasonable to expect Network Rail to improve efficiency over the control period.

13.7 The ORR then determines the charges that Network Rail should be able to recover from operators and the other income it should be expected to earn in order to meet those costs. By setting the charges at this level, the ORR provides Network Rail with an incentive to work efficiently in order to balance its books.

13.8 The ORR has an additional role to ensure that the reasonable requirements of freight operators and open-access passenger operators are provided for.

13.9 The ORR has set out its timetable for carrying out the current Periodic Review. This requires Ministers to provide information necessary (principally the HLOS and SoFA) by 31 July 2007. The timetable of events following this is:

- October 2007 – Network Rail Strategic Business Plan published, including its proposals for implementing the HLOS;
- December 2007 – ORR initial assessment of HLOS and SoFA;
- February 2008 – ORR assessment of Network Rail Business Plan;
- June 2008 – ORR Draft Determination of Access Charges;
- Summer 2008 – ORR consultations on Draft Determination of Access Charges; and

- December 2008 – ORR expected to issue its notice implementing the Periodic Review.

Confidence in the balance of outputs and funding

13.10 The development of the information now being provided to the ORR has already involved many months of joint working between the Government, the ORR and Network Rail. The Government has also spoken to operators, manufacturers and rolling stock companies.

13.11 It is inevitable that the ORR's assessment of the cost of delivering the HLOS will differ to some extent from the estimate made by the Government for the purposes of developing the SoFA. However, the Government is confident that the differences should not be substantial, because:

- A significant proportion of the infrastructure cost of the railway will relate to expenditure on operations, maintenance and renewals on the existing railway. While final charges will not be determined by the ORR until 2008, it has already estimated the likely costs, which the Government has used as the basis for its work;
- The further capacity enhancements required by the HLOS, while substantial in themselves, are the smaller part of the overall budget;
- Within these, the scope of the largest single element, the Thameslink Programme, is well understood, and has been subject to detailed development over the last decade. Construction is now planned to avoid excessive peaks in demand for resources. The cost plan has been subject to repeated scrutiny; and
- In the next Control Period, the Government has based its work on assumptions of operating efficiency that are at the lower end of the indicative ranges published by the ORR, and cost-of-capital assumptions that are at the higher end of the indicative range. These are both conservative assumptions.

13.12 In addition, the Government has worked closely with key stakeholders, to ensure that the provision of additional infrastructure supports and complements the additional rolling stock being purchased so as to ensure that the two are jointly capable of delivering the capacity outputs specified.

13.13 To assist the ORR in costing these outputs and to assist the rail industry in planning for their delivery, the Government has developed an illustrative package of rolling stock and infrastructure enhancements.[2] This has drawn upon work carried out as part of the RUS and RPA process, as well as other studies. It is not – nor should it be – the final word in how the outputs should be delivered. But it provides a good starting point. It improves confidence that the budget and HLOS outputs will balance, and give passengers an indication of the likely nature of the improvements to follow. It is on this basis that the Government has committed to funding a net increase of over 1,300 new carriages.

2 Details of this package can be found at www.dft.gov.uk

13.14 If there is a significant and unexpected divergence between the costs of the required outputs and funding available, the Secretary of State would first review the improvements sought in capacity and station modernisation. However, assumptions made regarding improvements in safety and reliability, the Thameslink Programme, and infrastructure works associated with the Intercity Express Programme implementation will not be reviewed. Nor will the overall size of the rail budget.

13.15 Network Rail's income will include a risk buffer assessed by the ORR, which provides a degree of protection against cost-escalation. There is also the potential for Network Rail to out-perform the efficiency assumptions made by the ORR in calculating the other building blocks of Network Rail's revenue requirement. Network Rail is clearly unable to commit to use the risk buffer or potential out-performance to fund discretionary investments that improve the railway until it is confident it would be prudent to do so, taking account of the impact on its financial position. Network Rail has therefore proposed that it will consult with its customers and funders on plans for potential uses for these funds, and develop investment schemes which can be implemented as and when funds become available. Network Rail has also suggested that these plans could be directed towards improvements in network reliability, the freight network, station improvements, local capacity enhancements (where demand is greater than anticipated) or long-term cost reductions. These areas are consistent with the delivery of the priorities in this White Paper.

13.16 The desired outputs for the railway discharge a statutory responsibility of the Secretary of State in that they form the basis of the 'reasonable requirements' that Network Rail is obliged to meet within the next Control Period (that is, the period from 2009 to 2014). Network Rail is obliged under Condition 7 of its licence to manage the rail network in accordance with best practice and in a timely, efficient and economical manner so as to satisfy the reasonable requirements of service providers and funders in respect of the quality and capability of the network and train services.

Delivering the Secretary of State's 'reasonable requirements'

13.17 While Government has defined the outputs it wants to achieve from the railway, it is for the rail industry to define the best way of delivering them.

Reliability

13.18 In relation to the required improvements in reliability, the industry has well-established mechanisms for working together. Network Rail takes the lead in this process through the development of Joint Performance Improvement Plans with train operators. Reliability will be monitored against the existing PPM and the new measure of significant lateness.

Safety

13.19 In relation to safety, the responsibilities of individual duty holders will be supported by work by the Rail Safety and Standards Board (RSSB). RSSB will monitor the safety metrics, in conjunction with Network Rail, and report on these to the ORR. The ORR in its role as safety regulator will also help facilitate this continuous improvement in safety. It will do this through the provision of advice and the enforcement of the regulatory framework applicable to the railway. The change implemented in the Railways Act 2005 to make the ORR the combined economic and safety regulator puts it in a good position to support the rail industry in its objective of taking more efficient and cost-effective safety decisions. This work will be supported by the Rail Accident Investigation Branch through its role in investigating the causes of accidents and incidents, and making recommendations to prevent further accidents occurring.

