Long Term Planning Process: Regional Urban Market Study

October 2013

What's inside this document

Foreword

I am pleased to introduce the completed Regional Urban Passenger Market Study, following the Draft for Consultation which was published in April 2013. This Market Study, together with the Long Distance Passenger, London & South East Passenger and Freight Market Studies, set out how demand for passenger and freight movement by rail is expected to change in each of these rail markets in Great Britain over the next 30 years.

The Regional Urban market relates primarily to travel by large numbers of people for commuting or leisure purposes in an area less than 50 miles from a regional centre and this study seeks to understand where rail can exploit its competitive advantages in best serving this market. Despite the recent recession, commuting demand into regional centres continues to grow as a result of modal shift from road to rail. It is anticipated that this growth will continue in the future. This Regional Urban Market Study builds on the work undertaken by Network Rail for the Northern Hub, a series of outputs that are now being implemented which will deliver a step change in connectivity benefits across the North of England. Equally the study takes cognisance of a number of committed electrification schemes across the North of England, around Bristol and in the East and West Midlands that will enable the development of new services using faster electric rolling stock.

The Regional Urban Market Study sets out the strategic goals for the sector before looking at the levels of demand that will need to be accommodated over the medium and long term. Looking at each regional centre in turn, the study articulates how the railway is best placed to deliver 'conditional outputs' that would meet current and potential funders' strategic goals for this market, using the methodology developed for the West Yorkshire example used in the Draft for Consultation. These conditional outputs show how the development of train services can support economic growth, reduce the transport sectors' environmental impact, improve the quality of life for communities and individuals and meet outputs in an affordable way.

The document has been strengthened as a result of the responses to the Draft for Consultation and discussions with The Rail Delivery Group's Planning Oversight Group and the Rail Industry Planning Group. For example further consideration has been given to the conditional outputs relating to HS2, airports and educational establishments and these have been expanded within the document.

This study has been developed jointly with the wider rail industry including passenger and freight operators, Passenger Transport Executives, Local Authorities, Local Enterprise Partnerships, the Department for Transport and Welsh Government. I would like to thank all those parties and those organisations and individuals who have both responded to the Draft for Consultation and contributed to the development of the Regional Urban Market Study.

The next stage is the development of a series of Route Studies, which will develop options to deliver the conditional outputs, across the four markets, in each of Network Rail's devolved routes, and to test them against funders' appraisal criteria. The output will be a series of choices for our funders to consider.

I look forward to continuing to work with the rail industry on the next stage of the Long Term Planning Process.

Paul Plummer

Group Strategy Director

Executive Summary

This Market Study seeks to understand where rail can best exploit its natural competitive advantage in the commuting market and to a lesser extent the leisure market for the overall wellbeing of Great Britain.

The rail industry has changed the way it approaches long term planning. The new 'Long Term Planning Process' (LTPP) is designed to enable the industry to take account, and advantage of long term strategic investment being made in Great Britain's rail network.

This document, the 'Regional Urban Market Study', is one of four Market Studies being published as a key element of the new LTPP. When established, this and the other Market Studies will form a key input to route planning and investment decision making over the next 30 years.

Scope and Context

Increasingly, long term strategic investments are being made in the rail network. These include plans for the development of a high speed line between London, Birmingham, Leeds and Manchester, implementation of modern signalling systems, the Crossrail and Thameslink programmes and electrification of significant parts of the system.

The balance of funders' objectives has changed, both in the light of the tighter fiscal environment brought on by economic uncertainty and as a result of the 'Rail Value for Money Report' (McNulty report), published in May 2011. This has led to an increasing focus on making best use of the rail network, and Governments are seeing an increasing role for rail in supporting economic activity.

The LTPP has been designed to take these changes into account, building on work completed in the preceding Route Utilisation Strategy process, and will enable an informed view to be taken of the role of rail in the economic life of Great Britain. Planning over 30 years clearly involves uncertainties, however, the approach is designed to take into account strategic change in the economy, and Great Britain's approach to social and environmental responsibility, so that the rail industry can respond to change over the long term life of assets used to operate the rail network.

There are three key elements to the LTPP:

- Market Studies. These will articulate strategic goals for each particular market sector, forecast future rail demand, and develop 'conditional outputs'
- Cross-Boundary analysis, which will consider options for services that run across multiple routes
- Route Studies, which will develop options for future services and for development of the rail network.

The LTPP will provide a key part of the evidence base for future investment in the rail network.

Four Market Studies will be published:

- London & South East passenger
- Long Distance passenger
- Regional Urban passenger
- Freight.

It is important to emphasise that each passenger Market Study will consider a particular market, rather than a particular set of train services. Market Studies will have three key outputs:

- identification of the long term strategic goals which define the successful provision of rail services in the three passenger market sectors
- demand forecasts for the sector, over a 10 and 30 year horizon
- 'conditional outputs' for the sector in terms of, for example, frequency, journey time and/or passenger capacity on key flows.

Markets that are relevant for the planning of train services or infrastructure within a single Route Study area, e.g. services operating wholly within Scotland or Wales, will be considered in more detail in the relevant Route Study. The outputs from the Market Studies will be conditional on both affordability and a value for money business case being determined.

The Freight Market Study will produce demand forecasts over a 10 and 30 year planning horizon, with preferred routeing of services and the implied requirements in terms of network capacity and capability.

Further information on the Long Term Planning Process can be found on Network Rail's website at www.networkrail.co.uk.

Regional Urban Passenger Market

The Regional Urban market relates to an area less than 50 miles from a regional centre where people travel in large numbers primarily for the purpose of commuting and leisure. Commuting trips in particular tend to be relatively short distance and a large number of leisure trips are also made over short distances into towns and cities. Whilst business trips are also important they make up a much smaller share of the rail market. Commuting trips in the Regional Urban market account for approximately 63 per cent of all trips made by rail, compared with 28 per cent leisure and 9 per cent business.

This Market Study seeks to understand where rail can best exploit its natural competitive advantage in the commuting market and to a lesser extent the leisure market for the overall wellbeing of Great Britain.

The leisure market includes visiting friends, entertainment, sport, holidays, day trips, shopping and other activities including walking.

As commuting makes up the largest portion of the Regional Urban market, this study seeks to demonstrate the conditions where rail has a competitive advantage in this market.

Study approach

The approach taken to produce this study was threefold:

- a review of the published literature relating to rail industry funders', stakeholders' and passengers' requirements for the Regional Urban passenger market
- an extensive and ongoing dialogue with stakeholders
- primary research into the impact of improvements to rail services on the wellbeing of Great Britain, building on previous work undertaken by the rail industry, Governments, and academic institutions.

The work to produce this study has been overseen by a Working Group comprising train operators, funders and central Governments, the Association of Train Operating Companies and the Office of Rail Regulation (as an observer). The group has supported the development of the strategic goals and has provided support and a review of the work to produce the demand forecasts and conditional outputs.

The Working Group has been aided by a series of smaller locally devolved groups who have provided location specific spatial and economic context for the study.

Strategic Goals

The Regional Urban Market Study identifies the role of this passenger market in achieving the key priorities of current and potential future national and regional funders over the long term. These priorities are the strategic goals that the Regional Urban market should aim to meet over this period. Strategic goals have been developed in collaboration with industry partners, stakeholders and through a review of literature.

The strategic goals are split by the overall goals for transport (in bold) and the subsequent goals for Regional Urban rail (in italics):

- **Enabling economic growth**
  - *by providing sufficient capacity for employers to access the labour pool*
  - *by improving access to workers for businesses.*
  - *by improving connectivity to/from the retail, leisure and tourism sectors of the economy*
- **Reducing carbon and the transport sector's impact on the environment**
  - *by reducing the use of less carbon efficient modes of transport*
  - *by directly reducing the environmental impact of rail.*
- **Improving the quality of life for communities and individuals**
  - *by improving access to employment and training opportunities*
  - *by providing sufficient capacity for workers to access employment*
  - *by connecting communities*
  - *by providing access to social infrastructure such as educational establishments and major leisure venues*
  - *by reducing road congestion.*
- **Improving affordability and value for money for Government and other funders**
  - *by meeting other outputs in an affordable and value for money way*
  - *by directly reducing whole industry subsidy*
  - *by improving the value for money for passengers and taxpayers.*

Long Term Demand Scenarios

Identifying the appropriate role of rail in the context of these long term strategic goals requires extension of Network Rail's current demand projections to a 30-year time horizon as typical major railway infrastructure components, such as track systems, have an asset life of around 30 years. Ten year projections are also required to provide a snapshot of the likely situation at the start of Control Period 6 in 2019, the next rail industry planning period where investment priorities have yet to be established.

A three-stage approach has been used to develop the long term demand projections:

- a review of the factors which influence the demand for travel by rail
- development of four alternative futures for Great Britain's economy and social and environmental planning, to examine how the factors which influence the demand for travel by rail could change
- production of a projected range of future passenger demand based on these four scenarios.

Continued growth in the market for Regional Urban rail travel is dependant on a number of factors, of which the most important are the location of economic activity in towns and large urban areas, maintaining rail's competitive advantage over car, and a return to long term national income growth.

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The maximum potential for growth over the 30-year period considered is higher than experienced over the previous 10-15 years as many, but not all, of the factors which support rail demand growth have occurred at once. Furthermore, it is unlikely that all of the factors which are currently in rail's favour will change materially in the short term, and annual passenger demand growth to 2023 is expected to be similar to the level experienced recently.

Over 30 years, growth in the number of passenger journeys could vary significantly, although the lower end of the range of projections is based on sizeable changes in a number of economic and spatial trends which would take a significant period of time to occur. On this basis the long term projections for the amount of future capacity required is based on the high end of the demand forecast range.

Long term conditional outputs – aspirations for 2043

The requirement to look to the long term has changed the emphasis of industry planning, from consideration of 'what can be achieved given existing constraints', to 'what should be achieved to deliver the desired outcome'.

The conditional outputs for the Regional Urban passenger market are a statement of the long term aspirations for the level of service provided and are required to inform future investment decisions. They are therefore the key deliverable of the Market Study and form the basis for the rest of the LTPP for this market. They are not constrained by considerations of cost and deliverability.

The conditional outputs have been developed using an assessment of how to deliver three of the four strategic goals:

- **enabling economic growth**
- **reducing carbon and the transport sector's impact on the environment**
- **improving the quality of life for communities and individuals.**

An assessment of the fourth goal has not been considered, although supporting commentary is provided where appropriate:

- **improving affordability.**

This goal will be considered in the remainder of the LTPP.

The conditional outputs are therefore conditional on a subsequent favourable assessment of value for money and affordability for current and potential future rail industry funders. They should be viewed as aspirations for the future rather than recommended investment decisions.

It is important to emphasise that improvements to rail services are only one of the conditions required to generate funders' desired outcomes, and the conditional outputs should be viewed as a statement of rail's role in a wider policy context.

It is also important to state that the conditional outputs shown are conditional on both affordability and a value for money business case being made for any interventions that subsequent Route Studies in the LTPP may consider as a way to deliver them. Equally the conditional outputs will need to be deliverable technologically, operationally and physically. Lastly, Regional Urban travel is only one of the markets present on a significant part of the railway in the regions and the nature of a mixed traffic (or market) network means that Route Studies will need to examine the trade offs between potentially differing conditional outputs when considering how they can be accommodated.

The provision of Regional Urban rail services, particularly in the commuter market are very location specific and depend to a large extent on the economic make up of towns and cities. The Regional Urban Market Study Draft for Consultation published on the Network Rail website in April 2013 presented a framework for developing conditional outputs in the Regional Urban rail market using West Yorkshire as a case study.

Since publication of the Draft for Consultation; this framework has been applied to produce conditional outputs across the network (excluding Wales and Scotland and the area covered by the London and South East Market Study). This has been achieved through collaboration with a wide group of stakeholders to provide a balance between consistency of application across different areas and the right level of pertinent local knowledge of issues and market drivers. These conditional outputs are presented in Appendices B – G of this Regional Urban Market Study.

In this context the following conclusions were reached in developing a series of quantitative, service-level, conditional outputs:

Improving transport links for commuters into commercial and employment centres helps to drive economic growth through improved supply of labour to employment. Prospective employees will be willing to commute longer distances to find employment if the generalised cost of travel (perceived cost including ticket price, journey time, station access, parking cost and interchange) is less than the perceived benefit of exploiting the employment opportunities further afield. In general terms most people are willing to commute to their place of employment if the generalised journey time (a measure of the attractiveness of a rail service which takes into account the train journey time, frequency of service and whether the journey requires an interchange) is less than 20 minutes. Unlike commuting into London, very few people are willing to commute into regional urban centres if the generalised journey time is greater than 60 minutes. Improvements to generalised journey times within this 20 – 60 minute range will have a large impact where both the number of people in the population catchment of the origin station and the number of jobs in the catchment of the destination station are high.

Rail has a relatively low environmental impact per passenger mile compared to other modes of transport. Improving rail services for commuters by improving frequency, journey times and the quality of the rail service offer encourages modal shift from road to rail. Improving Regional Urban rail services will have the biggest impact on the environment where the total market for travel is large and where rail has the potential to capture a large share of that total market.

Similar to the impact on economic growth of increasing labour supply to businesses, improving the links between people and jobs can also provide benefits for people in deprived communities. Reducing the perceived cost of travel can make commuting to find employment more attractive and open up new opportunities. Improving Regional Urban rail services will have the highest impact for communities and individuals where the existing rail market is large, income deprivation and the number of people in the population catchment of the origin station is relatively high and the number of jobs in the catchment of the destination station is high.

Given the contribution that the provision of services in the Regional Urban market makes to the economy, the environment and the quality of life for communities and individuals, accommodating future passenger demand is an important means of delivering the strategic goals. The conditional output related to capacity is therefore to plan (in subsequent Route Studies) to accommodate the high end of the background growth projections by 2043 detailed in Chapter 6, plus any further demand that is forecast as a result of schemes which are committed over this period.

Other, qualitative, conditional outputs have been developed relating to factors which could enable a successful outcome from the quantitative conditional outputs detailed above. These relate to:

- access to long distance transport gateways
- access to education establishments and social infrastructure
- passenger satisfaction
- access to the rail network.

01 Background

Since summer 2011, Network Rail and the industry have worked to develop a revised methodology to the RUS process to continue to develop the long term strategic direction of the rail network. This successor programme, the Long Term Planning Process, was endorsed by the ORR in April 2012.

1.1 Background to the development of the Long Term Planning Process

In June 2005 the Office of Rail Regulation (ORR) modified Network Rail's network licence to require the establishment and maintenance of Route Utilisation Strategies (RUSs), for the use and development of the network consistent with the funding that is, or is likely to become, available. This modification to the Network Rail network licence followed the Rail Review in 2004 and the Railways Act 2005.

The geographic RUS programme led by Network Rail commenced in late 2004 and a suite of strategies have been produced covering the whole of the country, culminating in the establishment of the West Coast Main Line RUS in August 2011. As the network licence requires the maintenance of RUSs, the completion of the initial programme of geographic RUSs gave the opportunity to review how best to discharge this requirement in the future. Since summer 2011, Network Rail and the industry have worked to develop a revised methodology to the RUS process to continue to develop the long term strategic direction of the rail network. This successor programme, the Long Term Planning Process, was endorsed by the ORR in April 2012.

1.2 Changes of context

Since the start of the RUS programme in 2004 there have been changes in administrations in England, Wales and Scotland and there have been very significant changes in planning policy context.

Long term strategic investments are being made in the rail network rather than tactical solutions to individual problems such as the electrification of significant route mileage, Crossrail, changes to signalling technology through deployment of the European Rail Traffic Management System (ERTMS) and progression of the Network Rail Operating Strategy. The development of a high speed line between London and Birmingham and beyond to Leeds and Manchester (HS2) will significantly reduce travel times between the UK's major cities and release capacity on the existing network, but will also need to be suitably integrated with the existing network and services.

Therefore, there is a need for the industry to consider network wide long term infrastructure development rather than 'as now plus isolated enhancements' to the rail network. This will also need to inform maintenance and renewal strategies in both the short and medium term.

The balance of funders' objectives has also changed in the light of a significantly tighter fiscal environment and the emerging conclusions from the 'Rail Value for Money' report published by Sir Roy McNulty in May 2011. There is a clear policy shift towards revenue generation and making best use of the existing railway. Indeed, the Rail Value for Money report explicitly recommends that rail planning should place more emphasis on making best use of the existing network, before considering further infrastructure investment. The Brown Review of the Rail Franchising Programme stated that the franchise term should be driven by the individual franchise and its circumstances and therefore there maybe a variety of franchise terms. Where it is sensible to do so, the specification and oversight of franchises should be managed by authorities that are closer to their communities and local economies and the government supports this view of devolution. All administrations see greater emphasis on the role of transport in supporting the economy, for example by widening access to labour markets and by improving connectivity between businesses.

Network Rail has recently restructured to become more accountable to its customers with the creation of nine devolved Routes to enable greater local decision making.

In the context of these changes, the RUS process to date has a number of limitations. The key challenge is that RUSs have developed options as incremental changes to existing services. This is unlikely to be appropriate in the future – at least as the only or main approach to option development – because many of the changes described above imply a need to consider step changes to services. In the future, making best use of the network may require looking beyond existing service patterns. Stakeholder aspirations for services to support economic growth, for example by connecting residential areas to labour markets, may involve entirely new services.

Investments such as HS2 and electrification also give opportunities for step changes in train service, not only on the parts of the network directly affected, but well beyond. However this study is not the vehicle to investigate locations which are not served by rail per se, rather the study supports the needs of the market.

Another limitation of the process to date is in the way that it has dealt with services that run across several RUS areas. Such services have generally been considered by each geographic RUS in isolation, each RUS looking at changes within its area but not considering the service as a whole. This has been workable only because, as noted above, options have been defined as incremental changes to existing services. With step changes to long distance services likely in future, for example as a result of HS2 or electrification, this approach will no longer be appropriate.

1.3 Long Term Planning Process overview

The Long Term Planning Process consists of a number of different elements, which when taken together, seek to define the future capability of the Network. The individual elements are detailed below:

- Market Studies, which will forecast future rail demand, and develop 'conditional outputs' for future rail services, based on stakeholders' views of how rail services can support delivery of the markets strategic goals
- Cross-Boundary analysis, which will consider options for services that run across multiple routes to enable Route Studies to make consistent assumptions in respect of these services
- Route Studies, which will develop options for future services and for development of the rail network, based on the conditional outputs and demand forecasts from the market studies, and assess those options against funders' appraisal criteria in each of Network Rail's devolved Routes.

The Market Studies, Route Studies and Cross-Boundary analysis are described in further detail in sections 1.4, 1.5 and 1.6 below.

The Long Term Planning Process (and in particular the Route Studies) will provide a key part of the evidence base for future updates of the Network and Route Specifications which bring together all the medium and long term plans for the development of a route, drawing on sources including RUSs, renewal plans, development of major projects and resignalling programmes.

In addition, the existing Network RUS process will continue to look at network-wide issues. Further information on the Long Term Planning Process, the current Network and Route Specifications and the Network RUS can be found on Network Rail's website at **www.networkrail.co.uk**.

1.4 Market Studies

There will be four Market Studies: Long Distance passenger, London & South-East passenger, Regional Urban passenger, and Freight. Although the three passenger Market Studies have obvious connections to the three 'sectors' into which passenger train services are often divided, it is important to emphasise that each Market Study will consider a particular passenger market, rather than a particular set of train services.

The passenger Market Studies will have three key outputs:

- identification of the long term strategic goals which define the successful provision of rail services to each of the three market sectors. These will be based on the aspirations of current and likely future rail industry funders
- demand forecasts for the sector, over a 10 and 30-year planning horizon. Scenarios will be used to reflect key uncertainties, where appropriate

- 'conditional outputs' for the sector. The conditional outputs will be aspired levels of service (in terms of, for example, frequency, journey time and/or passenger capacity on key flows in the sector). The conditional outputs will reflect stakeholder views of how rail can support delivery of their strategic goals, and opportunities created by planned investments, as well as reflecting current service levels and forecast future demand. The aim of the Market Studies is to provide demand forecasts, and conditional outputs, that are consistent across the Route Studies. The Market Studies will not consider in detail markets that are relevant for the planning of train services or infrastructure, only within a single Route Study area and the aspirations for such markets (e.g. services operating wholly within Scotland or Wales) will be considered in more detail in the relevant Route Study. The conditional outputs will be conditional on both affordability and a value for money business case being determined in subsequent Route Studies.

The Freight Market Study will produce demand forecasts over a 10 and 30-year planning horizon, with preferred routeing of services and the implied requirements in terms of network capacity and capability. Scenarios will be used to reflect key uncertainties.

All of the Market Studies will draw on existing work where appropriate, for example work done in RUSs, development of the Strategic Freight Network and Local Authority multi-modal studies.

1.5 Route Studies

There will generally be one Route Study for each of Network Rail's nine devolved routes. In a few cases a devolved Route may be covered by more than one Route Study, where part of the Route is largely self-contained.

A Route Study will develop and assess options for the long term use and development of the network. Its starting point will be to determine whether the conditional outputs from the relevant Market Studies can be accommodated on the existing network, with committed enhancements. It will then develop train service options, corresponding to different uses of the network (and hence to different trade-offs between stakeholders' strategic goals).

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A Route Study will first look at options for making use of the existing network, and only then at options involving infrastructure investment. Options will be assessed against funders' decision-making criteria. This will include quantitative appraisal as in the previous RUS process. It will also, where appropriate, include a wider assessment against factors such as strategic fit, wider economic impacts and affordability.

The output from a Route Study will be evidence based choices which will be available to Network Rail and industry funders to determine the long term use, and development, of the network.

1.6 Cross-Boundary analysis

Services that run across more than one Route Study area will be considered in a separate 'Cross-Boundary' workstream. This will develop and assess options for cross-boundary services (passenger and freight), in a similar way to the Route Studies. The output from this workstream will be a set of common assumptions that Route Studies should adopt regarding Cross-Boundary services. Assumptions might include the frequency and calling patterns of passenger services, and the frequency and operating characteristics (e.g. gauge, speed, tonnage) of freight services.

The work stream may also specify options for cross-boundary services to be examined in more detail in Route Studies, in order to better understand the trade-offs between cross-boundary and other services. The assumptions regarding cross-boundary services may be revised from time to time based on the analysis in Route Studies.

1.7 Long Term Planning Process outputs

The Long Term Planning Process occupies a particular place in the planning activity of the rail industry. The choices presented and the evidence of relationships and dependencies revealed in the work across all elements of the process form an input into decisions made by industry funders and suppliers on issues such as franchise specifications and investment plans. In particular, the Long Term Planning Process will form an essential evidence base for the development of the High Level Output Specification for Control Period 6 (2019-2024).

1.8 Long Term Planning Process Governance Arrangements

The Long Term Planning Process is designed to be as inclusive as possible with contributions encouraged both from the rail industry and wider stakeholders. Overall governance responsibility for the process lies with Rail Industry Planning Group (RIPG) which meets quarterly and whose membership comprises:

- Association of Train Operating Companies (ATOC)
- Department for Transport
- Freight Operators
- London Travel Watch
- Network Rail
- Office of Rail Regulation
- Passenger Focus
- Passenger Transport Executive Group
- Rail Freight Group
- Rail Freight Operators Association
- Railway Industry Association
- Rolling Stock Companies
- Transport for London
- Transport Scotland
- Welsh Government.

A two tier structure for stakeholder dialogue has been established to oversee and help produce this Regional Urban Market Study:

First, a Working Group provides high level support for developing the three key output deliverables detailed in section 1.4, a mandate to discuss these deliverables on behalf of the rail industry with other stakeholders, and a review of the ongoing work to develop them.

The Working Group comprises central Government(s), the Passenger Transport Executives Group (PTEG), all the current train operating companies (TOCs) who operate in the sector, ATOC, a freight industry representative nominated by the Strategic Freight Network steering group, Network Rail, and the Office of Rail Regulation (ORR) as an observer.

Second, a series of smaller locally devolved groups provide location specific spatial and economic context and evidence of planned and existing studies to enable the production of study output deliverables that are appropriate for both local circumstances and the national rail market sectors.

These groups typically comprise Local Enterprise Partnerships (LEPs), unitary and larger metropolitan local authorities, Passenger Transport Executives or equivalent, the Department for Transport, the current train operating companies which serve both the passenger market and locality in question, Welsh Government and the Regional Transport consortia in Wales and Network Rail.

The Regional Urban Market Study groups are termed Regional Groups and are based around the principal locally devolved regions in England and Wales. The meeting groupings are as follows:-

- East Midlands
- North East & Teesside
- North West
- South West
- Wales
- West Midlands
- Yorkshire & Humber.

Additionally a number of one to one meetings have been held with stakeholders to assist in the development of this study.

1.9 Document Structure

This study has been developed based on input from a wide range of stakeholders and comprehensive appraisal and analysis work:

- Chapter 2 provides a description of the Regional Urban passenger market sector in terms of its characteristics. It identifies the typical passenger journey purpose before considering those circumstances and flows where rail is most competitive
- Chapter 3 summarises the way in which the study has been approached. It details how and what evidence has been collected, the primary economic research, the consultation undertaken and sets the goals forecasts and outputs
- Chapter 4 details the literature review that has been undertaken to assist the study
- Chapter 5 sets out the strategic goals for the Regional Urban market sector in terms of how they have been developed and what they are
- Chapter 6 looks at the long term demand scenarios and details how the scenarios have been developed, the methodology used and the consequent forecasts themselves
- Chapter 7 identifies the long term conditional outputs for the Regional Urban market sector. It shows how the outputs were developed before summarising what they are
- Chapter 8 describes the consultation responses and how these have been reflected within the study before going on to articulate the next steps
- Appendix A details the criteria for developing conditional outputs.
- Appendices B – G describe the service level conditional outputs by region
- Appendix H is a technical guide for this Regional Urban Market Study.

This document has been published exclusively on Network Rail's website. If you would like a paper copy please write to or email the following address to arrange for a copy to be sent to you:

Regional Urban Market Study
RUS Planner
Network Rail
Kings Place
90 York Way
London
N1 9AG

regionalurbanmarketstudy@networkrail.co.uk

02 Regional Urban Passenger Market description

This Market Study seeks to understand where rail can best exploit its natural competitive advantage in the commuting market and to a lesser extent the leisure market for the overall wellbeing of Great Britain.

2.1 Introduction

As discussed in the previous chapter, the rail industry differentiates the rail passenger market in Great Britain (GB) into three sectors, these are:

- Long Distance
- London and South East
- Regional Urban.

This segmentation is based on a geographic allocation of each of the Train Operating Companies' (TOCs) groups of services, with the passenger journeys and revenue associated with a group of services assigned to the geography which pertains to that group . This allows the industry to estimate easily the total size of each market sector, but makes it more difficult to infer the characteristics of each sector, particularly in terms of journey purpose.

The first stage of the Regional Urban Market Study was therefore to explain the characteristics that define the regional urban sector, and to sense-check this definition with the market description from the other market studies undertaken as part of the Long Term Planning Process (LTPP).

This chapter sets the remainder of this document in context by explaining the characteristics that define the Regional Urban passenger market. The definition was produced using a combination of ticket sales data, passenger survey data, industry research, and conversations with stakeholders.

For the purposes of this study the characteristics of the Regional Urban Market comprise:

- the definition of the Regional Urban market and the passengers who use this product as defined by their journey purpose
- the circumstances where Regional Urban rail enjoys a competitive advantage over travel by other modes.

2.2 Definition of the Regional Urban Market

The Regional Urban market predominantly relates to short distance travel within an approximate 50 mile radius of one of the 13 largest regional centres in Great Britain, where the predominant reason for travelling by rail is either commuting to/from work or leisure. Each of these locations is the centre of employment and leisure activity for the surrounding city-region and, outside of London, the largest concentration of office-based and service sector employment, social infrastructure, commerce, and leisure activities are typically located in these places. This concentration of activity puts pressure on other forms of transport in the form of road congestion and increased car parking prices making rail a more competitive mode of transport.

The Regional Urban market also relates to short distance travel centred on smaller centres in Great Britain and other key drivers of shorter distance travel such as tourist centres. Whilst rail's market share in these markets tends to be lower compared to commuting into large urban centres, it is important to understand the drivers of demand and key issues in these markets to inform long term planning. Therefore, this market study attempts to discuss the drivers of rail demand on rural rail corridors and corridors around smaller urban centres, but issues tend to be highly localised and will be considered further, where appropriate, in the relevant Route Study.

Commuting trips in particular tend to be relatively short distance and a large number of leisure trips are made over short distances. Whilst business trips are also important they make up a much smaller share of the Regional Urban rail market. Commuting trips in the Regional Urban market account for approximately 63 per cent of all trips made by rail, compared with 28 per cent leisure and nine per cent business .

The Long Distance Market Study published in October 2013 details the service level conditional outputs for longer distance journeys.

The Regional Urban rail market accounts for approximately 340 million passenger journeys per annum, which is around 23 per cent of total journeys made on the the national rail network. The number of regional passenger journeys per annum increased by 55 per cent between 2002/03 and 2011/12 (ORR - National Rail Trends), around five per cent per annum. Demand into regional centres has tended to grow faster than traditional forecasts, driving the need for this market study to understand what has driven growth in rail demand.

2.3 The circumstances where Regional Urban rail enjoys a competitive advantage over travel by other modes

This Market Study seeks to understand where rail can best exploit its natural competitive advantage in the commuting market and leisure market for the overall wellbeing of Great Britain.

The leisure market includes visiting friends, entertainment, sport, holidays, day trips, shopping and other activities including walking.

The majority of people use private cars, active modes such as cycling and walking, buses, rail, and other rail based surface transport to commute to work and access leisure facilities and social infrastructure. Rail competes in the market for travel for these purposes. According to the National Travel Survey (NTS), eight per cent of commuting trips in the UK are made by rail, 69 per cent of commuting trips are made by car. Rail has a two per cent share in the leisure market. However, rail enjoys a substantially higher market share in some geographically specific market segments than others – in particular flows from rail served origins into principal urban centres. As commuting makes up the largest portion of the Regional Urban market, the following analysis demonstrates some of the conditions where rail has a competitive advantage in the commuting market:

Figure 2.1 shows the relative number of commuting journeys by rail by destination in 2011/12 for places outside London with more than one million commuters per annum. There are over 10 million commuting trips per annum that are made to and from Leeds, Manchester, Birmingham, Liverpool and Glasgow, which shows the importance of these regional centres in Britain as rail commuting hubs. Outside London, Leeds is one of the largest rail commuting markets in Great Britain and further analysis of Leeds and the rail market into and within West Yorkshire has been undertaken to understand why rail has a competitive advantage in some commuting markets. Demand for rail in West Yorkshire and particularly into Leeds has grown considerably in the last decade, particularly as the economy of Leeds has shifted to office based employment. The information available on mode share for commuting into Leeds is also very good; giving an opportunity to use West Yorkshire to evaluate the conditions where rail enjoys a competitive advantage over other modes.

Figure 2.2 and Figure 2.3 shows mode share of commuting in West Yorkshire and commuting demand into Leeds, respectively. Rail's market share in West Yorkshire is consistent with the NTS figures.

By comparing commuting demand by all modes into West Yorkshire with commuting demand by all modes into Leeds only, it can be shown that rail's market share is significantly higher into the regional centre. This implies that rail has a natural competitive advantage into regional centres because city centre land use and development puts pressure on other forms of transport such as roads and parking.

By looking at commuting demand into and within West Yorkshire by all modes, it can be shown that over very short distances rail struggles to compete against modes with a more 'turn up and go' style service such as active modes, car and bus. It should be noted however, that the West Yorkshire rail network is predominantly outer suburban in character and does not have the high frequency inner suburban services present in conurbations such as the West Midlands and Merseyside where rail can be more competitive over short distances.

As the distance increases, journey time plays a larger role in the decision on mode choice, and relatively high frequency rail services with short journey times become more attractive than other modes. Rail has the highest market share for commuting trips of more than 15 miles. This demonstrates that rail has a natural competitive advantage where end to end journey times make up a relatively large component of the perception of the cost of travel in other modes.

Chapter 7 looks in detail at the Regional Urban market in West Yorkshire and develops a methodology for stating service level conditional outputs. This analysis has been applied to the regional urban rail markets in England .

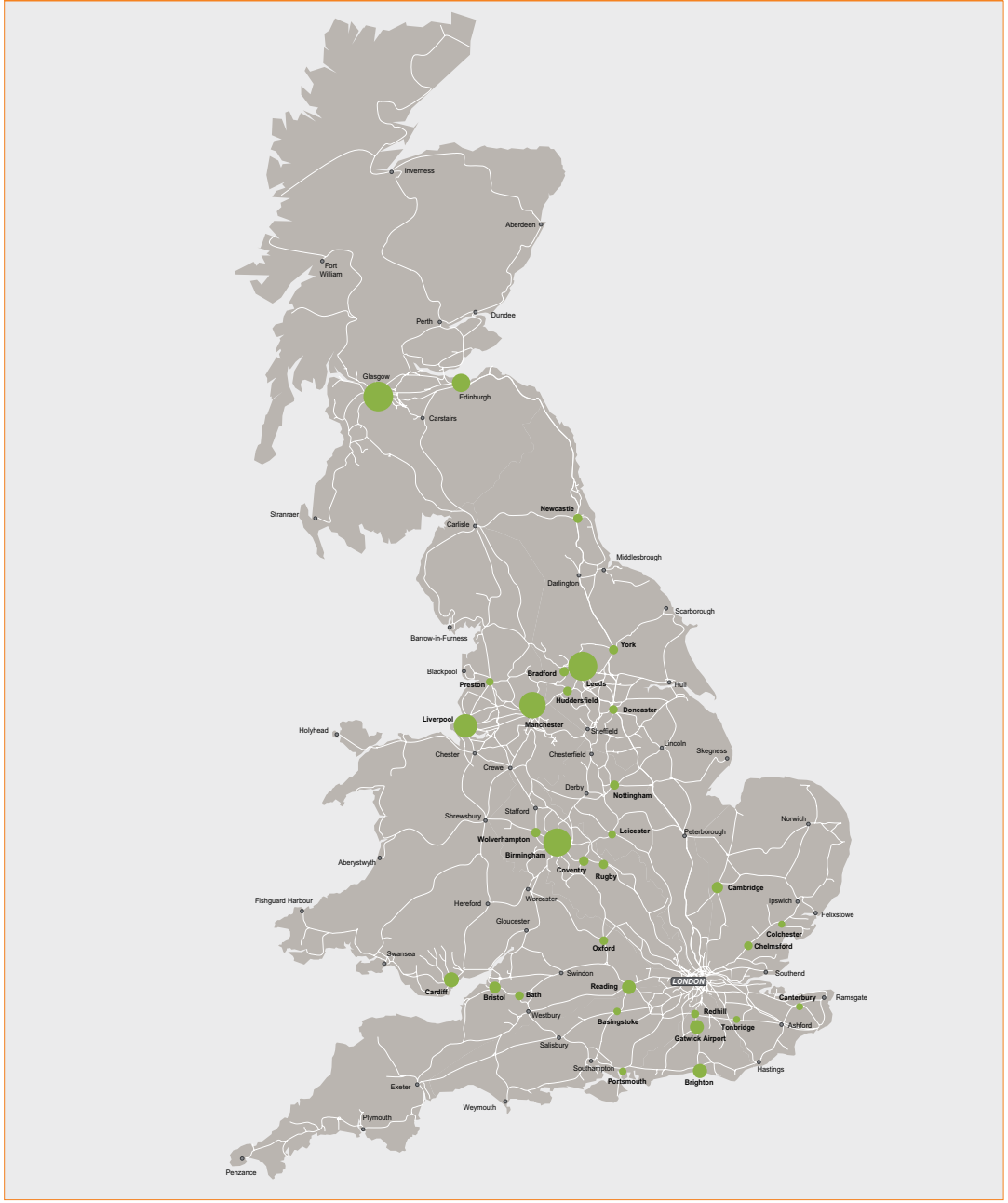
In summary, rail is capable of offering high capacity services into city centres with a set frequency and reliably low journey times. This type of offer enjoys a natural competitive advantage over other modes where:

- the city centre land use and development puts pressure on other forms of transport such as roads and parking
- end to end journey times makes up a relatively large component of the perception of the cost of travel in other modes
- generalised cost is competitive with competing modes.

Key

- 1 million
- 5 million
- 10 million

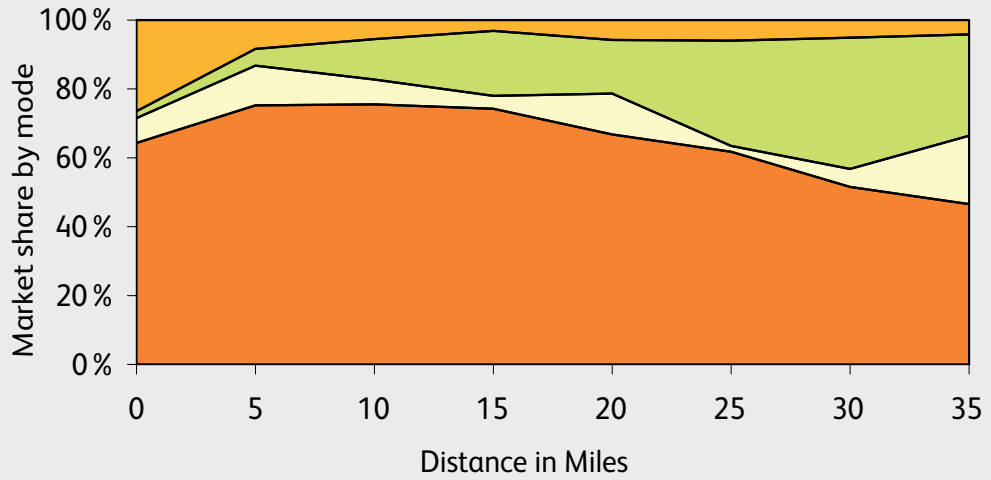
Figure 2.1 -relative number of commuting journeys by rail by destination in 2011/12 for places outside London with more than one million commuters per annum



Key

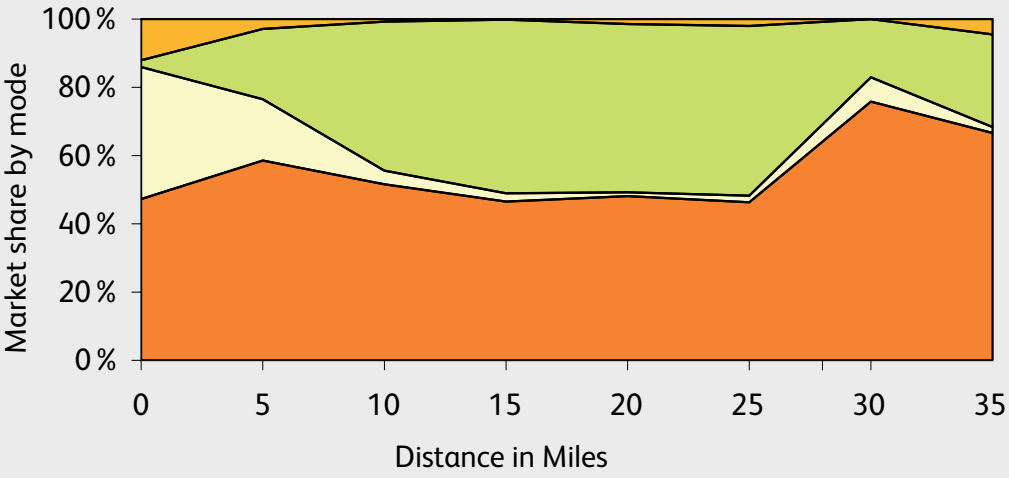
- Car
- Bus
- Rail
- Active Modes

Figure 2.2 Share of commuting demand in West Yorkshire by mode and by distance travelled



Source: Urban Dynamic model for West Yorkshire

Figure 2.3 share of commuting demand from West Yorkshire into Leeds city centre by mode and by distance travelled



Source: Urban Dynamic model for West Yorkshire

03 Study approach

An extensive and ongoing dialogue with stakeholders has been undertaken using meetings of the Working Group and Regional Groups as forums for this discussion.

3.1 Background

The Market Study approach has been designed to produce the three key deliverables outlined in Chapter 1, namely:

- identification of the long term strategic goals for the market sector, based on the aspirations of current and likely future rail industry funders
- production of long term demand scenarios for the market sector
- identification of conditional outputs for the specification of train services in the long term which will achieve the strategic goals for each market sector, given future circumstances identified in the demand scenarios.

These outputs are conditional upon subsequent value for money and affordability assessments.

The resultant study approach is outlined below.

3.2 Study approach

3.2.1 Literature review

The first stage in the process was to conduct a review of the published literature relating to rail industry funders', stakeholders' and passengers' requirements for the Regional Urban passenger market. This provided the starting point for the development of the strategic goals for the market, and was used to help understand how improvements to the train services provided for the Regional Urban market sector can help to achieve these goals.

This literature review is summarised in Chapter 4.

3.2.2 Stakeholder dialogue

An extensive and ongoing dialogue with stakeholders has been undertaken using meetings of the Working Group and Regional Groups outlined in Chapter 1 as forums for this discussion.

Meetings of these groups were timed to coincide with the completion of each of the Market Study deliverables, whereby the Working Group was asked to help develop and articulate strategic goals across Great Britain, demand scenarios and conditional outputs, and the Regional Groups were asked to confirm whether these deliverables were appropriate in the circumstances that apply to the areas they represent.

3.2.3 Primary research

Research into the impact of improvements to rail services on the wellbeing of Great Britain was undertaken to provide a thorough evidence base for development of the conditional outputs. This research sought to establish statistical relationships between the quality of transport opportunities and indicators of national and local wellbeing. This involved the collation of a significant body of new data on travel patterns, and social, demographic and economic trends, as well as estimating a series of statistical relationships between this data. This work is explained in Chapter 7.

Research was also conducted to provide new long term passenger demand projections. This is explained in Chapter 6.

Both pieces of research are built on existing work undertaken by Network Rail and other industry organisations such as the 2009 Network RUS Scenarios and Long Distance Forecasts and Prioritising Investment to Support our Economy, Network Rail 2010.

3.2.4 A case study approach

Instead of undertaking detailed primary analysis for all regional centres and rail markets in the UK, West Yorkshire has been used as a case study to understand the framework for developing service level conditional outputs and to understand how demand forecasts vary by scenario. The West Yorkshire case study was published in Chapter 7 of the Regional Urban Market Study Draft for Consultation.

However, there may be an inherent omission of local factors such as the presence of high frequency inner suburban services that can influence the outcome of the study. To mitigate this problem, the methodology drawn from the analysis of West Yorkshire has been applied to other Regional Urban markets in conjunction with a literature review and consultation with local stakeholders. Chapter 7 presents an evidence base for developing conditional outputs. Appendices B – G detail how this methodology has been applied to other Regional Urban markets in England. These appendices have been agreed with stakeholders both at the Regional Group meetings and with the Working Group.

As agreed with stakeholders, conditional outputs for the Regional Urban market in Wales and Scotland will be assessed in the Welsh and Scotland Route studies.

04 Literature review

This chapter presents a review of the published literature relating to rail industry funders', stakeholders' and passengers' requirements for the Regional Urban passenger market. This provided the starting point for the development of the strategic goals, long term demand scenarios and conditional outputs.

4.1 Introduction

This chapter presents a review of the published literature relating to rail industry funders', stakeholders' and passengers' requirements for the Regional Urban passenger market. This provided the starting point for the development of the strategic goals, long term demand scenarios and conditional outputs. The review considered three types of documents:

- Central Government(s) policy as evidenced by recent investment decisions, and the Rail Industry's activities to deliver this policy
- stakeholders' rail and transport strategies
- research on the demand for travel by rail.

4.2 Government(s) policy

The Department for Transport (DfT) and Transport Scotland (TS) are the principal public funding authorities for the rail industry. These Government departments published their investment priorities for 2014 – 2019 (Network Rail Control Period 5, CP5) in the 2012 High Level Output Specifications (HLOS) for England & Wales and for Scotland, respectively.

These documents outline Government(s) commitment to improvements to the capability of the rail network and the services which use it, with a combined value of over £11 billion.

Both documents indicate that the priorities for this investment are:

- supporting business and economic growth
- an improved environmental outcome
- supporting and connecting people and communities
- maintaining and improving the value for money and financial sustainability of the rail industry.

A number of the specified schemes and ring-fenced investment funds in these documents target improvements to Regional Urban rail services and infrastructure as a means to achieving these priorities.

These include:

- further electrification of the network – electrification of a number of routes in the North West, Yorkshire and South Wales which are designed to improve commuting into regional centres such as Manchester, Leeds and Cardiff, reduce ongoing industry operating costs and reduce rail's impact on the environment
- the Northern Hub which encompasses a series of schemes to increase capacity for commuting services on the radial routes around Manchester and improve journey times, enabling a greater supply of labour to employment.

The DfT is also supporting the development of the High Speed 2 project to connect London, the West Midlands and the north of England with a new high speed railway line, and is currently preparing a bill of Parliament for the first phase of this line. There will be stations at Manchester Airport, Manchester, Leeds, Sheffield (Meadowhall), Toton (between Nottingham and Derby), Birmingham Curzon Street, Birmingham Interchange and Old Oak Common. If implemented this unprecedented investment would provide a step change in the capacity provided for business passengers and commuters, and significantly reduce the journey times between Britain's largest centres of economic activity.

The rail industry received broadly £4.5bn support from the taxpayer in 2011/12. This demonstrates the value that funders' attach to the role of rail in a successful outcome for Great Britain, but also highlights that the overall affordability of the rail industry is a key challenge.

The industry is taking responsibility for this challenge through the Rail Delivery Group (RDG), which brings together senior leaders of the rail industry. RDG has initiated a number of working groups to examine opportunities to deliver efficiencies across the industry including asset, programme and supply chain management, contractual and regulatory reform, train utilisation, and technology, innovation and working practices. A work stream to examine the opportunities to reduce the costs of major projects through greater industry engagement in the development and delivery of enhancement schemes has also recently been started.

The rail industry is in agreement that efficiencies can be achieved over the forthcoming control periods. An implication of this is that some market sectors and sub-sectors could achieve a financial break even in the future, ergo placing a greater emphasis on private sector funding.

4.3 Stakeholders' rail/transport strategy

- Most stakeholder organisations have a strategy for future rail services intended to deliver their desired outcome for the areas they represent. The most detailed of these strategy documents have been produced by Passenger Transport Executives (PTEs) on behalf of the Integrated Transport Authorities (ITAs) which they represent. A number of these strategies cover more than one PTE area, in recognition that the functioning economic areas cross geographical and political boundaries.
- The following documents have been reviewed in the development of the strategic goals presented in Chapter 5. Whilst the details of these strategies are location specific the themes of supporting economic growth, a greener environment, connecting communities, and financial efficiency are common to most:
- Manchester Hub Conditional Output Statement. The Northern Way. April 2009
- Manchester Hub Rail Study. Network Rail. February 2010
- Yorkshire Rail Network Study Conditional Output Statement. Steer Davies Gleave on behalf of Metro, South Yorkshire Passenger Transport Executive (SYPTE) and Leeds City Region. March 2012
- A World Class Rail Network for the West Midlands, draft Summary Document. West Midlands Regional Rail Forum. January 2013
- Great Western Conditional Outputs Statement. Great Western Partnership. March 2012
- Route Utilisation Strategies (RUS). Network Rail. 2006 to 2011
- Network RUSs. Network Rail. 2009 to 2013
- Industry Strategic Business Plans for Control Period 5, and associated documents. Network Rail, Association of Train Operating Companies (ATOC), Rail Industry Association (RIA), Rail Freight Operators Association (RFOA). 2013
- Strategic Business Plans for Control Period 5, and associated documents. Network Rail. 2013
- Planning ahead 2010, the long term planning framework. Network Rail, ATOC and RFOA. August 2010
- The Eddington Transport Study. Sir Rod Eddington. December 2006
- Delivering a Sustainable Transport System: Main Report. Department for Transport. November 2008
- Economic Case for HS2. Department for Transport. February 2011
- Prioritising investment to support our economy. Network Rail. September 2010
- Local Transport Plans
- Local Economic Development strategies
- Airport Surface Access Strategies
- Enterprise Zone Submissions
- High speed rail: investing in Britain's future phase two – the route to Leeds, Manchester and beyond, Department for Transport January 2013.
- West Midlands Transport Prospectus
- Merseyside Long Term Rail Strategy, under development by Network Rail, Merseytravel and partners which has reached at least a final draft
- Realising the Potential of GB Rail - Report of the Rail Value for Money Study, Sir Roy McNulty May 2011.

Data on housing and population sourced from local authorities tends to focus on land that has been allocated to housing and how many houses could be built on that land, rather than evidence of the likely number of houses to be built and occupied over the time frame of the Long Term Planning Process. This means that the information provided on housing has had little influence over the recommendations made. In the future, the industry would welcome information that demonstrates the number of homes that are likely to be built and occupied at a local level in a format that is consistent across Great Britain.

4.4 Research into the demand for travel by rail in Great Britain

The final section of this chapter references the research that has been used to develop the long term demand scenarios and projections.

An extensive body of research exists into the factors which influence the demand for travel by rail. Since 1986, the Passenger Demand Forecasting Handbook (PDFH) has formed the rail industry's main source of reference for this research, detailing summaries of the most pertinent studies, and providing advice on the practical application of this work.

The Passenger Demand Forecasting Council (PDFC) is the rail industry association responsible for commissioning new research, and it periodically updates the PDFH when significant advancements in this research have been made.

Full members of the scheme include:

- the Association of Train Operating Companies (ATOC)
- all Train Operating Companies (TOCs)
- DfT
- Transport Scotland (TS)
- all Passenger Transport Executives
- The Office of Rail Regulation (ORR)
- Network Rail.

Associate members of the scheme include a number of consultancy firms which specialise in transport economics as well as some universities.

The PDFH/PDFC has provided the majority of the evidence used to develop the long term demand scenarios. The most recent synopsis of this research is provided in PDFH version 5.

This Market Study Draft has also used research that has not been commissioned by the PDFC (although some of this work has been undertaken by PDFC members).

Publications include:

- the portfolio of established Route Utilisation Strategies, Network Rail 2006 – 2011
- On the Move. Making sense of car and train travel trends in Britain, ORR, Integrated Transport Authorities (ITC), TS, RAC Foundation, 2012
- The Billion Passenger Railway. Lessons from the Past: Prospects for the Future, ATOC 2008
- Robust Foundations. Econometric Analysis of Long Time Series Rail Passenger Demand Aggregates Report to the Department for Transport, MVA 2008
- National Passenger Survey, Passenger Focus, (annually).

05 Strategic goals

Strategic goals are identified based on the aspirations of current and likely future rail industry funders. They are also developed through collaboration with industry partners and stakeholders and a review of existing literature.

5.1 Introduction

This chapter sets out the strategic goals for the Regional Urban rail market, explains how they have been developed, and lists the types of improvements to rail services that could deliver these goals.

5.2 Identification of strategic goals

This Market Study identifies the long term role of the Regional Urban passenger market in achieving the key priorities of the current and potential future national and regional funders. These statements of priorities are the strategic goals that the Regional Urban market should aim to meet in the long term.

Strategic goals are identified based on the aspirations of current and likely future rail industry funders. They are also developed through collaboration with industry partners and stakeholders and a review of existing literature. Conditional outputs which specify the rail service provision that the Regional Urban market should aim to deliver, subject to value for money and affordability, are developed to meet these strategic goals. These conditional outputs presented in Chapter 7, will inform issues and gaps to be addressed during the Route Study phase of the Long Term Planning Process (LTPP).

The strategic goals are summarised below and explained in more detail in the following section. They are split by the overall goals for transport (in bold) and the subsequent goals for rail (in italics):

- **Enabling economic growth**
  - *by providing sufficient capacity for employers to access the labour pool*
  - *by improving access to workers for businesses.*
  - *by improving connectivity to/from the retail, leisure and tourism sectors of the economy.*
- **Reducing carbon and the transport sector's impact on the environment**
  - *by reducing the use of less carbon efficient modes of transport*
  - *by directly reducing the environmental impact of rail.*
- **Improving the quality of life for communities and individuals**
  - *by improving access to employment and training opportunities*
  - *by providing sufficient capacity for workers to access employment*
  - *by connecting communities*
  - *by providing access to social infrastructure such as educational establishments and major leisure venues*
  - *by reducing road congestion.*
- **Improving affordability and value for money for Government and other funders**
  - *by meeting other outputs in an affordable and value for money way*
  - *by directly reducing whole industry subsidy*
  - *by improving the value for money for passengers and taxpayers.*

5.2.1 Enabling economic growth

As discussed in Chapter 2, rail plays a key role in supporting economic growth in the Regional Urban sector by improving access between businesses and labour. Access to a wide pool of labour enables businesses to match the demand and supply for skills and improve the productivity of their business. Employment, particularly service sector employment, tends to cluster in urban centres although there is also significant employment in non-urban centres and cross-city connections can also connect employees with employment. Commuters value direct connections, personal space, reliability, frequency, speed, value for money, receiving accurate information about their journey, the ability to work on the train and good interchange with other modes. Improving these factors will improve access between employment and labour, by increasing the willingness to commute. Therefore strategic goals for the Regional Urban rail market are:

- improve connectivity between population areas and employment areas
- provide sufficient capacity to meet demand
- passenger satisfaction, particularly in relation to rolling stock and station environment
- competitive prices compared to other modes and improved pricing and ticketing.

To a lesser extent for this market, improving business to business connectivity will have agglomerative effects, reducing the cost of transactions in the supply chain and increasing competition, resulting in improved productivity. The Regional Urban rail market can improve business to business connectivity through improved shorter distance connectivity between employment centres. In part this will be fulfilled by meeting the needs of the commuting market. Regional Urban rail also has a role in providing business to business connectivity through access to strategic transport hubs such as Major Airports, Ports and High Speed rail stations. Therefore strategic goals for the Regional Urban rail market are:

- improve intra-regional connectivity
- improve access to High Speed 2 stations, major airports and ports (for use of passengers and employees).

Improving rail access can also have demand side impacts on the economy through increased investment and access to leisure, education, tourism and commercial activities. These activities tend to cluster alongside employment centres and meeting the needs of the commuting market can also meet the needs of other users. However, leisure, education, tourism and commercial activities can also be the main market drivers on some rail corridors, in the evenings and at weekends. Therefore strategic goals for the Regional Urban rail market are:

- improve connectivity to retail, leisure and tourism centres
- improve access to further and higher education establishments and other social infrastructure.

5.2.2 Reducing carbon and the transport sector's impact on the environment

Depending on the mix of power generation electric traction is typically more carbon efficient and environmentally friendly than the diesel equivalent. Electrification of the network, in particular on sections connecting long distance routes which are already electrified, will reduce the transport sector's harmful impact on the environment. Therefore a strategic goal for the regional urban rail market is:

- directly reduce the environmental impact of rail

It is recognised that this goal could be achieved through service and infrastructure specifications rather than at a market level. Achieving this goal will therefore be considered further during later stages of the LTPP, in particular the Network Route Utilisation Strategy (RUS).

Over the network, deciding to travel by rail produces substantially less carbon per passenger kilometre than deciding to travel by road, regardless of whether electric or diesel traction is employed. Therefore, the carbon footprint of transport can be reduced by modal shift from road to rail. A strategic goal for the regional urban rail market is:

- improve rail's competitiveness to abstract trips from congested roads.

5.2.3 Improving the quality of life for communities and individuals

By providing access to employment opportunities and social infrastructure, Regional Urban rail can improve the quality of life for communities and individuals, particular in deprived areas.

In order to take advantage of employment opportunities, individuals from deprived communities value low cost of travel more than other commuters but still require space, reliability, frequency, speed, good information, the ability to work on the train and good interchange with other modes.

Strategic goals for the Regional Urban rail market are:

- improve connectivity between areas of high deprivation and employment areas
- provide sufficient capacity to meet demand
- passenger satisfaction, particularly in relation to rolling stock and station environment
- competitive prices compared to other modes and improved pricing and ticketing.

Improving access to social infrastructure such as hospitals, education establishments, entertainment, sporting venues, shopping centres and helping people to visit friends and family can be a critical factor in ensuring the long term sustainability of communities and fostering social inclusion. Strategic goals for the Regional Urban rail market are:

- connecting communities
- improve connectivity to tourism centres
- improve access to further and higher education establishments and other social infrastructure.

Rail can also play an important role in connecting communities and reducing congestion. Reducing car use in turn mitigates the negative impacts of road transport on quality of life, including air and noise pollution, accidents and the severance effects of busy roads. Therefore a strategic goal for the regional urban rail market is:

- reducing road congestion.

5.2.4 Improving affordability

Providing value for money is a key criterion, both for government and other funders' funding decisions as part of a wider transport appraisal framework and for the rail industry's customers. All rail industry investment proposals need to be justified in terms of an assessment of the likely value generated by the level of public investment sought.

In the context of government funding, the continuing pressure on UK public finances and a significant, albeit reducing, rail industry subsidy requirement per passenger kilometre means that improving industry affordability is a key priority. The importance of providing excellent value for money has been reinforced through the McNulty Value for Money report, Network Rail's Strategic Business Plans and the Industry Strategic Business Plans.

In broader terms, however, the balance of funding between the public sector and the railway's direct customers can and will vary, so affordability cannot be viewed from a purely public sector perspective. The 30 year timeframe considered by the LTPP means that affordability has to be considered over the 30 year period or the life of investment decisions, understanding the contributions that passengers and other customers are likely to make, rather than being conditioned solely by whether the availability of public finances increases or reduces.

Irrespective of the likely balance of future funding, it is important that, where possible, the difference between the rail industry's costs and revenue is reduced.

In developing the strategic goals for rail, the Market Studies do not provide statements on what the level of fares and pricing policies should be in the long term. However, some of these factors, such as changes in rail fare, are modelled when developing the demand scenarios in Chapter 6.

The strategic goals for rail are therefore to:

- meet all of the strategic goals (from above) in a value for money and affordable way
- directly reduce the whole industry subsidy.

These strategic goals cannot be addressed at a market level without also considering the specification of rail services and infrastructure to meet them. They are therefore more appropriate for detailed consideration in the later stages of the LTPP, however given the importance of these issues to funders they have been published at this stage of the process.

06 Long Term Demand Scenarios

Identifying the appropriate role of rail in the context of these long term priorities requires extension of the Network Rail's current demand projections to a 30-year time horizon.

6.1 Introduction

As discussed in Chapter 5, the aim of the market studies is to develop an understanding of how rail can make a successful long term contribution to the key priorities of current and potential future rail industry funders. These priorities or strategic goals are economic growth, a reduction in carbon and other adverse environmental impacts, improved quality of life, and improved industry affordability.

Identifying the appropriate role of rail in the context of these long term priorities requires extension of Network Rail's current demand projections to a 30-year time horizon. This is because common major railway infrastructure components, such as track systems, have an asset life of around 30 years. Decisions to change the capability of the network therefore require an understanding of the likely usage of it over this time period to maximise the value and useful life of the investment. Demand forecasting over such a long period represents a considerable challenge and a three-stage approach has been undertaken to develop the demand projections:

- first, the extensive body of industry research on rail demand has been reviewed to identify and group the likely factors that determine the number of people who travel by rail
- second, a series of potential alternative economic futures for Great Britain have been developed which would result in differences in these factors. These futures are articulated as four scenarios
- third, these scenarios have been used to define the inputs into long term demand models for each of the passenger market sectors. These models combine existing industry research and techniques, with some primary research undertaken by Network Rail.

The rest of this chapter is structured on the basis of this methodology:

- section 6.2 explains the factors that influence demand for travel by rail
- section 6.3 details the long term scenarios, and how they are likely to affect the factors which influence demand
- section 6.4 explains the demand modelling approach for the study
- section 6.5 presents the forecasts produced using these scenarios and modelling approach for the long distance market.

6.2 Factors which influence the demand for travel by rail

6.2.1 Background

A synopsis of factors which determine the demand for travel by rail is presented below. This synopsis is based on a review of the extensive body of existing evidence on the subject referenced in Chapter 4, and some primary research by Network Rail.

The existing research considered includes ongoing work by the Passenger Demand Forecasting Council (detailed in Section 4.4), by some of its member organisations including Network Rail, the Department for Transport (DfT), Train Operating Companies, the Passenger Transport Executives, academic institutions and by other organisations such as local authorities, the Independent Transport Commission and the Office for National Statistics.

The ongoing body of existing research into the factors which influence the demand for travel for rail is extensive, dating back to the 1980s. Compiling a summary of this research is therefore a challenging undertaking and there are many, equally valid, ways to categorise and structure it.

Network Rail's compendium of this research is presented below. This has been discussed in detail with the Working Group, outlined in Chapter 1, and whilst every endeavour has been made to accommodate the consensus of opinions from this group, organisations other than Network Rail may take a different view of some of the evidence that has been summarised. Given the

complexity of compiling this summary, the text in Section 6.2 is largely common to all three passenger market studies, with the specific impact on the long distance passenger market discussed in more detail in subsequent sections of this chapter.

The factors which influence the demand for travel have been grouped into five headline categories. These are listed below and then described in more detail:

- **Macro economic factors**
- **Micro economic factors**
- **Demographics**
- **Consumer tastes**
- **The supply of travel opportunities.**

A number of the factors presented under this categorisation are interdependent.

6.2.2 Macro economic factors

These are the factors which influence the demand for travel by rail as a result of economic incentives and pressures that occur outside of the transport sector, and comprise the following:

- **National and regional employment levels by type of employment.** Total employment levels affect the aggregate number of trips by all modes of transport including rail for the purposes of commuting, and the type of employment affects the proportion of these trips for which rail is a viable option. For example office based employees are more likely to travel by rail than construction workers who may be required to transport heavy apparatus to and from their locations of employment.

  The level and type of employment is driven by the performance and composition of the national and regional economies.

- **The distribution of employment between principal regional centres (e.g. London and Manchester) and other areas.** In particular this affects the number of people for whom commuting or travelling on employers' business by rail is more attractive than by other modes. This is because travel by rail into central urban areas at peak times is often faster than via the the highway network, as travel by rail is not subject to urban traffic congestion or limitations on the availability of city centre car parking.

  The distribution of employment between urban and other areas is driven by a number of factors, including the structure of the economy discussed above, the cost and supply of an appropriately skilled labour force, and public and private investment decisions.

- **National and regional income levels.** Income levels affect the number of people who are willing to travel over longer distances by all modes of transport, as longer distance travel is more expensive. This particularly affects the number of people who travel by rail as this mode of transport tends to be faster than by other modes over distances between around 50 and 300 miles. In addition, income levels are driven by factors such as the performance of the domestic economy, and wage inflation versus increases in the cost of living.

