Destination Growth: The Case for Britain's Regional Railways

FINAL REPORT

September 2015

Executive Summary

This report

Regional railways should be big news. They carry over 365 million passengers a year, operate over 1,100 trains and employ 17,000 people. They serve a population of almost 40 million people living and working in regional economies that are worth over £770bn per year in Gross Value Added to the UK.

In this report we set out the facts and figures behind regional railways. We show the vital role they play in supporting the national economy, how they have been growing very successfully over the last decade and a half and how this growth is now being constrained by many years of under investment. We then look at what the future could hold for them and show how a programme of investment could not only grow the market and deliver further valuable benefits to the economy but could also make them much more cost effective, substantially reducing the level of financial support they currently require.

Regional Rail is an important part of the railway network

Regional rail services carry more than three times the numbers of passengers than the much higher profile long distance (Inter-City) network. The major cities of Manchester, Birmingham, Liverpool, Bristol, Newcastle, Glasgow, Edinburgh and Cardiff and many smaller towns, rely on regional networks to provide the bulk of the rail services for employees commuting to work in their centres.

These regional services:

- ***invigorate city and regional economies;***
- ***connect the economies of our towns and cities;***
- ***support our rural economies;***
- *play an important role in* ***combating economic and social exclusion;***
- *and do all of the above in a more* ***environmentally supportive*** *manner than car travel.*

In fact they make a strong contribution right across the economy. In urban areas they support the development of growing cities, both directly, by transporting employees to jobs, and indirectly by reducing congestion for remaining road users. As city regions across the UK increasingly develop a service sector economy, concentrating workers in city centres, rail plays a vital role in enabling large numbers of people to be moved efficiently and effectively into increasingly congested urban areas. Good regional rail networks are therefore fundamental in enabling agglomeration economies to develop, and in capturing the benefits from such economies.

In rural areas the regional rail network provides important links for residents to access services and facilities in larger town and cities, addressing issues of economic and social exclusion while bringing tourists into their local economies. Finally the network also makes a contribution to helping specific areas of the economy through its own supply chain. In Derby alone the industry employs some 26,000 people, generating £2.6bn in economic output locally.

By any standards this makes regional railways important. And yet, they do not attract anything like the level of debate and interest that they should.

A growing and successful business...

In fact there are more positive stories. The regional network has enjoyed massive growth in recent years, making a strong contribution to the structural change of the economy in many of our city regions. Between 2002/3 and 2014/15 demand for regional services grew by 66%, and until 2012/13 the regional sector was the fastest growing part of the UK rail network and indeed remains so when measured

against passenger kilometres (74% growth) or passenger revenue growth (151%). At individual stations, demand has grown at more than twice the national average, whilst one of the regional train operators (TransPennine Express) carries the second highest number of passengers per available seat across the rail industry, second only to London Overground.

...that is now becoming a victim of its own success

This huge level of growth has however not been matched by an equivalent level of investment in infrastructure and rolling stock. Over the last ten years the average age of rolling stock has increased by 30% whilst the average age in other sectors has remained constant. In many places on the rural network signalling infrastructure and operating procedures dating back to the Victorian era are compounded by the effects of track rationalisation in the second half of the last century. This lack of investment is already beginning to limit growth, and this will only get worse in the future.

Regional rail services are often portrayed as having very high costs relative to the number of passengers carried. There are a range of reasons for this, including the process used for allocating costs, which is weighted against regional operations, but underinvestment has meant that some services are unattractive and deter potential passengers. Meanwhile the opportunities for financial savings from more efficient operation as a result of investment have been missed.

In summary regional rail has achieved a huge amount with only very limited resources over recent years but a point is being reached where it is not possible to achieve more without investment, and as we show in this report this is limiting the role that rail can play in developing the economy.

The opportunity

Our proposition is that with investment in infrastructure and vehicles, regional rail has the potential to perform even better, delivering more benefits, more cost effectively and enabling more people to access the most valuable parts of our economy.

And the timing is right...

There has not been a moment since the major re-organisation of Britain's railways at the time of privatisation in the mid-1990s when there has been a greater opportunity to develop our regional rail networks. Three dynamics are converging to create these conditions.

Firstly, there is widespread acknowledgement that investment in supporting economic growth in the UK's regions is fundamental and improved connectivity, including by rail, will be vital in securing the economic benefits that investing in UK regions will generate.

Secondly, there is real and growing progress towards the devolution of powers and funding decisions to the English regions, including for transport, and specifically rail investment. This follows earlier devolution over the control of transport to Scotland, Wales and London, all of which have enjoyed strong growth and investment in recent years.

Finally, rail investment has rarely been so clearly at the forefront of UK Government policy. Proposals for investment in a new high speed rail network, encapsulated in plans for HS2, and ideas for HS3 and beyond, provide a once in a generation opportunity to build on the construction of these core high speed routes. There is a very clear opportunity to develop complementary regional rail investment plans that link our regional cities and towns and take advantage of the openings that emerge from rail capacity released by the high speed network to provide better regional links.

Regional rail is capable of delivering a high capacity network capable of serving strong high density city centre locations. However, in order to deliver this successfully, the issue of capacity and investment needs to be addressed.

The future: 'Business as Usual', or time for a 'Step-change'?

To help us illustrate what would be involved and what could be realised we have developed two hypothetical scenarios to compare against a 'do-minimum' approach, using current projects to explore the impact that we think changes in approach could achieve. We have compared this 'Business as Usual' do-minimum with two 'Step-change' future scenarios for regional railways:

- ***what if we were to replace all existing diesel trains with modern ones**? This option assumes that there would be no further electrification beyond those schemes which are already committed. However all existing diesel trains would be replaced by new ones as part of a rolling programme to provide a higher quality network which would also deliver additional capacity.*
- ***what if we were to electrify the regional network and replace the trains with modern electric rolling stock?** This would build on existing electrification programmes and assumes that almost the whole network would be electrified, to bring a much improved and more cost effective network. It would also bring new rolling stock and a substantial increase in capacity.*

However whilst rolling stock is the 'public face' of the railway, investment in either scenario would be accompanied by investment in infrastructure to ensure that the modernised fleet is in a position to deliver faster journeys, more frequently and provide more direct links.

The infrastructure investment package associated with each scenario therefore includes proposals for line speed, track, signalling and junction capacity enhancement.

These are not 'either/or' scenarios. Nor are we proposing that either of these scenarios would be applied in their entirety across the whole regional network. But they provide a useful way of allowing us to quantify the costs and benefits.

The financial case for investment

These scenarios have been used to demonstrate the potential for developing a regional rail network with a sustainable long term future that seeks to reduce costs and increase usage, building on the substantial growth that has already taken place over the last 10 years. This would deliver a network capable of coping with high growth rates, would be cheaper to operate and deliver faster journeys and improved connectivity. The scenarios illustrate what the benefits of this sustained investment might be and provided an approach to identifying the potential of sustained investment rather than continuing to invest in a piecemeal way.

The cost and revenue implications of each of the scenarios are presented in the table below. In both of the Step-change scenarios the increase in revenue is much larger than the increase in operating costs associated with improving the services. The Modern Electric fleet scenario in particular delivers a large increase in revenue for a relatively small increase in operating costs, showing the inherent benefits of electrification.

The infrastructure schemes that come with the Step-change scenarios would bring benefits for many decades to come. Whilst typical economic appraisal looks over a period of sixty years many of the larger investments could have a life of over 100 years.

Investment, operating costs and revenues at 2015 prices

Net Costs £ bn pa	Business as Usual	Step Change 1 Modern Diesel	Step Change 2 Modern Electric
Investment Costs[1] £bn	-	£1.5	£1.9
Operating Costs (Relative to Now) £bn	£0.7	£1.3	£0.8
Revenue at Completion of Programme (Relative to Now) £bn	£0.9	£2.3	£2.3
Revenue Minus Operating Costs £bn	£0.2	£1.0	£1.5

Source: JMP

The scenarios feature a rolling programme of investment, with clear objectives over a sustained period, to revolutionise the regional rail network and deliver exciting and transformational change. ***By reducing costs and increasing passenger numbers, subsidy requirements would be slashed, both in real and absolute terms, with the possibility of the network being self-supporting.*** *The benefits of such capital investment would continue long after the investment in infrastructure and rolling stock are complete, whilst bringing substantial social, economic and environmental advantages.*

The case for the wider economy

However, the biggest reason for investing in the regional network would be for the wider economic benefits the investment could deliver. We have sought to quantify the scale of benefits that would be delivered by these Step-change scenarios.

Cost Benefit Analysis (60 year appraisal discounted to 2010 prices)

	Modern Diesel	Modern Electric
Present Value of Costs £bn	£35.10	£31.30
Present Value of Benefits £bn	£136.46	£136.46
Net Present Value £bn	£101.36	£105.16
Benefit Cost Ratio	3.89	4.36

JMP Analysis

The results shown in the table above offer a very positive case with very high benefit cost ratios (of between 3.89:1 and 4.36:1) compared to a Business as Usual scenario.

Our analysis would suggest that there are some very substantial benefits from the future development of the network. The economic benefits are spread across users, suppliers, users of other transport modes and the wider economy as a whole, illustrating the diverse benefits that the regional rail network can bring. ***The Step-change network would be delivering benefits of around £8 per passenger trip****.*

In summary

The regional network has grown very strongly over the last ten years with demand growth often outstripping growth on the rail network nationally, which has in itself enjoyed strong growth. However this has been achieved against a background of very limited investment and increasing constraints as capacity has failed to keep up with demand. This lack of investment is now a constraining factor, with the scope for more growth on some corridors being very limited, without significant investment.

[1] *Investment costs are relative to the Business as Usual scenario which assumes only existing committed schemes are delivered*

There is now an opportunity, with increased focus on the development of regional economies across the UK, through initiatives such as the "Northern Powerhouse", to take advantage of the acknowledged role of rail in supporting economic growth, to deliver the necessary investment to help regional rail fulfil its potential. This report shows that the regional rail network has a key role to play in the development of these regional economies. By increasing capacity and making regional rail services more attractive there is scope to help deliver economic growth by improving access to and between towns and cities, and by helping to decongest the road network.

Using some theoretical but plausible scenarios we have shown that with a sustained investment programme, the regional rail network could deliver benefits of as much as £10.5bn per annum at current prices. Around 25% of this benefit is through increases in GDP, particularly as a result of agglomeration benefits from bringing cities closer together, and by improving access to labour markets, demonstrating the importance of this investment to delivering on the regional growth agenda*. Cost benefit analysis shows that this represents very high value for money with every £1 of investment delivering £4.36 of benefits, relative to the Business as Usual scenario.*

There is a strong case for investing in the regional network to increase capacity, stimulate demand, and improve efficiency, aside from the wider economic benefits that improved connectivity will bring.

We have demonstrated that with a concerted long term approach to investment over 30 years it is possible to both reduce operating costs and raise demand significantly. This would help move the regional rail network from its present condition which requires a substantial level of subsidy, to one which operates close to breakeven. Given that the regional network offers a diverse range of operations, including many socially necessary services in rural areas, this would be a very noteworthy achievement.

Realising the potential

Delivering this brighter future for the regional rail network requires a series of steps to set the foundation for long term investment and renewal:

- *Identify routes where journey times or frequency are constraining the further growth of passenger numbers;*
- *Identify links where there is the greatest potential for improvement in connectivity through the development of more direct services;*
- *Develop devolution of control and responsibility further so that cities and regions can deliver solutions and take responsibility for issues that impact on their networks. This applies not just to strategic planning but also to the control of rail franchises;*
- *develop a coherent programme of rolling stock investment, allowing economies of scale to be achieved and replacing the piecemeal approach to investment in rolling stock which persists, including agreement of mechanisms for delivering the new stock;*
- *develop a comprehensive programme of infrastructure investment that addresses gaps in provision and seeks to deliver a modernised and sustainable regional rail network.*

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FINAL REPORT

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1 Introduction

1.1 Regional railways should be big news. They carry over 365 million passengers a year[1], serve a population of around 39 million people[2] (63% of the UK) and support local economies that are worth over £770bn in Gross Value Added (GVA)[3] to the national economy. By any standards this makes them important.

1.2 And yet, they do not attract anything like the level of debate and interest that they should, despite serving much of the UK population and facilitating activities that are vital to the health, wealth and sustainability of the national economy.

1.3 Over recent years the evidence base demonstrating how good transport links play a vital role in driving economic development has grown. It is especially strong in our city regions where rail services into city centres have played a crucial role in facilitating structural changes to their economies, mitigating the decline of traditional industries[4]. However the disproportionately low level of government investment in transport infrastructure in the regions is now widely thought to be holding back economic regeneration, and there appears to be cross party political support for the idea that carefully planned investment could unlock significant untapped potential for economic growth and address wider social and environmental concerns[5]. Part of the solution to this is considered to be greater devolution of control from central government allowing a greater focus on local and regional economic priorities.

1.4 Aside from a handful of high profile projects, most notably the Northern Hub[6] in Manchester and electrification schemes in the North West, it is clear that investment in regional railways hasn't kept up with this rapidly moving policy agenda. Yet in spite of this regional railways have enjoyed something of a renaissance in recent years.

1.5 Demand for regional services has been rising to unprecedented levels in many parts of the country over the last 10 to 15 years. Whilst broader environmental and social trends have had an impact, the most significant factor has been structural change in the economy where the rail network has gained a key role in linking people to jobs as traditional industries have declined and service sector jobs in city centres have grown. Together these factors have propelled demand for rail services to their highest levels since the Second World War.

1.6 However, the failure to invest to meet this rising demand has meant that that many of the country's regional rail services have started to become the victim of their own success, with overcrowded and poor quality rolling stock, long journey times, inconsistent station facilities, and indirect journeys threatening to undermine the gains that have been achieved.

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[1] Office of Rail and Road statistics for 2014/15

[2] JMP estimate from Office of National Statistics NUTS1 data

[3] JMP estimate from Office of National Statistics NUTS1 data

[4] See for example *pteg* report: The Economic Value of the Rail in the North of England

[5] Source: Investing in the Railway, House of Commons Transport Committee, Seventh Report of Session 2014-15, January 2015

[6] A major scheme to increase rail capacity in central Manchester which would bring benefits across much of the northern rail network

SO WHY DO REGIONAL RAILWAYS MATTER?

1.7 As we shall show throughout this report, regional railways perform a number of key functions that support the economy.

1.8 First and foremost, they **invigorate city and regional economies**. They support the growth of the increasingly important service sector, enabling large numbers of people to efficiently access congested city centres, facilitating the development of 'dense' economies of agglomeration that add value to the national economy.

1.9 They **connect towns and cities** across the country, increasing the volume of trade, competition amongst businesses, choice for consumers and greater opportunities for specialisation and increased productivity.

1.10 They **support rural economies**, providing access to nearby towns and cities for employment and other opportunities, bringing additional income from visitors and tourists, supporting market town economies and rural renaissance initiatives and providing a valuable alternative to road based transport.

1.11 They play an important role in **combating economic and social exclusion**, providing access to jobs and education, lowering the cost of, and widening the search area for, employment, service and leisure opportunities by bringing key locations closer to individuals.

1.12 And they have the ability to do all of the above in a more **environmentally supportive** manner than car travel, helping reduce congestion and impose less pollution, noise, energy and visual intrusion impact, while being a substantially safer means of transport.

1.13 Finally, they are **major employers** in their own right, both directly and indirectly through their supply chain.

PURPOSE OF THE REPORT

1.14 This report will evidence the above and demonstrate the importance of regional railways to Great Britain. We will also illustrate the further benefits that additional investment in them would bring, highlighting a significant 'invest to save' opportunity that exists which would provide not only better services but at a lower cost to the taxpayer. The aim is to inform national decision makers of the important role these networks play now and the significant economic, financial and social benefits that could be achieved from further investment in them.

1.15 The report is also intended for use as a reference document, bringing together the key evidence from many other pieces of research into one place.

STRUCTURE

1.16 In order to achieve the above, the rest of the report is set out in three parts:

- **Part A** describes the current situation including the diverse range of services operated, the key issues that they face and what they deliver to the economy today.
- **Part B** looks to the future. It describes how regional railways might look in 30 - 50 years if they carry on as they are doing at the moment and quantifies what benefits they would provide if a commitment was made to invest in a sustained and consistent manner.
- **Part C** summarises the findings, highlighting the 'invest to save' opportunity that exists in regional rail, both in terms of improved efficiency of the network and the capacity to deliver economic growth in the regions and also presents some next steps for the way forward.

1.17 The individual chapter structure is as follows:

Part A: Regional Railways Today

- Regional Railways in Britain Today (Chapter 2)
- The Value to the UK (Chapter 3)

Part B: Alternative Futures for Regional Railways

- The Opportunities(Chapter 4)
- A Sustainable Future for Regional Railways (Chapter 5)
- Valuing an Enhanced Regional Railway (Chapter 6)

Part C: Summary and Recommendations

- Key Findings and Next Steps (Chapter 7)

Part A: Regional Railways Today

2 Regional Railways in Britain Today

2.1 We begin with a review of the current state of regional railways in Great Britain. In this chapter we show that:

- regional services are the backbone of the rail network;
- demand has been growing rapidly in the last decade and a half;
- however, investment has failed to keep up with this growth, while;
- a misleading perception of high cost and poor returns has contributed to this under investment.

REGIONAL RAIL NETWORK COVERAGE

2.2 Passenger train services in Great Britain are managed and operated by Train Operating Companies (TOCs), usually under franchises awarded by the Department for Transport (DfT)[7]. The franchises specify the minimum service levels, quality and other conditions such as the cleanliness of trains, station facilities and the reliability to be provided.

2.3 The Office of Rail and Road[8] (ORR) categorise rail services into 'Long Distance[9]', 'London and the South East' and 'Regional'. Within this they define eight franchises as providing the bulk of the UK's regional rail services:

- Arriva Trains Wales
- Merseyrail
- Northern Rail
- East Midlands Trains (excluding Midland Mainline services)
- First Great Western (in the west of England)
- London Midland – West Midlands services
- ScotRail
- First TransPennine Express

2.4 Together these services reach into most parts of Great Britain as shown by Figure 2.1, which highlights routes that are wholly or predominantly operated by regional franchises[10]. While it is common to think of regional services as being either the urban networks of the North and the Midlands or perhaps the rural networks of Wales and northern Scotland, in fact, they serve most of the country.

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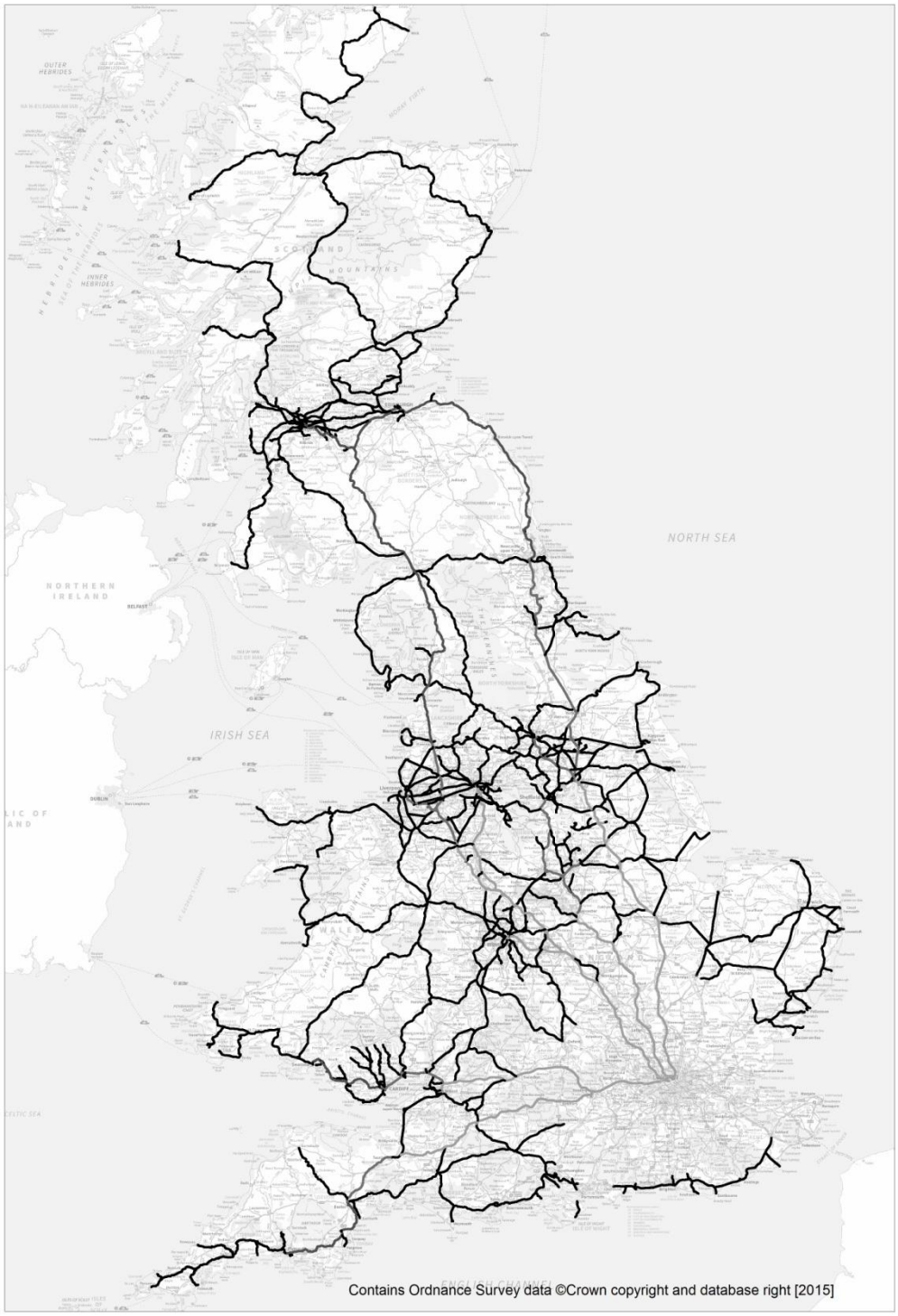
[7] There are exceptions to this. The franchise for Merseyrail services is awarded by the local passenger transport authority, Merseytravel; the franchise for London Overground is awarded by Transport for London; and franchises in Scotland are awarded by the Scottish Government. Whilst not strictly regional rail, Nexus has devolved power over the Metro which performs the urban commuter function in and around Newcastle and into Sunderland.