Capacity

13.20 Delivering the increase in capacity will require close co-ordination between the industry (led by Network Rail) and the Department for Transport.

13.21 Network Rail will take the illustrative capacity options developed by the Government, and discuss and refine these with train operators as well as suppliers. It will then advise the Government on the best way of achieving the required increases in capacity, route by route. The focus of this work will be on developing the most cost-effective combination of better utilisation of the rail network, additional rolling stock and new infrastructure.

13.22 The Government will negotiate with the train operators the necessary amendments to existing franchises to secure the purchase and redeployment of rolling stock and changes in service levels. This will typically require a change in subsidy (or premium). The train operators will continue to lease the rolling stock from a rolling stock company or other financial institution.

13.23 Because both the Government and Network Rail will be working from the same joint industry plans, the delivery of the additional capacity will align. In some cases, longer trains cannot come into service until necessary infrastructure work has been done. However, the schedule for the introduction of the trains must take account of other factors, particularly the seriousness of the crowding issues to be addressed and the capacity of the rolling stock manufacturers to supply new trains. The Government and Network Rail will work closely to ensure that a detailed delivery plan is developed, and work together to implement it. The HLOS and SoFA are intended to give certainty about the Government's requirements and funding, but not to create an artificial rigidity. If it transpires that growth on some lines is significantly faster than forecast and growth on other lines is slower, the investment programme can be rebalanced by agreement between the Department for Transport, Network Rail and the ORR.

13.24 The Government will publish a rolling stock plan by January 2008 setting out in more detail how rolling stock will be used to deliver increased capacity. The plan will also reflect Network Rail's strategic business plan which will be published in October 2007.

Major projects

13.25 The Secretary of State has generally identified the improvements she wishes to see from the railway in the form of outputs, rather than a detailed list of schemes. However, in accordance with provisions in the Railways Act 2005,[3] she is also specifying individual projects that she wishes to see delivered.

13.26 For the Thameslink Programme, the Government will be a direct client for the overall programme, just as it was for the latter stages of the West Coast Route Modernisation.[4] Network Rail will be required to deliver infrastructure capacity for a specified train service pattern (and, for station design, a specified passenger demand). The Government will specify and procure the train service changes necessary to accommodate the construction phase and to realise the planned capacity benefits, and will also initiate procurement of a new fleet of rolling stock.

13.27 At Birmingham New Street station, the Government has agreed to contribute to improvements in passenger capacity and in-station environment and at Reading it has agreed to fund significant enhancements to network capacity.

Industry-wide initiatives

13.28 Alongside these specific projects, the Government also requires the industry to take forward a number of industry-wide initiatives.

13.29 The Government will make available £150 million specifically for the modernisation of 150 stations. However, the provision of this money is subject to the production by Network Rail and train operators of robust plans to deliver the schemes. The Government expects these plans to include partnerships with developers and local authorities to secure additional funding and ensure that the projects respond to local needs and opportunities. The Government expects Network Rail to make it easier for such third parties to contribute and work with the industry in this way. The Government is facilitating train operator investment at stations by ensuring that assets pass to successor franchisees at balance sheet value.

13.30 Network Rail's plans will be delivered as part of their October 2007 strategic business plan and the Government has asked the ORR to scrutinise them. If it is satisfied that these plans are realistic, committed and achievable, the ORR will monitor Network Rail's delivery in the same way as it monitors other Network Rail investment, providing timely warning if it believes that projects are slipping or coming in over budget.

3 Railways Act 2005, Schedule 4, Para 2, subsection 1D (4(i))

4 The Modernisation of the West Coast Main Line, Public Accounts Committee Thirtieth Report, June 2007.

13.31 The Government is committed through European Interoperability Directives to the long-term implementation of cab-based signalling, or ERTMS.[5] An important first step has been taken with the commencement of a testing and feasibility project on the Cambrian line. The timetable for further implementation has to be submitted to the EU in September 2007 and is being developed by Network Rail. It will take account of the potential for long-term cost reductions and capacity increases offered by ERTMS, together with the opportunities for implementation alongside the delivery of new rolling stock and the re-signalling of Great Western and East Coast main lines between 2014 and 2020.

13.32 The introduction of the new Intercity Express train is intended to deliver more passenger capacity and greater passenger comfort, initially on the East Coast and Great Western main lines. While the Government is initiating procurement of the trains themselves, Network Rail will prepare the routes for operation of the fleet. The scope of work includes improvement to track quality, structural work to increase clearances at some critical sites, and lengthening of platforms at key stations.

Reporting and accountability

13.33 Network Rail must report regularly to the ORR to demonstrate that it is meeting its obligations; the ORR specifies what information these reports must contain. But it is also important that the Secretary of State is kept properly informed of progress towards meeting the outputs she has specified and funded.[6]

13.34 Accordingly, the Department for Transport agreed with the ORR and Network Rail in October 2005 that there should be a 'Reporting Requirement' to ensure the timely provision of relevant information to the Secretary of State to assist in discharging statutory duties and other functions. Such an arrangement would be expected between any specifier and funder and delivery body. However, it is no part of the purpose of this arrangement that the Secretary of State should be involved in, or in any way seek to influence, the management of Network Rail or the manner in which it conducts its business.