- **The distribution of income across the population of Great Britain.** Similarly to the above, the level of domestic income equality affects the number of longer distance rail trips, as only the higher income groups in society tend to have the financial means to travel frequently over longer distances.

  The level of income inequality can be influenced by a combination of taxation policy, and the ability of supply side innovations to reduce the cost of consumables in Great Britain.

- **The distribution of homes across Great Britain and between urban and other areas.** The distribution of homes and in particular the relationships between where people live, work, and spend leisure time affects the demand for travel for all purposes and by all modes including rail. For example large numbers of homes on the outskirts of urban areas leads to significant inward commuting and leisure trips, and a dominant regional centre of population leads to large levels of business and leisure travel between the centre and elsewhere.

  The distribution of homes is driven by a number of factors including the attractiveness of urban areas as places to live, the distribution of employment opportunities, the stability of

employment markets and employment practices, immigration and migration trends, and demographics (see Section 6.2.4). In addition, the distribution of residential and other development within a settlement can influence the modes of transport chosen, for example residential development clustered around suburban rail stations associated with high rail modal share.

- **The coverage of individuals' social networks.** The geographical coverage of people's social network affects the number of people who travel to visit friends and relatives by rail. This is because, as discussed above, travel by rail over longer distances is often faster than by other modes.

  A number of factors influence the coverage of the typical social network, including migration patterns (e.g. driven by university admissions), immigration trends, and the extent to which mobile technology, social networking and internet applications helps people to maintain long distance relationships.

6.2.3 Micro economic factors

These are the factors which influence the demand for travel through economic incentives and pressures that occur within the transport sector, principally via the cost of travel by the various modes of transport:

- **Cost of travel by car and car ownership.** Car has a dominant mode share in most markets for travel and in most parts of Great Britain, and a change in the cost of car travel can therefore have a significant proportional impact on the demand for travel by rail. There can often be a time delay before this impact occurs as the decision to travel by car or not can be associated with choices around car ownership.

  Several factors influence the cost of travel by car including the price of fuel, vehicle efficiency, the availability, cost and suitability of cleaner or non-fossil fuels, the cost of car parking and/or road pricing, Government taxation policy, the price of new and used cars and the cost of insurance, particularly for young people.

  These factors in turn influence the level of car ownership and use. Any future adoption of measures such as personal carbon rationing would be expected to have a similar impact on car ownership and use.

- **Cost of travel by rail.** The impact of the cost of travel by rail depends on the characteristics of the market which rail serves. Where rail has a dominant market position, e.g. for commuter travel into central London, the impact of a change in cost on rail demand is typically small, whereas in markets where car travel is very competitive, e.g. for off-peak travel between medium sized towns, a change in cost can significantly affect the number of rail passengers.

  The price of travel by rail is influenced by a number of factors including the rail industry cost base, rail fares policy, commercial decisions and the cost of car parking at stations.

- **Competition between modes.** The cost, and ultimately the commercial viability of service a route by a given mode will depend on the strength of the competition from other modes.

6.2.4 Demographics

These are the elements of the composition of the population of Great Britain which affect the demand for travel by rail. Namely:

- **The population of Great Britain and its regions.** Population affects the demand for travel by all modes including rail, with rail trip generation generally assuming to rise in step with population changes in a given station's catchment area.

  The factors which drive the size of the population are life expectancy, birth rates, immigration, emigration, domestic migration, and regional / local differences in the cost of living.

- **Age of the population**. The age of the population affects the number of people who travel by rail regularly such as commuters both directly and indirectly through its relationship with the state retirement age and the ability to travel by car. However an ageing population retaining a significant personal income may imply increases in leisure travel.

  The factors which determine the age of the population are analogous to those for the size of the population.

- **Household composition**. The structure of a household affects the number of people who travel by rail, particularly for the purposes of commuting and employers' business. For example, households with multiple occupants in employment generate more travel per person for these purposes than households where one or fewer people are employed. This is partly a result of the proportion of the household which is in employment, and partly as it is more difficult for a household with multiple workers to locate in an area close to the employer of all the workers within it. These factors lead to longer-distance commuting which plays to rail's competitive strengths.

  A number of inter-dependant factors influence household composition including the cost of living versus incomes, the age of parents when their first child is born and social preferences.

6.2.5 Consumer tastes

These are the factors that influence the demand for travel by rail as a result of the attitudes, preferences, and choices of consumers. Namely:

- **Use of travel time.** The facilities for people to use time spent travelling in the way they choose can influence the demand for travel by rail, particularly as it is not currently possible to use time spent on driving a car for other purposes.

  Factors which influence this are journey purpose (passengers are more likely to work during transit if they are commuting or on employers' business), on-board facilities, and the availability of enabling mobile technology. However, research indicates that this factor is also relevant to leisure travel, particularly with the spread of smartphones compatible with internet-based entertainment and social networking systems being cited as a factor in young people choosing rail travel.

- **The match between consumer tastes, consumer perceptions and rail travel products.** The ability of the rail industry to tailor its products to meet the requirements, tastes and expectations of customers will influence the number of people who travel by rail. Passengers' perceptions of the overall rail journey experience compared to the experience of using competitor modes of transport will also affect mode choice

  These factors include the provision of information around rail fares and journey opportunities, ticket booking facilities, ticketing technology, real time journey and product information, journey comfort and the quality of station facilities and access, including the supply and cost of car parking. Individuals' expectations around these factors are partly driven by how well products in other transport and non-transport sectors are tailored to their requirements, and their willingness to accept these elements will vary accordingly.

- **Alternatives to travelling.** Continuous improvements in information technology have long been cited as influencing the demand for travel by any mode, for example the advent of facilities such as internet shopping and video conferencing. There is a general absence of consensus on the likely impact of better information technology, with some citing it as a threat to individuals' desire to travel, and others arguing that it strengthens links between people, hence increasing their desire to meet each other. Rail industry research is weak in this area compared to most of the other factors discussed above, and several organisations are working to address this.

6.2.6 Supply of travel opportunities

These factors relate to the supply and quality of opportunities to travel by rail and the modes that compete with rail. The impact of these factors on the demand for travel by rail is similar to the micro economic factors described above. The supply and quality of travel opportunities have been categorised as follows:

- **Capacity of the rail network.** This is influenced by demand for travel at peak times and investment in additional capacity to keep pace with this demand.

- **Rail (generalised) journey times and punctuality.** This is influenced by investment in schemes to reduce journey times or increase the frequency of direct services between locations, commercial decisions and by the ability of the network to operate punctually.

- **Capacity of the highway network.** This is driven by demand for travel at peak times and investment in additional capacity to keep pace with this demand.
- **Highway (generalised) journey times.** This is driven by the ability of the road network to maintain/improve journey times given expected future traffic levels, and investment to maintain journey times on the existing network and expand the network to new locations.
- **The presence of long distance coach/bus competition.** Long distance coach/bus travel is typically significantly less expensive and more time consuming than rail travel, and the two modes usually compete for a very small shared market. The presence of long distance coach/bus operators tends to be driven by location of sizeable price-sensitive clusters of population or where rail does not provide a competitive journey time than bus/coach
- **Capacity and attractiveness of Britain's airports.** This will be determined by Government policy on future aviation capacity. The Airports Commission, chaired by Sir Howard Davies examines the need for additional UK airport capacity and is due to publish a final report in 2015. Commercial decisions also affect service provisions at the airports.

6.3 Long term scenarios

Forecasting market demand over a very long period of time such as 30 years is a difficult undertaking despite a strong body of market research of the type summarised above. This is because over a long time period structural changes can occur in society which radically alter the factors which have historically influenced demand in a market. Relying exclusively on a continuation of historical relationships is therefore likely to fail given a sufficient time period. For example most forecasts of national rail passengers produced in the late 1980s and based only on an extrapolation of decades of declining and stagnating patronage, would have failed to recognise any likelihood of the approximate doubling of passenger journeys that occurred over the following 20 years.

Network Rail has therefore used an approach called "scenario planning" which is designed to consider the range of societal outcomes that can occur over a long time period, then to estimate how these outcomes would be likely to change the factors which influence demand. This approach is common in other industries with very long term planning horizons and large sunk costs, and Network Rail first undertook scenario based demand forecasting in the June 2009 Network RUS Scenarios & Long Distance Forecasts.

The development of long term demand scenarios for the Market Studies has built on this approach developed in the Network RUS by updating and expanding the factors considered to all of those discussed in the previous section, by considering the Regional Urban and London and South East passenger markets, and also by increasing the time horizon to 30 years. The resultant narrative was discussed at meetings of the Working Group and Regional Groups, and refined to reflect the consensus of opinions from these groups.

This narrative postulates four future scenarios which would be likely to result in large differences in the factors which influence demand described in Section 6.2. These scenarios are intended to produce a range of the likely future demand for rail in 30 years and are not intended to be exhaustive. The scenarios are explained in detail below and summarised in Figure 6.1.

Two headline characteristics have been identified which determine these scenarios, namely:

- **The economy.** The performance of Great Britain's economy measured against the strength of other national economies and the extent to which the Great Britain economy is integrated with other national economies.

  The economy can either remain strong on the global stage maintaining its position within the G20 group of leading economies, or lose ground, perhaps only remaining in the top 50 world economies.

  The economy can either be integrated with other national economies, trading regularly across all types of goods and services, or be isolated, producing all or most of its goods and services domestically.

This implies four long term outcomes for the economy of Great Britain:

- **Strong, global.** A strong economy on the global stage which prospers from its integration with the rest of the world.
- **Strong, insular.** A strong economy on the global stage which prospers from its self sufficient nature.
- **Mid-ranking, global.** A mid ranking economy on the global stage which suffers from its integration and trading position with other national economies.
- **Mid-ranking, insular.** A mid ranking economy on the global stage which suffers from an absence of trade with other countries.

- **Our social and environmental planning.** The extent to which Great Britain is willing to intervene to address the negative impacts associated with modern society and globalisation, namely social inequality and carbon emissions, and the extent to which technology enables interventions.

  British society can either decide to intervene actively to reduce social inequality and carbon emissions, or to take a passive approach.

  Technological advancements will either provide effective low cost solutions to the negative impacts associated with modern life and globalisation, for example through provision of low-cost consumables and alternatives to fossil fuels, or it will provide piecemeal high-cost support to some of these problems.

This implies four long term outcomes for Great Britain's social and environmental planning:

- **Active, technologically enabled.** Great Britain society and Governments actively seek to reduce social inequality and carbon emissions, with technology limiting the requirement for this to be achieved through taxation.
- **Passive, technologically enabled.** Great Britain society and Governments are passive in their approach to social inequality and carbon emissions, although technological advancements allow some problems to be addressed.
- **Active, technologically limited.** Great Britain society and Governments actively seek to reduce social inequality and carbon emissions, although limited assistance from technology requires taxation to achieve this.
- **Passive, technologically limited.** Great Britain society and Governments are passive in their approach to social inequality and carbon emissions, and technology offers little solution to these problems.

These long term outcomes for Britain's social and environmental planning have been combined with those for the economy in order to articulate four future scenarios which examine the range in the likely factors which influence the demand for travel by rail. It is envisaged that these four scenarios presented represent the four most likely combinations of the economic and social/environmental outcomes, but other future combinations may also be possible.

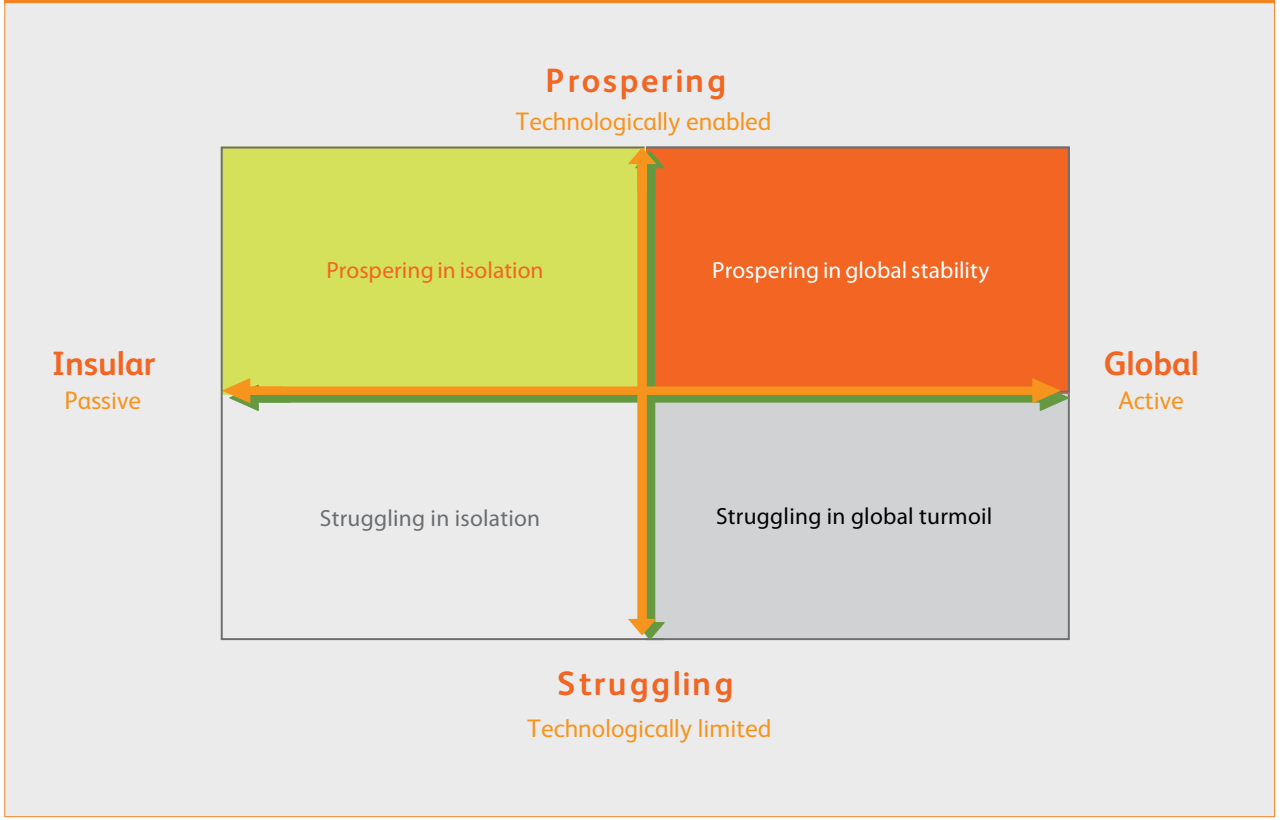
These scenarios are described below, and their likely impact on the factors which influence rail demand articulated in Section 6.2 is detailed in Figures 6.1 and 6.2. As discussed above the scenarios are not intended to be exhaustive and it is possible that over the next 30 years circumstances could change to reflect more than one scenario, or reflect a combination of scenarios.

Key

GB Economy

GB social and environmental conscience

Figure 6.1. Long term scenarios

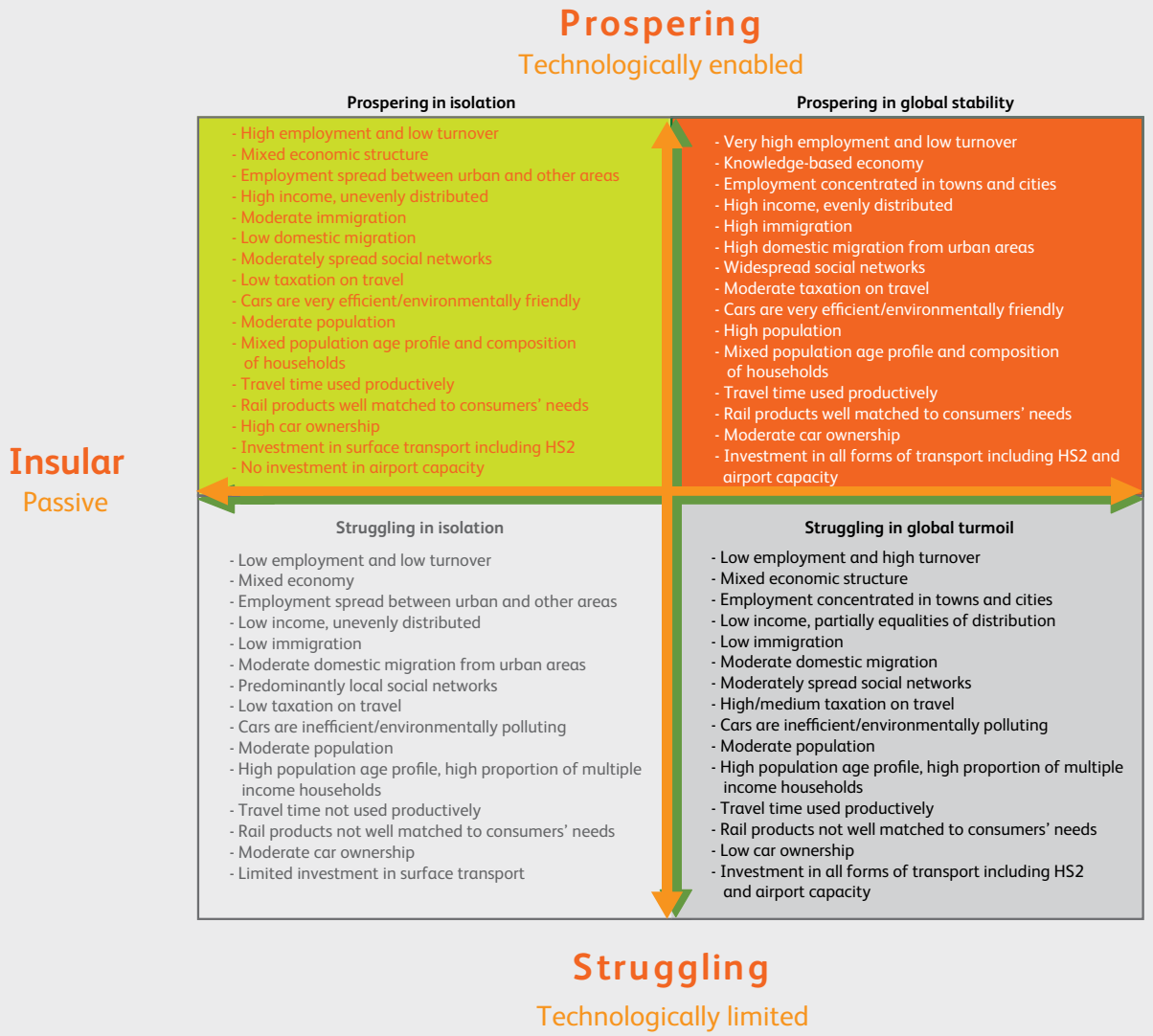


Key

GB Economy

GB social and environmental conscience

Figure 6.2. Impact of the long term scenarios on the factors which influence the demand for rail*



*The term HS2 in this graphic refers to the proposed new high speed line between London, Birmingham, and the north of England (the Y-shaped network) currently being developed by High Speed 2 Limited.

Prospering in global stability (PGS). The British economy is strong, prospering through its integration with other national economies by exporting high value products and importing low value products. Britain takes an active role in solving social and environmental problems, partly to maintain a stable service industry for its high value activities and a stable supply chain for the imports it requires, and partly because its technological advancement and high national wealth allows this to be done without worsening individuals' standard of living.

Prospering in isolation (PII). The British economy is strong, prospering by concentrating on domestic production in isolation from global market pressures. Britain takes little interest in solving social and environmental problems. This is partly because it has neither a dependency on stable foreign import markets, nor a stake in global technological innovation, and partly because the mixture in value of domestic economic activities undertaken to maintain self sufficiency prevents redistribution of domestic resources without worsening individuals' standard of living.

Struggling in global turmoil (SGT). The British economy is performing poorly, struggling to compete in high value export markets as the global supply chain and credit markets are volatile and other countries improve their employee skill levels and resource base. Britain takes an active role in addressing social and environmental problems, partly in an attempt to stabilise global import and credit markets, and partly because global technological innovation allows it to do so without worsening individuals' standard of living.

Struggling in isolation (SII). The British economy is performing poorly in the absence of both an export market for its high value products and a source of inexpensive imported materials and technological innovation to support domestic production. Britain takes little interest in solving social and environmental problems as it has neither the wealth nor the technology to achieve this without worsening individuals' standard of living.

6.4 Demand modelling approach

6.4.1 Introduction

The methodology used to produce passenger forecasts for each scenario is detailed below.

A key deliverable for the Regional Urban demand forecasts is a credible projection of how peak demand into each regional centre will change; as this will drive the requirements for peak capacity to be assessed in the route studies. As discussed in Chapter 3 West Yorkshire has been used as a case study to understand how the scenarios affect the variability in future peak demand. This information has been combined with a review of demand forecasts from previous studies, in particular Route Utilisation Strategies (RUSs) to produce forecasts for all of the other regional centres.

This approach has some strengths and weaknesses, strengths include:

- the approach consistently assesses the implications of different scenarios on regional urban demand across regions
- uses one consistent multi-modal data set to inform the implication of different scenarios on demand, rather than regional differences being driven by the underlying structure of different multi-modal models
- utilises the detailed analysis undertaken in previous studies such as Route Utilisation Strategies.

Weaknesses of this approach include:

- the reporting of forecasts is limited to peak demand into large regional urban centres
- drivers that cause variations in demand by scenario may have different implications in other regions.

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The Route Studies will seek to understand the implications of the demand forecasts from each of the Market Studies in combination with the impact on demand of any committed service improvements by the end of CP5 and report them in a way that is useful to option development and appraisal for the route in question.

The key drivers of passenger demand, discussed in Sections 6.2 and 6.3, were categorised according to whether they primarily impact upon:

- market size, or the propensity to undertake commuting trips. Examples include population growth and distribution
- modal choice, for example car availability, and whether people wish to use travel time productively or
- both of the above, for example the cost of travel.

A cross-sectional approach was adopted to forecast demand. This approach, which links the characteristics of the population with its propensity to travel, is ideal for forecasting under different scenarios.

The modelling was done in two parts:

- first, the total market for commuting travel into and within West Yorkshire was estimated
- second, rail's share of this market was estimated.

This modelling was based on the Urban Dynamic Model (UDM) developed for West Yorkshire Passenger Transport Executive. This structure divides Great Britain into 202 zones, with small zones in West Yorkshire and larger zones as the distance from West Yorkshire increases.

The population was segmented by household structure and income band as these elements are key determinants of the number of commuting trips.

The household structure segmentation is as follow:

- 1 adult aged 16 – 64
- 1 adult aged 65+
- 2 adults, Household Representative Person (HRP) aged 16 – 64
- 2 adults, HRP aged 65+
- single adult, 1 or more children
- 2 adults, 1 child
- 2 adults, 2 or more children
- other households.

The market was further segmented into five income bands using data from Family Spending 2010, produced by the Office for National Statistics (ONS).

The use of such detailed segments in the modelling process enables the model to reflect the impact of income distribution, social trends, and population changes (as defined by the scenarios) on commuting trips.

The demand forecasts use the 2010 National Travel Survey to define relationships between real income growth, economic development and the propensity to undertake commuting trips. These relationships are defined for each household type and income band and for business and leisure trips in Table 6.3.

Figure 6.4 shows the relationship between income growth and the propensity to commute in 2010 in Great Britain. Households with high incomes tend to have a higher propensity to commute; however the marginal impact of increasing income on trip rates is less than for lower income households.

Some of the demand drivers (such as cost of travel by car) discussed in Sections 6.2 and 6.3 impact upon people's choice of mode. The forecasts reflect these factors by using an incremental mode choice model, consistent with the Urban Dynamic Model(UDM).

The mode choice model uses the estimated generalised time[2] for each mode of travel to calculate the share of the total commuting market between each location carried by each mode. The mode choice parameters, for commuting trips, are taken from the UDM.

Several of the factors in the model were set at levels that are commensurate with the circumstances articulated by the four scenarios detailed in Figure 6.2. These levels are based on Network Rail's view following discussions with the Working Group, and do not necessarily represent official government projections. The model does not use all of the factors listed in Section 6.2, but rather a list of the factors which are expected to have a first-order impact on demand. This is a simplification in order to keep the modelling task manageable. The selected factors, and the level they were set at in each scenario are detailed below and summarised in Table 6.5.

- The assumed rate of growth in National Income is based on Network Rail's view of the maximum and minimum likely long term growth rates of 2.25 per cent and 0.5 per cent respectively, published in the Network RUS Scenarios and Long Distance Forecasts. The 'prospering' scenarios have been assigned the higher rate and the 'struggling' scenarios the lower rate.

- Under the 'global' scenarios, regional income growth in large cities is assumed to be higher than the national average; and under 'isolation' scenarios, large cities are assumed to have lower income growth than national average. This is because cities are the natural point of interaction between a service/knowledge based domestic economy and other national economies.

- Sub-national population projections by the Office of National Statistics (ONS) are used to estimate future population in each local authority. It is assumed that population will migrate to areas with more employment opportunities and higher income, therefore under 'global' scenarios large cities are assumed to have a regional population growth higher than ONS population projections and vice versa.

- The proportion of workers in office based employment and a shift in car parking prices in urban centres is used as a proxy for structural shift into commercial centre based employment which strongly favours commuting by rail. In the global scenarios, structural shift accounts for a three per cent shift in rail demand up to 2020, whereas in the other scenarios, this effect is not included.

- Cost of travel by car is determined by a number of factors including the cost of crude oil, the cost of car parking, vehicle efficiency and taxation on fuel. In the global scenarios it is assumed that Government(s) attempt to offset the externalities associated with car usage, such as pollution and traffic congestion, via an increase in fuel costs. In the prospering in global stability scenario it is assumed that this is partially offset by an increase in vehicle efficiency. In the prospering in isolation scenario it is assumed that taxation remains unchanged and that this increase in vehicle efficiency reduces the cost of car usage.

- The scenarios also vary the level of car ownership around Government's official projections in the TEMPro3 database.

- Under the global scenarios it is assumed that more commuters are able to use time travelling on a train productively than is the case currently. It is assumed that this rate of increase is higher in the high tech prospering in global stability scenario where mobile technology and train interior facilities are likely to be the most advanced.

2 Generalised time of travel is a combination of the various components of a journey, such as the cost of travel, in vehicle time, interchange, and time spent waiting for a train converted into an equivalent number of minutes, this is equivalent to using generalised cost. These components vary by mode.

Table 6.3 Commuting trips per annum by income band and household structure per person					
Journey Purpose	Income Band	Other Households	Single Adult 16-64	Single Adult 65+	Single parent family
Commuting	Bottom	46	100	6	21
Commuting	2nd	71	159	135	31
Commuting	3rd	90	106	130	45
Commuting	4th	126	155	92	109
Commuting	Top	132	172	99	92
Journey Purpose	Income Band	2 Adults 1 Child	2 Adults 2+ Children	2 Adults, 16-64	2 Adults, 65+
Commuting	Bottom	62	64	100	38
Commuting	2nd	44	48	87	30
Commuting	3rd	78	50	116	88
Commuting	4th	86	78	114	76
Commuting	Top	103	72	187	100
Source: National Travel Survey 2010					

Figure 6.4 Relationship between income growth and the propensity to commute in 2010 in Great Britain

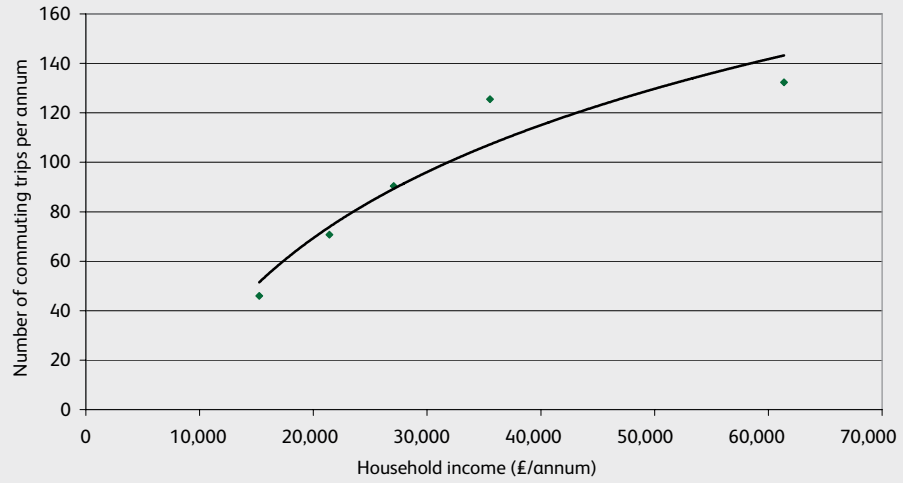


Table 6.5 Modelled factors which vary by demand scenario					
Model	**Factor**	**PII**	**PGS**	**SGT**	**SII**
Market size	National income growth	2.25% p.a.	2.25% p.a.	0.5% p.a.	0.5% p.a.
	Regional income growth vs. national average	Lower in large cities	Higher in large cities	Higher in large cities	Lower in large cities
	Regional population growth	Lower in large cities	Higher in large cities	Higher in large cities	Lower in large cities
Mode share	Cost of travel by car	12.5% less by 2043	12.5% greater by 2043	25% greater by 2043	As now
	Shift to city centre office based employment	No	Yes	Yes	No
	Productive use of travel time	As now	25% increase for commuting	12.5% commuting	As now

6.5 Long term demand scenarios

Figure 6.6 shows the forecasts for peak demand growth under the four scenarios for the principal regional centres in England. The forecasts for the Regional Urban market in Scotland and Wales (wholly within Wales) will be produced in their respective Route Studies, as agreed with stakeholders. The figures correspond to the level of growth expected by 2022/23 and 2042/43 as a result of the factors considered in the methodology described above. The forecasts exclude the impact of committed schemes because of the uncertainty of the scope and impact of enhancements that increase capacity into the regional centres. The key constraints for the Regional Urban market in the future will be about capacity for commuters in the peak into the regional centres. These constraints will be assessed in the next stages of the long term planning process. If constraints at locations other than the regional centres become apparent, it may be appropriate to assess the forecast demand for more localised markets.

The forecasts vary more by scenario than by regional centre, differences between regional centres is largely driven by small changes in expected population, employment and economic growth in each of the city regions. Slightly lower growth in each scenario for Liverpool and Newcastle is driven by slightly lower economic growth projections than the other regional centres.

In the last decade, the factors that affect rail's competitive advantage have been largely, but not entirely in rail's favour. Many regional centres have seen shifts of employment into city centre based office employment and increased congestion and car parking prices as a result, but the recession has meant that economic growth has been lower than expected. Therefore, the highest growth forecasts represent more favourable outcomes for rail than experienced in the last decade continuing in the future and all regional centres experiencing these outcomes, not just those that have experienced high growth in the past.

The range of forecasts between the scenarios is large, although the conditions assumed in the high growth scenarios are closest to the conditions experienced in the last decade. Therefore, in terms of determining conditional outputs and forming the case for option appraisal in the Route Studies, the highest growth forecasts will be used. The lower growth scenarios will be used to understand risk when appraising options.

The factors that are likely to have the largest impact on rail commuting demand are economic and employment growth and an expected shift to city centre based employment. As a result, growth is expected to be highest in the prospering in global stability scenario where both of these factors are strongest. An increase in commuting demand of between 38 per cent and 49 per cent is expected by 2022/23 in this scenario. Over a 30-year timescale, further economic and employment growth will drive rail commuting demand to increase by between 99 per cent and 115 per cent by 2042/43.

The shift to city centre based employment is assumed to happen in the short term and tail off over the 30 year period, this drives higher compound growth to 2023 than to 2043 (See Section 6.4).

Lower economic and employment growth is expected in the struggling in global turmoil scenario but a shift in employment to city centres is still expected. This drives relatively high growth to 2022/23 and lower growth from 2022/23 to 2042/43. In this scenario, rail commuting demand is expected to increase by between 27 per cent and 37 per cent by 2022/23 and between 55 per cent and 67 per cent by 2042/43.

In the prospering in isolation scenario economic and employment growth is expected to be high but a lack of shift to city centre based employment has a marked affect on rail commuting demand, particular to 2022/23. In this scenario, rail commuting demand is expected to increase by between seven per cent and 16 per cent by 2022/23 and between 44 per cent and 55 per cent by 2042/43.

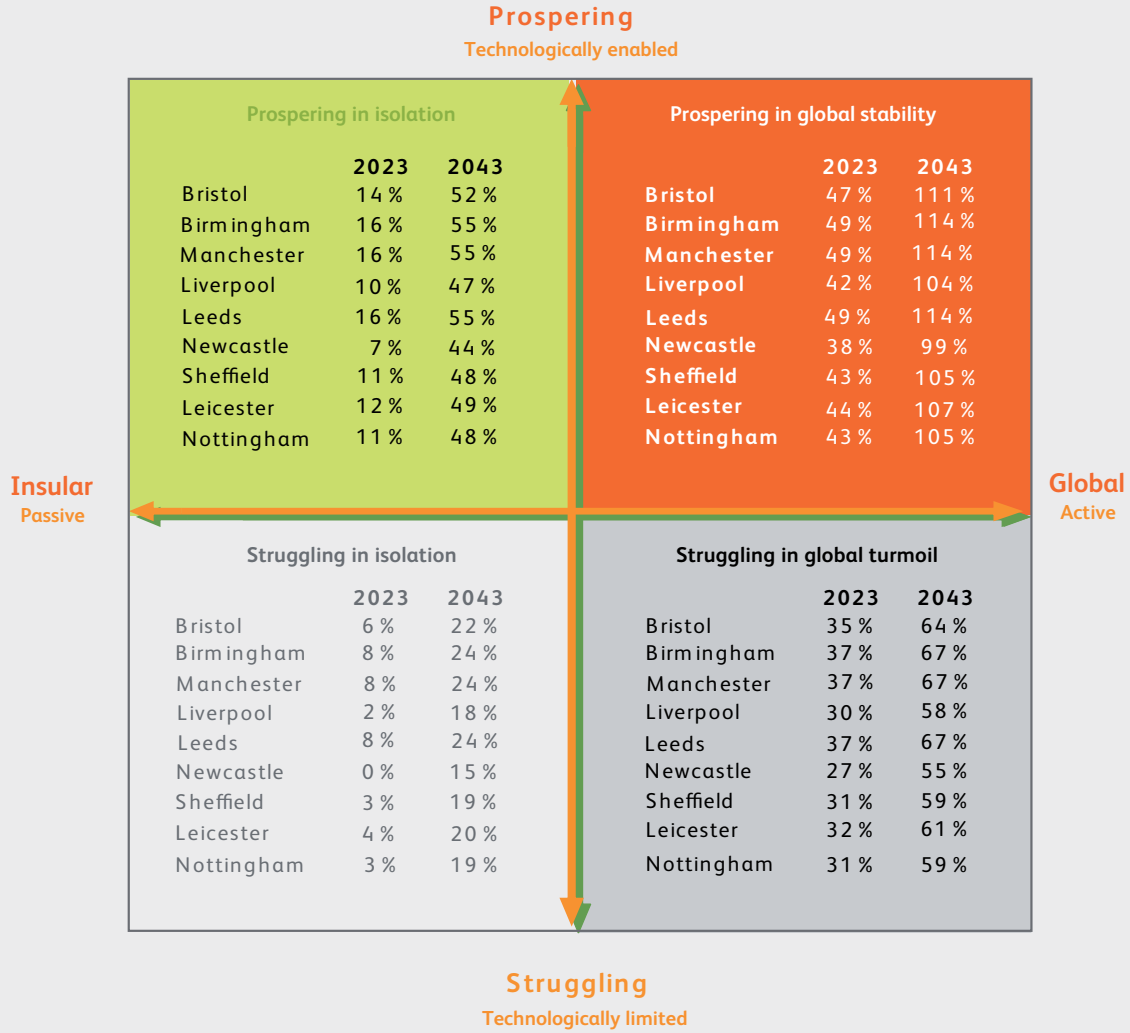
The struggling in isolation scenario demonstrates what could happen if the future holds little in the way of favourable outcomes for rail. Low economic and employment growth drive small changes in the total market for commuting demand and rail's mode share decreases slightly. In this scenario, rail commuting demand is expected to increase by between zero per cent and 10 per cent by 2022/23 and between 15 per cent and 25 per cent by 2042/43.

Key

GB Economy

GB social and environmental conscience

Figure 6.6 Peak demand growth into regional centres in England by 2022/23 and 2042/43



Prospering in isolation

	2023	2043
Bristol	14 %	52 %
Birmingham	16 %	55 %
Manchester	16 %	55 %
Liverpool	10 %	47 %
Leeds	16 %	55 %
Newcastle	7 %	44 %
Sheffield	11 %	48 %
Leicester	12 %	49 %
Nottingham	11 %	48 %

Prospering in global stability

	2023	2043
Bristol	47 %	111 %
Birmingham	49 %	114 %
Manchester	49 %	114 %
Liverpool	42 %	104 %
Leeds	49 %	114 %
Newcastle	38 %	99 %
Sheffield	43 %	105 %
Leicester	44 %	107 %
Nottingham	43 %	105 %

Struggling in isolation

	2023	2043
Bristol	6 %	22 %
Birmingham	8 %	24 %
Manchester	8 %	24 %
Liverpool	2 %	18 %
Leeds	8 %	24 %
Newcastle	0 %	15 %
Sheffield	3 %	19 %
Leicester	4 %	20 %
Nottingham	3 %	19 %

Struggling in global turmoil

	2023	2043
Bristol	35 %	64 %
Birmingham	37 %	67 %
Manchester	37 %	67 %
Liverpool	30 %	58 %
Leeds	37 %	67 %
Newcastle	27 %	55 %
Sheffield	31 %	59 %
Leicester	32 %	61 %
Nottingham	31 %	59 %

Notes: Does not include service changes

07 Long term conditional outputs – aspirations for 2043

The conditional outputs are conditional on a favourable assessment of value for money and affordability for current and potential future national and regional funders.

7.1 Introduction

This chapter presents an assessment and statement of the characteristics of the provision of services for the regional urban passenger market, which will be required to meet the long term strategic goals identified in Chapter 5. These required service characteristics are termed "conditional outputs".

The conditional outputs published in the three passenger market studies will be used in conjunction with the forecasts from the freight market study to form a statement of the long term aspirations for the remainder of the Long Term Planning Process (LTPP). In this process the Routes Studies, in particular, will:

- consider whether it is possible, given the capability of the current network, to accommodate all of the conditional outputs that relate to the route in question
- where it is not possible to accommodate all of the conditional outputs, identify packages of options to accommodate combinations of these outputs by first making best use of current infrastructure and then with changes to the current infrastructure capability
- assess the value for money of the of the options identified to deliver all of, or combinations of, the conditional outputs. The long term demand scenarios from Chapter 6 will form an input to these assessments, hence integrating the three deliverables of the market studies.

Given that the value for money of options to deliver the conditional outputs will not be undertaken until the Route Studies, and that funders would be unlikely to assess the affordability of these options until funding decisions are required, the conditional outputs from the Market Studies are conditional upon subsequent favourable assessments of value for money and affordability. They are therefore not recommendations for the funding of options to chance the specification of services or the capability of the network.

On this basis the conditional outputs have been developed using an assessment of how to deliver three of the four strategic goals from Chapter 5:

- **enabling economic growth**
  - *by providing sufficient capacity for employers to access the labour pool*
  - *by improving access to workers for businesses.*
  - *by improving connectivity to/from the retail, leisure and tourism sectors of the economy*
- **reducing carbon and the transport sectors' impact on the environment**
  - *by reducing the use of less carbon efficient modes of transport*
  - *by directly reducing the environmental impact of rail.*
- **improving the quality of life for communities and individuals**.
  - *by improving access to employment and training opportunities*
  - *by providing sufficient capacity for workers to access employment*
  - *by connecting communities*
  - *by providing access to social infrastructure such as educational establishments and major leisure venues*
  - *by reducing road congestion.*

However, they have not been based on an explicit assessment of the fourth goal (although supporting commentary is provided where appropriate):

- **improving affordability and value for money for Government and other funders**
  - *by meeting other outputs in an affordable and value for money way*
  - *by directly reducing whole industry subsidy*
  - *by improving the value for money for passengers and taxpayers.*

This goal will be considered in the remainder of the LTPP such as the Route Studies and subsequent decision making processes. The conditional outputs are conditional on a favourable assessment of value for money and affordability for current and potential future national and regional funders. They should therefore be viewed as desirable outputs based on the benefits they generate.

It is important to emphasise that improvements to rail services are only one of the conditions required to generate funders' desired outcomes, and the conditional outputs should be viewed in the context of rail's role in a wider policy framework. Equally the conditional outputs will need to be deliverable both technologically and physically, so when setting them a realistic view needs to be taken, given that some may never be able to be delivered as a result of topography or railway geography. Lastly the Regional Urban market is one of the markets present on much of the railway and the nature of a mixed traffic (or market) network means that Route Studies will need to examine the trade offs between potentially conflicting conditional outputs when considering how they can be accommodated both within a market and across all markets.

The conditional output between two places where the market is predominately for the purpose of business or leisure over a long distance and/or one or both places fall outside the Regional Urban market have been considered in the Long Distance Market Study. – See Chapter 2 for a more detailed explanation of the Regional Urban market. The conditional outputs will, where appropriate, incorporate the output from the Long Distance Market Study.

7.2 Developing a framework for conditional outputs

This section provides an evidence base to support the development of conditional outputs by demonstrating how rail in the Regional Urban market can best support the delivery of the strategic goals of the transport sector.

The starting point for developing the conditional outputs was the list of themes developed through the first round of Regional Group meetings discussed in Chapter 5.

This list, (repeated below), represents the potential means by which the supply of rail services to the Regional Urban passenger market can positively influence outcomes relating to the economy, environment and quality of life for communities and individuals, particular in deprived areas.:

- improve connectivity between population areas and employment areas Section 7.2.1
- improve connectivity between deprived areas of high deprivation and employment areas Section 7.2.2
- provide sufficient capacity to meet demand Section 7.3
- passenger satisfaction, particularly in relation to rolling stock and station environment Section 7.4.3
- competitive prices compared to other modes and improved pricing and ticketing. Section 7.4.5.
- improve intra-regional connectivity Section 7.2.1
- improve access to High Speed 2 stations, major airports and ports (for use of passengers and employees) Section 7.4.1
- improve connectivity to tourism centres Section 7.2.1
- improve access to further and higher education establishments and other social infrastructure Section 7.4.2
- directly reduce the environmental impact of rail Section 7.2.3
- improve rail's competitiveness to abstract trips from congested roads Section 7.2.3
- connecting communities Section 7.2.1
- Access to the rail network section 7.4.4

These themes were investigated using a combination of discussion with stakeholders, review of the literature summarised in Chapter 4 and primary research to understand the effect of service improvements on the strategic goals. This research is summarised below, and has been used to develop a framework for the conditional outputs relating to Regional Urban service levels detailed in Section 7.5.

Development of the long term demand scenarios detailed in Chapter 6 informs the capacity based conditional outputs presented in Section 7.3.

7.2.1 Assessment of the economic impact of rail service levels

Improving transport links for commuters into commercial and employment centres helps to drive economic growth through improved supply of labour to employment. Employers with a larger pool of labour to choose from are more likely to employ someone with the right skills to meet their needs; this will improve the productivity of their business, and in turn has an impact on economic growth. Prospective employees will be willing to commute longer distances to find employment if the generalised cost (perceived cost including ticket price, journey time, station access, parking costs and interchange) of travel is less than the perceived benefit of exploiting the employment opportunities further afield. This argument generates two hypotheses:

- as the generalised cost of travel increases, people are less willing to exploit employment opportunities further afield
- employment areas with a lower generalised cost of travel to a high number of people will have relatively high business productivity.

By looking at the pattern of travel around West Yorkshire, it is possible to determine a relationship between increased cost of travel and deterring employees from finding employment.

It shows that most people are willing to commute if the Generalised Journey Time (GJT) is less than approximately 20 minutes, therefore incremental improvements to these types of flows has very little impact. Very few people are willing to commute if the GJT is over 60 minutes, and improving services for commuting trips in this range will have a small impact unless the GJT can be reduced to significantly less than 60 minutes. People's willingness to commute is most sensitive between 20 and 60 minutes, and improvements in this range will have a large impact.

Rail can only influence willingness to commute if it is competitive with other modes of transport. As discussed in Chapter 2, Rail has a natural competitive advantage for travel into large urban centres where there is pressure on road infrastructure and parking and over longer distances where journey times begin to matter more than frequency.

By looking at people's willingness to travel, it is possible to show the number of prospective employees that are willing to travel to an area to show how well connected each area is to labour. A positive relationship can be shown between labour connectivity and Gross Domestic Product per capita (a measure of business productivity) of an employment area; demonstrating a link between labour connectivity and economic growth.

This analysis suggests that improving Regional Urban rail services will have the highest impact on economic growth for flows where all of the following is true:

- willingness to commute is very sensitive to changes in generalised cost
- the number of jobs in the catchment of the destination station is relatively high
- the number of people in the population catchment of the origin station is relatively high.
- rail is competitive in the market for travel or has the potential to be competitive.

7.2.2 Assessment of the impact of rail service levels on the quality of life for communities and individuals

The impact of Regional Urban rail on the quality of life for communities and individuals has been assessed in two ways. Firstly, by looking at the value of time for people travelling and secondly by looking at how improving rail services can reduce income deprivation in deprived areas.

The value of time for people travelling is based on the Department for Transport's (DfT's) transport appraisal guidance (WebTAG) and takes account of the number of people currently travelling by rail and the sensitivity of that market to changes in generalised cost. However, this approach does little to identify the specific impact that rail can have on deprived communities so further analysis in this area has been completed.

Similar to the analysis of the impact on economic growth of increasing labour supply to businesses, improving the links between people and jobs can also provide more opportunities for people in deprived communities. Reducing the perceived cost of travel can make commuting to find employment more attractive and open up new opportunities. This argument generates two hypotheses:

- as the generalised cost of travel increases, people are less willing to exploit employment opportunities further afield
- populations with a low cost of travel to a high number of jobs will have a relatively low measure of income deprivation.

In a similar manner to the methodology detailed in Section 7.2.1 above, understanding how people are deterred from commuting allows the measurement of an area's access to employment. Looking at the link between access to employment and the proportion of people claiming income support shows a statistically significant negative relationship. This demonstrates that as access to employment increases income deprivation falls. However, it should be noted that arguing the causal link between improving access to employment through transport and reduced deprivation is difficult. Whilst there may be certain situations where transport is a significant barrier and a significant difference can be made by improving transport, there are many barriers to reducing deprivation such as housing, education and skills, social and demographic factors that may be more effective.

This analysis demonstrates that improving Regional Urban rail services will have the highest impact on the quality of life for communities and individuals where all of the following is true:

- the potential rail market is large
- rail's market share is sensitive to changes in generalised cost (though, given the quality of data this is difficult to assess on a quantitative basis)
- willingness to commute is sensitive to changes in generalised cost
- income deprivation in the catchment of the origin station is relatively high
- the number of jobs in the catchment of the destination station is relatively high
- the number of people in the population catchment of the origin station is relatively high.

7.2.3 Assessment of the environmental impact of rail service levels

Rail has a relatively low environmental impact per passenger mile compared to other modes of transport. Improving rail services by improving frequency, journey times, and the quality of rail products encourages modal shift from road to rail.

The assessment of the environmental impact of improvements to Regional Urban rail services is based on an application of the DfT's WebTAG appraisal guidance. This approach estimates the modal shift from road to rail generated by an improvement in rail journey times (including time spent waiting for a train).

This analysis demonstrates that improving Regional Urban rail services will have the best impact on the environment where:

- rail has the potential to capture a large share of the total market for travel
- the market for overall travel is large
- growth in rail demand would derive primarily from modal shift rather than creating additional mobility.

7.3 Long term conditional outputs related to capacity

Given the contribution that the provision of services in the Regional Urban market makes to the economy, the environment and the quality of life for communities and individuals, accommodating future passenger demand is an important means of delivering the strategic goals.

The conditional output related to capacity is therefore to plan to accommodate the high end of the background growth projections by 2043, plus any further demand that is forecast as a result of schemes which are committed over this period. This assessment will be completed in the relevant Route Study.

Passenger capacity constraints are not specific to trains at peak times into urban centres, overcrowding is driven by a number of other different factors including tourism, in particular seasonal tourism, off-peak and weekend shopping, leisure trips and major events. The rail industry should continue to understand these drivers and improve upon its ability to manage capacity problems outside of peak times at urban centres.

7.4 Other conditional outputs

It is not appropriate to quantify all of the conditional output themes as they either do not relate directly to service level provision for the Regional Urban market, or are too bespoke to undertake a numerate analysis. It is however important to articulate these outputs as they will both enable the positive impact of the service level and capacity based outputs detailed above, and contribute to a likely successful outcome against the strategic goals.

7.4.1 Conditional outputs related to improving access to long distance transport gateways

Regional urban rail can play an important role in supporting the long distance market sector in meeting its strategic goals by improving access to long distance transport gateways.

Three types of long distance travel gateway have been considered, namely; long distance strategic rail interchanges, major and large airports and major ports.

Long distance strategic rail interchanges. The Regional Urban market can play a key role in supporting the strategic goals of the long distance market by improving shorter distance connections to strategic long distance stations. This is more pertinent in the context of High Speed 2 that could provide a number of long distance stations providing high speed connections between regional centres and London. High speed rail will drive regional urban rail trips as a connector to the long distance network and as an attractor of business activity and jobs into regional centres. A conditional output of the Regional Urban market is to provide connections to the long distance network including high speed rail

Major and large airports. The UK is served by one major airport, Heathrow, and several other large airports including Gatwick, Manchester, Stansted, Birmingham and Glasgow. These airports provide connectivity between Britain's cities and to international business markets, and are an important source of international access to tourist locations in Britain.

Airport policy for London and the UK is currently under review by Government. The findings of the Davies Airports Commission, due to make their final report in 2015, will be considered by the Government. In particular, it is considering the various options for expanding airport capacity in order to maintain the UK's position as Europe's most important aviation hub. Likely scenarios to be considered could potentially include expanding Heathrow or building a new hub airport near the Thames Estuary, together with proposals for additional runway capacity at Gatwick and elsewhere.

Good rail connectivity to major and large airports (circa five million passengers or more) is important in supporting economic growth, productivity and social mobility. It can play a key role in providing better access to markets, national and international destinations, business and leisure opportunities, and to jobs. New and improved rail services and their integration with other transport modes at major airports are key to providing more sustainable travel opportunities and improving overall connectivity. Rail is a vital ingredient in improving the travel experience and offering for passengers, employees and freight and in helping airports meet current and future travel demand.

Regional urban rail services should be able to meet the growing demand of short distance connectivity to major airports and earlier morning and later evening rail services should also be considered. As with other services in this study, key measurables are capacity, frequency, journey time and ease of transfer.

Major ports. Rail access to ports is primarily driven by freight requirements. However, ports are also large employers. Rail is not usually an attractive mode of access for port workers, as the sheer scale of the site often requires vehicular access within it.

Capacity and connectivity for any rail passenger traffic to ports should be considered on a case by case basis where necessary, either within the relevant Route Study or as a standalone scheme.

7.4.2 Conditional outputs related to improved access to educational establishments and social infrastructure

The potential for services to improve accessibility to education establishments and social infrastructure such as universities, colleges and hospitals should be considered in the next stage of the LTPP, particularly where they are not adequately represented by the service level conditional outputs. This will contribute to the strategic goal of improving the quality of life of communities and individuals as well as to economic growth by enabling the skills of the labour force to be improved.

Leisure and tourism can be significant drivers of demand particularly on some rural corridors, in the evenings and at weekends. Providing evening and weekend connectivity and capacity is a conditional output.

7.4.3 Conditional outputs related to improved passenger satisfaction

Passengers travel experiences are also important and affect mode choice and demand for rail. The industry will continue to seek to improve station environments, the quality, capacity and consistency of rolling stock, the availability of information to passengers and train punctuality. Rolling stock needs to meet the requirements and expectation of passengers and to enable an efficient provision of rail services.

7.4.4 Conditional outputs related to improved access to the rail network to cater for demand

In many cases, improving access to the existing rail network is the equivalent of improvements to rail journey times.

Good connectivity and accessibility of rail stations are important in attracting passengers to travel by rail. Car parking spaces need to be adequate to meet increasing demand. Integration with local transport such as buses and good station access and facilities for pedestrians and cyclists are also required to encourage rail travel while maximising the use of sustainable modes of access.

In some cases, new stations and new lines can have a significant impact on the ability of people to access the rail network. However, aspirations for new stations and new lines have not been formalised into conditional outputs for consideration in the Route Studies. Sponsorship of new lines and new stations to improve access to the rail network is the responsibility of local authorities, PTEs and other stakeholders.

7.4.5 Conditional outputs related to competitive rail prices compared to other modes and better ticketing

There is a balance between using pricing to support the other conditional outputs and industry affordability. The split of rail industry funding between passengers and taxpayers is an important consideration for other industry planning activities such as the Department for Transport's (DfT) ongoing rail fares and ticketing review.

7.5 Framework for developing service level conditional outputs for the Regional Urban market

To develop the conditional outputs for the Regional Urban market set out in Appendices B – G the following information has been taken into account:

- an assessment of the conditions against the criteria set out in Section 7.2 and above where Regional Urban rail can have the largest impact on economic growth, quality of life for communities and individuals and the environment
- the outputs from the Long Distance Market Study
- a review of literature
- consultation with stakeholders to understand local market drivers and issues and to provide consistency across different areas

Service level conditional outputs on a corridor have been recommended where all of the following conditions have been met:

- there is an aspiration for an improved service
- there are reasonable opportunities to improve the service
- there is a favourable assessment of the conditions against the criteria set out in Section 7.2.

07 Long term conditional outputs – aspirations for 2043

Conditional outputs are aspirations that the industry should seek to deliver conditional on a favourable assessment against affordability and value for money criteria.

Regional Urban conditional outputs for each route have been developed in collaboration with stakeholders through two sets of regional group meetings and one-to-one meetings with stakeholders and through correspondence. This process allowed for the consistent assessment of conditions against the criteria across the country overseen by stakeholders representing organisations with a wide geographical remit such as Network Rail, DfT, Office of Rail Regulation (ORR) and Passenger Transport Executives (PTEs); and the inclusion of evidence of local factors that influence the Regional Urban market overseen by stakeholders representing organisations with a smaller geographical remit such as, passenger operators, Local Enterprise Partnerships (LEPs) and local authorities.

The aim of this Market Study is to determine the conditional outputs that the industry should aspire to achieve as part of the ongoing Long Term Planning Process. In practice, the Route Studies will develop service specification options that reflect the conditional outputs from all of the relevant Market Studies to form a starting point for option development and appraisal.

Conditional outputs are being set in the context of a 30 year time frame but also in the context of evidence that we have now. Unforeseen changes in the future may drive different recommendations, and future assessments of market drivers to inform long term planning should re-examine evidence and amend recommendations accordingly.

The appendices are split by region and then into sub regions usually centred on one regional urban centre such as Leeds or Manchester or smaller centres such as Lincoln or Exeter. These sub regions are usually split into radial corridors around the main employment centre. Many stations and corridors are included in more than one Appendix, this is necessary when demand to and from this corridor is driven by more than one urban centre or other significant driver of demand. The map Figure 7.1 can be used to see which Appendix describe the conditional outputs for each rail corridor.

For each sub region, the drivers of Regional Urban rail demand are described including significant areas of employment, how employment might change in an area, committed changes in rail services and investment and other significant drivers of rail demand such as major airports or long distance interchange stations.

Demographic and socio-economic factors and the level of service from each station on a corridor is then described in the context of the Regional Urban centre in question. This shows the opportunities to improve services and sets each corridor against the criteria for developing conditional outputs set out in Section 7.2. Where there are opportunities to improve services and the majority of criteria for developing conditional outputs are met, the Regional Urban Market Study recommends a conditional output to improve services.

The appendices also describe conditional outputs that are specific to the region such as access to major airports or the development of cross-urban centre connectivity.

Key

Appendix B: East Midlands + Norfolk
Appendix C: North East
Appendix D: North West
Appendix E: South West
Appendix F: West Midlands
Appendix G: Yorkshire and the Humber

Figure 7.1 - Service level conditional outputs for the Regional Urban market by Regional centres

Notes: Wales and Scotland will be considered separately in the Route studies, as agreed with our stakeholders

08 Consultation

This section of the document sets out how the Regional Urban Market Study has been managed, how stakeholders have responded to the Draft for Consultation published in April 2013

The Long Term Planning Process (LTPP) has taken an inclusive and consultative approach from the outset. As a new approach to industry planning, it has been important to develop the process so that it allows an opportunity for all interested stakeholders, both within, and outside the rail industry, to contribute if they are interested in influencing the rail industry's plans for the future.

8.1 Development of the process

The Long Term Planning Process has been designed to build on the strengths of the preceding Route Utilisation Strategy process, whilst taking into account the recommendations of the 'Rail Value for Money Study (the McNulty Report)'. The process is led by the Rail Industry Planning Group comprising of key representatives from the rail industry including Association of Train Operating Companies (ATOC), Department for Transport, Freight Operators, London Travelwatch, Network Rail, Office of Rail Regulation, Passenger Focus, Passenger Transport Executive Group (PTEG), Rail Freight Group, Rail Freight Operators Association, Railway Industry Association, Rolling Stock Companies, Transport Scotland, and Welsh Government. As such, the development of the process prior to launch of the Market Studies was led by a cross-industry group enabling views from across passenger, freight, government and regulatory bodies to be taken into account and incorporated into the Long term Planning Process at a high level.

8.2 Regional Urban Market Study – Study Development

Consultation and guidance of the work during the development of the Regional Urban Market Study has been extensive and at a number of levels. There have been three key groups guiding the development of the work:

- Rail Industry Planning Group
- Regional Urban Market Study Working Group
- 'Regional group' meetings

The general approach of Rail Industry Planning Group has been set out above and in relation to the Regional Urban Market Study, it has provided a strategic overview of the work and a link between the LTPP and other industry planning processes. The Rail Industry Planning Group has met on a quarterly basis during the development of the Regional Urban Market Study.

The Regional Urban Market Study Working Group was established to steer, challenge and monitor progress of the work as well as to agree the publication of the Draft for Consultation and this final study.

'Regional group' meetings have been held throughout the development of the Regional Urban Market Study to ensure that local stakeholders were aware of the process and could contribute to the formulation of the strategic goals and conditionals outputs as they were developed.

In addition to all the meetings above, a large number of one to one meetings with interested parties, both within and outside the rail industry have been held to guide and develop the work.

8.3 Consultation process

The Regional Urban Market Study Draft for Consultation was published on the Network Rail website on 26th April 2013. A period of three months was given to allow stakeholders to respond with the consultation period ending on 26th July 2013.

The Draft for Consultation articulated a methodology for determining service level conditional outputs using West Yorkshire and specifically the corridors around Leeds as an example. During the consultation period, a number of 'regional group' meetings were held around the country to discuss and agree conditional outputs relating to the other regional centres. The meetings were particularly helpful in bringing a local focus with respect to economic development plans and special and housing development. Attendees at these meetings included representatives from County Councils, Unitary Authorities, Local Enterprise Partnerships, local Train Operators and Passenger Transport Executives, To ensure that as many stakeholders as possible had the opportunity to input, a number of one to one meetings and follow up discussions have been held. The conditional outputs for all regional centres can be found in Appendices B – G

8.4 Consultation responses

A total of 63 responses were received and these are broken down as follows::

Train Operating Companies	4
Government and local authorities	33
Airports	1
Members of Parliament	1
User Groups	18
Members of the public	6

Copies of the various responses can be found on the Network rail website at **www.networkrail.co.uk**.

8.5 Key themes in the consultation responses

The responses received were varied and in many cases comprehensive. Therefore, only the key and recurring themes are summarised below.

In general, respondents expressed support for the approach being taken by the industry in developing the Long Term Planning Process and understood the rationale for examining the various markets using the method developed by the rail industry. Clarification was sought on how the market studies will be used going forward.

An expansion of the conditional outputs relating to improving access to long distance transport gateways has been developed in Chapter 7 to reflect connectivity to the airports. ports and the wider long distance rail travel market. Regional Urban rail can play an important role in supporting the long distance market sector in meeting its strategic goals by improving access to long distance transport gateways.

Three types of long distance travel gateway have been considered, namely; long distance strategic rail interchanges, major and large airports and major ports.

In Chapter 5 the definition of Strategic Goals has been expanded to make clear that affordability as well as value for money would be a key determinant of any proposed interventions.

A small technical appendix (Appendix H) has been included to further clarify the forecasting methodology used for the Market Studies.

There were a number of responses detailing local issues and where these are not part of the market studies these have been noted for consideration in the next stage of the Long term Planning Process.

The key summary comments set out above have been used to inform the final changes throughout this document and in discussion with the Working Group, have greatly aided the completion of this study.

The consultation responses are being published on the Network Rail website, unless indicated as confidential or not for publication, alongside this document at www. **networkrail.co.uk**.

The Regional Urban Market Study Working Group wishes to offer thanks to those individuals and organisations who have contributed either by responding to the Regional Urban Market Study Draft for Consultation or those who have helped inform and develop the service level conditional outputs for the Regional Centres detailed in Appendix B – G.

The Regional Urban Market Study will become established 60 days after publication unless the Office of Rail Regulation issues a notice of objections within this period.

8.6. Planning for Control period 6 and beyond

As detailed in Chapter 1 the output from both this and the other Market Studies will be brought together under the auspices of the Route Studies which will present the case for continuing investment in the rail sector to funders. The Route Studies will inform plans for Control Period 6, the period from 2019 onwards.

Appendix A: Framework for developing service level conditional outputs for the Regional Urban Market

Appendix A: Framework for developing service level conditional outputs for the Regional Urban market

To develop the conditional outputs for the regional urban market set out in Appendices B to G the following information has been taken into account:

- An assessment of the conditions against the criteria set out in Section 7.2 of Chapter 7 where Regional Urban rail can have the largest impact on economic growth, quality of life for communities and individuals and the environment.
- The outputs from the Long Distance Market Study.
- A review of literature.
- Consultation with stakeholders to understand local market drivers and issues and to provide consistency across different areas.

Service level conditional outputs on a corridor have been recommended where all of the following conditions have been met:

- There is an aspiration for an improved service.
- There are reasonable opportunities to improve the service.
- There is a favourable assessment of the conditions against the criteria set out in Section 7.2.

Conditional outputs are aspirations that the industry should seek to deliver conditional on a favourable assessment against affordability and value for money criteria.

Regional Urban conditional outputs for each route have been developed in collaboration with stakeholders through two sets of regional group meetings, one-to-one meetings with individual stakeholders and through correspondence. This process allowed for consistency across the country overseen by stakeholders with a wide geographical remit such as Network Rail, Department for Transport, Office of Rail Regulation (ORR) and Passenger Transport Executives (PTEs); and the inclusion of local evidence overseen by stakeholders with a smaller geographical remit such as passenger operators, Local Enterprise Partnerships (LEPs) and local authorities.

