The Sustainable Case for Rail

Position paper by the Institute for European Environmental Policy

for

RMT Parliamentary Group's Seminar

"The Sustainable Case for Rail"

12 June 2006

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EXECUTIVE SUMMARY

Prior to privatisation, a nationalised British Rail took an active lead on environmental issues such as energy use. This was due to both a desire to be seen to be taking the initiative on such matters, as well as the incentive of the potential financial savings resulting in particular from lower energy use, given the scale of its operations at that time. Since privatisation, however, the fragmented nature of the rail industry has resulted in less priority being given to environmental concerns, although attempts have been made recently, by both the Office of the Rail Regulator and, latterly, Network Rail, to develop an industry-wide response to key issues.

The environmental and sustainable development agendas will, however, increasingly impact on rail, as:

- In terms of legislative attention, the environmental impacts of rail have been neglected, particularly compared to road transport, although this gap is now starting to be addressed;
- The nature of UK and EU environmental policy is changing, away from problems that are suitable for end-of-pipe solutions, such as air quality, towards issues that require a more integrated, multi-lateral approach, such as climate change; and
- The social and economic dimensions of sustainable development are increasing in their prominence on the policy agenda.

Having said this, rail's environmental performance relative to other motorised transport modes is still good in most respects. Hence, the developing environmental and sustainable development agendas should be seen as an opportunity for the rail sector to take a lead on environmental issues and to contribute proactively to the development of a sustainable transport system, of which it has to be an integral part.

In the UK, the modal share of the car is higher than in any other EU state. It is difficult to identify one single cause for this, but a more proactive and integrated approach is often taken towards the provision of public transport on the continent. The UK, for example, has very few high speed rail lines, whereas in France by contrast, the provision of these has been used to help revive areas in industrial decline, such as Lille.

However, the policy framework within which rail operates in the UK is far from coherent and tends to ignore the potential role that rail could play in the development of more sustainable communities and transport. The much-heralded integrated approach to transport policy of 1998 has not been translated into practical action on the ground. This failure has been criticised time and again by experts and parliamentary select committees, but with seemingly little impact on government policy. While multi-modal studies have attempted to take an integrated approach to developing transport infrastructure, for example, these have often not been implemented in full, usually omitting improvements to the rail network, due to a lack of financial resources and the differing strategic priorities of different key players. The sustainable communities agenda seems to be proceeding without due emphasis on

the needs for transport infrastructure or consideration to the potential contribution of rail; while other government policies, such as energy and climate change policies, also appear to largely overlook the potential role that rail could play in delivering the policy objectives.

Hence, while rail has a key role to play in delivering the policy objectives of the emerging environmental and sustainable development agendas, this potential is not yet being realised or capitalised upon, either by the government or by the rail industry itself.

1 INTRODUCTION

This paper was prepared by the institute for European Environmental Policy for the RMT's Parliamentary seminar 'The Sustainable Case for Rail', held at the House of Commons on Monday 12 June 2006.

We thank the RMT for their invitation to participate in this event, and gratefully acknowledge the many people who have contributed directly or indirectly to its content. The views expressed are those of the authors, however, as is the responsibility for any errors herein.

2 THE ENVIRONMENTAL CONTEXT

2.1 The UK Rail Industry and the Environment

Awareness of environmental issues and active energy management has long standing in the railway industry. As a nationalised industry British Rail needed to be seen to be taking a lead and being a role model on these issues. Also, as a large organisation, the financial incentives for efficient use of energy, for example, were quantifiable and on a significant scale. The organisations that comprise today's railway industry are smaller, and whilst energy efficiency may offer the same proportional benefits, the reduction in scale dilutes the incentive (small business saves in £thousands; big business saves in £millions). Additionally, there may be other issues of scale, as, for example, BR was large enough to fund a Research and Development division, which could claim many environmental achievements and which sold its expertise around the world. In addition, BR could exert purchasing pressure on suppliers and could justify the, sometimes high, capital outlay required to bring operational improvements.

However, in the immediate aftermath of privatisation, research suggested that the focus of train operators was likely to be on local environmental issues and immediate legislative requirements, which effectively amounted to compliance with the Environmental Protection Act (Part 1, 1990). Present and anticipated environmental regulation to control vehicle noise and emissions, plus satisfying regulation on effluents, waste and litter, etc, from rail operations were the only areas of serious concern. Rail's global environmental impacts were attracting very little attention and the positive role railways could play as part of a more sustainable transport system was of apparently of very little (and vague) concern.