13.35 The role of the ORR is to determine the level of income that Network Rail will require to deliver the HLOS and to set regulatory targets that Network Rail will be obliged to achieve as part of its licence conditions. The Secretary of State, Network Rail and the ORR have agreed that the regulatory targets form a major part of the Secretary of State's reasonable requirements as described in Network Rail's licence. As such, these targets will be enforceable by the ORR.

5 European Rail Traffic Management System.

6 Formally, this is reasonable requirement for the purposes of Condition 7 of Network Rail's licence.

Delivering the longer-term agenda

13.36 This White Paper identifies three long-term agendas for the railway that can broadly be described as increasing capacity, improving customer experience, and fulfilling the railways environmental potential which need to be tackled alongside the permanent priorities of safety, reliability and cost.

13.37 The balance of responsibility between the Government and the rail industry for these agendas varies. On capacity, the Government must specify clearly, in the HLOS and the individual franchise contracts, what improvement it wishes to buy. The role of the industry is to deliver this improvement as efficiently and economically as possible, and to exploit the commercial potential created by the additional capacity on the network.

13.38 In relation to the environment, the balance of responsibility is more evenly divided. The Government will ultimately have to decide what contribution to carbon emission targets it is looking to the railway to deliver, and specify this as an output (akin to safety, reliability or capacity) during the next Periodic Review. For its part, the industry has established a Sustainable Development Steering Group which the Government will continue to support. The rail industry has a key role in identifying the most cost-effective options for improving its environmental performance and, ultimately, for its corporate standing in the eyes of passengers and the public.

13.39 On the customer agenda, the lead should rest primarily with the rail industry in general and the train operators in particular, because they are closest to passengers; these are some of the key skills and experience purchased through franchising.

13.40 The longest chapter in this White Paper is the one on delivering for the passenger. This reflects not just the importance of these measures, but also the fact that it is the most complex, fast-changing and challenging agenda facing the railway. It involves:

- Changes to the fares structure and how rail travel is sold;
- Improvements in the gathering and dissemination of a wide range of real-time information to an even wider range of target audiences; and
- Working in partnership to modernise facilities at stations and improve access to them.

13.41 The challenges over the next seven years are substantial, but the longer-term challenges are likely to be significantly greater. While it has been innovative in many areas, the rail industry has ground to make up. Some elements of post-privatisation progress have too often been slow (for example, on quality of stations) or have fallen back on the public sector for leadership (for example, smartcards). The rail industry collectively needs to consider how it wants to plan and deliver across this complex agenda, how to develop best practice, how to promote the interests of rail and market the rail brand.

13.42 In order to meet the likely requirements identified in the White Paper over a 30-year timescale, railway technology needs to change. The delivery of a radical change in a complex engineering system with long-life assets requires the creation of a vision of the railway in the future, using the best of current and new technology. The *Rail Technical Strategy* is a strategy developed by Government which the Government hopes the industry will support. It describes the long-term technical framework for the railway and provides guidance to both the Government and the rail industry about the steps that need to be taken in order to achieve it.

13.43 Just as improvements in technology are essential to future delivery, so those improvements depend upon research. The Government will continue to provide funding for industry research aimed at improving the safety and cost-effectiveness of the railway. In the past, this has primarily been executed through the Rail Safety and Standards Board, and this arrangement is expected to continue.

13.44 However, following the publication of this White Paper, the Government intends to lead a wide-ranging review of railway industry research, ensuring that priorities are agreed, funding is appropriately directed and maximum value is obtained through collaboration within the industry and with European bodies. The results will be published in the *Rail Industry Research Strategy* later this year.

13.45 The 2004 White Paper *The Future of Rail* highlighted the need for Government and the rail industry to continue working together to raise the profile and sharpen the focus of efforts to improve railway skills. One of the key outcomes has been the establishment of the Rail Industry Skills Forum (RISF). Made up of key industry stakeholders, its purpose is to take a holistic view of the industry's skills framework to help ensure that its many parts attract, develop and retain the necessary skills required to deliver the future railway system. This White Paper identifies many areas, from more energy-efficient driving techniques to assisting customers unfamiliar with the railway, where skills and training will be essential to delivery.

13.46 Since privatisation, the franchised railway has delivered significant increases in passenger demand. Continued delivery through franchises is also an integral part of this strategy. The Government will keep the detailed contractual arrangements under review to ensure that they continue to deliver for the passenger and the taxpayer. This is not about revisiting the structure of the industry, but it is about ensuring that the contractual relationship between Government and train operators continues to deliver. Looking forward over 30 years it would be wrong to assume that the current franchise arrangements represent the final word in delivery.

13.47 At the outset, this White Paper identified that rail does not operate in isolation. The strategy has been developed within the context of other modes of transport. The flexibility inherent in the strategy is not just to enable it to adapt its response depending on how rapidly demand grows in the different urban, inter-urban and international-gateway corridors. It also enables it to adjust these responses to reflect how other transport networks evolve. So future investment decisions – rail or otherwise – will reflect this kind of fully multi-modal analysis. Adopting this approach was one of the main recommendations of the Eddington Transport Study.

13.48 The Department for Transport continues to update and improve its appraisal methodology and will shortly review all the NATA guidance.[7] This will form part of the analytical work to implement the recommendations made by the Eddington and Stern reviews. A major focus will be to ensure the guidance is more consistent with the Eddington Study's mode-neutral stance.

13.49 This multi-modal planning will be reflected in the next HLOS for rail in 2012. As noted in chapter 1, good rail planning is a continuous process for Government and industry, working in partnership to deliver a sustainable railway.