The aim of this Market Study is to determine the conditional outputs that the industry should aspire to achieve as part of the ongoing Long Term Planning Process. In practice, the Route Studies will develop service specification options that reflect the conditional outputs from all of the relevant Market Studies to form a starting point for option development and appraisal.

Conditional outputs are being set in the context of a 30 year time frame but also in the context of evidence that we have now. Unforeseen changes in the future may drive different recommendations, and future assessments should re-examine evidence and amend recommendations accordingly.

The appendices are split by region and then into sub regions usually centred on one regional urban centre such as Leeds or Manchester or smaller centres such as Lincoln or Exeter. These sub regions are usually split into radial corridors around the main employment centre. Many stations and corridors are included in more than one appendix, this is necessary when demand to and from this corridor is driven by more than one urban centre or other significant driver of demand. The map in Chapter 7 can be used to see which appendix describes the conditional outputs for each rail corridor.

For each sub region, the drivers of regional urban rail demand are described including significant areas of employment, how employment might change in an area, committed changes in rail services and investment and other significant drivers of rail demand such as major airports or long distance interchange stations.

Demographic and socio-economic factors and the level of service from each station on a corridor is then described in the context of the Regional Urban centre in question. This shows the opportunities to improve services and sets each corridor against the criteria for developing conditional outputs set out in Section 7.2. Where there are opportunities to improve services and the majority of criteria for developing conditional outputs are met, the regional urban market recommends a conditional output to improve services.

For some corridors an analysis of the value of meeting conditional outputs against the strategic goals has been completed. This is intended as a quantitative check to make sure that the conditional outputs that best meet the strategic goals on a corridor are recommended. The analysis should not be used to compare from one region to another and is not a fully comprehensive (WEBTAG compliant) assessment of the value of improving services. This analysis has only been completed for corridors into the nine urban centres where forecasts have been produced in Chapter 6. This is for two reasons, firstly the methodology focusses on the impact of improving services into one city centre terminus or group of termini (central Manchester stations for example) labour supply and is only fairly applied to corridors where the primary rail market driver is commuting into an urban centre; secondly the method has a tendency to underpredict the impact of service improvements on market share where rail's existing market share is already very low. A more detailed description of the method used and a summary of its strengths and weaknesses can be found in Appendix H.

To inform choices for funders, a much more comprehensive assessment of the value of services will be required in the Route Studies that will include the impact on revenue, operating costs, user and non user benefits to all passengers affected by an improved service, not just those passengers travelling into a an urban centre.

The appendices also describe conditional outputs that are specific to the region such as access to major airports or the development of cross-urban centre connectivity.

Appendix B Service level conditional outputs for the East Midlands and Norfolk

Appendix B: Service level conditional outputs for the East Midlands and Norfolk

This Appendix details the service level conditional outputs for Nottingham, Leicester, Derby, Lincoln, Grimsby and Norwich

B.1 Service level conditional outputs for corridors centred on Nottingham

This section is an interpretation of the Regional Urban conditional outputs for the East Midlands, disaggregated by the rail corridors into Nottingham. This study looks at services between regional centres within the East Midlands; the Long Distance Market Study will cover the conditional outputs pertinent to the long distance market.

The East Midlands is one of the fastest growing regions in the UK and Nottingham, as a Core City is an important driver of the national economy. It attracts many local passengers travelling for the purpose of commuting, leisure, business or educational activities, bolstered by Nottingham's two Universities, Science City Status and future Enterprise Zone growth. Travel will also continue to grow as the Greater Nottingham area has been designated as a Growth Point area, with a recognised need to invest in transport infrastructure to support this growth supported by Nottingham's Local Transport Plan and Growth Plan documents . There is also a large amount of travel between Nottingham and other places outside the East Midlands region, such as London, Birmingham, Sheffield, Manchester and Liverpool.

The main competition for the long distance high speed (LDHS) services is from car and coach travel. The M1 motorway lies parallel to the Midland Main Line and key roads connect it with the three main cities in the East Midlands. The road network parallels much of the core rail network and provides an attractive alternative for customers making cross-country journeys. Addressing poor journey times and the provision of direct services are therefore critical issues for rail on these corridors.

Nottingham is part of the first wave of core cities to achieve City Deal Status. This will give more accountability to the region in exchange for more powers to encourage jobs and growth in the area.

The Government recently announced that the High Speed Rail network would include a station at Toton (between Nottingham and Derby).

For the purpose of this market study, this section is organised into a description of the conditional outputs relating to each of the following corridors into Nottingham:

- Worksop and Mansfield.
- Lincoln and Newark Castle.
- Skegness, Boston, Sleaford, Grantham and Peterborough.
- Leicester.
- Birmingham, Matlock and Derby.
- Sheffield and Chesterfield.

B.1.1 Worksop and Mansfield

This corridor provides connectivity between Mansfield, Worksop and Nottingham, and connections to Sheffield via Worksop. Noittingham drives commuting trips on the corridor, and Mansfield is an employment centre in its own right.

The corridor is served by a slow stopping service serving Worksop and Mansfield and a number of relatively small communities. The railway has single line sections and low linespeeds.

B.1.1.1 Current services:

- One service per hour from Worksop to Nottingham services calling at Whitwell, Creswell, Langwith Whaley Thorns, Shirebrook, Mansfield Woodhouse, Mansfield, Sutton Parkway, Kirkby-in-Ashfield, Newstead, Hucknall and Bulwell.
- One service per hour (two in the peak) Mansfield Woodhouse to Nottingham services calling at Mansfield, Sutton Parkway, Kirkby-in-Ashfield, Newstead and Hucknall.

Service level conditional outputs for the East Midlands and Norfolk - corridors centred on Nottingham

B.1.1.2 Journey times and rolling stock:

- **Journey times/speeds**: The journey times are slow; average speed is low due to frequent stops and low linespeeds.
- **Rolling stock**: Early generation diesel stock with low acceleration.

B.1.1.3 Criteria for conditional outputs:

- **Willingness to commute:** The generalised journey times (GJT) for stations between Mansfield Town and Nottingham varies between 40 and close to 60 minutes. Improving journey times or frequency of services from these stations could improve the willingness of passengers to commute within their station catchments.
- **Jobs at destination:** Nottingham is a key urban centre in the East Midlands, attracting many local passengers for the purpose of commuting; it has the tenth highest employment rate of all cities in Great Britain.
- **Population catchments**: The 2011 census shows that the populations of Mansfield (99,600) and Ashfield (111,400) are similar to Chesterfield (103,800). Mansfield is one of the most densely populated districts in England outside London, with 3500 residents per square mile and most live within easy reach of a station. North of Mansfield Woodhouse, the population catchments are relatively small.
- **Market for rail**: The highest demand along this route is from Mansfield, Kirkby-in-Ashfield and Sutton Parkway.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share:** The motorway network provides a significantly faster journey time and has the competitive advantage over rail. The Nottingham Express Transit tram network serves the southern section of this route between Hucknall and Nottingham and although the end to end journey times are slower, the service is more frequent and serves more destinations within central Nottingham.

B.1.1.4 Recommendations for conditional outputs:

- Reduce journey time to improve rail's competitive advantage over the car.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

B.1.1.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Mansfield Woodhouse, Mansfield Town, Sutton Parkway, Kirkby-in-Ashfield and Hucknall on this corridor into Nottingham will have the largest impact on labour supply and reducing deprivation by providing access to employment. A half hourly frequency from these stations and a journey time speed of 40mph (reflecting a fast outer suburban service) could reduce the GJT to Nottingham by between 8 minutes for Hucknall and 12 to 17 minutes for the other stations named above. The impact of these improvements from these stations to Nottingham on Gross Value Added (GVA) through labour supply improvements is estimated to be around £42,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £110,000 per annum per minute of GJT. Smaller stations on the route and stations to Worksop either serve a small catchment population or the GJT cannot be improved enough to attract commuters into Nottingham. Improvements to services between Worksop, Mansfield and Nottingham may also be driven by business to business connectivity.

Table 1 Population, demand and current service for stations on the Worksop and Mansfield routes into Nottingham to inform conditional outputs												
Corridor	Station name	Total Journeys into Nottingham* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Nottingham	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Worksop and Mansfield	Worksop	35	464	9,700	23,000	2,600	32	1 (1)	80 (65)	106	24 (18)	
	Whitwell	5	24	4,000	2,300	10,200	27	1 (1)	56 (54)	96	29 (17)	
	Creswell	10	45	2,300	7,700	5,100	26	1 (1)	54 (51)	93	29 (17)	
	Langwith	4	26	0	11,100	10,500	24	1 (1)	49 (47)	89	29 (16)	
	Shirebrook	29	67	3,500	7,600	21,900	22	1 (1)	45 (43)	85	29 (15)	
	Mansfield Woodhouse	109	160	4,500	37,300	40,300	19	1 (1)	37 (37)	71	30 (16)	
	Mansfield Town	145	367	8,100	42,800	38,800	17	2 (1)	34 (32)	66	30 (15)	
	Sutton Parkway	94	140	2,200	35,500	33,800	14	2 (1)	28 (27)	61	30 (14)	
	Kirkby-in-Ashfield	104	176	6,900	21,400	32,500	13	2 (1)	25 (24)	58	31 (14)	
	Newstead	16	35	0	11,700	35,600	11	2 (1)	20 (19)	54	32 (12)	
	Hucknall	99	165	10,200	18,600	26,800	8	2 (3)	17 (14)	46	29 (11)	
	Bulwell	11	53	10,000	57,800	107,900	6	1 (3)	15 (9)	45	22 (7)	
Total		**661**	**1,723**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Nottingham between 0800 and 0900

Service level conditional outputs for the East Midlands and Norfolk - corridors centred on Nottingham

B.1.2 Lincoln and Newark

Newark is a government designated 'Growth point' that will see very significant population growth over the next 15 years. Newark & Sherwood District Council's strategy, as set out within the adopted Core Strategy Development Plan Document (DPD) and emerging Allocations & Development Management DPD is to deliver approximately 10,614 new dwellings and 220 hectares of employment land over the plan period (2006 – 2026) Of this 70 per cent of the housing and 157 hectares of employment (including up to 87 hectares of new allocations) will be within the Newark Urban Area. To help meet this growth the Core Strategy allocated three strategic sites:

- land south of Newark (which has outline planning permission for 3,150 dwellings, 50 hectares of employment and various community facilities),.
- land at Fernwood.
- land east of Newark.

This strategy seeks the comprehensive regeneration and redevelopment of the area and as such creates a number of opportunities for greater access to the station and the wider town centre.

Lincoln serves a wider population of 165,000 with projected housing growth of 19,000 homes between 2011 and 2031.

B.1.2.1 Current services:

- One service per hour from Lincoln Central to Nottingham calling at Newark Castle and other key stations on the route

B.1.2.2 Journey times and rolling stock.

- **Journey times/speeds**: The average journey times are high and speeds are low due to regular station stops and very low linespeeds.
- **Rolling stock**: Services are run by early generation diesel stock causing issues with passenger satisfaction.

B.1.2.3 Criteria for conditional outputs:

- **Willingness to commute**: The GJT for Lincoln and Newark are less than or close to 60 minutes so willingness to commute is sensitive to small improvements.
- **Jobs at destination:** Nottingham is a key urban centre in the East Midlands, attracting many local passengers for the purpose of commuting; it has the tenth highest employment rate of all cities in Great Britain.
- **Population catchments:** Lincoln, Newark and towns closer to Nottingham (such as Carlton and Burton Joyce) have relatively large populations.
- **Market for rail**: Demand from Lincoln and Newark is relatively high, all other stations have a small demand.
- **Deprivation:** There are pockets of deprivation on the route. **http://casa.oobrien.com/booth/**
- **Rail's market share:** Compared to other routes into Nottingham rail is a strong competitor with the car.

B.1.2.4 Recommendations for conditional outputs:

- To increase the competitiveness of rail travel along this corridor, journey times or frequency could be improved to decrease the GJT. However, for the vast majority of stations served, the GJT requires a significant reduction in order to improve willingness to commute.
- Improve frequency of services from Lincoln and Newark Castle to two trains per hour.
- Improve journey times to increase rail's competitive advantage with the road network.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

Service level conditional outputs for the East Midlands and Norfolk - corridors centred on Nottingham

B.1.2.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the GJT from Lincoln and Newark on this corridor into Nottingham will have the largest impact on labour supply and reducing deprivation by providing access to employment. A half hourly frequency from these stations and a journey time speed of 40mph (reflecting a fast outer suburban service) could reduce the GJT to Nottingham by 25 and 17 minutes, respectively. The impact of these improvements from Newark (both stations) to Nottingham on Gross Value Added (GVA) through labour supply improvements is estimated to be around £12,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £77,000 per annum per minute of GJT. Other stations on the route serve small catchment populations or are so close to Nottingham that rail tends to be uncompetitive against other more frequent modes. Improvements to services between Lincoln, Newark and Nottingham may also be driven by business to business connectivity.

Table 2 Population, demand and current services for stations on the Lincoln and Newark route to Nottingham to inform conditional outputs

Corridor	Station name	Total Journeys into Nottingham* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Nottingham	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Lincoln and Newark	Lincoln Central	172	1,655	11,800	34,900	31,500	33	1 (1)	56 (49)	100	35 (20)	
	Hykeham	8	35	2,100	27,900	27,300	30	<1 (1)	72 (46)	102	25 (18)	
	Swinderby	1	17	0	0	6,600	25	<1 (1)	58 (40)	97	26 (15)	
	Collingham	21	60	2,100	0	0	22	<1 (1)	58 (35)	85	23 (16)	
	Newark Castle	216	1,422	5,900	16,400	12,600	17	1 (1)	41(25)	69	25 (15)	
	Rolleston	2	4	900	0	9,900	14	<1 (1)	30 (26)	76	27 (11)	
	Fiskerton	5	11	900	0	8,800	13	<1 (1)	38 (18)	74	20 (10)	
	Bleasby	3	4	900	0	7,300	11	<1 (1)	38 (20)	72	18 (9)	
	Thurgarton	1	2	0	900	6,300	10	<1 (1)	28 (18)	76	21 (8)	
	Lowdham	18	42	1,200	3,100	7,500	8	<1 (1)	14 (11)	52	32 (9)	
	Burton Joyce	2	7	2,500	7,400	44,700	5	<1 (1)	36 (9)	67	9 (5)	
	Carlton	3	22	11,200	30,000	79,300	3	<1 (1)	19 (6)	55	10 (3)	
Total		**449**	**3,280**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Nottingham between 0800 and 0900

B.1.3 Boston/Sleaford and Peterborough/Grantham

Skegness remains a very popular seasonal tourist destination. In addition to day trippers, the area of coast between Skegness and Mablethorpe is home to the largest concentration of static caravans in western Europe. Road access to the coast is relatively poor, so rail travel is a popular option particular from the urban centres of the East Midlands. During the summer peak season East Midlands Trains provide longer rolling stock to provide capacity for the holiday makers.

B.1.3.1 Current services:

- One service per hour from Skegness to Nottingham calling at stations along the route with variations in stopping patterns.
- One service per hour from Ely/Norwich to Liverpool Lime Street calling at Peterborough, Grantham and Nottingham.

B.1.3.2 Journey times and rolling stock:

- **Journey times/speeds**: For the distance travelled, the journey times are relatively long; with slow average speeds due to frequent stopping.
- **Rolling stock**: Services are run by sprinter rolling stock with top speeds between 75 and 90mph.

B.1.3.3 Criteria for conditional outputs:

- **Willingness to commute**: The GJTs along this route are high; only Bingham has GJT less than 60 minutes and so is sensitive to small improvements in GJT.
- **Jobs at destination**: Nottingham is a key urban centre in the East Midlands, attracting many local passengers for the purpose of commuting; it has the tenth highest employment rate of all cities in Great Britain.
- **Population catchments:** The majority of towns along this route have relatively small populations within a 5km radius, barring Peterborough and Grantham.
- **Market for rail:** The majority of demand along this route is from Grantham.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share:** The road network dominates the market along this corridor as rail is competing with the A1 and A52.

B.1.3.4 Recommendations for conditional outputs:

- Improve journey times.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- Improve peak frequency from Grantham to Nottingham.

Service level conditional outputs for the East Midlands and Norfolk - corridors centred on Nottingham

B.1.3.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the GJT from Grantham on this corridor into Nottingham will have the largest impact on labour supply and reducing deprivation by providing access to employment. A half hourly frequency from this station and a journey time speed of 60mph (reflecting a fast interurban service) could reduce the GJT to Nottingham by 23 minutes to significantly less than 60 minutes. The impact of these improvements from this station to Nottingham on Gross Value Added (GVA) through labour supply improvements is estimated to be around £7,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £36,000 per annum per minute of GJT. Other stations on the route serve small catchment populations or the GJT cannot be improved enough to attract commuters into Nottingham. Improvements to services between Peterborough, Grantham and Nottingham may also be driven by business to business connectivity.

Table 3 Population, demand and current services for stations on the Boston/Sleaford and Peterborough/Grantham routes into Nottingham to inform conditional outputs

Corridor	Station name	Total Journeys into Nottingham* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Nottingham	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Boston and Sleaford	Boston	31	216	1,400	12,600	19,400	50	1 (0)	92 (74)	139	33 (22)	
	Hubberts Bridge	0	1	0	0	12,200	47	<1 (0)	109 (65)	256	26 (11)	
	Swineshead	0	2	0	1,500	1,300	43	<1 (0)	105 (80)	270	25 (10)	2 a day
	Heckington	4	65	2,400	1,400	0	39	1 (0)	77 (56)	124	30 (19)	
	Sleaford	19	337	6,900	6,100	2,700	34	1 (0)	74 (48)	115	27 (17)	
	Rauceby	0	2	0	4,400	10,100	32	<1 (1)	72 (65)	139	26 (14)	
	Ancaster	1	4	900	0	1,100	28	<1 (1)	79 (59)	130	21 (13)	4 a day off-peak
	Bottesford	33	57	2,500	0	0	15	<1 (1)	38 (23)	72	24 (13)	5 a day off-peak
	Elton & Orston	0	0	0	3,700	2,500	13	<1 (<1)	72 (25)	165	10 (5)	1 a day
	Aslockton	11	16	2,200	1,600	6,600	11	<1 (2)	42 (18)	67	15 (10)	4 a day off-peak
	Bingham	10	37	5,200	1,400	7,700	8	1 (2)	18 (12)	55	28 (9)	
	Radcliffe	1	8	4,100	3,200	35,500	5	<1 (1)	27 (10)	70	11 (4)	3 a day off-peak
	Netherfield	1	7	7,900	31,100	74,500	3	<1 (2)	44 (6)	95	5 (2)	
Total		**114**	**954**									
Peterborough	Peterborough	71	4,208	8,000	48,200	50,900	52	1 (1)	80 (65)	110	39 (28)	
	Grantham	178	1,120	8,500	21,700	4,500	22	2 (1)	37 (33)	71	36 (19)	4 a day off-peak
Total		**249**	**5,328**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Nottingham between 0800 and 0900

B.1.4 Leicester

Long Distance High speed serving Leicester into Nottingham originate from London St Pancras International

Barrow-upon-Soar, Sileby and Syston are in the suburban catchment of Leicester.

Electrification of the Midland Main Line will improve services on this route.

Both Broxtowe and Nottingham City Councils' Core Strategies identify the Boots site at Beeston as a strategic site for the delivery of housing and employment growth. It is proposed that 200,000 square metres of new business and commercial space is provided at the site. The Government has acknowledged the strategic potential of the site and has included the site within designated Nottinghamshire Enterprise Zone. This was in the first tranche of officially designated growth zones nationally.

B.1.4.1 Current services:

- Two services per hour London St Pancras International to Nottingham. One is a fast service from London St Pancras International with a calling pattern between Leicester and Nottingham of Leicester, East Midlands Parkway and Nottingham; the other a stopping train from London St Pancras International with a calling pattern between Leicester and Nottingham of Leicester, Loughborough, Beeston and Nottingham. Prior to reaching Leicester these services serve Kettering and Wellingborough.
- No direct services between Stamford and Nottingham. The Stamford route has services running from Stansted Airport to Birmingham New Street and is covered in the corridors into Leicester section of this appendix.

B.1.4.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey times are relatively quick compared with other corridors into Nottingham. However compared to other long distance high speed networks the journey times are slow.
- **Rolling stock:** Rolling stock with a top speed of 125mph.

B.1.4.3 Criteria for conditional outputs:

- **Willingness to commute:** The opportunity to improve willingness to commute along this corridor is greatest for stations between Loughborough and Nottingham, where the GJTs are less than 60 minutes.
- **Jobs at destination:** Nottingham is a key urban centre in the East Midlands, attracting many local passengers for the purpose of commuting; it has the tenth highest employment rate of all cities in Great Britain.
- **Population catchments:** The largest population catchments along this route are Leicester, Loughborough and Beeston.
- **Market for rail:** The highest demand on this route is from Leicester, Loughborough and Beeston.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share:** In terms of journey times, the road network has the competitive advantage over rail.

B.1.4.4 Recommendations for conditional outputs:

- The Long Distance Market Study recommends improving the service between Leicester and Nottingham.
- Increase frequency of services from Loughborough.
- An even pattern of services to Nottingham.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

Service level conditional outputs for the East Midlands and Norfolk - corridors centred on Nottingham

B.1.4.5 Analysis of conditional outputs against strategic goals:

The benefit of improving services between Leicester and Nottingham is very large from the perspective of commuting between the two cities. The Long Distance Market Study also marks the flow as high value for business to business connectivity.

Aside from Leicester to Nottingham, analysis shows that improving the GJT from Loughborough, East Midlands Parkway and Beeston to Nottingham on this corridor will have the largest impact on labour supply and reducing deprivation by providing access to employment. There is limited opportunity to improve the service from Beeston that is served by a frequent service into Nottingham. A half hourly frequency from Loughborough and East Midlands Parkway and a journey time speed of 60mph (reflecting a fast inter urban service) could reduce the GJT to Nottingham by 10/11 minutes. The impact of these improvements from these stations to Nottingham on Gross Value Added (GVA) through labour supply improvements is estimated to be around £16,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £32,000 per annum per minute of GJT, The majority of this benefit is driven by Loughborough to Nottingham rather than East Midlands Parkway. Other stations on the route have a GJT that cannot be improved enough to attract commuters into Nottingham.

Table 4 Population, demand and current services for stations on the Leicester route into Nottingham to inform conditional outputs

Corridor	Station name	Total Journeys into Nottingham* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Nottingham	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Leicester	Kettering	28	996	9,000	29,500	10,700	55	1 (2)	60 (49)	102	55 (32)	
	Market Harbrough	26	746	6,300	10,100	1,500	44	2 (2)	49 (41)	81	53 (32)	
	Leicester	570	4,881	24,600	116,700	116,700	28	2 (3)	34 (26)	59	49 (28)	
	Syston	18	187	6,800	40,300	83,500	23	1 (1)	36 (36)	79	38 (17)	
	Sileby	12	108	5,400	8,900	21,900	20	1 (1)	31 (31)	74	39 (16)	
	Barrow-Upon-Soar	12	75	3,700	9,600	26,600	18	1 (1)	38 (26)	70	28 (15)	
	Loughborough	139	1,249	6,200	26,800	24,700	15	2 (2)	25 (14)	51	36 (18)	
	East Midlands Parkway	22	262	0	2,100	18,000	9	2 (2)	17 (10)	46	32 (12)	
	Beeston	183	540	9,500	39,700	91,300	3	4 (7)	9 (4)	23	22 (9)	
Total		**1,010**	**9,044**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Nottingham between 0800 and 0900

Service level conditional outputs for the East Midlands and Norfolk - corridors centred on Nottingham

B.1.5 Birmingham/Derby/Matlock

Birmingham is a key destination outside the East Midlands region. The Matlock to Derby corridor is served by a suburban stopping service. Matlock is the northerly terminus of the Nottingham-Matlock service. The actions of the Derwent Valley Community Rail Partnership and Derbyshire County Council on the line in conjunction with the train operator has resulted in the provision of a reliable hourly service throughout most of the day with positive promotions to encourage rail travel. The service has significant commuter flows to Derby and Nottingham and is well used by visitors and local residents for leisure travel.

Both Broxtowe and Nottingham City Councils' Core Strategies identify the Boots site at Beeston as a strategic site for the delivery of housing and employment growth. It is proposed that 200,000 square metres of new business and commercial space is provided at the site. The Government has acknowledged the strategic potential of the site and has included the site within designated Nottinghamshire Enterprise Zone. This was in the first tranche of officially designated growth zones nationally.

Demand has doubled on the route since 2008. The relocation of the Matlock Tourist Information point to Matlock Station in 2012 has increased the throughput of visitors. Plans are being formulated locally in conjunction with existing rail promotions, to establish more hotels and local cycle facilities to build on the planned extension of cycle routes/network northwards to meet the very successful recent extension of the Monsal Trail to access the Peak District National Park and attractions on the Derwent Valley World Heritage site which straddles the railway.

The Derby remodelling scheme is proposed to increase capacity, improve journey times on the route and reduce delays by reducing the number of conflicting moves at the station.

B.1.5.1 Current services:

- One service per hour from Birmingham New Street to Nottingham, calling at (Wilnecote every 2 hours)Tamworth, Burton-on-Trent, Derby, Long Eaton and Beeston.
- One service per hour from Cardiff Central to Nottingham calling at Tamworth, Burton-on-Trent, Willington(not every hour), Derby, Long Eaton and Beeston.
- One service per hour from Matlock to Nottingham, calling at Matlock Bath, Cromford, Whatstandwell, Ambergate, Belper, Duffield, Derby, Spondon, Long Eaton, Attenborough and Beeston.

B.1.5.2 Journey times and rolling stock:

- **Journey times/speeds**: Given the distances journey times are relatively long, and the generalised speeds are low.
- **Rolling stock:** Variety of diesel rolling stock.

B.1.5.3 Criteria for conditional outputs:

- **Willingness to commute:** Along this corridor, the only stations with willingness to commute sensitive to changes in GJT are Attenborough, Long Eaton and Derby.
- **Jobs at destination:** Nottingham is a key urban centre in the East Midlands, attracting many local passengers for the purpose of commuting; it has the tenth highest employment rate of all cities in Great Britain.
- **Population catchments:** There are relatively large population catchments along this route.
- **Market for rail:** The highest demand on this route is from Derby, followed by Long Eaton and Attenborough.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share:** In terms of journey times, the road network dominates this market. There is a strong bus market from Derby to Nottingham.

Service level conditional outputs for the East Midlands and Norfolk - corridors centred on Nottingham

B.1.5.4 Recommendations for conditional outputs:

- The Long Distance Market Study recommends significant improvements between Nottingham and Derby and Birmingham.
- Improve frequency from Long Eaton and Attenborough.
- Improve journey times to increase competitive advantage with the road network.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

B.1.5.5 Analysis of conditional outputs against strategic goals:

The benefit of improving services between Derby and Nottingham is very large from the perspective of commuting between the two employment centres.

Aside from Derby to Nottingham, analysis shows that improving the GJT from Long Eaton to Nottingham on this corridor will have the largest impact on labour supply and reducing deprivation by providing access to employment. There is value in improving the service from Attenborough if rail is able to compete with more frequent modes. A twenty minute frequency from Long Eaton to Nottingham and a journey time speed of 40mph (reflecting a fast outer suburban service) could reduce the GJT to Nottingham by 11 minutes. The impact of these improvements from this station to Nottingham on Gross Value Added (GVA) through labour supply improvements is estimated to be around £19,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £38,000 per annum per minute of GJT. Other stations on the route serve small catchment populations or the GJT cannot be improved enough to attract commuters into Nottingham.

Table 5 Population, demand and current services for stations on the Birmingham/Derby/Matlock route into Nottingham to inform conditional outputs

Corridor	Station name	Total Journeys into Nottingham* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Nottingham	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Matlock/ Derby	Matlock	17	178	3,100	7,700	5,300	33	1 (1)	77 (66)	114	26 (17)	
	Matlock Bath	4	56	0	10,300	5,500	32	1 (1)	75 (62)	111	26 (17)	
	Cromford	4	34	1,100	6,300	9,600	31	1 (1)	72 (59)	108	26 (17)	
	Whatstandwell	2	27	0	2,600	6,500	28	1 (1)	54 (54)	104	31 (16)	
	Ambergate	2	40	1,400	6,500	18,100	26	1 (1)	62 (50)	98	25 (16)	
	Belper	17	174	5,400	13,200	13,500	23	1 (1)	55 (44)	90	26 (16)	
	Duffield	9	53	3,300	3,900	27,400	21	1 (1)	51 (39)	88	25 (14)	
	Derby	246	3,351	5,600	76,300	80,900	16	3 (4)	27 (20)	46	35 (20)	
	Spondon	11	20	2,600	35,100	65,000	13	<1 (1)	32 (15)	75	25 (11)	7 trains per day off-peak
	Long Eaton	194	586	7,000	24,300	25,300	8	2 (3)	18 (13)	41	26 (11)	
	Attenborough	58	80	3,800	33,500	73,200	5	1 (2)	14 (8)	40	20 (7)	
Total		**564**	**4,600**									
Birmingham	Birmingham	278	46,926	12,900	100,800	177,700	57	2 (2)	75 (72)	104	46 (33)	
	Water Orton	0	44	2,600	23,100	55,700	49	0 (0)	103 (60)	177	29 (17)	no direct
	Wilnecote	1	72	8,300	37,500	35,400	42	<1 (2)	72 (56)	109	35 (23)	off-peak every 2 hrs
	Tamworth	33	948	8,500	32,500	22,000	40	2 (2)	53 (49)	85	45 (28)	
	Burton-on-Trent	51	701	6,900	37,900	12,300	27	2 (3)	45 (35)	71	36 (23)	
	Willington	2	16	2,400	2,200	16,000	22	<1 (1)	51 (36)	102	26 (13)	3 trains per day off-peak
	Peartree	1	3	10,200	66,700	71,500	17	0 (0)	46 (36)	150	22 (7)	no direct
Total		**367**										

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Nottingham between 0800 and 0900

B.1.6 Sheffield/Chesterfield

This intercity route serves a few stations with relatively large population catchments.

Ilkeston is a new station on the Derbyshire Nottinghamshire border which has committed funding.

Chesterfield Station serves a large catchment population and has direct services to London, Birmingham and Nottingham: each with a 30 min frequency or better that coupled with a large car park which has been increased twice in recent times to meet increasing demand attracts rail users from a wider catchment. The station acts as a major railhead for the northern Peak District, and also for southbound journeys for the affluent southern suburbs of Sheffield due to fast road links.

B.1.6.1 Current services:

- One service per hour from Liverpool Lime Street to Norwich calling at Sheffield, Chesterfield, Alfreton.
- One service per hour from Leeds to Nottingham calling at Sheffield, Dronfield, Chesterfield, Alfreton, and Langley Mill.
- One service per day from Leeds to London St Pancras International calling at Sheffield, Chesterfield, Alfreton, and Langley Mill.

B.1.6.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey times on this route are relatively slow given the limited number of stops on the route.
- **Rolling stock:** Services are run by a mix of 90, 100 annd 125mph diesel rolling stock.

B.1.6.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJTs between Nottingham and Chesterfield, Alfreton and Langley Mill are less than or close to 60 minutes so the willingness to commute is sensitive to small changes.
- **Jobs at destination:** Nottingham is a key urban centre in the East Midlands, attracting many local passengers for the purpose of commuting; it has the tenth highest employment rate of all cities in Great Britain.
- **Population catchments:** The population within 5km of the station of towns along this corridor are relatively large compared to other corridors into Nottingham.
- **Market for rail:** Rail demand on this route is quite high for the East Midlands. The majority of demand is from / to Sheffield, however demand is low compared to other interurban / outer suburban routes.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share:** The motorway network provides an attractive alternative along this route so travelling by car has the competitive advantage over rail.

B.1.6.4 Recommendations for conditional outputs:

The link between Sheffield and Nottingham is valuable in terms of business to business connectivity. Significant improvement to journey time and / or frequency would be required to improve the willingness to commute for this particular journey.

All other stations are well served into Nottingham, although journey time improvements on this route could be made to gain the competitive advantage over the road network. For example, a small improvement in GJT for services from Chesterfield could attract more passengers from that catchment. This could be achieved through journey time improvements or increasing frequency. The capacity to meet extra demand could be met through train lengthening.

Service level conditional outputs for the East Midlands and Norfolk - corridors centred on Nottingham

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- The Long Distance Market Study recommends a significant improvement in the service between Manchester, Sheffield, Leeds and Nottingham.
- Journey time improvements from outer suburban stations into Nottingham could be improved to gain a competitive advantage over the car.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

B.1.6.5 Analysis of conditional outputs against strategic goals:

Aside from Sheffield to Nottingham that is driven by business to business connectivity, analysis shows that improving the GJT from Chesterfield, Alfreton and Langley Mill on this corridor into Nottingham will have the largest impact on labour supply and reducing deprivation by providing access to employment. The impact of any small journey time improvements from these stations to Nottingham on Gross Value Added (GVA) through labour supply improvements is estimated to be around £14,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £30,000 per annum per minute of GJT. Dronfield has a GJT that is difficult to improve enough to attract commuters into Nottingham, and is more in the suburban catchment of Sheffield.

Table 6 Population, demand and current service for stations on the Sheffield and Chesterfield route into Nottingham to inform conditional outputs

Corridor	Station name	Total Journeys into Nottingham* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Nottingham	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Sheffield	Sheffield	247	8,424	15,600	100,000	128,500	41	2 (2)	56 (51)	82	44 (30)	
	Dronfield	8	153	8,000	15,400	35,100	34	1 (1)	50 (37)	84	41 (24)	
	Chesterfield	71	1,487	6,300	43,900	32,900	29	3 (4)	40 (29)	64	43 (27)	
	Alfreton	43	212	3,400	19,200	16,000	18	2 (3)	26 (20)	53	42 (20)	
	Langley Mill	33	94	5,700	25,400	32,400	12	1 (2)	20 (14)	53	36 (14)	
Total		**402**	**10,370**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Nottingham between 0800 and 0900

B.2 Service level conditional outputs for the East Midlands (Leicester)

Leicester is one of the main regional centres within the East Midlands, and in terms of footfall, is one of the most used stations. Leicester is both a major attractor and generator of rail demand in the East Midlands area with London and Birmingham being key destinations for travel outside the East Midlands region

The main competition for the long distance high speed service is from car and coach travel. The M1 motorway lies parallel to the Midland Main Line and key roads connect it with the three main cities of Derby, Nottingham and Leicester in the East Midlands.. The road network parallels much of the core rail network and provides an attractive alternative for customers making cross-country journeys. Journey time and direct services are therefore critical issues for rail on these corridors.

This section is organised into a description of the conditional outputs relating to each of the following corridors into Leicester:

- Bedford.
- Birmingham.
- Peterborough.
- Nottingham/Derby.

Leicester and Leicestershire is part of the second wave of core cities to achieve City Deal status. This will give more accountability to the region in exchange for more powers to encourage jobs and growth in the area.

B.2.1 Bedford

Services along this corridor that call at Leicester include services from London St Pancras International to Nottingham/Sheffield via Leicester.

The North Northamptonshire towns of Corby, Kettering and Wellingborough are forecast to see extensive growth, with 12,973; 5,544 and 9,975 new houses and an equivalent level of new jobs currently planned in the three boroughs between 2011 and 2021. This represents a significant expansion of all three towns. The Stanton Cross development of 3,100 houses and 4,600 jobs, located immediately to the east of Wellingborough station, is likely to drive rail growth, with the key employment site located adjacent to a new eastern station entrance.

Long Distance High Speed services provide fast connections to Kettering, Wellingborough and Bedford. The majority of passengers travelling from these stations are commuters travelling into London, although some commute into Leicester and Nottingham, and capacity related conditional outputs for this corridor will be driven by demand into London, and covered in the London and South East Market study.

However, there is a strong market for travel between Market Harborough and Kettering into Leicester and this level of service should be maintained as a conditional outputs.

B.2.1.1 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the GJT from Wellingborough, Kettering and Market Harborough on this corridor into Leicester will have the largest impact on labour supply and reducing deprivation by providing access to employment. A half hourly frequency from these stations and a journey time speed as now (services to Leicester are already fast) could reduce the GJT to Nottingham by between five and seven minutes.

The impact of these improvements from these stations to Leicester on Gross Value Added (GVA) through labour supply improvements is estimated to be around £63,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £69,000 per annum per minute of GJT. Stations further south on the route have a GJT that cannot be improved enough to attract commuters into Leicester.

Table 7 Population, demand and current service for stations on the Bedford route into Leicester to inform conditional outputs

Corridor	Station name	Total Journeys into Leicester* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Leicester	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised Speed) (mph)	Notes
Bedford	Luton	10	3,440	16,900	68,800	46,900	69	<1 (0)	68 (45)	99	61 (42)	8 trains per day
	Bedford	26	3,304	13,900	44,300	30,000	49	1 (1)	48 (34)	82	62 (36)	
	Wellingborough	58	950	6,700	19,800	27,000	34	1 (1)	31 (25)	64	66 (32)	
	Kettering	123	996	9,000	29,500	10,700	27	1 (2)	27 (20)	54	60 (30)	
	Market Harborough	165	746	6,300	10,100	1,500	16	2 (3)	13 (12)	41	74 (23)	
Total		**383**	**9,438**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Leicester between 0800 and 0900

B.2.2 Birmingham

The services along this corridor provide interurban local stopping services between Birmingham New Street and Leicester as well as services to Stansted Airport.

Water Orton and Coleshill Parkway are more in the suburban catchment of Birmingham and conditional outputs for these stations are considered in the West Midlands section detailed in Appendix F - West Midlands.

This route has the potential to be a high value route in the future due to the high population on the route and links with Birmingham.

The A5 corridor between Northamptonshire, Leicestershire and Staffordshire, including the MIRA Enterprise Zone near Hinckley, is a major focus of housing and employment growth. In addition to 1.5 million sq ft of employment floorspace at MIRA itself, there are plans to deliver more than 45,000 new homes with associated employment opportunities along the route, which has recently benefited from 'pinch point' funding to deliver a number of priority highway improvement schemes.

B.2.2.1 Current services:

- Two services per hour from Birmingham New Street and Leicester/Stansted Airport. Fast services calling at Coleshill Parkway, Nuneaton and Leicester. Stopping services calling at Hinckley, Narborough and South Wigston additionally.

B.2.2.2 Journey times and rolling stock

- **Journey times/speeds**. Journey times are slow given the interurban nature of the route.
- **Rolling stock**: Services are run by 90mph diesel rolling stock

B.2.2.3 Criteria for conditional outputs:

- **Willingness to commute:** all stations from Nuneaton to Leicester have a GJT of less than 60 minutes and small improvements in the service will increase the willingness to travel.
- **Jobs at destination:** Leicester is one of the main regional centres in the East Midlands.
- **Population catchments:** Catchments within 5km of the stations, along the route are relatively heavily populated.
- **Market for rail:** The majority of demand comes from Birmingham, and picks up again at Nuneaton, Hinckley and Narborough.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share:** Road is a strong competitor on this route. South Wigston is close enough to Leicester such that rail is likely to never be competitive with more frequent convenient modes of transport such as the local bus network.

B.2.2.4 Recommendations for conditional outputs:

- Increase frequency of services from one to two trains per hour from Nuneaton, Hinckley and Narborough into Leicester.
- Improved journey times on suburban services.
- The Long Distance Market Study recommends a significant improvement in the service between Birmingham and Leicester.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

B.2.2.5 Analysis of conditional outputs against strategic goals:

The benefit of improving services between Birmingham and Leicester is very large from the perspective of commuting between the two cities. The Long Distance Market Study also marks the flow as high value for business to business connectivity.

Analysis shows that improving the GJT from Nuneaton, Hinckley and Narborough into Leicester and small journey time improvements could be made to the service. The impact of these improvements from these stations to Leicester on Gross Value Added (GVA) through labour supply improvements is estimated to be around £44,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £54,000 per annum per minute of GJT. Other stations on the route serve small catchment populations or are so close to Leicester that rail tends to be uncompetitive against other more frequent modes.

Table 8 Population, demand and current services for stations on the Birmingham route to Leicester to inform conditional outputs

Corridor	Station name	Total Journeys into Leicester (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Leicester	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised Speed) (mph)	Notes
Birmingham	Birmingham New Street	424	46,926	12,900	100,800	177,700	40	2 (2)	53 (50)	79	45 (30)	
	Water Orton	0	44	2,600	23,100	55,700	32	<1 (0)	64 (39)	152	30 (13)	9 trains per day
	Coleshill Parkway	8	170	0	6,200	37,800	31	2 (2)	41 (36)	66	45 (28)	
	Nuneaton	76	997	8,300	37,200	25,900	18	2 (2)	22 (20)	49	50 (22)	
	Hinckley	72	280	8,500	25,000	13,200	15	1 (1)	26 (15)	51	34 (17)	
	Narborough	124	363	5,100	18,800	34,200	7	1 (2)	9 (9)	43	45 (9)	
	South Wigston	7	59	7,400	49,600	68,500	4	<1 (2)	9 (5)	46	25 (5)	
Total		**771**	**48,839**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Leicesterbetween 0800 and 0900

B.2.3 Peterborough

This route provides connectivity between the Stansted Airport, East Anglia, Eat Midlands and West Midlands, and also provides suburban services from Stamford, Oakham and Melton Mowbray into Leicester.

B.2.3.1 Current services:

- One service per hour from Stansted Airport to Birmingham New Street, calling at Stamford, Oakham and Melton Mowbray.

B.2.3.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey times are fast.
- **Rolling stock:** Services are run by 90mph diesel rolling stock.

B.2.3.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT from Melton Mowbray, Oakham and Stamford could be improved to less than 60 minutes through modest frequency and journey time improvements.
- **Jobs at destination:** Leicester is one of the main regional areas within the East Midlands.
- **Population catchments:** Peterborough has the largest population on this corridor, while Stamford, Melton Mowbray and Oakham all serve small towns.
- **Market for rail**: Demand is low compared to other corridors into Leicester.
- **Deprivation:** There are pockets of deprivation on this route. http://casa.oobrien.com/booth/
- **Rail's market share:** The road network provides journey times between Peterborough and Leicester of just over an hour. In terms of average in-vehicle time, rail is a strong competitor. However, the perceived journey time (GJT) for railway passengers is considerably higher, giving the road network a competitive advantage.

B.2.3.4 Recommendations for conditional outputs:

- Increase frequency of services from one to two trains per hour from Melton Mowbray, Oakham and Stamford into Leicester.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- The Long Distance Market Study recommends a significant improvement in the service between Peterborough and Leicester.

B.2.3.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the GJT from Melton Mowbray and Oakham into Leicester will have the largest impact on labour supply and reducing deprivation by providing access to employment. A half hourly frequency from these stations and a journey time speed of 60mph (reflecting a fast interurban service) could reduce the GJT to Nottingham by 11 or 12 minutes. The impact of these improvements from these stations to Leicester on Gross Value Added (GVA) through labour supply improvements is estimated to be around £11,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £34,000 per annum per minute of GJT. Stamford has a GJT into Leicester that cannot be improved enough to attract commuters into Leicester, and the market from Peterborough is more long distance in nature and driven by leisure and business to business connections.

Table 9 Population, demand and current services for stations on the Peterborough route into Leicester to inform conditional outputs

Corridor	Station name	Total Journeys into Leicester* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station(census 2011)	Distance in miles from Leicester	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised Speed) (mph)	Notes
Peterborough	Peterborough	62	4,208	8,000	48,200	50,900	52	1 (1)	58 (56)	94	54 (33)	
	Stamford	36	289	3,400	11,000	5,000	40	1 (1)	42 (42)	80	57 (30)	
	Oakham	53	199	7,900	1,000	1,100	26	1 (1)	31 (26)	64	51 (25)	
	Melton Mowbray	118	234	6,800	13,100	2,400	15	1 (1)	16 (14)	52	56 (17)	
Total		**269**	**4,930**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Leicester between 0800 and 0900

B.2.4 Nottingham/Derby

This route provides interurban services from Loughborough, East Midlands Parkway, Beeston, Nottingham and Derby. Stations served by these services tend to be very good or are more in the suburban catchment of Nottingham.

Barrow-Upon-Soar, Sileby and Syston are in the suburban catchment of Leicester.

Electrification of the Midland Main Line will improve intercity services on this route

B.2.4.1 Current services:

- One service per hour from Nottingham to Leicester originating from Lincoln Central calling at Beeston, East Midlands Parkway, Loughborough, Barrow-Upon-Soar, Sileby and Syston on this corridor.
- One service per hour from Nottingham to London St Pancras International, calling at East Midlands Parkway.
- One service per hour from Nottingham to London St Pancras International, calling at Beeston and Loughborough.
- One service per hour from Derby to London St Pancras International originating from Sheffield and running nonstop between Derby and Leicester.
- One service per hour from Derby to London St Pancras International originating from Sheffield and calling at Long Eaton, East Midlands Parkway and Loughborough.

B.2.4.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey times from suburban stations into Leicester are poor.
- **Rolling stock**: Services are run by 125mph diesel stock on Intercity services and by early generation sprinter stock on suburban services causing poor running times and passenger satisfaction issues.

B.2.4.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT for Barrow Upon Soar, Sileby and Syston into Leicester is less than 60 minutes.
- **Jobs at destination:** Leicester is one of the main regional areas within the East Midlands.
- **Population catchments:** Catchments at stations along this corridor are relatively large. Barrow Upon Soar and Sileby are large villages and Syston is a small town.
- **Market for rail:** Demand is low from Barrow Upon Soar, Sileby and Syston into Leicester but relatively high given the poor service.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share:** The road network provides journey times between Nottingham and Leicester of just over 40 minutes. In terms of average in-vehicle time, rail is a strong competitor. However, the perceived journey time (GJT) for railway passengers is considerably higher, giving the road network a competitive advantage.

B.2.4.4 Recommendations for conditional outputs:

- Increase frequency of services from one to two trains per hour from Barrow-Upon-Soar, Sileby and Syston to Leicester.
- Improved journey times on suburban services.
- The Long Distance Market Study recommends a significant improvement in the service between Nottingham and Leicester and Derby and Leicester.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

B.2.4.5 Analysis of conditional outputs against strategic goals:

The benefit of improving services between Nottingham, Derby and Leicester is very large from the perspective of commuting between the two cities. The Long Distance market study also marks the flow as high value for business to business connectivity.

Analysis shows that there is limited opportunity to improve the service from East Midlands Parkway and Loughborough into Leicester, but there is significant value in doing so from the perspective of commuting into Leicester.

A half hourly frequency from Syston, Sileby and Barrow-Upon-Soar into Leicester and a journey time speed of 40mph (reflecting a fast outer suburban service) could reduce the GJT to Leicester by 14/15 minutes. The impact of these improvements from these stations to Leicester on Gross Value Added (GVA) through labour supply improvements is estimated to be around £10,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £38,000 per annum per minute of GJT.

Table 10 Population, demand and current services for stations on the Nottingham/Derby route into Leicester to inform conditional outputs

Corridor	Station name	Total Journeys into Leicester* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station(census 2011)	Distance in miles from Leicester	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised Speed) (mph)	Notes
Nottingham	Nottingham	570	6,437	15,000	85,800	112,700	28	3 (3)	34 (26)	59	49 (28)	
	Beeston	37	540	9,500	39,700	91,300	24	2 (2)	33 (21)	55	44 (27)	
	Attenborough	1	80	3,800	33,500	73,200	23	<1 (0)	53 (21)	82	26 (17)	
	East Midlands Parkway	14	262	0	2,100	18,000	18	3 (4)	26 (15)	46	42 (24)	
	Loughborough	320	1,249	6,200	26,800	24,700	13	3 (4)	16 (9)	34	47 (22)	
	Barrow-Upon-Soar	39	75	3,700	9,600	26,600	10	1 (1)	21 (15)	55	27 (10)	
	Sileby	55	108	5,400	8,900	21,900	8	1 (1)	19 (11)	52	24 (9)	
	Syston	95	187	6,800	40,300	83,500	5	1 (1)	19 (7)	48	15 (6)	
Total		**1,130**	**8,938**									
Derby	Chesterfield	24	1,487	6,300	43,900	32,900	48	2 (2)	52 (42)	82	55 (35)	
	Derby	224	3,351	5,600	76,300	80,900	29	2 (2)	29 (24)	56	61 (32)	
	Spondon	0	20	2,600	35,100	65,000	27	0 (0)	51 (18)	109	32 (15)	
	Long Eaton	53	586	7,000	24,300	25,300	22	1 (1)	32 (16)	62	40 (21)	
Total		**8**	**722**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Leicester between 0800 and 0900

B.3 Service level conditional outputs for Derby

This section is an interpretation of the Regional Urban conditional outputs for the East Midlands, disaggregated by the rail corridors into Derby. This study looks at services between regional centres within the East Midlands; the Long Distance Market Study will cover the long distance services.

The main competition for the long distance high speed rail services is from car and coach travel. The M1 motorway lies parallel to the route and key roads connect it with the three main cities in the East Midlands, Derby, Leicester and Nottingham. The road network parallels much of the core rail network and provides an attractive alternative for customers making cross-country journeys. Journey times and the provision of direct services are therefore critical issues for rail on these corridors.

The Government recently announced that the High Speed Rail network would include a station at Toton (between Derby and Nottingham).

This section is organised into a description of the conditional outputs relating to each of the following corridors into Derby:

- Sheffield.
- Matlock.
- Crewe.
- Birmingham.
- Nottingham.
- Leicester.

B.3.1 Sheffield

This corridor is used by long distance interurban services that provide fast services between Sheffield, Chesterfield and Derby. The Matlock to Derby service provides suburban services on this route from Belper to Derby.

Electrification of the Midland Main Line will improve intercity services on this route.

B.3.1.1 Current services:

- Two services per hour from Sheffield to London St Pancras International calling at Chesterfield and Derby.
- One service per hour from Scotland to Plymouth (via Leeds) calling at Chesterfield and Derby.
- One service per hour from Newcastle to Reading (via Doncaster) running fast from Sheffield to Derby.

Table 11 Population, demand and current service for stations on the Sheffield routes into Derby to inform conditional outputs

Corridor	Station name	Total Journeys into Derby* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Derby	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Sheffield	Sheffield	237	8,424	15,600	100,000	128,500	36	4 (4)	33 (29)	53	66 (42)	
	Chesterfield	88	1,487	6,300	43,900	32,900	24	3 (4)	20 (17)	39	73 (37)	
Total		**325**	**9,911**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Derby between 0800 and 0900

B.3.2 Matlock

A local stopping service is provided along this corridor.

The actions of the Derwent Valley Community Rail Partnership (CRP) and Derbyshire County Council on the line in conjunction with the train operator has resulted in the provision of a reliable hourly service throughout most of the day with positive promotions to encourage rail travel. The service provides commuting services to Derby and Nottingham and for visitors and local residents for leisure travel. Demand has doubled on the route since 2008, and the CRP has won a range of awards for its success in promoting the railway. The relocation of the Matlock Tourist Information Point to Matlock Station in 2012 has increased the throughput of visitors. Plans are being formulated locally in conjunction with existing rail promotions to establish more hotels and local cycle facilities to build on the planned extension of cycle routes/network northwards to meet the very successful recent extension of the Monsal Trail. This will enable better access to the Peak District National Park and attractions on the Derwent Valley World Heritage site which straddles the railway.

B.3.2.1 Current services:

- One service per hour from Matlock to Nottingham calling at Matlock Bath, Cromford, Whatstandwell, Ambergate, Belper, Duffield, Derby.

B.3.2.2 Journey times and rolling stock:

- **Journey times/speeds**: The journey times are relatively fast compared with other suburban services.
- **Rolling stock**: Services are run by 75 – 90mph diesel rolling stock.

B.3.2.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT for all stations into Derby is either less than 60 minutes or could be improved to less than 60 minutes through small frequency and journey time improvements.
- **Jobs at destination:** Derby is one of the main urban centres within the East Midlands, and has the sixth largest employment rate of all cities in Great Britain.
- **Population catchments:** Matlock is a small town and provides access to the Peak District for leisure travel. Belper is a small, expanding commuter town and has the second largest catchment on the route. However, the population on the route is low compared with other suburban routes.
- **Market for rail:** The highest demand on this route is from Matlock and Belper.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share:** The road network between Matlock and Derby provides journey times of about 35 minutes which is a close competitor with the average journey time; but the GJT is significantly greater.

B.3.2.4 Recommendations for conditional outputs:

- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

B.3.2.5 Analysis of conditional outputs against strategic goals:

Analysis shows that there is limited value in improving services from Matlock to Derby for the purposes of commuting as station catchments are small and stations close to Derby struggle to compete with more frequent modes.

Table12 Population, demand and current services for stations on the Matlock route to Derby to inform conditional outputs												
Corridor	Station name	Total Journeys into Derby* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Derby	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Matlock	Matlock	66	178	3,100	7,700	5,300	17	1 (1)	33 (33)	74	31 (14)	
	Matlock Bath	20	56	0	10,300	5,500	16	1 (1)	29 (30)	71	34 (14)	
	Cromford	13	34	1,100	6,300	9,600	15	1 (1)	29 (27)	68	32 (14)	
	Whatstandwell	11	27	0	2,600	6,500	13	1 (1)	22 (22)	63	34 (12)	
	Ambergate	16	40	1,400	6,500	18,100	11	1 (1)	19 (18)	57	33 (11)	
	Belper	65	174	5,400	13,200	13,500	8	1 (1)	12 (7)	50	39 (9)	
	Duffield	15	53	3,300	3,900	27,400	5	1 (1)	7 (7)	46	45 (7)	
Total		205	563									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Derby between 0800 and 0900

B.3.3 Crewe

This corridor is served by a local stopping service. There are aspirations to provide access to Manchester Airport from Derby by extending the service from Crewe.

This market tends to serve small towns on the route as well as Stoke-on-Trent and the market between Blythe Bridge and Crewe is more driven by commuting into Manchester and in part, the West Midlands.

There are resignalling and level crossing schemes along this route along with gauge enhancement works at Meir Tunnel.

B.3.3.1 Current services:

- One service per hour from Crewe to Derby calling at Crewe, Alsager, Kidsgrove, Longport, Stoke-on-Trent, Longton, Blythe Bridge, Uttoxeter, Tutbury and Hatton.

B.3.3.2 Journey times and rolling stock:

- **Journey times/speeds**. Journey times are relatively fast on this route compared with other suburban services although the large gaps between stations from Blythe Bridge to Derby may mean that a faster service could achieve improved journey times.
- **Rolling stock**: Rolling stock on the stopping services tends to be run by early generation sprinter rolling stock with poor acceleration. Single carriage trains causes issues with passenger satisfaction.

B.3.3.3 Criteria for conditional outputs:

- **Willingness to commute:** GJT from Uttoxeter and Tutbury and Hatton into Derby is around 60 minutes and small improvements could improve willingness to commute.
- **Jobs at destination:** Derby is one of the main urban centres within the East Midlands, and has the sixth largest employment rate of all cities in Great Britain.
- **Population catchments**: Uttoxeter is a small market town. Population catchments are relatively small.
- **Market for rail:** Demand is relatively low. The largest demand for journeys to Derby is from Stoke-On-Trent and Uttoxeter.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share:** It takes approximately 70 minutes on the road network between Crewe and Derby; Rail therefore provides a close competitor. Peartree is so close to Derby that other more frequent modes such as the local bus network will always have precedence over rail.

B.3.3.4 Recommendations for conditional outputs:

- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

B.3.3.5 Analysis of conditional outputs against strategic goals:

Analysis shows that there is limited value in improving services from this corridor to Derby for the purposes of commuting as station catchments are small and stations close to Derby struggle to compete with more frequent modes and many stations have GJTs that cannot be reduced to attract commuters to Derby.

Table 13 Population, demand and current services for stations on the Crewe routes into Derby to inform conditional outputs

Corridor	Station name	Total Journeys into Derby* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Derby	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Crewe	Crewe	25	2.351	8,600	36,800	18,800	51	1 (1)	87 (77)	118	35 (26)	
	Alsager	3	85	3,500	11,400	20,900	45	1 (1)	68 (67)	108	39 (25)	
	Kidsgrove	5	158	7,300	16,200	42,100	42	1 (1)	65 (62)	103	39 (25)	
	Longport	4	38	5,100	50,200	83,700	39	1 (1)	57 (57)	98	41 (24)	
	Stoke-on-Trent	51	2,444	8,600	49,500	104,700	36	1 (1)	53 (50)	92	41 (24)	
	Longton	7	61	9,700	43,800	68,500	34	1 (1)	45 (45)	86	45 (23)	
	Blythe Bridge	12	64	3,600	15,300	23,500	30	1 (1)	39 (39)	80	46 (23)	
	Uttoxeter	44	154	3,800	6,900	4,000	19	1 (1)	23 (23)	66	50 (17)	
	Tutbury and Hatton	16	56	4,200	2,200	13,000	11	1 (1)	14 (13)	56	49 (12)	
	Peartree	0	3	10,200	66,700	71,500	1	<1 (0)	10 (2)	87	8 (1)	
Total		**167**	**5,415**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Derby between 0800 and 0900

B.3.4 Birmingham via Burton on Trent

This corridor is served by long distance interurban services. Tamworth and Water Orton are more in the Regional Urban catchment of Birmingham. The service between Birmingham, Burton-on-Trent and Derby is fast and frequent and there is little opportunity for improvements.

B.3.4.1 Current services:

- One service per hour from Birmingham New Street to Nottingham calling at (Wilnecote every 2 hours), Tamworth, Burton-on-Trent.
- One service per hour from Cardiff Central to Nottingham calling at Tamworth, Burton-on-Trent, Willington (not every hour).
- One service per hour from Reading to Newcastle.
- One service per hour from Plymouth to Edinburgh Waverley/ Glasgow Central; calling at Tamworth.

B.3.4.2 Recommendations for conditional outputs:

- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

B.3.4.3 Analysis of conditional outputs against strategic goals:

There is significant value in improving services between Birmingham and Derby. However, there are limited opportunities to do so given the high speed and frequency and services on the line.

Table 14 Population, demand and current services for stations on the Birmingham route into Derby to inform conditional outputs

Corridor	Station name	Total Journeys into Derby* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Derby	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Birmingham	Birmingham	356	46,926	12,900	100,800	177,700	42	4 (4)	41 (32)	56	61 (44)	
	Water Orton	0	44	2,600	23,100	55,700	34	<1 (0)	81 (22)	138	25 (15)	one direct per day
	Tamworth	29	948	8,500	32,500	22,000	24	3 (4)	22 (16)	46	65 (31)	
	Burton-on-Trent	80	701	6,900	37,900	12,300	11	3 (3)	12 (9)	35	55 (19)	
	Willington	3	16	2,400	2,200	16,000	6	<1 (1)	18 (8)	64	20 (6)	3 trains per day off-peak
Total		**469**	**48,636**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Derby between 0800 and 0900

B.3.5 Nottingham

This corridor is served by a mixture of local stopping services and direct, faster services.

Beeston and Attenborough are more in the suburban catchment of Nottingham and conditional outputs are expressed in the Nottingham section although from Beeston to Derby the demand is relatively high.

There is limited opportunity to increase the service from Long Eaton into Derby and services from Spondon will always struggle to compete with more frequent / convenient modes of transport such as the local bus network because of it's proximity to Derby.

The Nottingham Enterprise Zone has been extended to cover three business parks – Nottingham Science Park, Beeston Business Park and the Queen's Medical Centre. The enterprise zone spans 140 acres with the potential to create up to 10,000 new jobs.

B.3.5.1 Current services:

- One service per hour from Nottingham to Birmingham New Street calling at Beeston, Attenborough and Long Eaton.
- One service per hour from Nottingham to Cardiff Central calling at Beeston, Attenborough and Long Eaton .
- One service per hour from Nottingham to Matlock calling at Beeston, Attenborough and Long Eaton.

B.3.5.2 Journey times and rolling stock:

- **Journey times/speeds**: Given the interurban nature of the route journey speeds could be improved.
- **Rolling stock**: Services are run by 75 – 100mph diesel rolling stock.

B.3.5.3 Criteria for conditional outputs:

- **Willingness to commute**: GJT varies between 30 and 60 minutes.
- **Jobs at destination**: Derby is one of the main urban centres within the East Midlands, and has the sixth largest employment rate of all cities in Great Britain.
- **Population catchments:** Population along this corridor is relatively high.
- **Market for rail:** Demand from Nottingham and Long Eaton are the highest on the route.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share:** The road network provides a journey time of about 25 minutes by car from Nottingham to Derby. The GJT needs to improve significantly for rail to gain a competitive advantage.

B.3.5.4 Recommendations for conditional outputs:

- The Long Distance Market Study recommends a fast and frequent service between Nottingham and Derby of three to four trains per hour and 60mph. This acknowledges that business to business connectivity is a driver between Derby and Nottingham.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

B.3.5.5 Analysis of conditional outputs against strategic goals:

The benefit of improving services between Derby and Nottingham is very large from the perspective of commuting between the two cities. The Long Distance Market Study also marks the flow as high value for business to business connectivity.

Table 15 Population, demand and current services for stations on the Nottingham route into Derby to inform conditional outputs

Corridor	Station name	Total Journeys into Derby* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Derby	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Nottingham	Nottingham	246	6,437	15,000	85,800	112,700	16	3 (3)	27 (20)	46	35 (20)	
	Beeston	43	540	9,500	39,700	91,300	12	2 (2)	24 (14)	45	31 (17)	
	Attenbrough	7	80	3,800	33,500	73,200	11	1 (1)	33 (17)	52	20 (13)	
	Long Eaton	123	586	7,000	24,300	25,300	8	3 (3)	9 (9)	34	53 (14)	
	Spondon	2	20	2,600	35,100	65,000	3	<1 (2)	5 (4)	65	30 (2)	9 trains per day off-peak
Total		**422**	**7,663**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Derbybetween 0800 and 0900

B.3.6 Leicester, Loughborough and East Midlands Parkway

This corridor is served by a fast intercity service and there are very limited opportunities to improve the speed of this service for the regional urban market.

Electrification of the Midland Main Line will improve intercity services on this route. There may be an opportunity to increase the frequency from Loughborough.

B.3.6.1 Current services:

- Two services per hour London St Pancras International to Sheffield alternating between fast and stopping service (Leicester, Loughborough, East Midlands Parkway, Long Eaton).

B.3.6.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey times are very fast from Leicester and slower from Loughborough and East Midlands Parkway with frequency being more of an issue.
- **Rolling stock:** Services are run by 125mph diesel rolling stock.