[8] The Office of Road and Rail (formerly the Office of Rail Regulation) is the independent economic and safety regulator of railways in the UK, and since April 2015 has regulated Highways England.

[9] There is an argument that much of the Cross Country franchise which is categorised as Long Distance actually performs a similar role to many of the longer distance regional services in linking regional towns and cities of England and Scotland but for consistency with other reports we have not included Cross Country in the statistics presented in this section

[10] In Figure 2.1 the Long Distance Intercity services are shown as greyed out on those sections of the route where that type of service dominates.

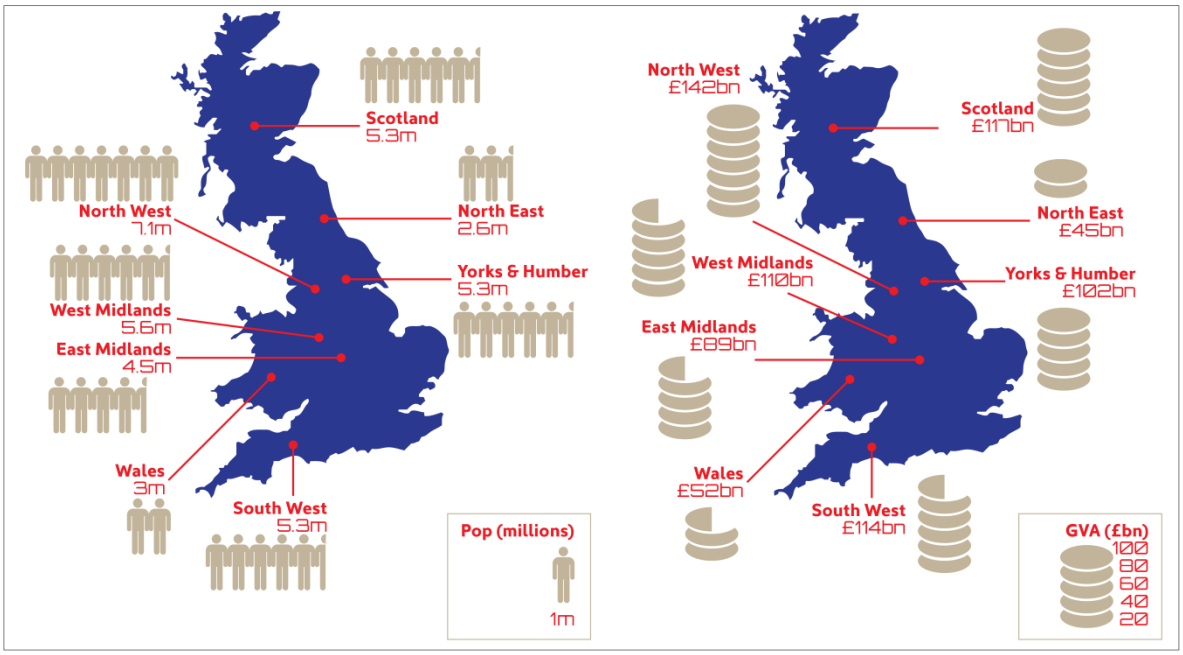
Figure 2.1 The GB Regional Rail Network[11]



[11] Map shows some routes operated by London & South East Operators but which are regional in character

2.5 Scotland, Wales and the six[12] English regions that are most directly served by the regional train operating companies, collectively account for almost 40 million people and they contribute around £770bn to the national economy.

Figure 2.2 Population & GVA Served by Regional Rail Services



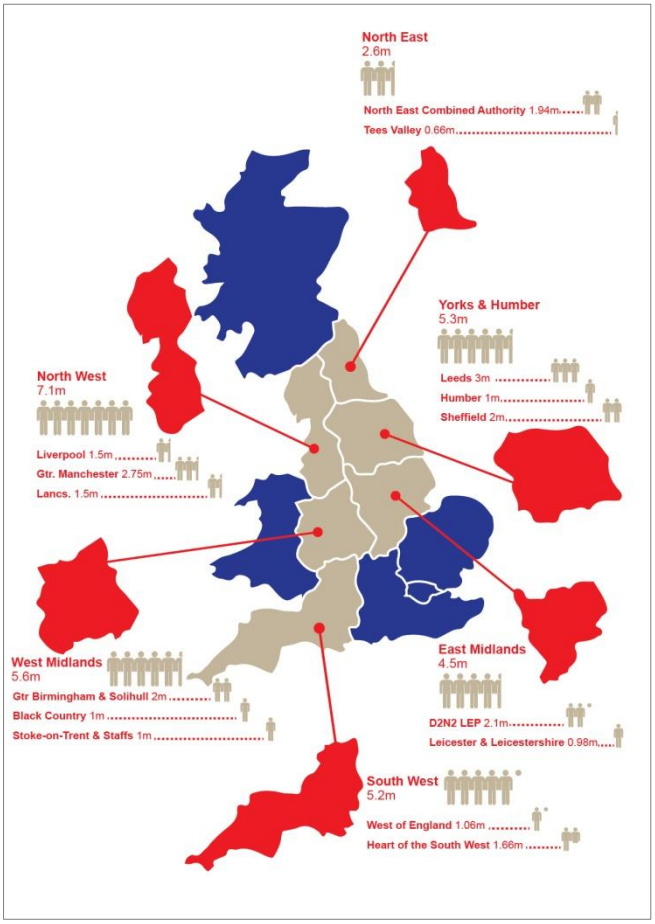
2.6 Some of the largest city regions in the country rely on the regional rail network to provide the bulk of their rail connectivity and rail commuting needs. Figure 2.3 shows four of the regions and their constituent City Region areas. They include Greater Manchester (population 2.75m), Leeds City Region (3m), Sheffield City Region (2m), Liverpool City Region (1.5m) and the North East Combined Authority area[13] (1.9m).

2.7 In the West Midlands the Greater Birmingham and Solihull LEP, and Black Country LEP areas together have a population of 2.4m and provide a workplace for around 925,000 people.

[12] The English regions are the South West, West Midlands, East Midlands, North West and Yorkshire and Humber, North East. NB this is a conservative calculation as it excludes the East of England which has a number of regional rail services and the South East which also has a handful of regional-type services

[13] Regional rail usage is lower in the North East where the Metro system plays a key urban commuter role. Operating on disused railway lines, it shows many of the same characteristics as regional rail and supplements the rail network.

Figure 2.3 Key Regions and their City Regions



2.8 The regional railway network offers a high capacity form of transport that plays a vital role in ensuring that people can access city centres to all of these places.

2.9 The city centres of Leeds and Manchester alone are key drivers of their regional economies and between them they concentrate over 320,000 jobs, more than half of which are in high value added consumer and business services.

2.10 It is a similar story elsewhere around the country. In Liverpool, Bristol, Cardiff, Glasgow, Edinburgh and Newcastle, to name but a few, it is the economically powerful city centres at the heart of the city regions that are driving the performance of their wider economic hinterlands.

2.11 And all of these cities rely on regional rail services for much of their rail commuting needs and to provide connectivity to the neighbouring economies with whom they trade.

THE SCALE OF THE REGIONAL RAILWAY NETWORK

2.12 Set against this background it is perhaps unsurprising to discover that regional railways carried over 365 million passengers in 2014/15. Data from the ORR (Table 2.1)[14] show that these passengers travelled 12Bn km between them at an average distance of 32 km. This relatively long average trip distance[15], longer than the London and South East region for example, illustrates the diversity of service offered by regional rail, from local urban commuter to long distance rural and inter-urban services. Average revenues are £3.63 per trip or 12.3 p/km, lower than both Long Distance (14.3p/km) and London and South East Services (15.0p/km)

2.13 Regional operators cover a network of over 10,000 route kilometres which in turn serve 1,300 stations. This is achieved with a fleet of around 1,100 trains and 17,000 staff and by operating 164 million train kms each year. The average age of this fleet in 2014 was 21 years.

[14] Note that is a relatively conservative estimate of the scale of regional operations as it does not include the regional components of East Midlands Trains and First Great Western

[15] The London and South east average trip length is 26 km for

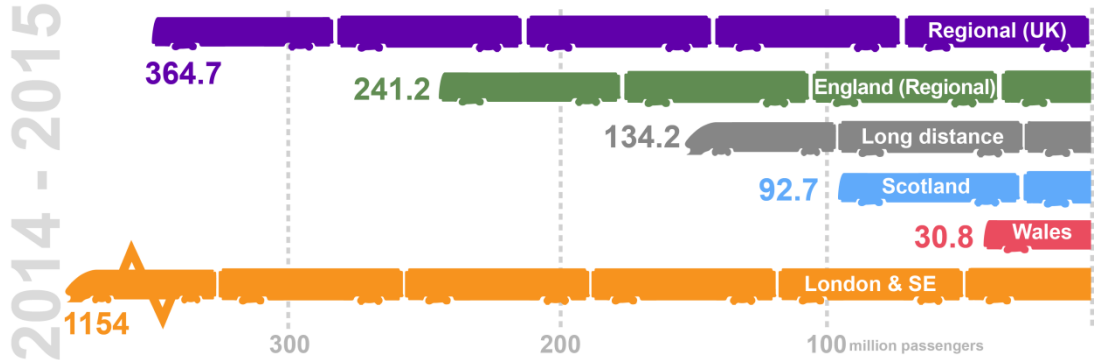
Table 2.1 GB Regional Railway Network - Key Statistics (2014-15)

Indicators	
Demand-side Statistics	
Passenger journeys (millions)	365
Passenger km (millions)	12,000
Passenger Revenue £m	1,342
Supply-side Statistics	
Route km operated	9,741
Number of trains	1,105
Average age of trains (years)	21
Timetabled train km (millions)	164
Number of stations operated	1,299
Number of employees	16,890

Office of Rail and Road Regulation

2.14 Patronage figures indicate that regional railways carry almost three times the number of passengers than the much more high profile Long Distance services. In fact regional services in the north of England alone carried more than the Long Distance operators in 2014/15. The figure below shows total passenger journeys across the three passenger sectors, Long Distance, London and South East and Regional. The regional routes are also shown for the three home nations.

Figure 2.4 Comparison of Total Passenger Journeys (2014-15)



Office of Rail and Road

What is the regional network and who uses it?

2.15 Regional railways cover a diverse group of markets with widely varying traffic patterns and economics of operation. Services range from inter-urban long distance services, commuter operations and services operating in deeply rural areas.

2.16 There are a number of inter-urban services which play a vital role in connecting towns and cities across the country. The TransPennine franchise provides this function across the North of England for example

between Liverpool and Newcastle, and also provides links to Scotland. ScotRail services connect the cities of Glasgow, Edinburgh, Dundee, Inverness and Aberdeen. The East Midlands franchise links regional towns and major urban centres such as Nottingham to Sheffield, Leicester and Derby. Meanwhile the Cross Country franchise, although categorised by the ORR as Long Distance, also provides linkages between places such as Peterborough and Nottingham which are more typical of a regional rail service.

An Inter-urban Example: Leeds - Sheffield - Nottingham

In 2004 the then new Northern Rail franchise introduced an hourly semi-fast service between Leeds and Sheffield via Barnsley, to provide increased capacity and reduced journey times between Leeds, Wakefield, Barnsley and Sheffield. Building on the success of this service, which provided Barnsley with its first inter-urban service for many years, the frequency was enhanced to half hourly in 2008, with one service per hour extending to and from Nottingham.

This provided an important strategic link between Leeds and Nottingham which had been missing for many years. The direct service improved journey times between these two locations, and also increased service frequencies between Sheffield and Nottingham from hourly to half hourly, a significant improvement on a key link between the two cities. Indeed the service links the three major centres in West Yorkshire, South Yorkshire and the East Midlands, which according to Centre for Cities data[16] contain over a million jobs.

Like many regional services Leeds – Nottingham is a multipurpose service providing short urban links as well as inter-urban connectivity. Having successfully established the service, stakeholders are now keen to see further improvements particularly to reduce journey times and improve rolling stock quality. This is understandable as the journey time for the service is around 2 hours for an 80 mile journey, an average speed of 40mph, illustrating that whilst the service is useful there is room for improvement. To place the journey time and speed in context Leeds can access London in around 2 hours 15 minutes at an average speed of 82 mph, while Nottingham can access London in 1 hour 42 minutes, with an average speed of 74mph.

2.17 Much of the regional rail network serves rural areas. In addition to well-known routes like the West Highland Line or the Heart of Wales Line there are entire rural networks. These cover much of Scotland (north of the Central Belt), the series of Devon and Cornwall branch lines off the Great Western main line, and the networks of Wales, Lincolnshire and East Anglia.

2.18 The bulk of the regional network can however be described as urban commuter, operating relatively dense networks out of city centres. These cover networks in all of the main conurbations such as Merseyside, Greater Manchester and West Yorkshire. Whilst some of these networks have historically been dominated by commuter services, especially so in Glasgow and Liverpool, routes in other cities have only comparatively recently started to make the transition to dense commuter services. Examples in this category include the Valley lines from Cardiff and routes such as Knottingley – Leeds in West Yorkshire.

2.19 Fares have historically been kept low for transport policy reasons, to promote alternatives to car use as well as to encourage large volumes of passengers. In such a situation, exacerbated by short franchise lengths which discourage investment, there is little commercial incentive for operators to deliver the high quality needed if they are to compete in attractiveness with the car.

2.20 The market position for regional railways is actually quite varied, in some cases having very high market shares, and in other places much lower shares, depending on a mixture of both the quality of the rail service offered but also the quality of alternative modes. To illustrate this we can look at the mode share of rail, bus and car for commuter trips between towns around Leeds and Leeds City Centre.

[16] Centre for Cities Data Tool: http://www.centreforcities.org/data-tool/

Table 2.2 Commuting Mode Shares into Leeds City Centre

	% Rail	% Bus	% Car
Keighley	80%	2%	16%
Ilkley	77%	0%	21%
Castleford	51%	12%	35%
Pontefract	36%	11%	50%
Harrogate	37%	11%	50%

Source: Nomis (2011 Census)

2.21 All five locations are served by trains to Leeds, but have widely varying rail mode shares. Keighley and Ilkley both have a rail share in excess of 75% whilst Castleford manages 51%. Pontefract and Harrogate in contrast have a rail share of less than 40%, with car dominating in both cases, illustrating that even within the catchment area of one city, rail operates in a range of environments with widely differing market shares. Leeds is not unique and rail commuters in most towns and cities in the UK have genuine travel choices, with car and bus, and in some cases, trams, as 'competitors' (particularly for off-peak travel).

West Midlands Rail Users – Profile

This profile from the West Midlands provides useful insight into the users of regional rail services in a large metropolitan area. Centro, The West Midlands PTE, conducted a series of surveys of bus, rail and metro users in 2013 and 2014. The surveys show that rail is the mode of choice for commuting to work by public transport, with 71% of peak users being commuters, compared to only 52% on bus services. In the weekday off-peak work trips still dominate with 40% of trips being for work trips compared to 29% on bus services. Whilst work related travel dominates weekday travel, rail networks also support other vital areas of the economy, namely shopping, leisure and education.

Rail journey purpose (2013)

Purpose	Peak %	Weekday off-peak %	Saturday %
Work	71	40	20
Education	17	22	4
Shopping	4	17	33
Other leisure	8	21	43

During the week education is the second largest non-work purpose whilst at weekends shopping and other leisure activities dominate. This highlights that rail services are important in supporting access to education and for accessing the regenerated retail space that exists in city centres.

2.22 From the perspective of the rail operator, trips for shopping and leisure are a useful source of additional revenue as passengers travelling in the off-peak and at weekends contribute towards covering the fixed costs of operation, without imposing significant additional operating costs.

2.23 The same Centro survey also presented some interesting responses to a question related to the reason for choosing rail over other modes.

Table 2.3 Reasons for Choosing Rail: Centro Survey

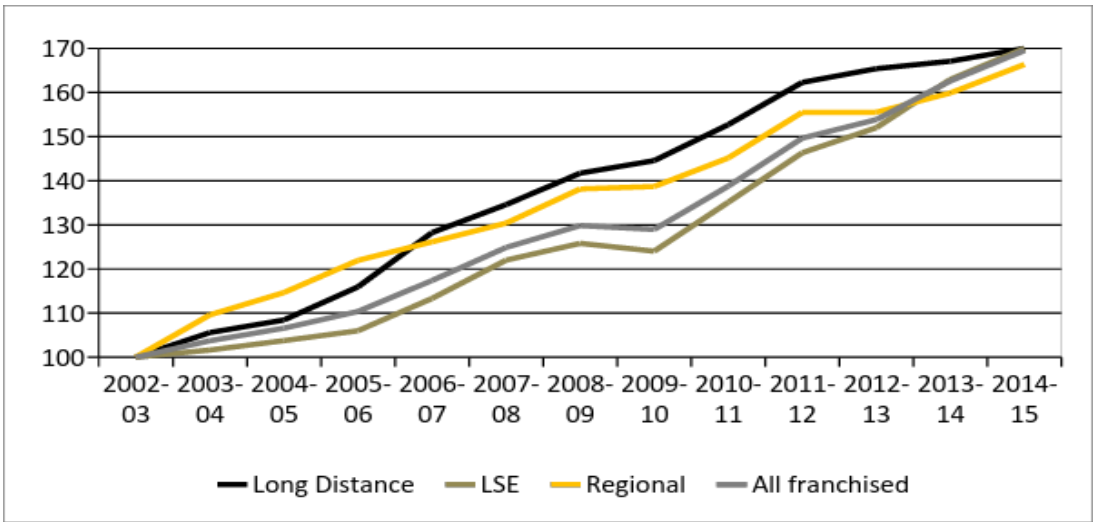
Reason for Choosing Rail	% Response
Train is quicker	40
No car/do not drive/car not available	22
Do not have to worry about/ pay costs of parking	10
Train is cheaper	7
Do not like driving/no need to worry about driving	7
Convenient/easier by train	6
No choice/only method available	3
Other	3
Have a rail pass	1
Train services frequent	1
Train are comfortable	0

2.24 It is clear that the key reason for choosing rail is the time advantage that it brings over other modes. However, other than speed there are comparatively few users who provide a positive reason for using rail suggesting that there must be room for improvement in the quality of the service provided to make travelling by rail a more positive experience.

A STORY OF GROWING DEMAND

2.25 Railways in Great Britain have been characterised by an extended period of growth over the last decade or so. Between 2002-03 and 2014-15 passenger numbers increased by 70% across all three rail sectors. The growth for regional franchises has been broadly in line with this at 66%, although prior to 2012-13 growth it had in fact been higher than the national average. The number of regional passengers increased from around 219 million per year to 350 million over this time.

Figure 2.5 Rail Passenger Journeys by Sector 2002-03 to 2014-15 (2002/03 = 100)

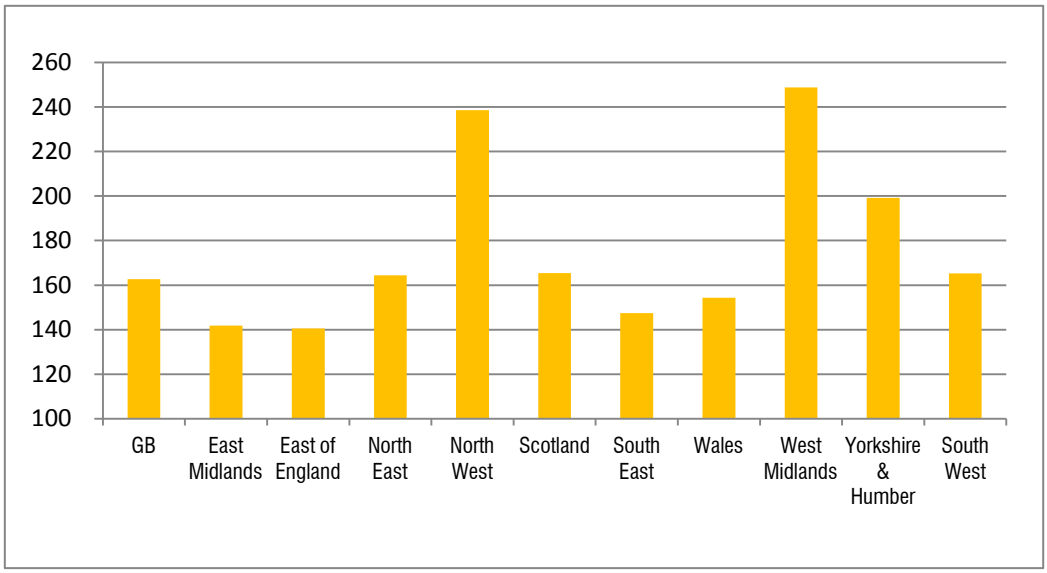


Office of Rail and Road

2.26 The greatest percentage growth has been in the long distance sector, perhaps unsurprising given the change in service levels on long distance routes over this period, with substantial increases in frequency on the East and West Coast Mainlines in particular. The figure below compares growth in passenger demand across Great Britain as a whole and by regions outside of London. Many of the regions

outstripped the national level of growth by some margin, with the North West, West Midlands and Yorkshire & Humber performing best.

Figure 2.6 Increase in Passenger Demand 2002/03-2013/14 (2002/03 = 100)



2.27 Indeed much of this growth has been achieved in areas where there has been little investment in the rail network.

Regional Rail: Growth in Greater Manchester

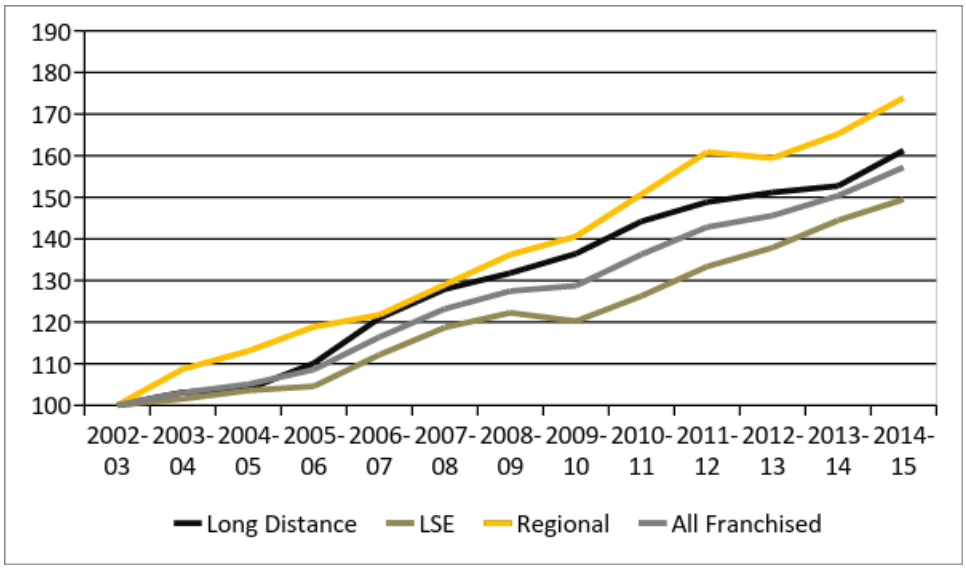
The local rail network around Greater Manchester, operated by Northern Rail, has changed little since privatisation with comparatively limited service changes and the same British Rail built diesel and electric units working services. The routes operated by diesel trains use some of the oldest trans in the country, many of which are of a poor quality.