7 New Approach to Appraisal.

Appendix A. Railways Act 2005 Statement

Introduction

A1. In the White Paper the Government sets out its long-term view of the challenges and opportunities facing the railway and the ways in which rail can contribute to the broader economic and environmental goals of the country. The White Paper constitutes the Government's Rail Strategy, to which the Office of Rail Regulation (ORR) should have regard, pursuant to paragraph 9 of the Secretary of State's Guidance to the Office of Rail Regulation (May 2007). The White Paper sets the context for this Statement which, following receipt of the ORR's notice dated 28 February 2007 under paragraph 1C of Schedule 4A to the Railways Act 1993, as inserted by Schedule 4 to the Railways Act 2005, sets out for the ORR the information about what the Secretary of State wants to be achieved by railway activities during the review period 1 April 2009 to 31 March 2014 (CP4), and about the public funds that are or are likely to be available to secure delivery, as required by paragraph 1D(1) of Schedule 4A to the Railways Act 1993. Although this Statement is an appendix to the White Paper, it is only this Statement, and not the White Paper itself, which constitutes the information for that purpose.

A2. The Government has made it clear that it intends to discharge its duty to notify the ORR about its desired outputs *primarily* by framing a High Level Output Specification (HLOS) for the railway, setting out the improvements in safety, reliability and capacity which the Secretary of State wants to secure. Paragraphs A3 to A12 of this Statement, together with the attached Schedule, set out these High Level Output Specification metrics. In addition, paragraphs A13 to A24 of this Statement provide the supplementary high level specification of major projects and other investments which the Secretary of State wants the railway to deliver in CP4, but which cannot be subsumed within the HLOS metrics because they deliver benefits that extend beyond improvements to safety, reliability and capacity. Paragraphs A3 through to A24 together with the Schedule all constitute information for the purpose of paragraph 1D(1) referred to above. All figures quoted in this section are in 2005/06 prices unless otherwise specified. Paragraphs A25 and A26 provide additional contextual information.

The High Level Output Specification

A3. The Secretary of State recognises the significant improvements that have been made to safety and reliability in CP3 and wants to see the railway maintain this momentum in CP4.

Safety

A4. The Secretary of State wants to see a 3 per cent reduction in the risk relating to death or injuries to rail workers and to passengers from accidents on the railway from the end of CP3 to the end of CP4. Performance is to be measured by, and monitored against, the Rail

Safety and Standards Board's (RSSB) model of safety risks. Account should be taken of risk-exposure by measuring the changes in risk relative to the kilometres travelled by passengers and hours worked by employees, and account should be taken of the different severities of injury by applying the weightings under the industry's 'fatalities and weighted injuries' measure. The Secretary of State is not specifying any particular safety initiatives by which this reduction should be achieved, and the Department's only safety input would be regulation made pursuant to advice from the ORR. Because safety is not a devolved matter, the Secretary of State is looking for risk-reduction across the whole of the railway in Great Britain.

Reliability

A5. The Secretary of State wants to see reliability, as measured by the 'public performance measure' (PPM), improve in CP4 across the whole of the franchised passenger railway in England and Wales. She wants to see an improvement to: 92 per cent on long-distance (inter-urban, including cross-border) services; 93 per cent on London & South East services; and 92 per cent on regional services. The definition of the services falling within each of these three categories of service is at the Schedule to this Statement.

A6. The Secretary of State also wants to see, for each of these categories of service, a reduction between 2006/07 and 2013/14 in the percentage of trains which arrive at their final destination 30 or more minutes late, or are cancelled. The required reductions are: 36 per cent on long distance services; 21 per cent on London & South East services; and 27 per cent on regional services.

A7. Since it is the Government's wish that its output specification for the railway should be 'high level', the Secretary of State is not specifying reliability down to the level of individual routes or services. However, she attaches importance to narrowing the gap between the poorest performing services and the rest, because it is no consolation to passengers suffering a poor service on one line to know that the service on other lines is improving.

Capacity

A8. The Secretary of State's priority for investment in CP4 is to secure an increase in the carrying capacity of the franchised passenger railway to reflect the growth in demand and to relieve crowding. She intends to do so by continuing the broad pattern of services in current franchise agreements and by securing the incremental capacity specified in this HLOS. The Schedule to this Statement sets out the total level of demand in passenger kilometres which the Secretary of State wants to see accommodated on each of Network Rail's 23 strategic routes, together with the numbers of arriving passengers to be accommodated at Birmingham, Cardiff, Leeds, Manchester and other urban areas, and at the main London termini across the three-hour morning peak and across the one-hour high-peak.

A9. The Schedule to this Statement also sets out the maximum average load factors which the Secretary of State wants to see achieved across these peak periods at these demand levels. The load factor is the ratio of passengers actually carried by a train to the design capacity of the train.

A10. The Secretary of State is not specifying load factors down to the level of individual routes, but the Department's initial assessment suggests that, within the specified maximum average load factors, it is feasible to maintain or reduce current peak load factors over CP4 on services into most of the stations listed in the Schedule to this Statement. Subject to any overriding value for money considerations, the Secretary of State attaches considerable importance to securing such reductions in crowding over CP4.

A11. The Secretary of State is not specifying separately load factors for long distance services, because the infrastructure required to accommodate increased demand on such services generally will be driven by the specification for peak commuter services.

A12. The Secretary of State wants to ensure that capacity increases are delivered as cost-effectively as possible, in order to maximise the number of passengers who benefit from relief of crowding in CP4. She considers that Network Rail should have regard to this principle in framing its strategic business plan, and asks the ORR to do likewise in appraising that plan.