Reflecting this, in July 1994 the then Office of the Rail Regulator (ORR) issued a consultation document on environmental guidance, which included an appendix summarising issues, current best practice and options for improvement (ORR, 1994). This referred to 'pollution, global warming and the depletion of the ozone layer'. The consultation document included sections on non-renewable resources, energy conservation and ozone-depleting chemicals. In March 1996, this consultative document was followed by environmental guidance that set out the elements that are 'essential in a well-constructed environmental policy' (ORR, 1996). The guidance was, however, essentially administrative, ie it focused on how to structure an environmental policy. The Regulator's introduction said that it would 'not be

appropriate for me to try to summarise current requirements and standards', as he had done in the consultative document. However he did suggest a 'forum' to 'exchange relevant environmental information'.

In March 2003, Network Rail published an Environment Policy statement that set out its vision for the environment and its environmental aims in terms of its commitments, responsibilities and its partners (Network Rail, 2003a). The Environment Policy is supported by a three-year plan which integrates safety and environment, the first of which was also published in 2003 and covers the period from 2003 to 2006 (Network Rail, 2003b). The plan describes various environment policy related initiatives and processes, for example, the Network Rail Annual Environment Conference; Annual Network Rail-sponsored environment awards; an environment management system and a process of monitoring and review. The plan also sets out Network Rail's objectives for improvement against identified environmental impact risks. Each year the plan is reviewed and an update published including progress against objectives in the previous year and actions that will be taken in the coming year (Network Rail, 2004).

Integrating environment and safety should ensure that environment issues are given consideration. However, it is apparent from reading the plan that the tie-in with safety has resulted in a risk-based approach to environmental issues. This may stifle innovation as developments that do not address a specific risk may be overlooked.

Following recommendations from Lord Cullen's Inquiry into the Ladbroke Grove incident a new Rail Safety and Standards Board (RSSB) was created. RSSB is responsible for Railway Group Standards (RGS). The purpose of RGS is to provide a framework for system safety and safe interworking by providing clear, concise and cost effective standards, which encourage compliance and consistency without hindering innovation (RSSB, 2006). Although RGS are essentially safety related standards there are some incidental connections with environmental issues, eg the use of audible warnings and noise pollution.

Franchising may have introduced a problem of short term-ism, which, along with the focus on achievement of rigid targets, could stifle innovation on environmental issues. A further problem in a fragmented industry is the 'landlord and tenant' problem, wherein one organisation needs to incur costs in order for another to reap the benefit (for example, in installing regenerative braking), and hence an institutional barrier to innovation exists.

With greater direct government control of the rail industry (as envisaged in the Railways Act 2005) there is now the opportunity for positive intervention from the Treasury, which could promote a broader environmental agenda by both encouraging modal shift *and* delivering a more environmentally-sound rail network.

2.2 The New Environment and Sustainable Development Agenda

The environmental and the broader sustainable development agendas will increasingly impact on the rail industry in the years ahead, for three distinct reasons:

- Rail has been neglected, in terms of environmental legislation, when compared to other transport modes;
- The nature of environmental policy in the UK and Europe is changing; and
- A wider sustainable development agenda is also emerging.

Compared with, say, road traffic or industrial installations, ***the rail industry has been relatively lightly regulated to date*** in terms of environmental requirements, but increasingly is being brought within the framework of environmental legislation as other (often bigger or easier) targets are addressed. The 2004 European Directive on emissions from non-road mobile machinery, which covered railway locomotives for the first time, is a good example of this process. While these requirements will improve certain aspects of the environmental performance of the rail industry, they will do so at a cost, and these costs come at a difficult time in terms of the finances of the rail industry. Hence there is a strong tendency for the rail operators to react negatively and only reactively in response to such requirements.

The ***nature of environment policy is also changing***, with arguably, a 'new' environmental agenda emerging, which will see greater attention paid to certain pressing issues such as climate change and biodiversity. Whereas the 'old' agenda focused on issues that were relatively easy to identify and which often had technical solutions, eg engine emissions, the issues on the new agenda do not offer simple or straightforward solutions, and are not generally subject to 'end of pipe' solutions. Also, because they are diffuse problems they are, in their nature, difficult for individual institutions to deal with in a complex inter-institutional setting. At the same time, these are issues that will often require responses from a much wider range of actors than those subject to most traditional environmental regimes.

However, issues such as climate change and biodiversity are areas where the rail sector can position itself as a positive actor, and as part of the solution, not part of problem. On climate change, for example, action could build on work begun by the SRA (for example in *Everyone's Railway*) to portray and promote rail as a dynamic part of the solution to greenhouse gas emissions, by taking trucks off the roads and diverting passengers from road and air travel, as well as by improving its own performance on greenhouse gas emissions. Similarly, the success of the Highways Agency in promoting itself as a major planter of trees suggest that rail could probably do far better at promoting itself as a steward of the countryside than is currently the case.