In recent years they have often been unable to keep up with demand, with many services severely overcrowded, in peak periods. Only since early 2015 has there been a slight improvement with the introduction of higher capacity electric trains on services between Liverpool and Manchester.

Services in South Manchester illustrate the point well, with demand at stations on the Goyt Valley routes increasing substantially over the period between 1997 and 2014. For example passenger numbers at Romiley increased by 90% from 1997 levels, at Marple by 115% and at the two stations at New Mills by 163%, compared to a national average of 116%. Similar changes can be found at many points across Greater Manchester, and indeed across the many parts of the regional network. And yet at most of these locations they have the same level of service as they did 20 years ago, and with the same trains operating them.

2.28 A different measure to total passenger numbers is the change in passenger kilometres, combining the absolute number of passengers with the distance that they are travelling. Using this measure the regional sector has grown by some 74%.

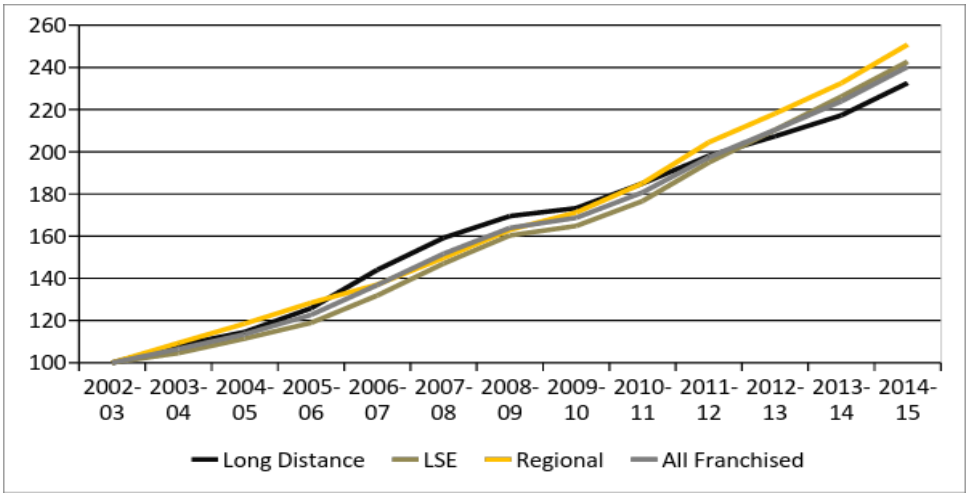
Figure 2.7 Passenger km Indexed 2002/03 to 2014/15 (2002/03 = 100)



Source: Office of Rail and Road

2.29 Another indicator is revenue which has more than doubled since 2002 across the passenger railway, a trend also reflected across the regional sector. Research by the Office of Rail and Road (ORR) suggests that a little under half of this growth is due to fare rises whilst the remainder is related to increases in patronage. Again regional rail services have topped growth rates with an increase in total revenue of 151% from 2002-03 to 2014-15, against a national average of 140%. Overall there has been a significant increase in yield as revenue increases have outstripped demand increases.

Figure 2.8 Passenger Revenue Growth 2002/3-2014/15 (Indexed to 2002/03)



Source: Office of Rail and Road

INVESTMENT LAGS BEHIND

2.30 However, investment in these regional services has not kept pace with this growth. Taking a snapshot of expenditure on rail per person by English region (Table 2.2) it is clear that even allowing for recent increases in spending in the North West and Yorkshire and the Humber, London absorbs the lion's share of investment receiving almost three times more than the next highest region.

Table 2.4 Rail Spending Per Head 2012/13

Region	£/person
London	294
Yorkshire & the Humber	101
North West	89
North East	52
West Midlands	50
South West	41
East Midlands	37

Source: Investing in the Railway, House of Commons Transport Committee, Seventh Report of Session 2014-15, January 2015

2.31 These figures will vary over time as particular investments will impact on spend in particular regions in any given year but even when you consider planned investment in rail over the whole of Network Rail's Control Period 5 (2014-2019) the same broad message remains – with investment in the Midlands and the North of England being only around a quarter to a third of the investment in London and the South East.

Figure 2.9 Per Capita Rail Investment in CP5[17]

***pteg** 2014 Rail in the North of England*

2.32 Interestingly in the devolved Scottish administration a much higher level of investment per person is planned, and even the Welsh Assembly, which has fewer devolved powers than Scotland, is due to invest more than in the English regions, although this may be more a reflection of the lower population densities in the area than a much higher level of investment. In the case of Scotland there have been a number of large investments such as the opening of the Borders Railway which contribute to the higher level of spending.

2.33 As we shall argue later, this imbalance in rail spending also impacts upon the ability of the regional economies to deliver their economic growth potential. As the House of Commons Transport Committee notes[18] *"We remain concerned that the Benefit Cost Ratio used to allocate rail spending has failed to*

[17] These figures are based on regionally identifiable schemes and therefore exclude some general purpose funds for which spending is not disaggregated

[18] House of Commons Transport Committee (2015): Investing in the Railway HC257

give sufficient weight to the wider economic and social benefits of rail investment. Focusing simply on passenger numbers and the short term economic return from rail investment will inevitably continue to focus investment in London and the South East. Instead we recommend that the Department for Transport adopt and publish broader criteria for allocating funding which considers the contribution to the Government's wider policy objectives – such as long-term economic regeneration, environmental policy or social need."

2.34 This long term level of limited investment not only impacts on the wider benefits of rail services, but also perpetuates some long term cost inefficiencies. The lack of investment means that regional services continue to have higher operating costs than they need have, while opportunities to invest to increase demand and thus revenue are missed. Instead the railway continues to rely on subsidies to make up for the lack of investment.

Lack of Signalling Investment Impacts on Regional Service Viability

Investment in signalling systems across the regional network has for many years lagged behind other sectors. Many routes are still controlled by signal boxes using equipment and procedures that date from the nineteenth century. This can impact on both costs and operational flexibility. For example in rural areas a small number of trains are often controlled by a large number of signal boxes, especially where they supervise level crossings, increasing the costs of operation significantly. Between Barrow-in-Furness and Carlisle there are 21 signal and level crossing boxes over a distance of 85 miles, an average of one box every four miles, on a route that operates at best an hourly passenger service, plus a limited number of freight trains. This impacts on the timetable it is possible to run for the route. For many years there has been no Sunday service between Whitehaven and Barrow-in-Furness due in part to the cost of manning the 15 signal and level crossing boxes on this section.

Some key routes on the regional network are also signalled using nineteenth century signal boxes, for example the Hope Valley Line – the main route from Sheffield to Manchester is signalled by seven mechanical signal boxes. The location of these boxes as well as the spacing of signals determines the capacity and line speed of this route.

2.35 So, how have regional railways managed to make the case for investment against this unpromising backdrop? And what have been the results? Part of the answer has been that investment has often been incremental and piecemeal. The case of electrification across the north is a good example of this.

Northern Electrification – Incremental Steps?

A recent example of investment in regional rail services has been the electrification of the Liverpool – Manchester (Chat Moss) route, along with the line from Liverpool to Wigan. This is a precursor to further electrification of services in the North West, although other schemes have now been put on hold.

Electrification presents a huge opportunity to improve services and deliver a step-change in service levels. However the initial electrification retains the previous diesel operated service pattern, and the rolling stock used (cascaded from elsewhere on the network) are as old as the diesel trains they replace. The full benefits of electrification have consequently not been realised as the trains used are, by the standards of modern electric trains, comparatively under powered. With services operating with frequent stops, trains with good acceleration would help reduce journey times further helping to maximise the benefits of the investment.

Evidence from the past illustrates the pitfalls of an incremental approach to realising the benefits of electrification. In the mid-1990s the Airedale and Wharfedale Lines in West Yorkshire were electrified. However they too were operated by cascaded rolling stock until around 2001. In the two years after the introduction of new trains demand increased by 22%, the same demand increase that had occurred in the previous five years put together.

North West electrification was to have been followed by electrification of the North Trans Pennine route to Leeds, York and Selby. However this has now been put on hold. This would have upgraded many of the key links across the north. In doing so the opportunities for efficiencies in capital costs from a rolling programme may have been missed, whilst reductions in operating costs have also been deferred. Clearly investment in electrification and journey time reductions is to be welcomed, but there is a risk that without appropriate rolling stock the impact will be diluted and the full benefits may not be realised. This could be compounded further if electrification remains confined to a limited number of routes resulting in the inefficient use of a mixed fleet of diesel and electric trains.

2.36 It has been possible however, often with local authority or PTE support, to achieve more substantial investments. The reopening of the line between Halifax and Huddersfield to provide a new service and a new station at Brighouse is one example (see box below).

Brighouse Station and New Services

Brighouse is a town in the Calder Valley of around 32,000 people. The original station serving the town closed in 1970, however the line remained open for freight traffic. In 2000 the station reopened served by an hourly service in each direction linking Leeds and Huddersfield via Bradford and Halifax, which in addition to serving Brighouse provided new links between Kirklees, Calderdale and Bradford.

This original service proved a success but only provided an indirect link to the main regional centre of Leeds. To remedy this, since 2008 a new service linking Leeds and Manchester via Dewsbury, Brighouse and Rochdale has operated. Since the new service was introduced usage of the station has grown by 154% and now stands at around 372,000 trips per annum. The example of Brighouse shows over a 15 year period the benefits of both opening new stations and developing new, more direct, services.

2.37 The Trans-Wilts service below is another example, albeit in a more rural context.

The Trans-Wilts Project – the Impact of Investing in Rural Services

The Trans-Wilts service operates from Swindon to Westbury via Chippenham, Melksham and Trowbridge. These towns across Wiltshire were, prior to 2013, served by just two trains per day in each direction. Following a successful Local Sustainable Transport Fund (LSTF) bid, funding was provided to operate a service of eight trains per day in each direction. The funding is a pump priming initiative to help develop the service over two years with a view to it being continued in the long term.

The initial forecast of demand for the service contained within the LSTF bid estimated that in the first year of operation there would be 45,000 new passengers, rising to 120,000 passengers after five years of operation. However in the first four months alone the service attracted 43,900 passengers – close to the target for the whole of the first year, and on course to be close to the five year target in the opening year alone. This clearly demonstrates the power of a transformational change in connectivity, and shows the important role that rail can play in connecting places, even away from the main urban centres.

Of the new users of the service 10% were previously car users, while over a quarter were wholly new trips. It might be expected that over time the number transferring from car will increase as users make longer term decisions about changing mode. In the longer term, there are aspirations in Wiltshire to improve the service further to provide an hourly service linking Salisbury with Swindon, enhancing connections between all of the main towns of Wiltshire.

2.38 In recent years Scotland has successfully reopened the Airdrie-Bathgate route, the Stirling-Alloa route and will shortly see the Galashiels route brought back into operation, while the Welsh Assembly has supported the very successful Ebbw Vale reopening (complete with six stations). More significant interventions have seen the rebuilding of Birmingham New Street station to increase passenger capacity and the major remodelling of Leeds station which increased both track and passenger capacity.

2.39 Nevertheless the overall picture is that investment levels have been significantly lower for regional rail than for other sectors and there is now a backlog of pressing requirements to provide a railway that is fit for purpose and which can help deliver the Government's economic growth and other policy objectives.

Over Crowding and Rolling Stock Renewal

2.40 Rolling stock renewal is where the contribution of unprecedented demand growth and lack of investment in regional rail come together to adversely impact on the service offered by regional rail and on its ability to deliver on one of its key roles of linking city region economies.

Economic Consequences of Overcrowding on Northern Trains

There are significant consequences for the city region economies of rail overcrowding.

Analysis by KPMG in 2009 for the Greater Manchester and West Yorkshire PTEs is reported by ***pteg*** to have indicated that overcrowding on the Northern Trains services had potentially cost Leeds and Manchester around 20,000 new jobs by 2013/14 at around £500m in Gross Value Added.

*Reported in **pteg** 2014 Rail in the North of England*

2.41 Overcrowding is now a serious issue for a number of regional services. The TransPennine routes for example have the highest 'density of usage' (measured as passengers per available seat) outside of the metro-like London Overground service in the peak hours. Some 23% of TransPennine passengers from Sheffield, Manchester and Leeds have to stand in the evening peak.

2.42 Although the equivalent measure of passengers per available seat for the Northern franchise shows it has one of the lowest ratios, this is a reflection of its extensive rural network. In fact, because the Northern franchise was let on a 'no-growth' basis, it now suffers from some of the worst problems of overcrowding in the national network on routes into the major cities of the north. Figure 2.10 below demonstrates the growth in usage at a number of stations since 2002.

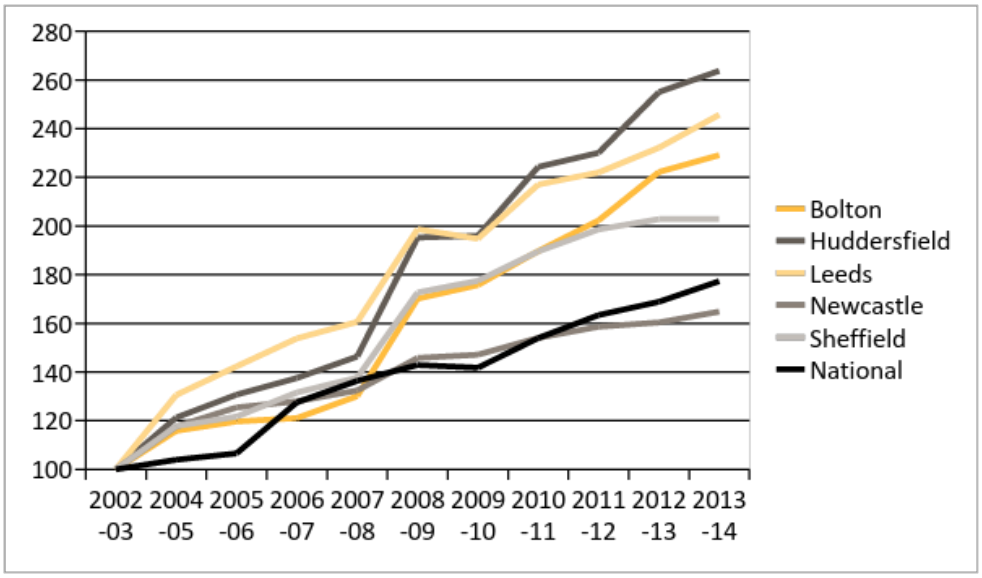
2.43 This has led to a situation where 45% of evening peak commuter services in Leeds, and 43% in Manchester, have standing room only. This means that 12% of all passengers out of these two cities in the evening have to stand – figures which are comparable to the high levels of overcrowding seen on services out of London[19] but without the equivalent investment in place to address this challenge.

2.44 Recent analysis[20] for Rail North on rolling stock requirements has identified that between 40% and 70% more rolling stock will be required to meet planned developments across the North of England, although the increase in capacity that this would bring may be greater through the replacement of shorter vehicles with longer ones.

[19] Equivalent London & South East services such as those operated by South Eastern or Southern

[20] Steer Davies Gleave 2014, Rail North Rolling Stock Strategy

Figure 2.10 Growth at Selected Stations across the North of England (Indexed to 2002/03 base)

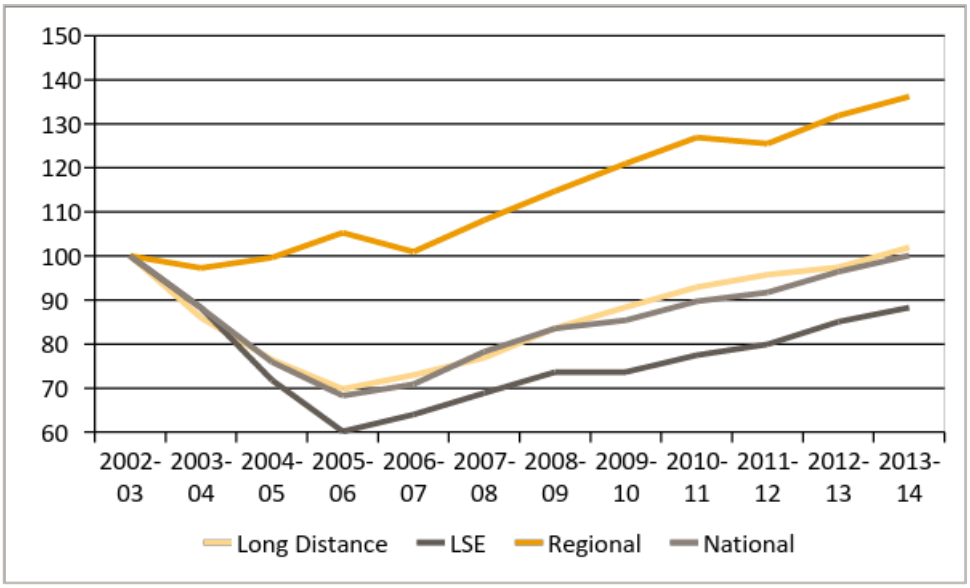


Source: ORR Station Usage Data

An ageing fleet

2.45 The regional fleets, other than some very minor investment in the early 2000s, have seen a general stagnation in investment. Part of this is because large parts of the regional rolling stock fleet were renewed in the late 1980s and therefore it might be expected that these would not fall due for renewal yet. However given the significant growth in the use of regional services, this limited investment in rolling stock has led to these severe capacity challenges.

Figure 2.11 Average Age of Rolling Stock by Sector (2002/3 = 100)



Source: Office of Rail and Road

2.46 To put this in context the average age of a train in the Northern Trains franchise is 25 years while the franchises providing commuter services in London and the South East have received 580 new carriages within the last five years. London Overground rolling stock has an average age of only four years, whilst the average age on the larger Southern franchise is only 14 years. Whilst other parts of the railway have

seen significant investment that has lowered the national average the regional fleet has not enjoyed any significant investment in the last 10 years.

2.47 The news[21] that the new Northern franchise for 2016 includes a requirement to replace the poor quality railbus-derivative trains which are around 30 years old, (known as Pacers) by 2020 has therefore been welcomed. These trains were originally designed with a 15 year lifespan, much shorter than more conventional trains but will survive to operate for more than twice their design life.

Electrification

2.48 In some areas regional services are operated by a mixture of diesel and electric rolling stock but across the regional network as a whole the vast majority of services are operated by diesel trains, of varying quality.

2.49 The potential benefits of electrification are widely understood (and are quantified later in Chapter 5). Examples of the success of electrification are the Airedale and Wharfedale lines in West Yorkshire which have seen huge growth in the period since electrification and have helped to support the structural change to a city centre focused economy in this area (see case study in chapter 3 for more detail).

2.50 There are clearly challenges ahead to deliver electrification in a cost effective manner and within a reasonable timeframe, but Scotland can provide us with examples that show it can be done.

Glasgow to Paisley Canal: Cost effective electrification

It is often claimed that regional rail services have high costs and require high levels of subsidy to support services. However good examples exist of investment that can be delivered cost effectively and can contribute to a reduction in operating costs.

An excellent example of this has been the electrification of the Glasgow – Paisley Canal line, completed in 2012. The aims of the scheme were to:

- replace diesel trains with cheaper to operate electric trains;
- improve reliability on the route by using electric trains with better acceleration which could cope better with frequent station stops;
- improve utilisation of the ScotRail electric fleet;
- release the diesel trains for use elsewhere on the network.

As the scheme was being developed the potential costs began to rise. However rather than cancelling the scheme a review was undertaken with the objective of maximising the benefits in relation to the costs. The scheme costs were driven down from £28M to £12.2m, largely by developing an innovative approach to the infrastructure costs, in particular the need to reconstruct bridges to provide adequate clearances for overhead wires.

The scheme progressed rapidly and was wholly delivered during the second half of 2012. The success of the scheme has led to other similar schemes such as an extension of electrification to Whifflet in east Glasgow.

This provides lessons for other areas of the country, as electrification of key routes spreads and the opportunity arises for apparently minor schemes that can deliver significant benefits and improve the efficiency of operation across the regional sector.

Investment in Stations

2.51 Opening new stations or investing in upgrading existing stations has traditionally been one of the areas where PTEs (and to a lesser extent Local Authorities) have been active in supporting the development

[21] Local Transport Today LTT667 6th March 2015 Page 1 'McLoughlin overruled officials to eliminate North's Pacer trains'

of regional rail services. Stratford Parkway, Glasshoughton and Liverpool South Parkway are just a few of the numerous successful investments over the last ten years.

New Stations – A Focus for Regeneration

A number of station openings have been closely linked to the regeneration of the areas they serve, helping to increase demand for rail services and stimulate the economy, often in areas which have seen substantial structural change to their economies over the last 40 years.

A good example for this is Wavertree Technology Park located in the east of Liverpool. This station opened in 2000 and serves the adjacent technology parks. Such is the importance of the station that it is served by five trains per hour in each direction making the area attractive for businesses. It now has two trains per hour from Liverpool to Manchester, two trains per hour from Liverpool to Wigan and one train per hour from Liverpool to Warrington. In 2013 the Liverpool Innovation Park was developed nearby offering high quality office facilities. The station was opened to help contribute to the regeneration of this part of east Liverpool.

A different example of the same phenomenon is the opening of Kirkstall Forge station between Leeds and Shipley. This will be at the centre of a large development site on the former forge. The development site has been stalled for many years, in large part due to the economic crisis but the opening of the station is being used as a way of making the location more attractive for residential development in particular. Also in West Yorkshire, Glasshoughton has acted as a catalyst for regeneration and development. Opened in 2004 the station was built on the site of the former Glasshoughton colliery. As well as acting as a Park & Ride location for services to Leeds the station has acted as a destination for the leisure and retail facilities that have developed in conjunction with it.