Supplementary high-level specification of major projects and other investments

A13. The Secretary of State has given financial approval for the Thameslink Programme, upgrading the Thameslink line and extending its service pattern. The benefits will be delivered in two increments. The first involves the provision of the capability for 12-car operations at a frequency of 16 trains per hour through the core London section and via the Midland Main Line towards Bedford by December 2011. The second increment, which involves the connection of the Great Northern services into the route and operation of 12 car trains on the Peterborough and Cambridge routes, is planned to be delivered by December 2015.

A14. The overall Programme involves £3.55 billion of infrastructure works, which will be undertaken by Network Rail, as well as the acquisition of new trains and the revision of relevant franchises. The Programme, which will be managed by the Department for Transport, is at an advanced stage of preparation and cost estimates have been subject to close scrutiny. The Secretary of State believes that delivery of the CP4 elements of the Programme to the above timetable is achievable within the statement of funds available. Completion of the first phase of the Programme is assumed within the capacity enhancements specified in the Schedule to this Statement.

A15. The Secretary of State wants to see the railway works which are required to tackle the crowding problems and improve the passenger environment at Birmingham New Street station undertaken, either as a discrete project

or as an element within Birmingham City Council's broader aspirations for redevelopment of the station and surrounding area, to a maximum rail expenditure in CP4 of £128 million. The Secretary of State believes that this is achievable within the statement of funds available.

A16. The Secretary of State also wants to see works undertaken at Reading station to deliver the increased capacity required in CP4 and to meet other longer term passenger and freight movement requirements. Network Rail is to undertake further development work to confirm the full scope and timing for delivery of this scheme, which the Secretary of State expects to be delivered within a maximum CP4 expenditure of £425 million. The Secretary of State expects a regulatory protocol to be established with Network Rail that sets out governance arrangements for delivery of this programme. The Secretary of State believes that delivery of the works is achievable within the statement of funds available.

A17. The Department has agreed with Network Rail the remaining elements of the West Coast Strategy (Strategic Rail Authority, 2002) which are required to enhance capacity on the West Coast Main Line, as set out in Network Rail's Initial Strategic Business Plan 'Base Case' (June 2006). The Secretary of State wants to see these completed and believes that this is achievable within the statement of funds available.

A18. The Secretary of State considers that the introduction of radio-based cab signalling will be a key enabler in the affordable development of the future railway. It should reduce costs in the long term and will provide flexibility to meet changing needs and to underpin enhancements to railway carrying capacity beginning in CP5 and CP6. She notes that the rail industry has reached collective agreement on a programme of work and on an acceptable range of costs which together provide the targets for the further development and implementation of ERTMS. The Secretary of State wants to see the work proceeding consistent with that agreement and believes that this is achievable within the statement of funds available.

A19. The Secretary of State has invited expressions of interest in developing, manufacturing and financing a new generation of inter-city express trains. The Secretary of State has received advice from Network Rail on the probable cost of the infrastructure works that are necessary in CP4 to permit the operation of the new trains and wants these works to be undertaken. She recognises that the cost estimate necessarily will be refined in the light of the technical specification that will be incorporated in the Invitation to Tender, but considers that the works are achievable within the statement of funding available.

A20. The lead responsibility for most of the actions that should be taken in CP4 to improve customer services rests with the train operators. Network Rail will have an important contributory role in many aspects of this agenda, e.g. the provision of better information to passengers and the gating of stations, but the Secretary of State does not consider that this should require significant investment or operating expenditure over and above that for which Network Rail should already have made provision in its

estimate of baseline costs for CP4. The significant exception is the need for investment to improve stations.

A21. The Secretary of State shares the concern that has been expressed by the Transport Select Committee and others about the quality of some stations. Within the statement of funds available, she has therefore provisionally allowed for £150 million during CP4 to support investment to improve facilities at approximately 150 intermediate stations. These are stations which rank within the top 500 in England and Wales in terms of the numbers of passengers departing from them, but excluding termini and other major stations directly managed by Network Rail. Such improvements could cover enhancement of passenger facilities and the passenger environment, including station security and visual appearance. While this funding is additional to the 'Railways for All' fund (£190 million in CP4), provided under the Access for All programme, where appropriate, improvement in facilities should include measures to improve access for persons of reduced mobility.

A22. The Secretary of State looks to Network Rail to take the lead in identifying stations to improve, working closely with Passenger Focus, DiPTAC, local authorities and train operating companies, and having regard to the potential to secure third-party contributions, which will be critical to the deliverability of the programme. Network Rail will set out its proposals for securing station improvement in its October strategic plan. The Secretary of State will look to the ORR to determine whether Network Rail's proposals are deliverable: should this not be the case she wants the £150 million provisionally ring fenced for stations to be used instead to achieve further increases in capacity.

A23. The Secretary of State wants to continue to fund the Network Rail Discretionary Fund, at the level of £45 million in each year of CP4, and has made provision for this within the statement of funds available.

A24. To facilitate the implementation of a Strategic Freight Network, which will enhance the network used by freight trains and reduce conflict between freight and passenger traffic, as described in the White Paper, the Secretary of State has allowed for a maximum of £200 million of expenditure in the last four years of CP4. The Secretary of State also wants to fund certain freight costs in the manner set out in the Department's letter to the ORR of 30 January 2007. The Secretary of State considers that these costs are achievable within the statement of funds available.

Additional information

A25. The Secretary of State will publish, by January 2008, a plan and timetable for the introduction of additional rolling stock, taking account of Network Rail's plans and such advice as the ORR is able to provide in the time available on the cost and affordability of those plans.