Finally, the ***emerging sustainable development agenda*** broadens the emphasis of policy from pure environmental issues, to social and economic concerns. This will clearly impact on the future of the rail industry, as rail is a key mode in moves towards a more sustainable transport sector, for example. Numerous definitions of sustainable development exist, most of which are not very precise or operational, and therefore of little use for this purpose. The two key elements identified in the UK's Sustainable Development Strategy (DEFRA, 2006) are:

- Living within environmental limits, and
- Ensuring a strong, healthy and just society.

A key element within this is also the promotion of a sound economy (conventionally viewed as the third 'pillar' of SD). In a report to the SRA, ADL used a variety of sources to develop a model of rail's contribution to SD under these three pillars (ADL, 2003). While the current paper focuses on the first of these three pillars, it should be noted that all three are closely interconnected at a strategic level. For example, reducing emissions and noise contributes to a healthy society, and reducing traffic congestion brings environmental as well as economic benefits. These considerations are particularly important when considering the 'bigger picture' aspects of rail and environmental policy, and should be reflected in future strategy.

3 THE ENVIRONMENTAL IMPACTS OF RAIL COMPARED TO OTHER MODES

3.1 Introduction

The 'green' credentials of the rail industry *viz a viz* road transport are often taken for granted, but some recent studies have suggested that road transport is less polluting than rail. In reality this analysis is rather selective, and figures supplied by AEA Technology confirm that rail overall retains an advantage over road (ATOC and the Railway Forum, 2004). However this is an average; it is far less certain whether diesel passenger rail retains the advantage over road in some respects. Some continental studies have also suggested that road freight can be better than rail in terms of environmental performance.

It is certainly the case that the road sector has improved its performance in terms of pollutant emissions such as nitrogen oxides and particulates over the past two decades, and continues to do so, while rail has yet to make significant progress. It is therefore timely to consider ways in which the rail industry might improve its environmental performance, and thereby safeguard its green credentials.

In this section, the environmental performance of rail are compared to that of its competitor modes – road, and, to a lesser extent, aviation. In terms of aggregate environmental impact – for example, total greenhouse gas emissions – rail will in almost all cases have a lesser total impact than the other modes. However this is not a fair comparison, in that road accounts for 92% of passenger-kilometres of domestic travel and 83% of freight-tonne-kilometres, with rail contributing only 6% and 11% respectively (ONS, 2005). A fairer comparison, therefore, is of the levels of impact per unit of useful transport achieved, ie per passenger- or tonne-kilometre. Below an indication of relative environmental performance is provided for some of the main environmental challenges that we face today and for the future.

3.2 Emissions of Regulated Pollutants

As the operation of the railways – with either diesel or electric traction – requires the combustion of fossil fuels, either within the train or elsewhere at a power station, pollution is produced. The principal pollutants emitted are the oxides of nitrogen (NO_x), carbon monoxide (CO), volatile organic compounds (VOCs), particulates and sulphur dioxide (SO_2). Such pollutants can have an adverse effect on human health and can damage vegetation and infrastructure.

According to recent UK transport statistics, railways contribute 1% or less to national emissions of NO_x, CO, VOCs and particulates, which is significantly less than the proportion contributed by road transport, which is more than 50% in some cases (Office of National Statistics, 2004). An AEA report for the SRA highlighted that emissions of SO_2 from railways were higher than those from road transport (Watkiss and Jones, 2001), but the most recent figures for the UK suggest that transport in total contributes no more than 2% to UK SO_2 emissions (National Atmospheric Emissions Inventory, 2003). The suggestion that rail produces more SO_2 than road transport was

due to the fact that the diesel fuel in road transport is of a much higher quality, and therefore contains less sulphur, than that used by trains[1].

On a passenger kilometre basis, emissions of CO and VOCs from most common rail locomotives/units compared favourably with road based modes, whereas the comparison is not favourable for SO_2, as discussed above. Emissions of NO_x and particulates compared poorly for diesel-powered rail engines, but more favourably for electric units. For freight, the figures for rail compared favourably with those of road transport for all the main pollutants bar SO_2 (Watkiss and Jones, 2001).

In terms of the impact on human health, it is NO_x and particulates that are of most concern at the moment, as emissions of other pollutants have declined significantly in recent years. If rail is going to have a major impact on human health it will likely be in major cities, where major rail termini are located. However, a recent report for London, in which numerous rail termini are located, suggested that the contribution of NO_x and particulate emissions from the railways to pollution in London is not significant compared to the other sources in the capital. On the other hand, the City of Westminster has highlighted emissions of NO_x, particulates and SO_2 around Paddington station as issues in its Air Quality Action Plan (City of Westminster, 2004), and a casual visit is enough to convince that rail has, at the very least, an image problem where diesel particulates are concerned.

3.3 Greenhouse Gas Emissions

There is now a broad scientific consensus that greenhouse gas emissions are changing the climate, which will have very serious implications for human health and natural ecosystems. For the most important greenhouse gas carbon dioxide (CO_2), this effectively means we will need to reduce consumption of fossil fuels across the board. Other greenhouse gases or relevance to the rail industry include methane, sulphur hexafluoride and hydrofluorocarbons.