As well as supporting regeneration new stations also support access to services at a local and regional level. The most recent example of this is the James Cook University Hospital Station on the line from Middlesbrough to Whitby. The hospital provides specialised services to a population of around 1.5M. The opening of the station, which provides direct links to Middlesbrough, Hartlepool, Sunderland Newcastle and Whitby, has improved access for those without a car and will also contribute to relieving congestion on the busy A172 road, where the hospital is a major generator of traffic. In addition to providing access to the hospital the station will in the longer term help support future development in the area including a sports village and significant housing development.

In all cases these stations were entirely new sites with no previous history of a station, showing how rail can help facilitate development and regeneration and adapt to new circumstances to serve entirely new markets.

THE COST AGENDA: STIFLING INVESTMENT?

2.52 Against this backdrop of growth but underinvestment, the cost of providing these services has remained firmly in the spotlight. Indeed the issue of cost has impacted directly on the story of under investment in regional rail. There is no doubt that the potentially poor returns from investing in what is considered to be a high cost part of the national rail network has influenced decisions on investment over the years.

2.53 Regional rail services have the potential to be no more expensive to operate than any other rail service, but in their present form do consume significant sums of public subsidy and have therefore been historically seen as less attractive investment propositions than other parts of the network. In some ways this is a self-fulfilling prophesy, for a long period of time regional rail has been thought of as expensive, therefore does not receive investment, and so becomes more expensive than those areas of the rail network or broader transport network that have received investment. In fact by investing it would be possible to reduce costs and increase demand.

2.54 Firstly it should be considered that the role of subsidy in supporting services is in principle meant to be a positive feature. Subsidy was introduced where services could not cover their costs but were felt to bring a wider benefit to society. This can cover all manner of issues, for example services help reduce road congestion in cities; provide transport for those without cars, especially the elderly, the young and those on low incomes; and can help to limit and reduce levels of emissions.

2.55 A starting point is to look at the official sources of cost estimates. Work by the ORR in 2012[22] provides comparisons of a range of different metrics between train operators. This is useful for comparing the costs of different types of operation.

2.56 The most useful metric to begin with is a comparison of train operating costs. The ORR used four different measures to assess the costs for each Train Operating Company (TOC). These were:

- cost per passenger km;
- cost per vehicle km;
- cost per train km;
- cost per train hour.

2.57 The table below compares some of the main regional operators with Chiltern Railways. Chiltern Railways has been chosen as a comparator as a non-regional operator which has seen significant investment over the last 20 years but continues to operate an all diesel fleet. It also has a mixture of commuter and long distance services representing a similar mix to much of the regional network. The route was very much a Cinderella route until immediately prior to privatisation when it received a route modernisation. With more recent infrastructure investment as part of the Evergreen programme, and the extension from Bicester to Oxford, Chiltern is a useful and relevant example of the potential that investment can deliver, recognising that not all aspects of its market are relevant to typical regional services. Nevertheless it does demonstrate that infrastructure investment can help deliver a cost efficient railway.

Table 2.5 Operating Cost Comparison between TOCs (£)

	Cost per Pax km[23]	Cost per Veh km[24]	Cost per train km[25]	Cost per train hour[26]
Arriva Trains Wales	0.16	3.16	7.6	433
Northern	0.19	3.58	8.7	449
ScotRail	0.15	2.93	9.6	580
Merseyrail	0.18	4.92	16.6	610
TPE	0.10	3.20	9.2	736
Chiltern	0.10	3.01	10.1	679

2.58 Regional services have the highest costs per passenger km, with Northern and Merseyrail being the highest of all the TOCs. Merseyrail has higher operating costs in part due to the deep level underground stations in Liverpool that they are responsible for. Only TransPennine Express (TPE) is close to Chiltern, illustrating that the comparatively low load factors that arise from the diversity of services that form the regional networks and a high fixed-cost allocation weigh heavily on the financial performance of the regional TOCs.

2.59 Regional services also have higher cost per vehicle km. This is a function of the generally shorter trains that they operate, as costs are spread over a smaller number of vehicles. A good example of this effect

[22] Costs & Revenues of Franchised Passenger Train Operators in the UK. Office of Rail Regulation 2012

[23] Cost per passenger km refers to the total costs of operation divided by the total distance travelled by all passengers over a given period

[24] Cost per vehicle km refers to the total cost of operation divided by the total distance travelled by vehicles in the fleet. One two coach train travelling one km would represent two vehicle km

[25] Cost per train km refers to the total cost of operation divided by the total distance travelled by train in the fleet. One two coach train travelling one km would represent one train km.

[26] Cost per train hour refers to the total cost of operation of a service divided by the number of timetabled hours operated.

is the impact on train crew costs, where a crew of two (driver and conductor) might be in charge of a train of just two or three vehicles on a regional service, compared to up to twelve on a London and the South East service.

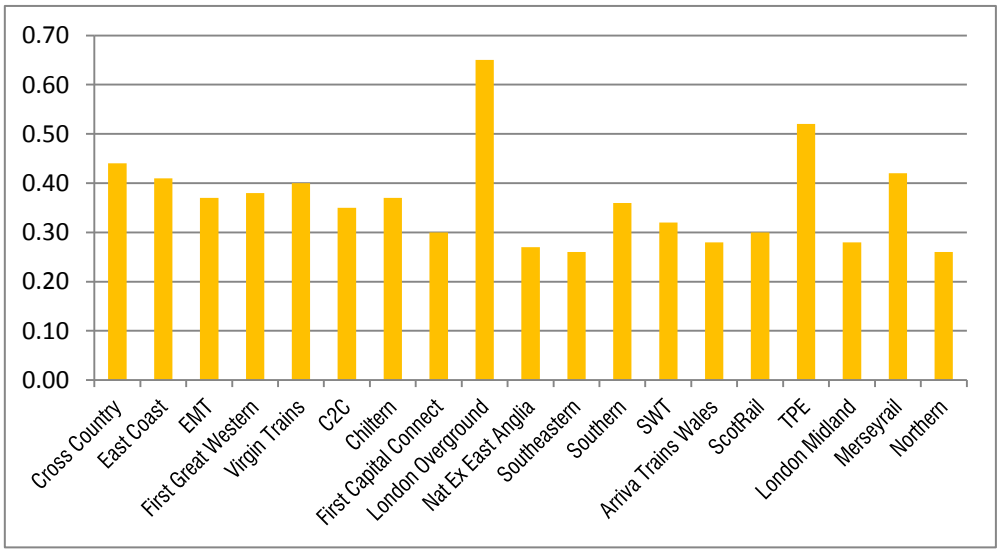
2.60 Regional TOCs in general suffer from disproportionally high operating costs for the service operated. The predominance of diesel rather than cheaper electric trains and higher staff costs as a proportion of total operating costs due to the use of shorter trains. While the leasing costs of vehicles may well be lower where trains have not been replaced, (new rolling stock tends to be more expensive to lease), the cost saving is almost certainly offset by the revenue that more attractive trains, generating more passengers, would deliver.

2.61 Regional services do however have lower costs per train hour operated, reflecting lower average speeds which limit distance-based costs, such as fuel, that can be attributed to an hour's operation.

2.62 Overall these results tend to paint regional services in an unfavourable light. However this is somewhat unfair for a network of services that has a very diverse range of operations covering a mixture of secondary long distance services, commuter operations and deeply rural services. When compared to the very specialist roles of the long distance and London and the South East sectors regional services do not perform well when looked at using aggregate cost measures. This is further compounded by the lack of investment in rolling stock and line speeds which has prevented the regional sector achieving the efficiencies that other sectors have.

2.63 An interesting comparison between TOCs is the average number of passengers per available seat, a measure of the 'density' of usage. The ORR presents this measure in its 2012 TOC Benchmarking Report. TPE has the second highest in the country with 0.52 passengers per seat, second only to London Overground – a TOC that operates trains designed for very dense peak conditions and therefore having very few seats. This illustrates the success of the TPE operation in growing its market and the need to increase capacity on a network which, despite its greater specialisation, still fulfils both a long distance and urban role.

Figure 2.12 Passengers per Available Seat by TOC 2012



Source: ORR 2012

2.64 The TOC with the fourth highest density is Merseyrail. A long term constraint to expanding these services has been the length of platforms, which is not easy to resolve at the underground stations in Liverpool in particular. Indeed this operation is one of the closest in the regional sector to the London Overground network. Whilst the other regional TOCs tend to have lower seat densities they are nevertheless quite similar to the London and South East operators.

An Alternative Way of Viewing Costs

2.65 Infrastructure cost allocation is one factor that tends to work against making the investment case for regional rail. In 2014 ***pteg*** produced a report titled '*A Heavy Load to Bear*?' which examined the allocation of infrastructure costs to different sectors of the railway in the UK. This looked specifically at the two types of infrastructure charge, fixed infrastructure costs, (that as the name suggests cover fixed costs such as signalling, or earthworks), and variable marginal wear and tear costs being covered on a per vehicle km basis (for example the wear inflicted on track by different types of train). The infrastructure costs included: maintenance, operations & other costs, renewals, enhancements and financing costs.

2.66 It was shown that the allocation of these costs to different sectors of the railway is biased against regional rail. For example regional services were allocated 32% of maintenance costs but only account for 15% of the costs incurred. A similar situation exists across the other cost categories with costs allocated being roughly double those generated by the regional sector.

2.67 The cause of this is largely the use of train km as the method of cost allocation. This is an issue as different types of train inflict different levels of wear and tear on the infrastructure. For example freight trains are heavier than passenger trains and inflict more damage on track, they are also slower requiring passing loops to allow passenger services to pass, and this generates additional track and signalling costs. Long distance services in contrast tend to be much faster than average requiring enhanced track maintenance. Both freight and long distance passenger services are also longer than regional services and therefore generate higher costs than shorter regional services. The ***pteg*** work estimated that a long distance service inflicts around 20 times as much damage on the track as a typical regional service. In the case of regional rail this is complicated further as many regional rail services share capacity with freight operators who do not pay any fixed track access charges. The burden of costs is passed through to passenger operations.

2.68 There are good policy reasons for freight traffic not paying its full costs, but passing the additional costs onto regional passenger services does not seem an appropriate solution. The impact of this allocation problem is to significantly overestimate the level of support that the regional rail sector requires, and by implication underestimates the charges accruing to London and the South East and long distance operators. In the case of enhancements and financing this is especially unfair as regional services have tended to receive less investment, but have been allocated the costs of upgrades that other areas have benefitted from.

2.69 The report advocates an alternative approach to cost allocation[27]. ***pteg*** found that using this method the burden of support for the railway would change significantly. The table below summarises the changes to infrastructure subsidy (shown as pence per passenger km) that would occur with their method.

[27] They proposed the following methods for costs groups: Maintenance & Renewal to be based around wear and tear of rolling stock; Operations to be based on passenger revenues, with a view to moving towards a 'prime user' allocation method ; prime user refers to the predominant user of a particular piece of infrastructure at a particular location

Table 2.6 Comparison *of* Actual and Proposed Infrastructure Charges (p per passenger km)

Sector	ORR Method	*pteg* Method
Long Distance	6	14
London & South East	6	10
Regional	12	7

2.70 The proposed changes would make a significant difference to all sectors. Whilst regional services would still require subsidy this would be driven by train operation rather than infrastructure issues. The changes would reduce the total support for the regional rail sector from £2.3bn per annum to £1.8bn.

SUMMARY

2.71 We have seen that the regional rail network is a substantial part of the national rail network. Carrying over 365 million passengers on over 1,100 trains and employing 17,000 people they serve a significant proportion of the national population and the economically most important city regions in the country.

2.72 The network has enjoyed massive growth in recent years, making a strong contribution to the structural change of the economy in many of our city regions. At individual stations demand has grown at more than twice the national average, whilst we have seen that a regional train operator (TPE) has the second highest number of passengers per seat across the rail industry, second only to London Overground.

2.73 This huge level of growth has however not been matched by an equivalent level of investment in infrastructure and rolling stock. Over the last ten years the average age of rolling stock has increased by 30% whilst the average age in other sectors has remained constant. Looking to the future this lack of investment could limit future growth whilst the potential benefits of more efficient operation as a result of investment have been missed.

2.74 Regional rail services are often portrayed as having very high costs relative to the passengers carried. There are a range of reasons for this including the process used for allocating costs, which is weighted against regional operations, whilst as a result of underinvestment some services are unattractive and deter potential passengers. A historic lack of investment has also resulted in the sector having less cost effective operations than other sectors. Opportunities to ‘invest to save’ have been missed on numerous occasions over the years.

2.75 In summary, regional rail has achieved a huge amount with only very limited resources over recent years but a point is being reached where the potential to achieve more without investment will be limited, and as we shall show this is limiting the role that rail can play in developing the economy.

3 The Value to the UK

INTRODUCTION

3.1 Regional rail services provide a number of benefits that support local economies and business, as well as contributing to broader social, environmental and economic goals.

3.2 In its 2014 report on rail in the North of England[28] ***pteg*** illustrated how the regional rail network delivers net economic benefits, (improved efficiency, productivity and well-being), amounting to £1.6bn per year across the north of England.

3.3 Only one quarter of these benefits accrue to rail passengers themselves. Other benefits come in the form of reduced road congestion, improved business productivity, and the 'option' or 'insurance' value which rail networks provide.

3.4 Furthermore, spending on regional rail has a supply-side effect. ***pteg*** identified that the regional rail network in the North of England delivers £4.30 of economic value for every £1 of direct government support and government backed borrowing.

3.5 In this chapter, we explore how regional rail services already support the UK economy. We start with a look at how local and regional economies are increasingly being driven by the cities at their heart, and provide an insight into how regional services are therefore likely to become even more important in serving our regional cities as they evolve to compete within a competitive global marketplace.

INVIGORATING CITY REGION ECONOMIES

3.6 The importance of cities in driving growth and prosperity is increasingly recognised. The rise of cities, with the concentration of productivity, innovation and creativity, will drive our economic future[29]. Cities are 21% more productive than non-urban areas and host 72% of all highly skilled jobs[30].

3.7 It is now generally accepted that this concentration of economic resources in cities is, in large measure, due to agglomeration economies[31]. At their broadest level, agglomeration economies occur when individuals benefit from being "near" to other individuals, where the spatial concentration of economic activity gives rise to increasing returns in production. Agglomeration is essentially about the scale that can be achieved through proximity. In this sense it is clear that the ease of movement within cities and city regions, which is crucial to proximity, clearly counts. Transport and communications play a crucial role because, in most contexts, speed and low costs in transportation and communication provide a direct substitute for physical proximity[32].

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[28] ***pteg***, The economic value of rail in the North of England, July 2014

[29] City Growth Commission, Unleashing Metro Growth: Final recommendations, October 2014

[30] Louise McGough & Elli Thomas, Delivering change: Putting city centres at the heart of the local economy, Centre for Cities, London, December 2014

[31] ***pteg***, Transport works for growth and jobs: why urban transport drives successful economies, February 2014

[32] Daniel Graham & Patricia Melo, 2010, Advice on the Assessment of Wider Economic Impacts: a report for HS2

CONNECTING PLACES

3.8 Transport investments can, and generally do, benefit the economy. In very simplistic terms if a transport improvement reduces the time needed to make a particular journey, it is likely to facilitate economic growth.

3.9 One North[33] identifies how cities can benefit from improved transport links. Better connectivity means improved journey time reliability, better travel quality and shorter journeys that will widen and strengthen labour markets and improve business efficiency by:

- stimulating business investment and innovation by supporting economies of scale and new ways of working;
- achieving agglomeration economies by bringing firms and their employees closer to business rivals and partners;
- enabling firms to access a larger labour supply and providing wider employment opportunities for workers and those seeking work;
- increasing competitiveness through access to new and larger markets with the benefits of increased labour market specialisation;
- reducing trading costs and using more efficient logistics networks;
- strengthening the existing comparative advantages of a place to do business.

3.10 As our city regions across the United Kingdom increasingly develop a service sector economy, concentrating workers in city centres, rail plays an increasingly important role in enabling large numbers of people to be moved efficiently and effectively into increasingly congested urban areas. Good regional rail networks are therefore fundamental in enabling agglomeration economies to develop, and in capturing the benefits from such economies.

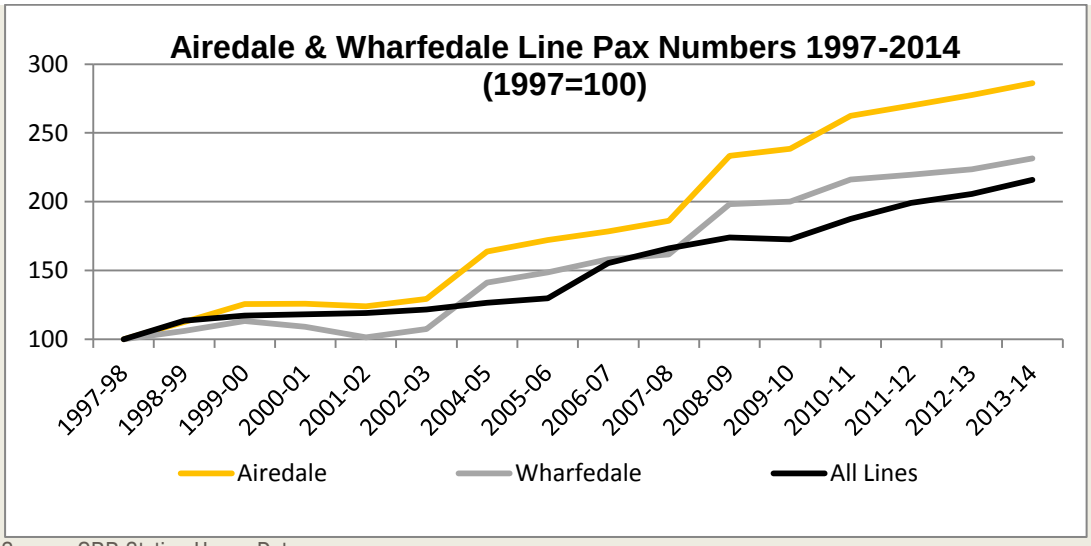
Airedale & Wharfedale Lines – investment supporting the growth of labour markets

The Airedale and Wharfedale Lines from Leeds and Bradford to Skipton and Ilkley were electrified in 1995, and the Class 333 trains were introduced to the route in 2001.

ORR Station Usage Data shows that growth on the Airedale and Wharfedale Line since 1997 has been 186% and 131% respectively. This growth is in no small part a result of the introduction of electrification and an associated timetable improvement, and the subsequent introduction of the new, high quality, trains. This investment provides a high quality service faster than the previous diesel service and operating at a high frequency. The investment in improved rail services has brought about changes in the patterns of travel to work trips in the area, with more commuting trips being undertaken by train, and workers travelling further to jobs.

The investment in the rail service has supported the changing economic structure of the area, with the emergence of many new jobs in the finance and business services sector in city centres especially Leeds.

[33] One North, A proposition for an Interconnected North, July 2014



Source: ORR Station Usage Data

This value has remained even during a period of significant economic downturn. Growth on the Airedale & Wharfedale routes has remained strong, with the period between 2008-09 and 2013-14 seeing growth of 23% on the Airedale Line and 17% on the Wharfedale Line.

3.11 The research by ***pteg*** in the north of England suggests that only one quarter of these economic benefits accrue to regional rail passengers themselves[34]. Benefits include income from rail operations, such as fares and wages, and from access to wider distribution markets. There are direct demand benefits including improved accessibility, and time and cost savings. Rail user benefits are based largely on these time savings. Amongst the indirect benefits are environmental benefits for society as a whole, including reduced carbon emissions, local air quality impacts, (and the consequent effect on public health), noise, energy consumption and safety.

The Wider Value of Regional Rail Enhancements: Birmingham – Walsall – Rugeley

The case for regional rail is often presented in terms of the wider transport and social benefits of the services operated.

At present the service from Birmingham to Walsall and Rugeley operates on an 'enhanced' frequency, subsidised by Centro. The subsidy for this service has been reviewed through an appraisal of the potential impact of withdrawing the additional enhancements to the service. At the present time evening services towards Walsall operate at a half hourly frequency, but without the subsidy the service would be curtailed to hourly, and no services would run to Rugeley.

The appraisal identified that the additional service generated £1.63 for each £1 invested, i.e. the subsidy was generating a positive return on the investment. Much of the benefit was generated from the impact of journey time savings to users, who might otherwise have to use other modes or face longer journeys. The service was also shown to generate a carbon saving of 107 tonnes per year, even though the service operates during the evenings when alternative road based options are not affected by congestion.

Assessment of the impacts of proposed electrification which will reduce operating costs, increase line speeds, and bring an associated uplift in demand, shows that the benefits of the enhanced service rise, to around £3 for every £1 invested.

As well as illustrating the value of regional rail services this case study also highlights the importance of providing a high quality all day service, and not purely focussing on the peak periods of operation.

[34] ***pteg***, The economic value of rail in the North of England, July 2014

3.12 There are also a range of non-user benefits that arise from the regional rail network. These include the benefits to road users of reduced levels of congestion, improved safety and improved air quality. Work by ***pteg***[35] has shown that in the north of England the rail network generates around £216m of non-user benefits each year, or around £1.93 per trip.

3.13 There are further benefits in the form of option and non-use values. Option values represent a value held by those who don't use the rail network frequently but hold a value on its existence, essentially as form of insurance. Examples of this might be the use of the service in bad weather when rail services often continue when roads become unusable. Non-use values are a value which is wholly unrelated to the future use of a service by an individual. Examples might include the value held by parents of children being able to use public transport rather than having to be escorted by parents in a car. Whilst traditionally associated with rural services these option and non-use values also apply to urban services. ***pteg*** have estimated the option and non-use value of services in the north as being around £700M per annum.

SUPPORTING RURAL ECONOMIES

3.14 Rural rail has gone through a revival over recent years[36], with increasing passenger and freight usage. There are a number of benefits that accrue from investment in services that serve more rural communities.

3.15 Rural rail services have two key roles. Firstly they provide important links for residents of rural areas to access services and facilities in larger towns and cities. They often provide a sustainable transport option, which can often be quicker than the car in areas where the road network may be poor. Good access to towns and cities can help maintain the viability of rural areas for local residents, especially for the young or those without a car. While rail can also help provide a sustainable options for bringing tourists into rural areas. In many areas tourism is central to the rural economy, and rural rail services can hold a dual role, as a means of bringing visitors to the area, and as a tourist attraction in its own right. For example, stations in the national parks provide leisure access to large numbers of people, removing traffic from sensitive roads, and helping areas with poor road links become more easily accessible.