B.3.6.3 Criteria for conditional outputs:

- **Willingness to commute:** GJT varies between 50 to 100 minutes.
- **Jobs at destination:** Derby is one of the main urban centres within the East Midlands, and has the sixth largest employment rate of all cities in Great Britain.
- **Population catchments:** Population along this corridor is relatively high.
- **Market for rail:** Demand from Leicester and Loughborough is high.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share:** The M1 provides competitive journey times between Leicester and Derby.

B.3.6.4 Recommendations for conditional outputs:

- The Long Distance Market Study recommends an improvement in the service between Leicester and Derby for the purposes of business to business connectivity.
- Increase frequency Loughborough to Derby to two trains per hour.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

B.3.6.5 Analysis of conditional outputs against strategic goals:

The benefit of improving services between Derby and Leicester is very large from the perspective of commuting between the two cities. The Long Distance market study also marks the flow as high value for business to business connectivity.

Analysis shows that improving the GJT from Loughborough into Derby will have the largest impact on labour supply and reducing deprivation by providing access to employment. The impact of small improvements to Derby on Gross Value Added (GVA) through labour supply improvements is estimated to be around £6,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £9,000 per annum per minute of GJT.

Table 16 Population, demand and current service for stations on the Leicester route into Derby to inform conditional outputs												
Corridor	Station name	Total Journeys into Derby* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Derby	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Leicester	Kettering	8	996	9,000	29,500	10,700	57	1 (2)	56 (45)	98	61 (35)	
	Market Harborough	9	746	6,300	10,100	1,500	46	<1 (1)	49 (38)	92	56 (30)	7 trains per day off-peak
	Leicester	224	4,881	24,600	116,700	116,700	29	2 (3)	29 (24)	56	61 (32)	
	Loughborough	46	1,249	6,200	26,800	24,700	17	1 (1)	34 (14)	59	30 (17)	
	East Midlands Parkway	5	262	0	2,100	18,000	11	1 (1)	17 (10)	57	39 (12)	
Total		**287**	**7,872**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Derby between 0800 and 0900

B.4 Service level conditional outputs for North Lincolnshire and Lincolnshire

This section is an interpretation of the Regional Urban conditional outputs for rail corridors into and within Lincolnshire disaggregated by the rail corridors around Lincoln, and corridors in North Lincolnshire and North East Lincolnshire.

There are no large urban centres in Lincolnshire comparable in size to Leeds, Nottingham or Manchester, instead there are several employment centres in their own right that drive commuting and business trips across the region such as Immingham, Cleethorpes, Grantham, Grimsby, Lincoln, Newark and Scunthorpe. Employment in Nottingham and Sheffield also drive commuting to outside Lincolnshire and some rail corridors are also discussed in Appendix G Yorkshire and Humber.

As well as being important drivers of rail freight demand on the rail network, the ports of Immingham and Grimsby are also employment centres in their own right. Connections on to the East Coast Main Line (ECML) can be made at Newark Northgate, Grantham, Doncaster, Retford and Peterborough.

According to the centre for cities Factbook, there are 72,800 jobs in North Lincolnshire and 16,000 in the public sector (source: ONS annual population survey (survey of hours and earnings) – March 2013) 66,000 jobs in North East Lincolnshire with 20,000 in the public sector and 97,400 jobs in Newark and Lincoln with 22,300 in the public sector. Andrew Thomas to send statistics.

The Humber Green Port Corridor Enterprise Zone and the Humber Renewable Energy Super Cluster are enterprise zones on the North and South banks of the river Humber specialising in renewable energy, green technologies and marine industries. The Port of Grimsby has been identified as a centre of excellence as part of this deal and an enterprise zone in its own right. The enterprise zones along with the strategy set out in the North Lincolnshire Local Development Framework is expected to increase employment in the area.

Cleethorpes is a seaside resort accessible by train, straight onto the promenade. Tourists enjoy traditional seaside attractions as well as Pleasure Island, a large theme park.

The south bank of the Humber is the largest remaining development site in the North of England fronting a deep water estuary, covering four square miles, and potentially the biggest job creator in the region, or indeed the North, with the prospect of up to 20,000 (direct and indirect) private sector jobs. Over 10,000 of these jobs will result as part of the major Able UK developments.

The University of Lincoln has 15,000 undergraduate and post graduate students and Lincoln College has 18,500 students, with smaller campuses across Northern Lincolnshire and Lincolnshire. There are also several further education establishments that drive student travel across the area.

The capacity improvement scheme on the GN/GE joint line between Peterborough and Doncaster via Sleaford, despite being developed primarily for freight may improve capacity and linespeeds for passenger services on routes in this region.

This section is organised into a description of the conditional outputs relating to each of the following corridors centred on Lincoln:

- Grimsby to Lincoln via Barnetby and Market Rasen.
- Sleaford, Spalding and Peterborough (including the Nottingham to Skegness corridor).
- Newark and Nottingham.
- Gainsborough, Doncaster, Worksop, Retford and Sheffield.
- and around Northern Lincolnshire:
- Barton-on-Humber to Grimsby and Cleethorpes.
- Barnetby, Scunthorpe and Doncaster.
- Brigg and Gainsborough.

There is no one urban centre that drives the majority of the regional urban market in Lincolnshire as you might expect around larger urban centres, data tables have been produced centred on Lincoln and Grimsby because they form a natural centre of a number of rail corridors.

B.4.1 Grimsby to Lincoln via Barnetby and Market Rasen

This corridor provides connections between Northern Lincolnshire, Lincoln and Newark. The services are infrequent and do not provide a high peak service into Lincoln Central or Grimsby with capacity issues on some services.

Barnetby provides access to Humberside International Airport.

Stakeholders aspire for a more frequent service on this corridor that better connects across Lincolnshire in particular at Cleethorpes and the East Coast Main Line at Newark North Gate.

B.4.1.1 Current services:

- Seven services per day between Grimsby and Lincoln Central some of which continue to Newark North Gate. All trains stop at Habrough, Barnetby adn Market Rasen.

B.4.1.2 Journey times and rolling stock:

- **Journey times/speeds**: The journey times on this route are relatively fast because of the low number of stations, but the low frequency of services means that in some hours it may be more convenient to travel via other routes.
- **Rolling stock:** Services are run by early generation diesel stock causing issues with acceleration and passenger satisfaction.

B.4.1.3 Criteria for conditional outputs:

- **Willingness to commute**: The GJT for journeys for all stations to Lincoln is significantly more than 60 minutes. Providing peak services from Barnetby and Market Rasen could promote a significant improvement in willingness to commute into Lincoln and Grimsby by achieving less than 60 minutes in to Lincoln and Grimsby with one train per hour on this route.
- **Jobs at destination:** This corridor connects employment centres at Lincoln, Newark, Grimsby and could further connect into Cleethorpes.
- **Population catchments:** Market Rasen is a small town and the station has a relatively small population catchment. Barnetby and Habrough are villages with relatively small population catchments.
- **Market for rail:** Overall demand is relatively low but with high demand at peak times. Demand may be suppressed by the poor level of service on this route.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share:** The journey times on this route are competitive with car, but the frequency and the connectivity of services are uncompetitive with more convenient modes.

B.4.1.4 Recommendations for conditional outputs:

- Provide peak services into Lincoln Central and Grimsby to promote willingness to commute.
- Provide sufficient capacity to meet demand.

Table 17 Population, demand and current service for stations on the Market Rasen corridor into Lincoln to inform conditional outputs

Corridor	Station name	Total Journeys into Lincoln* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Lincoln	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Lincoln	Market Rasen	2	59	2,500	2,200	1,400	29	<1 (0)	34 (34)	118	52 (15)	
	Lincoln Central	39	1,655	11,800	34,900	31,500	44	<1 (0)	93 (53)	112	28 (22)	
Total		**42**	**7,872**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Lincoln between 0800 and 0900

Table 18 Population, demand and current service for stations on the Market Rasen corridor into Grimsby to inform conditional outputs

Corridor	Station name	Total Journeys into Grimsby* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Grimsby	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Grimsby	Cleethorpes	6	213	6,300	33,000	26,300	47	<1 (0)	119 (61)	171	24 (17)	
	Grimsby Town	39	213	12,400	51,200	29,100	44	<1 (0)	93 (53)	122	28 (22)	
	Habrough	5	426	0	1,100	10,800	36	<1 (0)	58 (42)	111	37 (19)	
	Barnetby	10	853	1,400	0	2,200	29	<1 (0)	74 (33)	100	24 (18)	
	Market Rasen	40	1,705	2,500	2,200	1,400	15	<1 (0)	16 (16)	87	56 (16)	
Total		**100**	**3,410**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Grimsby between 0800 and 0900

B.4.2 Sleaford and Skegness

This corridor provides suburban services between Peterborough and Lincoln, and connects onto the Nottingham to Skegness line at Sleaford.

Conditional outputs for the Nottingham to Skegness line are also discussed in the Nottingham section of this appendix. Skegness is a seaside resort and a significant attractor of leisure trips, particularly in the summer. Rail services should seek to meet the requirements of this market driver.

B.4.2.1 Current services:

- One service per hour between Sleaford and Lincoln Central some starting at Peterborough some at Sleaford, and some ending at Lincoln Central and some at Doncaster calling at all stations.

B.4.2.2 Journey times and rolling stock:

- **Journey times/speeds**: The journey times are relatively fast compared to suburban services on other corridors, this is due to the low number of stations on the route.
- **Rolling stock:** Services are run by early generation diesel stock causing issues with acceleration and passenger satisfaction.

B.4.2.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT from Metheringham, Ruskington and Sleaford to Lincoln Central are either less than 60 minutes or could be improved to less than 60 minutes through journey time and frequency improvements.
- **Jobs at destination**: This corridor provides access to Lincoln and Peterborough.
- **Population catchments**: Sleaford and Spalding serve relatively large population catchments.
- **Market for rail:** Demand on this route is high compared to other routes into Lincoln, but demand is relatively low on this route compared to corridors into larger urban centres with a similar level of service provision. Demand is highest from Sleaford to Lincoln.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share**: The journey times on this route are competitive with car, but the frequency and the connectivity of services are uncompetitive with more convenient modes.

B.4.2.4 Recommendations for conditional outputs:

- Provide peak services into Lincoln Central to promote willingness to commute.
- Increase capacity to meet demand.

Table 19 Population, demand and current service for stations on the Sleaford corridor into Lincoln to inform conditional outputs

Corridor	Station name	Total Journeys into Lincoln* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Lincoln	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Sleaford, Spalding and Lincoln	Metheringham	84	110	2,300	1,500	0	10	1 (1)	12 (12)	54	48 (11)	
	Ruskington	61	92	2,500	1,500	5,900	17	1 (1)	22 (22)	64	46 (16	
	Sleaford	136	337	6,900	6,100	2,700	21	1 (1)	32 (31)	73	40 (18)	
	Spalding	15	173	8,600	13,500	3,700	38	<1 (0)	79 (56)	192	29 (12)	
	Peterborough	31	4,208	8,000	48,200	50,900	55	<1(0)	80 (65)	140	41 (24)	
Total		**327**	**4,919**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Lincoln between 0800 and 0900

B.4.3 Newark and Nottingham

This corridor provides suburban services into Lincoln Central from Newark Northgate and provides connections between Nottingham, Newark and Lincoln.

This route is also described in the Nottingham section of this appendix.

Newark is served by two stations, Newark Castle is on the route from Nottingham to Lincoln Central, and Newark Northgate is on a branch of the line to Lincoln and also on the East Coast Main Line. Interchange between the two stations can be difficult and causes a trade-off between better serving the regional urban market with one destination in Newark and providing interchange with longer distance services.

B.4.3.1 Current services:

- One service per hour between Nottingham and Lincoln Central calling at Newark Castle and some services calling at some or all other stations on the route. No peak service into Lincoln Central.
- One service per hour between Newark Northgate and Lincoln Central calling at some stations between Newark and Lincoln Central, with many services going onwards to Grimsby, Peterborough or Doncaster.

B.4.3.2 Journey times and rolling stock:

- **Journey times/speeds:** The journey times are relatively slow on this route.
- **Rolling stock:** Services are run by early generation diesel stock causing issues with acceleration and passenger satisfaction.

B.4.3.3 Criteria for conditional outputs:

- **Willingness to commute**: The GJT from all stations to Newark is either less than 60 minutes.
- **Jobs at destination:** This corridor provides access to Lincoln, Newark and Nottingham. Hykeham station is likely to serve the Siemens site.
- **Population catchments**: Newark is a large town and the two Newark stations serve large population catchments.
- **Market for rail:** Demand on this route is high between Nottingham, Newark and Lincoln, but demand may be suppressed on this route compared to other similar corridors due to the poor level of service offer.
- **Deprivation**: There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share**: Rail struggles to compete with car on this route because of poor journey times and frequency of services given the size of towns and cities on the route.

B.4.3.4 Recommendations for conditional outputs:

- Increase the frequency of services between Nottingham, Newark and Lincoln Central (consistent with Nottingham section).
- Improve journey times on the route.
- Increase capacity to meet demand.
- The Long Distance Market Study recommends a significant improvement in the service between Lincoln and a number of key urban centres in Yorkshire, the East Midlands and West Midlands.

Table 20 Population, demand and current service for stations on the Nottingham and Newark corridor into Lincoln to inform conditional outputs

Corridor	Station name	Total Journeys into Lincoln* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Lincoln	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Nottingham	Nottingham	174	6,437	15,000	85,800	112,700	33	1 (0)	56 (49)	100	35 (20)	
	Carlton	4	22	11,200	30,000	79,300	30	1 (1)	56 (43)	103	32 (17)	
	Burton Joyce	0	7	2,500	7,400	44,700	28	<1 (0)	63 (43)	110	27 (15)	
	Lowdham	8	42	1,200	3,100	7,500	26	1 (1)	41 (35)	87	37 (18)	
	Thurgaton	0	2	0	900	6,300	23	<1 (0)	47 (39)	107	30 (13)	
	Bleasby	1	4	900	0	7,300	22	<1 (0)	48 (36)	96	28 (14)	
	Fiskerton	3	11	900	0	8,800	20	<1 (0)	45 (29)	93	27 (13)	
	Rolleston	1	4	900	0	9,900	20	<1 (0)	47 (30)	94	25 (13)	
	Newark	223	334	5,900	16,400	12,600	16	2(2)	26 (23)	60	36 (16)	
	Collingham	18	60	2,100	0	0	11	1 (1)	24 (14)	54	27 (12)	
	Swinderby	6	17	0	0	6,600	8	<1 (1)	21 (13)	62	23 (8)	
	Hykeham	9	35	2,100	27,900	27,300	3	1 (1)	17 (7)	51	12 (4)	
Total		**446**	**6 ,975**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Lincoln between 0800 and 0900

B.4.4 Gainsborough, Doncaster, Worksop, Retford and Sheffield to Lincoln

Worksop, Retford and Kiveton Park are more in the suburban catchment of Sheffield, conditional outputs for these stations are described in Appendix G Yorkshire and Humber.

Gainsborough and Saxilby are the main origins for journeys into Lincoln on this route.

There is a significant student market on this route into Lincoln from Gainsborough and Saxilby.

This route provides connectivity with the East Coast Main line for connectivity to the North at Doncaster and Retford.

Stakeholders aspire to increase the frequency of services between Doncaster and Lincoln Central.

B.4.4.1 Current services:

- One service per hour between Sheffield and Lincoln Central calling at all stations to Lincoln Central.
- Four services per day between Doncaster and Lincoln Central calling at all stations to Lincoln Central.

B.4.4.2 Journey times and rolling stock:

- **Journey times/speeds**: For longer distance stations the journey times are relatively slow; the journey speeds from Gainsborough and Saxilby are relatively fast compared with other suburban services, largely because of the small number of stations on the route.
- **Rolling stock**: Services are run by early generation diesel stock causing issues with acceleration and passenger satisfaction.

B.4.4.3 Criteria for conditional outputs:

- **Willingness to commute**: The GJTs from Saxilby and Gainsborough into Lincoln are either less than 60 minutes or could be improved to less than 60 minutes through small improvements in GJT.
- **Jobs at destination:** This route provides access to Sheffield, Doncaster, Worksop and Lincoln.
- **Population catchments:** Gainsborough serves a small town with a large population catchment less than 3km from the station.
- **Market for rail:** The demand for rail into Lincoln is low on this route.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share:** Demand may be suppressed by station environment issues at Gainsborough.

B.4.4.4 Recommendations for conditional outputs:

- The Long Distance Market Study recommends a significant improvement in the service between Lincoln and a number of key urban centres in Yorkshire, the East Midlands and West Midlands.
- Increase the frequency of services between Lincoln and Sheffield via Worksop and Retford (consistent with Appendix G Yorkshire and Humber).
- Provide sufficient capacity to meet demand.

Table 21 Population, demand and current service for stations on the Sheffield, Worksop, Retford and Doncaster to Gainsborough and Lincoln corridor to inform conditional outputs

Corridor	Station name	Total Journeys into Lincoln* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Lincoln	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Sheffield, Worksop, Retford	Sheffield	57	8,424	15,600	100,000	128,500	49	1 (1)	84 (73)	124	35 (24)	
	Kiveton Park	9	49	0	10,800	14,600	38	1 (1)	62 (54)	106	37 (21)	
	Worksop	17	464	9,700	23,000	2,600	33	1 (1)	48 (47)	92	41 (21)	
	Retford	38	406	6,500	9,600	2,600	25	1 (1)	47 (35)	81	32 (19)	
Total		**122**	**9,344**									
Doncaster	Doncaster	20	3,884	5,700	42,300	38,500	37	<1 (1)	92 (50)	126	24 (18)	4 trains per day
Total		**20**	**3,884**									
Gainsborough and Saxilby	Gainsborough Lea Road	90	154	2,100	10,000	3,800	16	1.5 (2)	27 (21)	65	35 (14)	
	Saxilby	45	59	2,000	1,800	1,200	6	1.5 (2)	9 (9)	51	41 (7)	
Total		**135**	**213**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Lincoln between 0800 and 0900

B.4.5 Barton-on-Humber to Grimsby and Cleethorpes

The Barton-on-Humber corridor provides connections between the town of Barton-on-Humber, Grimsby and Cleethorpes. The route also provides connections via a bus interchange to Hull and the north bank of the river Humber via the Humber Bridge.

This route is supported by a community rail partnership.

B.4.5.1 Current services:

- One service every two hours between Barton-on-Humber and Cleethorpes calling at all stations to Cleethorpes.

B.4.5.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey times are relatively slow into Grimsby.
- **Rolling stock:** Services are run by early generation diesel stock causing issues with acceleration and passenger satisfaction.

B.4.5.3 Criteria for conditional outputs:

- **Willingness to commute**: The GJTs from all stations to Ulceby are either less than 60 minutes or could be improved to less than 60 minutes through small improvements in GJT.
- **Jobs at destination**: This route provides access to Grimsby, Cleethorpes and Barton-on-Humber.
- **Population catchments:** Barton-on-Humber, Grimsby and Cleethorpes serve large catchment populations, all other stations tend to serve small catchments on the route.
- **Market for rail:** The demand for rail into Grimsby is low on this route.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share**: Rail struggles to compete with car on this route due to the good road links.

B.4.5.4 Recommendations for conditional outputs:

- Continue to collaborate with the Community Rail Partnership to develop services on the route .

Table 22 Population, demand and current service for stations on the Barton-on-Humber corridor to Grimsby to inform conditional outputs

Corridor	Station name	Total Journeys into Grimsby* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Grimsby	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Barton-on-Humber	Barton-on-Humber	13	48	5,500	2,500	17,000	20	<1 (1)	41 (40)	97	29 (12)	
	Barrow Haven	0	2	0	4,800	34,200	18	<1 (1)	35 (35)	92	30 (12)	
	New Holland	5	22	1,000	3,800	19,800	16	<1 (1)	31 (31)	88	31 (11)	
	Goxhill	8	20	1,200	3,600	1,100	14	<1 (1)	27 (27)	84	31 (10)	
	Ulceby	4	8	0	0	5,800	10	<1 (1)	19 (19)	77	31 (8)	one every two hours
	Habrough	11	33	0	1,100	10,800	8	1.5 (2)	13 (9)	46	37 (11)	
	Stallingborough	8	11	900	2,100	16,800	4	<1 (1)	12 (10)	65	22 (4)	
	Healing	7	11	2,100	8,400	23,500	3	<1 (1)	9 (7)	62	22 (3)	
	Cleethorpes	37	265	6,300	33,000	26,300	3	1.5 (2)	7 (6)	45	28 (4)	
Total		**94**	**419**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Grimsby between 0800 and 0900

B.4.6 Doncaster, Scunthorpe, and Barnetby to Grimsby and Cleethorpes

This route provides long distance connections from Northern Lincolnshire to Doncaster, Sheffield, Manchester and Manchester Airport, and serves the suburban market between Doncaster, Scunthorpe, Barnetby, Grimsby and Cleethorpes.

Barnetby serves Humberside International Airport.

This route is important in the context of the Enterprise zones in Northern Lincolnshire.

This route connects to London and other key destinations at Doncaster.

B.4.6.1 Current services:

- One service per hour from Manchester Airport to Cleethorpes stopping at Doncaster, Scunthorpe and Barnetby. With some services serving smaller intermediate stations.
- One service per hour between Sheffield and Scunthorpe – Stopping at all stations

B.4.6.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey times are slow compared to other interurban routes.
- **Rolling stock**: Manchester Airport to Cleethorpes services are run by modern diesel stock, Sheffield to Scunthorpe services are run by early generation diesel stock causing issues with acceleration and passenger satisfaction.

B.4.6.3 Criteria for conditional outputs:

- Willingness to commute: The GJT from Barnetby to Grimsby could be improved to significantly less than 60 minutes to increase willingness to commute.
- Jobs at destination: This route provides access to Grimsby, Cleethorpes, Scunthorpe, Doncaster,Sheffield and Manchester.
- Population catchments: Barnetby serves a small catchment population. Cleethorpes, Grimsby, Scunthorpe and Doncaster serve large towns and catchment populations.
- Market for rail: The demand for rail into Grimsby is low on this route compared to other interurban corridors. Compared to other corridors locally, demand on the route is high.
- Deprivation: There are pockets of deprivation on the route. **http://casa.oobrien.com/booth/**
- Rail's market share: This route competes with car on long distance journeys.

B.4.6.4 Recommendations for conditional outputs:

- Provide sufficient capacity to meet demand.
- Improve journey times on the route.
- Provide direct connectivity to longer distance destinations including Sheffield, Manchester and Manchester Airport.

Table 23 Population, demand and current service for stations on the Doncaster, Scunthorpe and Barnetby corridor to Grimsby to inform conditional outputs												
Corridor	Station name	Total Journeys into Grimsby* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Grimsby	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Barnetby, Scunthorpe and Doncaster	Doncaster	21	3,884	5,700	42,300	38,500	49	1 (1)	61 (62)	108	48 (27)	
	Hatfield & Stainforth	0	109	3,000	12,900	14,900	42	<1 (1)	69 (60)	137	37 (18)	1 a day
	Thorne South	0	139	8,200	4,300	11,900	39	<1 (1)	64 (55)	133	37 (18)	1 a day
	Crowle	2	34	0	3,900	2,600	33	0 (0)	67 (46)	124	30 (16)	1 a day
	Althorpe	0	9	2,200	1,700	19,100	29	0 (0)	61 (40)	118	29 (15)	1 a day
	Scunthorpe	34	395	7,500	36,900	13,400	26	1 (1)	34 (33)	82	46 (19)	
	Barnetby	7	69	1,400	0	2,200	15	1.5 (2)	22 (18)	61	40 (14)	
Total		**94**	**419**									

***Year to March 2012**
****Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator**
*****Number of trains arriving into Grimsby between 0800 and 0900**

B.4.7 Brigg and Gainsborough

This route only provides passenger services on a Saturday. Stations on the route tend to serve small catchment populations and a high level of service would be required in order to compete with road.

There are local aspirations to improve services on this route.

Table 24 Population, demand and current service for stations on the Gainsborough and Brigg corridor to Grimsby to inform conditional outputs

Corridor	Station name	Total Journeys into Grimsby* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Grimsby	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Brigg and Gainsborough	Brigg	N/A	1	2,500	3,900	3,400		0 (0)				
	Kirton Lindsey	N/A	0	0	1,400	3,800		0 (0)				
	Gainsborough Central	1	1	4,600	8,700	4,200	35	0 (0)	131 (Ind)	185	16 (11)	
Total		1	2									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Grimsby between 0800 and 0900

B.5 Service level conditional outputs for routes centred on Norwich

This section is an interpretation of the Regional Urban conditional outputs for suburban routes centred on Norwich. The largest rail market to and from Norwich, by passenger demand is to and from London. However, for some suburban corridors the majority of demand is for travel to and from Norwich.

Links to other cities are important, and there is a small suburban rail market around Norwich which caters for commuting.

Norwich is the administrative, cultural and commercial centre of Norfolk. Businesses in Norwich employ a substantial number of people in the insurance and financial services sector. According to the Centre for Cities Factbook, the private sector employed 97,200 people in Norwich and the public sector employed 33,400.

Greater Norwich area is part of the second wave of core cities to achieve City Deal status. This will give more accountability to the region in exchange for more powers to encourage jobs and growth in the area.

Around Norfolk are a number of tourist destinations including Norwich, the Norfolk Broads, Thetford Forest, Great Yarmouth and other seaside destination such as Cromer and Sheringham.

The University of East Anglia, based in Norwich employs around 4,000 staff and has around 17,000 under-graduate and post-graduate students.

This section is organised into a description of the conditional outputs relating to each of the following corridors into Norwich:

- Sheringham and Cromer.
- Great Yarmouth and Lowestoft.
- Diss and Stowmarket (the Great Eastern Main Line).
- Ely via Thetford.

B.5.1 Sheringham and Cromer

The services along this corridor provide suburban services into Norwich. Cromer and Sheringham are small tourist destinations and attract rail passengers.

Around half of all demand on this route is to and from Norwich.

B.5.1.1 Current services:

- One train per hour from Sherringhamm to Norwich some services only call at key stations and others call at all stations.

B.5.1.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey times are relatively fast compared with many other suburban services into regional centres, but improvements could be made through rolling stock and line speed improvements. Journey times do not compete with road times into Norwich.
- **Rolling stock:** 75/90mph diesel stock with relatively slow acceleration characteristics compared with electric stock. Poor quality of rolling stock causes issues with passenger satisfaction.

B.5.1.3 Criteria for conditional outputs:

- **Willingness to commute:** All stations from Salhouse to North Walsham have a Generalised Journey Time (GJT) of less than 60 minutes or a GJT that could be improved to less than 60 minutes with small journey time and frequency improvements.
- **Jobs at destination**: Norwich is one of the main regional centres in the region with approximately 130,000 jobs.
- **Population catchments**: The route tends to serve relatively small communities compared with suburban routes around other cities, the largest catchments are around North Walsham, Cromer and Sheringham. Because of the rural nature of some stations the catchment of each station being higher for longer distance services.
- **Market for rail:** Demand on the route is low compared with suburban routes around other cities; the highest demand comes from North Walsham, Hoveton & Wroxham, Cromer and Sheringham.

- **Deprivation:** There are pockets of deprivation on the route. **http://casa.oobrien.com/booth/**
- **Rail's market share:** The market for travel into Norwich for commuting struggles to compete with road.

B.5.2.4 Recommendations for conditional outputs:

- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- Improve journey times and passenger satisfaction through rolling stock improvements and line speed increases.

Table 25- Population, demand and current services for stations on the Sheringham and Cromer line into Norwich to inform conditional outputs

Corridor	Station name	Total Journeys into Norwich* (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km (census 2011)**	Population 1 to 3km (census 2011)	Population 3 to 5km (census 2011)	Distance in miles	Frequency off peak (peak***)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) (mph)	Notes
Sheringham and Cromer	Sheringham	83	189	5,000	700	2,500	31	1 (1)	55 (51)	101	33 (18)	
	West Runton	9	24	1,600	5,400	6,600	29	1 (1)	51 (47)	96	34 (18)	
	Cromer	73	185	2,700	4,300	2,400	27	1 (1)	44 (39)	88	36 (18)	
	Roughton Road	6	14	1,900	5,300	3,300	24	<1 (1)	41 (38)	85	35 (17)	
	Gunton	9	17	0	3,500	2,800	20	<1 (1)	34 (33)	80	35 (15)	
	North Walsham	109	222	2,800	5,900	1,800	16	1 (1)	28 (24)	67	34 (14)	
	Worstead	13	22	0	2,300	4,600	13	<1 (1)	24 (20)	64	33 (12)	
	Hoveton & Wroxham	54	114	1,300	1,100	5,500	9	1 (1)	17 (13)	56	31 (9)	
	Salhouse	3	6	0	2,500	17,300	6	<1 (1)	12 (10)	57	30 (6)	
Total		**358**	**792**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Norwich between 0800 and 0900

B.5.2 Great Yamouth and Lowestoft

The services along this corridor provide suburban services into Norwich from Great Yarmouth and Lowestoft. Great Yarmouth is a large tourist destination and attracts rail passengers in its own right.

The Community Rail Partnership in collaboration with the Local Authority is developing plans to improve the quality of Great Yarmouth station and the surrounding environment and onward links into the town.

Around half of all demand on this route is to and from Norwich, with the exception of Lowestoft and stations to the south of Lowestoft, where a substantial number of journeys are made to other destinations such as Ipswich.

B.5.2.1 Current services:

- One service per hour from Lowestoft to Norwich calling at key stations only in some hours and all stations in others. (one extra in the peak hour into Norwich).
- One service per hour from Great Yarmouth to Norwich via Acle calling at all stations (extra in the peak hours into Norwich).
- Two service per day from Great Yarmouth to Norwich via Berney Arms.

B.5.2.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey times are relatively fast compared with many other suburban services into other regional centres, but improvements could be made through rolling stock and line speed improvements. Journey times do not compete with road times into Norwich.
- **Rolling stock:** 75/90mph diesel stock with relatively slow acceleration characteristics compared with electric stock. Poor quality of rolling stock causes issues with passenger satisfaction.

B.5.2.3 Criteria for conditional outputs:

- **Willingness to commute**: All stations to Great Yarmouth and Lowestoft have a GJT of less than 60 minutes or a GJT that could be improved to less than 60 minutes with small journey time and frequency improvements.
- **Jobs at destination**: Norwich is one of the main regional centres in the region with approximately 130,000 jobs.
- **Population catchments**: Lowestoft and Great Yarmouth are large towns that are also rail destinations in their own right. Other stations on the route tend to serve relatively small communities compared with suburban routes around other cities; the largest catchments are around Great Yarmouth, Lowestoft, Oulton Broad North and Brundell.
- **Market for rail:** Demand from Great Yarmouth and Lowestoft is relatively high compared with other routes into Norwich, demand from other stations on the route is low compared with suburban routes around other cities.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share**: The market for travel into Norwich for commuting struggles to compete withthe bus market between Norwich and Great Yarmouth.

B.5.2.4 Recommendations for conditional outputs:

- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- Improve journey times and passenger satisfaction through rolling stock improvements and line speed increases.

Table 26 Population, demand and current services for stations on the Great Yarmouth and Lowestoft lines into Norwich and from the Saxmundham line into Lowestoft to inform the conditional outputs

Corridor	Station name	Total Journeys into Norwich* (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km (census 2011)**	Population 1 to 3km (census 2011)	Population 3 to 5km (census 2011)	Distance in miles	Frequency off peak (peak***)	Average journey time (best)	Generalised Journey Time	Average speed (Generalised Speed) (mph)	Notes
Brundall	Brundall	60	89	1,100	4,300	5,100	6	1.5 (3)	12 (8)	36	29 (10)	
	Brundall Gardens	9	11	2,200	3,200	13,100	5	<1 (2)	10 (7)	40	29 (7)	
Total		69	100									
Great Yarmouth	Great Yarmouth	205	441	7,600	14,300	21,500	18	1 (2)	33 (30)	64	33 (17)	
	Acle	32	53	1,900	0	4,300	10	1 (2)	22 (16)	54	28 (12)	
	Lingwood	35	48	1,900	0	9,100	8	1 (2)	17 (12)	49	28 (10)	
Total		271	542									
Lowestoft	Lowestoft	164	414	6,800	28,600	14,900	24	1 (2)	42 (35)	81	34 (17)	
	Oulton Broad	85	119	5,300	42,700	3,200	22	1 (2)	35 (30)	76	38 (18)	
	Somerleyton	5	11	0	1,200	6,200	18	<1 (1)	35 (32)	75	31 (14)	
	Haddiscoe	6	10	0	0	5,200	16	<1 (1)	31 (28)	72	31 (14)	
	Reedham	29	44	1,100	0	2,100	12	<1 (2)	22 (16)	58	33 (13)	
	Cantley	10	16	0	900	4,300	10	<1 (2)	19 (12)	54	32 (11)	
	Buckenham		0	0	900	7,200						Very small - no data
Total		299	613									
Berney Arms	Berney Arms	0	1	0	2,200	7,800	16	<1 (0)	42 (25)	219	23 (4)	2 a day in each direction
Total		0	1									
Darsham	Darsham	1	44	0	1,400	900	46	0 (0)	101 (Ind)	148	27 (19)	
	Halesworth	1	77	2,200	1,100	1,500	41	0 (0)	99 (Ind)	151	25 (16)	
	Brampton	0	6	0	0	3,200	37	0 (0)	99 (Ind)	150	22 (15)	
	Beccles	1	79	3,400	5,600	3,900	32	0 (0)	79 (Ind)	147	24 (13)	
Total		2k	206									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Norwich between 0800 and 0900

B.5.3 Diss, Stowmarket (The Great Eastern Main Line)

This route provides fast services to and from London, and demand from stations on this route into Norwich is small in comparison with demand into London. Therefore the conditional outputs for this route are driven by issues related to the London and South East Market Study.

Table 27 Population, demand and current services for stations on the Great Eastern main line into Norwich to inform conditional outputs

Corridor	Station name	Total Journeys into Norwich* (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km (census 2011)**	Population 1 to 3km (census 2011)	Population 3 to 5km (census 2011)	Distance in miles	Frequency off peak (peak***)	Average journey time (best)	Generalised Journey Time	Average speed (Generalised Speed) (mph)	Notes
Ipswich, Stowmarket and Diss	Ipswich	157	3,159	7,300	63,200	38,400	46	2 (2)	42 (38)	68	66 (41)	
	Needham Market	1	78	2,100	1,200	4,700	38	0 (0)	57 (ind)	99	40 (23)	
	Stowmarket	65	880	6,600	8,700	4,700	34	1 (2)	31 (29)	63	67 (33)	
	Diss	192	615	3,100	5,600	900	20	1 (2)	19 (17)	45	63 (27)	
Total		**414**	**4,732**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Norwich between 0800 and 0900

B.5.4 Ely via Thetford

The services along this corridor provide suburban services into Norwich from Ely, Brandon, Thetford, Attleborough and Wymondham, and Interurban destinations such as Cambridge, Peterborough, the East Midlands, South Yorkshire and the North West of England. Journeys from Ely and other stations on the Kings Lynn to London line via Cambridge are more concentrated on Cambridge and London.

The Long Distance Market Study recommends improving the service between Norwich and Cambridge.

Around half of all demand from Thetford, Attleborough and Wymondham is to and from Norwich.

B.5.4.1 Current services:

- One service per hour from Cambridge to Norwich calling at key stations on the route.
- One service per hour from Liverpool Lime Street/Nottingham to Norwich calling at key stations on the route.

These services provide two services per hour between Ely and Norwich, albeit on an irregular pattern.

B.5.4.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey times are relatively fast compared with many other suburban services into other regional centres.
- **Rolling stock:** 90mph diesel stock with relatively fast acceleration characteristics compared with 75mph diesel stock, but slow acceleration compared with electric stock.

B.5.4.3 Criteria for conditional outputs:

- **Willingness to commute:** Wymondham, Attleborough and Thetford have a GJT of less than 60 minutes or a GJT that could be improved to less than 60 minutes with small journey time and frequency improvements.
- **Jobs at destination:** Norwich is one of the main regional centres in the region with approximately 130,000 jobs.
- **Population catchments:** Ely, Wymondham, Attleborough and Thetford serve relatively large catchments compared with other routes around Norwich. Other stations on the route tend to serve relatively small communities compared with suburban routes around other cities,.
- **Market for rail:** Demand from Attleborough, Wymondham and Thetford is the highest suburban demand on the route, demand from other stations on the route is low.
- **Deprivation**: There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share**: The market for travel into Norwich for commuting struggles to compete with road.

B.5.4.4 Recommendations for conditional outputs:

- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- Improve frequency from some suburban stations on the route by changing stopping patterns but the benefit of this will have to be compared with the loss of journey times from interurban stations.

Table 28 Population, demand and current services for stations on the Ely line into Norwich to inform conditional outputs

Corridor	Station name	Total Journeys into Norwich* (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km (census 2011)**	Population 1 to 3km (census 2011)	Population 3 to 5km (census 2011)	Distance in miles	Frequency off peak (peak***)	Average journey time (best)	Generalised Journey Time	Average speed (Generalised Speed) (mph)	Notes
Ely	Ely	46	1,824	2,200	11,500	2,800	54	2 (2)	63 (48)	90	51 (36)	
	Shippea Hill		0	0	0	0						
	Lakenheath		0	0	1,100	3,400						
	Brandon	22	90	1,700	4,900	2,200	38	1 (2)	47 (41)	84	48 (27)	
	Thetford	112	258	9,200	8,500	0	30	2 (2)	30 (26)	66	61 (28)	
	Harling Road		4	0	1,200	900						Very small - No data
	Eccles Road		1	0	1,600	2,500						Very small - No data
	Attleborough	119	171	2,700	5,300	2,100	16	1 (2)	22 (16)	56	44 (17)	
	Spooner Row		0	0	1,100	4,800						Very small - No data
	Wymondham	84	157	1,900	8,300	1,200	10	1 (2)	11 (11)	47	56 (13)	
Total		**383**										

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Norwich between 0800 and 0900

Appendix C Service level conditional outputs for the North East

Appendix C: Service level conditional outputs forthe North East

This Appendix is an interpretation of the Regional Urban conditional outputs into and within the North East disaggregated by the rail corridors into Newcastle and Middlesborough.

C.1 Service level conditional outputs for corridors centred on Newcastle

The following section details the conditional outputs for **Newcastle. The** Tyne and Wear Metro provides light rail suburban services around Tyne and Wear and recommending conditional outputs for the Metro system is outside the scope of the Long Term Planning Process.

Newcastle is a key centre for employment in the North East. Other towns and cities such as Durham, Darlington, Morpeth, Hexham, Middlesbrough, Sunderland, Redcar and Hartlepool drive interurban and suburban rail trips across the region.

Newcastle employs just under 400,000 people, with around 250,000 in the public sector (Centre for Cities factbook).

Newcastle station and Metro Centre station serve employment centres and a retail and leisure market that drives demand at the weekends.

The North East Enterprise Zone covers 10 sites clustered around the Port of Blyth, on the north bank of the River Tyne and adjacent to the A19, south of the Nissan plant in Sunderland. The zone focuses on low carbon and advanced manufacturing sectors, specifically targeting offshore and marine energy, wind turbine manufacture, ultra low carbon vehicles, high-value manufacturing and associated research and development.

Newcastle University and Northumbria University have just over 50,000 undergraduate and postgraduate students.

Newcastle is part of the first wave of core cities to achieve City Deal Status. This will give more accountability to the region in exchange for more powers to encourage jobs and growth in the area.

The rail corridors around Newcastle provide an inconsistent level of service. Whilst the East Coast Main Line provides fast intercity services to key cities across Great Britain. Intra-regional connectivity tends to be quite poor, particularly between Newcastle, Sunderland and Middlesbrough and suburban services tend to be run by early generation diesel rolling stock. Stakeholders have raised concerns over the early ramp down of services in the evenings.

This section is organised into a description of the conditional outputs relating to each of the following corridors around Newcastle:

- East Coast Main Line North.
- Middlesbrough, Stockton, Hartlepool, Sunderland and Seaham.
- Durham, Darlington, Eaglescliffe, East Coast Main Line South.
- Carlisle, Hexham and Metrocentre (Tyne Valley).

There are aspirations to run services on the freight line from Newcastle to Ashington and Blythe, the feasibility of this is being investigated in a separate project.

C.1.1 East Coast Main Line (ECML) North

The East Coast Main Line route provides intercity services and suburban services into Newcastle from Northumberland and Scotland. Suburban services are infrequent and slow.

C.1.1.1 Current services:

- One service per hour from Morpeth to Metrocentre calling at all stations to Newcastle, extended to start from Chathill in the peak.
- Intercity services provide services from Berwick-upon-Tweed, Alnmouth and Morpeth to Newcastle.

C.1.1.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey times from stations served by intercity operators are relatively fast to Newcastle. Journey times from suburban stations are relatively slow.
- **Rolling stock**: Rolling stock on the stopping services tends to be run by early generation diesel rolling stock with poor acceleration and low top speeds and causes issues with passenger satisfaction.

Service level conditional outputs for the North East - corridors centred on Newcastle

C.1.1.3 Criteria for conditional outputs:

- **Willingness to commute:** The Generalised Journey Time (GJT) from Alnmouth, Morpeth and Cramlington is less than 60 minutes. Small frequency and journey time improvements will improve the GJT and willingness to commute to Newcastle. For other stations, significant improvements are required to reduce the GJT to less than 60 minutes.
- **Jobs at destination:** Newcastle is the largest employment centre in the North East and is an important cultural centre. Metrocentre also serves a growing employment centre.
- **Population catchments:** Morpeth and Cramlington have relatively large catchment populations.
- **Market for rail:** Demand from Alnmouth, Morpeth and Cramlington is the highest on the route, but is low compared with suburban stations into other regional centres. Manors is a short walk from Newcastle city centre and on the Metro and rail will never be competitive into Newcastle in comparison.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share:** Rail's market share is relatively low into Newcastle, and gains can still be made.

C.1.1.4 Recommendations for conditional outputs:

- Improved journey times through improved rolling stock characteristics.
- Increased frequency from one to two trains per hour from Morpeth and Cramlington to Newcastle.
- Increased capacity to meet demand through lengthening or increased frequency.

C.1.1.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Morpeth and Cramlington on this corridor into Newcastle will have the largest impact on labour supply and reducing deprivation by providing access to employment. Increasing the frequency to two trains per hour all day to Newcastle with an average journey speed of 40mph could improve the GJT from Morpeth by approximately 10 minutes and from Cramlington by approximately 20 minutes. The impact of these improvements from these stations to Newcastle on Gross Value Added (GVA) through labour supply improvements is estimated to be around £98,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £41,000 per annum per minute of GJT.

Service level conditional outputs for the North East - corridors centred on Newcastle

Table 1. Population, demand and current servicess for stations on the East Coast Main Line from the north to Newcastle to inform conditional outputs												
Corridor	Station name	Total Journeys into Newcastle* (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average Speed (Generalised Speed) - mph	Notes
East Coast Main Line - North	Chathill	5	5	0	1,100	0	46	<1 (1)	71 (52)	178	39 (16)	
	Alnmouth	114	256	0	1,300	7,000	35	1 (2)	32 (24)	68	65 (31)	
	Acklington	0	0	0	0	8,700	31	<1 (1)	58 (38)	163	32 (11)	
	Widdrington	4	5	2,500	0	2,300	23	<1 (1)	47 (31)	161	30 (9)	
	Pegswood	2	2	1,400	4,500	23,700	19	<1 (1)	47 (25)	159	24 (7)	
	Morpeth	143	268	3,200	9,600	6,100	17	1 (2)	22 (12)	53	45 (19)	
	Cramlington	60	82	3,700	18,600	20,200	10	1 (1)	16 (9)	59	37 (10)	
	Manors	1	4	9,000	94,600	129,300	1	1 (1)	10 (2)	60	4 (1)	
Total		329	623									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Newcastle between 0800 and 0900

C.1.2 Middlesbrough, Stockton, Hartlepool, Sunderland and Seaham

This route provides suburban services into Newcastle via Sunderland. Demand from stations to Nunthorpe on the Whitby branch, Stockton, Billingham and Seaton Carew is more driven by commuting into Middlesbrough and conditional outputs for these stations are presented in the Tees Valley section of this appendix. Middlesbrough and Sunderland are large urban centres with established employment centres and Stockton and Thornaby also serve employment centres, therefore services between these cities and Newcastle should also be improved from the perspective of business to business connectivity. Sunderland and Heworth are part of the Tyne and Wear Metro. However, rail offers a much faster service from Sunderland to Newcastle than the metro service but people also choose to use the Metro to Newcastle because of access to central employment and the frequency of services.

C.1.2.1 Current services:

- One service per hour from Middlesbrough to Hexham calling at all stations to Newcastle, extended to Nunthorpe in some hours and extra services are planned to be extended to Nunthorpe beyond the current timetable. One extra in the peak.
- Saltburn to Darlington peak extension to Newcastle.
- Infrequent long distance services from Sunderland to Kings Cross

C.1.2.2 Journey times and rolling stock:

- **Journey times/speeds:** Given the large gaps between stations on this route, journey times into Newcastle are relatively poor.
- **Rolling stock**: Stopping services tend to be run by early generation diesel rolling stock with poor acceleration and low top speeds and causes issues with passenger satisfaction.

C.1.2.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT from Hartlepool, Seaham, Sunderland and Heworth is either less than 60 minutes or improved frequency and journey times from these stations could reduce the journey time to less than 60 minutes.
- **Jobs at destination:** Newcastle is the largest employment centre in the North East and is an important cultural centre. Metrocentre also serves a growing employment centre
- **Population catchments:** All stations serve relatively large communities.
- **Market for rail:** Demand from Sunderland, Hartlepool and Middlesbrough is the highest on the route, but is low compared with suburban stations into other regional centres.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share is relatively low into Newcastle, and gains can still be made.

C.1.2.4 Recommendations for conditional outputs:

- Improve journey times through improved rolling stock characteristics.
- Run an additional limited stop service picking up principal stations from Newcastle to Middlesbrough to significantly reduce journey times to increase commuting and business connectivity and deliver a half hourly frequency.
- Increase capacity to meet demand through lengthening or increased frequency.

C.1.2.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Seaham to Newcastle will have the largest impact on labour supply and reducing deprivation by providing access to employment. Sunderland is well served by the Tyne and Wear Metro, and other towns are too far away from Newcastle to promote commuting by improving rail services, business to business connectivity should be the driver for improving interurban rail services on this corridor. Increasing the frequency to two trains per hour all day to Newcastle with an average journey speed of 40mph could improve the GJT from Seaham to Newcastle by around 20 minutes. The impact of these improvements from these stations to Newcastle on Gross Value Added (GVA) through labour supply improvements is estimated to be around £17,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £11,000 per annum per minute of GJT.

Table 2. Population, demand and current servicess for stations on the Middlesbrough, Stockton, Hartlepool, Sunderland and Seaham corridor to Newcastle												
Corridor	Station name	Total Journeys into Newcastle* (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average Speed (Generalised Speed) - mph	Notes
Middlesbrough, Stockton, Hartlepool, Sunderland and Seaham.	Nunthorpe	2	22	4,600	19,500	48,700	51	<1 (1)	100 (91)	157	31 (20)	
	Gypsy Lane	1	23	5,400	30,200	57,400	51	<1 (1)	93 (85)	153	33 (20)	
	Marton	1	9	3,500	55,800	68,100	50	<1 (1)	90 (82)	151	33 (20)	
	Middlesbrough	74	1,423	4,800	36,300	59,400	47	1 (3)	75 (69)	105	37 (27)	
	Thornaby	37	575	5,000	46,000	89,200	44	1 (3)	66 (64)	99	40 (26)	
	Stockton	9	70	9,300	50,800	55,000	42	1 (2)	64 (63)	106	39 (24)	
	Billingham Cleve	15	71	8,100	25,900	37,800	38	1 (2)	63 (56)	101	36 (22)	
	Seaton Carew	9	45	4,800	24,400	21,100	32	1 (2)	49 (49)	96	40 (20)	
	Hartlepool	140	523	4,900	38,800	20,100	30	1 (2)	51 (43)	85	36 (21)	
	Seaham	57	122	8,100	9,600	15,700	17	1 (2)	27 (28)	67	38 (15)	
	Sunderland	126	753	12,000	52,900	54,000	12	1 (2)	25 (19)	37	29 (20)	Tyne and Wear Metro
	Heworth	1	17	7,200	57,600	116,900	3	1 (2)	7 (5)	19	26 (10)	Tyne and Wear Metro
Total		**472**	**3,652**									

*Year to March 2012

**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator

***Number of trains arriving into Newcastle between 0800 and 0900

C.1.3 East Coast Main Line (ECML) South

The East Coast Main Line South route provides services into Newcastle from Darlington, Durham and Chester-le-Street. Darlington and Durham are stops on the intercity network and have an excellent service into Newcastle. Timing of long distance services tend to be fixed by other constraints further down the route, as a result the pattern of services from Darlington and Durham into Newcastle tends to leave large gaps in each hour. There is an aspiration to provide a more even pattern of services.

Chester-le-Street has a very poor off-peak frequency, and there is an opportunity to improve this by stopping more services at this station. However, the benefits of this opportunity will have to be traded against the increased journey times from other stations.

Stations between Bishop Auckland, Darlington and Middlesbrough form part of a suburban network around Middlesbrough and Darlington and conditional outputs for these stations are represented in the section centred on corridors around Middlesbrough.

C.1.3.1 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Darlington, Durham and Chester-le-Street will have the largest impact on labour supply and reducing deprivation by providing access to employment. Increasing the frequency to two trains per hour all day from Chester-le-street to Newcastle with an average journey speed of 60mph (commensurate with long distance services) could improve the GJT from by around 15-20 minutes. The impact of these improvements from Chester-le-Street to Newcastle on Gross Value Added (GVA) through labour supply improvements is estimated to be around £19,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £28,000 per annum per minute of GJT.

Service level conditional outputs for the North East - corridors centred on Newcastle

Table 3. Population, demand and current services for stations on the East Coast Main Line from the south to Newcastle including stations from Middlesbrough and Saltburn to inform conditional outputs

Corridor	Station name	Total Journeys into Newcastle* (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average Speed (Generalised Speed) - mph	Notes
Middlesbrough	Saltburn	10	259	4,300	10,900	10,800	60	<1 (1)	100 (101)	147	36 (25)	
	Marske	2	77	5,300	13,300	24,900	58	<1 (1)	93 (97)	141	38 (25)	
	Longbeck	2	41	4,900	17,200	21,400	58	<1 (1)	90 (95)	139	39 (25)	
	Redcar East	6	140	7,500	20,500	7,700	56	<1 (1)	85 (91)	135	40 (25)	
	Redcar Central	22	377	8,400	16,800	10,500	55	<1 (1)	83 (89)	132	40 (25)	
	Middlesbrough	74	1,423	4,800	36,300	59,400	47	1 (3)	75 (69)	105	37 (27)	
	Thornaby	37	575	5,000	46,000	89,200	44	1 (3)	66 (64)	99	40 (26)	
	Eaglescliffe	11	135	3,400	19,500	52,600	45	<1 (1)	65 (59)	105	41 (26)	
	Allens West	5	64	5,200	14,100	37,800	44	<1 (1)	65 (56)	103	41 (26)	
	Dinsdale	1	28	2,400	1,100	19,600	40	<1 (1)	57 (50)	98	42 (24)	
Total		**171**	**3,118**									
Northallerton and Yarm	Yarm	3	133	3,100	10,900	15,900	47	0 (0)	85 (Ind)	144	33 (20)	
	Northallerton	42	572	6,500	5,700	2,900	50	1.5 (1)	50 (34)	89	60 (34)	
Total		**45**	**705**									
ECML South	Darlington	462	2,256	11,200	41,300	20,400	36	5 (4)	32 (27)	51	68 (43)	
	Durham	1,032	2,281	8,600	23,800	24,500	14	5 (4)	15 (11)	36	56 (23)	
	Chester Le Street	142	189	9,500	14,300	32,100	8	1/2 (2)	17 (8)	51	29 (10)	
Total		**1,635**	**4,727**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Newcastle between 0800 and 0900

C.1.4 Carlisle, Hexham and Metrocentre

This route provides suburban services into Newcastle from Carlisle, via Hexham and Metrocentre and also provides interurban connectivity between Glasgow, Dumfries, Carlise and Newcastle. Stakeholders raised issues with parking facilities at stations on this route.

C.1.4.1 Current services:

- One service per hour from Hexham to Middlesborough calling at all stations to Newcastle. One extra in the peak.
- One service per hour from Carlisle to Newcastle calling at all stations to Hexham and then principal stations to Newcastle.
- Five services per day from Glasgow Central / Dumfries to Newcastle calling at all stations to Newcastle.

C.1.4.2 Journey times and rolling stock:

- **Journey times/speeds:** Given the large gaps between stations on this route, journey times into Newcastle are relatively poor.
- **Rolling stock:** Stopping services are run by early generation diesel stock with poor acceleration and low top speeds and causes issues with passenger satisfaction. Services from Scotland are run by 75mph diesel stock.

C.1.4.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT from all stations between Hexham and Newcastle is either less than 60 minutes or could be improved to less than 60 minutes through small frequency and journey time improvements.
- **Jobs at destination:** Newcastle is the largest employment centre in the North East and is an important cultural centre. Metrocentre also serves a growing employment centre.
- **Population catchments**: Hexham, Prudhoe, Wylam and Blaydon serve the largest communities and Metro Centre is close to Newcastle city centre and is an attractor of trips.
- **Market for rail:** Demand from Hexham and Metrocentre is the highest on the route, but is low compared with suburban stations into other regional centres.
- **Deprivation:** There are pockets of deprivation on the route. **http://casa.oobrien.com/booth/**
- **Rail's market share:** Rail's market share is relatively low into Newcastle, and gains can still be made.

C.1.4.4 Recommendations for conditional outputs:

- Improve journey times through improved rolling stock characteristics, improving stopping patterns to improve journey times from principal stations, and possibly infrastructure improvements.
- Increase capacity to meet demand through lengthening or increased frequency.
- Increase the frequency of services from key stations to Newcastle in the off peak to improve interurban and suburban connectivity.

C.1.4.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Prudhoe, Hexham and Wylam will have the largest impact on labour supply and reducing deprivation by providing access to employment. Incremental improvements can be made through increasing off peak and shoulder peak frequency, improving the pattern of services and improving the speed of service. The GJT could be improved by between 10 and 20 minutes. The impact of these improvements to Newcastle on Gross Value Added (GVA) through labour supply improvements is estimated to be around £11,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £77,000 per annum per minute of GJT.

Service level conditional outputs for the North East - corridors centred on Newcastle

Table 4. Population, demand and current servicess for stations on the Carlisle, Hexham and Metrocentre corridor to Newcastle to inform conditional outputs

Corridor	Station name	Total Journeys into Newcastle* (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average Speed (Generalised Speed) - mph	Notes
Carlisle, Hexham and Metrocentre	Carlisle	161	1,787	11,300	37,400	12,300	62	1 (2)	90 (80)	136	41 (27)	
	Wetheral	4	17	0	3,300	14,400	57	<1 (2)	93 (77)	130	37 (27)	
	Brampton	5	12	0	3,200	0	51	<1 (2)	75 (68)	121	41 (25)	
	Haltwhistle	26	76	2,800	1,700	0	39	1 (2)	58 (49)	103	40 (23)	
	Bardon Mill	5	9	0	0	0	34	<1 (2)	67 (45)	101	30 (20)	
	Haydon Bridge	13	31	1,600	0	0	30	<1 (2)	54 (39)	97	33 (18)	
	Hexham	223	380	4,000	6,800	0	22	2 (3)	40 (30)	69	33 (19)	
	Corbridge	50	75	0	3,700	2,700	19	1 (3)	39 (32)	68	30 (17)	
	Riding Mill	20	29	0	0	4,300	17	1 (3)	28 (28)	64	36 (16)	
	Stocksfield	43	61	1,000	1,900	8,000	15	1 (3)	24 (24)	60	37 (15)	
	Prudhoe	88	152	3,700	8,400	6,300	12	2 (3)	19 (17)	52	38 (14)	
	Wylam	72	111	1,400	12,700	15,400	10	1 (3)	24 (14)	51	25 (12)	
	Blaydon	4	4	3,400	37,200	77,800	6	1 (3)	18 (10)	45	18 (7)	
	Metrocentre	193	357	1,400	55,900	98,600	4	2 (3)	10 (4)	34	21 (6)	
Tota		**907**	**3,102**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Newcastle between 0800 and 0900

C.2 Service level condional outputs for corridors centres on Middlesbrough

This section is an interpretation of the Regional Urban conditional outputs into and within the North East disaggregated by the rail corridors into Middlesbrough and Darlington.

Middlesbrough is a smaller conurbation than Newcastle, but is the centre of a number of rail corridors. Sunderland, Redcar, Darlington, Durham and Hartlepool drive interurban and suburban rail trips across the region.

Middlesbrough employs around 180,000 people, with around 60,000 in the public sector (Centre for Cities factbook).

Middlesbrough, Darlington, Thornaby, Stockton, Redcar and Hartlepool all serve employment centres in the Tees Valley. Sunderland is an employment centre in its own right and drives commuting on the Newcastle, Sunderland and Middlesbrough corridor. Darlington also provides important connections with the East Coast Main line.

The Tees Valley Enterprise Zone is made up of 12 sites specialising in advanced manufacture and engineering, renewable energy, chemicals, healthcare, and digital technology.

Teesside University has around 28,000 undergraduate and postgraduate students while over 2,000 students attend the Durham University Queens Campus site which is very close to Thornaby station. In addition there are a number of large colleges of further education campuses across the Tees Valley, notably in Middlesbrough, Darlington, Stockton, Redcar and Hartlepool, all very close to rail stations.

Intra-regional connectivity tends to be quite poor, particularly between Newcastle, Sunderland and Middlesbrough and suburban services tend to be run by early generation diesel rolling stock. Stakeholders raised concerns over the early ramp down of services in the evenings.

This section is organised into a description of the conditional outputs relating to each of the following corridors around Middlesbrough:

- Newcastle, Seaham, Sunderland, Hartlepool and Stockton
- Redcar and Saltburn
- Nunthorpe
- Whitby
- York to Middlesbrough via Yarm
- Bishop Auckland and Darlington to Middlesbrough

C.2.1 Newcastle, Sunderland, Hartlepool and Stockton

This route provides suburban services into Middlesbrough from Newcastle and Sunderland. There are aspirations to improve the frequency of services.

C.2.1.1 Current services:

- One service per hour from Hexham to Middlesbrough calling at all stations from Hexham to Middlesbrough.
- Infrequent services from Sunderland to London Kings Cross via Eaglescliffe and Hartlepool.
- Additional peak service from Newcastle to Nunthorpe.

C.2.1.2 Journey times and rolling stock:

- **Journey times/speeds:** Given the large gaps between stations on this route, journey times into Middlesbrough are relatively poor.
- **Rolling stock:** Local services tend to be run by early generation diesel rolling stock with poor acceleration and top speeds that causes issues with passenger satisfaction.

C.2.1.3 Criteria for conditional outputs:

- **Willingness to commute:** The Generalised Journey Time (GJT) from Stockton, Billingham, Seaton Carew and Hartlepool into Middlesbrough is either less than 60 minutes or improved frequency and journey times from these stations could reduce the journey time to less than 60 minutes.
- **Jobs at destination:** Middlesbrough, Stockton and Thornaby serve employment centres.
- **Population catchments:** Stockton, Billingham, Seaton Carew and Hartlepool all have large population catchments.
- **Market for rail:** Demand into Middlesbrough is low from all stations compared with corridors into other urban centres, Hartlepool, Sunderland and Newcastle have the highest demand into Middlesbrough. However there has been significant growth in the last 10 years.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share:** Rail's market share is relatively low into Middlesbrough, and gains can still be made.

C.2.1.4 Recommendations for conditional outputs:

- Improve journey times through improved rolling stock characteristics.
- Run an additional limited stop service stopping at principal stations from Newcastle to Middlesbrough to significantly reduce journey times to increase commuting and business connectivity and deliver a half hourly frequency.
- Increase capacity to meet demand through lengthening or increased frequency.
- Retain good connections between local/regional services and long distance services at Thornaby and Middlesbrough.

Service level conditional outputs for the North East - Tees Valley

Table 5. Population, demand and current servicess for stations on the Newcastle, Seaham, Sunderland, Hartlepool and Stockton corridors to Middlesbrough to inform the conditional outputs												
Corridor	Station name	Total Journeys into Middlesbrough* (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average Speed (Generalised Speed) - mph	Notes
Newcastle, Seaham, Sunderland, Hartlepool and Stockton	Newcastle	74	7,706	6,200	90,100	125,400	47	1 (2)	75 (69)	105	37 (27)	
	Heworth	1	17	7,200	57,600	116,900	44	1 (2)	78 (67)	111	34 (24)	
	Sunderland	34	753	12,000	52,900	54,000	35	1 (2)	58 (55)	98	36 (21)	
	Seaham	8	122	8,100	9,600	15,700	30	1 (2)	44 (44)	88	40 (20)	
	Hartlepool	84	523	4,900	38,800	20,100	17	1 (2)	34 (29)	71	29 (14)	
	Seaton Carew	8	45	4,800	24,400	21,100	14	1 (2)	24 (24)	70	36 (12)	
	Billingham	9	71	8,100	25,900	37,800	9	1 (2)	22 (18)	64	25 (9)	
	Stockton	7	70	9,300	50,800	55,000	5	1 (2)	10 (10)	54	29 (5)	
Total		**224**	**9,307**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Middlesbrough between 0800 and 0900

C.2.2 Redcar and Saltburn

This route provides suburban services into Middlesbrough.

C.2.2.1 Current services:

- Two services per hour from Saltburn to Darlington extended to Bishop Auckland every two hours calling at all stations from Saltburn to Middlesbrough.
- There are gaps in the half hourly pattern into Middlesbrough, particularly in the morning peak.

C.2.2.2 Journey times and rolling stock

- **Journey times/speeds:** The large distance between Redcar Central and Middlesbrough stations means that journey times into Middlesbrough are good, although improvements could be made through improved rolling stock. **Rolling stock:** Stopping services tend to be run by early generation diesel rolling stock with poor acceleration and low top speeds and causes issues with passenger satisfaction.

C.2.2.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT from all stations is less than 60 minutes.
- **Jobs at destination:** Middlesbrough, Darlington, Stockton and Thornaby serve employment centres.
- **Population catchments:** Population catchments from all stations are relatively large.
- **Market for rail:** Demand from Redcar and Saltburn are the highest on the route, but demand is low compared with suburban stations into other regional centres. However there has been significant growth in the last 10 years.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share:** Rail's market share is relatively low into Middlesbrough, and gains can still be made.