Rail transport contributes to climate change principally through the combustion of fossil fuels to operate trains – either directly in a rail engine or indirectly at the power station – that give rise to emissions of CO_2. Rail's contribution to CO_2 emissions in the UK is only around 1%, even including its contribution to emissions at power stations. This is low when compared to the contribution from road transport, which makes up around 26% of UK emissions (Office of National Statistics, 2004). Emissions of CO_2 per passenger- and freight-kilometre for a range of DMUs and diesel and electric locomotives compared favourably with CO_2 emissions from all other modes (Watkiss and Jones, 2001).

There are also other sources of greenhouse gas emissions associated with the rail industry:

- CO_2 emissions from road vehicles owned and operated by the industry;
- Methane emissions from landfill sites managed by Network Rail;

[1] It should be noted that, as rail uses electricity, it indirectly contributes to emissions at power stations. However, as these emissions are effectively those of another sector, ie the energy sector, power station emissions are not addressed in this report.

- Sulphur hexafluoride (SF_6), which is used as an insulator in electricity switching mechanisms;
- Hydrofluorocarbons (HFCs) in air conditioning and refrigeration;
- Additional life-cycle emissions associated with the extraction and production of the diesel fuel used by the sector;
- Additional lifecycle emissions associated with the manufacture, maintenance and disposal of rolling stock; and
- Additional life cycle emissions associated with the construction and maintenance of infrastructure, eg railways, stations, etc.

3.4 Noise and Vibration

The 1990 Noise Incidence Survey identified that railways were a source of at least background noise at around 15% of the dwellings that were surveyed. This appears to be a very high figure and gives rise to some concern, but no systematic assessment of the impacts of railway noise has yet been carried out for the UK (DEFRA, 2001). The European Environment Agency quotes research based on evidence form France, Germany and the Netherlands, that estimates that 10% of the EU population is exposed to noise levels from railways that are considered to be highly annoying (EEA, 2001a), and this does seem to bear out the suggestion that rail is a significant source of noise nuisance. Road traffic noise is clearly more widespread and likely to be more continuous in nature, but direct comparisons are as yet difficult.

The main sources of railway noise are (DEFRA, 2001):

- the wheel/rail rolling contact;
- wheel impact on rail joints where the rail is not continuously welded;
- sliding contact of wheel flanges resulting in 'wheel squeal' and wheel flats;
- rail corrugations; and
- diesel engines.

In general, electric trains are considerably quieter than diesel trains, while new diesels are better than old.

3.5 Waste and Resource Use

The EU generates approximately 1,300 million tonnes of waste per year, and it is expected that this figure will increase, as it has in recent years (EEA, 2001b). The hazardous content of waste is also a problem as products become more sophisticated and technologically intensive. Set against this, the number of suitable landfill sites is running out and incineration – in spite of being subject to strict emission standards – is always a source of concern for those living near such plants.

There are a number of potential sources of waste in the railway sector:

- Waste generated from the disposal of locomotives and carriages;
- Waste generated in the refurbishment of locomotives and carriages;
- Sleepers and ballast;
- Construction waste;

- Rubbish generated at stations and on board trains;
- Toilet waste from trains; and
- Waste oils.

In relation to the rolling stock, railway locomotives, DMUs and carriages typically last longer than on-road vehicles, as they are regularly refurbished, which extends their lifespan to around 30 years. However, both refurbishment and final disposal leads to waste that has to be disposed of. Disposal of rail rolling stock is completely dwarfed by the number of road vehicles scrapped annually; however recent EU requirements will mean that the latter are progressively easier to dispose of and to recycle in the future.

Network Rail uses 2.5 million tonnes of new ballast each year and lifts 1.5 million tonnes. The lifted old ballast is returned to Local Distribution Centres, where much of it is recycled[2]. Paved track is up to 1.3 times more expensive to install but significantly reduced maintenance results in pay-back in 9 years, while removing the ballast disposal problem. Hence rail produces relatively little large-scale mineral waste compared with a range of other construction activities including road building.

In relation to toilet waste, new trains tend to have retention tanks built into their design to store toilet waste, although some of the older 'slam-door' rolling stock and some high-speed diesel trains still deposit waste on the tracks. In relation to waste oils, many depots already have arrangements with sub-contractors who collect waste oil for recycling. Most major stations in the UK have waste compactors, but there appears to be little or no recycling.

In conclusion, therefore, the railways already have a reasonably good record on waste arisings, and options are available to improve further on this; but there is still significant room for improvement.