Rail tourism: Learning from Europe

In Europe, especially Switzerland, there has been significant attention paid to developing tourism services, accompanied by strong marketing. A good example of this the Centovalli line linking Italy and Switzerland, a narrow gauge line passing through the Alps, linking Domodossala and Locarno. At its eastern end the service forms part of the City of Locarno's regionally controlled public transport network. The western end of the line is much more rural serving a plethora of small villages.

The line operates a mixture of services with a more intense service at the east end of the route and a reasonable service of local trains at the west end of the route. The line also operates a number of well promoted "Panoramic" trains operated by dedicated rolling stock. These trains maximise the scenic aspects of the route and are an easily marketable tourism product.

The revenue from tourist operations contributes to supporting the line as a whole, providing an effective public transport link through difficult terrain which according to the operator generates 1.3M journeys each year (Source: Ferrovie Autolinee Regionali Ticinesi).

[35] ***pteg***. The economic value of rail in the North of England, July 2014

[36] ***pteg*** The economic value of rail in the North of England, July 2014

3.16 There are a range of routes around the country where tourism and local residential traffic coexists. The most well-known routes are probably the West Highland Line in Scotland, the Settle – Carlisle Line in northern England and the branch lines of South West England. These lines have the scope to be developed further, particularly as the UK has tended not to develop or market tourist services in the way that other countries have. Instead there has been a tendency to use normal urban or inter-urban rolling stock which is less suitable for longer scenic journeys than the bespoke low density rolling stock used in some countries for such services. This is to some extent now being addressed in franchise specifications with both the recent ScotRail franchise and the ITT for the Northern franchise requiring franchisees to pay more attention to tourist services and scenic routes. Developing the tourism economy can help bring additional spending to rural areas, address issues of rural deprivation and help support local businesses. Work by the Association of Community Rail Partnerships[37] in 2008 suggested an average spend per trip of around £15 by tourists.

Developing the Rural Economy: Gilsland Station

The village of Gilsland is situated on the Tyne Valley Line that runs from Carlisle to Newcastle. The village is at the centre of Hadrian's Wall and receives large number of tourists to the area to visit the remains of the Wall and the surrounding landscape. However public transport access to the village and surrounding area is poor, limiting the opportunities for young people in particular.

A study[38] has been carried out on the case for reopening a station at Gilsland. This found that the case for reopening based on the usage by local residents alone was very poor, reflecting the high capital costs and low population base. However when use by tourists was considered the case improved significantly. Furthermore there could be up to £300,000 of additional spend in the local economy from tourists generating up to seven additional jobs in the local economy. Whilst this number may seem low it represents an important boost to an isolated village in a rural area. Were the scheme taken forward it would bring direct benefits to local residents and tourists alike, and help to develop the local economy, as well as providing sustainable access to the World Heritage Site, illustrating the dual role that regional rail can play in the rural economy.

3.17 Other benefits to rural areas include:

- supporting market town economies and rural renaissance;
- branch lines often act as feeder services to Intercity and longer distance rail routes contributing to and helping support wider networks.

3.18 Rural stations also increasingly expand the catchment of urban areas, with rail travel providing shorter journey times to more distant locations. This enables cities to develop more dense economies. The earlier case study of the Airedale and Wharfedale lines is a case in point, with growth in rail travel extending the influence of the Leeds City Region, and widening the labour market for employers in the city centres of Leeds and Bradford.

[37] Association of Community Rail Partnerships: The Value of Community Rail Partnerships

[38] Gilsland Station Re-opening, JMP Consultants Ltd for Tyne Valley Line Rail Users Group, 2013

The Far North: Developing a Rural Network

In the north of Scotland the Highlands & Islands Transport Partnership (HiTrans), working with ScotRail franchisees over a number of years, has been successful in developing local rail services north of Inverness. The lines comprise those from Inverness to the Kyle of Lochalsh, and the Far North Line to Wick and Thurso. Historically these lines were served by a handful of services, typically three each way per day.

HiTrans set out to develop a series of shorter services to intermediate towns on the line especially those on the Cromarty and Dornoch Firths. This has now led to an extension of the core services to provide four trips each way per day, year round between Inverness and Kyle of Lochalsh, and between Inverness and Wick and Thurso, supplemented by four shorter services each way. This has served to regenerate a route which had begun to lose its relevance to the communities it served as road investment had made rail less attractive for longer journeys, particularly after the construction of new bridges on the Black Isle and across the Dornoch Firth. The increase in service levels has made the routes viable for commuting and leisure trips to Inverness. This investment has also been accompanied by the opening of two new stations at Conon Bridge and Beauly on the section from Inverness to Dingwall which are common to all routes.

The improvements have helped to make better use of the infrastructure and the effect on demand has been dramatic. For the four stations from Inverness to Dingwall total demand has increased seven fold since 1997, from 34,000 to 251,000 (albeit from a low base and not including Inverness itself) and there has been a 43% increase in demand since 2008/09.

COMBATING ECONOMIC AND SOCIAL EXCLUSION

Poor transport can lead to exclusion

3.19 In addition to direct benefits to the economy, the role of transport investment in combating economic and social exclusion is also important and there are several research reports which articulate the link between transport provision and levels of social exclusion[39]. In 2004 research for ***pteg***[40] identified that regional rail services played an important role in reducing exclusion through:

- providing access to jobs and education;

[39] See for example Church, A., Frost, M., & Sullivan, K. (2000), Transport and social exclusion in London. Transport Policy, 7(3), 195-205

[40] ***pteg***, Rail in the City Regions JMP Consultants Ltd March 2004

- lowering the costs of, and widening the area of search for, employment;
- providing access to a range of other social and leisure opportunities for the whole community;
- increasing the provision of, and improved access to, a range of services and opportunities for disabled passengers.

3.20 More recently, work by ***pteg*** on estimating the value of rail in the north of England has highlighted the potential scale of the opportunity with regards to access to employment, estimating that over 70% of the employment opportunities in the region are within walking distance of the regional rail network.

Employment Benefits

3.21 An important facet of regional railways is that they support local employment across the UK, both directly and within supply chains. The UK rail industry provides significant direct economic benefits to the regions, alongside the benefits accrued through improved connectivity. Oxera[41] identify that the rail industry and supply chain in the UK employs 212,000 people and generates £9.3bn in Gross Value Added (GVA) each year.

3.22 A wide range of high value-added sectors operate within the UK rail supply chain, including engineering, software, consulting and research organisations. Investment in rail has little 'leakage' relative to other sectors, with infrastructure investment delivered on the UK's railways providing significant direct employment along the routes in the UK. These jobs are often relatively well paid, and support local economies across the extent of the regional rail network, enabling significant second order benefits to be captured within local economies.

3.23 Investment in rail continues to benefit the UK regions, with Hitachi soon to open its Newton Aycliffe facility in County Durham. The firm will initially supply 866 carriages as part of the £5.7bn IEP project, which will provide 730 jobs directly at the plant and support an estimated 6,000 jobs indirectly[42]. In other areas rail has a long history of supporting parts of the economy.

Derby and the East Midlands Rail Cluster

The key UK hub for rail-related activity is located in the East Midlands. Research[43] has indicated that the region is home to around 450 rail-related businesses. The importance and contribution of the rail industry to the East Midlands region and the value it brings to the UK has been further underlined by URS[44]. This research estimated the cluster generated:

- direct employment of 5,010 jobs
- total local jobs including those indirectly employed in the rail industry: 26,000
- local economic output (East Midlands): £2.6bn

In Derby alone, there are an estimated 26,000 jobs provided by the cluster. Major employer Bombardier is unique in that it retains design services in the UK alongside production in the town[45], and Derby is home to the world's largest cluster of rail engineering companies, with 8.8 times the national concentration of rail firms. Almost 20 per cent of Derby's economic output – some £2.6bn a year – comes from the industry[46].

[41] Oxera Consulting (London), What is the contribution of rail to the UK economy?, 2014

[42] Financial Times, Hitachi to open £82m train plant in Durham this year, London, 2015

[43] Transport iNet, Mapping of the elements of the rail sector supply chain the East Midlands and identifying the main innovation drivers, East Midlands Development Agency Innovation INets, 2009

[44] URS, Planes, Trains and Automobiles Research, 2009

[45] Source: http://www.investinderby.co.uk/global-city/

[46] FT, November 14, 2011

REGIONAL RAIL IS ENVIRONMENTALLY LESS DAMAGING

3.24 Investing in regional railways and supporting rail travel on the regional networks across the UK supports the achievement of a wide range of environmental and sustainability outcomes[47]. The regional railway network helps to tackle climate change, by providing options to transfer passenger journeys and freight from the roads, thereby helping to reduce greenhouse gas emissions. Work by the Rail Freight Group[48] demonstrates that one train load of freight can remove up to 60 lorries from the road network. As well as reducing road congestion this brings significant environmental benefits as a tonne of goods can travel 246 miles by rail using a gallon of fuel compared to only 88 miles by road.

3.25 Statistics collected by the ORR demonstrate that freight tonne kms have increased significantly over the period 2002-03 to 2014-15, with an average increase of 20% across the whole sector. This masks variations that reflect the broader trends in the UK economy. For example the movement of metals (for example finished steel products) has declined by 31% over this period, in contrast construction traffic (for example the movement of aggregates) has increased by 56% and domestic intermodal (for example shipping containers) has increased by 92%. The rail freight network has a very diverse geography with freight traffic being greater than passenger traffic in some parts of the regional network, for example on the South Humber Bank. In rural areas freight can help to support the network where passenger services are limited.

Rail freight and regional rail

Transporting freight by rail is important for local economies. The rail freight sector directly contributes £870 million to the UK economy and supports output of £5.9bn[49]. Rail freight movements are also environmentally sound, helping to remove significant lorry mileage from the UK's roads, and in a way that is fuel efficient.

Local Rail Freight: Settle & Carlisle: Regional rail enables freight operations to be transferred from the main long distance lines. For example, the survival of passenger services on rural lines, such as the Settle to Carlisle Line, has allowed the route to be used for heavy freight traffic which would otherwise have had to be routed via the West Coast or East Coast mainlines. In the case of Settle to Carlisle, this would have created numerous operational problems. This also has a consequential benefit of making greater use of some lightly used rural lines, helping to justify continued use of and investment in the infrastructure. The Settle to Carlisle Line is also a good example of how rail freight supports local economies. The route has generated its own freight traffic with gypsum being processed at Kirkby Thore, logs moved from Ribblehead and cement traffic operating from a works at Clitheroe. These industrial activities are all linked to the creation of jobs in the rural communities along the line, as well as providing a sustainable alternative to HGV trips in an area where many roads are unsuitable for heavy vehicles. Freight traffic on this route consequently helps to justify the retention of a route which serves a sparse population and has many historic tunnels, viaducts and earthworks to maintain. Looking to the future a new link is to be constructed at Horton-in-Ribblesdale linking to a quarry, this will help retain local jobs but move lorries from sensitive roads within a National Park.

Freight and Strategic Investment: Another recent example of a strategic freight intervention which will help promote complementary regional passenger rail services is the upgrading of the Great Northern Great Eastern Joint Line from Peterborough to Doncaster. This has been upgraded for freight traffic involving a complete re-signalling of the route. This allows freight to operate 24 hours per day, and also provides for an increase in line speeds. The rationale for the investment has been to allow the diversion of freight traffic from the East Coast Mainline, allowing more freight and more long distance passenger traffic to operate in parallel. However it also supports regional passenger rail services by securing the long term future of the Joint Line. The ability to increase the operating hours of the route potentially allows for a better passenger service to operate, and will reduce journey times. This benefits three contrasting sectors (long distance passenger, regional passenger, and freight) with a single intervention.

[47] Friends of the Earth, Why travelling by rail is better for the environment, undated

[48] Source: http://www.rfg.org.uk/rail-freight

[49] Freight on Rail website, May 2015

3.26 This growth in freight traffic, and continued growth in the future can of course produce tensions with the development of regional rail services, especially where passenger and freight services compete for scarce capacity. However opportunities also exist. For example a number of routes including the core freight route from East Anglia to the West Midlands have been upgraded in recent years. Infrastructure delivered as part of such schemes can benefit both passenger and freight services by delivering more capacity. Further investment in capacity is important to ensure that growth in the passenger or freight sectors is not constrained by growth in the other sector.

SUMMARY

3.27 It can be seen from the above that the regional rail network makes a strong contribution across the UK economy. In urban areas it supports the development of growing cities, both directly by transporting employees to jobs and indirectly by reducing the congestion for remaining road users. In rural areas the network brings tourists to isolated areas, whilst addressing issues of economic and social exclusion. Finally the network also makes a contribution to helping specific areas of the economy through its own supply chain.

Part B: A Vision for Regional Rail

4 The Opportunities

INTRODUCTION

4.1 So what does the future hold for the UK's regional railways?

4.2 We have shown that regional rail has been booming in the last ten to fifteen years. Although this has been largely unheralded it is fair to say that it has been a major success story of the British railway network. Serving a population of around 40 million people, providing a means of access to around 19.3 million jobs within their catchment area and operating 1,100 train sets, 1,300 stations and carrying around 365 million passengers a year they represent a substantial operation and are a significant economic entity in their own right. Since the millennium, whilst still being seen by many as the poor relation of the passenger rail network, they have seen a massive growth in demand, outstripping growth in other areas of the rail network and providing for a larger share of commuting into our major regional cities. In spite of this the potential of the network has still not been fully recognised and investment still falls short of what is required.

4.3 We have also shown that regional railways are vital for achieving city region growth, and will become more important in delivering economic growth over time. In short they have become a vital cog in the economy, but they could do much more. Aged, cramped and unattractive rolling stock provide the bulk of these services into most urban centres around the country. Investment in infrastructure has lagged behind other parts of the network and this has resulted in inefficiencies in operation and utilisation, leading to unnecessary costs and missed opportunities to grow revenue. Years of under investment and of operating regional railways on a 'do-minimum' basis mean that they are not only costing government more than they need to do year on year but they are also holding back the economic performance of our regions.

4.4 There is a real opportunity to transform the economics of our regional railways, to develop services that are able to actively drive growth and in so doing help to transform the performance of large sectors of the UK economy.

4.5 Our proposition is that with investment in infrastructure and vehicles, regional rail has the potential to perform even better, delivering more benefits, more cost effectively and enabling more people to access the most valuable parts of our economy.

And the timing is right...

4.6 There has not been a moment since the major re-organisation of Britain's railways at the time of privatisation in the mid-1990s when there has been a greater opportunity to develop our regional rail networks. Three dynamics are converging to create these conditions.

4.7 Firstly, there is widespread acknowledgement that investment in supporting economic growth in Britain's regions is fundamental. As we showed in the previous chapter, improved connectivity, including by rail, will be vital in securing the economic benefits that investing in UK regions will generate.

4.8 Secondly, there is real and growing progress towards the devolution of powers and funding decisions to the English regions, including for transport, and specifically rail investment. This follows earlier devolution over the control of transport to Scotland, Wales and London, all of which have enjoyed strong growth and investment in recent years.

4.9 Finally, rail investment has rarely been so clearly at the forefront of UK Government policy. Proposals for investment in a new high speed rail network, encapsulated in plans for HS2, and ideas for HS3 and beyond, provides a once in a generation opportunity to build on the construction of these core high speed routes. There is a very clear opportunity to develop complementary regional rail investment plans

that link our regional cities and towns and take advantage of the openings that emerge from rail capacity released by the high speed network to provide better regional links.

4.10 High speed rail investment is not the only high profile undertaking from government. Acknowledgement from Westminster that the quality of rolling stock on our regional networks is woefully sub-standard, encapsulated in pledges from both the Prime Minister and the Chancellor of the Exchequer to replace ageing 'Pacer' trains, has further enhanced the profile of the need for investment in regional railways.

4.11 Crucially, all three dynamics are linked. Regional economic growth and devolutionary powers go hand-in-hand, and rebalancing the UK economy in support of regional economies is a primary motivation in cross-party support for high speed rail investment.

THE REGIONAL GROWTH AGENDA

4.12 Developing the regions is a core part of UK Government's economic strategy. At the heart of this is the role of cities in driving growth and prosperity. Regional cities, and their hinterlands, are therefore fundamental to the UK's economic future.

4.13 UK Government is therefore increasingly recognising the importance of investing in improved transport, and specifically in rail, to help our city regions grow. In the North of England, government working in partnership with Northern city regions and Local Enterprise Partnerships, and alongside Highways England, Network Rail, and HS2 Ltd has developed its shared aim to transform the northern economy and establish the North as a global powerhouse. This is encapsulated within a transport strategy for the North: The Northern Powerhouse: One Agenda, One Economy, and One North.

4.14 This strategy identifies that a world class transport network must better link the cities and towns in the North, allowing it to function as a single economy and to be stronger than the sum of their parts. Rail is central to developing this world class network.

4.15 The vision for rail services across the North, TransNorth, aims to build upon the investment already committed to the Northern Hub and electrification programmes. Five key aims are to be addressed by this Northern Powerhouse Rail Plan:

- reduction of long journey times for some journeys, especially east-west;
- reduction of unacceptable overcrowding on some rail services;
- improvements to the frequency of some rail services;
- replacement of very poor rolling stock in some parts of the North;
- improvements to some slow and overcrowded north-south links to other parts of the UK.

4.16 In the English Midlands, the Midlands Connect programme, being developed in close collaboration with Local Authorities, Local Enterprise Partnerships and the transport industry (including Network Rail, Highways England, transport operators, and the wider business community), seeks to achieve similar objectives to the Northern Powerhouse across both the East and West Midlands regions.

4.17 Once again, rail is central to the delivery of this vision for maximising the economic contribution of our city regions, and Midlands Connect will 'act as a vehicle for the delivery of emerging proposals for a devolved local rail network in the Midlands'. In part, this is about taking advantage of the opportunities presented by HS2, through providing excellent connectivity across the Midlands to proposed HS2 stations in the area, and in maximising the use of the released capacity on the conventional network. In doing so, Midlands Connect will seek to improve rail journey times between important cities and towns, many of which are often not competitive. For example a comparison of journey times between the relatively well served Birmingham-Coventry connection and east-west links in the area show the latter to be slow (Stoke-Derby) or infrequent (Coventry-Leicester) or both (Birmingham-Nottingham). Tackling congestion on key rail commuter routes is also a priority.

City Centre Growth Since the Recession

Over the last few years the key regional centres have seen a strong return to growth following the financial crisis and recession.

Percentage Increase in Jobs in Selected Cities: 2010-14

City	% Increase in Jobs 2010-14
Leeds	4%
Manchester	10%
Birmingham	8%
Liverpool	4%
Coventry	3%

Source: Centre for Cities Data Tool

4.18 Elsewhere within the English regions significant investment is being made in regional economies through the Local Growth Fund. Rail investment is an important element of this. In the West of England, to complement investment on electrification and new rolling stock of the Great Western line to Bristol by 2018, the Local Enterprise Partnership is investing £53.4m of Local Growth Funding to implement MetroWest. This will deliver half hourly cross-Bristol rail services and include reopening the Portishead and Henbury rail lines linking up major growth areas at Bristol Temple Quarter Enterprise Zone and the Enterprise Areas.

RAIL DEVOLUTION

4.19 The success of pro-devolution advocates in the aftermath of the 2014 Scottish Referendum has set the base for local areas to argue strongly for more powers and control to be devolved to local people.

4.20 Beyond the politics and the rhetoric, there is clear evidence that, in terms of transport at least, devolution works. Research conducted for ***pteg***[50] has shown that where devolution has taken place investment in the rail network also increases, bringing a closer alignment with local and regional priorities. Examples of where a devolved approach to local decision-making on transport is more effective include Transport for London, Scottish Government, Nexus (Tyne & Wear Metro) and Merseytravel.

4.21 Since powers over London's transport network were transferred from Whitehall to the Mayoralty significant investment has given London one of the best bus services in the world, Oyster ticketing, a reinvigorated London Underground, transformation of mainline terminals, the creation of the London Overground, and significant investment in cycling. In Scotland, since responsibility for ScotRail was transferred to the Scottish Executive there have been significantly higher levels of investment in Scotland's rail network including new trains, line re-openings and electrification. Since control was transferred from DfT to Merseytravel (Merseyside PTE) in 2003, there has been a transformation in the performance and passenger satisfaction levels on the Merseyrail Electrics rail network.

[50] Enhancing the PTE Role on Rail in the City Regions (2010)

Long Term Devolution: The Tyne & Wear Metro

The idea of devolving control of rail services is not new. In the North East the Tyne & Wear Metro has been under the direct control of Nexus (the Tyne & Wear PTE) since it was first opened in the 1980s. Devolved control of a number of former heavy rail routes allowed the redevelopment of a number of commuter routes that had been in a spiral of decline. The construction of new links across the river Tyne and under the centre of Newcastle allowed the routes to achieve city centre penetration, and with high frequency services develop a Tram-Train style of network. The network opened in stages from 1980 to 1984 and since then has adapted to changing demands in the area it serves with further extensions, first to Newcastle Airport and then later to Sunderland.

The network carries over 40 million passengers per year, and is the second largest Metro system in the UK behind London Underground. Devolved control of the network has allowed a local focus to remain and plans are being developed for greater expansion of the network to serve more of the Tyne & Wear area, whilst at the present time a £389m Asset Renewal Programme is being implemented.

4.22 Moreover, the success of devolved authorities in delivering locally determined, good value, effective investments in our local transport systems, including in railways, has been a constant across the English City Regions for the best part of half a century. Evidence of this success and the experience and knowledge, built up over nearly half a century that now resides in the PTEs and successor bodies, is encapsulated in a 2013 report for ***pteg***[51].

4.23 Simply in terms of funding, evidence in England shows that public spending per head on transport is considerably higher in devolved London than in the North of England and the West Midlands. A total of £545 is spent on transport for every Londoner (2012/13), more than twice the spending per head on transport in the North and the West Midlands, £265 in the North West, £246 in Yorkshire & Humber, £213 in the North East, and £202 in the West Midlands.

4.24 Devolved powers for decision making and funding local transport have been progressively introduced since 2010. Two waves of City Deals between government and local authorities giving powers to the cities in exchange for taking on the responsibility of creating economic growth in its area were approved in 26 cities and city regions in 2013. Local Growth Deals for 39 Local Enterprise Partnership areas followed in 2014 including plans to invest at least £12 billion in local economies, with over £1 billion of additional deals following in January 2015.