C.2.2.4 Recommendations for conditional outputs:

- Provide a full half hourly service all day, into Middlesbrough.
- Improve journey times through improved rolling stock characteristics.
- Increase capacity to meet demand through lengthening or increased frequency.

Service level conditional outputs for the North East - Tees Valley

Table 6. Population, demand and current servicess for stations on the Redcar corridor to Middlesbrough to inform conditional outputs												
Corridor	Station name	Total Journeys into Middlesbrough* (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average Speed (Generalised Speed) - mph	Notes
Middlesbrough	Saltburn	89	259	4,300	10,900	10,800	14	2 (2)	27 (23)	54	30 (15)	
	Marske	35	77	5,300	13,300	24,900	12	2 (2)	18 (18)	49	39 (14)	
	Longbeck	18	41	4,900	17,200	21,400	11	2 (2)	16 (16)	47	42 (14)	
	Redcar East	81	140	7,500	20,500	7,700	10	2 (2)	13 (13)	43	44 (13)	
	Redcar Central	138	377	8,400	16,800	10,500	9	2 (2)	10 (10)	40	52 (13)	
	Redcar British Steel	0	1	2,100	13,200	16,200	7	0 (1)	16 (11)	132	24 (3)	1 train a day
Total		**362**	**893**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Middlesbrough between 0800 and 0900

C.2.3 Nunthorpe to Middlesbrough

This route provides suburban services into Middlesbrough. A new station (James Cook) will be opened by early 2014, delivered in partnership between Tees Valley Unlimited, Middlesbrough Council, Network Rail, Northern Rail and the South Tees NHS Trust to serve James Cook University Hospital and adjacent residential and development sites. Service frequency will increase to 16 trains per day to coincide with the opening of the new station. There are aspirations to provide a park and ride service from Nunthorpe and increased housing is planned around the station.

C.2.3.1 Current services:

- 11 services per day from Nunthorpe to Middlesbrough but not on a standard pattern calling at all stations from Nunthorpe to Middlesbrough.

C.2.3.2 Journey times and rolling stock

- **Journey times/speeds**: Train journey times are relatively slow.
- **Rolling stock:** Stopping services tend to be run by early generation diesel rolling stock with poor acceleration and low top speeds and causes issues with passenger satisfaction.

C.2.3.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT from all stations is less than 60 minutes.
- **Jobs at destination:** Middlesbrough, Stockton and Thornaby serve employment centres.
- **Population catchments:** population catchments from all stations are relatively large, particularly compared with stations south of Nunthorpe on the Whitby line.
- **Market for rail:** Demand on the route is relatively low; this could be caused by the poor frequency of services. However there has been significant growth in the last 10 years.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share:** Rail's market share is relatively low into Middlesbrough, and gains can still be made.

C.2.3.4 Recommendations for conditional outputs:

- Improve journey times through improved rolling stock characteristics.
- Increase capacity to meet demand through lengthening or increase frequency.
- Improve pattern of local services and improve connections at Middlesbrough, particularly after James Cook station opens.

Table 7. Population, demand and current servicess for stations on the Nunthorpe corridor to Middlesbrough to inform conditional outputs

Corridor	Station name	Total Journeys into Middlesbrough* (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average Speed (Generalised Speed) - mph	Notes
Nunthorpe	Nunthorpe	10	22	4,600	19,500	48,700	5	11 a day	12 (10)	60	23 (5)	
	Gypsy Lane	15	23	5,400	30,200	57,400	4	11 a day	10 (8)	56	24 (4)	
	Marton	3	9	3,500	55,800	68,100	3	11 a day	5 (5)	54	36 (3)	
Total		28	54									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Middlesbrough between 0800 and 0900

C.2.4 Whitby

The Whitby line From Whitby to Nunthorpe serves an important tourist market into the North Yorkshire Moors National Park that is centred on Whitby and links with the North Yorkshire Moors Railway. The services should be designed to continue to cater for the important tourist market in particular but must also cater for key local issues such as school travel and connectivity for local people to employment, education, healthcare, retail and onward connection opportunities at both ends of the line.

The existing service pattern along the whole length of the line between Middlesbrough and Whitby is very infrequent with four trains per day in each direction on Monday to Saturday, and Sunday services operating from April to October. Esk Valley Rail Development Company (EVRDC), the community rail partnership for the line is working with the current train operator to investigate the feasibility of providing more services on the route. The priorities are for an early morning service into Middlesbrough and a later evening return service and for more services to call at James Cook. The aspiration is for a doubling in frequency to eight trains per day in each direction and an all year round Sunday services.

There is planned housing growth in the borough of Scarborough. Plans have been proposed for a Potash Mine South of Whitby. Should planning permission be granted, planned housing growth is projected at 494 dwellings per annum up until 2030. Conversely, should planning permission not be granted, planned housing growth is projected at 420 dwellings up until 2030. There is an opportunity for increased demand in rail at Whitby due to population growth south of Whitby.

Improvement work at Whitby station is planned, including the implementation of a second track and platform enabling increased North Yorkshire Moors Railway services.

Table 8. Population, demand and current servicess for stations on the Whitby corridor to Middlesbrough to inform conditional outputs												
Corridor	Station name	Total Journeys into Middlesbrough* (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average Speed (Generalised Speed) - mph	Notes
Whitby	Whitby	34	140	4,200	5,400	1,800	35	4 a day	88 (86)	197	24 (11)	4 a day
	Ruswarp	1	3	1,200	9,500	800	34	4 a day	81 (80)	193	25 (10)	4 a day
	Sleights	2	5	1,000	1,200	10,600	32	4 a day	76 (74)	189	25 (10)	4 a day
	Grosmont	2	24	0	2,100	1,000	29	4 a day	70 (66)	182	25 (10)	4 a day
	Egton	0	11	1,100	0	0	27	4 a day	67 (62)	178	24 (9)	4 a day
	Glaisdale	1	19	0	1,100	0	26	4 a day	60 (56)	173	26 (9)	4 a day
	Lealholm	1	20	0	0	1,100	24	4 a day	55 (52)	170	26 (8)	4 a day
	Danby	2	12	1,600	0	0	20	4 a day	49 (45)	164	24 (7)	4 a day
	Castleton Moor	1	5	0	1,600	0	19	4 a day	45 (42)	162	25 (7)	4 a day
	Commondale	0	5	0	0	1,600	17	4 a day	42 (39)	160	24 (6)	4 a day
	Kildale	0	2	0	1,200	2,500	13	4 a day	35 (32)	155	22 (5)	4 a day
	Battersby	0	2	0	0	4,900	11	4 a day	25 (23)	148	27 (4)	4 a day
	Great Ayton	1	7	1,200	2,500	4,200	9	4 a day	20 (17)	143	26 (4)	4 a day
Total		**48**	**253**									

*Year to March 2012

**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator

***Number of trains arriving into Middlesbrough between 0800 and 0900

C.2.5 York to Middlesbrough via Yarm

This route provides connectivity between the Tees Valley and other regions for business and leisure travel as well as providing a fast but infrequent service from Yarm to Middlesbrough. This is delivered by an hourly interurban service between Manchester Airport, Manchester, Leeds, York and Middlesbrough. A small number of services are routed via Darlington but local stakeholders are lobbying for all services to be operated via Yarm for consistency. Grand Central run services from London King's Cross to York and Sunderland via this route but do not call at Yarm.

In the context of future electrification of the routes in the North and the decisions that this may require in terms of service specification to other regions, conditional outputs for this route are to maintain the current level of direct connectivity.

Table 9. Population, demand and current servicess for stations on the Yarm corridor to Middlesbrough to inform conditional outputs

Corridor	Station name	Total Journeys into Middlesbrough* (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average Speed (Generalised Speed) - mph	Notes
York to Yarm	York	97	7,581	12,200	71,500	37,500	51	1 (1)	67 (53)	100	45 (31)	
	Thirsk	8	188	1,100	6,300	0	29	1 (1)	44 (35)	84	39 (20)	
	Northallerton	51	572	6,500	5,700	2,900	21	1 (1)	33 (27)	74	38 (17)	
	Yarm	36	133	3,100	10,900	15,900	9	1 (1)	13 (13)	65	40 (8)	
Total		**191**										

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Middlesbrough between 0800 and 0900

C.2.6 Bishop Auckland and Darlington to Middlesbrough

This route provides suburban services between Bishop Auckland, Darlington and Middlesbrough. Darlington provides access to the East Coast Main Line from the Tees Valley. There are aspirations to improve the frequency of services.

C.2.6.1 Current services:

- Two services per hour from Darlington to Saltburn starting from Bishop Auckland every two hours calling at all stations between Darlington and Middlesbrough, calling at all stations on this line.

C.2.6.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey times are relatively slow.
- **Rolling stock:** Stopping services tend to be run by early generation diesel rolling stock with poor acceleration and low top speeds and causes issues with passenger satisfaction.

C.2.6.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT from all stations between Darlington and Middlesbough are less than 60 minutes. Significant improvements would be required to improve the GJT from stations on the Bishop Auckland route to less than 60 minutes.
- **Jobs at destination:** Middlesbrough, Stockton and Thornaby serve employment centres. Darlington is also an important employment centre for stations on this route and tables of statistics into Darlington have been included on this **basis.The** proposed Hitachi plant is expected to be located at Newton Aycliffe.
- **Population catchments:** Eaglescliffe, Thornaby, Darlington and Allens West serve the largest communities and Darlington serves a main employment centre, and provides important links with the East Coast Main Line.
- **Market for rail:** Demand into Darlington and Middlesbrough is low from all stations compared with corridors into other urban centres, but highest between Darlington, Thornaby and Middlesbrough. However there has been significant growth in the last 10 years.
- **Deprivation:** There are pockets of deprivation on the route. **http://casa.oobrien.com/booth/**
- **Rail's market share:** Rail's market share is relatively low into Middlesbrough, and gains can still be made.

C.2.6.4 Recommendations for conditional outputs:

- Improve journey times through improved rolling stock characteristics.
- Increase capacity to meet demand through lengthening or increase frequency.
- The retention of good connections between local services and long distance services at Darlington.

Table 10. Population, demand and current servicess for stations on the Darlington and Bishop Auckland corridors to Middlesbrough to inform conditional outputs												
Corridor	Station name	Total Journeys into Middlesbrough* (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average Speed (Generalised Speed) - mph	Notes
Darlington to Middlesbrough	Darlington	153	2,256	11,200	41,300	20,400	15	2 (2)	26 (24)	55	35 (16)	
	Dinsdale	8	28	2,400	1,100	19,600	11	2 (2)	21 (15)	50	32 (14)	no data for Tees-side airport
	Allens West	22	64	5,200	14,100	37,800	7	2 (2)	14 (13)	41	29 (10)	
	Eaglescliffe	26	135	3,400	19,500	52,600	6	2 (2)	12 (9)	38	31 (10)	
	Thornaby	83	575	5,000	46,000	89,200	3	4 (5)	5 (4)	24	38 (8)	
Total		**292**	**3,058**									
Bishop Auckland	Bishop Auckland	17	101	7,400	11,800	15,000	27	<1 (1)	56 (54)	116	29 (14)	
	Shildon	7	58	6,200	5,400	30,500	24	<1 (1)	50 (49)	109	29 (13)	
	Newton Aycliffe	10	64	5,100	15,500	7,500	22	<1 (1)	46 (45)	101	29 (13)	
	Heighington	0	11	0	5,300	18,400	21	<1 (1)	43 (41)	99	29 (13)	
	North Road	7	33	9,000	56,200	3,900	16	<1 (1)	35 (33)	91	28 (11)	
Total		**42**	**267**									

*Year to March 2012

**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator

***Number of trains arriving into Middlesbrough between 0800 and 0900

Table 11. Population, demand and current servicess for stations on the Middlesborugh and Bishop Auckland corridors to Darlington to inform conditional outputs												
Corridor	**Station name**	**Total Journeys into Darlington* (thousands)**	**Total Journeys to and from station (ORR station usage 2011-12) (thousands)**	**Population <1km from station (census 2011)****	**Population between 1 and 3km from (census 2011)**	**Population between 3 and 5km from station (census 2011)**	**Distance in miles**	**Frequency off peak (peak***) (trains per hour)**	**Average journey time (best) (minutes)**	**Generalised Journey Time (minutes)**	**Average Speed (Generalised Speed) - mph**	**Notes**
Middlesbrough to Darlington	Middlesbrough	153	1,423	4,800	36,300	59,400	15	2 (2)	26 (24)	55	35 (16)	
	Thornaby	82	575	5,000	46,000	89,200	12	2 (2)	19 (18)	49	37 (14)	
	Eaglescliffe	17	135	3,400	19,500	52,600	9	2 (2)	13 (12)	44	41 (12)	
	Allens West	14	64	5,200	14,100	37,800	8	2 (2)	16 (10)	42	31 (12)	
	Dinsdale	6	28	2,400	1,100	19,600	4	2 (2)	5 (5)	37	46 (6)	no data for Tees-side airport
Total		**272**	**2,225**									
Bishop Auckland to Darlington	Bishop Auckland	24	101	7,400	11,800	15,000	12	<1 (1)	26 (26)	75	28 (10)	
	Shildon	18	58	6,200	5,400	30,500	9	<1 (1)	18 (18)	68	30 (8)	
	Newton Aycliffe	19	64	5,100	15,500	7,500	7	<1 (1)	14 (14)	62	30 (7)	
	Heighington	2	11	0	5,300	18,400	6	<1 (1)	11 (11)	59	32 (6)	
	North Road	2	33	9,000	56,200	3,900	1	<1 (1)	3 (3)	51	26 (2)	
Total		**66**	**267**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Darlington between 0800 and 0900

Appendix D: Service level conditional outputs for the North West

Appendix D: Service level conditional outputs for the North West

This appendix describes the conditional outputs for the North West Region centred on the conurbations of Manchester and Liverpool and a section on the other corridors in the North West that are not centred on Manchester and Liverpool.

D.1 Service level conditional outputs for Greater Manchester

This section is an interpretation of the Regional Urban conditional outputs into and within Greater Manchester disaggregated by the rail corridors into Manchester.

Manchester is the largest city in the North West and is a centre for employment, commerce and culture, It has a large inner and outer suburban rail network centred on four Manchester and two Salford stations. Greater Manchester employs around 900,000 people, with around 250,000 in the public sector (Centre for Cities factbook). Greater Manchester is part of the first wave of core cities to achieve City Deal status, Preston and Lancashire are part of the second wave. This will give more accountability to the region in exchange for more powers to encourage growth and jobs in the area.

Manchester Airport is a large international airport, and direct access to Manchester Airport from corridors around Manchester is a conditional output. The Manchester Airport City has been designated as an enterprise zone specialising in advanced manufacturing, healthcare, bio-technologies and logistics.

The University of Manchester and the Manchester Metropolitan University have just under 80,000 undergraduate and postgraduate students, and are the 2nd and 4th largest Universities in the UK by enrolment respectively. The University of Salford has around 21,000 students. (HESA from 2010-2011).

The rail corridors around Manchester provide an inconsistent quality of suburban rail service. The Northern Hub programme will significantly improve services around Manchester, particularly interurban services and provide capacity for further **improvements. The** Government recently announced that the High Speed rail network will include a station at Manchester.

The North West and North Cross-Pennine electrification schemes will cascade electric rolling stock on to routes around Manchester.

Access to employment in Greater Manchester is made from a number of key central stations including Manchester Piccadilly, Manchester Oxford Road, Manchester Victoria, Salford Crescent and Salford Central. Other urban centres such as Preston, Bolton, Chester, Stockport, Stoke-on-Trent, Crewe and Manchester Airport are also relatively large employment centres that attract commuters from key corridors in the North West. Direct access to key employment centres in Greater Manchester by utilising services on each radial corridor to provide cross-corridor connectivity is a conditional output.

For the purposes of this case study, this section is organised into a description of the conditional outputs relating to each of the following corridors around Manchester:

- Leeds to Manchester via Bradford Interchange, Halifax and Rochdale (Calder Valley).
- Leeds to Manchester via Huddersfield.
- Hadfield and Glossop to Manchester.
- Marple and Romiley to Manchester.
- Sheffield to Manchester via Chinley .
- Buxton to Manchester via Hazel Grove.
- Stoke-on-Trent, Macclesfield and Crewe to Manchester.
- Manchester Airport to Manchester via Heald Green.
- Chester and Northwich to Manchester via Altrincham.
- Liverpool Lime Street to Manchester via Warrington Central.
- Liverpool Lime Street and Chester to Manchester via Newton-le-Willows.
- Wigan, Southport and Kirkby to Manchester via Atherton.
- Blackpool North, Preston and Bolton to Manchester.
- Clitheroe and Blackburn to Manchester via Bolton.

D.1.1 Leeds to Manchester via Bradford Interchange, Halifax and Rochdale (Calder Valley)

The Calder Valley route provides inner suburban commuting services into Manchester Victoria from stations south of Rochdale, and provides an interurban service from West Yorkshire. The route also serves Leeds, and conditional outputs are expressed for this route in Appendix G - Yorkshire and Humber.

There is a committed scheme to provide a rail link between Accrington, Burnley and Manchester via Todmorden.

D.1.1.1 Current services:

- One service per hour from Rochdale to Wigan Wallgate stopping at all stations to Manchester Victoria.
- One service per hour from Leeds to Manchester Victoria via Brighouse stopping at all stations.
- Two services per hour from Leeds to Manchester Victoria via Bradford Interchange stopping at key interurban stops on the route, and suburban stops into Manchester in the peak.

D.1.1.2 Journey times and rolling stock:

- **Journey times/speeds:** Considering the interurban nature of the route journey speeds are slow compared with other routes.
- **Rolling stock**: Services tend to be run by early generation diesel stock with poor acceleration and top speeds that causes issues with passenger satisfaction. Interurban services tend to have higher top speeds.

D.1.1.3 Criteria for conditional outputs:

- **Willingness to commute:** The Generalised journey Time (GJT) for all stations from Hebden Bridge is either less than 60 minutes or could be improved to less than 60 minutes through small frequency and journey time improvements.
- Jobs at destination: Greater Manchester is a key employment centre in the North West. Leeds, Bradford and Halifax are also important employment centres that drive demand on the route.
- **Population catchments**: Many stations on the route serve large towns such as Bradford, Halifax and Rochdale and population catchments around other stations tend to be large. Castleton, Mills Hil and Moston serve suburban Manchester and population catchments are large. Some communities are served by more than one station such as Hebden Bridge and Mytholmroyd.
- **Market for rail**: Demand is relatively high on the route particularly from Rochdale.
- **Deprivation:** There are pockets of deprivation on the route. **http://casa.oobrien.com/booth/**
- **Rail's market share:** Manchester is a key urban centre with constrained road and parking infrastructure where rail has the potential to gain significant improvements in market share. The introduction of the Metrolink service to Rochdale via Oldham may abstract rail journeys from inner suburban stations, particularly Moston. Bus has a high market share for short distance journeys.

D.1.1.4 Recommendations for conditional outputs:

- The Long Distance Market Study recommends a significant improvement in the service between Leeds, Bradford, Halifax, Rochdale and Manchester.
- Improve journey times through improved rolling stock characteristics on the suburban services.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

D.1.1.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Bradford Interchange, Halifax, Sowerby Bridge, Mytholmroyd, Todmorden, Littleborough, Smithy Bridge, Rochdale, Castleton, Mills Hill and Moston to Manchester on this corridor will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements could be made through journey time and frequency improvements.

The impact of these improvements from these stations to Manchester on Gross Value Added (GVA) through labour supply improvements is estimated to be around £250,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £445,000 per annum per minute of GJT.

Table 1. Population, demand and current services for stations on the Calder Valley corridor to Manchester to inform conditional outputs

Corridor	Station name	Total Journeys into Manchester* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Manchester	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) - mph	Notes
Calder Valley	Brighouse	16	267	5,500	22,900	51,800	30	1 (1)	65 (58)	96	28 (19)	
	Bramley	3	337	7,800	59,800	93,000	46	2 (2)	79 (74)	105	35 (26)	
	New Pudsey	19	797	7,600	52,500	89,400	44	2 (2)	80 (70)	103	33 (26)	
	Bradford	163	5,035	7,600	88,400	110,200	41	2 (2)	76 (59)	94	32 (26)	
	Halifax	119	1,857	2,500	44,100	48,900	33	2 (2)	52 (45)	81	38 (24)	
	Sowerby Bridge	39	322	5,800	34,600	37,200	29	2 (2)	53 (42)	79	33 (22)	
	Mytholmroyd	22	159	2,400	6,000	11,800	25	3 (3)	45 (36)	73	33 (21)	
	Hebden Bridge	127	761	2,400	8,300	2,500	24	3 (3)	40 (31)	62	36 (23)	
	Todmorden	152	568	3,100	5,700	3,200	19	3 (4)	33 (24)	54	35 (21)	
	Walsden	25	93	1,100	8,600	3,600	18	1 (2)	36 (26)	65	30 (16)	
	Littleborough	225	384	4,800	11,300	29,200	14	2 (4)	27 (20)	51	30 (16)	
	Smithy Bridge	120	163	4,600	33,200	39,400	11	2 (3)	24 (17)	50	29 (14)	
	Rochdale	738	1,106	10,600	52,800	47,000	10	4 (4)	19 (12)	37	33 (17)	
	Castleton	107	153	6,000	35,000	87,400	9	2 (3)	19 (14)	40	27 (13)	
	Mills Hill	278	341	9,900	48,100	109,800	6	2 (3)	14 (9)	35	27 (11)	
	Moston	112	140	10,400	72,100	121,500	4	2 (3)	11 (6)	34	21 (7)	
Total		**2,266**	**12,482**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Manchester between 0800 and 0900

D.1.2 Leeds to Manchester via Huddersfield

The Huddersfield route provides interurban services between Yorkshire and Humberside, the North East, the North West, Manchester city centre and Manchester Airport and also provides suburban commuting services into Manchester. The route also serves Leeds, and conditional outputs are expressed for stations between Huddersfield and Leeds in Appendix G – Yorkshire and Humber. The route is planned to be electrified and this will cascade electric stock onto the route. The Northern Hub will improve services on the route.

D.1.2.1 Current services:

- Two services per hour from Middlesbrough / Newcastle to Manchester Airport per hour stopping at Dewsbury and Huddersfield all day and Stalybridge in the peak.
- One service per hour from Scarborough to Liverpool Lime Street stopping at Huddersfield and Stalybridge.
- One service per hour from Hull to Manchester Piccadilly stopping at Huddersfield only all day and Stalybridge in the peak.
- One service per hour from Huddersfield to Manchester Victoria calling at all stations with one extra service in the peak.

D.1.2.2 Journey times and rolling stock:

- **Journey times/speeds**: The suburban journey speeds are slow, interurban journey times are relatively slow compared with other high value interurban routes.
- **Rolling stock**: Suburban services tend to be run by early generation diesel stock with poor acceleration and top speeds that causes issues with passenger satisfaction. Interurban services tend to be run by later generation diesel units.

D.1.2.3 Criteria for conditional outputs:

- **Willingness to commute**: The GJT for all stations from Huddersfield is less than 60 minutes or could be improved to less than 60 minutes through small frequency and journey time improvements.
- **Jobs at destination:** Greater Manchester is a key employment centre in the North West. Leeds and Huddersfield are also employment centres and drive demand on the route.
- **Population catchments**: Huddersfield is a large town with a large employment centre, and Greenfield, Mossley and Stalybridge serve large suburbs of Manchester.
- **Market for rail:** Demand is relatively high on the route particularly from Dewsbury, Huddersfield and Stalybridge.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share:** Rail's market share is relatively low into Manchester and gains can still be made. Manchester is a key urban centre with constrained road and parking infrastructure where rail has the potential to gain significant improvements in market share.

D.1.2.4 Recommendations for conditional outputs:

- The Long Distance Market Study recommends a significant improvement in the service from Leeds to Manchester and other destinations across the regions.
- Increase the off-peak frequency from Greenfield and Mossley into Manchester to match the current peak frequency.
- Improve journey times through improved rolling stock characteristics on the suburban services.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

D.1.2.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Leeds, Dewsbury, Huddersfield, Greenfield, Mossley, Stalybridge and Ashton to Manchester on this corridor into Manchester will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements could be made through journey time and frequency improvements. The impact of these improvements from these stations to Manchester on Gross Value Added (GVA) through labour supply improvements is estimated to be around £417,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £603,000 per annum per minute of GJT.

Table 2. Population, demand and current services for stations on the Huddersfield corridor to Manchester to inform conditional outputs

Corridor	Station name	Total Journeys into Manchester* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Manchester	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) - mph	Notes
Huddersfield	Selby	16	485	7,500	10,000	6,300	63	1 (2)	92 (75)	123	41 (31)	
	South Milford	1	108	3,000	5,100	0	55	<1 (0)	91 (68)	141	36 (23)	1 a day
	Micklefield	1	193	1,100	2,000	22,000	52	<1 (0)	92 (105)	127	34 (24)	1 a day
	East Garforth	1	276	6,200	13,100	13,800	50	<1 (0)	85 (101)	123	36 (25)	1 a day
	Garforth	23	677	5,400	8,600	27,900	49	1 (2)	80 (68)	104	37 (28)	
	Cross Gates	8	499	9,500	37,600	54,000	47	<1 (0)	86 (67)	118	32 (24)	2 a day
	Leeds	809	25,020	13,600	95,400	123,600	42	4 (4)	55 (53)	73	46 (35)	
	Cottingley	0	97	4,800	46,200	98,300	40	0 (0)	71 (86)	112	33 (21)	
	Morley	5	348	8,600	30,200	80,600	37	0 (0)	69 (81)	98	33 (23)	
	Batley	7	277	9,000	44,100	73,800	34	0 (0)	64 (75)	93	32 (22)	
	Dewsbury	111	1,483	8,800	50,600	55,100	33	2 (2)	43 (39)	68	46 (29)	
	Ravensthorpe	0	24	4,000	33,300	68,100	32	0 (0)	64 (79)	98	30 (19)	
	Brighouse	16	267	5,500	22,900	51,800	30	1 (1)	65 (58)	96	28 (19)	
	Mirfield	11	334	5,000	17,700	68,300	30	0 (0)	61 (66)	91	29 (20)	
	Huddersfield	470	4,200	13,200	54,900	51,300	25	4 (4)	36 (29)	50	42 (30)	
	Slaithwaite	27	208	3,600	9,700	31,700	21	1 (2)	44 (35)	69	28 (18)	
	Marsden	39	189	2,500	1,100	8,300	18	1 (2)	42 (31)	64	26 (17)	
	Greenfield	255	306	2,600	15,600	31,300	12	1 (2)	29 (23)	57	25 (12)	
	Mossley	233	310	6,800	23,400	72,800	10	1 (2)	25 (19)	54	23 (11)	
	Stalybridge	716	1,118	9,000	60,500	65,400	7	3 (5)	16 (13)	34	26 (12)	
	Ashton-under-Lyne	419	581	9,800	57,600	99,900	6	3 (3)	14 (9)	37	27 (10)	
Total		**3,169**	**37,000**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Manchester between 0800 and 0900

D.1.3 Hadfield and Glossop to Manchester

The Hadfield and Glossop route provides a suburban service into Manchester Piccadilly. The route is electrified.

D.1.3.1 Current services:

- Two services per hour from Hadfield to Manchester Piccadilly via Glossop and Dinting stopping at all stations to Manchester Piccadilly , one extra in the in the peak.

D.1.3.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey speeds on the route are slow compared with other suburban services despite the quality of rolling stock.
- **Rolling stock:** Services are run by fast accelerating electric multiple units.

D.1.3.3 Criteria for conditional outputs:

- **Willingness to commute**: The GJT for all stations from Hadfield is less than 60 minutes.
- **Jobs at destination**: Greater Manchester is a key employment centre in the North West.
- **Population catchments**: Hadfield and Glossop serve large communities outside Manchester, and other stations on the route serve large suburbs of Manchester.
- **Market for rail:** Demand is high from Glossop.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share**: Rail's market share is relatively low into Manchester and gains can still be made. Manchester is a key urban centre with constrained road and parking infrastructure where rail has the potential to gain significant improvements in market share.

D.1.3.4 Recommendations for conditional outputs:

- There may be opportunities to improve journey times through infrastructure improvements and / or changed stopping patterns.
- Increase frequency to four trains per hour from stations closer to Manchester in the peak with corresponding improvements in the off-peak.
- There is a trade-off between running four services per hour (two from Glossop and two from Hadfield) and running an indirect service that provides a direct connection between Glossop and Hadfield.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

D.1.3.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from all stations to Manchester on this corridor will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements could be made through journey time and frequency improvements. The impact of these improvements from these stations to Manchester on Gross Value Added (GVA) through labour supply improvements is estimated to be around £96,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £297,000 per annum per minute of GJT.

Table 3. Population, demand and current services for stations on the Hadfield and Glossop corridor to Manchester to inform conditional outputs

Corridor	Station name	Total Journeys into Manchester* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Manchester	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) - mph	Notes
Hadfield and Glossop	Glossop	482	765	8,600	15,900	5,600	13	2 (3)	35 (29)	55	23 (14)	
	Dinting	88	120	2,200	24,500	8,000	12	2 (3)	30 (26)	51	24 (14)	
	Hadfield	167	341	4,600	21,200	10,200	13	2 (3)	39 (28)	60	20 (13)	
	Broadbottom	102	133	2,500	13,300	51,100	10	2 (3)	26 (20)	45	23 (13)	
	Hattersley	27	49	3,200	24,900	61,900	9	2 (3)	23 (18)	43	23 (13)	
	Godley	50	71	2,500	39,800	74,900	8	2 (3)	22 (16)	41	23 (12)	
	Newton for Hyde	120	181	9,800	46,900	67,300	8	2 (3)	19 (14)	38	24 (12)	
	Flowery Field	156	208	7,100	62,600	75,500	7	2 (3)	17 (12)	37	24 (11)	
	Guide Bridge	173	275	6,700	58,200	126,100	5	2 (3)	14 (8)	27	21 (11)	
	Fairfield	17	21	8,000	67,000	134,300	4	2 (3)	15 (8)	43	14 (5)	
	Gorton	105	135	11,700	75,100	169,000	3	2 (3)	11 (6)	32	14 (5)	
Total		**1,485**	**2,300**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Manchester between 0800 and 0900

D.1.4 Marple and Romiley to Manchester

The Marple and Romiley route provides suburban services into Manchester. There are aspirations for light rail to use this route.

D.1.4.1 Current services:

- Two services per hour from Rose Hill Marple to Manchester Piccadilly stopping at stations via Hyde Central.
- Two services per hour from New Mills Central to Manchester Piccadilly via Marple stopping at stations via Bredbury, two extra in the peak.
- One service in most hours from Sheffield to Manchester Piccadilly stopping at stations via Bredbury.

D.1.4.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey speeds on the route are very slow compared with suburban services due to the quality of rolling stock and low line speeds.
- **Rolling stock:** Services are run by early generation diesel rolling stock, that causes passenger satisfaction issues.

D.1.4.3 Criteria for conditional outputs:

- **Willingness to commute**: The GJT for all stations from New Mills Central is less than 60 minutes.
- **Jobs at destination:** Greater Manchester is a key employment centre in the North West.
- **Population catchments**: Most stations serve suburban Manchester and catchments are large. Chinley has a large catchment and has a very infrequent service. Catchments are served by more than one station.
- **Market for rail:** Demand is high from Marple.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share**: Rail's market share is relatively low into Manchester and gains can still be made. Manchester is a key urban centre with constrained road and parking infrastructure where rail has the potential to gain significant improvements in market share.

D.1.4.4 Recommendations for conditional outputs:

- Improve journey times through rolling stock improvements and infrastructure improvements.
- Increase frequency of services from Chinley into Manchester to two trains per hour.
- Increase frequency in the off-peak from key suburban stations.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

D.1.4.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from all Bredbury, Romiley, Marple and New Mills Central to Manchester on this corridor will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Significant improvements can be made by improving the average speed of services to 30mph. The impact of these improvements from these stations to Manchester on Gross Value Added (GVA) through labour supply improvements is estimated to be around £97,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £161,000 per annum per minute of GJT.

Table 4. Population, demand and current services for stations on the Marple and Romiley corridor to Manchester to inform conditional outputs

Corridor	Station name	Total Journeys into Manchester* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Manchester	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) - mph	Notes
Marple and Romiley	Dore	32	106	4,300	27,800	59,800	38	<1 (3)	68 (48)	89	33 (25)	
	Grindleford	13	55	0	2,800	1,300	32	<1 (1)	67 (52)	102	29 (19)	
	Hathersage	9	56	0	2,800	1,100	31	<1 (1)	66 (49)	101	28 (18)	
	Bamford	6	25	0	1,100	5,000	29	<1 (1)	69 (45)	98	25 (18)	
	Hope	13	52	0	3,300	900	27	<1 (1)	60 (42)	96	27 (17)	
	Edale	16	73	0	900	800	22	<1 (1)	55 (36)	89	24 (15)	
	Chinley	57	103	2,100	4,200	11,700	17	<1 (2)	41 (28)	73	24 (14)	
	New Mills Central	118	156	4,100	8,100	12,400	13	2 (3)	30 (22)	54	26 (14)	
	Strines	8	12	0	15,700	15,900	11	<1 (2)	36 (20)	66	19 (10)	
	Rose Hill	96	119	6,900	24,500	51,800	10	2 (3)	32 (24)	61	18 (10)	
	Marple	327	422	3,000	15,800	41,700	9	2 (4)	25 (16)	44	22 (13)	
	Woodley	32	45	4,400	45,900	85,600	9	2 (2)	26 (18)	52	20 (10)	
	Hyde Central	41	65	7,000	54,300	82,800	8	2 (2)	24 (14)	49	19 (9)	
	Romiley	216	279	7,700	30,700	83,600	8	4 (6)	24 (12)	37	19 (12)	
	Bredbury	146	188	6,300	35,700	114,900	7	2 (4)	20 (13)	39	20 (10)	
	Brinnington	43	79	4,600	62,600	131,900	6	2 (4)	18 (11)	39	18 (9)	
	Reddish North	109	151	12,300	67,200	154,600	4	2 (4)	15 (7)	34	15 (7)	
	Ryder Brow	22	28	11,300	78,600	179,500	3	1 (2)	14 (7)	43	13 (4)	
	Belle Vue	10	20	11,600	92,800	166,500	3	<1 (2)	20 (6)	49	8 (3)	
	Ashburys	24	86	5,100	93,000	184,700	1	3 (5)	8 (4)	23	11 (4)	
Total		**1,388**	**2,122**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Manchester between 0800 and 0900

D.1.5 Sheffield to Manchester via Chinley (Hope Valley)

The Hope Valley route is a key interurban route between Sheffield and Manchester

The Long Distance Market study recommends significant improvements in the frequency and journey times between Sheffield and Liverpool

The Hope Valley also serves smaller stations in the peak district with an infrequent train service. This market is driven by some commuting into Sheffield and Manchester and leisure trips to and from the Peak District National Park. There are aspirations to improve the frequency of services from these stations particularly in the shoulder peaks.

Table 5. Population, demand and current services for stations on the Hope Valley corridor to Manchester

Corridor	Station name	Total Journeys into Manchester* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Manchester	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) - mph	Notes
Hope Valley	Doncaster	71	3,884	5,700	42,300	38,500	60	1 (0)	91 (82)	121	39 (29)	
	Conisbrough	1	88	3,800	13,500	25,600	56	0 (0)	100 (Ind)	149	33 (22)	
	Mexborough	1	327	7,000	20,200	40,600	53	0 (0)	98 (Ind)	145	33 (22)	
	Swinton	3	389	5,400	25,700	38,300	52	0 (0)	94 (Ind)	134	33 (23)	
	Meadowhall	52	2,057	5,500	39,800	82,800	45	1 (1)	68 (60)	99	40 (27)	
	Derby	54	3,351	5,600	76,300	80,900	69	0 (0)	105 (Ind)	146	40 (28)	
	Nottingham	183	6,437	15,000	85,800	112,700	74	1 (1)	124 (109)	154	36 (29)	
	Alfreton	18	212	3,400	19,200	16,000	56	1 (1)	89 (83)	136	38 (25)	
	Chesterfield	53	1,487	6,300	43,900	32,900	45	1 (1)	77 (73)	117	35 (23)	
	Dronfield	5	153	8,000	15,400	35,100	40	1 (1)	99 (69)	133	24 (18)	
	Sheffield	583	8,424	15,600	100,000	128,500	42	2 (2)	59 (51)	83	43 (30)	
Total		**1,023**	**26,809**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Manchester between 0800 and 0900

D.1.6 Buxton

The Buxton route provides suburban services into Manchester via Hazel Grove, Stockport, and Levenshulme.

D.1.6.1 Current services:

- One service per hour from Buxton to Manchester Piccadilly stopping at all stations with one extra in the peak.
- One service per hour from Hazel Grove to Preston stopping at Woodsmore, Davenport, Stockport and Manchester Piccadilly.
- One peak service from Hazel Grove to Manchester Piccadilly.
- Services from the Corridor into Manchester from Crewe and Stoke-on-Trent also stop at Heaton Chapel and Levenshulme into Manchester Piccadilly.
- Additional stops in interurban services from Sheffield at stations between Hazel Grove and Manchester Piccadilly in the peak.

There is an uneven pattern of services from some suburban stations into Manchester.

D.1.6.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey speeds on the route are very slow compared with suburban services due to the quality of rolling stock and low line speeds.
- **Rolling stock**: Suburban services are run by early generation diesel rolling stock, that causes passenger satisfaction issues.

D.1.6.3 Criteria for conditional outputs:

- **Willingness to commute**: The GJT for all stations is either less than 60 minutes or could be improved to less than 60 minutes through small frequency and journey time improvements.
- **Jobs at destination:** Greater Manchester is a key employment centre in the North West.
- **Population catchments:** Buxton, Whaley Bridge, Hazel Grove, Woodsmore and Davenport serve large catchments.
- **Market for rail**: Demand is high from the inner suburban stations. Buxton has the highest demand on the outer suburban route.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share**: Rail's market share is relatively low into Manchester and gains can still be made. Manchester is a key urban centre with constrained road and parking infrastructure where rail has the potential to gain significant improvements in market share.

D.1.6.4 Recommendations for conditional outputs:

- Improve journey times through rolling stock improvements and infrastructure improvements.
- Increase frequency of services in the off-peak from one to two trains per hour from key stations on the Buxton route.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

D.1.6.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Hazel Grove, Woodsmoor, Davenport and Heaton Chapel to Manchester on this corridor into Manchester will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements can be made by improving the pattern of services. The impact of these improvements from these stations to Manchester on Gross Value Added (GVA) through labour supply improvements is estimated to be around £86,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £239,000 per annum per minute of GJT. The largest impact on GJT can be achieved by improving services from Buxton, Whaley Bridge and Disley to Manchester. The impact of these improvements from these stations to Manchester on Gross Value Added (GVA) through labour supply improvements is estimated to be around £17,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £47,000 per annum per minute of GJT.

Table 6. Population, demand and current services for stations on the Buxton and Hazel Grove corridors to Manchester to inform conditional outputs												
Corridor	**Station name**	**Total Journeys into Manchester* (thousands)**	**Total Journeys to and from station (ORR station usage 2011-2012) (thousands)**	**Population <1km from station (census 2011)****	**Population between 1 and 3km from station (census 2011)**	**Population between 3 and 5km from station (census 2011)**	**Distance in miles from Manchester**	**Frequency off peak (peak***) (trains per hour)**	**Average journey time (best) (minutes)**	**Generalised Journey Time (minutes)**	**Average speed (Generalised speed) - mph**	**Notes**
Hazel Grove	Hazel Grove	437	610	7,600	42,200	80,400	9	2 (5)	21 (16)	44	25 (12)	
	Woodsmoor	125	179	9,000	61,300	81,100	8	2 (3)	19 (15)	43	25 (11)	
	Davenport	152	216	11,300	66,100	90,800	7	2 (3)	17 (13)	41	24 (10)	
	Heaton Chapel	480	620	9,100	84,200	164,800	4	4 (4)	12 (8)	27	22 (10)	
	Levenshulme	293	434	17,300	116,700	149,000	3	411	8 (5)	24	22 (7)	
Total		**1,487**	**2,059**									
Buxton	Buxton	121	298	8,400	8,200	1,700	26	1 (2)	57 (50)	88	27 (18)	
	Dove Holes	2	6	800	2,500	9,900	23	1/2 (1)	55 (47)	103	25 (13)	
	Chapel-en-le-Frith	19	44	900	5,500	4,600	20	1 (2)	47 (41)	76	26 (16)	
	Whaley Bridge	35	95	2,600	3,300	14,500	17	1 (2)	41 (34)	69	24 (14)	
	Furness Vale	7	20	1,100	10,900	8,300	15	1 (1)	38 (31)	70	24 (13)	
	New Mills Newtown	56	199	1,200	10,700	12,900	14	1 (2)	35 (28)	63	24 (13)	
	Disley	79	135	2,200	7,200	21,500	13	1 (2)	31 (25)	60	24 (13)	
	Middlewood	4	20	0	17,600	41,500	11	<1 (1)	42 (22)	73	16 (9)	
Total		**324**	**818**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Manchester between 0800 and 0900.

D.1.7 Stoke-on-Trent, Macclesfield and Crewe to Manchester

The Stoke-on-Trent, Macclesfield, Stockport and Crewe route provides intercity services from London and Birmingham and suburban services into Manchester from Crewe and Stoke-on-Trent.

D.1.7.1 Current services:

- One ser vice per hour from Crewe to Manchester Piccadilly via Stockport stopping at all stations.
- One service per hour from Alderley Edge to Manchester Piccadilly via Stockport stopping at all stations to Manchester Piccadilly ,extended to start from Crewe in the peak.
- One service per hour from Crewe to Manchester Piccadilly via Manchester Airport stopping at all stations.
- One service per hour from Stoke-on-Trent to Manchester Piccadilly stopping at all stations, with one extra peak service from Macclesfield.
- Intercity services from London Euston and Birmingham New Street pick up key outer urban stops (Wilmslow, Macclesfield, and Stockport) into Manchester Piccadilly.

D.1.7.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey speeds on the route are relatively fast considering the dense network of stations, there are specific examples of timetable conflicts, particularly on the approach to Manchester Piccadilly that increase journey times into Manchester.
- **Rolling stock**: Suburban services are run by fast accelerating electric stock. Intercity services are run by a mix of high quality and high speed diesel and electric stock.

D.1.7.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT for all stations is either less than 60 minutes or could be improved to less than 60 minutes through small frequency and journey time improvements.
- **Jobs at destination**: Greater Manchester is a key employment centre in the North West. Stoke on Trent, MAcclesfield, Crewe, and Stockport are employment centres in their own right.
- **Population catchments:** Stoke-on-Trent, Macclesfield, Crewe and Stockport, serve large towns; inner suburban stations tend to serve large catchments served by more than one station, and outer suburban stations tend to serve relatively large communities.
- **Market for rail:** Demand is high from many stations on the route, particularly from Stoke-on-Trent, Macclesfield, Wilmslow, Cheadle Hulme and Stockport.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share**: Rail's market share is relatively low into Manchester and gains can still be made. Manchester is a key urban centre with constrained road and parking infrastructure where rail has the potential to gain significant improvements in market share.

D.1.7.4 Recommendations for conditional outputs:

- There are limited opportunities to improve journey times through rolling stock and infrastructure improvements, but reducing conflicts on the approaches to Manchester Piccadilly may give opportunities.

- Some stations on this route are well served by long distance trains into Manchester, specific conditional outputs to improve the frequency and journey time to Manchester have not been made. The provision of direct connectivity commensurate with the current level of service should continue to be provided.
- Increase frequency from other stations that serve large communities on the outer suburban station on the route in the off-peak to meet peak frequencies. In particular from Sandbach, Kidsgrove, Congleton, Poynton and Bramhall.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

D.1.7.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Crewe, Stoke-on-Trent, Macclesfield and Stockport to Manchester on this corridor will have the largest impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements can be made by improving the pattern of services. The impact of these improvements from these stations to Manchester on Gross Value Added (GVA) through labour supply improvements is estimated to be around £364,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £482,000 per annum per minute of GJT.

The largest impact on GJT can be achieved by improving services from stations served by suburban services only on the route. The impact of improvements from these stations to Manchester on Gross Value Added (GVA) through labour supply improvements is estimated to be around £93,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £315,000 per annum per minute of GJT.

Table 7. Population, demand and current services for stations on the Macclesfield and Stoke-on-Trent and Crewe corridors to Manchester to inform conditional outputs

Corridor	Station name	Total Journeys into Manchester* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Manchester	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) - mph	Notes
Macclesfield and Stoke	Stoke-on-Trent	536	2,444	8,600	49,500	104,700	38	5 (4)	45 (32)	60	51 (38)	
	Longport	1	38	5,100	50,200	83,700	35	<1 (1)	68 (53)	108	31 (20)	
	Kidsgrove	39	158	7,300	16,200	42,100	32	1 (2)	54 (43)	82	35 (23)	
	Congleton	145	263	5,900	11,000	11,600	26	1 (2)	52 (26)	74	30 (21)	
	Macclesfield	553	1,324	9,600	28,000	9,600	18	3 (5)	29 (20)	47	37 (23)	
	Prestbury	22	45	1,300	11,000	30,100	15	1 (3)	34 (25)	62	27 (15)	
	Adlington	9	17	1,200	3,800	22,900	13	1 (2)	31 (22)	60	26 (13)	
	Poynton	102	195	3,800	22,400	43,100	11	1 (3)	28 (19)	56	24 (12)	
	Bramhall	158	246	6,900	27,200	83,700	10	1 (3)	25 (16)	53	24 (11)	
	Cheadle Hulme	387	697	7,400	56,300	89,400	8	3 (5)	19 (13)	36	26 (14)	
	Stockport	942	3,313	9,900	71,700	116,800	6	14 (15)	12 (7)	17	30 (21)	
Total		**2,893**	**8,741**									
Crewe	Crewe	379	2,351	8,600	36,800	18,800	31	3 (3)	53 (29)	63	35 (29)	
	Sandbach	56	159	3,600	10,300	8,500	26	1 (2)	52 (38)	75	30 (21)	
	Holmes Chapel	61	155	3,000	2,700	2,700	22	2 (2)	48 (38)	72	28 (18)	
	Goostrey	20	38	1,100	2,600	3,100	20	1 (1)	40 (35)	78	30 (15)	
	Chelford	13	31	800	1,100	4,300	16	1 (1)	36 (30)	73	27 (13)	
	Alderley Edge	72	219	3,600	10,500	11,600	13	3 (2)	35 (26)	53	23 (15)	
	Wilmslow	397	1,070	3,500	20,600	13,300	12	5 (5)	29 (14)	39	24 (18)	
	Handforth	91	237	5,000	26,100	48,300	11	2 (2)	31 (20)	48	20 (13)	
Total		**6,875**	**21,743**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Manchester between 0800 and 0900.

D.1.8 Manchester Airport to Manchester via Heald Green

Manchester Airport is a major international gateway and is a destination from key corridors in the North West, North East and Yorkshire and Humber. However, the route also serves a suburban market into Manchester Piccadilly.

Manchester Airport is also served from the south via Crewe with opportunities to connect with other regions.

D.1.8.1 Current services:

- One service per hour from Crewe to Manchester Piccadilly via Manchester Airport stopping at all stations to Manchester Piccadilly
- One service per hour from Manchester Airport to Manchester Piccadilly stopping at all stations to Manchester Piccadilly
- One service per hour from Manchester Airport to Southport stopping at Heald Green and East Didsbury to Manchester Piccadilly.
- One service per hour from Manchester Airport to Blackpool North stopping at Heald Green, Gatley and East Didsbury in the peak to Manchester Piccadilly.
- Other interurban services from Manchester Airport to Manchester Piccadilly and beyond.

D.1.8.2 Journey times and rolling stock:

- **Journey times/speeds**: Given the inner suburban nature of the route, the journey speeds are relatively fast, there may be opportunity to improve journey times on specific services through reduced conflicts on the approaches to Manchester Piccadilly.
- **Rolling stock:** Suburban services are run by fast accelerating electric stock. Interurban services are run by a mix of diesel rolling stock types.

D.1.8.3 Criteria for conditional outputs:

- **Willingness to commute**: The GJT for all stations is less than 60 minutes.
- **Jobs at destination:** Greater Manchester and Manchester Airport are key employment centre in the North West.
- **Population catchments**: All suburban stations serve large suburbs of Manchester.
- **Market for rail**: Demand is high from all stations.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share**: Rail's market share is relatively low into Manchester and gains can still be made. Manchester is a key urban centre with constrained road and parking infrastructure where rail has the potential to gain significant improvements in market share.

D.1.8.4 Recommendations for conditional outputs:

- There are limited opportunities to improve journey times.
- Improve frequency into Manchester in the off-peak, but there is a trade off with journey times to other destinations from Manchester Airport would need to be taken into account.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

D.1.8.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from all stations to Manchester on this corridor will have a relatively large impact on labour supply and reducing deprivation by providing access to employment.

Small incremental improvements could be made. The impact of these improvements from these stations to Manchester on Gross Value Added (GVA) through labour supply improvements is estimated to be around £49,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £415,000 per annum per minute of GJT.

Table 7 Population, demand and current services for stations on the Manchester Airport route into Manchester to inform conditional outputs

Corridor	Station name	Total Journeys into Manchester* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Manchester	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Manchester Airport	Manchester Airport	1,011	3,164	3,500	32,400	70,300	10	9 (9)	18 (13)	28	33 (22)	
	Heald Green	287	417	5,900	38,500	66,400	8	3 (4)	18 (11)	33	28 (15)	
	Gatley	209	279	6,200	61,500	123,900	7	2 (4)	17 (12)	37	24 (11)	
	East Didsbury	185	343	7,200	71,100	163,000	6	3 (4)	15 (9)	35	22 (9)	
	Burnage	147	216	14,700	86,500	171,200	5	2 (2)	13 (9)	37	21 (7)	
	Mauldeth Road	238	323	21,200	114,800	154,300	4	2 (2)	11 (7)	36	20 (6)	
Total		**2,075**	**4,741**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Manchester between 0800 and 0900

D.1.9 Chester to Manchester via Northwich and Altrincham

The Chester via Northwich and Altrincham route provides suburban services into Manchester and Chester via Stockport.

Altrincham and Navigation Road are served by Metrolink tram services into Manchester.

D.1.9.1 Current services:

- One service per hour from Chester to Manchester Piccadilly stopping at all stations to Stockport then direct to Manchester Piccadilly.
- One peak only service from Chester to Stockport stopping at all stations to Stockport.

D.1.9.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey speeds on the route are slow compared with other outer suburban services due to the quality of rolling stock and low line speeds.
- **Rolling stock**: Suburban services are run by early generation diesel stock, that causes passenger satisfaction issues.

D.1.9.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT for all stations from Knutsford into Manchester could be improved to less than 60 minutes through small frequency and journey time improvements.
- **Jobs at destination:** Greater Manchester is a key employment centre in the North West. Chester and Stockport are also employment centres and drive demand on the route.
- **Population catchments**: Greenbank, Northwich, Hale, Altrincham and Navigation road serve large communities on this line
- **Market for rail:** Demand is relatively high from Knutsford and Altrincham into Manchester but relatively low compared to other suburban routes. Demand into Chester is relatively low from all stations.
- **Deprivation:** There are pockets of deprivation on the route. **http://casa.oobrien.com/booth/**
- **Rail's market share:** Rail's market share is relatively low into Manchester and gains can still be made. Manchester is a key urban centre with constrained road and parking infrastructure where rail has the potential to gain significant improvements in market share.

D.1.9.4 Recommendations for conditional outputs:

- Improve journey times through rolling stock improvements and Infrastructure improvements.
- Increase frequency of services from Greenbank, Northwich, Knutsford and Altrincham to two trains per hour all day into Manchester.
- There is an opportunity to run a limited stop service via this route to significantly improve the journey times from Chester and key stations further from Manchester.
- Increase capacity to meet demand through lengthening or increase frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

D.1.9.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Altrincham and Navigation Road to Manchester on this corridor will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Two trains per hour at an average speed of 30mph could improve the GJT to Manchester by approximately 10 minutes. The impact of these improvements from these stations to Manchester on Gross Value Added (GVA) through labour supply improvements is estimated to be around £40,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £39,000 per annum per minute of GJT.

Table 9. Population, demand and current services for stations on the Chester via Northwich corridor to Manchester to inform conditional outputs

Corridor	Station name	Total Journeys into Manchester* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Manchester	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Chester to Manchester via Northwich and Altrincham	Chester	344	2,949	10,900	36,800	21,800	40	1 (2)	72 (57)	92	34 (26)	
	Mouldsworth	4	32	0	2,800	7,200	38	1 (1)	83 (71)	112	28 (20)	
	Delamere	5	38	0	1,100	10,100	35	1 (1)	83 (67)	107	25 (20)	
	Cuddington	14	59	3,200	5,000	9,000	32	1 (1)	71 (62)	103	27 (19)	
	Greenbank	30	117	5,700	21,500	13,800	29	1 (1)	68 (57)	99	26 (18)	
	Northwich	60	190	6,200	17,100	14,000	28	1 (1)	63 (52)	94	26 (18)	
	Knutsford	119	399	6,000	3,300	4,500	22	1 (1)	49 (39)	81	26 (16)	
	Mobberley	6	17	0	4,600	15,000	19	1 (1)	45 (35)	77	25 (15)	
	Ashley	2	7	0	15,200	29,100	17	1 (1)	42 (32)	73	24 (14)	
	Hale	30	141	11,700	25,800	47,300	15	1 (1)	38 (29)	70	24 (13)	
	Altrincham	179	463	10,000	40,100	55,000	15	1 (1)	33 (26)	66	27 (13)	
	Navigation Road	14	85	10,300	54,700	51,500	14	1 (1)	31 (24)	64	27 (13)	
Total		**806**	**4,495**									

**Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Manchester between 0800 and 0900

Table 10. Population, demand and current services for stations on the Northwich and Altrincham corridor to Chester to inform conditional outputs

Corridor	Station name	Total Journeys into Chester* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Manchester	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Manchester to Chester via Northwich	Stockport	20	3,313	9,900	71,700	116,800	39	1 (1)	69 (68)	99	34 (23)	
	Navigation Road	4	85	10,300	54,700	51,500	30	1 (1)	59 (58)	98	31 (19)	
	Altrincham	22	463	10,000	40,100	55,000	30	1 (1)	59 (56)	96	30 (19)	
	Hale	9	141	11,700	25,800	47,300	29	1 (1)	52 (51)	92	34 (19)	
	Ashley	0	7	0	15,200	29,100	28	1 (1)	53 (48)	90	31 (18)	
	Mobberley	1	17	0	4,600	15,000	26	1 (1)	46 (45)	86	33 (18)	
	Knutsford	12	399	6,000	3,300	4,500	23	1 (1)	41 (41)	81	34 (17)	
	Plumley	2	21	0	1,000	14,900	20	1 (1)	36 (36)	77	34 (16)	
	Lostock Gralam	1	26	1,800	9,700	13,700	18	1 (1)	33 (32)	74	33 (15)	
	Northwich	23	190	6,200	17,100	14,000	17	1 (1)	29 (29)	70	35 (15)	
	Greenbank	21	117	5,700	21,500	13,800	15	1 (1)	25 (25)	65	36 (14)	
	Cuddington	17	59	3,200	5,000	9,000	12	1 (1)	20 (20)	61	37 (12)	
	Delamere	18	38	0	1,100	10,100	9	1 (1)	16 (16)	56	35 (10)	
	Mouldsworth	16	32	0	2,800	7,200	7	1 (1)	11 (11)	52	35 (8)	
Total												

**Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Chester between 0800 and 0900

D.1.10 Liverpool Lime Street to Manchester via Warrington Central (Cheshire Lines Committee)

The Cheshire Lines Comittee route provides interurban services from Liverpool Lime Street, Warrington Central and key suburban stations into Manchester and beyond. Suburban services run into Manchester Oxford Road.

Manchester, Liverpool and Warrington drive demand on this route, particularly commuting demand. Conditional outputs from Hough Green to Mossley Hill is driven more by Liverpool and this is discussed in the Merseyside section of this appendix.

D.1.10.1 Current services:

- One service per hour from Liverpool Lime Street to Scarborough stopping at Warrington Central and key suburban stations on the route to Manchester.
- One service per hour from Liverpool Lime Street to Nottingham / Norwich stopping at Warrington Central and key suburban stations on the route to Manchester.
- Two services per hour from Liverpool Lime Street to Manchester Oxford Road skip stopping smaller stations on the route.

D.1.10.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey speeds from suburban stations are relatively slow.
- **Rolling stock**: Suburban services are run by early generation diesel stock, that causes passenger satisfaction issues. Interurban services are run by later generation diesel stock.

D.1.10.3 Criteria for conditional outputs:

- **Willingness to commute**: The GJT for all stations from Widnes is either less than 60 minutes or could be improved to less than 60 minutes through small frequency and journey time improvements.
- **Jobs at destination:** Greater Manchester is a key employment centre in the North West.
- **Population catchments:** Warrington is a large town with an employment centre in its own right, all stations serve large catchments of suburban Manchester and Warrington.
- **Market for rail:** Demand is particularly high from Warrington Central, and demand from Birchwood, Irlam and Urmston is high.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share**: Rail's market share is relatively low into Manchester and gains can still be made. Manchester is a key urban centre with constrained road and parking infrastructure where rail has the potential to gain significant improvements in market share. The line competes with the frequent local bus network which provides greater city centre penetration from some inner suburban stations like Trafford Park and Humphrey Park causing low rail patronage.

D.1.10.4 Recommendations for conditional outputs:

- The Long Distance Market Study recommends a significant improvement in the service from Liverpool to Manchester.
- Improve journey times on suburban services through rolling stock improvements and infrastructure improvements.
- Sufficient improvement in journey times may improve the effectiveness of suburban stock in providing a more frequent service from other key stations on the route.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

D.1.10.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Widnes, Warrington Central, Birchwood and Urmston to Manchester on this corridor will have a relatively large impact on labour supply and reducing deprivation by providing access to employment.

Small incremental improvements could be made. The impact of these improvements from these stations to Manchester on Gross Value Added (GVA) through labour supply improvements is estimated to be around £188,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £234,000 per annum per minute of GJT.

Table 11. Population, demand and current services for stations on the Liverpool to Manchester via Warrington Central corridor to inform conditional outputs

Corridor	Station name	Total Journeys into Manchester* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Manchester	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Liverpool to Manchester via Warrington Central	Liverpool Lime Street	1,035	14,569	18,500	76,400	162,700	32	3 (3)	51 (42)	71	37 (27)	
	Mossley Hill	14	302	13,100	81,000	104,200	31	2 (1)	63 (56)	91	29 (20)	
	West Allerton	4	47	9,000	33,100	89,500	30	2 (2)	63 (54)	89	28 (20)	
	Allerton	102	734	9,000	31,900	90,800	29	2 (2)	45 (33)	64	38 (27)	
	Hunt's Cross	15	1,160	6,800	39,900	55,300	27	1 (1)	51 (35)	78	32 (21)	
	Halewood	5	105	6,200	31,900	54,800	26	1 (0)	56 (43)	86	28 (18)	
	Hough Green	10	186	7,700	20,800	57,400	24	2 (2)	46 (30)	74	31 (19)	
	Widnes	108	365	6,400	28,100	41,600	22	2 (2)	37 (27)	60	36 (22)	
	Sankey for Penketh	32	120	7,600	25,900	39,400	19	1 (0)	38 (29)	76	29 (15)	no peak train
	Warrington Central	615	2,459	4,900	56,700	54,900	16	2 (2)	24 (19)	43	40 (22)	
	Padgate	45	91	9,400	42,900	46,500	14	1 (2)	33 (22)	65	26 (13)	
	Birchwood	255	555	2,200	25,300	53,100	13	2 (2)	24 (16)	43	32 (18)	
	Glazebrook	21	48	1,000	13,400	24,100	10	<1 (2)	30 (20)	61	20 (10)	
	Irlam	143	225	3,400	18,500	16,500	9	2 (3)	22 (13)	46	23 (11)	
	Flixton	59	82	6,900	33,700	63,900	7	1 (2)	25 (13)	49	16 (8)	
	Chassen Road	30	39	7,500	34,000	76,200	6	<1 (2)	28 (10)	54	12 (6)	
	Urmston	191	277	10,700	38,100	83,800	5	2 (2)	15 (7)	41	21 (8)	
	Humphrey Park	23	31	8,700	43,300	144,100	4	<1 (2)	27 (9)	55	9 (5)	
	Trafford Park	23	45	9,700	47,200	156,600	3	<1 (2)	20 (7)	49	10 (4)	
Total		**2,734**	**21,440**									

**Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Manchester between 0800 and 0900

D.1.11 Liverpool Lime Street and Chester to Manchester via Newton-le-Willows

This route provides suburban services into Manchester Victoria and interurban services to the south side of Manchester and Manchester Airport. The route is planned to be electrified and this will cascade electric rolling stock onto the route. The Northern Hub may improve the pattern of interurban services.

This route is being electrified as part of the North West Electrification scheme.

There is some overlap of commuting into Manchester and Liverpool from different stations on the route. For simplicity, Huyton and stations west are assumed to be driven by the employment market in Liverpool and conditional outputs for this section of the route are articulated in the Merseyside section of this appendix.

This route also provides connections from the North Wales coast to Manchester and Chester. Regional urban conditional outputs for the North Wales coast (including into Chester) will be expressed in the Wales Route Study. The Long Distance Market Study also makes recommendations that will affect this corridor.

D.1.11.1 Current services:

- One service per hour from Liverpool Lime Street to Stalybridge via Manchester Victoria stopping at all stations to Manchester Victoria, with one extra in the peak.
- One service per hour from Liverpool Lime Street to Manchester Airport via Manchester Piccadilly, calling at Wavertree Technology Park, St Helens Junction, Newton-le-Willows, Manchester Oxford Road, Manchester Piccadilly and Manchester Airport.
- One service per hour from Llandudno to Manchester Piccadilly, calling at all stations from Chester to Warrington Bank Quay and then Earlestown, Newton-le-Willows and Manchester Oxford Road, with one extra peak service Chester to Manchester Piccadilly.

D.1.11.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey speeds on the route are relatively fast into Manchester and should improve as a result of electrification.
- **Rolling stock**: Suburban services are run by early generation diesel stock, that causes passenger satisfaction issues, but electric stock will be cascaded to the route. The Llandudno services are run by 100mph diesel stock.