3.6 Land Take, Habitats and Biodiversity

All transport infrastructure takes up space, but rail has an advantage over road in that it can support a high density of traffic (in terms of passenger movements) on a much narrower total width of track than a motorway can. This is especially valuable in bringing large numbers of commuters into urban centres during peak hours. The most extreme example of this is in Central London, where three out of every four commuters arrive by rail, and it is impossible to imagine how so many could arrive by any other means.

There are also numerous beneficial impacts of railway infrastructure in relation to habitats and biodiversity, through their provision of wildlife corridors, particularly in urban areas. However, where railways pass through areas of natural habitat, such as conservation areas, they can have negative impacts such as fragmentation of the habitat. Nonetheless it is likely that the severance effect is less severe than with roads because the level of traffic is much lower and is discontinuous, and the active area covered in aggregate is much narrower, so animals have more opportunity to cross

[2] Watkiss and Jones (2001) estimated that, for example, in 1999, 95% of lifted ballast was recycled.

tracks. However, rail infrastructure does impact on a number of wetland sites covered under the Ramsar Convention. According to the European Environment Agency approximately 52% of UK wetland sites have rail infrastructure within 5km of their centre, which is the highest percentage in the EU. Moreover approximately 330 Sites of Special Scientific Interest (SSSIs) are intersected by the rail network in the UK. The EEA also concluded that 44% of Special Bird Areas (as designated under the EU Birds Directive) have major rail infrastructure within 5km of their centre (EEA, 2000).

Broadly, land used for the railways is either covered in ballast or is managed vegetation. In addition, there is land used for buildings, such as stations, depots, signal boxes, etc. Whilst the total land take from the railways is considerably lower than that for roads, issues may arise from proposed capacity upgrades that may occur in the future. For instance, the former 10 year transport plan highlighted the need for additional land take in which to upgrade the East Coast Main Line and Great Western Main Line and Thameslink (Watkiss and Jones, 2001). However, any significant projects will be subject to EIA and addressed on a site by site basis.

3.7 Contaminated Land and Hazardous Substances

Contaminated land has become a major issue in the UK over the past few decades. However, currently a comprehensive list of sites of contaminated land does not exist. A government report in 1993 estimated that of approximately 39,600 hectares of derelict land in the UK, 80% could possibly be contaminated. The railway's role in contributing to the issue of contaminated land has been highlighted as a particular problem. Indeed Railtrack estimated that approximately 600 sites which have been used for railway operations could be contaminated. The majority of these have arisen from the storage of diesel used in maintaining and refuelling locomotives(Watkiss and Jones, 2001).

Railway operations can result in a number of incidences of hazardous substances being released into the environment leading to contaminated land (Watkiss and Jones, 2001):

- Fuel spills: ground soil can be contaminated during the re-fuelling of diesel engines.
- De-icing: Railtrack's spraying of de-icing fluid on the tracks is also responsible for some contamination of land.
- Pollution from lubricants such as coolants and hydraulic oils used in locomotives and cleaning chemicals.
- Contamination from ballast: end of life ballast and construction waste from Railtrack activities can become contaminated.

4 COMPARISON WITH OTHER MEMBER STATES

For passenger travel, the UK currently has the largest modal share in favour of cars out of any EU state. This fact will largely be attributable to the fact that in other EU states other modes of transport are made more attractive to the individual. For example, in Germany the modal split of cars is lower than in the UK and the level of use of cars is low despite high levels of ownership. Continental public transport systems tend to be run by a single organisation, this allows them to run a more coherent service which can compete directly with private transport (ie car or airplane) instead of competing with other operators (CfIT, 2005). Look at certain cities in Germany, for example, where authorities have recognised that car travel is not suitable for every journey and have put in place long term strategies to promote other forms of transport. These strategies have also been backed up by substantial long term investment. In Munich, for example, they have succeeded in effecting a modal shift to cycling with the share of cycling going from 6% to 15% within 16 years. An initial investment of DM45 million (£15 million) was spent on Karlsruhe's innovative tram system which runs both in the city centre and on regional railways and a further investment of DM4.5 million per vehicle as well as ongoing subsidies to cover running costs. The bus and tram services in Karlsruhe offer a coherent service which runs long hours and has flexible ticketing. Despite this high level of subsidies 75% of running cost is accounted for by fares (CfIT, 2005).

France too shows a significant difference in the modal split by comparison to the UK. France and the UK have comparable populations, but the French travel more by train than the British (79,493 million passenger kilometres (mpkm) compared to 47,213 mpkm in 2000; INFRAS, 2004). This may be partially explained by French geography, whereby people have to make longer journeys as a result of the size of the country and wide spacing of conurbations. However, British people make more journeys on both comparing road and aviation compared to the French. Britain accrued 14,804 mpkm in short haul flights and 161,765 in million road vehicle kilometres (mvkm), while the respective figures for France were 12,521 mpkm and 111,835 mvkm (INFRAS, 2004).