4.25 More significant powers have subsequently been devolved to some of England's largest city regions. Government and leaders of the Greater Manchester Combined Authority signed a devolution agreement on 3 November 2014. The agreement will result in devolving new powers and responsibilities to Greater Manchester, and to the adoption of a directly elected Mayor for the city region. Similar, if less wide ranging, agreements have been signed between government and leaders in the Sheffield City Region and of the West Yorkshire Combined Authority. It is expected that further agreements will follow between government and the North East Combined Authority, the Greater Birmingham Combined Authority, and the Liverpool City Region.

4.26 In the context of understanding that supporting regional growth will benefit the UK as a whole, and that increasing regional autonomy will support this, it can be argued that rail devolution is essential, not a 'nice to have' with the benefits being:

- greater integration of rail services with local transport networks;
- the opportunity for greater local investment in the rail network;

[51] Delivering Successful Local Transport: The City Region Experience, JMP Consultants Ltd for *pteg* 2013

- removal of central control bringing a greater local focus;
- understanding of local circumstances enabling more efficient operations and decision making.

4.27 There is already momentum for devolving rail powers to local areas. Rail North is already working with the Department for Transport, Local Transport Authorities and other bodies to specify and deliver high-quality rail services across the north of England. Rail North has had a role in specifying services in the North of England that will operate from April 2016, and from this date both the new Northern and TransPennine Express franchises will be jointly managed through a formal partnership between Rail North and the Department for Transport. Looking further forward the review of the future of Network Rail presents the opportunity to extent the principles of devolution from train operations to infrastructure[52].

4.28 Devolving powers to fund and manage rail networks locally works, as is illustrated by the Tyne & Wear Metro example above. The potential to devolve more rail funding and management powers across the regional rail network for the benefit of users, and more broadly to benefit local economies across Great Britain is therefore an opportunity whose time is right. The formation of Rail North and West Midlands Rail shows that local authorities, city regions and Combined Authorities can successfully set aside political and geographic differences and work together and take responsibility for planning at a regional, not just a city-regional, level.

HIGH SPEED RAIL AND THE REGIONAL RAIL OPPORTUNITY

4.29 Much of the momentum for investment at the present time builds on the opportunity presented by HS2. Both the Midlands Connect and the Northern Powerhouse strategies emphasise the importance of HS2 as a catalyst for investment in connecting rail services to the high speed network.

4.30 HS2 brings a range of opportunities for regional rail, by:

- releasing rail capacity to support both city region labour markets, and business to business catchments, providing the opportunity for new or higher frequency city and town linkages;
- enabling the spread of benefits from HS2 connectivity to a wider area and link economies not directly served by HS2 into the high speed network;
- providing the catalyst for urban regeneration and renewal around stations.

4.31 The development of a high speed rail network opens up a vast range of opportunities for developing the regional rail network. At the present time there are two main strands to high speed rail proposals. The most developed is the HS2 scheme which will provide high speed north to south links, effectively replacing existing long distance routes for the most strategic links. The second group of proposals (HS3) relate to the development of east to west links in the north, which would complement existing services.

4.32 HS2 is clearly targeted at the services presently operated by the long distance north to south operators such as Virgin Trains and East Midlands Trains. However its benefits would go further than this. The transfer of the very fastest services to the high speed network would release capacity to expand the role of the regional network. Presently the development of many services, especially east to west services that cross the three north to south main lines (West Coast, Midland, East Coast), is limited by the need to plan for long distance high speed services. On the main lines themselves the development of viable, high quality regional links has for many years been limited by the growth of long distance services.

[52] See for example ***pteg*** statement "***pteg*** calls for rail reviews to map onto a devolving Britain", http://www.pteg.net/media-centre/press-releases/pteg-calls-rail-reviews-map-devolving-britain

4.33 The diversion of the fastest services to HS2 will reduce many of the existing constraints on planning services. This will provide the opportunity to develop new services, to speed up existing operations, and potentially to develop the case for opening new stations.

4.34 Network Rail has examined the possibilities for developing services post-HS2, with new regional services including Cambridge to Leeds via the East Coast Main Line; and Birmingham to Manchester via Walsall, Rugeley and Stoke being suggested. These initial suggestions are however only a starting point. The full potential of the possibilities presented by the capacity released through the delivery of HS2 has yet to be realised.

4.35 The HS2 network itself will also form a part of the regional network providing fast direct links from Leeds to Sheffield, the East Midlands, and Birmingham; and from Manchester to Birmingham. This will also help to release capacity on the Cross Country network, as well as helping to increase capacity on the approach to regional centres through the reallocation of capacity.

4.36 The proposed HS3 network could also present considerable opportunities for developing the regional network in the north. The HS3 proposals could reduce journey times on key medium to long distance flows between, for example, Newcastle and Liverpool, while releasing capacity to develop the urban commuter networks in Leeds and Manchester to a much higher standard than presently exists. It will serve to break the present compromise in service planning and development that requires short distance commuting trips to be made on long distance services, to the benefit of neither commuters nor long distance passengers.

4.37 The development of both HS2 and HS3 would bring immense benefits to the regional network. The delivery of high speed networks would be a major step towards providing the conditions to enable tailored services to be developed on regional networks aimed at specific market sectors. This will help regional rail to start to fulfil its potential across Britain.

Urban regeneration

4.38 Research evidence points towards high speed rail investment bringing catalytic effects in terms of urban regeneration and growth around stations. Experience from Rotterdam shows that the new Central Station has acted as an icon for transformation, not only serving to raise real estate values and trigger wider regeneration in the area, but becoming a desirable destination in its own right. For example it is estimated that the development around the station will be in the order of 600,000 sq/m and generate 25,000 jobs[53].

4.39 In the English regions, cities are already planning for the effect of high speed stations. The Birmingham Curzon HS2 Draft Masterplan presents the HS2 as a once in a century opportunity to radically enhance the City's national rail connectivity and accelerate its economic growth potential, and promotes major regeneration and growth opportunities that can provide 14,000 (net) jobs, 600,000m.sq new business space, and 2,000 new homes within the plan area. This is predicted to deliver a £1.3 billion economic uplift for the Birmingham city region.

4.40 In Manchester the delivery of HS2 will bring major regeneration benefits to the region, the city and the area around Manchester Piccadilly. The connectivity associated with the multimodal transport hub will help to bring 4,500 new homes, 625,000m.sq of commercial office space, 100,000m.sq of retail space, 1,000 new hotel rooms, the creation of new high quality public spaces, and new cultural and community use buildings.

[53] ITC Ambitions & Opportunities: Understanding the Spatial Impacts of High Speed Rail

Summary

4.41 At the present time the regional rail network is in a position to make a strong contribution to the regional growth agenda, aided by the devolution agenda which will bring the opportunity to mould the regional network to aid specific local issues. Regional rail is capable of delivering a high capacity network able to serve strong high density city centre locations.

4.42 However to deliver this successfully the issue of capacity and investment needs to be addressed. The opportunity to redistribute capacity presented by investment such as HS2, the need to address existing issues with capacity and crowding and the need to renew the existing fleet, coupled to the huge growth in usage of the regional network in recent years all contribute to presenting a wider opportunity to deliver a transformational investment in the regional network to further increase usage, lower costs, reduce subsidy and stimulate the economy.

4.43 The following chapter sets out what scale of change could be achieved and then in Chapter 6 we look at the economic benefits that such change could bring.

5 A Sustainable Future for Regional Railways

WHERE WE ARE NOW

5.1 Having identified that there is an excellent opportunity to develop the regional rail network to help deliver the regional growth agenda, there is a need to understand how best to realise these opportunities. Our proposition is that that with a clear vision and plan, supported by investment to deliver efficiencies and grow revenues, regional railways can perform this vital role.

5.2 The alternative is more of the same, an underinvested railway that is expensive to run, is already starting to constrain growth and prevents cities from realising their economic potential.

5.3 In this chapter we set out to demonstrate how the network could be improved through a programme of sustained investment which would seek to deliver services that are both more cost effective and attract substantially more passengers, helping to deliver a sustainable future for the railway.

Developing scenarios

5.4 We will do this by presenting some high level scenarios that examine a long term programme of investment and demonstrate the benefits of such an approach. A 30-50 year horizon has been chosen because the long life of many of railways assets means that change does not happen quickly.

5.5 To help us illustrate what would be involved and what could be realised we have benchmarked our proposals against a do-minimum approach, using current projects to explore the impact that we think changes in approach could achieve. We have compared this ***'Business as Usual'*** do-minimum with two different future scenarios for regional railways:

- ***what if we were to replace all existing diesel trains with modern ones?*** This option assumes that there would be no further electrification beyond those schemes which are already committed. However all existing diesel trains would be replaced by new ones as part of a rolling programme to deliver a higher quality network which would also deliver additional capacity.
- ***what if we were to electrify the regional network and replace the trains with modern electric rolling stock?*** This would build on existing electrification programmes, and assumes that almost the whole network would be electrified, to bring a much improved and more cost effective network. It would also bring new rolling stock and a substantial increase in capacity.

5.6 The scenarios have been developed around two options for developing and modernising the rolling stock fleet as the decision to focus on diesel or electric propulsion has an impact on operating costs, but also impacts on capital spending on electrification schemes. However whilst rolling stock is the "public face" of the railway, investment in either scenario would be accompanied by investment in infrastructure to ensure that the modernised fleet is in a position to deliver faster journeys, more frequently and provide more direct links.

5.7 The ***infrastructure investment package*** associated with each scenario includes proposals for line speed, track and junction capacity enhancement:

- major pinch-point alleviation programme;
- double tracking/ four tracking;
- signalling enhancements;
- electrification (electric fleet scenario only).

5.8 These are not either/or scenarios. Nor are we proposing that either of these scenarios would be applied in their entirety across the whole regional network. But they provide a useful way of allowing us to quantify the costs and benefits. We do not pretend to have all the answers, or to have fully quantified all

of the impacts, but we aim to provide enough information to set out what could be achieved and the scale of impact on regional rail operators in order to stimulate and inform future debate

A MORE COST-EFFICIENT RAILWAY?

5.9 This will clearly require investment but the key question is whether regional railways can deliver an improved network helping the economy in a more cost effective way. By investing in regional railways can we make them cheaper and more efficient to operate, more attractive to passengers, and by doing so increase passenger loadings, and increase revenues? In effect is it possible to 'invest to save'?

5.10 We believe it is, and that the scale of the opportunity to significantly reduce operating costs, grow revenues and improve the economics of regional rail is significant.

5.11 The efficiency or cost effectiveness 'gap' that already exists between those parts of the railway that have received investment and those that have not was highlighted in Chapter 2 (summarised here in Table 5.1). Chiltern Railways was used as a comparator as it is a route that contains a mixture of commuter and long distance services, operates a fleet of diesel trains, and has received significant investment in infrastructure over the last 15-20 years, therefore setting an example of what can be achieved.

Table 5.1 Comparison of TOC Costs and Revenues

	Northern	TPE	ATW	ScotRail	Chiltern[54]	All TOCs
Pax Journeys per Employee	18,876	22,213	14,431	17,812	29,231	33,578
Staff Cost as % Pax Income[55]	95%	31%	80%	63%	29%	30%
Revenue per Train km	£5.18	£10.86	£5.02	£7.00	£14.40	£16.06
Operating Cost per train km	£13.30	£14.08	£12.39	£18.50	£15.14	£17.37
Total Operating Cost per vehicle pa[56]	£96,961	£461,988	£216,912	£187,342	£175,879	£101,985
Support per train km	£7.72	£3.79	£6.26	£11.17	£0.00	£2.73

Source: ORR

5.12 For three of the four regional operators presented costs are higher than the national average and in all cases revenue is lower than the national average.

5.13 Understanding these variations provides us with an indication of what could potentially be achieved, even before we consider the potential for further improvements from changes in technologies or changes in operating practices in the future.

[54] Chiltern Railways is presented as a comparator as a TOC which despite operating a 100% diesel fleet and serving a mixture of commuter and long distance trips operates without a subsidy, and manages to achieve revenue and operating cost figures very close to the national average.

[55] Staff Cost as percentage of passenger revenue (i.e. excludes subsidy and other income)

[56] Based on 2012-13 data from ORR

ACHIEVING A STEP-CHANGE FOR REGIONAL RAIL

5.14 There is the opportunity to create a much more attractive, comfortable and cost effective service than is currently on offer. There are many elements to achieving this but four in particular encapsulate some of the opportunities:

- more and better quality rolling stock;
- faster and more frequent services;
- better connectivity between towns and cities, and;
- the infrastructure (track, signalling and stations) to ensure that all of the above combine to provide a reliable and cost effective service.

5.15 The quality and quantity of rolling stock is one of the key determinants of the extent to which regional railways can help facilitate the growth of the city region economies. Improved rolling stock will also assist in better connecting our regional economies and our rural areas and more generally support environmental aims, by enabling growth that isn't reliant on car travel. However improved rolling stock is merely a tool for delivering a better service. Better more capable trains would be used to deliver more direct services, filling missing links between key locations. They would also help reduce journey times on existing services and help increase service frequencies. This would be complemented by infrastructure investment which would improve capacity and allow services to operate faster.

5.16 To look at the benefits of growing the regional network we have developed three scenarios for the development of services.

- Business as Usual
- Step-change 1: Modern Diesel Fleet (and associated infrastructure package)
- Step-change 2: Modern Electric Fleet (and associated infrastructure package)

5.17 A Business as Usual scenario implies an incremental approach to investment with assets largely being replaced on a like for like basis, with only limited further investment in infrastructure schemes beyond those already committed. A Step-change in investment implies significant improvements in the regional network with faster and more frequent services providing capacity that meets the size of the potential market. In such a scenario we have assumed that the full costs and benefits of the investment are phased over a 30 year period, although the benefits of capital investment would last longer.

5.18 To assess the scenarios we have defined two trajectories for demand over the next 30 years, the first looking at Business as Usual the second covering the two Step-change scenarios. This was achieved using standard rail industry demand forecasting methodologies. To assess the "Business as Usual" scenario we have assumed that there are no fundamental changes in the attractiveness of rail services over the next 30 years implying that journey times remain broadly similar to present and all growth would come from background external factors such as changes in the cost of car travel, changes in population and underlying economic growth.

5.19 In contrast the assessment of the "Step-change" approach assumes that the increase in demand from the external factors will also arise but that the significant improvements in the quality of services due to improvements in frequency, journey times and overall connectivity, will have an additional impact on demand[57].

[57] We have modelled this as being the equivalent of a 20% average improvement in the 'generalised cost' of rail travel (a measure of both fare and service quality)

THE BUSINESS AS USUAL SCENARIO

5.20 To understand the potential benefits from doing something more expansive it is helpful to quantify this 'do-minimum' or 'Business as Usual' scenario to provide a baseline.

5.21 There are around 1,100 trains in the regional fleet today and the average age of the fleet is 21 years[58]. Looking to the future, a piecemeal approach to replacing rolling stock might be expected. This would be a largely like-for-like replacement programme which would gradually replace the existing fleet with newer trains bringing an improvement in quality, and as the oldest rolling was replaced, improved reliability and some cost savings. Improved reliability would also facilitate a small increase in capacity and service levels as more trains would be available for operation. The ratio of electric to diesel trains would also increase slightly reflecting the programme of electrification already underway and a likely continuation of the current incremental approach to further electrification. However there would be only limited improvements to the quality of services, as there would be little development of services or reductions in journey times.

Efficiencies within the Rolling Stock Market?

Even within the 'Business as Usual' view of the future of regional railway it is possible there will be alternative structures for the supply of rolling stock that will bring the costs down.

The small number of leasing companies that dominate the market provide a very similar model of leasing. The reality is that there is relatively little risk involved in many of the fleets that are used in regional markets. The trains used are not highly specialised, and can be used elsewhere, but in spite of this there has been very little movement of rolling stock around the country since privatisation.

5.22 To enable us to provide a broad brush quantification of these scenarios a picture of the potential level of service and demand that could arise in them needs to be considered. In order to do this the regional rail market was split into three distance based groups, based on 'typical' trip length:

- under 20 miles - an example of which might be the Cross City Line in Birmingham
- 20 miles – 50 miles - for example trips between Sheffield and Manchester
- 50 miles+ - for example trips between York and Newcastle

5.23 These three groups have each been subdivided by three journey purposes: business, commuting, and other/leisure trips[59].

5.24 The following tables define the inputs to the model for each category. These have been derived from information in the National Travel Survey.

Table 5.2 Current Estimated Demand by Distance & Purpose (million trips per year)

Journey Length	Commute	Business	Other	Total
Under 20 Miles	95.9	22.2	53.1	171.2
20-50 Miles	48.3	21.3	72.5	142.1
50+ Miles	6.1	8.7	36.3	51.1

5.25 For the purposes of the analysis it is assumed that fares would rise in line with the Retail Price Index, and that crowding would worsen as demand increases.

[58] Latest available information for Q4 2013-14

[59] The definition of these categories and the weighting between journey purposes was derived from data available from the 2013 National Travel Survey, the National Rail Passenger Survey (2007), and was validated using Office of Rail and Road statistics.

Table 5.3 Service Level Inputs (Business as Usual)

Journey length	Ave Trip Distance (miles)	Average Journey Time (min)	Trains per Hour
Under 20 Miles	14.5	25	2
20-50 Miles	39.5	50	2
50+ Miles	59	60	1

5.26 The following table shows the estimated increase in trips by 2045 (some 30 years into our 50 year horizon) derived for the Business as Usual scenario. The results were derived using a generalised cost[60] elasticity based approach and are in line with those predicted by Network Rail's Long Term Planning Process.

Table 5.4 Business as Usual Demand Increase 2015 to 2045 (%)

Journey length	Journey Purpose		
	Commute	Business	Other
Under 20 Miles	76%	76%	75%
20-50 Miles	77%	76%	76%
50+ Miles	76%	77%	77%
Overall		76%	

5.27 To complete the quantification for the Business as Usual scenario we have also assumed the following:

- that the average age of the rolling stock in operation would remain the same as it is now (21 years);
- some increase in seating capacity would be delivered through new vehicles having a higher seating capacity and through some new trains having more vehicles in each set than those they replace;
- that rolling stock would continue to be procured in an ad hoc way using the present model, bringing an increase in leasing costs as existing trains are replaced;
- electric stock would represent 40% of the regional fleet (up from 22% now), as a result of the schemes that have been committed over the next five years;
- Network Rail will achieve efficiency savings of 1% per annum over 30 years, bringing a reduction to the fixed track access charges paid by TOCs.

5.28 It is estimated that this would provide for a regional railway with the following capacity, demand, revenue and cost characteristics:

[60] 'Generalised cost is a measure of the time and costs of travel where the time element is converted into an equivalent monetary cost. 'Elasticity' refers to a proportionate change in demand arising from a change in the generalised cost of travel

Figure 5.1 Summary of Now v Business as Usual

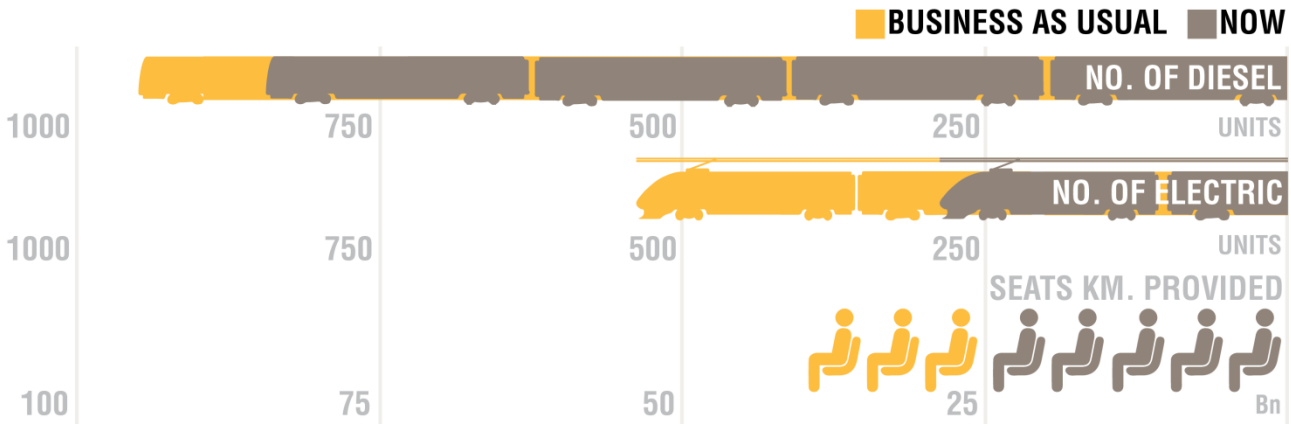


Table 5.5 The Business as Usual Scenario (2045)

Characteristic	Now	Business as Usual	Change
Total Passenger Numbers (m)	365	642	76%
Passenger kms Per Year bn	11	19	73%
Revenue £ bn	1.2	2.1	75%
Number of Diesel Units	842	946	12%
Number of Electric Units	263	527	100%
Seat km Provided pa (bn)	27	38	41%
Annual Operating Costs (Total) (£ bn)	2.7	3.4	26%
Annual Operating Cost (exc Network Rail costs) (£ bn)	1.4	2.0	43%
Revenue as % of Total Costs	44%	63%	19%
Cost per Passenger Km (£)	0.26	0.18	-31%
Grams CO_2 per Passenger km	67	51	-24%

JMP Analysis

5.29 Compared to today we might expect a fleet that is circa 40% bigger but failing to keep up with demand and carries around 76% more passengers, at an average cost of 18 pence per passenger km. Within this scenario revenue does cover a higher percentage of costs, although continuation of the piecemeal approach to rolling stock replacement leading to higher costs dilutes the potential impact. Overall, the Business as Usual scenario does not deliver the full potential of the regional rail network.

STEP-CHANGE 1: A MODERN DIESEL FLEET

5.30 After the fixed track access charge the single largest group of costs for train operators is that of rolling stock. An often stated view is that it is difficult to make a case for replacing existing trains with new trains on the regional network as new trains cost significantly more to lease than the existing trains. This overlooks the reductions in operating costs, the greater fleet utilisation and higher patronage that can be achieved by offering faster more comfortable services.

5.31 The first scenario for a better future for regional railways therefore forsakes this incremental like-for-like replacement of rolling stock and instead sees the replacement of the diesel fleet with state of the art units that would be faster, longer, more reliable and more comfortable. The size of the fleet reflects a policy of accommodating growth into our regional cities and the further growth in demand from the release of suppressed demand that results from a higher quality product.

5.32 A proportion of the fleet remains electric (as per the Business as Usual base case) reflecting the likelihood that where electric power is already supplied an electric fleet will continue to operate under it. It is assumed that all electrification committed at the present time will still take place.