A26. The Government is promoting a Hybrid Bill for the construction of the London Crossrail Line 1. The Secretary of State cannot anticipate the decision of Parliament on whether or not to grant powers to construct

the new line. If the powers are granted, the Secretary of State would wish Network Rail to undertake the infrastructure works on the existing railway outside the tunnel, which are required to permit the operation of Crossrail services, and would expect their involvement to be on the basis of an implementation agreement between Cross London Rail Links Ltd and Network Rail. The Secretary of State has not made provision within the statement of funds available for Crossrail-related works undertaken by Network Rail.

Statement of funds available

A27. As required by paragraph 1D(1)(b) of Schedule 4A to the Railways Act 1993, as inserted by Schedule 4 to the Railways Act 2005, the Secretary of State is also setting out the public funds which are available or likely to become available for the railway during the period 2009/10 to 2013/14. Table A1 provides this information. The Scottish Ministers have a similar duty relating to Scottish railway activities.

Table A1: **Statement of funds available per year (£m, nominal, prices of the day)**

£m, nominal (prices of the day)	2009/10	10/11	11/12	12/13	13/14
Funds available	3,156	3,031	3,122	3,043	2,977
Illustrative split* :					
Franchise Support	1,612	1,386	1,105	856	535
Network Grant	1,544	1,645	2,017	2,186	2,442

* Based on CP3 Access Charges, subject to change following conclusions of PR08

A28. The funding provided by the Government to the national rail industry in recent years has been directed either to support franchised passenger service operators[1] or as a direct grant to Network Rail. The Secretary of State anticipates that these funding arrangements will continue, though recognises that it is for the ORR to confirm this as part of the Periodic Review process. In particular, final conclusions on the absolute level of access charges levied by Network Rail on train operators will affect the balance of funding. The split of funds available between franchised operators and Network Rail shown above is therefore illustrative only, assuming a continuation of the access charge levels set in the current control period. It should be stressed, however, that the total funds available does not change.

A29. In assessing the funds to be made available, the Secretary of State has taken account of the expected financial impact of forecast demand growth. In addition the Secretary of State has been mindful of the advice which previously has been provided by the ORR on the industry financial framework and other key financial parameters for the next control period.

1 Individual franchised passenger service operators may either be in receipt of subsidy or alternatively required to pay a premium in any given year. References to the aggregate funding provided or expected to be provided in support of franchised operations should be taken to mean the net of all subsidy and premia payments.

A30. In addition to the funding set out above, there are certain other potential sources of public funding for the railway in England and Wales during CP4. Given that these funds are available to be applied across a range of transport modes, they have not been included within the statement of funds available. However, it is open to bodies to apply for funding from these sources for railway purposes – such applications will be judged on their merits on a case by case basis.

Additional financial information

The Transport Innovation Fund (TIF)

A31. The Transport Innovation Fund is a potential additional source of funding to the statement of funds available. It is aimed at directing resources towards the achievement of two key objectives: specifically tackling congestion and improving productivity. The TIF is operated as a single funding pot with two entry points, termed congestion and productivity TIF.

A32. Congestion TIF will support local packages aimed at tackling congestion through a combination of demand management measures and public transport improvements. Bids for congestion TIF have been invited from local transport authorities, and the Department expects to receive the first bids in the course of this year.

A33. The aim of productivity TIF is to support transport schemes expected to make a major contribution to national productivity. The Department for Transport has not operated productivity TIF as a bidding round, but developed a list of potential schemes, taking account of the views of the English RDAs, and its own knowledge of the transport networks and of pre-existing transport schemes. In December 2006, the Secretary of State announced that a number of these schemes had shown strong potential to provide significant benefit to national productivity. Amongst them were five strategic rail enhancement schemes. Final decisions on the allocation of funding are subject to investment appraisal and business case scrutiny processes.

Regional Funding Allocations

A34. The 2004 Spending Review announced a number of new measures, including a commitment to better integrate decision-making on regional transport, housing and economic development, based on a framework of indicative long term regional funding allocations (RFA).

A35. In July 2005 details were given of the RFA for each region (for each year up to 2007/08) together with longer term planning assumption figures (for each year from 2008/09 to 2015/16). These figures represent only part of total Government spending on these functions in each region. For transport, the RFAs comprise capital funding for local authority major road and public transport schemes under the Local Transport Plan system and for most Highways Agency major schemes.

A36. The Government responded to the transport aspects of the regional advice on 6 July 2006, announcing formal approval of various transport schemes in each region, and providing a further list of schemes which the Department expects to fund over the RFA period (subject to their meeting all the necessary assessment tests). The Government is considering the options for taking forward the RFA exercise as part of the wider sub-national review of economic development and regeneration, which will report ahead of the 2007 Spending Review.

Schedule to Appendix A: High Level Output Specification Metrics

Safety metric

A 3% reduction in the national level of risk to passengers and rail workers from 2008/09 to 2013/14.

- The metric is a risk-based measure expressed as a percentage change in risk over the five-year period from 2008/09 to 2013/14. It is defined in terms of the industry's current measure of 'fatalities and weighted injuries'. Should the industry's weighting for this measure subsequently change, the HLOS metrics will need to be recalculated accordingly;
- The passenger risk is expressed as fatalities and weighted injuries per million passenger kilometres;
- The employee risk is expressed as fatalities and weighted injuries per million employee hours;
- The risk assessed is for fatalities, major injuries and minor injuries on Network Rail managed infrastructure, the overwhelming bulk of the national rail network. This is consistent with the current geographic scope used for reporting in the rail industry Safety Management Information System (SMIS) and the outputs of the Safety Risk Model (SRM). SMIS and SRM injury definitions apply. Further information on these is to be found at the Rail Safety and Standards Board's web site: www.rssb.co.uk;
- This metric covers the railway in Scotland as well as England and Wales, as safety on the railways has not been devolved. Should Scottish Ministers want to see any increment to the national level of risk reduction, they may include this in the Scottish HLOS and meet any additional costs that may arise from this increment.