D.1.11.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT for all stations from Earlestown and from Frodsham is either less than 60 minutes or could be improved to less than 60 minutes through small frequency and journey time improvements.
- **Jobs at destination:** Greater Manchester is a key employment centre in the North West. Trafford Park and Salford Quays are employment centres accessible from Eccles.
- **Population catchments**: all stations from Earlestown serve large suburbs of Manchester and Warrington. Warrington and Chester are large towns with an employment centre in their own right. Runcorn and Frodsham serve relatively large communities. Newton-le-Willows has a wide catchment for rail heading.
- **Market for rail:** Demand is high from Chester, Warrington Bank Quay and Newton-le-Willows.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share:** Rail's market share is relatively low into Manchester and gains can still be made. Manchester is a key urban centre with constrained road and parking infrastructure where rail has the potential to gain significant improvements in market share. Eccles and Patricroft compete with the Metrolink tram services into Manchester.

Service level conditional outputs for the North West - Greater Manchester

D.1.11.4 Recommendations for conditional outputs:

- Increase frequency of services in the off-peak from one to two trains per hour from Helsby, Frodsham, Runcorn and Warrington Bank Quay to Manchester .
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- The Long Distance Market Study recommends a significantly improved service between North Wales, Chester and Liverpool to Manchester.

D.1.11.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Newton-le-Willows, Earlestown and St Helens Junction to Manchester on this corridor will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements could be made. The impact of these improvements from these stations to Manchester on Gross Value Added (GVA) through labour supply improvements is estimated to be around £142,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £107,000 per annum per minute of GJT.

Table 12 Population, demand and current services for stations on the Liverpool Lime Street and Chester corridors via Newton-le-Willows to Manchester to inform conditional outputs

Corridor	Station name	Total Journeys into Manchester* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Manchester	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Liverpool via Newton-le-Willows	Liverpool Lime Street	1,035	14,569	18,500	76,400	162,700	32	3 (3)	51 (42)	71	37 (27)	
	Edge Hill	3	142	13,700	119,200	118,300	30	2 (3)	61 (54)	81	30 (22)	
	Wavertree Technology Park	23	367	12,100	91,800	169,000	29	2 (3)	51 (38)	71	35 (25)	
	Broad Green	21	661	12,100	91,400	161,100	28	1 (2)	51 (48)	76	33 (22)	
	Roby	8	332	9,300	65,000	96,900	27	1 (2)	48 (44)	75	33 (21)	
	Huyton	23	1,234	8,200	50,800	85,000	26	1 (2)	48 (36)	73	33 (21)	
	Whiston	17	242	9,300	32,100	61,200	24	1 (2)	43 (39)	72	34 (20)	
	Rainhill	30	470	6,900	34,900	64,600	23	1 (2)	40 (33)	68	34 (20)	
	Lea Green	80	499	8,000	27,300	64,000	21	1 (2)	37 (28)	62	34 (20)	
	St.Helens Junction	95	260	5,900	25,000	65,900	20	2 (3)	32 (25)	53	37 (22)	Uneven pattern
	Earlestown	109	444	8,600	18,300	49,900	17	1 (4)	25 (22)	49	41 (21)	Uneven pattern
	Newton-le-Willows	326	645	2,300	22,900	45,500	16	2 (5)	22 (19)	41	42 (23)	
	Patricroft	25	45	12,300	33,200	93,400	5	1 (2)	29 (9)	45	11 (7)	
	Eccles	78	149	8,200	57,800	98,600	4	1 (1)	27 (6)	41	9 (6)	Metrolink
Total		**1,874**	**20,059**									
Chester via Warrington Bank Quay	Llandudno Junction	118	356	4,700	7,300	20,300	85	1 (1)	118 (104)	157	43 (32)	
	Shotton	12	246	4,000	20,700	10,100	48	1 (1)	79 (70)	115	36 (25)	
	Chester	344	2,949	10,900	36,800	21,800	40	1 (2)	72 (57)	92	34 (26)	
	Helsby	44	87	2,300	2,600	8,900	33	1 (2)	52 (47)	83	38 (24)	
	Frodsham	38	122	5,000	5,600	34,300	30	1 (2)	49 (43)	79	37 (23)	
	Runcorn East	58	153	7,500	20,100	18,300	28	1 (2)	39 (38)	74	43 (23)	
	Warrington Bank Quay	615	2,459	4,900	56,700	54,900	16	1 (2)	24 (30)	43	40 (22)	
Total		**1,228**	**6,373**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Manchester between 0800 and 0900.

D.1.12 Wigan, Southport and Kirkby to Manchester via Atherton

The Atherton route provides suburban services into Manchester.

Wigan provides an important interchange to other interurban destinations.

D.1.12.1 Current services:

- One service per hour from Southport to Stalybridge via Atherton calling at most but not all stations between Wigan Wallgate and Manchester Victoria.
- One service per hour from Kirkby to Manchester Victoria via Atherton calling at all stations between Wigan Wallgate and Manchester Victoria.
- Two service in the peak hour from Wigan Wallgate to Manchester Victoria via Atherton calling at key suburban stations to Victoria.
- One service per hour from Southport to Manchester Airport via Bolton, calling at key stations to Manchester Piccadilly.
- One service per hour from Wigan Wallgate to Manchester Victoria / Rochdale via Bolton calling at limited stations to Manchester Victoria with one extra in the peak.

D.1.12.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey speeds on the route are relatively slow.
- **Rolling stock**: Suburban services are run by early generation diesel stock, that causes passenger satisfaction issues.

D.1.12.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT for all stations from Wigan is less than 60 minutes.
- **Jobs at destination**: Greater Manchester is a key employment centre in the North West. Salford Quays and Trafford Park are employment centres accessible from Salford Crescent.
- **Population catchments:** all stations from Wigan serve large population catchments. Stations on the lines from Southport and Kirkby tend to serve smaller communities.
- **Market for rail:** Demand is high from Atherton and Daisy Hill but relatively low compared with other suburban lines.
- **Deprivation**: There are pockets of deprivation on the route. http://casa.oobrien.com/booth/
- **Rail's market share:** Rail's market share is relatively low into Manchester and gains can still be made. Manchester is a key urban centre with constrained road and parking infrastructure where rail has the potential to gain significant improvements in market share.

D.1.12.4 Recommendations for conditional outputs:

- Increased frequency of services in the off-peak to meet peak frequencies.
- Improved journey times.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

D.1.12.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Wigan, Hindley, Atherton and Walkden to Manchester on this corridor will have a relatively large impact on labour supply and reducing deprivation by providing access to employment.

Four trains per hour at an average speed of 30mph could improve the GJT from these stations to Manchester by between 10 – 15 minutes. The impact of these improvements from these stations to Manchester on Gross Value Added (GVA) through labour supply improvements is estimated to be around £209,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £283,000 per annum per minute of GJT.

Table 13. Population, demand and current services for stations on the Atherton, Southport and Kirkby corridors to Manchester to inform conditional outputs

Corridor	Station name	Total Journeys into Manchester* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Manchester	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Atherton	Wigan Wallgate	719	2,762	7,600	52,200	47,400	18	5 (6)	39 (32)	55	28 (19)	
	Ince	6	22	6,700	42,300	55,700	17	1 (4)	43 (31)	69	24 (15)	
	Hindley	104	325	4,700	30,600	53,400	15	3 (5)	37 (27)	55	25 (16)	
	Daisy Hill	159	259	5,600	37,500	63,700	13	2 (5)	37 (23)	54	21 (14)	
	Hag Fold	19	65	7,300	32,000	86,400	11	1 (3)	41 (27)	60	16 (11)	Uneven pattern
	Atherton	260	424	7,700	29,000	102,000	11	2 (5)	27 (19)	49	24 (13)	Uneven pattern
	Walkden	173	305	9,500	42,100	73,400	7	2 (4)	21 (15)	46	21 (10)	
	Moorside	24	48	6,600	42,000	94,700	6	1 (3)	29 (15)	48	12 (7)	
	Swinton	73	153	9,800	38,100	103,300	5	2 (3)	16 (13)	41	18 (7)	Metrolink
Total		**1,537**	**4,363**									
Southport	Southport	121	2,675	10,900	33,900	13,800	35	2 (2)	79 (66)	100	27 (21)	
	Meols Cop	26	65	11,800	29,300	18,400	34	2 (2)	67 (60)	94	30 (21)	
	Bescar Lane	1	4	0	2,900	14,500	31	<1 (1)	73 (59)	121	25 (15)	
	New Lane	0	3	0	7,900	9,500	29	<1 (1)	71 (56)	121	24 (14)	
	Burscough Bridge	71	219	4,300	2,400	13,300	27	2 (2)	56 (52)	84	29 (20)	
	Hoscar	0	1	0	6,700	12,400	26	<1 (1)	64 (50)	114	24 (14)	
	Parbold	44	116	1,900	2,300	22,800	24	2 (2)	51 (47)	80	29 (18)	
	Appley Bridge	80	237	2,300	9,600	42,500	22	2 (2)	47 (43)	74	28 (18)	
	Gathurst	39	91	800	27,400	62,200	20	1 (2)	51 (40)	77	24 (16)	
Total		**383**	**3,410**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Manchester between 0800 and 0900

Table 13. (continued) Population, demand and current services for stations on the Atherton, Southport and Kirkby corridors to Manchester to inform conditional outputs												
Corridor	Station name	Total Journeys into Manchester* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Manchester	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Kirkby	Kirkby	13	1,891	8,400	31,200	66,100	30	1 (1)	77 (61)	112	23 (16)	
	Rainford	4	52	1,000	12,100	27,800	25	1 (1)	63 (49)	109	24 (14)	
	Upholland	2	25	1,100	20,800	48,400	23	1 (1)	59 (45)	106	23 (13)	
	Orrell	21	112	2,900	31,500	52,800	21	1 (1)	56 (42)	103	23 (12)	
	Pemberton	15	59	9,600	51,100	45,600	20	1 (1)	53 (38)	107	22 (11)	
Total		**56**	**2,140**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Manchester between 0800 and 0900

D.1.13 Blackpool North, Preston and Bolton

This route provides interurban services from Scotland, Barrow-in-Furness, Blackpool North and Windermere into Manchester and Manchester Airport and also serves a key outer suburban market from Bolton and communities between Preston and Bolton. The routes between Blackpool North and Preston and Manchester via Bolton are planned to be electrified and this will cascade electric stock onto these routes. The Northern Hub may improve the pattern of interurban services on the route.

D.1.13.1 Current services:

- Two services per hour from Blackpool North/Scotland/ Windermere/Barrow-in-Furness to Manchester Airport calling at Lancaster/Poulton-le-Fylde, Preston, key outer suburban stations between Preston and Bolton, Bolton, Salford Crescent, Manchester Oxford Road and Manchester Piccadilly.
- One service per hour from Preston to Hazel Grove caling at all stations to Bolton then fast to Salford Crescent, Manchester Oxford Road, Manchester Piccadilly.
- One service per hour from Blackpool North to Manchester Victoria calling at key stations to Bolton then fast to Salford Crescent, Salford Central and Manchester Victoria.
- Further services from Bolton to Manchester Piccadilly and Manchester Victoria from other routes.

D.1.13.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey speeds on the route are relatively slow given the interurban / outer suburban nature of the route.
- **Rolling stock:** Electrification will cascade electric stock onto the route

D.1.13.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT for all stations from Preston is either less than 60 minutes or could be improved to less than 60 minutes through small frequency and journey time improvements.
- **Jobs at destination**: Greater Manchester is a key employment centre in the North West. Salford Quays and Trafford Park are employment centres accessible from Salford Crescent.
- **Population catchments**: all stations serve relatively large communities. Blackpool, Preston and Bolton are large towns that are employment centres in their own right.
- **Market for rail:** Demand is particularly high from Preston and Bolton and high from key stations on the route.
- **Deprivation**: There are large pockets of deprivation on route. http://casa.oobrien.com/booth/
- **Rail's market share:** Rail's market share is relatively low into Manchester and gains can still be made. Manchester is a key urban centre with constrained road and parking infrastructure where rail has the potential to gain significant improvements in market share.

D.1.13.4 Recommendations for conditional outputs:

- The frequency of services is relatively high on the route, maintaining the frequency of services to all employment catchments in Central Manchester and Salford is important.
- Change the frequency of services from outer suburban stations after electrification reduces the speed differential between outer suburban and interurban services on the route.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- The Long Distance Market Study recommends an improvement in services from Blackpool, Preston and Bolton to other towns and cities in the North West and other regions.

D.1.13.5 Analysis of conditional outputs against strategic goals

Analysis shows that improving the Generalised Journey Time (GJT) from Preston, Chorley, Blackrod, Horwich and Bolton, and from Wigan, Hindley, Atherton and Walden to Manchester on this corridor will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements could be made to improve GJT from these stations. The impact of these improvements from these stations to Manchester on Gross Value Added (GVA) through labour supply improvements is estimated to be around £423,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £564,000 per annum per minute of GJT.

Table 14. Population, demand and current services for stations on the Bolton, Preston and Blackpool North corridors to Manchester to inform conditional outputs												
Corridor	Station name	Total Journeys into Manchester* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Manchester	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Bolton	Bolton	1,659	3,259	6,900	78,600	74,300	11	7 (6)	19 (15)	30	33 (21)	
	Moses Gate	7	23	5,500	66,200	91,600	9	1 (2)	26 (14)	57	22 (10)	
	Farnworth	15	45	5,700	54,100	89,600	8	1 (2)	26 (16)	58	19 (9)	
	Kearsley	16	35	8,300	38,400	97,900	8	1 (2)	26 (14)	57	18 (8)	
	Clifton	0	0	2,200	52,900	108,300	5	<1 (0)	25 (12)	139	11 (2)	1 a day
Total		**1,698**	**3,363**									
Preston	Preston	592	4,385	11,000	65,700	61,200	31	4 (3)	47 (37)	64	39 (29)	
	Leyland	60	402	8,000	23,300	49,500	27	1 (2)	52 (42)	78	31 (21)	
	Westhoughton	82	210	6,900	15,400	75,800	15	1 (2)	34 (23)	58	27 (16)	
	Chorley	275	836	10,800	19,800	24,300	22	4 (4)	34 (27)	52	39 (26)	
	Adlington	32	110	4,100	7,300	38,300	19	1 (2)	38 (33)	70	30 (17)	
	Blackrod	219	456	4,600	16,000	15,400	17	2 (2)	34 (29)	65	30 (16)	
	Horwich Parkway	292	586	0	18,900	41,200	16	3 (2)	27 (21)	50	35 (19)	
	Lostock Parkway	185	244	2,000	34,900	72,400	14	2 (2)	25 (22)	50	33 (16)	2 via WAC
Total		**1,736**	**7,230**									
Scotland/ Windermere/ Blackpool North	Lancaster	226	1,834	10,300	31,300	23,800	52	1 (2)	65 (56)	95	48 (33)	
	Blackpool North	288	1,724	12,300	49,700	48,300	48	2 (2)	79 (63)	103	37 (28)	
	Layton	6	63	11,200	48,600	55,500	47	1 (3)	79 (60)	104	36 (27)	
	Poulton-le-Fylde	109	449	6,700	25,000	60,600	45	1 (3)	70 (56)	95	39 (28)	
	Kirkham & Wesham	51	241	4,700	4,400	9,500	39	1 (3)	72 (54)	91	32 (25)	
Total		**679**	**4,311**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Manchester between 0800 and 0900.

D.1.14 Clitheroe and Blackburn to Manchester

This route provides suburban services into Manchester Victoria.

D.1.14.1 Current services:

- One service per hour from Clitheroe to Manchester Victoria via Bolton stopping at all stations to Manchester Victoria (except Entwhistle).
- One peak service from Blackburn to Manchester Victoria via Bolton stopping at all stations to Manchester Victoria.

D.1.14.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey speeds on the route are relatively slow given the outer suburban nature of the route.
- **Rolling stock:** Services are run by early generation pacer and sprinter stock, that causes passenger satisfaction issues.

D.1.14.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT for all stations from Blackburn is either less than 60 minutes or could be improved to less than 60 minutes through small frequency and journey time improvements.
- **Jobs at destination:** Greater Manchester is a key employment centre in the North West. Salford Quays and Trafford Park are employment centres accessible from Salford Crescent. Bolton and Blackburn are key employment centres in the area.
- **Population catchments**: all stations (with the exception of Entwhistle) serve relatively large communities. Blackburn is a large town.
- **Market for rail:** Demand from Bromley Cross and Blackburn is high but lower than many other suburban routes.
- **Deprivation:** There are pockets of deprivation on the route. **http://casa.oobrien.com/booth/**
- **Rail's market share:** Rail's market share is relatively low into Manchester and gains can still be made. Manchester is a key urban centre with constrained road and parking infrastructure where rail has the potential to gain significant improvements in market share.

D.1.14.4 Recommendations for conditional outputs:

- Improve journey times.
- Improve off-peak frequency from Blackburn to Manchester to meet the peak frequency.
- Increase capacity to meet demand through lengthening or increase frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

D.1.14.5 Analysis of conditional outputs against strategic goals

Analysis shows that improving the Generalised Journey Time (GJT) from Blackburn, Darwen, Bromley Cross and Hall I' th' Wood to Manchester on this corridor will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Two trains per hour at an average speed of 40mph could improve the GJT by between 15 and 20 minutes from these stations to Manchester. The impact of these improvements from these stations to Manchester on Gross Value Added (GVA) through labour supply improvements is estimated to be around £78,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £124,000 per annum per minute of GJT.

Table 15. Population, demand and current services for stations on the Blackburn, Clitheroe and Colne corridors to Manchester to inform conditional outputs												
Corridor	Station name	Total Journeys into Manchester* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Manchester	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Blackburn	Blackburn	251	1,370	11,000	62,100	23,100	25	1 (2)	56 (48)	83	26 (18)	
	Darwen	109	287	10,600	15,000	24,700	20	1 (2)	42 (36)	72	29 (17)	
	Entwistle	3	15	0	2,400	15,100	17	0 (1)	39 (33)	75	26 (13)	1 a day
	Bromley Cross	201	399	3,600	28,600	50,200	14	1 (2)	30 (25)	60	27 (14)	
	Hall I' Th' Wood	54	110	5,100	63,600	64,000	12	1 (2)	27 (22)	57	27 (13)	
Total		**618**	**2,181**									
Clitheroe	Clitheroe	57	339	8,300	3,300	4,800	36	1 (1)	74 (70)	112	29 (19)	
	Whalley	23	87	3,500	2,500	14,800	32	1 (1)	68 (63)	104	28 (18)	
	Langho	10	40	1,700	4,200	26,500	29	1 (1)	64 (59)	101	28 (18)	
	Ramsgreave & Wilpshire	35	108	4,000	22,500	46,700	27	1 (1)	59 (55)	97	28 (17)	
Total		**124**	**574**									
Colne	Colne	2	98	6,900	22,400	19,400	41	0 (0)	124 (ind)	174	20 (14)	
	Nelson	1	130	13,900	25,800	24,400	39	0 (0)	119 (ind)	167	20 (14)	
	Brierfield	0	28	5,200	33,700	41,700	38	0 (0)	116 (ind)	164	20 (14)	
	Burnley Central	1	150	7,000	41,100	29,600	36	0 (0)	110 (ind)	158	20 (14)	
	Burnley Barracks	0	17	7,300	36,800	26,700	35	0 (0)	105 (ind)	155	20 (14)	
	Rose Grove	0	40	4,800	29,000	24,200	34	0 (0)	102 (ind)	152	20 (14)	
	Hapton	0	20	2,400	14,300	41,400	33	0 (0)	102 (ind)	145	19 (14)	
	Huncoat	0	19	2,200	21,500	45,200	31	0 (0)	96 (ind)	135	20 (14)	
	Accrington	9	346	13,000	27,200	20,700	30	0 (0)	80 (ind)	118	22 (15)	
	Church & Oswaldtwistle	1	42	8,200	33,000	29,900	29	0 (0)	89 (ind)	125	19 (14)	
	Rishton	2	66	4,900	27,400	65,000	27	0 (0)	87 (ind)	122	19 (13)	
Total		**17**	**956**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Manchester between 0800 and 0900

D.2 Service level conditional outputs for Merseyside

This section is an interpretation of the Regional Urban conditional outputs into and within Merseyside disaggregated by the rail corridors into Liverpool.

Liverpool is a centre for employment, commerce and culture in the North West, and has an excellent suburban rail network centred on four central Liverpool stations.

Liverpool employs around 350,000 people with around 120,000 in the public sector (Centre for Cities factbook). Including Birkenhead and the Wirral increases the total employment by approximately 105,000 with around 44,000 in the public sector

The Mersey Waters Enterprise Zone comprises two waterside projects on either side of the River Mersey, to make up the largest regeneration project in the UK. The Liverpool Waters vision involves regenerating a 60-hectare dockland site to create a high quality mixed-use waterfront quarter. Wirral Waters on the Birkenhead side will include 17 million square feet of mixed-use floor space plus the largest and most sustainable trade centre in Europe.

The Liverpool City Region City Deal has identified the potential for an additional 100,000 jobs over the next 10 years.

Liverpool John Moores University and the University of Liverpool have around 55,000 undergraduate and postgraduate students. (Higher Education Statistics Agency statistics, from 2010-2011).

The Northern Hub and North West electrification programmes of investment will improve the service on some lines into Liverpool and cascade electric stock onto suburban services. A key challenge for the Wirral and Northern Lines in the next control period and beyond will be the procurement of a fleet of rolling stock that is able to meet the capacity requirements on the network and continue to meet or improve upon the good level of service on these lines.

This section is organised into a description of the conditional outputs relating to each of the following corridors around Liverpool:

- Blackpool North and Preston to Liverpool via Wigan North Western.
- Manchester to Liverpool via Newton-le-Willows.
- Manchester to Liverpool via Warrington Central.
- Crewe and Runcorn to Liverpool.
- Hunts Cross to Liverpool.
- Chester and Ellesmere Port to Liverpool.
- West Kirby, New Brighton and Wrexham to Liverpool.
- Southport, Ormskirk and Kirkby to Liverpool.

D.2.1 Blackpool North and Preston to Liverpool Lime Street via Wigan North Western

This route provides commuting services into Liverpool and interurban services connecting Blackpool, Preston, Wigan and Liverpool. The North West electrification scheme will cascade electric stock onto the route.

D.2.1.1 Current services:

- Two services per hour from Wigan North Western to Liverpool Lime Street calling at all stations to Liverpool Lime Street.
- One service per hour from Blackpool North to Liverpool stopping at key stations from Wigna North Western with one extra peak train from Preston to Liverpool.

D.2.1.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey speeds on the route are very slow compared with other suburban routes.
- **Rolling stock:** Services tend to be run by early generation diesel stock with poor acceleration that cause issues with passenger satisfaction.

D.2.1.3 Criteria for conditional outputs:

- **Willingness to commute:** The Generalised Journey Time (GJT) for all stations from Wigan North Western is either less than 60 minutes or could be improved to less than 60 minutes through small frequency and journey time improvements.
- **Jobs at destination**: Liverpool is a key employment centre in the North West. Blackpool, Preston and Wigan are employment centres that also drive commuting on the route.
- **Population catchments**: Wigan, Preston, Blackpool and St Helens are large towns, all stations from Wigan North Western serve relatively large population catchments.
- **Market for rail:** Demand is relatively high on the route but spread across a dense network of stations, demand is highest from Preston, Wigan North Western, St Helens Central, Prescot, Huyton and Broad Green.
- **Deprivation:** There are pockets of deprivation on the route. **http://casa.oobrien.com/booth**/.
- **Rail's market share**: Rail's market share is relatively low into Liverpool, and gains can still be made.

D.2.1.4 Recommendations for conditional outputs:

- Increase the frequency from one to two interurban trains per hour from Preston and Wigan North Western to Liverpool Lime Street to significantly reduce the GJT into Liverpool from these key urban centres.
- Improve journey times through improved rolling stock characteristics and infrastructure improvements. This will be partly delivered through electrification of the route.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

D.2.1.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Wigan North Western, St Helens Central and Huyton on this corridor into Liverpool will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements could be made to other stations through journey time and frequency improvements. The impact of these improvements from these stations to Liverpool on Gross Value Added (GVA) through labour supply improvements is estimated to be around £71,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £105,000 per annum per minute of GJT.

Table 16. Population, demand and current services for stations on the Blackpool and Preston route to Liverpool via Wigan North Western to inform conditional outputs												
Corridor	Station name	Total Journeys into Liverpool* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Liverpool	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Wigan to Liverpool	Wigan North Western	151	2,762	7,600	52,200	47,400	20	3 (4)	46 (31)	68	25 (17)	1 fast 2 slow
	Bryn	34	177	7,000	27,300	61,200	16	2 (2)	42 (34)	66	23 (14)	
	Garswood	60	331	4,500	30,700	53,400	15	2 (2)	38 (31)	62	23 (14)	1 per day
	St.Helens Central	283	722	6,400	51,400	37,700	11	3 (3)	29 (17)	50	22 (13)	1 per day
	Thatto Heath	84	161	11,200	43,000	53,200	9	2 (2)	28 (20)	52	20 (11)	
	Eccleston Park	49	164	7,100	39,300	54,900	8	2 (2)	25 (17)	49	20 (10)	
	Prescot	143	502	10,100	32,800	60,500	7	2 (2)	23 (15)	46	19 (10)	
	Huyton	304	1,234	8,200	50,800	85,000	6	4.5 (5)	18 (9)	29	18 (11)	
	Roby	96	332	9,300	65,000	96,900	5	4 (4)	18 (11)	30	17 (10)	
	Broad Green	196	661	12,100	91,400	161,100	3	4.5 (6)	14 (7)	26	15 (8)	
	Wavertree Technology Park	111	367	12,100	91,800	169,000	2	5.5 (6)	11 (4)	22	13 (6)	
	Edge Hill	28	142	13,700	119,200	118,300	2	6 (6)	8 (2)	19	11 (5)	
Total		**1,539**	**7,555**									
Blackpool and Preston to Liverpool	Blackpool North	83	1,724	12,300	49,700	48,300	46	1 (1)	107 (81)	134	26 (20)	
	Poulton-le-Fylde	14	449	6,700	25,000	60,600	43	1 (1)	104 (72)	138	25 (18)	
	Kirkham & Wesham	8	241	4,700	4,400	9,500	36	1 (1)	85 (68)	125	25 (17)	
	Preston	128	4,385	11,000	65,700	61,200	28	1 (2)	67 (55)	96	25 (18)	
	Leyland	23	402	8,000	23,300	49,500	31	1 (1)	69 (47)	99	27 (19)	
	Euxton Balshaw Lane	25	61	5,300	17,500	52,800	28	1 (1)	60 (42)	100	28 (17)	
Total		**281**	**7,261**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Liverpool between 0800 and 0900

D.2.2 Manchester to Liverpool via Newton-le-Willows

The Manchester to Liverpool route via Newton-le-Willows provides commuting services into Liverpool and Manchester and will be a key corridor for interurban services after the implementation of the Northern Hub and electrification of the route.

Commuting from Eccles and Patricroft is more focussed on Manchester, conditional outputs for these stations are expressed in the Manchester section of this appendix.

D.2.2.1 Current services:

- One service per hour from Manchester Victoria to Liverpool Lime Street stopping at all stations with one extra in the peak.
- One service per off-peak hour from Warrington Bank Quay to Liverpool Lime Street stopping at all stations to Liverpool Lime Street.
- One service per hour from Manchester Airport to Liverpool Lime Street via Manchester Piccadilly with a limited stop pattern to Liverpool Lime Street.

D.2.2.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey speeds on the route are very slow compared with other suburban services.
- **Rolling stock:** Services tend to be run by early generation diesel stock with poor acceleration and top speeds that causes issues with passenger satisfaction.

D.2.2.3 Criteria for conditional outputs:

- **Willingness to commute**: The GJT for all stations from Newton-le-Willows is less than approximately 60 minutes.
- **Jobs at destination:** Liverpool is a key employment centre in the North West.
- **Population catchments**: There are no large towns on the route, but stations serve suburban Liverpool and Manchester, so catchments are relatively high.
- **Market for rail**: Demand is low from stations on the route compared with other corridors into Liverpool. Demand from Manchester is high with over 1 million passengers per annum.
- **Deprivation:** There are pockets of deprivation on the route. **http://casa.oobrien.com/booth/**
- **Rail's market share:** Rail's market share is relatively low into Liverpool, and gains can still be made.

D.2.2.4 Recommendations for conditional outputs:

- The Long Distance Market Study recommends a significant improvement in the service between Manchester and Liverpool.
- Improve journey times through improved rolling stock characteristics and infrastructure improvements. This will be partly delivered through electrification of the route.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

D.2.2.5 Analysis of conditional outputs against strategic goals:

With the exception of Manchester, analysis shows that improving the Generalised Journey Time (GJT) from Lea Green, Rainhill, Whiston, St Helens Junction, Earlestown and Newton-le-Willows on this corridor into Liverpool will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Journey times could be significantly improved through improving the speed of service on this corridor. The impact of these improvements from these stations to Liverpool on Gross Value Added (GVA) through labour supply improvements is estimated to be around £78,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £120,000 per annum per minute of GJT.

Table 17. Population, demand and current services for stations on the Manchester to Liverpool route via Newton-le-Willows to inform conditional outputs

Corridor	Station name	Total Journeys into Liverpool* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Liverpool	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Manchester to Liverpool via Newton-le-Willows.	Manchester	1,035	39,900	20,300	100,000	177,300	32	3 (3)	51 (40)	71	37 (27)	
	Eccles	11	149	8,200	57,800	98,600	28	2 (2)	56 (33)	84	30 (20)	1 per day
	Patricroft	3	45	12,300	33,200	93,400	27	2 (2)	54 (48)	83	29 (19)	1 per day
	Newton-le-Willows	99	645	2,300	22,900	45,500	16	3 (3)	36 (21)	57	27 (17)	
	Earlestown	63	444	8,600	18,300	49,900	15	2 (2)	39 (19)	61	23 (15)	
	St.Helens Junction	72	260	5,900	25,000	65,900	12	3 (3)	30 (16)	50	24 (14)	
	Lea Green	116	499	8,000	27,300	64,000	11	2 (3)	30 (15)	52	21 (12)	
	Rainhill	121	470	6,900	34,900	64,600	9	2 (3)	26 (12)	48	21 (11)	
	Whiston	131	242	9,300	32,100	61,200	7	2 (3)	23 (17)	46	19 (10)	
Total		**1,652**	**42,654**									
Rochdale	Rochdale	7	1,106	10,600	52,800	47,000	42	1 (1)	105 (Ind)	141	24 (18)	
Total		**7**	**1,106**									
Huddersfield	Huddersfield	35	4,200	13,200	54,900	51,300	57	1 (1)	98 (68)	127	35 (27)	
	Stalybridge	18	1,118	9,000	60,500	65,400	39	2 (2)	84 (72)	109	28 (22)	
	Ashton-under-Lyne	3	581	9,800	57,600	99,900	38	1 (1)	88 (77)	131	26 (17)	
Total		**56**	**5,899**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Liverpool between 0800 and 0900

D.2.3 Manchester to Liverpool via Warrington Central

The Cheshire Lines Committee (CLC) line from Warrington Central provides commuting services into Liverpool and Manchester and is a key corridor for interurban services.

Commuting from stations between Glazebrook and Trafford Park is more focussed on Manchester, conditional outputs for these stations are expressed in the Manchester section.

Liverpool John Lennon Airport provides domestic and international flights and is accessible from Liverpool South Parkway station.

D.2.3.1 Current services:

- Two services per hour from Manchester Oxford Road to Liverpool Lime Street with an uneven stopping pattern skipping stations on route due to capacity constraints on the line.
- One service per hour from Scarborough to Liverpool Lime Street stopping at key stations.
- One service per hour from Nottingham/Norwich to Liverpool Lime Street service stopping at key stations.

D.2.3.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey speeds on the route are very slow compared with other suburban services.
- **Rolling stock:** Suburban services tend to be run by early generation diesel stock with poor acceleration and top speeds that cause issues with passenger satisfaction. Interurban services are run by later generation diesel stock.

D.2.3.3 Criteria for conditional outputs:

- **Willingness to commute**: The GJT for all stations from Birchwood to Liverpool Lime Street is either less than 60 minutes or could be improved to less than 60 minutes through small frequency and journey time improvements.
- **Jobs at destination**: Warrington and Liverpool are key employment centres on this corridor.
- **Population catchments**: Warrington is a large town on the route and has links into the interurban network. Other stations serve suburban Liverpool and Manchester, so catchments are relatively high.
- **Market for rail:** Demand is high from Warrington Central , Hunts Cross and Liverpool South Parkway.
- **Deprivation:** There are pockets of deprivation on the route. **http://casa.oobrien.com/booth/**.
- **Rail's market share:** Rail's market share is relatively low into Liverpool, and gains can still be made.

D.2.3.4 Recommendations for conditional outputs:

- The Long Distance Market Study recommends a significant improvement in the service from Manchester to Liverpool.
- Improved journey times through improved rolling stock characteristics and possibly infrastructure improvements.
- Increase frequency from suburban stations with one service per hour to two services per hour in the off-peak.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

D.2.3.5 Analysis of conditional outputs against strategic goals:

With the exception of Manchester, analysis shows that improving the Generalised Journey Time (GJT) from Warrington Central on this corridor into Liverpool will have the largest impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements in journey times and the pattern of services can be made. The impact of these improvements from this station to Liverpool on Gross Value Added (GVA) through labour supply improvements is estimated to be around £29,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £80,000 per annum per minute of GJT.

Table 18. Population, demand and current services for stations on the Manchester to Liverpool route via Warrington Central to inform conditional outputs

Corridor	Station name	Total Journeys into Liverpool* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Liverpool	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Manchester to Liverpool via Warrington Central	Manchester	1,035	39,900	20,300	100,000	177,300	32	2 (2)	51 (39)	71	37 (27)	
	Trafford Park	1	45	9,700	47,200	156,600	31	<1 (1)	65 (56)	102	29 (18)	
	Humphrey Park	0	31	8,700	43,300	144,100	30	<1 (1)	64 (53)	106	28 (17)	
	Urmston	11	277	10,700	38,100	83,800	29	2 (1)	61 (51)	90	29 (19)	less in peak
	Chassen Road	0	39	7,500	34,000	76,200	29	<1 (1)	62 (51)	103	28 (17)	
	Flixton	2	82	6,900	33,700	63,900	28	2 (1)	57 (48)	94	29 (18)	
	Irlam	5	225	3,400	18,500	16,500	26	2 (1)	53 (34)	84	29 (18)	
	Glazebrook	3	48	1,000	13,400	24,100	25	<1 (1)	52 (42)	104	28 (14)	
	Birchwood	66	555	2,200	25,300	53,100	22	2.5 (2)	42 (25)	63	31 (20)	
	Padgate	13	91	9,400	42,900	46,500	20	1 (1)	46 (34)	82	26 (15)	
	Warrington Cemtral	396	2,459	4,900	56,700	54,900	18	4 (4)	29 (22)	52	38 (21)	2 fast 2 slow
	Sankey for Penketh	54	120	7,600	25,900	39,400	16	1 (2)	47 (33)	68	20 (14)	
	Widnes	134	365	6,400	28,100	41,600	12	3 (3)	30 (17)	53	24 (14)	
	Hough Green	85	186	7,700	20,800	57,400	11	2 (3)	28 (15)	53	23 (12)	
	Halewood	30	105	6,200	31,900	54,800	8	1 (2)	27 (20)	56	18 (9)	
	Hunt's Cross	391	1,160	6,800	39,900	55,300	7	1 (2)	17 (12)	31	25 (14)	More services via the Merseyrail electric network
	Allerton	301	734	9,000	31,900	90,800	6	5 (6)	13 (8)	21	25 (16)	
	West Allerton	28	47	9,000	33,100	89,500	5	2 (2)	15 (10)	40	18 (7)	
	Mossley Hill	80	302	13,100	81,000	104,200	4	2 (2)	13 (8)	38	18 (6)	
Total		**2,638**	**46,770**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Liverpool between 0800 and 0900.

Table 18. (continued) Population, demand and current services for stations on the Manchester to Liverpool route via Warrington Central to inform conditional outputs

Corridor	Station name	Total Journeys into Liverpool* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Liverpool	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Manchester to Stockport and Hazel Grove	Levenshulme	5k	434k	17,300	116,700	149,000	38	1 (1)	74 (Ind)	113	31 (20)	
	Heaton Chapel	4k	620k	9,100	84,200	164,800	39	2 (2)	77 (Ind)	115	31 (20)	
	Stockport	39k	3,313k	9,900	71,700	116,800	41	1 (1)	70 (60)	101	35 (24)	
	Woodsmoor	1k	179k	9,000	61,300	81,100	43	1 (1)	80 (Ind)	125	32 (21)	less in peak
	Davenport	1k	216k	11,300	66,100	90,800	42	1 (1)	78 (Ind)	122	32 (21)	
	Hazel Grove	4k	610k	7,600	42,200	80,400	44	1 (1)	82 (66)	125	32 (21)	
Total		54	5,372									
Manchester to Manchester Airport	Manchester Airport	126k	3,164k	3,500	32,400	70,300	45	1 (1)	81 (57)	110	33 (25)	
	Heald Green	3k	417k	5,900	38,500	66,400	43	0 (1)	90 (52)	121	29 (22)	
	Gatley	4k	279k	6,200	61,500	123,900	42	0 (1)	91 (74)	125	27 (20)	
	East Didsbury	6k	343k	7,200	71,100	163,000	40	0 (1)	91 (71)	125	27 (19)	
	Burnage	3k	216k	14,700	86,500	171,200	40	0 (0)	88 (Ind)	127	27 (19)	
	Mauldeth Road	3k	323k	21,200	114,800	154,300	39	0 (0)	86 (Ind)	126	27 (18)	
Total		146	4,741									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Liverpool between 0800 and 0900.

D.2.5 Crewe and Runcorn to Liverpool

This line serves a key intercity market from London and Birmingham. Crewe and Runcorn serve large populations with fast and frequent services into Liverpool that do not require improvement. Winsford, Hartford and Acton Bridge serve relatively small communities with a fast but infrequent service. There may be scope to improve the frequency of services from these stations but the benefit of doing so would have to be traded against a slower service from Crewe, Stafford and beyond to Birmingham and London.

There is a key employment flow between Winsford and Hartford to Warrington that is currently met by road, there is an aspiration to link the two stations directly to Warrington Bank Quay.

Table 19. Population, demand and current servicess for stations on the Crewe and Runcorn corridor to Liverpool to infiorm conditional outputs

Corridor	Station name	Total Journeys into Liverpool* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Liverpool	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Crewe and Runcorn	Stafford	57	1,842	5,300	35,400	14,000	60	2 (2)	60 (45)	87	60 (41)	
	Crewe	192	2,351	8,600	36,800	18,800	36	2 (3)	42 (31)	68	51 (31)	
	Winsford	81	167	3,000	15,400	17,000	28	1 (2)	44 (26)	72	38 (23)	
	Hartford	90	210	3,400	20,400	18,600	23	1 (2)	31 (29)	67	44 (21)	
	Acton Bridge	5	20	0	5,600	15,100	21	<1 (2)	33 (22)	71	38 (18)	
	Runcorn	241	661	7,300	18,700	51,900	13	3 (3)	20 (15)	40	39 (20)	
Total		667	5,253									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Liverpool between 0800 and 0900.

D.2.6 Hunts Cross to Liverpool

The Hunts Cross line serves a large suburban market with a frequent and fast accelerating service that does not require improvements.

Liverpool John Lennon Airport provides domestic and international flights and is accessible from Liverpool South Parkway station.

The following conditional output is recommended:

- increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money

D.2.6.1 Analysis of conditional outputs against strategic goals:

- Analysis shows that improving the Generalised Journey Time (GJT) from all stations on this corridor into Liverpool will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements in journey times could be made, though the services are already run by fast accelerating electric stock. The impact of these improvements from these stations to Liverpool on Gross Value Added (GVA) through labour supply improvements is estimated to be around £29,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £310,000 per annum per minute of GJT.

Table 20. Population, demand and current servicess for stations on the Hunts Cross corridor to Liverpool to inform conditional outputs

Corridor	Station name	Total Journeys into Liverpool* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Liverpool	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Hunts Cross (Merseyrail)	Hunt's Cross	391	1,160	6,800	39,900	55,300	7	4 (4)	17 (12)	31	25 (14)	
	Allerton	301	734	9,000	31,900	90,800	6	4 (4)	13 (8)	21	25 (16)	
	Cressington	146	427	10,100	28,200	92,800	5	4 (4)	11 (11)	25	26 (11)	
	Aigburth	219	702	6,800	49,100	97,300	4	4 (4)	9 (9)	23	27 (10)	
	St.Michaels	262	466	12,400	64,600	123,800	3	4 (4)	7 (7)	21	22 (7)	
	Brunswick	232	1,007	7,800	74,900	138,700	1	4 (4)	4 (4)	18	21 (5)	
Total		**1,552**	**1,497**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Liverpool between 0800 and 0900.

D.2.7 Chester and Ellesmere Port to Liverpool

The Chester and Ellesmere Port line serves a large suburban market with a frequent and fast accelerating service that does not require improvements.

The following conditional outputs are recommended:

- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- The Long Distance Market Study recommends a significant improvement in the service from Chester to Liverpool and Manchester.

D.2.7.1 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from all stations on the Chester and Ellesmere corridors including Hamilton Square and stations between Hooton and Birkenhead into Liverpool will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements in journey times could be made, though the services are already run by fast accelerating electric rolling stock. The impact of these improvements from these stations to Liverpool on Gross Value Added (GVA) through labour supply improvements is estimated to be around £178,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £773,000 per annum per minute of GJT.

Table 21. Population, demand and current servicess for stations on the Chester Hooton and Ellesmere Port corridor to Liverpool to inform conditional outputs

Corridor	Station name	Total Journeys into Liverpool* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Liverpool	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Hamilton Square	Birkenhead Hamilton Square	768	2,524	4,000	64,900	127,000	2	14 (15)	6 (2)	11	16 (9)	
Total		768	2,524									
Hooton to Birkenhead	Hooton	464	535	900	19,000	33,500	9	6 (7)	29 (25)	39	18 (14)	
	Eastham Rake	134	497	4,400	15,400	25,400	8	6 (7)	27 (23)	37	17 (13)	
	Bromborough	228	877	8,000	17,000	22,100	7	6 (7)	24 (20)	34	18 (13)	
	Bromborough Rake	77	408	4,600	24,700	24,500	7	6 (7)	22 (18)	32	18 (12)	
	Spital	221	319	3,400	30,600	39,100	6	6 (7)	20 (16)	30	17 (12)	
	Port Sunlight	228	696	8,100	28,400	61,800	5	6 (7)	18 (14)	28	18 (12)	
	Bebington	394	1,216	7,100	35,600	69,300	4	6 (7)	16 (12)	26	17 (10)	
	Rock Ferry	254	1,021	9,100	49,500	103,300	3	6 (7)	13 (9)	23	16 (9)	
	Green Lane	246	702	10,100	52,300	123,400	3	6 (7)	11 (7)	21	14 (7)	
	Birkenhead Central	211	1,005	9,700	54,000	124,400	2	6 (7)	8 (5)	18	17 (7)	
Total		2,458	7,276									
Chester to Hooton	Chester	350	2,949	10,900	36,800	21,800	17	4 (4)	42 (38)	59	24 (17)	
	Bache	100	192	5,900	40,000	26,200	16	4 (4)	39 (34)	55	24 (17)	
	Capenhurst	30	113	1,000	30,000	18,400	12	2 (4)	33 (29)	55	22 (13)	
Total		479	3,254									
Ellesmere Port to Hooton	Ellesmere Port	78	275	4,400	28,000	14,500	13	2 (3)	38 (34)	61	20 (12)	
	Overpool	38	119	8,500	30,600	14,400	11	2 (3)	35 (31)	57	20 (12)	
	Little Sutton	43	115	9,300	22,900	27,600	11	2 (3)	33 (29)	55	19 (12)	
Total		**160**	**508**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Liverpool between 0800 and 0900

D.2.8 West Kirby, New Brighton and Wrexham to Liverpool

The West Kirby and New Brighton lines serve a large suburban market with a frequent and fast accelerating service that does not require improvements.

Wrexham is a large town in Wales that is 30 miles from Liverpool without a direct connection. Demand is relatively high from Wrexham despite the poor service.

The following conditional output is required:

- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- Provide direct connectivity between Wrexham and Liverpool.
- Shotton and Neston serve relatively large communities on the line between Wrexham and Bidston, connections that reduce the GJT to Liverpool. to less than 60 minutes could significantly improve access to employment of these areas. Other stations on the route serve small communities.

D.2.8.1 Analysis of conditional outputs against strategic goals:

- Analysis shows that improving the Generalised Journey Time (GJT) from all stations on the West Kirby and New Brighton Merseyrail lines on this corridor including Hamilton Square and stations between Birkenhead and Hooton into Liverpool will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements in journey times could be made, though the services are already run by fast accelerating electric stock. The impact of these improvements from this station to Liverpool on Gross Value Added (GVA) through labour supply improvements is estimated to be around £129,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £734,000 per annum per minute of GJT.

Table 22. Population, demand and current services for stations on the West Kirby, New Brighton and Wrexham corridors to Liverpool to inform conditional outputs

Corridor	Station name	Total Journeys into Liverpool* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Liverpool	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Hamilton Square	Birkenhead Hamilton Square	768	2,524	4,000	64,900	127,000	2	14 (15)	6 (2)	11	16 (9)	
Total												
Birkenhead stations	Birkenhead North	195	903	5,600	64,700	79,100	4	8 (8)	14 (25)	22	16 (10)	
	Birkenhead Park	335	1,108	6,300	63,800	101,800	3	8 (8)	12 (23)	19	14 (9)	
	Conway Park	290	1,718	6,000	64,800	130,000	2	8 (8)	9 (20)	17	16 (8)	
Total		**820**	**3,729**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Liverpool between 0800 and 0900.

Table 22. (continued) Population, demand and current services for stations on the West Kirby, New Brighton and Wrexham corridors to Liverpool to inform conditional outputs

Corridor	Station name	Total Journeys into Liverpool* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Liverpool	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Wrexham	Wrexham General	105	622	7,000	35,700	19,100	29	0 (0)	76 (Ind)	113	23 (16)	
	Gwersyllt	N/A	36	6,700	21,900	35,200	N/A	0 (0)	N/A	N/A	N/A	
	Cefn-y-Bedd	N/A	9	0	14,800	18,700	N/A	0 (0)	N/A	N/A	N/A	
	Caergwrle	N/A	22	2,100	5,900	20,900	N/A	0 (0)	N/A	N/A	N/A	
	Hope	N/A	26	3,000	2,600	14,900	N/A	0 (0)	N/A	N/A	N/A	
	Penyffordd	N/A	22	1,300	6,800	19,300	N/A	0 (0)	N/A	N/A	N/A	
	Buckley	N/A	52	2,300	16,100	23,000	N/A	0 (0)	N/A	N/A	N/A	
	Hawarden Bridge	N/A	4	0	22,500	11,300	N/A	0 (0)	N/A	N/A	N/A	
	Shotton	30	246	4,000	20,700	10,100	19	0 (0)	59 (Ind)	98	20 (12)	
	Neston	16	47	5,600	6,200	10,200	13	0 (0)	47 (Ind)	93	17 (9)	
	Heswall	N/A	55	2,100	15,000	30,600	N/A	0 (0)	N/A	N/A	N/A	
Total		152	1,140									
West Kirby	West Kirby	264	756	4,300	10,300	17,300	10	4 (4)	32 (28)	48	20 (13)	
	Hoylake	145	593	2,100	15,100	16,800	9	4 (4)	29 (25)	44	19 (12)	
	Manor Road	86	361	4,300	13,000	21,300	9	4 (4)	27 (23)	42	19 (12)	
	Meols	180	618	4,300	14,300	30,300	8	4 (4)	25 (21)	40	19 (12)	
	Moreton	180	731	5,400	27,600	44,400	6	4 (4)	22 (18)	36	17 (10)	
	Leasowe	267	947	8,300	23,400	59,400	6	4 (4)	20 (16)	34	17 (10)	
	Bidston	48	276	2,000	57,500	72,100	5	4 (4)	17 (13)	31	17 (9)	
Total		1,170	4,281									
New Brighton	New Brighton	281	1,031	9,300	28,400	71,900	7	4 (4)	25 (28)	40	16 (10)	
	Wallasey Grove Road	299	448	7,900	36,100	41,800	6	4 (4)	21 (25)	35	16 (10)	
	Wallasey Village	178	371	6,600	44,300	48,900	5	4 (4)	19 (23)	33	17 (10)	
Total		**758**	**1,850**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Liverpool between 0800 and 0900.
N/A - Data not available

D.2.9 Southport, Ormskirk and Kirkby to Liverpool

The Southport, Ormskirk, and Kirkby lines serve a large suburban market with a frequent and fast accelerating service that does not require improvements.

Burscough Junction and Upholland (Skelmersdale) serve large communities, direct connections that reduced the GJT to less than 60 minutes could significantly improve access to employment of these areas.

Stakeholders aspire for a direct connection between Skelmersdale and Liverpool to connect a large town with no rail access currently with employment in Liverpool City Centre.

The following conditional output is recommended:

- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

D.2.9.1 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from all stations on the Merseyrail lines on this corridor into Liverpool will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements in journey times could be made, though the services are already run by fast accelerating electric rolling stock. The impact of these improvements from these stations to Liverpool on Gross Value Added (GVA) through labour supply improvements is estimated to be around £230,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £1,278,000 per annum per minute of GJT.

Table 23. Population, demand and current services for stations on the Southport, Ormskirk and Kirby lines to Liverpool to inform conditional outputs												
Corridor	Station name	Total Journeys into Liverpool* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Liverpool	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Sandhills	Sandhills	170	501	7,500	69,500	161,400	2	12 (14)	6 (3)	13	21 (10)	
Total												
Kirkdale	Kirkdale	237	1,084	16,100	70,100	141,900	3	8 (8)	8 (6)	18	23 (10)	
Total												
Wigan and Kirkby	Pemberton	10	59	9,600	51,100	45,600	18	0 (0)	61 (Ind)	105	18 (10)	
	Orrell	18	112	2,900	31,500	52,800	16	0 (0)	58 (Ind)	101	17 (10)	
	Upholland	7	25	1,100	20,800	48,400	15	0 (0)	55 (Ind)	98	16 (9)	
	Rainford	10	52	1,000	12,100	27,800	13	0 (0)	38 (Ind)	94	20 (8)	
	Kirkby	698	1,891	8,400	31,200	66,100	8	4 (4)	18 (15)	33	25 (14)	
	Fazakerley	283	861	3,700	45,600	92,300	6	4 (4)	15 (12)	30	24 (12)	
	Rice Lane	68	290	11,100	73,600	120,900	4	4 (4)	12 (9)	27	22 (10)	
Total		1,093	3,290									
Preston and Ormskirk	Croston	4	45	2,300	2,800	20,900	21	0 (0)	63 (Ind)	114		
	Rufford	3	18	0	2,600	10,800	18	0 (0)	60 (Ind)	108		
	Burscough Junction	6	37	4,300	3,900	15,400	16	0 (0)	57 (Ind)	104		
	Ormskirk	541	715	10,400	7,000	10,100	13	4 (4)	30 (28)	47		
	Aughton Park	67	79	2,900	16,600	10,600	12	4 (4)	27 (25)	43		
	Town Green	134	149	3,100	10,100	30,300	11	4 (4)	25 (23)	41		
	Maghull	570	1,863	5,400	26,300	55,100	8	4 (4)	20 (18)	36		
	Old Roan	234	815	6,300	45,400	116,600	7	4 (4)	17 (15)	33		
	Aintree	322	1,147	5,600	62,000	121,600	6	4 (4)	15 (13)	31		
	Orrell Park	385	1,185	14,500	79,900	107,000	5	4 (4)	13 (11)	29		
	Walton	66	159	13,500	80,600	110,700	4	4 (4)	11 (9)	27		
Total		2,330	6,213									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Liverpool between 0800 and 0900.

Table 23 (continued). Population, demand and current services for stations on the Southport, Ormiskirk and Kirby lines to Liverpool to inform conditional outputs												
Corridor	Station name	Total Journeys into Liverpool* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Liverpool	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Southport	Southport	310	2,675	10,900	33,900	13,800	19	4 (6)	45 (42)	59	25 (19)	
	Birkdale	141	735	9,900	25,700	21,800	18	4 (6)	41 (38)	54	26 (20)	
	Hillside	90	579	4,400	21,900	24,600	17	4 (6)	39 (36)	52	26 (20)	
	Ainsdale	115	961	4,200	6,300	20,900	16	4 (6)	36 (33)	49	26 (19)	
	Freshfield	124	760	3,000	13,000	8,900	13	4 (6)	32 (29)	45	24 (17)	
	Formby	251	1,513	8,100	8,800	3,600	12	4 (6)	30 (27)	44	24 (16)	
	Hightown	65	408	1,600	6,000	27,800	10	4 (6)	26 (23)	40	22 (15)	
	Hall Road	31	256	900	26,400	26,700	8	4 (6)	23 (20)	37	20 (13)	
	Blundellsands & Crosby	442	1,643	9,600	28,800	35,800	7	4 (6)	21 (18)	35	20 (12)	
	Waterloo	501	955	9,300	48,000	57,200	6	4 (6)	18 (15)	31	20 (11)	
	Seaforth & Litherland	195	761	11,900	58,200	83,700	5	4 (6)	16 (13)	30	18 (10)	
	Bootle New Strand	183	912	11,200	59,700	132,400	4	4 (6)	13 (10)	27	18 (9)	
	Bootle Oriel Road	88	511	6,000	56,500	156,100	4	4 (6)	12 (9)	26	18 (8)	
	Bank Hall	23	175	8,300	71,200	154,200	3	4 (6)	10 (7)	23	17 (7)	
Total		2,557	12,845									
Southport to Wigan	Meols Cop	1	65	11,800	29,300	18,400	20	0 (0)	71 (Ind)	111	17 (11)	
	Bescar Lane	N/A	4	0	2,900	14,500	N/A	0 (0)	N/A	N/A	N/A	
	New Lane	N/A	3	0	7,900	9,500	N/A	0 (0)	N/A	N/A	N/A	
	Burscough Bridge	0	219	4,300	2,400	13,300	27	0 (0)	73 (Ind)	116	22 (14)	
	Hoscar	N/A	1	0	6,700	12,400	N/A	0 (0)	N/A	N/A	N/A	
	Parbold	0	116	1,900	2,300	22,800	26	0 (0)	80 (Ind)	118	20 (13)	
	Gathurst	0	91	800	27,400	62,200	22	0 (0)	85 (Ind)	125	16 (11)	
Total		2	498									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Liverpool between 0800 and 0900.
N/A - Data not available

D.3. Service level conditional outputs for other corridors in the North West

This section is an interpretation of the Regional Urban conditional outputs in the North West by key corridors not included in the Manchester and Liverpool sections. Many of the drivers of the market on these corridors do not fit with the structure and recommendations of the Regional Urban Market Study because they tend to serve many locally important markets. It is the intention of this section to discuss the market drivers, and issues with the current service and recommend conditional outputs accordingly.

This section is organised into a description of the conditional outputs relating to each of the following corridors:

- Cumbrian Coast.
- East of Carlisle (Tyne Valley line).
- Settle & Carlisle .
- Blackpool, Preston, Burnley to Calder Valley.
- West Coast Main Line.
- Barrow-in-Furness (Furness line).
- Windermere (Lakes Line).
- Ellesmere Port to Helsby.
- Wrexham and the North Wales Coast to Chester .

D.3.1 Cumbrian Coast

D.3.1.1 Cumbrian Coast Line

The Cumbrian Coast Line connects many local communities between Carlisle and Barrow-in-Furness, and serves a variety of transport purposes for businesses, residents and visitors. There are regular commuting flows into Carlisle, Barrow-in-Furness and Lancaster and a key commuting flow into Sellafield. Some of the current timetable is designed around the shift patterns at the Sellafield Nuclear Plant, however the availability of rolling stock does not support peak time passenger demand. In addition, the infrequency of service creates further capacity constraints.

Stakeholders aspire to improve the frequency and quality of services on this route and introduce an acceptable seven day per week timetable. Whitehaven and Workington are key destinations as are Maryport, Ravenglass and Millom.

D.3.1.2 Current services:

- An irregular pattern of services, calling at all stations, Monday to Saturday.
- An infrequent evening train service between Barrow-in-Furness and Carlisle.
- Trains in each direction on Sundays, Carlisle to Whitehaven only, commencing in the afternoon
- No Sunday service between Whitehaven and Barrow-in-Furness.

D.3.1.3 Journey times and rolling stock:

- **Journey times/speeds:** Journey times are poor line speeds are poor with unattractive journey times.
- **Rolling Stock:** Services are run using early generation diesel stock with poor acceleration characteristics that cause issues with passenger satisfaction.

D.3.1.4 Criteria for conditional outputs:

- **Willingness to commute:** the line offers commuting opportunities to key employment and education centres in Carlisle and Sellafield, as well as Barrow-in-Furness, Workington and Whitehaven.
- **Jobs at destination:** Sellafield is a major employment site (10,000 workforce) and is accessible by rail from along the coast (from Barrow-in-Furness, Whitehaven, Workington and Maryport). Carlisle and Barrow-in-Furness are major administrative and retail centres.
- **Population catchments**: Barrow-in-Furness and Carlisle are the largest population centres though the West Cumbria corridor between Whitehaven, Workington and Maryport is densely populated and rail is well placed to serve it.
- **Market for rail:** Demand is high from particular locations e.g. Millom, whilst rail is a popular mode of transport from

Whitehaven and Workington into Carlisle as well as commuting to Sellafield.

- **Deprivation**: There are pockets of deprivation on the route. **http://casa.oobrien.com/booth/**
- **Rail's market share:** Rail has a competitive advantage for Millom – Barrow-in-Furness journeys compared with the road equivalent, as well as for inward journeys to Sellafield. The attractiveness of the service suffers from an irregular timetable and the lack of a full Sunday service.

D.3.1.5 Recommendations for conditional outputs:

The recommended conditional outputs are as follows:

- Improve journey times on the route.
- Increase capacity to meet demand through lengthening or increase frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- Sellafield conditional output – meet the demands of the commuting market to and from Sellafield.
- Improve service to meet leisure and community needs including later evening services and an all-year Sunday service between Whitehaven and Barrow-in-Furness.

Table 24. Population, demand and current services for stations on the Cumbria corridor to Barrow-in-Furness to inform conditional outputs

Corridor	Station name	Total Journeys into Barrow-in-Furness* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Barrow-in-Furness	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Cumbria	Maryport	2	105	3,500	5,300	2,400	58	<1 (0)	119 (100)	175	29 (20)	
	Flimby	0	16	1,300	4,800	6,600	56	<1 (0)	117 (97)	172	29 (20)	
	Workington	5	174	3,900	14,000	4,600	52	<1 (0)	113 (90)	165	28 (19)	
	Harrington	1	23	2,400	9,200	10,100	50	<1 (0)	110 (85)	160	27 (19)	
	Parton	0	7	1,000	7,000	11,900	47	<1 (0)	96 (77)	147	29 (19)	
	Whitehaven	10	254	4,600	13,300	4,200	46	<1 (0)	92 (71)	132	30 (21)	
	Corkickle	1	29	4,900	13,800	5,600	45	<1 (0)	74 (70)	129	36 (21)	
	St.Bees	2	51	1,400	0	13,300	41	<1 (0)	68 (62)	122	36 (20)	
	Sellafield	51	221	0	0	2,300	35	<1 (0)	56 (52)	108	37 (19)	
	Seascale	3	37	1,100	0	1,100	33	<1 (0)	50 (48)	111	40 (18)	
	Drigg	1	12	0	0	3,100	31	<1 (0)	50 (47)	111	37 (17)	
	Ravenglass	3	36	0	0	2,000	29	<1 (0)	44 (42)	106	40 (17)	
	Bootle	4	13	0	0	1,000	24	<1 (0)	43 (37)	102	34 (14)	
	Silecroft	2	10	0	0	7,000	19	<1 (0)	38 (32)	96	30 (12)	
	Millom	107	214	4,400	1,500	2,500	16	<1 (0)	27 (27)	73	36 (13)	
	Green Road	3	8	0	1,100	5,300	14	<1 (0)	21 (21)	67	39 (12)	
	Foxfield	10	28	0	0	2,700	12	<1 (0)	17 (17)	64	41 (11)	
	Kirkby-in-Furness	5	16	0	900	0	9	<1 (0)	14 (14)	61	40 (9)	
	Askam	24	63	2,600	0	8,100	6	<1 (0)	16 (10)	56	23 (6)	
Total		**235**	**1,318**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Barrrow-in-Furness between 0800 and 0900.

D.3.2 Tyne Valley Line to Carlisle

The Tyne Valley Line (Newcastle – Carlisle) serves many small communities and the market towns of Brampton (Cumbria), Haltwhistle, Hexham and Corbridge (Northumberland). There are small commuting flows into Carlisle and a much larger flow into Newcastle from the Northumberland market towns. However, there are considerable end to end journeys, including from south west Scotland, and shopping trips from Carlisle and West Cumbria to the Metro Centre in Newcastle. There is some leisure travel into the area, including access to Hadrian's Wall which the line parallels. There are aspirations for a station at Gilsland which would serve local needs as well as provide access to Hadrian's Wall.

Conditional outputs for this route between Hexham and Newcastle are also described in Appendix C - North East.

D.3.2.1 Current services

- One service per hour from Newcastle to Carlisle stopping at key stations, some trains continue to Glasgow Central via Dumfries (west end of line) and Sunderland/Teeside to the east.

D.3.2.2 Journey times and rolling stock

- **Journey times/speeds:** The journey speeds are fast compared to other suburban services. However, there may be potential to improve line speeds in the future to match rolling stock capabilities.
- **Rolling Stock:** Services are run using early generation diesel stock with poor acceleration characteristics that cause issues with passenger satisfaction.

D.3.2.3 Criteria for conditional outputs

- **Willingness to commute:** Wetherall, Brompton and Haltwhistle have a GJT to Carlisle that could be improved to less than 60 minutes to improve willingness to commute.
- **Jobs at destination:** Newcastle and the Metro Centre are both important employment centres. Carlisle is a growing administrative and retail centre.
- **Population catchments**: Newcastle and Gateshead have a combined population of nearly half a million people. Carlisle is much smaller but still significant, at 100,000 including the outer city area.
- **Market for rail:** Demand into Carlisle is very low compared with other suburban routes. The largest flow on the route is between Newcastle and Carlisle, and demand into Newcastle is higher (see Appendix C - North East).
- **Deprivation**: There are pockets of deprivation on the route. **http://casa.oobrien.com/booth**/.
- **Rail's market share:** Rails market share into Carlisle is low and could be improved.