5.33 A rolling programme of construction of new trains will cause leasing costs to fall as significant efficiencies will be obtained from long production runs of standards trains. Examples of this can be seen for orders in the South East, for example an order for 116 Class 387 vehicles was valued at £180m (£1.551m per vehicle), however an optional order of a further 140 vehicles brought the total value of the order to £385m (£1.503m per vehicle), a reduction of 3%[61]. An even stronger example is that of the order for new trains to operate the upgraded Thameslink route, where an order for 1,129 vehicles, was valued at £1.6bn, around £1.403m per vehicle a reduction of 10% compared to the order for 116 vehicles above[62].

5.34 The new trains form a mixed fleet consisting of three broad types that are fit for purpose for the markets they serve;

- *regional express* trains with high levels of performance (speed, acceleration and deceleration), all passengers seated and a high level of comfort and amenity provided as part of the specification;
- *urban commuter* trains having a high density layout with provision for some degree of standing for short periods at peak times; these trains would also have good acceleration to ensure they can perform well on services where stations are close together;
- *rural* trains with lower densities, performance appropriate for the routes served and an expectation of 100% seating.

5.35 This scenario is expected to deliver:

- increased demand from operating more attractive trains and services;
- higher load factors (passengers per seat km);
- higher revenues per train km (as a result of the quality improvements attracting more passengers);
- lower average operating costs through a reduction in both fuel and leasing costs;
- greater reliability and higher speeds/ faster acceleration meaning fewer like-for like vehicles required;
- lower emissions.

5.36 Replacing the diesel fleet with higher quality rolling stock will deliver more passengers than a Business as Usual scenario as suppressed demand is released and new passengers are attracted by the improved facilities and ambience of the stock.

A Change in Connectivity:

5.37 In this scenario it would be possible to provide more capacity to accommodate commuting growth into city centres and also to provide more trains to improve connectivity between centres.

[61] Source: Press release on Southern Website: http://www.southernrailway.com/southern/news/bombardier-to-manufacture-116-new-train-carriages-for-thameslink-rolling-stock-cascade

[62] Source: Railway Gazette: http://www.railwaygazette.com/news/passenger/single-view/view/dft-confirms-thameslink-rolling-stock-order.html

Better Connectivity

Additional rolling stock can be used to increase capacity into existing centres but also to improve connections between centres. A good example of this is providing direct links between cities that lack direct services such as the example below of services between Sheffield and Bradford. A direct service will remove an interchange, which as well as extending total journey times, acts as a deterrent to many passengers due to the increased inconvenience and the additional risk to a reliable journey that connections present.

Alternatives include improving existing connections - reducing journey times, or achieving a Step-change in frequencies. In doing so this brings better connectivity and enhances cost effectiveness by increasing revenues and releasing suppressed demand as longer distance express services become faster, whilst urban services provide the capacity to meet commuting needs more closely. Delivering such improvements need more than just changes to rolling stock but also changes to the infrastructure to speed journeys up and increase capacity. Such measures will support the performance of city region economies and particularly the connectivity between economies.

Devolution of powers for determining regional rail provision will be an important determinant of success of such local connectivity enhancements. Decisions on how best to improve connectivity between neighbouring or linked economies are best taken locally at the appropriate economic functional area. Local control allows for these options to be assessed and evaluated based on an understanding of the local links and how the economies work and interact with each other.

The example below is of a key missing regional link, in this case Bradford – Sheffield, but many similar examples exist. Both Bradford and Sheffield have populations in excess of 500,000 and collectively have around 0.5M jobs, a major part of the Yorkshire economy.

	Now	Future
Journey Time (min)	77	55
Trains per hour	2	2
Interchange	1	0
Average Speed (mph)	35	50
Quality of Trains	Low	High
Potential: Demand/Revenue Impact	-	153% Increase (Demand and Revenue)[63]

The scope for improvement is considerable. The present journey from Bradford to Sheffield involves an interchange at Leeds, bringing the average speed down to 35mph. By removing the interchange and modestly improving the average speed a sub-one hour journey can be achieved. This is estimated to increase the demand for the link by 153% relative to the present service, and making journey times competitive with the private car.

Such a service would help link two of the major centres of Yorkshire improving the economies of both and helping to contribute to the vision of the Northern Powerhouse. Such improvements are possible across the regional network, with more services able to fill more missing links in the network.

5.38 Quantification of the demand increases that could be expected from this first Step-change scenario begins with the assumed service levels for each of our three 'typical' trip lengths.

Table 5.6 Service Level Inputs (Step-change Scenario 1: All Diesel Fleet)

Journey Length	Ave Trip Distance (miles)	Average Journey Time (min)	Trains per Hour
Under 20 Miles	14.5	17	4
20-50 Miles	39.5	32	3
50+ Miles	59	35	2

5.39 Table 5.7 shows that a Step-change in service quality will bring a large uplift in demand across all sectors with the 50+ miles sector seeing the greatest increase. This would make significant inroads into the subsidy requirements of the regional rail network, with average costs per passenger falling and

[63] Demand and revenue change calculated using principles set out in ATOC Passenger Demand Forecasting Handbook

infrastructure utilisation rising considerably, as longer and more frequent services are operated. For comparison the average increase in demand in the Business as Usual scenario was 76%.

Table 5.7 Modern Diesel Fleet Patronage Increase 2015 to 2045 (%)

	Step-change Demand Scenario		
	Commute	Business	Other
Under 20 Miles	194%	182%	156%
20-50 Miles	209%	197%	171%
50+ Miles	224%	212%	193%
Overall		186%	

5.40 This scenario if applied to the whole network would require a net increase of 3,847 vehicles compared to the Business as Usual scenario, around a doubling of the total fleet size. Many of these vehicles would be used to increase the length of existing services with average train length increasing from the present average of 2.3 vehicles to 4 vehicles, whilst around 1400 vehicles would need to be built to allow the number of services to increase.

5.41 The benefits of these new trains will be spread further as infrastructure investment would allow services to operate faster improving utilisation of the fleet, whilst the removal of bottlenecks would allow more efficient timetables to be planned. In combination this would improve connectivity, reduce journey times and increase frequencies.

5.42 The new trains will have better acceleration and deceleration characteristics and be more reliable than older vehicles. They will also have lower operating costs and leasing costs, estimated to be around 10%-15% cheaper overall than existing fleets.

5.43 The reduction in total leasing costs is a result of more effective procurement and the development of a rolling programme of rolling stock renewal. Using a small number of standard train types across the country, allows manufacturers to develop efficiencies rather than the present piecemeal approach with orders for small numbers of trains. Additionally, more reliable trains would deliver a higher level of availability, meaning that fewer trains are needed to operate a given level of service.

5.44 It is also assumed that over this 30 year period Network Rail will be able to achieve efficiency savings of around 2.5% per annum a higher figure than achieved in the business annual scenario but representing the results of the associated infrastructure investment which would reduce the costs of infrastructure operations (an example of the 'invest to save' policy).

Figure 5.2 Business as Usual v Modern Diesel Fleet

Table 5.8 All New Diesel Fleet Scenario

Characteristic	Business as Usual	All New Diesel Fleet	Change
Passenger Numbers (m)	642	1,044	63%
Passenger kms Per Year bn	19	31	63%
Revenue £ bn	2.1	3.5	67%
Number of Diesel Units	946	1,130	20%
Number of Electric Units	527	754	43%
Seat Km Provided pa (bn)	38	77	102%
Annual Operating Costs (Total) (£ bn)	3.4	4.0	18%
Annual Operating Cost (exc Network Rail costs) (£ bn)	2.0	3.0	50%
Revenue as % of Total Costs	63%	86%	23%
Cost per Passenger km (£)	0.18	0.13	-28%
Grams CO_2 per Passenger km	51	38	-25%

5.45 Compared to 'Business as Usual' the Modern Diesel Fleet scenario would see a fleet containing twice as many vehicles offering an overall doubling in passenger capacity, as the trains operated would be longer, carrying around 63% more passengers, at an average cost of 13 pence per passenger km. This would be 28% cheaper per passenger km than Business as Usual and 50% cheaper than today. It would also offer a significant improvement in efficiency and a major uplift in the outputs of the regional railway with significantly better connectivity across the regional network.

STEP-CHANGE 2: A MODERN ALL-ELECTRIC FLEET

5.46 Scenario 2 takes this idea a little further and considers what would be the impact if the regional network were to be electrified and the regional fleet replaced with a new electric fleet. In such a scenario the diesel fleet would be replaced as routes were electrified, providing a rolling programme of rolling stock renewal, whilst existing electric fleets would be replaced as they became life expired, again as part of the rolling fleet renewal programme. All but the most rural routes, served by very infrequent services would be electrified, although even here electrification might be justified if freight traffic could justify the investment.

5.47 An all-electric fleet would be expected to bring additional benefits over the Business as Usual scenario through:

- improved acceleration/deceleration;
- lower operating costs;
- higher reliability, and;
- lower emissions

5.48 Electric trains do not carry heavy diesel engines, nor do they carry their own fuel. As a result, electric trains are lighter and more efficient than their diesel counterparts. With fewer moving parts compared to a diesel engine they exhibit greater reliability, allowing mores services to be operated with fewer trains. Significantly less fuel weight means there is a reduction of wear and tear on lines. They are also quicker, quieter and cleaner - producing 20%-30% less carbon dioxide. Rather than contributing to local air quality problems in city centres the energy for electric trains is sourced elsewhere and can potentially come from green sources.

Electric trains: Cost effective and environmentally friendly

When comparing electric and diesel trains, cost comparisons are inevitable. According to Network Rail, it costs approximately 60p per vehicle mile to maintain a diesel train while electric train maintenance comes in at just 40p.
Energy costs for diesel trains are equivalent to 47p per mile in comparison to 26p for electric, and electric trains are also cheaper when taking track wear into account, beating diesel's 9.8p costs at 8.5p per mile.
Taking these cost comparisons into account, diesel trains cost approximately £1.17 per mile to run, whereas electric trains cost just under £0.75; equivalent to a saving of £0.42 per vehicle mile.

Source: Network Rail: Network RUS: Passenger Rolling Stock (2011)

5.49 This combination of attributes means that the Modern Electric fleet scenario would bring further benefits to both passengers and tax payers over the Modern Diesel fleet scenario. The acceleration and reliability advantages mean that fewer vehicles will be required to run the same level of service, and will have lower operating costs and incur lower infrastructure maintenance charges. The example below demonstrates this with a doubling of mileage delivered with only 80% more trains. In addition the service increase and improved quality would increase passenger numbers and generate wider economic benefits. More generally this could apply across the whole network delivering improved services without a proportional increase in the number of trains required.

Example: Improved Cost Efficiency from electrification

Below is an example of the benefits of electrification of a hypothetical route of around 30 miles in length. The table sets out the costs and benefits of the scheme over a 30 year period. Typical examples of such a link might be Leeds – Harrogate – York or Stratford-upon-Avon to Birmingham.

Electrification would be accompanied by a doubling of service frequency, supported in part by the reduction in operating costs from conversion from diesel to electric operation. The assumptions have been taken from a range of business cases looking at similar issues.

	Diesel	Electric
Train Miles m.pa	0.541	1.082
No. Trains Sets Needed	5	9
Electrification Capital Cost £m	-	90
Journey Time Saving (60 year £m)	-	500
Total Costs (NPV £m 60 years)		150
Total Benefits (NPV £m 60 years)		550
Benefit Cost Ratio		3.6

Electrification would bring a substantial reduction in operating costs. This needs to be offset against the costs of electrification but such a benefit could be used to either deliver an improved service for the same cost as the existing service, stimulating further demand and revenue growth, or alternatively could reduce the level of operating subsidy needed.

5.50 Looking at the regional network as a whole and applying these efficiency savings to provide a fleet of similar size to that in the all diesel scenario, but with some minor lines remaining diesel operated, would imply a railway where 95% of trains would be electric. There would also be a small reduction in the fleet size based on improved availability relative to diesels. In terms of TOC operating costs this would represent a saving of 40% per passenger km, falling from £0.18 per passenger km to £0.11 per passenger km compared to the Business as Usual scenario.

5.51 Inclusive of Network Rail costs ***this would potentially deliver a subsidy free railway***, (compared to a subsidy of 14% of total costs under the Modern Diesel fleet or 37% under the Business as Usual scenario). This would be a huge turnaround for a sector of the railway, which for good policy reasons, has required subsidy for many decades.

Figure 5.3 Business as Usual v Modern Electric Fleet

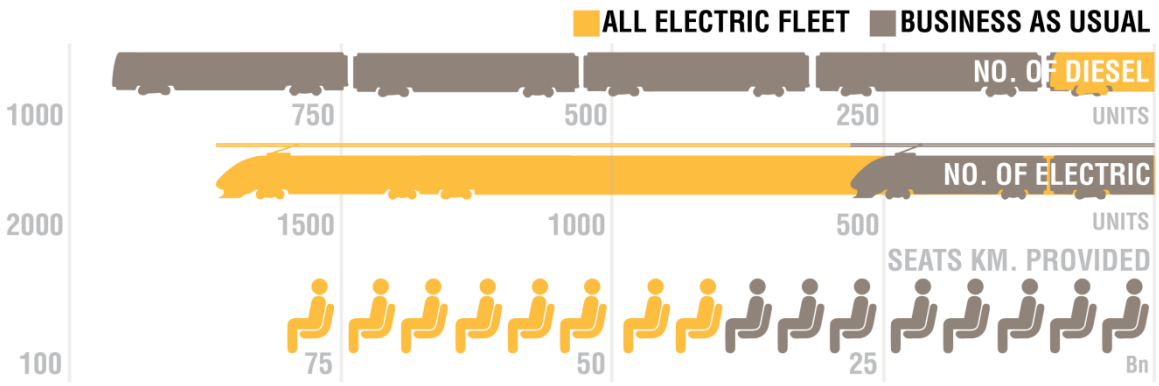


Table 5.9 Modern Electric Fleet Scenario

Characteristic	Business as Usual	New All-Electric Fleet	Change
Passenger Numbers (m)	642	1,044	73%
Passenger kms Per Year bn	19	31	63%
Revenue £ bn	2.1	3.5	66%
Number of Diesel Units	946	89	-90%
Number of Electric Units	527	1,700	222%
Seat km Provided pa (bn)	38	77	102%
Annual Operating Costs (Total) (£ bn)	3.4	3.5	3%
Annual Operating Cost (exc Network Rail costs) (£ bn)	2.0	2.5	25%
Revenue as % of Total Costs	63%	99%	36%
Cost per Passenger km (£)	0.18	0.11	39%
Grams CO_2 per Passenger km	51	33	-35%

5.52 Like the Modern Diesel fleet option, the Modern Electric fleet scenario delivers a major increase in patronage, and provides a significant boost to connectivity. However the use of an almost entirely electric fleet would bring massive improvements to the efficiency of the operation. An increase in demand of 62% above the Business as Usual scenario can be delivered for a 25% increase in train operating costs, with the cost per passenger km falling by around 40%. It can also be seen that the green credentials of rail would be improved with a reduction in emission per passenger km of around 35%. The increase in seat kilometres provided would also make large inroads into overcrowding issues and provide ongoing room for growth.

Summary of Operating Efficiencies from the Scenarios

5.53 Bringing the future scenarios together, Table 5.10 shows that investing in more and better rolling stock and infrastructure could enable the UK's regional railways to carry 679 million more passengers than they do today (+186%) and the associated infrastructure at a cost of £0.11 per passenger km (a reduction of over 54% on today's costs).

Table 5.10 Summary of Cost Savings

	Current	Future Scenarios		
	Now	Business as Usual	Scenario 1 Modern Diesel	Scenario 2 Modern Electric
Passenger Numbers per annum (m)	365	642	1,044	1,044
Annual Operating Costs bn (inc NR)	£2.75	£3.43	£4.08	£3.52
Cost per Passenger km	£0.26	£0.18	£0.13	£0.11

INVESTMENT REQUIRED TO DELIVER A MORE COST EFFECTIVE SERVICE

5.54 These benefits will come at a cost both in terms of the investment in rolling stock (captured in the leasing cost component of the operating costs) and in terms of capital infrastructure investment to deliver them. However as we have shown a targeted plan to develop services and significantly increase usage has the potential to improve the overall efficiency of the network in the long run. As we saw in Chapter 2 many infrastructure costs are fixed, therefore as service densities increase and usage increases the proportion of fixed costs covered by income from services will generally increase.

5.55 Investment in infrastructure is vital if the full benefits of a modernised regional network are to be realised, whilst the trains themselves are the "public face" of the railway it is the associated investment in infrastructure such as track capacity, signalling and line speeds that deliver improvements in connectivity, frequency enhancements and journey times reductions, which will drive demand growth and provide scope to reduce costs.

5.56 So what are the necessary infrastructure investments to facilitate the two scenarios?

5.57 To support city region economic growth there is a need to eliminate bottlenecks in a number of the major city commuter networks. More generally if our regional economies are to be better connected we need to facilitate the deployment of trains and service levels that are suited to the needs of the journey. Greater infrastructure capacity is needed to allow long distance services to play a strategic role leaving urban services to deal with shorter trips. It is also needed to eliminate ongoing conflicts that exist in the planning of services where regional services have been eroded to provide capacity for long distance services, or where regional services are operated less efficiently than previously due to capacity shortages where long distance services are prioritised.

5.58 There is also a need to provide capacity for more cross city operations, improving efficiency of operation by removing the need to turn services around at busy stations, and at the same time increasing connectivity through cities and across regions.

What might be required?

5.59 In order to help quantify the investment requirements of our two future scenarios we have assumed that there will be a series of requirements;

- major pinch point alleviation;
- extra track capacity (double tracking single line sections and quadrupling double track sections);
- electrification infrastructure – overhead lines and other facilitating works (Scenario 2 only);
- local minor works to enable more efficient operation of local services.

Major Pinch Point Alleviation:

5.60 It is assumed that there will be a need for ten major schemes equivalent to the recent £850m Reading Station re-modelling project[64] or the Northern hub project £600m[65]. This would imply spending of around £7bn over a thirty year period from 2020 - or looked at another way, a spend of £233m pa. Such investment would deliver benefits to long distance and freight operators as well as regional operators.

Example: Key regional pinch point scheme

This is an example of a hypothetical major pinch point scheme for Sheffield:

The scheme will deliver:

- extra track capacity from north and south
- remodelled station approaches to provide more efficient operation
- realigned platforms to accommodate more and longer trains
- existing service operated: ~10 regional arrivals in the morning peak hour
- scope to lengthen typical peak train formations from 4 to 8 vehicles
- scope to operate 50% more train paths for regional services
- result = 200% increase in peak time capacity for regional services

Double tracking/ four tracking:

5.61 We have assumed that there will be a need to double or four track around 20% (1,800km) of the regional network. At a typical cost of £2m per km (Source: Cotswold Line Redoubling) this would cost £3.6bn to deliver, or £120m per year over the thirty year period from 2020. It is expected that much of the four tracking would largely occur in areas which were previously four tracked and then rationalised, but that there would be a need for some entirely new four tracking in some areas.

Electrification:

5.62 To complete electrification of the regional network would require the electrification of a further 8,000 route kms. Whilst costs vary depending on the complexity of the route a typical cost of around £1.55m per route km[66] would indicate a total cost of around £12.4bn over the period, or £413m per annum, although the development of a rolling programme might allow the costs per km to fall over time.

5.63 The above assumes that the all-electric scenario described above is progressed; clearly the cost would be lower if the all diesel scenario was adopted.

Signalling:

5.64 Investment in signalling systems across the regional network has for many years lagged behind other sectors. Many routes are still controlled by signal boxes using equipment and procedures that date from the nineteenth century. This can impact on both costs and operational flexibility. Network Rail have in place a committed programme of re-signalling works over the next twenty years which will centralise control and reduce costs significantly, however the programme of re-signalling does not prioritise the

[64] The Reading Station project has involved the rebuilding and enlargement of Reading Station, along with significant investment in capacity on the station approaches including grade separation of routes.

[65] The Northern Hub project involves a substantial investment in infrastructure across the north but focussed on Manchester, an includes the development of a new chord line to greatly increase capacity and link Piccadilly and Victoria stations in Manchester

[66] This is based on estimated costs for electrification of the Leeds – Harrogate – York route including overhead equipment, power supplies and structures work but excluding signalling and track works

routes where signalling represents a higher proportion of operating costs due to a high density of signal boxes. Whilst a number of routes are programmed for re-signalling before 2020 there are significant sections of route that will not be re-signalled until 2025 or later.

5.65 Whilst a major re-signalling programme is already committed and can help to deliver other objectives in this report, a reprogramming of planned works to bring forward renewal on expensive to operate regional routes would help support an invest to save agenda. It will also be important to ensure that in carrying out these re-signalling works the opportunity is taken to enhance capacity rather than locking in existing capacity issues for another generation.

Local Minor Works:

5.66 Around 300 small scale local schemes (broadly a scheme every 15 miles across the regional network) will be needed (for example the doubling tracking of a single-track junction lead to remove a constraint on the operation of a regional service). At an assumed cost of £10m per scheme this would require a budget of £3bn over 30 years or £100m per year.

5.67 Such minor issues often cause major constraints to planning services. A single-track junction can limit the frequency of services on the branch route, limiting the supply of services and in turn not providing a service that meets demand. Additionally such constraints can impact on the planning of services on the mainline as well as the branch, further limiting capacity.

SUMMARY OF THE FINANCIAL IMPACTS

5.68 This chapter has set out to demonstrate the potential for developing a regional rail network with a sustainable long term future that seeks to reduce costs and increase usage, building on the substantial growth that has already taken place over the last 10 years. This would deliver a network capable of coping with high growth rates, would be cheaper to operate and deliver faster journeys and improved connectivity. The scenarios that are presented should be seen as an approach to identifying the potential of sustained investment rather than continuing to invest in a piecemeal way, and also to illustrate what the benefits of this sustained investment might be.

5.69 The cost and revenue implications of each of the scenarios are presented in table 5.11. The benefits of the investments would continue for many years beyond this 30 year programme of investment. It can be seen in both of the Step-change scenarios the increase in revenue is much larger than the change in operating costs associated with improved services. The Modern Electric fleet scenario in particular delivers a large increase in revenue for a relatively small increase in operating costs, showing the inherent benefits of electrification. This does however require an upfront investment in electrification.

5.70 The infrastructure schemes that come with the Step-change scenarios will bring benefits for many decades to come. Whilst typical economic appraisal looks over a period of sixty years many of the larger investments could have a life of over 100 years.