Reliability metric

Public Performance Measure (PPM) to be achieved by the end of CP4 and the reduction in significant lateness and cancellations between 2006/07 and the end of 2013/14 is shown in Table A2.

Table A2: **PPM to be achieved by end of CP4**

Sector	PPM by end CP4 (%)	Reduction in significant lateness and cancellations (%)
Long-distance services	92	36
London & South-East services	93	21
Regional services	92	27

Sectors

The operators in each sector are:

- Long distance services
  - First Great Western (High Speed Services)
  - Great North Eastern Railway
  - Midland Mainline (Midland Rail from November 2007)
  - 'one' (Anglia Main Line)
  - First TransPennine Express
  - Virgin CrossCountry (Arriva CrossCountry from November 2007)
  - Virgin West Coast
- London & South East services
  - c2c
  - Chiltern Railway
  - First Capital Connect
  - First Great Western (London and Thames Valley)
  - 'one'
  - Silverlink (London Midland from November 2007)
  - Southeastern
  - Southern (including Gatwick Express from May 2008)
  - South West Trains (including Island Line)
- Regional services
  - Arriva Trains Wales
  - Central Trains (London Midland and Midland Rail from November 2007)
  - First Great Western (West)
  - Merseyrail
  - Northern Rail

Public Performance Measure (PPM)

This measures the percentage of trains arriving at destination within ten minutes of the time shown on the published timetable for long distance services, and within five minutes for regional services and London and South East services.
It covers all timetabled services on all days of the week.
Cancellations are included within PPM as services not arriving within time.

Significant lateness

A train is significantly late if it arrives at destination 30 or more minutes later than the time shown on the public timetable. This criterion applies to all timetabled services on all days of the week. For the purpose of this metric, part and full cancellations are scored as 'significantly late'.

Capacity metric

(1) Total level of demand to be accommodated (forecast demand in 2008/09 plus the forecast additional demand to be accommodated by 2013/14) expressed in passenger kilometres by Network Rail Strategic Route is shown in Table A3.

Table A3: **Total demand to be accommodated by Strategic Route**

Routes	Annual passenger km forecast in 2008/09 (millions)	Additional passenger km to be accommodated by 2013/14 (millions)
1. Kent	3,350	333
2. Brighton Main Line and Sussex	4,681	536
3. South West Main Line	5,012	706
4. Wessex Routes	431	58
5. West Anglia	1,561	482
6. North London Line and Thameside	1,047	118
7. Great Eastern	2,775	319
8. East Coast Main Line	6,375	975
9. North East Routes	156	13
10. North Trans-Pennine, North and West Yorkshire	1,189	189
11. South Trans-Pennine, South Yorkshire and Lincolnshire	741	113
12. Reading to Penzance	1,178	158
13. Great Western Main Line	4,327	637
14. South and Central Wales and Borders	328	29
15. South Wales Valleys	153	13
16. Chilterns	661	98
17. West Midlands	1,862	258
18. West Coast Main Line	5,737	913
19. Midland Main Line and East Midlands	2,655	498
20. North West Urban	1,141	157
21. Merseyrail	337	18
22. North Wales and Borders	223	26
23. North West Rural	153	12

Routes

The routes are the 23 England and Wales Strategic Routes defined by Network Rail and used by the rail industry for planning purposes. For details see the business planning section of the NR web site: www.networkrail.co.uk.

(2) Numbers of arriving passengers to be accommodated, and city maximum average load factors, on services into Birmingham, Cardiff, Leeds, Manchester and other urban areas by the end of CP4, on a weekday morning in the three hour peak and in the high peak hour are shown in Table A4.

Table A4: **Peak demand to be accommodated in major urban areas by end of CP4**

City	Peak three hours			High-peak hours		
	Forecast demand in 2008/9	Extra demand to be met by 2013/14	Maximum average load factor at end CP4 (%)	Forecast demand in 2008/9	Extra demand to be met by 2013/14	Maximum average load factor at end CP4 (%)
Birmingham	32,000	4,600	48	15,400	2,400	55
Cardiff	8,500	900	39	4,000	600	43
Leeds	23,400	5,100	64	11,300	2,700	70
Manchester	22,100	4,100	45	10,700	2,200	49
Other urban areas	27,700	3,600	41	12,300	2,000	46

City station definitions

- Birmingham stations are: New Street, Snow Hill and Moor Street.
- Cardiff stations are: Cardiff Central and Queen Street.
- Manchester stations are: Oxford Road, Piccadilly and Victoria.
- Leeds is the single station.
- Other urban areas evaluated were Bristol, Leicester, Liverpool (excluding Merseyrail), Newcastle, Nottingham and Sheffield, because these cities are current significant users of rail for commuting.

For definitions of peak periods and load factors see notes below.

(3) Numbers of arriving passengers to be accommodated on services into the main London termini and London city maximum average load factors by the end of CP4, on a weekday morning in three hour peak and in the high peak hour are shown in Table A5.