The larger number of passenger kilometres made by rail in France could also be attributable to the well-developed high speed rail network, which allows people to make longer journeys by rail more quickly, and enables rail to compete more effectively with short haul air transport operators.

High speed rail in the UK has seen relatively little development compared with that on the continent. The UK’s high speed rail was developed in the 1970 and is not as fast as that on the continent. Recent upgrades to the West Coast Main Line and the construction of the Channel Tunnel Rail Link have meant that something approaching high speed rail is now in existence here, but this is still very limited compared to what has been achieved on the continent. By 2010, Europe will have around 6,000km of dedicated high speed rail lines, with the UK only contributing 109km of this. The economic and social benefits of high speed rail are significant. Lille has seen a shift in its economic fortunes since the introduction of a high speed TGV line in 1993 and subsequent Eurostar services. Lille has since attracted a lot of investment and has become France’s third most powerful financial, commercial and industrial centre (The

Railway Forum, 2005). High speed rail also has also been claimed to have significant environmental advantages in that its emissions are lower than those of other transport modes.

5 UK GOVERNMENT'S APPROACH TO RAIL

The integration of transport policy into the wider cross-governmental issues such as climate change, which have come to the fore in recent years, is vital if the aspirations set out by these programmes are to stand any hope of success. This integration, however, must not only occur at the strategic level but must be enshrined in the development of transport solutions at all levels, thus necessitating the participation of all modes in the policy packages, not least the role of rail. Unfortunately, this 'joined-up' approach both within and between departments has been crucially lacking for a number of key government priorities, with the result that problems are merely being stored up for the future.

This section provides some examples of where transport policy in general, and rail policy in particular, have failed to be adequately 'joined-up' in the policy process. Discussion begins with the issue of the evolution of policy integration, followed by three examples at different levels of government decision-making on the multi-modal studies, Sustainable Communities and climate change and energy policies.

5.1 Integrated Transport Policy

Following the Labour election victory in 1997, the creation of the Department of the Environment, Transport and the Regions (DETR) was heralded as the way to take a more integrated and 'joined-up' approach to decision-making in transport, the environment and planning. In 1998, this was reflected in the first Integrated Transport White Paper, which aimed to pursue a more sustainable transport policy and tackle the issues of congestion and pollution (Begg and Gray, 2004a). The approach of DETR did not last long, however, and in 2001 the department's responsibilities were split between the Department for Transport, Local Government and the Regions (DTLR) and the Department for the Environment, Food and Rural Affairs (DEFRA). Only a year later in 2002, another split occurred, which saw the creation of the current Department for Transport (DfT) and the Office of the Deputy Prime Minister (ODPM). Following the Government's reshuffle in May 2006 the bulk of the powers of the ODPM have now been transferred to the newly created Department for Communities and Local Government (DCLG). While this propagation of acronyms illustrates the fragmentation of the responsibility for integrated policy, it has been suggested that as a result, the thrust of policy making has also been reduced (eg Docherty and Shaw, 2003).

The manifestation of these changes and confrontation of the real thorny issues at the heart of the 1998 White Paper led Begg and Gray (2004b; page 158) to suggest there has been a slippage of transport policy to one

> "that is currently focused on supply side investment, DfT investing large amounts of money on infrastructure in expectation that improvement will be delivered".

Two House of Commons Select Committees have also raised the issue of the loss of the joined-up approach to policy:

> "Since the separation of the functions of the former DETR in 2001 and 2002, there has been a loss of coherence between transport, planning, housing, regeneration and environment policy…" (ODPM Commons Select Committee 2003 page 6)

> "It is becoming increasingly clear that the break-up of the DETR has had a negative impact as evidenced, for example, by the failure to incorporate a deeper understanding of sustainable development within the Aviation White Paper and ODPM's 'sustainable communities' initiative…" (Environmental Audit Select Committee, 2004 page 34)

Even at the less strategic level, there appears to be conflict between the policy aims of different departments, with two particular examples highlighted in the 2003 ODPM's Commons Select Committee Report. After citing the Secretary of State for Transport's negative statements on the use of planning for the reduction in travel and the need to reduce travel demand it concludes:

> "The Government's planning policy aims to reduce the need for travel and the length of journeys. We are concerned that the Secretary of State for Transport may not share the aim of restricting commuter journeys." (ODPM Commons Select Committee, 2003 page 7)

This lack of crossover between departments is also illustrated when looking at the competing priorities of departments and their measures of success. The regeneration priorities of the ODPM are not reflected in those of the DfT, who focus their sights on long distance improvements (ODPM, 2003). This is further emphasised when looking at the means the DfT uses to gauge its success; for example, in 2002 the Passenger Transport Executive Group criticised the use of total passenger kilometres as an indicator, as it favours the development of long distance cross-country routes and London commuter services at the expense of suburban and local rail (Marsden and Bonsall, 2006).