Table 5.11 Investment, operating costs and revenues at 2015 prices

Net Costs £ bn pa	Business as Usual	Scenario 1 Modern Diesel	Scenario 2 Modern Electric
Investment costs[67] £bn	-	£1.5	£1.93
Operating Costs (Relative to Now) £bn	£0.7	£1.3	£0.8
Revenue at completion of programme (Relative to Now) £bn	£0.9	£2.3	£2.3
Revenue minus Operating Costs £bn	£0.2	£1.0	£1.5

Source: JMP

5.71 The scenarios feature a rolling programme of investment, with clear objectives over a sustained period, to revolutionise the regional rail network and deliver an exciting and transformational change to the network in the future. By reducing costs and increasing passenger numbers, subsidy requirements would be slashed both in real and absolute terms, with the possibility of the network being self-supporting. The benefits of such capital investment would continue long after the investment in infrastructure and rolling stock are complete, whilst bringing substantial social, economic and environmental advantages.

[67] Investment costs are relative to the Business as Usual scenario which assumes only existing committed schemes are delivered

6 Valuing an Enhanced Regional Railway

6.1 So what might these scenarios deliver to the wider economy?

6.2 To understand the potential future value of regional rail we have to look at more than just the financial aspects of their operation, and look at the wider benefits that such investment could bring. To provide a quantification of this we have developed an assessment that builds on previous work carried out by ***pteg***[68]. The results demonstrate that the regional network could deliver around £10.5bn of additional economic benefits (relative to our Business as Usual scenario) to users, non-users and the supply chain each year. The remainder of the chapter will set out our approach to calculating these benefits and where they lie.

APPROACH TO ESTIMATING ECONOMIC BENEFITS

6.3 The regional rail network provides a wide range of services, operating over a very large area and linking diverse economies. Using a series of assumptions and transport appraisal guidance, which will be explained through this chapter, it is possible to develop a high-level understanding of the impact on the economy as a whole of an enhanced regional rail network.

6.4 To look at the benefits of growing the regional network we have continued with the different scenarios for the development of services, used and described in more detail in Chapter 5:

- Business as Usual;
- A Step-change[69].

6.5 In measuring the benefits it is assumed that the investment is delivered at a linear rate between 2015 and 2045, representing a long period of sustained investment. It has been assumed that reductions in subsidy achieved through the programme of investment will be used to fund capital works to complete the programme.

6.6 To identify the benefits we have followed the principles in DfT Webtag guidance, including those relating to User Impacts, Non-User Impacts, and Wider Impacts.

THE POTENTIAL SCALE OF BENEFITS

6.7 There is a core group of economic benefits that arise from an improved and larger regional rail network. These include the impacts on GDP of the growth of denser and more productive urban economies, benefits to rail users and to wider society in the form of non-users, and from employment in the rail industry and its supply chain.

Economic Benefits to Regional Rail Users

6.8 Any user of a rail service derives some economic benefit from doing so relative to the alternative option, whether this is travelling by another mode – car or bus for example - or forgoing the journey altogether. User benefits can be estimated for the Step-change in service relative to the Business as Usual service.

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[68] ***pteg*** The Economic Value of Rail in the North of England. July 2014

[69] In order to simplify the quantification of the wider economic benefits that would be derived for the Step-change we have assumed that they would be broadly similar for either the All New Diesel or the All Electric Fleet scenario

When assessing the scale of this benefit we assume that on average new users do not receive the same level of benefit from an improvement as current users of the service do. The standard approach in transport economics is to assume that on average they enjoy half the benefit[70] of a service improvement that existing users enjoy[71].

6.9 Assuming that the introduction of a Step-change in service was phased over 30 years it is estimated that by 2045 user benefits of around £5.5bn per annum (at today's prices) will accrue in addition to the growth resulting from the Business as Usual situation. This benefit is achieved through reduced journey times and improved frequencies. In many cases, especially for longer journeys this will mean the total removal of interchanges which represent a large component of the time cost of many journeys, as a result of the introduction of more direct services.

Table 6.1 "Step-change" User Benefits per annum (£m) at 2015 prices for Existing Users

Journey Length	Commute	Business	Other	Total
Under 20 Miles	£1,091	£248	£246	£1,585
20-50 Miles	£575	£377	£554	£1,506
50+ Miles	£121	£182	£345	£648
Total	**£1,787**	**£807**	**£1,145**	**£3,739**

Source: JMP Analysis

Table 6.2 "Step-change" User Benefits per annum (£m) at 2015 prices for New Users

Journey Length	Commute	Business	Other	Total
Under 20 Miles	£366	£124	£123	£613
20-50 Miles	£288	£189	£277	£754
50+ Miles	£61	£115	£285	£461
Total	**£715**	**£428**	**£685**	**£1,828**

Source: JMP Analysis

6.10 The scale of these user benefits per annum are large compared to the capital costs of around £2bn pa associated with the investment. The benefits would be spread across the network, and although all areas would receive some benefits it is likely that the most concentrated benefits would be in the areas that received the most intensive and transformational investment, typically links between major cities and the local network surrounding key cities.

GDP Impacts – Supporting Increased Productivity

6.11 One of the primary functions of the regional rail network is to provide services for commuters travelling to and from work - the vast majority of these being into the main regional cities. The regional rail network has facilitated positive structural change in local economies as traditional industries have declined and the number of jobs in knowledge intensive sectors has grown in city centres. The regional network also has a critical role to play in facilitating city centre to city centre business travel.

6.12 It is possible to provide an estimate of the GDP benefits of a Step-change in service levels. To achieve this, the principles set out in DfT guidance on assessing the Wider Impacts of Transport Improvements have been applied, specifically those relating to Agglomeration Benefits, Imperfectly Competitive

[70] The rule of a half is a recognition that users transferring from one mode to another will have had differing journey times and costs to existing users of the mode. Therefore rather than them receiving the full benefit of the change in service they are assumed to on average receive half the benefit.

[71] Arguably as services are improved as a result of reduced journey times or improved frequencies the user benefits will actually increase over time, both to existing users and new users. Indeed there is potential for even greater benefits as a result of greater levels of mode shift from road to rail over time.

Markets and Labour Market changes. These are separate to the user benefits described above and relate specifically to the benefits to the UK economy from an improved regional rail network.

6.13 To assess the benefits, assumptions have been made about the number of jobs in economies served by the regional rail network[72] and the change in transport costs resulting from the proposed Step-change in service levels described in Chapter 5. This approximates to a reduction in total journey costs of around 20%. The three types of benefit assessed are:

- agglomeration Benefits - the benefits arising from firms being closer to each other, with firms that are closer together generating more economic activity than those which are further apart;
- imperfectly Competitive Markets – this is the effect of consumers valuing an output more than the cost of producing the output, for example better rail connectivity resulting in the cost of the output falling but the price remains the same;
- labour Market Changes - this relates to the opening up of labour markets by providing workers with greater access to a wider range of jobs and providing companies with a greater pool of labour to choose from, helping to create a better match between skills and opportunities.

6.14 The table below sets outs the modelled wider impacts of a Step-change in service levels on the regional network.

Table 6.3 Wider Impacts of Step-change in Service 2045 (GDP £m)

Group	GDP £mpa
Agglomeration Impacts	£2,366
Imperfect Markets	£157
Labour Market Change	£2
Total	**£2,524**

JMP Analysis

6.15 Within this assessment it has been assumed that the present focus on city centre employment remains in place. To provide a conservative assessment it was assumed that the total number of jobs in the economy remained the same. In practice it is likely that both the number and location of jobs will change (with further emphasis on city centres) as services improve, further strengthening the role that regional rail will play. There is potentially significant capacity to deliver this within regional centres. Comparison of city centre job density reveals that the City of London has a jobs density of 1,229 jobs per hectare[73], compared to 467 jobs per hectare in the centre of Birmingham and 310 in Manchester, suggesting that there is room for growth. Even a doubling of densities in regional cities would still fall short of the densities seen in the City of London.

6.16 Developments in local accessibility across city centre areas could make a big difference to the accessibility of central rail stations. Sometimes this can be achieved in quite simple ways, for example at Leeds a southern entrance to the station is being developed which will make access from the growing south side of the city to the station much easier. It is therefore possible that there is substantial scope for increasing jobs densities in the regional cities, for which rail would be able to provide a sustainable means of access.

[72] This is based on information presented in the DfT Wider Economic Impacts dataset for local authorities that are served by the regional rail network.

[73] Data from Nomis web and ONS Neighbourhood Statistics, middle super output areas

Non-User Benefits – The Contribution to the Wider Economy

6.17 Although users of the regional rail network are obvious beneficiaries from enhancements to the level of service, these improvements will also bring a number of often very valuable benefits to wider society (people who do not actually use the rail service). There are a range of non-use benefits that accrue from rail networks including the benefits of decongesting the road network, improving safety and reducing pollution.

Road Decongestion, Safety and Environmental Benefits

6.18 Looking at decongestion, safety and pollution it is possible to estimate the benefits of the Step-change in quality proposed. The approach to estimating these benefits has used DfT Webtag guidance on the external costs of road use[74]. This guidance contains information on the percentage of newly generated trips by rail that would be abstracted from car, as well as valuations for congestion, safety and environmental benefits of removing car trips, from a range of different road types. A national average value of £0.10 per km was chosen to represent the wide variety of trips that are made on the regional rail network. This is likely to underestimate the benefits as a large proportion of the benefits are likely to be in urban areas on the approach to cities where the value of decongestion on the road network is much higher[75].

6.19 Using this approach it was estimated there could be £108m of decongestion benefits per annum as a result of the Step-change in services[76], as the growth in rail travel removes around 1.05bn km from the road network. This would have a secondary positive impact on economic growth as decongested roads would allow other parts of the economy not best served by rail to operate more efficiently.

6.20 The table below presents the net decongestion benefits by service type and journey purpose.

Table 6.4 Road Decongestion, Safety and Environmental Benefits (£m 2045)

Journey Length	Commute	Business	Other	Total
Under 20 Miles	£14.2	£22.3	£4.8	£41.3
20-50 Miles	£2.9	£8.9	£6.2	£18.0
50+ Miles	£5.0	£22.7	£21.6	£54.3
Total	**£22.1**	**£53.9**	**£32.6**	**£108.6**

JMP Analysis

6.21 This represents a very substantial benefit from investment in the regional rail network. It is also likely that this is an underestimate of the potential decongestion benefits as they have been based on national average values. In the case of increased commuting by rail the benefits might be higher as there will be abstraction from roads into city centres which are heavily congested.

Regional Rail Employment and Direct Economic Impact

6.22 Analysis by Oxera[77], reported earlier, identified that the rail industry, including its supply chain, employs around 212,000 people in the UK and has a GVA value of around £9.3bn per annum. Using passenger

[74] Webtag Unit A5.4: Marginal External Costs

[75] To provide context the national average value is 10 pence per km, but for the most congested urban roads this can rise to 204 pence per km

[76] Based on DfT guidance that around 26% of new passengers on the rail network are abstracted from cars

[77] Oxera Consulting (London), What is the contribution of rail to the UK economy? 2014

journeys as a scalar for the regional network as a proportion of the whole rail industry (around 25% of total passenger journeys by rail) this implies around 50,000 jobs[78] and a GVA of around £2.2bn per annum are attributable to the current regional network. If employment were to grow broadly in line with patronage then using our assessment of demand for the Business as Usual and Step-change scenarios it is possible to present an estimate of the likely impact on the supply chain going forward[79]. It is however possible that this is an under estimate of the benefits as the regional sector will represent a much smaller proportion of the supply chain at the present time due to the relative lack of capital investment.

Table 6.5 Supply Chain Impacts 2045 (Additional Jobs)

Scenario	Additional Jobs	Additional GVA (£bn)
Business as Usual	40,000	£1.76
Step-change	93,000	£3.96
Difference	53,000	£2.2

JMP Analysis

Option & Non-Use Values

6.23 Option and non-use values relate to the benefits of rail services that accrue to those people who either do not use the service or do so very infrequently. Specifically option values relate to the valuation held by those who value the option of being able to use a rail service at times when their usual mode is unavailable, for example due to a breakdown or poor weather conditions.

6.24 Within transport scheme appraisal the use of option values has tended to be limited to rural areas, and has been applied in a binary way depending on if a service can provide an opportunity for commuting or not. It is however possible that option values apply across both urban and rural areas and that they vary depending on level of service on offer and if they are relevant to the economic geography of an area.

6.25 ORR research on Rail Passenger Satisfaction (2014) indicates that around 30% of the population never use rail services in the UK, around 12m people in the area served by the regional network. Assuming that all of these held the Option Value for rail services (rather than bus services) of £74[80] that is implied by DfT guidance, then the total Option Value for rail services would be around £888M per annum.

6.26 As the research on which these values are based was conducted in more rural areas, which almost inevitably will not provide as wide a range of accessibility as services in more urban areas, this is arguably a conservative estimate[81].

[78] direct employment by the franchised regional train operators is circa 17,000 – see table 2.1 in Chapter 2

[79] This may be a simplification as it is possible that increasing operating efficiencies will have an impact on the number of jobs created. However this could well be partially offset by the fact that the current regional network may have a higher proportion of the total number of current jobs within the rail industry due to the higher number of operating staff per passenger (from shorter trains for example) and more labour intensive operating practices due to historic underinvestment (more staffed signal boxes on rural routes for example).

[80] See Webtag Unit A4.1 Social Impact Appraisal and Webtag Data Book

[81] It could also argued that as a Step-change in rail services would result in a decline in non-users (as they become users) this estimate is too high, however we would note that for the remaining non users option values may well increase to reflect the higher quality of the service.

High Speed 3: A Special Case?

Within the last two years tentative plans to develop a significantly improved rail links between the six core cities of the north (Manchester, Leeds, Sheffield, Liverpool, Hull and Newcastle) have been developed. Whilst the details of the scheme has yet to be fully developed, indicative headline journey times were identified as part of the HS2 Rebalancing Britain Report. This suggested that, for example Leeds – Manchester journey times should be reduced from 55 minutes to 30 minutes, with a similar absolute reduction in journey times for all other links that cross the Pennines. Clearly this represents a very significant change in the rail network, and would have wide ranging impacts across both the transport system and the economy. Improved connectivity between the largest cities would promote greater economic integration between city regions.

Delivering a significant increase in capacity and a reduction in journey times would provide the scope for addressing many of the issues described in this report. This would include the following:

- significant demand increase for longer distance Trans Pennine services;
- increased capacity to allow better urban commuter services to develop into the main cities;
- potential for abstraction from the strategic road network providing improved journeys for links which rail does not serve well;
- agglomeration benefits between the main cites of the north;
- labour market benefits to the economy from more effectively connected labour markets;
- operation of a more efficient railway that can serve its purpose more effectively helping to deliver more for less.

COST BENEFIT ANALYSIS

6.27 Having looked at both the costs and benefits of investing in the regional rail network a high level cost benefit analysis has been completed to demonstrate the benefits of the Step-change scenarios that have been examined The cost benefit analysis compares the Modern Diesel fleet option and Modern Electric fleet option against the Business as Usual option.

6.28 As described previously the Step-change scenarios represent a concerted programme of investment over a 30 year period which sets out to achieve improvements in efficiency – invest to save – whilst also delivering a substantial uplift in passenger numbers as a result of vastly improved services in terms of journey times, frequency and more direct services between key centres.

6.29 The cost benefit analysis looks at the discounted benefits over a sixty year period, in line with DfT appraisal guidance. In many respects this will be an underestimate of the potential long term benefits of the investment as the major capital investments in infrastructure might be expected to deliver benefits over an extended period.

6.30 The discounted costs presented are the combined capital costs of the investment programme and the additional operating costs associated with leasing and operating a much enlarged fleet delivering a large uplift in train km. The discounted benefits presented include additional revenue generated by new passengers, as well as the transport and wider economic benefits associated with the investment that have been described in this chapter. It has been assumed that during the investment programme the benefits of the programme are phased in proportion to the spend on the programme.

6.31 The table below sets out the result of the cost benefit analysis comparing the Step-change scenarios with the Business as Usual scenario.

Table 6.6 Cost Benefit Analysis (60 Year Appraisal Discounted to 2010 Prices)

	Modern Diesel Fleet	Modern Electric Fleet
Present Value of Costs £bn	£35.1	£31.3
Present Value of Benefits £bn	£136.46	£136.46
Net Present Value £bn	£101.36	£105.16
Benefit Cost Ratio	3.89	4.36

JMP Analysis

6.32 The results show a very positive case for the sorts of long term and transformational investment programme that have been described. The diesel fleet scenario represents high value for money (a Benefit Cost Ratio in excess of 2.00), with a BCR of 3.89. The electric fleet scenario has a BCR of 4.36 representing very high value for money (a BCR in excess of 4.00). This is a strong result given that these are hypothetical scenarios and as such there has been no prioritisation of options or identification of schemes that would deliver the greatest benefits. The reason that the Modern Electric option delivers an improved case over the diesel option is that although investment costs are higher this is offset in the longer term by significantly reduced operating costs.

6.33 A more detailed assessment might well generate even higher benefits when targeted schemes were identified. Overall there would seem to be the scope for an exciting long term future for the regional rail network.

SUMMARY

6.34 Our analysis would suggest that there are some very substantial benefits from the future development of the regional rail network. The following table summarises the overall benefits, presented as the additional benefit generated by our "Step-change" scenario compared to the "Business as Usual" scenario. Option and Non-Use Values are excluded as we feel that there is arguably more uncertainty over the size of these benefits. The table represents the change between the existing service and a Step-change in service levels.

Table 6.7 Summary of Potential Benefits of Step-change relative to Business as Usual (£m pa 2015 prices)

Group	Benefit (£m pa)
Benefits to Rail Users	5,500
GDP Impacts	2,525
Non User Benefits	108
Rail Industry & Supply Chain Employment	2,200
Total	10,333

JMP Analysis

6.35 These benefits are spread across users, suppliers, users of other modes and the wider economy as a whole, illustrating the diverse benefits that the regional rail network can bring. Averaged across all passengers using the network at the time that the Step-change network is completed the regional rail network would be delivering benefits of around £8 per passenger trip.

6.36 A cost benefit analysis conducted to demonstrate the overall case for investment has shown that either of the Step-change options would represent high value for money. Indeed the Modern Electric fleet scenario would represent very high value for money.

6.37 While these scenarios need to be seen as hypothetical constructs to enable us to illustrate the potential scale of costs and benefits it is clear that substantial investment in the regional rail network has the potential to both deliver on an invest to save regime whilst also delivering a much improved rail network that helps support the growth agenda of regional economies.

Part C: Summary and Recommendations

7 Key Findings and Next Steps

SUMMARY

The Value of Regional Rail

7.1 This report has examined the issues surrounding the present regional rail network in the UK looking at the present services delivered and the contribution that it makes to the UK economy.

7.2 The regional network has grown very strongly over the last ten years with demand growth often outstripping growth on the rail network nationally, which has in itself enjoyed strong growth. However this has been achieved against a background of very limited investment and increasing constraints as capacity has failed to keep up with demand. This lack of investment is now a constraining factor, with the scope for more growth on some corridors being very limited, without significant investment.

7.3 There is now an opportunity, with increased focus on the development of regional economies across the UK through initiatives such as the "Northern Powerhouse", to take advantage of the acknowledged role of rail in supporting economic growth, to deliver the necessary investment to help regional rail fulfil its potential. This report shows that the regional rail network has a key role to play in the development of these regional economies. By increasing capacity and making regional rail services more attractive there is scope to help deliver economic growth by improving access to and between towns and cities, and by helping to decongest the road network.

7.4 Using some theoretical but plausible scenarios we have shown that with a sustained investment programme, the regional rail network could deliver benefits of as much as £10.5bn per annum at current prices. Around 25% of this benefit is through increases in GDP, particularly as a result of agglomeration benefits from bringing cities closer together, and by improving access to labour markets demonstrating the importance of this investment to delivering on the regional growth agenda. Cost benefit analysis shows that this represents very high value for money with every £1 of investment delivering £4.36 of benefits, relative to a Business as Usual scenario if the scenario of fully electrifying the network is pursued.

The Case for Investment

7.5 There is a strong case for investing in the regional network to increase capacity, stimulate demand, and improve efficiency, aside from the wider economic benefits that improved connectivity will bring.

7.6 We have demonstrated that with a concerted long term approach to investment over 30 years it is possible to reduce operating costs significantly, whilst raising demand significantly. This would help move the regional rail network from its present condition which requires a significant level of subsidy, to one where the network is close to breakeven. Given that the regional network runs a diverse range of services, including many socially necessary services in rural areas, this would be a significant achievement.

DELIVERING THE POTENTIAL

7.7 To deliver this brighter future for the regional rail network would require a number of actions to begin the process and identify the priorities for investment. We set out below a series of steps based on the results of this work that would set the foundation for long term investment and renewal of the regional network, which would serve to deliver the potential that has been identified:

- identify routes where journey times or frequency are constraining the further growth of passenger numbers;

- identify links where there is the greatest potential for improvement in connectivity through the development of more direct services;
- develop devolution of control and responsibility further so that cities and regions can deliver solutions and take responsibility for issues that impact on their networks. This applies not just to strategic planning but also to the control of rail franchises;
- develop a coherent programme of rolling stock investment, allowing economies of scale to be achieved and replacing the piecemeal approach to investment in rolling stock which persists, including agreement of mechanisms for delivering the new stock;
- develop a coherent programme of infrastructure investment that addresses the gap analysis described above and seeks to deliver a modernised and sustainable regional rail network.

7.8 There remains much to debate and discuss but what is very clear is the transformational benefit that could be achieved from investment in the regional rail network. Such investment would address the twin issues of improving efficiency and in turn reducing subsidy, whilst simultaneously helping to strengthen and renew the wider economy, and addressing the regional growth agenda. Investment that reduces the need for ongoing revenue subsidy would help to set a sustainable future for the regional rail network. What is needed to achieve this is a sustained programme of investment rather than a piecemeal approach which leaves gaps and does not deliver the full potential.

7.9 The story that we have presented here of regional railway today is one of major success. While largely unheralded it has in fact been booming while doing so it has been delivering significant benefits to the country as a whole. However, many decades of under investment mean that this growth is already being constrained and will soon start to be choked off.

7.10 With appropriate investment our regional railways can perform even better, delivering more value for money and enabling more people to access the most valuable parts of our economy. The opportunity to develop the regional network and transform it from a poor relation into a high quality modern network that supports the areas it serves is now, and it is an opportunity that should be grasped.

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