D.3.2.4 Recommendations for conditional outputs

The recommended conditional outputs are as follows:

- Improve journey times primarily through rolling stock improvements.
- Introduce an hourly fast service serving major centres (Metrocentre, Prudhoe, Hexham, Haltwhistle) with some services continuing to West Cumbria/Scotland.

Table 25. Population, demand and current services for stations on the Tyne Valley corridor from Newcastle into Carlisle to inform conditional outputs

Corridor	Station name	Total Journeys into Carlisle* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Carlisle	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Tyne Valley	Newcastle	162	7,706	6,200	90,100	125,400	62	<1 (0)	90 (80)	136	41 (27)	
	Metro Centre	13	357	1,400	55,900	98,600	58	<1 (0)	76 (70)	127	46 (28)	
	Blaydon	na	4	3,400	37,200	77,800	56	<1 (0)	na	na	na	
	Wylam	1	111	1,400	12,700	15,400	52	<1 (0)	90 (61)	133	35 (23)	
	Prudhoe	3	152	3,700	8,400	6,300	50	<1 (0)	64 (57)	115	47 (26)	
	Stocksfield	1	61	1,000	1,900	8,000	47	<1 (0)	80 (60)	127	35 (22)	
	Riding Mill	1	29	0	0	4,300	45	<1 (0)	77 (56)	124	35 (22)	
	Corbridge	1	75	0	3,700	2,700	43	<1 (0)	73 (51)	121	35 (21)	
	Hexham	16	380	4,000	6,800	0	39	<1 (0)	51 (45)	101	46 (23)	
	Haydon Bridge	2	31	1,600	0	0	32	<1 (0)	60 (38)	96	32 (20)	
	Bardon Mill	0	9	0	0	0	28	<1 (0)	44 (38)	98	38 (17)	
	Haltwhistle	16	76	2,800	1,700	0	23	<1 (0)	31 (27)	78	45 (18)	
	Brampton	3	12	0	3,200	0	11	<1 (0)	26 (16)	77	25 (9)	
	Wetherall	11	17	0	3,300	14,400	4	<1 (0)	14 (7)	63	18 (4)	
Total		**229**	**9,021**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Carlisle between 0800 and 0900.

D.3.3 Settle to Carlisle Line

The Settle to Carlisle Line serves many small communities between Settle amd Carlisle well as the larger market towns of Appleby and Kirkby Stephen. Beyond Settle the service calls at some smaller centres and then the towns of Skipton, Keighley, Bingley and Shipley to Leeds. The service has gradually developed in recent years though the timetable remains irregular, with some notable gaps in the service in both the morning and evening. There are growing capacity constraints on the line due to increasing freight traffic. The line is one of the UK's great scenic routes with the active Friends of the Settle – Carlisle Line (FoSCL) and a trust which is developing railway buildings for new uses.

There are also aspirations to increase the frequency of services on this line.

The Skipton to Leeds section of this route is discussed in more detail in Appendix G - Yorkshire and Humber.

D.3.3.1 Current services

- Less than one service per hour from Leeds to Carlisle calling at all stations to Carlisle.

D.3.3.2 Journey times and rolling stock

- **Journey times/speeds:** Journey speeds are relatively quick compared to suburban services, but could be improved.
- **Rolling Stock:** Services are run using early generation diesel stock with poor acceleration characteristics that cause issues with passenger satisfaction.

D.3.3.3 Criteria for conditional outputs

- **Willingness to commute**: The line offers commuting opportunities to Carlisle from Kirkby Stephen northwards and to Skipton and Leeds from Kirkby Stephen southwards, becoming a much stronger flow south from Settle. The GJT from all stations to Calrisle is significantly more than 60 minutes.
- **Jobs at destination**: Carlisle is the main employment centre at the northern end of the line – an important administrative and retail centre. Leeds is the prime employment centre at the southern end of the line, though Skipton, Keighley and Bingley are also significant. The lack of a direct service to Bradford limits commuting to that city.
- **Population catchments**: Carlisle is the main centre to the north, whilst Skipton, Keighley, Bingley and above all Leeds are the main centres to the south. The railway serves the Aire Valley corridor which is densely populated.
- **Market for rail:** Demand is low on the route compared with suburban corridors and highest from locations such as Settle and Appleby as commuting distances in either direction are long. The line serves a tourist market, both for accessing the Yorkshire Dales National Park and Carlisle and as a journey experience in its own right.
- **Deprivation**: There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share**: Rail has a relatively small market share owing to the dispersed nature of the population.

D.3.3.4 Recommendations for conditional outputs

The recommended conditional outputs are as follows:

- Improve journey times through rolling stock improvements and line speed improvements.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are affordable and demonstrate better value for money.

Table 26. Population, demand and current services for stations on the Settle corridor to Carlisle to inform conditional outputs

Corridor	Station name	Total Journeys into Carlisle* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Carlisle	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Settle	Skipton	11	949	1,800	8,800	5,400	87	<1 (1)	151 (110)	196	34 (27)	
	Gargrave	1	22	1,000	0	2,600	83	<1 (1)	128 (112)	218	39 (23)	
	Hellifield	1	27	1,600	0	0	77	<1 (1)	119 (96)	185	39 (25)	
	Settle	37	139	1,500	1,100	1,400	72	<1 (1)	95 (88)	184	45 (23)	
	Horton-in-Ribblesdale	1	19	0	0	0	66	<1 (1)	89 (85)	201	44 (20)	
	Ribblehead	2	21	0	0	0	61	<1 (1)	82 (76)	170	44 (21)	
	Dent	1	11	0	0	0	55	<1 (1)	73 (73)	230	45 (14)	
	Garsdale	3	15	0	0	0	51	<1 (1)	68 (62)	155	45 (20)	
	Kirkby Stephen	11	32	0	1,800	1,700	43	<1 (1)	54 (50)	139	48 (19)	
	Appleby	29	69	2,200	0	1,900	31	<1 (1)	45 (35)	122	41 (15)	
	Langwathby	9	27	0	1,200	1,000	19	<1 (1)	27 (27)	110	43 (11)	
	Lazonby & Kirkoswald	13	19	0	1,000	1,100	15	<1 (1)	21 (18)	104	43 (9)	
	Armathwaite	5	10	0	0	1,300	10	<1 (1)	19 (13)	92	30 (6)	
Total		**124**	**1,358**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Carlisle between 0800 and 0900.

D.3.4 Blackpool, Preston, Blackburn, Burnley, Colne and Calder valley

This corridor serves several small rail commuter flows into Burnley, Blackburn, Preston and Blackpool, and also serves an interurban market into Leeds.

The Long Distance Market Study recommends improvements to the service between Blackpool, Preston and Leeds.

The suburban service (Colne to Blackpool South) is run by early generation diesel stock with poor acceleration and top speeds and the quality of the rolling stock causes passenger satisfaction issues. There are poor line speeds on this route.

The folling conditional outputs are recommended:

- Improve journey times.
- Increase capacity to meet demand through lengthening or increase frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

D.3.5 West Coast Main Line

The West Coast Main Line (WCML) provides some commuting and shorter distance leisure provision in the North West and to Glasgow, although the service is generally designed to cater for the long distance and interurban market. For example the WCML serves interurban flows between:

- Crewe and Chester.
- Crewe, Warrington Bank Quay , Wigan North Western, Preston, Lancaster and Carlisle.
- Connections and local services at Lancaster, Oxenholme Lake District, Penrith North Lakes (bus) and Carlisle.
- Lockerbie and the Central Belt.

Rolling stock tends to be 100/125mph diesel and electric stock.

Oxenholme Lake District station is an interchange between the WCML and Lakes Line trains to Windermere.

Carlisle station is a key interchange location with the Cumbrian Coast Line, Settle-Carlisle Line, Tyne Valley Line and the Glasgow South Western Line via Kilmarnock and Dumfries all linking into the WCML.

Shorter distance flows on the WCML are well served with fast and frequent services; this level of connectivity should continue to be provided and is a conditional output.

D.3.6 Windermere (Lakes Line)

The Lakes Line to Windermere serves a key interurban flow to Manchester and Manchester Airport largely driven by leisure travel. Despite relatively small settlements along the line, it serves an area with 16 million visits per year.

There are aspirations to electrify the Lakes Line to continue through services to Manchester Airport. Current facilities at Oxenholme Lake District station are poor for passengers changing trains.

There is currently a shuttle from Windermere to Oxenholme and four trains per day to Manchester and Manchester Airport.

The line is served by 100mph diesel stock with fast acceleration characteristics. Whilst there is some commuting on the route to Windermere and Kendal, the key drivers of demand are off-peak leisure and tourism to the Lake District National Park.

Demand is relatively high on the route particularly to and from Windermere. Rail's market share is relatively low compared to car traffic in the southern part of the Lake District but the Lake District National Park Authority and Cumbria Tourism seek to reduce the numbers of visitors arriving by car and to increase the use of trains. With constrained road and parking infrastructure, rail has the potential to gain significant improvements in market share.

The following conditional outputs are recommended:

- Maintain through services between Manchester, Manchester Airport and Windermere.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

D.3.7 Lancaster to Barrow-in-Furness (Furness line)

The Furness Line to Barrow-in-Furness provides a key interurban flow from Lancaster, Preston, Manchester and Manchester Airport partly driven by business travel to and from Barrow-in-Furness and from Sellafield along the Cumbrian Coast Line and partly by leisure trips.

Increasingly, the Furness Line is being used and marketed as a key tourism link to the Cumbrian Coast Line and providing a link to South Lakeland including the tourism centres of Grange-over-Sands and Armside. The services on the line are approximately hourly for the key stations but there are gaps of two or more hours at the smaller stations.

D.3.7.1 Current services:

- One service every two hours from Manchester Airport to Barrow-in-Furness stopping at key on the route.
- One service per hour from Preston to Barrow-in-Furness calling at all stations.

D.3.7.2 Journey times and rolling stock:

- **Journey times/speeds:** The line speeds are currently adequate as the rail route is quicker than the alternative road routes and it is a scenic line increasingly used by tourism and leisure travellers.
- **Rolling Stock:** The Furness Line is served by both 100mph diesel stock with good acceleration and early generation diesel stock with poor acceleration and causing passenger satisfaction issues.

D.3.7.3 Criteria for conditional outputs

- **Willingness to commute**: Commuting by train into Lancaster/ Preston in one direction and into Barrow-in-Furness in the other is a better option than using the car or bus on routes that take longer due to geography and traffic congestion.
- **Jobs at destination**: Key employment centres along the line include BAE Systems in Barrow-in-Furness, GSK in Ulverston and Lancaster. The links to Manchester and Preston also provide key commuter opportunities for those in South Cumbria. Sellafield on the Cumbrian Coast Line is also a key employment centre.
- **Population catchments**: Barrow-in-Furness is the largest town. It also serves the towns of Ulverston and Grange-over-Sands. The railway stations also serve a largely rural area and therefore large catchment areas. These scenic coastal areas attract leisure travellers.
- **Market for rail:** Demand is relatively high on the route particularly from Barrow-in-Furness.
- **Deprivation**: There are pockets of deprivation on the route. **http://casa.oobrien.com/booth**/.
- **Rail's market share**: Rail's market share is constrained by the gaps in the timetable and overcrowding on some peak services. The rail market would be larger if more stops could be made at stations such as Silverdale. Preston, Lancaster/Morecambe and Barrow-in-Furness are centres of education and employment with constrained road and parking infrastructure where rail has the potential to gain significant improvements in market share.

D.3.7.4 Recommendations for conditional outputs

The recommended conditional outputs are as follows:

- Maintain through services between Manchester, Manchester Airport and Barrow-in-Furness.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are affordable and demonstrate better value for money.

Table 27. Population, demand and current servicess for stations on the Lancaster corridor to Barrow-in-Furness to inform conditional outputs

Corridor	Station name	Total Journeys into Barrow-in-Furness* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Barrow-in-Furness	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) - mph	Notes
Lancaster to Barrow-in-Furness	Lancaster	43	1,834	10,300	31,300	23,800	35	<1 (1)	60 (52)	105	35 (20)	
	Morecambe	4	220	7,100	22,200	21,000	39	<1 (0)	86 (82)	146	27 (16)	1 per day
	Bare Lane	0	141	1,700	21,600	34,000	38	<1 (0)	96 (78)	142	23 (16)	1 per day
	Carnforth	9	191	3,200	5,400	3,400	29	<1 (1)	49 (44)	97	35 (18)	
	Silverdale	1	45	1,500	0	4,600	25	<1 (1)	49 (42)	98	31 (15)	
	Arnside	6	102	1,800	1,100	3,000	23	<1 (1)	43 (34)	85	32 (16)	
	Grange-over-Sands	11	135	800	1,900	3,100	20	<1 (1)	32 (28)	80	37 (15)	
	Kents Bank	2	21	900	3,200	1,400	17	<1 (1)	35 (30)	83	30 (13)	
	Cark & Cartmel	12	52	1,400	1,300	2,800	15	<1 (1)	27 (23)	74	34 (13)	
	Ulverston	71	225	5,600	4,200	3,400	9	<1 (1)	17 (15)	67	33 (8)	
	Dalton	4	40	4,500	3,900	23,100	6	<1 (1)	18 (9)	60	20 (6)	
	Roose	0	30	6,600	24,400	16,200	2	<1 (1)	7 (4)	59	16 (2)	
Total		**162**	**3,036**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Barrow-in-Furness between 0800 and 0900.

D.3.8 Ellesmere Port to Helsby

This corridor serves a small rail market between Ellesmere Port and Helsby with two trains per day in each direction.

Stakeholders aspire for an improved service on this line.

The conditional outputs are as follows:

- Increased capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

D.3.9 Wrexham and the North Wales Coast to Chester

These corridors provide connectivity between North Wales and the North West and also provide connectivity between South Wales and North Wales. All stations into Chester (with the exception of stations south of Chirk) are in Wales and Regional Urban conditional outputs should be considered in the Welsh Route Study.

Appendix E: Service level conditional outputs for the South West

Appendix E: Service level conditional outputs for the South West

This Appendix is an interpretation of the Regional Urban conditional outputs into the South West cities of Bristol, Bath, Swindon, Exeter and Plymouth. The Appendix also considers the branch lines in Devon and Cornwall.

E.1 Service level conditional outputs for corridors centred on Bath and Bristol

This section considers Regional and Urban rail market for corridors into Bristol and Bath.

Bristol is a key centre for business, legal and financial services outside London and the largest economic centre in the South West. There are over 390,000 jobs in Bristol, with three times as many private sector jobs as public sector jobs. The University of Bristol and the University of the West of England have over 43,000 students combined.

Bristol Temple Meads station has the highest footfall in the South West with over eight million passenger journeys made to/from Bristol Temple Meads in 2011/12 . Demand for rail in the Greater Bristol area has increased significantly over the last decade and continues to increase despite the recent slow economic growth. In particular, commuter journeys by rail have increased partly due to the worsening of road congestion in Bristol and the increased cost of car travel. The significant increase in the number of jobs planned at the Temple Quarter Enterprise Zone around Bristol Temple Meads station also drives commuting demand to the city centre.

Bristol is part of the first wave of core cities to achieve City Deal status. This will give more accountability to the region in exchange for more powers to encourage jobs and growth in the area.

The Great Western Main Line electrification and Intercity Express Programme, to be completed in 2017-2019, will improve long distance service frequency and journey times between Bristol, London and the South East. Network Rail's Control Period Five (CP5) Business Plan also includes capacity enhancements on routes approaching Bristol including provision of an additional two tracks between Bristol Temple Meads and Bristol Parkway and station improvements at Bristol Temple Meads.

Bath is a key economic, leisure and cultural centre which drives interurban and suburban rail trips across the region. The University of Bath and Bath Spa University have 18,000 students combined. Approximately 5.7 million passengers journeys were made to/from Bath Spa in 2011/12. The largest passenger flow is between Bristol Temple Meads and Bath Spa with over 1.1 million passenger journeys in 2011/12.

There are several key employment centres across the region driving commuter, business and leisure demand. Whilst this Appendix sets conditional outputs into key centres, the use of this capacity to improve cross corridor connections is a conditional output.

A description of the conditional outputs relating to each of the following corridors into Bristol is presented:

- Severn Beach to Bristol Temple Meads.
- Cardiff Central to Bristol Temple Meads.
- Cheltenham Spa/Gloucester to Bristol Temple Meads.
- Bath Spa/Warminster/Chippenham to Bristol Temple Meads.
- Exeter St Davids to Bristol Temple Meads.

A description of the conditional outputs relating to each of the following corridors into Bath is presented. Some of the conditional outputs are the same as those for Bristol.

- Swindon/Chippenham to Bath Spa.
- Bradford-on-Avon to Bath Spa.
- Filton Abbey Wood/Bristol Temple Meads to Bath Spa.

E.1.1 Severn Beach to Bristol

The Severn Beach route provides services into Bristol Temple Meads.

E.1.1.1 Current services:

- Two services arrive at Bristol Temple Meads between 07:00 and 08:00 and one train between 08:00 and 09:00
- Three services every two hours in the interpeak and off-peak between Avonmouth and Bristol Temple Meads. Severn Beach and St Andrews Road have only one service every two hours in

the interpeak/off-peak. Stapleton Road and Lawrence Hill are also served by the Gloucester to the South Coast services.

E.1.1.2 Journey times and rolling stock

- **Journey times/speeds:** Journey times on the Severn Beach branch are slow compares to other suburban routes into Bristol Temple Meads because of the low linespeed and the number of station stops.
- **Rolling stock:** Rolling stock on the stopping services tends to be run by early generation diesel rolling stock with poor acceleration. There is scope for improving the quality and journey time of services by improving rolling stock

E.1.1.3 Criteria for conditional outputs:

- **Willingness to commute**: The Generalised Journey Time (GJT) for all stations between Avonmouth and Bristol Temple Meads is between approximately 20 and 60 minutes. The GJT from Severn Beach and St Andrews Road could be improved to less than 60 minutes through frequency and journey time improvements and better rolling stock.
- **Jobs at destination**: Bristol is a large employment and commercial centre. Bath Spa is a key destination in Somerset and a large number of journeys are made from stations on the Clifton Down route to Bath Spa, by interchanging at Bristol Temple Meads. 8,000 jobs are planned at the Avonmouth Severnside Enterprise Area.
- **Population catchments:** The Severn Beach route has a large population, particularly within the catchment of the stations between Clifton Down and Lawrence Hill. For example, Clifton Down has a population of 25,000 within one kilometre of the station. Stapleton Road and Lawrence Hill are suburbs of Bristol and have a large catchment area due to their proximity to the city centre. The route also provides direct links between places without a parallel bus service alternative e.g. between Stapleton Road and Clifton Down.
- **Market for rail:** Demand from Clifton Down is high compared to other stations in England that have an hourly service only in the peak. Demand at some of the stations on the route is relatively low and could be suppressed because of the poor service offer in terms of journey times and frequency.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share**: Rail's market share is relatively low into Bristol and there is potential for rail to capture a higher market share if both frequency and journey times on this corridor are improved. Improving frequency to half hourly throughout the day will improve GJT significantly and provides large benefits to the strategic goals.

E.1.1.4 Recommendations for conditional outputs:

- Improve journey times through improved rolling stock characteristics and/or infrastructure improvements to meet capacity requirement.
- Increase frequency to two trains per hour from all stations on the corridor to Bristol Temple Meads.
- Provide services to enable better connections across Bristol

E.1.1.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Severn Beach, Shirehampton, Clifton Down and Lawrence Hill to Bristol on this corridor into Bristol will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Significant improvements can be made to the GJT to Bristol by improving the average speed of the services and the frequency. Increasing the frequency to two trains per hour and an average speed of 30mph could improve the GJT from Severn Beach by around 40 minutes and from other stations into Bristol by around 10 – 15 minutes. The impact of these improvements from these stations to Bristol on Gross Value Added (GVA) through labour supply improvements is estimated to be around £6,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £62,000 per annum per minute of GJT.

Table 1. Population, demand and current services for stations on the Severn Beach line to Bristol Temple Meads to inform conditional outputs												
Corridor	Station name	Total Journeys into Bristol Temple Meads stations (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 to 3km from station (census 2011)	Population between 3 to 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) - mph	Notes
Severn Beach	Severn Beach	80	142	1,200	1,500	1,400	14	0.5 (1)	39 (37)	91	22 (9)	
	St Andrews Road	0	6	1,200	6,500	18,300	10	0.5 (1)	33 (31)	83	21 (7)	
	Avonmouth	40	89	2,400	11,300	18,600	9	1.5 (1)	32 (28)	61	17 (9)	
	Shirehampton	10	43	7,000	15,300	29,600	8	1.5 (1)	29 (24)	57	22 (8)	
	Sea Mills	20	52	1,900	40,300	100,900	6	1.5 (1)	25 (21)	53	20 (7)	
	Clifton Down	200	471	25,100	93,900	110,900	4	1.5 (1)	18 (15)	47	20 (5)	
	Redland	30	97	23,400	106,300	120,200	3	1.5 (1)	15 (12)	44	22 (4)	
	Montpelier	40	122	24,800	105,700	135,300	3	1.5 (1)	13 (11)	42	24 (4)	
	Stapleton Road	30	129	17,400	106,600	154,800	2	1.5 (1)	7 (5)	28	19 (3)	Also served by the Gloucester to the South Coast services
	Lawrence Hill	20	103	19,500	103,200	160,600	1	1 (1)	4 (3)	26	15 (2)	
Total		470	1,254									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Bristol Temple Meads between 0800 and 0900

E.1.2 Cardiff to Bristol

Cardiff Central to London Paddington services are routed via Bristol Parkway while the services to the city centre of Bristol are routed via Filton Abbey Wood into Bristol Temple Meads station. This section outlines the conditional outputs for the services between Cardiff Central and Bristol Temple Meads.

Passenger demand between Cardiff Central and Bristol Temple Meads is high with over half a million rail journeys made in 2012/13. It is the third largest flow to/from Bristol Temple Meads after London Paddington and Bath Spa. Business interaction between Cardiff and Bristol is high and improving business to business connectivity between these two cities is vital in enabling economic growth and productivity in the regions. There is also an increasing demand for commuting between Cardiff, stations in South East Wales and Bristol.

There are major employment and education centres near Filton Abbey Wood including the Ministry of Defence (11,000 jobs). 7,000 to 12,000 jobs are planned at the Filton Enterprise Area. Future employment growth is envisaged at Cribbs Patchway New Neighbourhood (8,000 jobs).

Filton Abbey Wood has significant local population which is set to increase with new developments adjoining the University of the West of England site and the Cribbs/Patchway New Neighbourhood (5,700 homes).

The conditional outputs for business to business connectivity between Cardiff and Bristol are considered in the Long Distance Market Study.

E.1.2.1 Current services:

- Two services per hour from Cardiff Central to Bristol Temple Meads (which are extended beyond Bristol Temple Meads to the South Coast) in the peak and off-peak, calling at Newport, Severn Tunnel Junction and Filton Abbey Wood, and the hourly service at Patchway. Filton Abbey Wood is also served by the hourly Gloucester to Bristol Temple Mead trains.

E.1.2.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey times are relatively slow compared with other interurban flows.
- **Rolling stock:** Services are run by early generation diesel rolling stock, which has poor acceleration and low top speeds of between 75 and 90 mph.

E.1.2.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT from all stations between Cardiff Central and Bristol Temple Meads is between 20 and 60 minutes and could be improved by small frequency improvements and journey time improvements to less than 60 minutes.
- **Jobs at destination:** Bristol is a large employer and commercial centre. There are also major employment and education centres near Filton Abbey Wood including the Ministry of Defence (11,000 jobs). Cardiff is the capital of Wales and a major economic centre.
- **Population catchments**: The Cardiff Central to Bristol Temple Meads route has a large population, particularly within the catchment of Cardiff Central station. Over 100,000 people live within three kilometres of Cardiff Central station. Newport has a population of 47,000 within three kilometres of the station. Severn Tunnel junction has a wide catchment area including Chepstow and the rural hinterland. Filton Abbey Wood has a large local population which is set to increase.
- **Market for rail:** Demand is high from Cardiff Central, Newport and Filton Abbey Wood. Demand at Patchway is low despite its large population catchment area.
- **Deprivation**: There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share**: Rail's market share is relatively high compared with other routes into Bristol Temple Meads but gains can still be made by improving speed and attractiveness of rail especially from the growth areas in North Bristol. Improving frequency can help to reduce GJT and increase market share. Road travel between South Wales and Bristol involves payment of a toll on the Severn Bridge so the comparative price of rail is competitive.

Service level conditional outputs for services into Bristol and Bath

E.1.2.4 Recommendations for conditional outputs:

- The Long Distance Market Study recommends a significant improvement in the service between Cardiff and Bristol.
- Improve generalised journey time through either increased service frequency from Newport and Severn Tunnel Junction to three services per hour and/or improve journey times. As most of the line will be electrified there is scope to allocate electric rolling stock offering greater capacity and better acceleration / braking characteristics.
- Increase the frequency of services from one to two services per hour from Bristol Parkway to Bristol Temple Meads.
- Improve peak hour offer at Patchway to meet population and employment growth.
- Increase capacity to meet demand on this corridor through train lengthening or an increased frequency of services.

E.1.2.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Cardiff Central, Newport and Severn Tunnel Junction on this corridor into Bristol Temple Meads will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Significant improvements can be made to the GJT to Bristol by improving the average speed of the services. The impact of these improvements from these stations to Bristol on Gross Value Added (GVA) through labour supply improvements is estimated to be around £97,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £158,000 per annum per minute of GJT.

Table 2. Population, demand and current services for stations on the Cardiff corridor to Bristol Temple Meads to inform conditional outputs												
Corridor	**Station name**	**Total Journeys into Bristol Temple Meads stations (in thousands)**	**Total Journeys to and from station (ORR station usage 2011-12) (thousands)**	**Population <1km from station (census 2011)****	**Population between 1 to 3km from station (census 2011)**	**Population between 3 to 5km from station (census 2011)**	**Distance in miles**	**Frequency off peak (peak***) (trains per hour)**	**Average journey time (best) (minutes)**	**Generalised Journey Time (minutes)**	**Average speed (Generalised speed) - mph**	**Notes**
Cardiff	Cardiff Central	510	11,502	12,900	93,300	72,400	38	2 (2)	55 (47)	77	42 (30)	
	Newport	200	2,274	11,500	47,300	37,600	26	2 (2)	35 (33)	61	45 (26)	
	Severn Tunnel Junction	80	189	1,300	8,200	6,300	16	1 (2)	24 (22)	54	41 (18)	
	Patchway	30	67	3,300	41,500	57,500	6	1 (1)	14 (11)	51	25 (7)	
	Filton Abbey Wood	140	771	9,000	45,400	149,100	5	4 (5)	10 (8)	24	27 (11)	Also served by services from Gloucester
Total		**960**	**14,803**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Bristol Temple Meads between 0800 and 0900

E.1.3 Cheltenham Spa/Gloucester to Bristol

Services on the Cheltenham Spa and Gloucester corridor are a mixture of long distance and interurban services into Bristol Temple Meads.

The North Yate development will provide 3,000 new homes.

Filton Abbey Wood has significant local population which is set to increase with new developments adjoining the UWE site and the Cribbs/Patchway new neighbourhood (5,700 homes and 8,000 jobs).

E.1.3.1 Current services:

- One service per hour from Manchester Piccadilly to Bristol Temple Meads calling at Cheltenham Spa and Bristol Parkway.
- One service per hour from Scotland/North East to Plymouth calling at Cheltenham Spa and Bristol Parkway.
- Gloucester, Cam & Dursley and Yate are served by the almost hourly West Midlands to South Coast stopping services throughout the day. In the morning peak, there are half hourly stopping services from Gloucester, Cam & Dursley and Yate to Bristol Temple Meads. These services also stop at Filton Abbey Wood supplementing Cardiff Central to Bristol Temple Meads trains.

E.1.3.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey times from Cheltenham Spa and Bristol Parkway are relatively fast as they are served by the long distance services with no intermediate stops. Filton Abbey Wood has a good frequency provided by both the Cardiff Central and Gloucester services. Journey time for local Gloucester to Bristol Temple Meads stopping services is relatively slow due to the number of station stops. Frequency and journey times at Yate and Cam & Dursley are poor, especially during the day.
- **Rolling stock:** 125mph rolling stock is used on the long distance services. Rolling stock on the local stopping services are the early generation diesel with slow acceleration and maximum speeds of between 75 and 90 mph.

E.1.3.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT for Gloucester to Bristol Temple Meads could be improved to less than 60 minutes through frequency and journey time improvements. Yate, Bristol Parkway and Filton Abbey Wood have GJTs between 20 and 60 minutes.
- **Jobs at destination**: Bristol is a large employment centre and commercial centre. There are also major employment and education centres near Filton Abbey Wood including the Ministry of Defence (11,000 jobs). 7,000 to 12,000 jobs are planned at the Filton Enterprise Area. Other key destinations on the route include Bath Spa, another major employment area.
- **Population catchments:** Gloucester and Cheltenham Spa have large population catchments. Cam & Dursley serves relatively small communities and this is reflected in the number of journeys from this station. Yate has a large population catchment. The North Yate development will add 3,000 new homes. Filton Abbey Wood has significant local population which is set to increase.
- **Market for rail**: Demand is high from Cheltenham Spa. Gloucester demand can be increased by improving its attractiveness of journey time and or frequency. Despite the poor off-peak frequency and slow journey time, demand from Yate is high when compared to other corridors because rail gives an advantage over road links, particularly during peak periods. Demand at Cam & Dursley is low. Footfall at Bristol Parkway and Filton Abbey Wood are high. There is also demand for cross-Bristol flows, such as journeys to Bath Spa.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share**: Improving journey time and/or frequency from Gloucester and Cheltenham Spa would reduce GJT significantly and bring it closer to the 60 minutes boundary. This will have significant impact on economic growth and the environment. Reducing GJT for Yate is likely to increase demand significantly. Bristol Parkway and Filton Abbey Wood already have good frequency to Bristol Temple Meads and improving frequency further may not have a significant impact on rail's market share.

Service level conditional outputs for services into Bristol and Bath

E.1.3.4 Recommendations for conditional outputs:

- Improve frequency to two trains per hour and/or journey times on stopping services from Gloucester to Bristol Temple Meads.
- Increase capacity through lengthening on the non-stopping long distance services.
- Improve frequency from Yate to two trains per hour to accommodate increased demand from commuters and future housing growth.

E.1.3.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Cheltenham Spa and Gloucester into Bristol Temple Meads will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Providing a similar level of speed and frequency from Gloucester as Cheltenham Spa to Bristol, could improve thre GJT from Gloucester to Bristol by around 25 minutes. The impact of these improvements from these stations to Bristol Temple Meads on Gross Value Added (GVA) through labour supply improvements is estimated to be around £17,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £84,000 per annum per minute of GJT.

Table 3. Population, demand and current services for stations on the Cheltenham Spa/Gloucester corridor to Bristol Temple Meads to inform the conditional outputs

Corridor	Station name	Total Journeys into Bristol Temple Meads stations (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 to 3km from station (census 2011)	Population between 3 to 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) - mph	Notes
Cheltenham/ Gloucester	Cheltenham Spa	290	1,813	9,500	52,200	29,500	44	2 (2)	40 (39)	72	65 (36)	
	Gloucester	130	1,247	11,900	41,400	41,600	37	1 (2)	57 (50)	88	39 (25)	
	Cam & Dursley	60	163	0	4,900	13,100	24	1 (2)	33 (35)	74	44 (19)	
	Yate	130	295	5,800	20,800	8,000	12	1 (2)	20 (20)	59	37 (12)	
	Bristol Parkway	250	2,254	5,600	38,500	92,400	6	4 (4)	12 (9)	28	30 (13)	
	Filton Abbey Wood	140	771	9,000	45,400	149,100	5	4 (5)	10 (8)	24	27 (11)	Also served by services from Cardiff
Total		1,000	6,544									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Bristol Temple Meads between 0800 and 0900

Service level conditional outputs for services into Bristol and Bath

E.1.4 Bath/Warminster/Chippenham to Bristol

Services on the Bath Spa corridor are a mixture of long distance and interurban services into Bristol Temple Meads

Wiltshire Council's Core Strategy has major housing areas planned for Bradford-on-Avon (400 homes), Trowbridge (4,600) Westbury (800) and Warminster (1,400). Also on the Cardiff-Portsmouth route it is Salisbury (5,100 homes).

There are proposals for 3,500 new homes near Chippenham plus a further 2,100 within the railheading catchment of the station.

96 hectares of employment land (expected to accommodate 10,000 new jobs) is proposed for the western Wiltshire corridor.

1.4.1 Current and planned services:

- Two services per hour from London Paddington to Bristol Temple Meads service calling at Chippenham, Bath Spa and Keynsham (one service) in the peak.
- One service per hour from Portsmouth Harbour to Cardiff Central calling at most stations between Warminster and Bristol Temple Meads in the peak.
- One service per hour from the South Coast to Gloucester calling at most stations between Westbury and Bristol Temple Meads in the peak, extends to Great Malvern once every two hours.
- An infrequent service from London Waterloo to Bristol Temple Meads calling at most of the main stations between Warminster and Bristol Temple Meads.

E.1.4.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey speed varies significantly on this corridor. Journey times on the London Paddington to Bristol Temple Meads services are good and will be improved further as part of the Intercity Express Programme (IEP) and electrification of the route. Journey times for stations that are served by the stopping services are poor.
- **Rolling stock:** Rolling stock for the London Paddington services are High Speed Trains and will be replaced by Super Express Trains as part of the IEP to be completed in 2017-19. Rolling stock on the stopping services are early generation diesels with poor acceleration and low top speeds.

E.1.4.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT for all stations between Trowbridge and Bristol Temple Meads is less than 60 minutes. Chippenham also has a GJT of less than 60 minutes and will be further improved by the IEP. Warminster and Westbury have more than 60 minutes GJT.
- **Jobs at destination**: Bristol is a large employer and commercial centre. 9,000 jobs are also planned at Bath 'City of Ideas' Enterprise Area. Salisbury and Southampton are other key destinations on the corridor which are served by the Cardiff Central to Portsmouth Habour services.
- **Population catchments:** Stations between Warminster and Freshford have relatively small catchment areas except Trowbridge. Oldfield Park is a suburb of Bath and serves a large population particularly students. Bath has a large catchment area within 3 km of the train station. Keynsham is a commuter town to both Bath and Bristol.
- **Market for rail:** Demand is reflected by the catchment size. For example, demand for rail to Bristol is relatively low at Westbury and Warminster. Demand at Oldfield Park and Keynsham is high.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share is relatively low into Bristol and gains can still be made. Current off-peak/interpeak frequency at Oldfield Park and Keynsham is low. Increasing services from one tph to two tph (same as peak hour frequency) will reduce GJT with significant impact on demand and strategic goals. Although Trowbridge and Chippenham share a similar distance and generalised journey time from Bristol and have a similar population, there is only half the rail demand from Trowbridge. This may reflect differences in journey ambience such as rolling stock quality and crowding.

Service level conditional outputs for services into Bristol and Bath

E.1.4.4 Recommendations for conditional outputs:

- Increase capacity to meet demand through lengthening or increase frequency on this corridor.
- Improve the off-peak and inter-peak frequency to match the peak frequency from Oldfield Park to Bristol Temple Meads.
- Improve journey times through improved rolling stock characteristics and possibly infrastructure improvements

E.1.4.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Swindon, Chippenham, Trowbridge, Bath Spa and Oldfield Park into Bristol will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements can be made to GJT by speed and frequency improvements. The impact of these improvements from these stations to Bristol Temple Meads on Gross Value Added (GVA) through labour supply improvements is estimated to be around £221,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £372,000 per annum per minute of GJT.

Table 4. Population, demand and current services for stations on the Bath corridor to Bristol Temple Meads to inform conditional outputs

Corridor	Station name	Total Journeys into Bristol Temple Meads stations (in thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 to 3km from station (census 2011)	Population between 3 to 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) - mph	Notes
Bath/ Warminster/ Chippenham	Swindon	270	3,235	15,500	58,200	66,600	41	2 (2)	42 (42)	70	58 (35)	
	Chippenham	250	1,751	6,700	19,100	4,900	24	2 (2)	25 (28)	56	59 (26)	
	Salisbury	70	1,875	10,500	22,300	4,600	53	2 (1)	72 (68)	113	44 (28)	
	Warminster	40	351	5,100	7,300	1,800	33	2 (2)	50 (47)	87	39 (23)	
	Westbury	50	453	2,900	9,700	8,000	28	2.5 (3)	43 (38)	67	39 (25)	
	Trowbridge	120	779	8,400	20,400	11,400	24	2.5 (3)	36 (32)	60	40 (24)	
	Bradford-on-Avon	80	455	5,600	4,500	23,900	21	2.5 (3)	33 (26)	53	38 (24)	
	Avoncliff	0	18	800	9,000	7,400	20	1 (2)	36 (28)	62	33 (19)	
	Freshford	10	37	1,000	3,100	14,600	19	1 (3)	31 (25)	57	36 (20)	
	Bath Spa	1,110	5,676	10,300	52,900	12,200	12	4.5 (5)	13 (11)	29	53 (24)	
	Oldfield Park	110	253	13,200	51,300	5,400	11	1 (3)	15 (14)	42	42 (15)	
	Keynsham	110	306	3,500	20,600	57,500	5	1.5 (4)	11 (8)	34	25 (8)	
Total		2,220	15,189									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Bristol Temple Meads between 0800 and 0900

E.1.5 Exeter to Bristol

Exeter to Bristol is a key business to business flow in the South West. Its conditional output is considered in the Long Distance Market Study, which proposes improved journey time to improve business to business connectivity and enable economic growth in these areas.

Rail services between Taunton and Bristol Temple Meads help to accommodate demand for leisure and commuting journeys by rail.

17,000 jobs are planned at the Temple Quarter Enterprise Zone close to Bristol Temple Meads.

There are aspirations to reopen the Portishead line to passenger operators.

E.1.5.1 Current services:

- One service per hour from the South West to Scotland calling at Exeter St Davids, Tiverton Parkway, Taunton and Bristol Temple Meads in the peak and off-peak. In some hours services also call at Weston-super-Mare.
- One service per hour fom Taunton to Cardiff Central calling at Bridgwater, Highbridge & Burnham-on-Sea, Weston-super-Mare, Worle, Yatton, Nailsea & Backwell and Bristol Temple Meads. In the peak, there are additional calls at Bedminster and Parson Street.
- One service per hour from Weston-super-Mare to Bristol Parkway calling at Weston Milton, Worle, Yatton, Nailsea & Backwell, Parson Street, Bedminster and Bristol Temple Meads.
- In the morning and evening peak, there are London Paddington services via Weston-super-Mare calling at most stations between Taunton and Bristol Temple Meads.

E.1.5.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey time varies by type of service and routeing (e.g. via Weston-super-Mare).
- **Rolling stock:** 125mph rolling stock with fast acceleration used for the long distance services. Rolling stock on the stopping services are early generation diesel stock with poor acceleration and low top speeds. There are plans for the long distance services to London Paddington to be replaced by bi-modes Intercity Express Programme trains.

E.1.5.3 Criteria for conditional outputs:

- **Willingness to commute:** All stations between Weston-super-Mare and Bristol Temple Meads have a GJT between 20 and 60 minutes. Stations between Exeter St Davids and Highbridge have more than 60 minutes GJT.
- **Jobs at destination:** Bristol is a large employer and commercial centre in the South West. 10,000 jobs are planned at the Junction 21 Enterprise Area in Weston-super-Mare. Filton Abbey Wood is also another key destination on this corridor.
- **Population catchments:** Most stations have large catchment areas except Highbridge, Yatton and Nailsea & Backwell.
- **Market for rail:** Demand varies significantly on the route and this is reflected by the service frequency. Bedminster and Parson Street have low footfall and there are competitive bus services to Bristol city centre. Weston-super-Mare, Worle, Yatton and Nailsea & Backwell have very high rail demand despite small catchment size in some of the areas.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share at Taunton, Weston-super-Mare, Yatton and Nailsea & Backwell is relatively high while market share at Bedminster and Parson Street is low.

E.1.5.4 Recommendations for conditional outputs:

- Improve journey times through possibly infrastructure improvements.
- Increase capacity to meet demand through lengthening or increase frequency.

Service level conditional outputs for services into Bristol and Bath

- Improve inter-peak and off-peak frequency to two trains per hour at Parson Street and Bedminster recognising there is strong competition from buses.
- The Long Distance Market Study recommends an improvements in the service between Exeter and Bristol.

E.1.5.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Taunton and Weston-Super-Mare into Bristol Temple Meads will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements can be made to GJT by speed and frequency improvements. The impact of these improvements from these stations to Bristol Temple Meads on Gross Value Added (GVA) through labour supply improvements is estimated to be around £32,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £124,000 per annum per minute of GJT.

Table 5. Population, demand and current servicess for stations on the Exeter corridor to Bristol Temple Meads to inform conditional outputs

Corridor	Station name	Total Journeys into Bristol Temple Meads stations (in thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 to 3km from station (census 2011)	Population between 3 to 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) - mph	Notes
Exeter	Exeter St Davids	170	2,394	11,000	45,700	27,800	76	2 (2)	67 (60)	96	68 (47)	
	Tiverton Parkway	40	392	1,200	1,700	5,100	59	2 (2)	52 (46)	83	68 (43)	
	Taunton	230	1,293	9,800	34,100	7,800	45	2 (3)	44 (33)	68	61 (40)	
	Bridgwater	60	287	10,500	19,100	7,800	33	1 (2)	53 (50)	86	38 (23)	
	Highbridge & Burnham-on-Sea	40	167	3,900	9,100	5,600	27	1 (2)	49 (41)	79	33 (20)	
	Weston-super -Mare	390	1,104	12,700	23,700	22,100	19	2 (4)	31 (19)	53	37 (21)	
	Weston Milton	20	47	6,200	45,000	14,100	18	1 (3)	29 (29)	57	37 (19)	
	Worle	100	241	8,900	20,600	20,900	16	2 (3)	22 (23)	46	44 (21)	
	Yatton	130	384	3,300	4,700	7,300	12	2 (3)	16 (16)	40	45 (18)	
	Nailsea & Blackwell	160	410	3,000	12,600	3,400	8	2 (3)	11 (10)	34	44 (14)	
	Parson Street	10	78	16,900	75,500	111,600	2	1 (2)	8 (6)	37	27 (3)	
	Bedminster	10	76	15,800	97,800	116,700	1	1 (2)	4 (3)	34	14 (2)	
Total		1,360	6,873									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Bristol Temple Meads between 0800 and 0900

Service level conditional outputs for services into Bristol and Bath

E.1.6 Chippenham to Bath

Regional Urban demand from stations on the Chippenham corridor is met by the long distance services from London Paddington.

Housing planned for 2026 includes 3,500 in the Chippenham Community area; also within the station catchment are Calne (900), Corsham (700) and Malmesbury (600).

E.1.6.1 Current services:

- Two services per hour from London Paddington to Bristol Temple Meads via Bath Spa calling at Swindon and Chippenham.

E.1.6.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey times on the London Paddington to Bristol Temple Meads services via Chippenham and Bath Spa are good and will be improved further as part of the Intercity Express Programme.
- **Rolling stock:** Rolling stock for the London Paddington services is High Speed Trains (HSTs) and will be replaced as part of the Intercity Express Programme to be completed in 2017-19.

E.1.6.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT for Swindon and Chippenham to Bath Spa is between 20 and 60 minutes.
- **Jobs at destination:** Bath is a large employment and tourism centre. It has two universities with over 18,000 students combined. 9,000 jobs are planned at the Bath City of Ideas Enterprise Area.
- **Population catchments:** Chippenham and Swindon have a large population catchment.
- **Market for rail:** Demand for rail between Swindon, Chippenham and Bath Spa is high with over 900,000 passenger rail journeys made between these stations.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Further gains in market share can be made by improving journey time and speed. The Intercity Express Programme will help to achieve this.

E.1.6.4 Recommendations for conditional outputs:

- Increase capacity to meet demand through lengthening or frequency improvement.

E.1.7 Warminster to Bath Spa

Demand from stations on the Warminster corridor is met by a mixture of Long Distance and Regional Urban services.

Wiltshire County Council's Core Strategy has major housing areas planned for Bradford-on-Avon (400 homes), Trowbridge (4,600) Westbury (800), Warminster (1,400), and Salisbury (5,100 homes).

A further 96 hectares of employment land is proposed for the western Wiltshire corridor by 2026, anticipated to accommodate an additional 10,000 jobs.

E.1.7.1 Current services:

- One service per hour from Portsmouth Harbour to Cardiff Central calling at most stations between Warminster and Bath Spa in the peak.
- One service per hour from the South Coast to Gloucester calling at most stations between Westbury and Bath Spa in the **peak. Extends** to Great Malvern in alternate hours.

E.1.7.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey times for stations that are served by the stopping services are poor due to the geography of the line.
- **Rolling stock**: Rolling stock on the stopping services are early generation diesel rolling stock with poor acceleration and low top speeds

E.1.7.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT for all stations between Westbury and Bath Spa are less than 60 minutes. Warminster and Dilton Marsh have more than 60 minutes GJT.
- **Jobs at destination:** Bath is an important employment and tourism centre. It has two universities with over 18,000 students combined.
- **Population catchments:** Stations between Warminster and Freshford have relatively low catchment areas except Trowbridge.
- **Market for rail:** Demand for rail to Bath Spa is relatively low at Westbury and Warminster. Demand from Bradford-upon-Avon is high for its catchment size, having doubled following a service increase from one to two services per hour in 2008. Road congestion in Bath increases the attractiveness of rail.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share is relatively small into Bath and gains can still be made.

E1.7.4 Recommendations for conditional outputs:

- Improve journey speed through better rolling stock.
- Provide sufficient capacity to accommodate demand, particularly from Trowbridge and Bradford-on-Avon to Bath Spa.

E.1.8 Filton Abbey Wood/Bristol Temple Meads to Bath

Demand from stations on the Bristol corridor to Bath is met by a mixture of Long Distance and Regional Urban services. Demand for cross-Bristol flows is increasing and is significant on this corridor.

7,000 to 12,000 new jobs are planned at the Filton Enterprise Area.

Filton Abbey Wood has significant local population which is set to increase with new developments adjoining the UWE site and the Cribbs/Patchway new neighbourhood (5,700 homes and 8,000 jobs).

E.1.8.1 Current and planned services:

- Two services per hour from Bristol Temple Meads to London Paddington services calling at Bristol Temple Meads and Bath Spa
- One service per hour from Cardiff Central to Portsmouth Harbour calling at most stations between Filton Abbey Wood and Bath Spa in the peak.
- One service per hour from the South Coast to Gloucester calling at most stations between Bristol Parkway and Bath Spa in the peak. Extends to Great Malvern in alternate hours.

E.1.8.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey speed varies significantly on this corridor. Journey times on the Bristol Temple Meads to London Paddington services are good and will be improved further as part of the Intercity Express Programme (IEP). Journey times for stations that are served by the stopping services are poor.
- **Rolling stock:** Rolling stock for the London Paddington services is HSTs and will be replaced as part of IEP to be completed in 2017-19. Rolling stock on the stopping services are early generation diesel rolling stock with slow acceleration speed.

Service level conditional outputs for services into Bristol and Bath

E.1.8.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT for all stations between Filton Abbey Wood and Bath Spa is less than 60 minutes.
- **Jobs at destination**: Bath is an important employer and tourism centre. Filton Abbey Wood is a significant employment hub.
- **Population catchments:** Stations between Filton Abbey Wood and Bath Spa have very large catchment areas.
- **Market for rail:** The largest flow in the South West is between Bath Spa and Bristol Temple Meads. Demand for rail between Bath Spa and Filton Abbey Wood is high with 130,000 journeys made on this flow in 2012/13.
- **Deprivation:** There are pockets of deprivation on this route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share for flows between Bath Spa and Bristol Temple Meads and between Filton Abbey Wood and Bath Spa is high.

E.1.8.4 Recommendations for conditional outputs:

- Improve journey times through better rolling stock for both stopping services and the Cardiff Central to Portsmouth Harbour service.
- Provide sufficient capacity to accommodate demand through legthening or increased frequency.

Table 6. Population, demand and current services to Bath Spa to inform conditional outputs												
Corridor	Station name	Total Journeys into Bath Spa stations (in thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 to 3km from station (census 2011)	Population between 3 to 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) - mph	Notes
Chippenham	London	1,000	33,737	36,400	222,100	417,800	107	2 (2)	89 (83)	115	72 (56)	
	Reading	60	15,276	11,100	69,600	62,700	71	2 (2)	59 (56)	87	72 (49)	
	Swindon	320	3,235	15,500	58,200	66,600	30	2 (2)	27 (27)	55	66 (32)	
	Chippenham	560	1,751	6,700	19,100	4,900	13	2 (2)	13 (12)	40	70 (20)	
Total		**1,940**	**52,998**									
Warminster	Salisbury	60	1,875	10,500	22,300	4,600	41	1.5 (1)	58 (53)	97	43 (25)	
	Warminster	70	351	5,100	7,300	1,800	21	1.5 (2)	35 (33)	72	37 (18)	
	Dilton Marsh	10	17	2,100	10,600	1,900	18	0 (2)	41 (34)	93	26 (12)	irregular service in the off-peak
	Westbury	90	453	2,900	9,700	8,000	17	2 (3)	27 (24)	49	37 (20)	
	Trowbridge	310	779	8,400	20,400	11,400	13	2 (3)	20 (18)	42	38 (18)	
	Bradford-on-Avon	210	455	5,600	4,500	23,900	9	2 (3)	14 (12)	36	40 (16)	
	Avoncliff	10	18	800	9,000	7,400	8	1 (2)	15 (13)	43	32 (11)	
	Freshford	20	37	1,000	3,100	14,600	7	1 (3)	15 (10)	38	29 (11)	
Total		**780**	**3,985**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Bath Spa between 0800 and 0900

Table 6 (continued) Population, demand and current services to Bath Spa to inform conditional outputs												
Corridor	**Station name**	**Total Journeys into Bath Spa stations (in thousands)**	**Total Journeys to and from station (ORR station usage 2011-12) (thousands)**	**Population <1km from station (census 2011)****	**Population between 1 to 3km from station (census 2011)**	**Population between 3 to 5km from station (census 2011)**	**Distance in miles**	**Frequency off peak (peak***) (trains per hour)**	**Average journey time (best) (minutes)**	**Generalised Journey Time (minutes)**	**Average speed (Generalised speed) - mph**	**Notes**
Gloucester	Cheltenham Spa	40	1,813	9,500	52,200	29,500	55	0.5 (2)	85 (83)	116	45 (29)	
	Gloucester	20	1,247	11,900	41,400	41,600	49	1 (3)	88 (71)	118	33 (25)	
	Cam & Dursley	10	163	0	4,900	13,100	36	1 (3)	63 (56)	104	34 (20)	
	Yate	10	295	5,800	20,800	8,000	24	1 (3)	50 (41)	91	28 (16)	
	Bristol Parkway	70	2,254	5,600	38,500	92,400	18	1 (3)	38 (29)	63	28 (17)	
	Filton Abbey Wood	130	771	9,000	45,400	149,100	16	2 (4)	33 (25)	53	29 (18)	
	Stapleton Road	20	129	17,400	106,600	154,800	13	0.5 (1)	35 (27)	66	22 (12)	
	Lawrence Hill	10	103	19,500	103,200	160,600	13	0.5 (1)	35 (25)	64	21 (12)	
	Bristol Temple Meads	1,110	8,875	7,800	135,800	116,000	12	4.5 (6)	13 (11)	29	53 (24)	
	Keynsham	90	306	3,500	20,600	57,500	7	1.5 (3)	14 (7)	40	30 (10)	
	Oldfield Park	10	253	13,200	51,300	5,400	1	1 (3)	3 (1)	34	6 (2)	
Total		**1,520**	**34,174**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Bath Spa between 0800 and 0900

E.2 Service level conditional outpus for services into Swindon

This section considers Regional Urban demand for rail to Swindon. The London and South East Market Study considers demand for rail to London and journeys made within the South East. It includes guidance on conditional outputs for demand to London Paddington from Wiltshire, Reading and Hampshire.

Swindon is an important economic centre in the South West and drives interurban and regional journeys across the area. It has over 110,000 jobs and a population of 210,000. In 2011/12, approximately 3.2 million passenger journeys were made to/from Swindon.

The Great Western Main Line Electrification and Intercity Express Programme (IEP), to be completed in 2017-2019, will improve long distance service frequency and journey times between Cardiff, Bristol, Cheltenham Spa, Swindon, Reading and London Paddington.

This following section is organised into a description of the conditional outputs relating to each of the following corridors into Swindon:

- Reading to Swindon.
- Cheltenham Spa to Swindon via Kemble.
- Bath Spa/Chippenham/Melksham to Swindon.
- Bristol Parkway to Swindon

E.2.1 Reading to Swindon

The long distance London Paddington to Cardiff Central, Cheltenham and South West services also serve regional demand between Reading, Didcot Parkway and Swindon.

E.2.1.1 Current services:

- Two services per hour from London Paddington to Bristol Temple Meads calling at Reading and Swindon, and one service per hour calls at Didcot Parkway.
- Two services per hour from London Paddington to Cardiff Central/Swansea calling at Reading and Swindon, one service per hour calls at Didcot Parkway.
- One service every two hours from London Paddington to Cheltenham Spa calling at Reading, Didcot Parkway and Swindon.

E.2.1.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey times on the London Paddington services are good and will be improved further as part of the Intercity Express Programme (IEP).
- **Rolling stock:** Services are currently served by 125mph rolling stock. With the Intercity Express Programme to be completed in 2017 – 19, most services will be using electric trains. Bimode IEP trains will be used on the Cheltenham Spa route.

E.2.1.3 Criteria for conditional outputs:

- **Willingness to commute:** The Generalised Journey Time (GJT) for Reading and Didcot Parkway to Swindon is between 20 and 61 minutes.
- **Jobs at destination:** Swindon is a large employment and economic centre.
- **Population catchments:** Reading and Didcot Parkway have large populations. Demand for rail between Reading and Swindon is large, with passengers commuting in both directions.
- **Market for rail:** Demand is high.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share is very high. The overall market for transport is large and a small modal shift from road to rail can have a large impact on rail's demand. Further improving journey time and/or frequency will lower GJTs, providing further economic benefits.

E.2.1.4 Recommendations for conditional outputs:

- Improve connectivity to the Thames Valley.
- Provide sufficient capacity to accommodate demand through lengthening or increased frequency.

E.2.2 Cheltenham Spa to Swindon

This corridor has a mixture of long distance and regional services to serve demand to Swindon by rail.

E.2.2.1 Current services:

Stations between Cheltenham Spa and Swindon are served by the following services

- One service every two hours from Cheltenham Spa to London Paddington calling at all stations between Cheltenham Spa and Swindon, via Kemble. (There are two extra peak services to London Paddington and one service from Worcester Shrub Hill to London Paddington via this route).
- One service every two hours from Cheltenham Spa to Swindon calling at all stations between Cheltenham Spa and Swindon, via Kemble. When IEP is introduced, this service will be replaced by an hourly Cheltenham Spa to London Paddington using bimode Super Express Trains.
- Two services per day from Cheltenham Spa/Gloucester to Westbury/Southampton calling at all stations between Cheltenham Spa/Gloucester and Swindon

E.2.2.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey times on the London Paddington services are good and will be improved further as part of the IEP.
- **Rolling stock:** A mixture of 125mph rolling stock and early generation diesel stock is used currently. Fast services will be replaced by bimode trains as part of the IEP.

E.2.2.3 Criteria for conditional outputs:

- **Willingness to commute:** GJTs for all stations between Cheltenham Spa and Swindon are more than 60 minutes except Kemble.
- **Jobs at destination:** Swindon is an important employment and commercial centre.
- **Population catchments:** The route has a large population catchment.
- **Market for rail:** Demand between Cheltenham Spa and Swindon is relatively low for its population catchment.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share is relatively small and improving frequency can reduce GJTs significantly.

E.2.2.4 Recommendations for conditional outputs:

- Improve generalised journey times between Cheltenham Spa and Swindon.
- Provide sufficient capacity to accommodate demand through lenthening or increased frequency.

E.2.3 Bath Spa/Chippenham/Melksham to Swindon

Demand to Swindon on this corridor is met by the long distance services to London Paddington and regional services between Westbury and Cheltenham.

Wiltshire County Council's Core Strategy has major housing areas planned for Chippenham (3,500 homes), Melksham (1,500), Trowbridge (4,600) Westbury (800) and Warminster (1,400).

Additional employment areas of 96 hectares are proposed for the western Wiltshire corridor, expected to accommodate 10,000 additional jobs.

E.2.3.1 Current services:

- Two services per hour from Bristol Temple Meads to London Paddington calling at Bath Spa, Chippenham and Swindon.
- Two services per day from Westbury to Cheltenham calling at Trowbridge, Melksham, Chippenham and Swindon. This will increase to eight services per day on the Westbury – Swindon section of the route calling at all stations from December 2013. The increase in frequency is funded by Wiltshire County Council.

E.2.3.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey times on the long distance services to London Paddington are relatively good and will be further improved in the IEP programme. The irregular stopping services via Melksham are relatively slow due to rolling stock characteristics and the linespeed profile.
- **Rolling stock:** 125 mph rolling stock is used currently on the London Paddington services and will be replaced by electric/bimode trains. Local stopping services are run by early generation diesel stock with poor acceleration and low top speeds.

E.2.3.3 Criteria for conditional outputs:

- **Willingness to commute:** GJTs for Bath Spa and Chippenham to Swindon are less than 60 minutes. GJTs from Trowbridge and Melksham to Swindon are very high due to the limited number of services from these stations.
- **Jobs at destination:** Swindon is an important employment centre in the region.
- **Population catchments:** Bath and Chippenham have large population catchments. Trowbridge and Melksham also have large population catchment with more than 15,000 people living within three kilometres of the train stations.
- **Market for rail:** Demand from Bath Spa and Chippenham to Swindon is high. Demand from Trowbridge and Melksham are low due to the unattractive rail services.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Providing a regular service from Melksham and Trowbridge would reduce GJT significantly and bring it closer to the 60 minutes boundary.

E.2.3.4 Recommendations for conditional outputs:

- Provide sufficient capacity to accommodate demand through lengthening or increased frequency.
- Improve service provision from Trowbridge.
- Provide regular, frequent rail services from Melksham to accommodate increasing demand for rail.

E.2.4 Bristol Parkway to Swindon

This corridor is served by the regular long distance services to London Paddington.

E.2.4.1 Current services:

- Two services per hour from Swansea/Cardiff Central to London Paddington service calling at Bristol Parkway and Swindon.

E.2.4.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey times on the London Paddington services are good and will be improved further as part of the IEP.
- **Rolling stock:** Rolling stock for the London Paddington services are 125mph rolling stock and will be replaced as part of IEP to be completed in 2017-19.

E.2.4.3 Criteria for conditional outputs:

- Willingness to commute: The GJT between Bristol Parkway and Swindon is less than 60 minutes.
- Jobs at destination: Swindon is a large employer and commercial centre.
- Population catchments: Bristol Parkway has a large catchment with over 40,000 people living within three kilometres from the station. It is also used as a railhead station for passengers travelling to Cardiff, London, the West Midlands and the South West.
- Market for rail: Demand is high with over 100,000 passengers per year travelling between Swindon and Bristol Parkway.
- Deprivation: There are pockets of deprivation on the route. **http://casa.oobrien.com/booth**/.
- Rail's market share: Rail's market share is high

E.2.4.4 Recommendations for conditional outputs:

- Provide sufficient capacity through train lengthening on this corridor to accommodate demand especially in the peak.

Table 7. Population, demand and current services to Swindon to inform conditional outputs

Corridor	Station name	Total Journeys into Swindon stations (in thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 to 3km from station (census 2011)	Population between 3 to 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) - mph	Notes
Reading	London	1,010	33,737	36,400	222,100	417,800	77	4 (4)	62 (54)	74	75 (63)	
	Reading	150	15,276	11,100	69,600	62,700	41	4.5 (4)	30 (27)	47	83 (52)	
	Didcot Parkway	130	2,787	7,700	11,500	8,500	24	2.5 (3)	17 (16)	39	85 (38)	
Total		**1,290**	**51,800**									
Cheltenham Spa	Worcester stations	0	780	8,900	56,600	13,800	64	0 (1)	123 (84)	173	31 (22)	
	Cheltenham Spa	40	1,813	9,500	52,200	29,500	42	1 (1)	64 (62)	103	39 (25)	
	Gloucester	50	1,247	11,900	41,400	41,600	37	1 (1)	62 (47)	93	36 (24)	
	Stonehouse	20	137	5,600	9,500	12,900	28	1 (1)	35 (34)	74	47 (22)	
	Stroud	40	464	7,800	13,700	17,500	25	1 (1)	30 (28)	68	50 (22)	
	Kemble	20	357	0	1,400	4,200	14	1 (1)	15 (14)	53	55 (15)	
Total		**170**	**4,798**									
Cardiff	Cardiff Central	100	11,502	12,900	93,300	72,400	68	2 (2)	63 (62)	100	65 (41)	
	Newport	40	2,274	11,500	47,300	37,600	56	2 (2)	49 (48)	85	69 (39)	
	Bristol Parkway	100	2,254	5,600	38,500	92,400	35	2 (2)	26 (26)	56	80 (37)	
Total		**240**	**16,030**									
Bath Spa	Bristol Temple Meads	270	8,875	7,800	135,800	116,000	41	2 (2)	42 (40)	70	58 (35)	
	Bath Spa	320	5,676	10,300	52,900	12,200	30	2 (2)	27 (27)	55	66 (32)	
	Melksham	10	11	2,500	12,600	5,700	23	0 (0)	28 (28)	242	49 (6)	two trains per day
	Trowbridge	10	779	8,400	20,400	11,400	29	0 (0)	55 (9)	94	31 (18)	
	Chippenham	210	1,751	6,700	19,100	4,900	17	2 (2)	15 (15)	40	67 (25)	
Total		**820**	**17,092**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Swindon between 0800 and 0900

E.3 Service level conditional outputs for services into Exeter, Plymouth, Truro and the branch lines in Devon and Cornwall

This section is an interpretation of the Regional Urban conditional outputs into Exeter, Plymouth and Truro. It also considers conditional outputs on the branch lines in Devon and Cornwall.

The Long Distance Market Study considers the markets for long distance journeys, made predominately for business purposes.