Table A5: **Peak demand to be accommodated at the main London termini by end of CP4**

London Terminus	Peak three hours			High-peak hours		
	Forecast demand in 2008/9	Extra demand to be met by 2013/14	Maximum average load factor at end CP4 (%)	Forecast demand in 2008/9	Extra demand to be met by 2013/14	Maximum average load factor at end CP4 (%)
Blackfriars	21,900	3,500	67	11,200	1,200	76
Euston	23,800	3,400		10,600	1,600	
Fenchurch Street	26,000	2,500		13,900	1,600	
Kings Cross	18,300	2,300		8,000	1,100	
Liverpool Street	74,300	10,600		36,700	4,900	
London Bridge	127,600	12,600		65,200	7,800	
Marylebone	9,100	1,000		4,600	600	
Moorgate	13,000	700		7,400	400	
Paddington	24,100	2,900		11,500	1,400	
St. Pancras	25,900	10,900		13,100	5,700	
Victoria	58,700	5,300		29,300	2,800	
Waterloo	74,300	9,200		36,800	4,900	

London stations definitions

- St Pancras values include Thameslink services, Midland Mainline and the Channel Tunnel Rail Link domestic services but exclude international services.
- Kings Cross values cover terminating services only and do not include through Thameslink services.
- Moorgate values are only for services using the Northern City Line. Thameslink is excluded.
- London Bridge values cover services terminating there and services continuing to Cannon Street, Charing Cross and Blackfriars.
- Blackfriars values are only for those services coming via Elephant and Castle.

Load factor

- The load factor is calculated as the forecast passenger demand divided by train capacity, expressed as a percentage.
- Train capacity on commuter stock has generally been calculated on the basis of the total number of passengers that can be accommodated, seated or standing, allowing 0.45 sq. m of space per person.
- In a minority of cases of commuter rolling stock for which no information on 'furnishable space' was available, train capacity has been estimated at a ratio of 1.4 times the number of seats.
- For all inter-city rolling stock, train capacity has been estimated at a ratio of 1.2 times the number of seats.
- The load factor causes a minimum volume of total train capacity to be provided into the identified station(s) during the peak period and sets a cap on the average level of peak train crowding across the city.

Forecasts

- All figures relate to franchised passenger services.
- The forecasts of demand and the load factors listed are the Department's best assessment using available models and based on available information and plausible assumptions.
- The Department is at risk for the forecast at the start of CP4 and any variance in the forecasts between the start and end of CP4.
- Should better evidence of forecast demand at the start of CP4 become available during the course of the periodic review, the values will be adjusted accordingly.

Peak three hours and high-peak hour

- The peak three hours covers all services timetabled to arrive in the morning between 0700 and 0959.
- The high peak hour covers all services timetabled to arrive in the morning between 0800 and 0859.
- Where two or more stations are included, e.g. Birmingham Snow Hill and Moor Street, the first station called at determines whether the train falls within the peak.

Evening peak

- Only the morning peak is used for HLOS. The evening peak is typically between 6 per cent and 20 per cent less in demand over both the high peak and the peak three hours. The train capacity provided for the morning peak is expected to be used for the evening peak with the load factors maintained or bettered for passenger comfort.

Timing of capacity delivery

- Delivery of some of the specified capacity may be brought forward before the start of CP4 if this is feasible and value for money.

Appendix B. Glossary of terms

ALARP	As low as reasonably practical
ATOC	Association of Train Operating Companies
BML	Brighton Main Line
BR	British Rail
CAA	Civil Aviation Authority
CP3	Network Rail Control Period 2004–09
CP4	Network Rail Control Period 2009–14
CP5	Network Rail Control Period 2014–19
CP6	Network Rail Control Period 2019–24
CTRL	Channel Tunnel Rail Link
CLG	Communities and Local Government
DDA	Disability Discrimination Act 2005
DfT	Department for Transport
DMU	Diesel multiple unit
DPTAC	Disabled Persons Transport Advisory Committee
DRC	Disability Rights Commission
ECML	East Coast Main Line
EMU	Electric Multiple Unit
ERTMS	European Rail Traffic Management System
ETS	Emissions Trading Scheme
EU	European Union
FOC	Freight Operating Company
GDP	Gross Domestic Product
GWML	Great Western Main Line
HLOS	High Level Output Specification
HSE	Health & Safety Executive
HSL	High-speed line
HST	High-speed train
IEP	Intercity Express Programme
ITSO	Smartcard
km/h	Kilometres per hour
LTP	Local transport plan
MML	Midland Main Line
NAO	National Audit Office
NMF	Network Modelling Framework
NR	Network Rail

NRES	National Rail Enquiry Service
NSBP	Network Rail Strategic Business Plan
OPRAF	Office of Passenger Rail Franchising
ORR	Office of Rail Regulation
PAC	Public Accounts Committee
PDFH	Passenger Demand Forecasting Handbook
PiXC	Passengers in excess of capacity
PPM	Public Performance Measure
PRM	Persons of reduced mobility
PTE	Passenger Transport Executive
RAB	Regulated Asset Base
RIFF	Rail Industry Forecasting Framework
ROSCO	Rolling stock company
RPA	Regional Planning Assessment
RPG	Regional Planning Guidance
RSS	Regional Spatial Strategy
RSSB	Rail Safety and Standards Board
RUS	Route Utilisation Strategy
RVAR	Rail Vehicle Accessibility Regulations
SFN	Strategic Freight Network
SNCF	Societé Nationale des Chemins de Fer Français (French Railways)
SoFA	Statement of Funds Available
SRA	Strategic Rail Authority
TAC	Track access charges
TEN	Trans-European Network
TfL	Transport for London
TKM	Tonne Kilometres
TS	Transport Scotland
TGV	Train à Grande Vitesse
TIF	Transport Innovation Fund
TOC	Train operating company
TSI	European Technical Standard for Interoperability
TTW	Travel to work
WAG	Welsh Assembly Government
WCML	West Coast Main Line

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