Examination of current transport policy documents such as the 2004 Future of Transport White Paper also illustrates another point made by the Commons Transport Select Committee in 2005, which is the apparent lack of a strategic approach to both heavy and light rail within transport policy. Current policy focus for heavy rail is short term, about improving the existing infrastructure and containing the cost. There is no vision as to the potential contribution rail should be making more widely to meet the objectives of an integrated transport policy or how it can contribute to the more significant cross-governmental challenges of climate change and sustainable development. This point was again highlighted by the Commons Transport Select Committee in 2006:

> "If the Government is to entertain any hope of achieving its targets on emissions and congestion, it is essential for it to encourage a significant shift from road to rail". (Commons Transport Select Committee, 2006, page 7)

5.2 Multi-modal Studies

A key illustration of the lack of a joined-up approach to the integration of rail into wider transport policy is evidenced by the deficiencies in the progression of the multi-modal studies. By the nature of their name they were intended to produce a package of measures (rail, road and demand management) to solve an area-specific transport problem based on the premise that individual elements could not be effectively introduced separately (Begg and Gray, 2004b). Begg and Gray note that recommendations for rail investment were greater than those for road and a number of schemes also relied on demand management through the introduction of road tolls. Thus the findings of the multi-modal studies were at least superficially truly multi-modal, but the key stumbling block for this policy came in the allocation for delivery. The "recommendations were unpacked, turned into a list of projects, and then the projects referred to separate implementation agencies for further scrutiny testing and decision" (Goodwin, 2003; page 7). Goodwin indicated that whilst the Highways Agency responded positively to the road recommendations, the Strategic Rail Authority was much less positive over the rail recommendations, owing largely to its severe financial restraints and separate set of strategic objectives. While there had been a shift in the consideration of multi-modal solutions to transport problems, the underlying disparity in the structure of the delivery has undermined the achievement of the overall objectives. As a result, many of the road elements of the supposed packages have been taken forward, but the rail components have not.

Alongside this internal failure on the delivery of the solutions for the multi-modal studies are wider reaching concerns on the strategic objectives adopted by the studies and how these fit into wider environmental sustainable development. Serious concerns have been raised about the scope and context of the work, particularly in relation to the threat from climate change:

> "It is clear from the detailed modelling results of the multimodal studies that technology alone will not solve transport's contribution to climate change. The Department has already taken decisions on the outcomes of the eight studies yet the impact on climate change has not been mentioned. We are astounded that strategies that manifestly work against the UK's climate change commitments are being approved." (House of Commons Transport Select Committee, 2003, paragraph 71)

Priorities both within and across the multi-modal studies serve to illustrate how their scope, context, design and delivery have removed the integrated approach on the ground and failed to adequately consider the long term sustainability implications of their development.

5.3 Sustainable Communities

The case of the Sustainable Communities Plan, which was launched in 2003, again highlights the lack of 'joined-up' policy making between the ODPM and DfT. Such is the concern over this and other development plans and the lack of adequate consideration of transport infrastructure (particularly rail), that it has featured as an issue in a number of Select Committee reports.

In 2004, the ODPM Commons Select Committee emphasised its concerns over the transport infrastructure plans for the Thames Gateway scheme and raised the issue that the DfT's Ten Year Plan had not prioritised the transport development in the northern region that would be required for the Northern Way programme. In 2005, the Committee indicated that "our experience as Members of Parliament tells us that senior figures in Government can have significantly misconceived ideas about the effectiveness of cooperation between Departments" (ODPM Commons Select Committee, 2005, page 12). They report the then Minister for Communities and Local Government David Milliband acknowledging the lack of joined up government within the Sustainable Communities policy:

> "the revealed preference of government is not to be the most perfectly joined-up organisation in world history" (ODPM Commons Select Committee, 2005, page 12).

The treatment of transport in the original plan was vague, with little consideration given to the costs of transport infrastructure. The Environmental Audit Committee 2005 Report on Sustainable Communities highlights the apparent massive funding gap between the infrastructure requirements and the actual allocations, setting the additional £200 million capital grant allocation of the Community Infrastructure Fund (CIF) over 2006/07 and 2007/08 in context. A consultants report on the public cost of infrastructure found the funding gap for transport over 20 years amounted to £4,267 million for the South East and £6,676 million for the Eastern Counties (Roger Tym and Partners, 2005). They also found that there was no financing for major rail schemes costed at £1,745 million for the South East and £2,714 for the Eastern Counties. The improvements to be financed by the CIF appear to be very localised to the Growth Areas, eg a major upgrade at Milton Keynes Station to allow more intercity trains to stop there, with little consideration given to the impact of the growth on the wider network or trip destinations (eg with respect to current load factors and ability to expand capacity on the roads and railways). The Environmental Audit Committee also expresses concern over the total allocation of the CIF fund to the Growth Areas which is likely to be at the expense of the rest of the country (Environmental Audit Committee, 2005).

The issue of funding infrastructure was again considered in the Committee's follow-up report in 2006, where the consideration of the proposed Planning Gain Supplement was scrutinised in terms of its potential contribution to funding infrastructure. They concluded that the long lead times required for the completion of infrastructure would limit the use of the Supplement, which is unlikely to be introduced before 2008. The Committee concludes that the direction of this policy is still failing to take account of the infrastructural issues posed by the house building programme:

> "We remain deeply concerned that ODPM is determined to build new homes first and then worry later, if at all, about how the supporting infrastructure can be provided. The communities that are created as a result of such a short-sighted policy will be anything but sustainable." (Environmental Audit Committee, 2006, page 41)

5.4 UK Climate Change Programme, PSA Agreement and Energy White Paper

Three Labour Party Manifestos have committed the Government to a Public Service Agreement to tackle the issue of climate change which is widely acknowledged as being the most significant problem that we currently face. The Department for Transport is now a party to this agreement which forms one of a number of agreements in the 2004 Future of Transport White Paper (DfT, 2004, page 136):

> "Objective III – balance the need to travel with the need to improve quality of life by improving safety and respecting the environment.
>
> > 7. Reduce greenhouse gas emissions to 12.5% below 1990 levels in line with our Kyoto commitment and move towards a 20% reduction in carbon dioxide emissions below 1990 levels by 2010 through measures including energy efficiency and renewables. Joint with DEFRA and DTI."

According to the 2006 Climate Change Programme, transport was responsible for around 27% of total UK carbon dioxide emissions in 2004. Carbon dioxide emissions had increased by 10% on 1990 levels, whilst total greenhouse gas emissions increased by 12%. It is also interesting to note that these figures do not include emissions from international aviation and shipping which have also grown significantly in this time. As noted in Section 3, in total rail accounts for a very small fraction of these emissions and is widely viewed as a more environmentally sustainable transport mode than either road or aviation. Logically therefore the Climate Change Programme focuses its efforts on reducing the impact of road transport and to a much lesser extent, turns its attention to aviation. The difficulty with this approach is that there is relatively little linkage to the alternatives or tackling the issue of demand. Rail receives scant attention, with only a passing reference to its ability to offer an alternative to both road and air travel for passengers and some reference to existing grant schemes for rail freight. Even here, the budget for the rail freight grants stands at only £20 million per year, with the freight grants system having also undergone a great deal of uncertainty in recent years due to funding constraints; the Freight Facilities Grant remains suspended in England due to a lack of funds. Clearly, as a tool to address transports impact on climate change, the long term signal this sends to industry is one of less than joined-up strategic planning.

This second Climate Change Programme also runs concurrently with the strategy of the Department for Trade and Industry's 2003 Energy White Paper – creating a low carbon economy. The objective of the transport chapter was to improve the carbon efficiency of transport. Again the focus of strategy is technological innovation within the road transport sector, with little reference to the alternative modes or the management of demand. While reference is made to the opportunity for investment in rail infrastructure for modal shift for both passenger and freight, it lacks any attempt to set out a strategic plan for the future contribution to the low carbon economy. Given that the heart of the Energy White Paper is the Royal Commission for Environmental Pollution's target of 60% cut in carbon emissions by 2050 (DTI, 2003), the lack of a strategy for rail clearly diminishes the opportunity for rail to contribute to the goal.

6 CONCLUSIONS

To a first approximation, rail remains environmentally more benign than either road or air transport; the SRA effectively defended this and other benefits of the railways (SRA, 2003). This holds good for many, if not most, of the environmental issues listed in Section 3. That is, rail is, or can be, much cleaner and more fuel efficient than road or air; land take per passenger-kilometre and impacts on habitats are less; noise is an issue but a much more localised one than for road or air; resource consumption is less; and so on.

There are some caveats to this, such as that old or poorly maintained diesels, in particular, can be very polluting in terms of particulates and nitrogen oxides; and that empty trains cause pollution while delivering little or no benefit in social or economic terms. There is no room for complacency, but in most cases and by most environmental criteria, rail remains environmentally beneficial relative to road and air.

There is therefore a clear strategic benefit in improving the share of journeys undertaken by rail relative to other modes. This is a major strategic goal, which encompasses many aspects of the management and operation of the railways and ways in which it can be made attractive to more people.

It is beyond the scope of this report to offer DfT rail or other rail interests advice on ‘how to run a better railway’, although running a better railways is of course entirely germane to gaining environmental improvements. Rail is subject to increasing environmental policy pressures, but has potential to contribute (compared to other modes) positively to the sustainability agenda. Although central government appears to recognise this at the level of principle, as yet there is a lack of a coherent policy approach to put it into practice in key policy initiatives, such as Sustainable Communities.

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