Exeter and Plymouth are key economic and cultural centres in the South West which drive interurban and suburban rail trips across the region. Exeter has three stations in the city centre: Exeter St Davids, Exeter Central and Exeter St Thomas, with Exeter St Davids having the highest footfall and number of passenger trains. Approximately 4.3 million passengers travelled to/from Exeter city centre by rail in 2011/12. Of these, 2.4 million passengers travelled to/from Exeter St Davids and 1.8 million to/from Exeter Central. Plymouth has over 2.6 million passengers using the station per year.

A description of the conditional outputs relating to each of the following corridors into Exeter is presented:

- Plymouth/Paignton/Newton Abbot to Exeter St Davids.
- Barnstaple to Exeter St Davids.
- Exmouth to Exeter St Davids.
- Taunton to Exeter St Davids.
- Axminster to Exeter St Davids.

A description of the conditional outputs relating to each of the following corridors into Plymouth is presented as follows:.

- Exeter St Davids /Newton Abbot to Plymouth.
- Penzance to Plymouth.

Demand and passenger journeys to Truro are also considered in this section.

The conditional outputs for the following branch lines are also presented:

- St Ives.
- Newquay.
- Falmouth.
- Looe.
- Gunnislake.

E3.1 Plymouth/Paignton/Newton Abbot to Exeter, St Davids

The Plymouth to Exeter route serves interurban and long distance demand to Exeter predominantly from Plymouth, Totnes, Teignmouth, Dawlish and Newton Abbot. The Paignton to Exeter route serves suburban, and to a lesser extent interurban, demand to Exeter from Torbay and Newton Abbot. Due to the differing service on each route they act as two separate commuting corridors into Exeter.

Plymouth to Exeter is a key business to business flow in the region and its conditional outputs are considered and specified in the Long Distance Market Study which proposes improved journey time and/or frequency to improve business to business connectivity and enables economic growth in these regions.

Significant new residential and employment development are planned for Plymouth (including a new community at Sherford), northern Torbay, Newton Abbot, Dawlish and South West Exeter.

Devon County Council has an aspiration to run metro-style passenger services into Exeter city centre, increasing service frequency from various corridors including the Paignton corridor.

The following sections focus on the commuting and leisure trips for stations between Plymouth and Exeter and between Paignton and Exeter.

E.3.1.1 Current services:

- One service per hour from Plymouth to Scotland (a few start from Penzance) calling at Totnes, Newton Abbot and Exeter St Davids.
- One service per hour from Plymouth to London Paddington (some start from Penzance) calling at Totnes, Newton Abbot and Exeter St Davids.
- One service per hour from Paignton to Exmouth services calling

at most stations between Paignton and Exeter St Davids serving the local communities. An additional hourly service from Paignton to Newton Abbot is committed and funded for three years from December 2013, as a pilot for a permanent service from Paignton to Exeter St Davids. The additional Paignton to Exeter St Davids service is a Great Western Main Line Route Utilisation Strategy recommendations.

- Infrequent services from Paignton to London Paddington calling at Torquay, Torre, Dawlish and Exeter St Davids.
- Infrequent services from Paignton to Manchester Piccadilly calling at Torquay, Newton Abbot, Dawlish and Exeter St Davids
- Infrequent service from Penzance to Plymouth calling all stations.

The introduction of the Intercity Express Programme (IEP) trains in 2017-19 is likely to lead to the amendment of certain timetables in the region.

E.3.1.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey times from Paignton into Exeter St Davids are slow because of the low linespeed, the number of station stops and rolling stock characteristics. Journey times on the long distance services are relatively slow compared to other regions. This is partly due to the linespeed profile and topography.
- **Rolling stock:** Rolling stock on the stopping services tends to be early generation diesel stock with poor acceleration and low top speeds. There is scope for improving quality of services by improving rolling stock in the long term. Diesel stock with high acceleration and speed up to 125mph are used for the long distance services.

E.3.1.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT for stations between Newton Abbot (inclusive) and Exeter St Davids are between 20 and 60 minutes. Stations between Paignton and Newton Abbot and between Plymouth and Newton Abbot have more than 60 minutes GJT and can be significantly reduced to within the 60 minutes boundary by either better journey time or improved frequency.
- **Jobs at destination:** Exeter is an important employment and commercial centre in Devon, principal destinations being Exeter St Davids and Exeter Central, plus Digby and Sowton. There are also commuter flows into Newton Abbot.
- **Population catchments:** Plymouth has a large population catchment as it is a major city in the South West. Paignton, Torquay, Torre, Newton Abbot, Teignmouth and Dawlish have significant populations and generate strong demand. Other settlements on the routes Plymouth to Exeter and Paignton to Exeter are generally small with a small population catchment. Some of the places are popular tourist destinations and population fluctuates during the year.
- **Market for rail:** Demand between Plymouth, Newton Abbot and Exeter is large. Demand for rail at other stations is lower but remains significant at Totnes, Teignmouth, Dawlish, Paignton and Torquay.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share is relatively small into Exeter and there is a potential for rail to capture a higher market share if journey times on this corridor are improved. Given the size of the population within Torbay the rail market share at Torre, Torquay, and Paignton is particularly low

E.3.1.4 Recommendations for conditional outputs:

- Improve journey times on the corridor through improved rolling stock characteristics and/or infrastructure improvements.
- Increase capacity to accommodate increasing demand on the Paignton line through train lengthening and/or increase frequency.

Table 8. Population, demand and current servicess for stations on the Plymouth corridor to Exeter stations to inform conditional outputs

Corridor	Station name	Total Journeys into Exeter stations (in thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 to 3km from station (census 2011)	Population between 3 to 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) - mph	Notes
Plymouth	Plymouth	250	2,597	15,800	75,800	56,400	52	2 (2)	61 (54)	88	51 (35)	
	Ivybridge	10	86	3,700	4,900	3,300	40	0 (0)	68 (54)	126	36 (19)	irregular service
	Totnes	100	640	3,600	3,500	1,300	29	2 (2)	34 (31)	63	51 (27)	
	Torre	40	224	9,200	38,000	25,800	25	1.5 (2)	42 (54)	74	36 (20)	
	Torquay	80	408	6,100	41,900	27,900	26	1 (2)	43 (54)	74	37 (21)	
	Paignton	110	555	9,500	24,700	20,800	28	2 (2)	52 ()	82	33 (21)	
	Newton Abbot	200	1,088	6,400	19,300	8,500	20	3 (4)	24 (18)	44	51 (28)	
	Teignmouth	170	567	4,700	8,800	7,800	15	2 (2)	27 (17)	52	34 (17)	
	Dawlish	170	481	4,700	4,700	11,600	12	2 (2)	23 (12)	47	32 (15)	
	Dawlish Warren	30	141	0	8,400	18,100	11	1 (1)	24 (18)	49	26 (13)	
	Starcross	40	101	1,000	9,900	21,900	9	1 (2)	19 (13)	44	27 (12)	
Total		**1210**	**7,025**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Exeter St Davids between 0800 and 0900

E.3.2 Barnstaple to Exeter St Davids

The Barnstaple line serves relatively small communities, with the exception of Barnstaple itself, and this is reflected in the relatively low demand into Exeter and the high proportion of end to end trips.

The Barnstaple line serves the local communities on the route meeting demand for travel by rail into Exeter. In summer months the leisure market into north Devon also becomes important.

Significant housing is planned for the Ilfracombe, Barnstaple and Bideford area, all of which feeds into Barnstaple station.

E.3.2.1 Current and planned services:

- One service per hour from Barnstaple to St James Park/Exmouth calling at most stations on the Barnstaple line.

E.3.2.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey times are relatively slow due to the line speed profile, rolling stock characteristics and number of station stops.
- **Rolling stock:** Rolling stock is early generation diesel stock with slow acceleration and maximum speed of between 75 and 90mph.

E.3.2.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJTs from all stations on the route are more than 60 minutes and many stations are more than 100 minutes.
- **Jobs at destination:** Exeter is a large employment and commercial centre, principal destinations from the Barnstaple line being Exeter St Davids and Exeter Central, plus to a much lesser extent Digby and Sowton. Barnstaple is a key destination on the route with the majority of journeys made to this station.
- **Population catchments:** Many stations on the route have low population catchment with no more than 5,000 people living within the 3 km of train stations. Some passengers rail head to Barnstaple and Exeter.
- **Market for rail:** Demand for rail is high from the Barnstaple area but low from intermediate stations, however rail services are important to serve the local communities and connect rural areas to Exeter.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share is relatively small into Exeter except from Barnstaple but has been growing steadily in recent years.

E.3.2.4 Recommendations for conditional outputs:

- The services should be designed to cater for commuting demand, focused on morning services into Exeter and afternoon/evening returns, along with an extra focus in summer on the leisure market in both directions.
- Provide sufficient capacity to meet local demand during weekday and weekend.
- Improve end to end journey times on the corridor.

Table 9. Population, demand and current servicess for stations on the Barnstaple corridor to Exeter stations to inform conditional outputs												
Corridor	Station name	Total Journeys into Exeter stations (in thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 to 3km from station (census 2011)	Population between 3 to 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) - mph	Notes
Barnstaple	Barnstaple	160	372	4,600	17,700	4,800	39.0	1 (1)	67 (65)	119	35 (20)	
	Chapelton	0	0	0	0	2,700	34.7	0 (1)	84 (62)	152	25 (14)	
	Umberleigh	10	24	0	0	1,700	32.3	1 (1)	56 (57)	109	35 (18)	
	Portsmouth Arms	0	1	0	0	1,700	28.1	0 (1)	73 (51)	147	23 (11)	
	Kings Nympton	0	3	0	1,500	0	25.3	0 (1)	68 (46)	109	22 (14)	
	Eggesford	10	27	0	0	2,700	21.3	1 (1)	42 (37)	90	30 (14)	
	Lapford	0	2	0	2,400	0	17.5	0 (1)	32 (32)	112	34 (9)	
	Morchard Road	0	11	0	0	2,500	15.1	1 (1)	28 (27)	79	36 (11)	
	Copplestone	10	13	0	0	3,000	13.5	1 (1)	28 (24)	76	29 (11)	
	Yeoford	10	14	0	1,700	3,600	10.5	1 (1)	19 (19)	70	37 (9)	
	Crediton	20	49	2,800	2,700	3,900	6.9	1 (1)	11 (11)	62	38 (7)	
	Newton St Cyres	0	3	0	1,100	4,300	4.2	0 (1)	9 (9)	128	36 (2)	
Total		220	519									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Exeter stations between 0800 and 0900

E.3.3 Exmouth to Exeter St Davids

The Exmouth to Exeter St Davids line serves suburban demand into Exeter from several communities, including the large town of Exmouth, and rapidly growing residential and employment areas in the east of Exeter. Digby and Sowton also attract commuters from across the city to and from other routes. The line is busy throughout the year with commuting and retail trips during autumn and winter months supplemented by additional leisure trips during summer months. Other specific demand drivers include sporting events with both Exeter Centrals (Chiefs Rugby ground) and Exeter City(football ground) served by the branch, and long distance trips to and from the line including by Royal Marine Commandos travelling to Lympstone Commando.

A new station is planned at Newcourt which is funded and committed for 2015, to serve a new and growing residential area.

New residential development is expected in the Exmouth area along with regeneration of key sites to attract new visitors including a redevelopment and improvement of the transport interchange facility.

Devon County Council has an aspiration to operate metro-style passenger services into Exeter city centre, increasing service frequency and capacity from various corridors including the Exmouth corridor.

E.3.3.1 Current services:

- One service per hour from Exmouth to Paignton services calling at most stations between Exmouth and Exeter St Davids.
- One service per hour from Exmouth to Exeter St Davids/ Barnstaple calling at most stations between Exmouth and Exeter St Davids.

E.3.3.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey times on the Exmouth branch are slow because of the low linespeed, the number of station stops and rolling stock characteristics.
- **Rolling stock:** Rolling stock on the services are early generation diesel stock with poor acceleration and low top speeds. There is scope for improving quality of services by improving rolling stock in the long term.

E.3.3.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJTs for all station on the Exmouth line are between 20 and 60 minutes. Therefore improving GJT can have an economic impact.
- **Jobs at destination:** Exeter is a large employment centre and commercial centre, with Digby and Sowton a significant destination as well as Exeter Central and Exeter St Davids.
- **Population catchments:** A number of rail stations have relatively large population catchments including St James Park, Polsloe Bridge and Digby and Sowton.
- **Market for rail:** Demand for rail is high and has grown significantly in competition with a congested road corridor.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Car ownership is low in areas close to Exeter city centre and there are opportunities to improve rail market share by improving journey time and quality of rolling stock. The parallel road to Exmouth is congested and difficult to improve. Within Exeter the line provides some journey opportunities that are not offered by buses.

E.3.3.4 Recommendations for conditional outputs:

- Improve journey time through better rolling stock and possibly infrastructure enhancements.
- Provide sufficient capacity to meet demand during weekdays and at weekends.

Table 10. Population, demand and current servicess for stations on the Exmouth line to Exeter stations to inform conditional outputs												
Corridor	Station name	Total Journeys into Exeter stations (in thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 to 3km from station (census 2011)	Population between 3 to 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) - mph	Notes
Exmouth	Exmouth	490	826	7,600	16,300	7,800	11	2 (2)	31 (28)	59	22 (11)	
	Lympstone Village	30	88	1,200	10,500	21,400	9	2 (2)	24 (22)	54	23 (10)	
	Lympstone Commando	20	39	0	3,500	22,600	8	1 (2)	27 (23)	53	18 (9)	
	Exton	10	20	0	4,300	15,400	8	1 (2)	26 (22)	52	18 (9)	
	Topsham	110	221	2,600	7,000	19,900	6	2 (2)	16 (16)	45	23 (8)	
	Digby & Sowton	170	374	3,500	28,500	42,900	4	2 (2)	12 (11)	41	21 (6)	
	Polsloe Bridge	20	99	12,500	50,600	25,300	2	1 (2)	10 (9)	38	14 (4)	
	St James Park	10	61	17,000	55,400	16,000	1	1 (2)	6 (6)	33	13 (2)	
Total		890	1,728									

*Year to March 2012

**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator

***Number of trains arriving into Exeter stations between 0800 and 0900

E.3.4 Taunton to Exeter St Davids

The Taunton to Exeter St Davids line serves interurban demand into Exeter from Taunton itself on long distance services. However, the absence of other local stations limits the current market into Exeter. Also the lack of direct services through to Exeter Central makes the route relatively unattractive as a commuting corridor into Exeter city centre.

Significant housing is planned in the Wellington, Cullompton and Tiverton areas including an urban extension at Tiverton towards the railway.

Significant new employment planned at Tiverton.

E.3.4.1 Current services:

- One service per hour from London Paddington to the South West (Plymouth/Paignton/Penzance) serves demand from Taunton and Tiverton Parkway to Exeter St Davids.
- One service per hour from the West Midlands (and beyond) to the South West (Paignton/Plymouth/Penzance) calling at Taunton and Tiverton Parkway.
- Infrequent regional service between Taunton, Exeter and points further west.

E.3.4.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey speed is relatively good.
- **Rolling stock:** Diesel rolling stock with good acceleration of up to 125mph on the long distance services. Rolling stock on the local stopping services are early generation diesel stock with poor acceleration and low top speeds.

E.3.4.3 Criteria for conditional outputs:

- **Willingness to commute:** GJTs from both Taunton and Tiverton Parkway to Exeter are between 20 and 60 minutes.
- **Jobs at destination:** Exeter is a large employment and commercial centre.
- **Population catchments:** Taunton has a large population catchment. A number of communities have poor or no access to the railway. Tiverton is located some distance from Tiverton Parkway.
- **Market for rail:** Demand for rail is relatively high, with 80,000 passenger journeys made between Taunton and Exeter St Davids per year. Poor rail connections make journeys to the centre of Exeter unattractive. Bridgwater has a large population catchment but has a very limited number of train services to Exeter.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share into Exeter City Centre is relatively low due to the lack of direct local services to Exeter City Centre and lack of stations on the corridor.

E.3.4.4 Recommendations for conditional outputs:

- Provide sufficient capacity to accommodate demand.
- Improve journey time possibly through infrastructure enhancements.
- Improve journey opportunities through improving rail connection between stations at Exeter, particularly to Exeter Central.

Table 11. Population, demand and current servicess for stations on the Taunton corridor to Exeter stations to inform conditional outputs												
Corridor	Station name	Total Journeys into Exeter stations (in thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 to 3km from station (census 2011)	Population between 3 to 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) - mph	Notes
Taunton	Taunton	120	1,293	9,800	34,100	7,800	31	2 (1)	27 (25)	56	68 (33)	
	Tiverton Parkway	30	392	1,200	1,700	5,100	17	2 (1)	13 (13)	43	76 (23)	
Total		420	2,327									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Exeter stations between 0800 and 0900

E.3.5 Axminster to Exeter

The Axminster to Exeter line carries longer distance services from the South East and London but within Devon acts predominantly as a local line for commuting and retail trips into Exeter. The line also provides important rail head stations at Honiton and Axminster which serve large areas of east Devon which otherwise have no rail access. The line benefited from the introduction of an hourly service from London Waterloo in 2009 but is set to undergo significant growth due to the scale of population growth on the corridor which includes a new town at Cranbrook.

A station at Cranbrook is funded and due to open in 2014. The population catchments will increase significantly with the development planned or under construction particularly at Pinhoe and Cranbrook.

Significant employment growth around Pinhoe and Cranbrook stations is planned over the next ten years including the existing Business Park, new Science Park, new Skypark and growth around the existing airport

Over 1,500 new dwellings planned for Honiton and Axminster plus additional employment land at Honiton.

Devon County Council has an aspiration to operate metro-style passenger services into Exeter city centre, increasing service frequency and capacity from various corridors including from Axminster.

E.3.5.1 Current services:

- One service per hour from London Waterloo calling at most stations between Yeovil Junction and Exeter St Davids throughout the day. Smaller stations have one service every two hours in the off-peak.

E.3.5.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey time is competitive due to the calling patterns and rolling stock characteristics.
- **Rolling stock:** Rolling stock is early generation diesel stock with poor acceleration and low top speeds.

E.3.5.3 Criteria for conditional outputs:

- **Willingness to commute:** All stations between Axminster and Whimple have more than 60 minutes GJT.
- **Jobs at destination:** Exeter is a large employment and commercial centre in the South West.
- **Population catchments:** Most stations have relatively small catchment areas with less than 10,000 people living within 3 kilometres of the train stations apart from Honiton.
- **Market for rail:** Demand for rail is relatively high at Honiton and Axminster but low at other stations. Honiton has a relatively high demand for its catchment size. The market is expected to increase significantly with the planned growth on the corridor including the new town at Cranbrook which is under construction currently.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share is strong into Exeter City Centre with competitive journey times and there is potential for this share to increase with population growth on the corridor (and associated increasing highway congestion).

E.3.5.4 Recommendations for conditional outputs:

- Improve journey times through improved rolling stock characteristics.
- Provide sufficient capacity to accommodate demand through train lengthening and/or increased frequency to two trains per hour.

Table 12. Population, demand and current servicess for stations on the Axminster corridor to Exeter stations to inform conditional outputs												
Corridor	**Station name**	**Total Journeys into Exeter stations (in thousands)**	**Total Journeys to and from station (ORR station usage 2011-12) (thousands)**	**Population <1km from station (census 2011)****	**Population between 1 to 3km from station (census 2011)**	**Population between 3 to 5km from station (census 2011)**	**Distance in miles**	**Frequency off peak (peak***) (trains per hour)**	**Average journey time (best) (minutes)**	**Generalised Journey Time (minutes)**	**Average speed (Generalised speed) - mph**	**Notes**
Axminster	Axminster	100	281	3,100	0	4,300	28	1 (1)	39 (39)	78	43 (21)	
	Honiton	200	354	6,300	1,800	1,000	18	1 (1)	28 (26)	64	44 (16)	
	Feniton	40	69	1,000	1,500	7,000	13	0.5 (1)	23 (21)	68	40 (12)	
	Whimple	50	68	1,800	0	1,000	9	0.5 (1)	16 (16)	64	35 (9)	
	Pinhoe	30	47	2,200	20,000	38,600	4	0.5 (1)	9 (9)	59	24 (4)	
Total		**420**	**819**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Exeter stations between 0800 and 0900

Service level conditional outputs for services into Exeter, Plymouth, Truro and the branch lines in Cornwall

E.3.6 Exeter/Paignton/Newton Abbot to Plymouth

Exeter to Plymouth is a key business to business flow in the region and its conditional output is considered and specified in the Long Distance Market Study which proposes improved journey time and/or frequency to improve business to business connectivity and enable economic growth in these regions.

The following section considers regional and urban journeys to Plymouth on the Exeter to Plymouth line.

E.3.6.1 Current services:

- One service per hour from Scotland to Plymouth calling at Exeter St Davids , Newton Abbot, Totnes and Plymouth. A limited number of services call at smaller stations between Exeter St Davids and Plymouth. Some also extend to Penzance.
- One service per hour from London Paddington to Plymouth calling at Exeter St Davids , Newton Abbot, Totnes and Plymouth. A limited number of services call at smaller stations between Exeter St Davids and Plymouth. Some also extends to Penzance.
- Infrequent regional service from Newton Abbot to Plymouth.

E.3.6.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey times are relatively slow compared to other regions. This is partly due to the linespeed profile and topography.
- **Rolling stock:** 125mph diesel stock with fast acceleration on the long distance services. Rolling stock on the local stopping services are early generation diesel stock with poor acceleration and low top speeds.

E.3.6.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJTs from Newton Abbot and Totnes to Plymouth are marginally above 55 minutes. Other stations between Exeter and Plymouth have very low demand due to the infrequent services.
- **Jobs at destination:** Plymouth is an important employment and commercial centre in Devon.
- **Population catchments:** Places on the route are generally small with a small population catchment. Newton Abbot has a large catchment population and passengers rail head from Newton Abbot and Totnes and Torbay to travel to Exeter, Plymouth and beyond.
- **Market for rail:** Demand between Exeter and Plymouth is large with about 200,000 journeys made in 2012/13. Demand for rail at other stations is relatively low except from Newton Abbot and Totnes.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share from Newton Abbot and Totnes to Plymouth is relatively high. Demand from other stations notably Ivybridge, is relatively small due to the irregular service. There is demand for travel from Paignton/Torquay to Plymouth and rail's market share can be improved through better travel opportunities.

E.3.6.4 Recommendations for conditional outputs:

- Improve journey times from Newton Abbot and Totnes to Plymouth, recognising the topography in the area may restrict the scope for improvement.
- Provide sufficient capacity to accommodate demand.
- Improve journey opportunities to Plymouth from Torbay through co-ordinating and/or extending services.

Table 13. Population, demand and current services to Plymouth to inform conditional outputs												
Corridor	Station name	Total Journeys into Plymouth stations (in thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 to 3km from station (census 2011)	Population between 3 to 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best)**** (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) - mph	Notes
Exeter	Starcross	0	101	1,000	9,900	21,900	44	0 (1)	77 (64)	115	34 (23)	
	Dawlish Warren	0	141	0	8,400	18,100	42	0 (1)	69 (59)	107	36 (23)	
	Dawlish	20	481	4,700	4,700	11,600	40	0 (1)	65 (52)	99	37 (24)	
	Teignmouth	20	567	4,700	8,800	7,800	37	0 (1)	59 (50)	94	38 (24)	
	Newton Abbot	130	1,088	6,400	19,300	8,500	32	2 (2)	41 (38)	68	47 (28)	
	Totnes	130	640	3,600	3,500	1,300	23	2 (2)	26 (26)	56	54 (25)	
	Ivybridge	50	86	3,700	4,900	3,300	12	0.5 (1)	25 (13)	62	28 (11)	
Total		350	3,104									
Penzance	Saltash	40	76	3,200	27,200	50,700	4	1 (2)	11 (9)	140	3 (2)	
	St Germans	30	51	0	1,500	3,400	9	1 (2)	19 (17)	156	6 (4)	mostly hourly
	Gunnislake	40	520	2,200	2,400	2,200	15	0.5 (1)	45 (45)	106.3	20 (6)	
	Menheniot	0	2	0	1,200	2,500	15	0 (1)	30 (26)	254	29 (3)	irregular service
	Liskeard	160	345k	3,000	3,800	6,400	18	1 (3)	28 (25)	59	38 (18)	
	Bodmin Parkway	60	248	0	0	8,400	27	1 (3)	40 (38)	152	41 (11)	
	Lostwithiel	10	77	2,100	0	1,300	30	1 (2)	49 (46)	181	37 (10)	
	Par	30	186	3,800	3,300	7,700	35	1 (3)	52 (50)	167	40 (13)	
	St Austell	80	467	6,100	13,500	4,900	39	1 (3)	60 (58)	174	39 (14)	
	Truro	110	1,278	5,300	9,400	6,600	54	1 (3)	70 (75)	192	40 (17)	
Total		520	3,250									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Plymouth between 0800 and 0900
****Journey time to direct services is shown here. For the generalised journey time, all day average including indirect services is used

E.3.7 Penzance to Plymouth

The Penzance to Plymouth line serves long distance and suburban demand into Plymouth from cities and urban centres in Devon and Cornwall, and smaller communities in the region. The line used throughout the year with commuting and retail trips during autumn and winter months and additional leisure trips during the summer. Cornwall is part of the European economic regeneration programme and receives European Regional Development Funding to help build a more diverse economy.

E.3.7.1 Current services:

- Infrequent service from Penzance to London Paddington calling at bigger stations between Penzance and Plymouth including Par, St Austell, and Liskeard.
- Infrequent service from Penzance to Scotland calling at larger stations between Penzance and Plymouth including Truro, Bodmin Parkway and Liskeard.
- One service every two hours from Gunnislake to Plymouth calling at all stations between Gunnislake and Plymouth.
- Infrequent service from Penzance to Plymouth/Newton Abbott calling at most stations between Par and Plymouth serving the local communities.

E.3.7.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey times are relatively slow compared to other regions. This is partly due to the linespeed profile, rolling stock characteristics and topography.
- **Rolling stock:** 125mph diesel stock with fast acceleration is used on the long distance services. Rolling stock on the local stopping services are the early generation diesel stock with slow acceleration and a maximum speed of between 75 and 90mph.

E.3.7.3 Criteria for conditional outputs:

- **Willingness to commute:** All stations except Liskeard on this route have more than 60 minutes GJT and some are significant higher than 60 minutes.
- **Jobs at destination:** Plymouth is an important employment and commercial centre in Devon. Penzance and Truro are other key destinations on the route.
- **Population catchments:** Plymouth has a large travel to work catchment area. There is demand for long distance commuting and leisure trips to Plymouth such as from Liskeard and Truro. Penzance and Truro have relatively large catchment areas.
- **Market for rail:** Demand for rail to Plymouth is high, comprised of commuting and leisure journeys. There is demand to travel by rail from Cornwall to Plymouth throughout the year and there are opportunities for rail to increase its competitiveness.
- **Deprivation**: There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share is small.

E.3.7.4 Recommendations for conditional outputs:

- Improve journey times through better rolling stock in the long term, or possibly infrastructure enhancements.
- The services should be designed to cater for the commuter and retail flows all year round and the leisure market in summer months.

E.3.8 Demand to Truro

Truro is a key economic and cultural city in Cornwall driving interurban and urban trips across the region. Approximately 1.3 million passenger journeys are made to/from Truro each year. The top five rail passenger flows to/from Truro are as follow:

- Plymouth.
- Penmere.
- St Austell.
- Penzance.
- Penryn.

Penmere is a suburban station in Falmouth (essentially Falmouth North).

Demand for rail between Truro, Plymouth, Exeter and London is considered in the Long Distance Market Study. The conditional outputs proposed are better journey times and/or frequency between these key economic centres.

The long distance services on the mainline connect Truro to key urban centres and communities in Cornwall and Devon, including St Austell, Par, Redruth, Camborne, Penzance and Plymouth. They serve demand for commuting and leisure trips throughout the year. The branch line services to Falmouth are well used by commuters and university students, and demand has continued to increase after the recent service improvement to two trains per hour.

This rest of this section considers the regional and urban services to/from Truro and the branch lines in the Cornwall area.

E.3.8.1 Current services:

- Nine services each way unevenly spread across the day with gaps of up to four hours from Penzance to London Paddington calling at all major and some smaller stations in Cornwall including Truro.
- Three services depart Cornwall in the morning and three return in the evening from Penzance to Scotland calling at all major stations in Cornwall including Truro.
- Irregular services from Penzance to Plymouth/Newton Abbott calling at most stations between Penzance and Plymouth.
- Two services per hour from Falmouth to Truro calling at all stations on the route.

E.3.8.2 Journey times and rolling stock

- **Journey times/speeds:** Journey times are relatively slow compared to other regions. This is partly due to the linespeed profile, rolling stock characteristics and topography.
- **Rolling stock:** 125mph diesel stock with fast acceleration on the long distance services. Rolling stock on the local stopping services are early generation diesel stock with slow acceleration and maximum speed of between 75 and 90mph.

E.3.8.3 Criteria for conditional outputs:

- **Willingness to commute:** GJTs to Truro from the mainline stations tend to be more than 60 mintues indicating that improvement in journey time and/or frequency can benefit strategic goals. Only a few mainline stations in Cornwall have GJTs of less than 60 minutes to Truro including St Austell, Redruth and Camborne. On the Falmouth branch line, most stations have GJTs of less than 60 minutes to Truro.
- **Jobs at destination:** Truro is a key employment, education, health and tourist centre in Cornwall.
- **Population catchments:** Stations on the main line tend to have relatively large catchment areas including Plymouth, St Austell, Penzance, Bodmin, Redruth and Camborne. On the Falmouth branch line Penryn and Penmere have large catchment areas. There are university campuses with a large number of students travelling to these places.
- **Market for rail:** Demand for rail on the route is relatively high on the mainline and the Falmouth branch line compares with branch lines in other regions. Passenger numbers on the Falmouth line have increased significantly after recent service frequency improvement.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.

Service level conditional outputs for services into Exeter, Plymouth, Truro and the branch lines in Cornwall

- **Rail's market share:** Approximately three per cent of commuter journeys are made by rail.

E.3.8.4 Recommendations for conditional outputs:

- Improve journey times perhaps through better rolling stock in the long term and possibly infrastructure enhancements.
- Provide sufficient capacity to accommodate increasing demand on the mainline especially in the peak and in the summer.
- The services on the branch lines should be designed to cater for the commuter and retail flows all year round and the leisure market in summer months.

Table 14. Population, demand and current services for station into Truro to inform conditional outputs

Corridor	Station name	Total Journeys into Truro stations (in thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 to 3km from station (census 2011)	Population between 3 to 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) - mph	Notes
Penzance	Plymouth	110	2,597	15,800	75,800	56,400	54	1 (1)	78 (68)	116	41 (28)	
	Par	40	186	3,800	3,300	7,700	19	1 (1)	24 (22)	63	47 (18)	
	St Austell	110	467	6,100	13,500	4,900	14	1 (1)	17 (16)	55	51 (16)	
	Penzance	100	580	7,100	8,200	3,600	26	1 (1)	39 (38)	80	40 (19)	
	Camborne	90	276	8,800	8,500	11,300	13	1 (1)	17 (16)	56	45 (14)	
	Redruth	90	335	7,800	9,900	14,500	9	1 (1)	10 (11)	49	55 (11)	
Total		**540**	**4,441**									
Falmouth	Falmouth Docks	40	104	1,300	16,200	7,900	12	2 (2)	28 (28)	54	25 (13)	
	Falmouth Town	100	194	6,600	12,100	5,400	11	2 (2)	25 (25)	51	27 (13)	
	Penmere	110	172	9,500	14,600	3,500	10	2 (2)	22 (21)	48	28 (13)	
	Penryn	100	211	5,400	11,200	14,700	8	2 (2)	14 (14)	42	36 (12)	
Total		**350**	**681**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Truro between 0800 and 0900

E.4 Demand to/from/within Cornwall: branch lines

Cornwall is a key tourism destination and holiday traffic is a significant element of the overall rail passenger market. The rail services in Cornwall serve the tourism, leisure markets and the local communities. The summer timetables tend to operate more frequent and direct services from Cornwall to London and other regions. Demand for long distance travel to/from Cornwall is considered in the Long Distance Market Study and Truro is used as a proxy for Cornwall . The conditional outputs proposed for long distance journeys are improved journey times and or frequency from Truro (Cornwall) in the long term.

There is demand for commuting trips to employment centres such as Truro and Newquay. There is also demand to higher educational establishments and the Falmouth line provides services to the university campus. The conditional outputs for Truro, including the Falmouth line are discussed in Section E.3.8.

The branch lines in Cornwall include:

- St Ives (St Erth-St Ives)
- Liskeard-Looe (also known as the Looe Valley Line)
- Gunnislake to Plymouth (also known as the Tamar Valley line). This is also considered in the Plymouth Section E.3.7
- Par to Newquay line (also known as the Atlantic Coast line)
- Falmouth (discussed in Section E.3.8)

The branch lines serve relatively small communities (except Falmouth line where demand for rail is high throughout the year) and this is reflected in the relatively low demand, although demand in peak season can be significantly higher. These branch line services serve the key tourist areas such as Newquay, St Ives and Penzance over the summer months.

E.4.1 St Ives Bay line (St Erth-St Ives)

St Ives is a popular tourist resort with 11 per cent of visitors to Cornwall staying in or near St Ives. Just over half a million journeys are made on the line each year, a 24 per cent increase since 2006. Travel on the branch line is very seasonal with over 60 per cent of travel occurring between June and mid-September. The line has a park and ride facility at Lelant Saltings which is very popular, particularly in the summer months when St Ives town centre and car parks are difficult to access by car. Cornwall Council is developing a new Park and Ride facility and interchange station at St Erth.

Out of the main tourist season, travel is made on the line for mainly leisure purposes, with a small number of commuters and longer distance travellers connecting to the mainline at St Erth.

Table 15 summarises the top flows to and from St Ives station (station with the highest footfall on the St Ives – St Erth branch line).

E.4.1.1 Current services

- Two services per hour from St Erth to St Ives. Two trains per day run through to Penzance

E.4.1.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey times are relatively slow compared to other due to the stopping pattern, rolling stock type and geography of the line.
- **Rolling stock**: Rolling stock on the local stopping services are early generation diesel stock with slow acceleration and maximum speed of 75 mph.

Service level conditional outputs for services into Exeter, Plymouth, Truro and the branch lines in Cornwall

E.4.1.3 Criteria for conditional outputs:

- **Willingness to commute**: A very small proportion of commuting trips along the line are undertaken by rail.
- **Jobs at destination:** Tourism, cultural and creative industries are important employers in St Ives. Over two thirds of employees live and work in the town. Penzance, Truro and Plymouth are the key job destinations.
- **Population catchments:** The population around the village of St Erth is small and St Erth acts as a rail head for trips to St Ives for the whole of Cornwall. The largest catchment on the line is around the settlements of St Ives and Carbis Bay.
- **Market for rail**: Future development is limited in St Ives due to geographical constraints. The development of the park and ride at St Erth has the potential to increase travel on the line. Ongoing constraints on car use and parking in St Ives in the peak months will continue to make rail an attractive alternative. Penzance is the major regional centre and rail's ability to compete with road on this flow is constrained by the need to change trains most of the time at St Erth, with trains at irregular times between St Erth and Penzance.
- **Deprivation**: There are pockets of deprivation on the route. **http://casa.oobrien.com/booth**/.
- **Rail's market share:** Rail's market share is small compared to road and bus though it helos to reduce road traffic to St Ives in the summer.

E.4.1.4 Recommendations for conditional outputs:

- Provide sufficient capacity to accommodate increasing demand especially in the peak and in the summer.
- The services should be designed to cater for the commuter and retail flows all year round and the leisure market in summer months.

Table 15. Population, demand and current services for services on the St Ives branch to inform the conditional outputs

Corridor	Station name	Total Journeys into St Ives stations (in thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 to 3km from station (census 2011)	Population between 3 to 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) - mph	Notes
St Ives	Penzance	40	580	7,100	8,200	3,600	10	1 (1)	38 (25)	86	15 (7)	interchange at St Erth
	St Erth	20	203	0	9,100	4,700	4	2 (1)	13 (12)	46	19 (5)	
	Lelant Saltings	20	102	0	6,900	10,300	4	1 (1)	11 (9)	83	19 (3)	
	Carbis Bay	60	207	1,100	7,300	7,200	1	1 (1)	4 (3)	43	18 (2)	
Total		**140**	**1,090**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into St Ives between 0800 and 0900

E.4.2 Looe Valley Line (Liskeard-Looe)

The majority of travel is for leisure purposes with small numbers of commuters and through journeys onto the mainline. The line experiences higher volumes in the summer months with half the journeys made between June and mid-September. Six per cent of visitors to Cornwall stay in or near the town of Looe, with a further three per cent staying in or near Liskeard.

E.4.2.1 Current services:

- 12 services per day from Liskeard to Looe. Sunday services only between May and October.

E.4.2.2 Journey times and rolling stock:

- **Journey times/speed:** Journey times ar relativley slow due to the stopping pattern, rolling stock and the need for services to reverse at Coombe Junction.
- **Rolling stock**: Rolling stock on the services is early generation diesel stock with slow acceleration and maximum speed of 75 mph.

E.4.2.3 Criteria for conditional outputs

- **Willingness to commute**: A very small proportion of commuting trips along the line are undertaken by rail.
- **Jobs at destination:** Liskeard is an employment centre with jobs in retail and services. Employment in Looe is based around hospitality, retail and health and social care. Plymouth and Truro are key destinations in Devon and Cornwall.
- **Population catchments:** Looe and Liskeard have relatively large catchment areas. The halts along the line do not serve any large areas of population. Even the smaller villages are some distance walk from these halts.
- **Market for rail:** Housing development near Liskeard may potentially increase market for rail.
- **Deprivation:** There are pockets of deprivation on the route. **http://casa.oobrien.com/booth**/.
- **Rail's market share:** Rail's market share is generally small compared to road, though it does play an important role in reducing road traffic to Looe in the summer.

E.4.2.4 Recommendations for conditional outputs:

- Provide sufficient capacity to accommodate increasing demand especially in the peak and in the summer.
- The services should be designed to cater for the leisure market in summer months.

Table 16. Population, demand and current services for stations on the Liskeard to Looe corridor to inform conditional outputs												
Corridor	**Station name**	**Total Journeys into Looe stations (in thousands)**	**Total Journeys to and from station (ORR station usage 2011-12) (thousands)**	**Population <1km from station (census 2011)****	**Population between 1 to 3km from station (census 2011)**	**Population between 3 to 5km from station (census 2011)**	**Distance in miles**	**Frequency off peak (peak***) (trains per hour)**	**Average journey time (best) (minutes)**	**Generalised Journey Time (minutes)**	**Average speed (Generalised speed) - mph**	**Notes**
Liskeard - Looe	Plymouth	160	2,597	15,800	75,800	56,400	18	1 (1)	28 (25)	59	38 (18)	
	Liskeard	40	120	3,000	1,000	900	9	1 (1)	27 (28)	77	19 (7)	
Total		**200**	**2,717**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Truro between 0800 and 0900

E.4.3 Tamar Valley Line (Gunnislake – Plymouth)

Travel on the line is not particularly seasonal and the majority of journeys are made by commuters, shoppers, school children and students travelling into Plymouth in the morning and out in the evening. Commuting demand to Plymouth from Gunnislake is also considered in the Plymouth section 3.7.

E.4.3.1 Current services:

- One service every two hours from Gunnislake to Plymouth calling at all intermediate stations.

E.4.3.2Journey times and rolling stock

- **Journey times:** End to end journey time is 45 minutes.
- **Rolling stock:** Rolling stock on the services is early generation diesel stock with slow acceleration and maximum speed of 75 mph.

E.4.3.3 Criteria for conditional outputs:

- **Willingness to commute**: A very small proportion of commuting trips along the line are undertaken by rail.
- **Jobs at destination:** Plymouth station is close to the city centre and the University. A large number of jobs are within 15 minutes' walk of the station.
- **Population catchments**: The population of Plymouth is just over 256,000. The population within the catchment of the Tamar Valley stations is around 9,000 (Calstock Parish 6,095, Bere Ferrers Parish 3,066.)
- **Market for rail**: The current population of the Tamar Valley is unlikely to grow significantly over future years due to controls on development in the Area of Outstanding Natural Beauty. Therefore a steady state of commuting is expected on this line in future years. Devon County Council have an aspiration to reconnect the line north to Tavistock – another growing town, with a population of just over 11,000, and to improve the service to an hourly frequency. Should this plan proceed, the dynamics of the line will change considerably.
- **Deprivation:** There are pockets of deprivation on the route. **http://casa.oobrien.com/booth**/.
- **Rail's market share**: rail has a good share of this market as road links between Tamar Valley Line communities and Plymouth are poor.

E.4.3.4 Recommendations for conditional outputs:

- Provide sufficient capacity to accommodate increasing demand especially in the peak and in the summer.
- The services should be designed to cater for the commuter and retail flows all year round and the leisure market in summer months.

E.4.4 Par-Newquay (also known Atlantic Coast Line)

Newquay is Cornwall's most popular tourist resort with 21 per cent of Cornwall visitors staying in or near the town. Travel on the local rail services is made mainly by locals, tourists and day trippers connecting with main line services at Par, mostly for leisure travel. The high speed services in the summer months are used by leisure travellers. There has been significant growth on the line over the last ten years which has seen an increase in the number of services provided.

The allocation of the Entreprise Zone to Newquay Airport is likely to see an increase in the total size of transport market. Further development is planned in Newquay with the population and jobs forecast to grow.

E.4.4.1 Current services:

- Six services per day from Par to Newquay except Sundays. In peak summer, one of these is a daily through high speed service between London Paddington and Newquay. On Saturdays between late May and early September, all the line's six services are through services either to or from London Paddington or the North. The summer Sunday service includes one through cross country and one through London Paddington service, with four other local trains.
- A winter Sunday service of three trains a day from Par to newquay was introduced in December 2011.

E.4.4.2 Journey times and rolling stock:

- **Journey times/speed:** End to end journey time is 50 minutes.
- **Rolling stock**: Rolling stock on the local stopping services is early generation diesel stock with slow acceleration and maximum speed of 75mph.125mph rolling stock is used for the long distance services to London and the North during the summer months.

E.4.4.3 Criteria for conditional outputs

- **Willingness to commute**: A very small proportion of commuting trips undertaken by rail along the line.
- **Jobs at destination:** Newquay is a key employment area on the branch line and a third of all jobs in Newquay are in hotels and catering. Over 70 per cent of jobs are held by people who live in Newquay.
- **Population catchments:** The largest catchment is Newquay and the other stations on the line have small population catchments.
- **Market for rail**: The predominant market is tourists visiting Newquay for short and long stays. The Eden Project is around two miles from the line, with the nearest station at Luxulyan.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share is small compared to road and bus.

E.4.4.4 Recommendations for conditional outputs:

- Provide sufficient capacity to accommodate increasing demand especially in the peak and in the summer.
- The services should be designed to cater for the commuter and retail flows all year round and the leisure market in summer months.

Table 17. Population, demand and current services for services to Newquay to inform conditional outputs												
Corridor	Station name	Total Journeys into Newquay stations (in thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 to 3km from station (census 2011)	Population between 3 to 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) - mph	Notes
Newquay - Par	Par	10	187	3,800	3,300	7,700	163	infrequent	48 (48)	192	203 (51)	
Total		**10**	**187**									
*Year to March 2012 **Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator ***Number of trains arriving into Newquay between 0800 and 0900												

Appendix F: Service level conditional outputs for the West Midlands

Appendix F: Service level conditional outputs for services in the West Midlands

This Appendix is an interpretation of the Regional Urban conditional outputs for passenger journeys made to, from and within the West Midlands. It presents the conditional outputs for key destinations in the West Midlands. Birmingham is a key destination and attracts the highest number of Regional Urban trips in the West Midlands. Other economic and urban centres including Coventry, Shrewsbury, Walsall, Warwick, Wolverhampton and Worcester also attract commuting trips. Cross-West Midlands flows are also considered in this section.

The Long Distance Market Study considers the markets for journeys made predominately for business purposes and generally over 50 miles.

F.1 Service level conditional outputs for Birmingham

Birmingham is the second largest city in England with a population of approximately 2.3 million in Birmingham and the surrounding conurbations and is an important economic, financial and commercial centre. There are over one million jobs in Birmingham, with 2.5 times as many private sector jobs as public sector jobs . Birmingham also has five universities and demand for travel to access higher educational establishments is high.

Birmingham has three main railway stations in the city centre: Birmingham New Street, Birmingham Snow Hill and Birmingham Moor Street. Birmingham New Street is the largest station with approximately 31 million passenger journeys starting/ending there in 2011/12. Birmingham New Street is also a significant interchange station in the West Midlands with 5 million passenger interchanges at the station in 2011. The Birmingham New Street Gateway project will see the transformation of the station, providing a new, bigger concourse and improved station facilities to accommodate increased rail demand.

Birmingham Moor Street and Birmingham Snow Hill had a combined footfall of over 11 million passengers in 2011/12.

Demand for rail in Birmingham has increased significantly over the last decade and continues to increase despite the recent slower economic growth. In particular, commuter journeys by rail have grown rapidly; one contributing factor is the worsening of road congestion in Birmingham and increased overall cost of car travel.

The Enterprise Zones in Birmingham city centre are also expected to drive commuting demand to the city centre through the creation of additional jobs. Similarly, the City Deals, which are agreements between the government and a city which give the city more control over its planning policy are expected to attract new business resulting in an increase in employment and economic growth. These deals are being negotiated by a number of cities and urban centres in the West Midlands; Birmingham is included in the first wave and other cities that have submitted proposals as part of the second wave include the Black Country, Coventry and Warwickshire as well as Leicester and Leicestershire in the East Midlands.

Birmingham Airport is a large international airport carrying around nine million passengers a year. This is expected to grow as a result of investment in additional runway and terminal capacity. It is an important destination and international gateway. It is also a large employment centre in the area and approximately 7,000 staff work at the airport. The airport is erved by rail and is accessed by the station at Birmingham International, which also serves the National Exhibition Centre (NEC).

Services on the new High Speed 2 (HS2) phase one route start in 2026, and will provide high speed rail services between London Euston and a new station in Birmingham city centre (Curzon Street) and a new interchange station near Birmingham Airport. HS2 Phase 2 links Birmingham to Manchester, the East Midlands and Leeds. HS2 improves connectivity and journey times between the biggest cities in England and helps to support economic growth through improved business to business connections and generating agglomeration of economic activities.

Service level conditional outputs for the West Midlands - Birmingham

The Regional Urban conditional outputs for the West Midlands are presented by rail corridors centred on Birmingham organised into a description of the conditional outpus realting to each of the following corridors:

- North Birmingham and Lichfield.
- Nottingham/Derby/Tamworth.
- Leicester/Nuneaton.
- Northampton/Coventry.
- Leamington Spa/Dorridge.
- Stratford-upon-Avon.
- South Birmingham and Redditch/Bromsgrove.
- Worcester/Kidderminster/Stourbridge.
- Wolverhampton and Shrewsbury.
- Stafford / Wolverhampton.
- Rugeley Trent Valley/Walsall.

F.1.1 North Birmingham and Lichfield Corridor

The North Birmingham and Lichfield corridor provides suburban commuter services into Birmingham New Street.

There is planned housing growth in Lichfield and Burton-on-Trent areas. Surburban areas in the north of Lichfield are currently not served by rail and there are plans for substantial new housing in the area. There is an opportunity for rail to gain market share if an appropriate intervention is developed. The City Council is also promoting an advanced manufacturing hub in Aston and a food hub at Witton which are expected to create high skilled jobs. Expansion of the car park at the station at Four Oaks is planned.

F.1.1.1 Current and planned services:

- Seven services from Lichfield Trent Valley/Four Oaks to Longbridge/Redditch arriving at Birmingham New Street between 08:00 and 09:00, with four starting from Lichfield Trent Valley, calling at most stations on the route. Throughout the day there are six services per hour on the corridor with two services starting from Lichfield Trent Valley.

F.1.1.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey time on this line is competitive with road. There is a regular interval ten minute service frequency on this route.
- **Rolling stock:** The stopping services use electric rolling stock capable of up to 90mph.

Service level conditional outputs for the West Midlands - Birmingham

F.1.1.3 Criteria for conditional outputs:

- **Willingness to commute:** The Generalised Journey Time (GJT) for all stations to Birmainham New Street except Lichfield Trent Valley is less than 60 minutes. GJTs to Lichfield City and Lichfield Trent Valley are poor. Frequency is good on the line, but reduces north of Four Oaks.
- **Jobs at destination**: Birmingham is a large employment and financial centre. University and Five Ways are also key destinations on this corridor, for access to the university and hospital.
- **Population catchments:** The route has a large population catchment. Most stations have more than 20,000 people living within three kilometres of the train station. The largest catchment areas are the suburbs of Birmingham such as Aston, Gravelly Hill and Erdington. There is also rail heading to stations on the Cross City North route particularly to Four Oaks by residents in the Tamworth area.
- **Market for rail**: This is a key commuting route into Birmingham. Demand for rail is high on this route, which is reflected by the high passenger loadings in the morning peak.
- **Deprivation**: There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share is large overall.

F.1.1.4 Recommendations for conditional outputs:

- Provide sufficient capacity to accommodate demand on this corridor
- Improve overall journey times (equivalent GJTs) from Lichfield to Birmingham

F.1.1.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the GJT from Lichfield on this corridor into Birmingham will have the largest impact on labour supply and reducing deprivation by providing access to employment. Four trains per hour on an even pattern and a journey time speed of 40mph (reflecting a fast outer suburban service) could reduce the GJT to Birmingham by around 12 minutes from Lichfield City and 20 minutes from Lichfield Trent Valley. The impact of these improvements from these stations to Birmingham on Gross Value Added (GVA) through labour supply improvements is estimated to be around £63,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £114,000 per annum per minute of GJT. Improving the journey times from inner suburban stations on the route could also drive significant benefit, but there is limited opportunity because of the high frequency service and short distances between stops on the route.

Table 1 Population, demand and current service for stations on the North Birmingham and Lichfield corridor to Birminagham New Street to inform conditional outputs												
Corridor	Station name	Total Journeys into Birmingham New Street* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) (mph)	Notes
North Birmingham and Lichfield	Lichfield Trent Valley	338	899	5,000	14,300	5,600	18	2 (4)	41 (39)	62	26 (17)	
	Lichfield City	232	621	6,000	15,300	3,500	16	4 (5)	36 (32)	52	27 (19)	
	Shenstone	45	160	0	3,400	17,100	13	2 (2)	33 (31)	56	24 (14)	
	Blake Street	177	313	4,200	10,800	26,400	11	4 (4)	28 (27)	44	23 (15)	
	Butlers Lane	93	189	5,400	18,400	33,600	10	4 (4)	26 (25)	42	23 (14)	
	Four Oaks	401	581	5,300	22,800	55,300	9	6 (7)	23 (21)	34	23 (16)	
	Sutton Coldfield	480	1,377	2,200	38,900	77,800	8	6 (7)	20 (18)	29	23 (16)	
	Wylde Green	263	488	6,600	56,000	83,100	6	6 (7)	17 (15)	27	23 (14)	
	Chester Road	328	748	9,700	63,600	87,900	6	6 (7)	15 (13)	24	23 (14)	
	Erdington	250	815	10,500	60,500	111,700	5	6 (7)	13 (11)	23	23 (13)	
	Gravelly Hill	194	636	7,800	67,600	139,200	4	6 (6)	11 (9)	21	21 (11)	
	Aston	61	445	4,000	75,100	156,400	3	6 (7)	7 (6)	16	24 (11)	
	Duddeston	30	180	6,400	72,600	161,200	2	2 (4)	6 (4)	20	15 (5)	
Total		2,893	7,451									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Birmingham New Street between 0800 and 0900

F.1.2 Nottingham/Derby/Tamworth corridor

This corridor supports a mixture of long distance and commuter flows, as well as large amounts of freight traffic. Derby, Burton-on-Trent and Tamworth are served by the long distance services. Conditional outputs from Nottingham to Birmingham are addressed in the Long Distance Market Study.

The draft Birmingham Development Plan shows a large proportion of the city's core employment areas are on this corridor. Housing growth is planned in Atherstone and Tamworth, with approximately 2000 new dwellings.

F.1.2.1 Current services:

- Two services per hour from Nottingham to Birmingham New Street/Cardiff Central calling at Derby, Burton-on-Trent, Tamworth (Wilnecote in some hours) and Birmingham New Street.
- One service per hour from the North East to South West calling at Derby and Birmingham New Street. In the peak hours calling at Burton-on-Trent and Tamworth and alternate hours in the off-peak.
- One service per hour from Newcastle to Reading calling at Derby during the day, and makeing additional calls at Burton-on-Trent and Tamworth in the peak.

F.1.2.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey speed is moderate, averaging 60 miles per hour. Journey times on this corridor are good due to the long distance nature of the services. Frequency is variable through the day particularly at Water Orton and Wilnecote.
- **Rolling stock:** A mix of 100mph and 125mph diesel rolling stock is used

F.1.2.3 Criteria for conditional outputs:

- **Willingness to commute**: GJTs for most stations between Derby and Birmingham are less than 60 minutes. Wilnecote has a GJT over 60 minutes due to the infrequent services. Commuting demand on the corridor is accommodated by long distance services on the route.
- **Jobs at destination:** Birmingham is a large employment and financial centre. Nottingham and Derby are significant economic centres in the East Midlands.
- **Population catchments:** The route has a relatively large population catchment.
- **Market for rail**: Commuting demand by rail is high on this corridor, which is reflected by the high passenger loadings in the peak. Catchment areas in Castle Bromwich and Castle Vale are not served by rail despite their relatively large populations. Commuting demand from Tamworth is currently met by calling long distance services at Tamworth, which is not ideal. Wilnecote is not well served by rail and competition is strong from bus/coach. A number of rail passengers living in the Tamworth area rail head to nearby rail stations on the North Birmingham and Lichfield corridor to travel to Birmingham city centre and beyond. Water Orton is served by the Leicester to Birmingham services.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** There is increasing demand for rail in the morning peak.

F.1.2.4 Recommendations for conditional outputs:

- Provide sufficient capacity to accommodate demand on this corridor.
- Improve frequency and/or journey times from Tamworth and Burton-on-Trent to Birmingham
- Improve frequency and/or journey times to Nottingham, as proposed by the Long Distance Market Study.

F.1.2.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the GJT from Derby, Burton-on-Trent, Wilnecote and Tamworth on this corridor into Birmingham will have a large impact on labour supply and reducing deprivation by providing access to employment. There are some opportunities to improve the frequency, pattern of services (particularly in the off-peak) and journey times on this route, though Derby to Birmingham services are fast and frequent all day. The impact of improvements from these stations to Birmingham on Gross Value Added (GVA) through labour supply improvements is estimated to be around £298,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £190,000 per annum per minute of GJT..

Table 2 Population, demand and current services for stations on the Nottingham/Derby/Tamworth corridor to Birmingham New Street to inform conditional outputs

Corridor	Station name	Total Journeys into Birmingham New Street* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) (mph)	Notes
Nottingham/ Derby/ Tamworth	Derby	356	3,351	4,300	61,600	75,700	42	4 (4)	41 (34)	56	61 (44)	
	Burton-on-Trent	212	701	3,000	36,000	12,100	31	2 (4)	32 (27)	51	57 (36)	
	Tamworth	375	948	5,500	32,000	24,300	18	2.5 (4)	20 (16)	40	53 (27)	
	Wilnecote	62	72	5,800	34,200	25,800	16	0.5 (2)	25 (17)	57	38 (16)	
Total		**1,005**	**5,073**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Birmingham New Street between 0800 and 0900

F.1.3 Leicester/Nuneaton corridor

This corridor provides interurban services from the East Midlands to Birmingham, and joins the Nottingham, Derby, Tamworth corridor at Water Orton.

Significant housing growth of 3,000 new dwellings is planned in the catchment of Nuneaton station.

F.1.3.1 Current services:

- One service per hour from Leicester to Birmingham New Street calling at most stations between Leicester and Birmingham New Street
- One service per hour from Stansted Airport to Birmingham New Street calling at a limited number of stops and calling at Leicester, Nuneaton and Coleshill Parkway

F.1.3.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey speed is slow on this corridor averaging between 30 and 40mph. Most stations have a two train per hour frequency and journey times are relatively slow.
- **Rolling stock:** Diesel rolling stock of 90mph.

F.1.3.3 Criteria for conditional outputs:

- **Willingness to commute:** GJTs for all stations between Leicester and Birmingham New Street (except Nuneaton and Coleshill Parkway) are greater than 60 minutes. GJTs from Leicester to Birmingham New Street are 79 minutes. Reducing the GJT below 60 minutes would bring significant economic benefits.
- **Jobs at destination:** Birmingham is a large employment and financial centre in the West Midlands. Leicester is a key economic centre in the East Midlands
- **Population catchments:** The route has a very large population catchment.
- **Market for rail:** Rail Demand between Leicester and Birmingham New Street is high and is one of the largest flows to Birmingham from outside of the West Midlands. There is also passenger demand for travel between Coventry and Leicester via Nuneaton which is considered in the cross-West Midlands flows section.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** There is increasing demand for rail in the morning peak and throughout the day.

F.1.3.4 Recommendations for conditional outputs:

- Provide sufficient capacity to accommodate demand on this corridor.
- Improve journey frequency and/or journey times from Leicester and Nuneaton to Birmingham New Street.

F.1.3.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the GJT from Leicester and Nuneaton on this corridor into Birmingham will have the largest impact on labour supply and reducing deprivation by providing access to employment. Providing four trains per hour at 60mph, a good interurban service, could improve the GJT by approximately 20 minutes from Leicester and Nuneaton to Birmingham. The impact improvements from these stations to Birmingham on Gross Value Added (GVA) through labour supply improvements is estimated to be around £129,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £128,000 per annum per minute of GJT. Improving the GJT from other stations on the route such as Narborough, Hinckley and Coleshill Parkway on the route could also drive significant benefit, demonstrating the importance of the balance of interurban and outer suburban services on this route.

Table 3 Population, demand and current services for stations on the Leicester/Nuneaton corridor into Birmingham New Street to inform conditional outputs												
Corridor	**Station name**	**Total Journeys into Birmingham New Street* (thousands)**	**Total Journeys to and from station (ORR station usage 2011-2012) (thousands)**	**Population <1km from station (census 2011)****	**Population between 1 and 3km from station (census 2011)**	**Population between 3 and 5km from station (census 2011)**	**Distance in miles**	**Frequency off peak (peak***) (trains per hour)**	**Average journey time (best) (minutes)**	**Generalised Journey Time (minutes)**	**Average speed (Generalised speed) (mph)**	**Notes**
Leicester/ Nuneaton	Leicester	424	4,881	16,600	94,200	104,600	40	2 (2)	53 (48)	79	45 (30)	
	South Wigston	8	59	5,300	48,600	63,500	36	0.5 (1)	66 (50)	92	33 (24)	
	Narborough	136	363	3,900	15,800	35,400	33	1 (2)	47 (45)	77	43 (26)	
	Hinckley	85	280	8,600	22,300	12,200	25	1 (2)	39 (37)	68	39 (22)	
	Nuneaton	218	997	5,200	35,600	24,600	22	2 (2)	35 (28)	54	37 (24)	
	Coleshill Parkway	134	170	1,200	6,000	34,200	10	2 (2)	15 (13)	38	38 (15)	
	Water Orton	39	44	2,600	21,400	55,700	8	0.5 (1)	25 (10)	64	19 (7)	
Total		**1,045**	**6,794**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Birmingham New Street between 0800 and 0900

F.1.4 Northampton/Coventry corridor

This corridor caters for both long distance flows to London and Northamptonshire as well as local commuter services to Birmingham and Coventry. Birmingham International provides direct access to the airport and National Exhibition Centre (NEC), and is an important station on this corridor. Approximately 23 per cent of air passengers access Birmingham Airport by rail and of these, 70 per cent interchange at Birmingham New Street. There are also local flows between the intermediate stations. Major office development is also planned at Friargate which is located next to Coventry station.

The Coventry and Warwickshire City Deal is proposing to boost growth in high value advanced manufacturing and engineering through investment in skills; access to innovation and space for growth.

The City Council is working with the Coventry and Warwickshire Local Enterprise Partnership to develop the Coventry Gateway, a major new employment area in the southeast of Coventry. The site has recently gained planning permission and will create up to 14,000 new jobs.

F.1.4.1 Current services:

- Three services per hour from London Euston to Birmingham New Street/Wolverhampton/North West/Scotland providing fast services from Coventry to Birmingham New Street calling at Birmingham International en route. From December 2013, one service per hour is extended to the North West and Scotland.
- Three services per hour from London Euston to Birmingham New Street calling at most stations between Northampton and Birmingham New Street. Intermediate station calls are not on an even pattern, with not all services stopping at all stations.
- One service per hour from Bournemouth to Manchester Piccadilly calling at Leamington Spa, Coventry, Birmingham International and Birmingham New Street.
- One service per hour from Birmingham International to mid/north Wales calling at the bigger stations in the West Midlands.
- One service per hour from Birmingham International to Birmingham New Street calling at Lea Hall, Stechford and Adderley Park.

F.1.4.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey speed varies on this corridor and rail journey times are competitive with road. Journey times on the non-stopping services are good. The stopping services are slower but speeds are still relatively good compared to other rail corridors in Birmingham.
- **Rolling stoc**k: Rolling stock on this route is a mix of electric and diesel stock capable of 125mph, high accelerating diesel rolling stock capable of 90 to 100mph and early generation diesel stock of 90mph.
- **High Speed Two:** The implementation of HS2 services will release capacity on the route. This will give an opportunity to change rail service offerings on this corridor to accommodate the growing demand for suburban and interurban services.

F.1.4.3 Criteria for conditional outputs:

- **Willingness to commute:** GJTs to Birmingham from all stations between Rugby and Birmingham New Street are below 60 minutes. Northampton to Birmingham's GJT is greater than 60 minutes and reducing this would bring significant economic benefits. GJTs from Northampton, Long Buckby and Rugby to Coventry are also less than 60 minutes. Suburban stations on the corridor do not currently get regular interval services which increases their GJT's.
- **Jobs at destination:** Birmingham is a large employment and financial centre. Coventry is a significant employment centre on the corridor and attracts a large number of commuting trips. Northampton and Milton Keynes are other key destinations on the corridor as well as trip generators. Birmingham Airport is another major trip attractor and employment centre on the corridor for commuting and business trips. The National Exhibition Centre (NEC) is served by Birmingham International and attracts business and leisure journeys.

Service level conditional outputs for the West Midlands - Birmingham

- **Population catchments:** The route has a large population catchment.
- **Market for rail:** This is key commuting route into Birmingham, Coventry and Milton Keynes. A large number of passengers commute from Northampton and Coventry to Birmingham. There are significant leisure and business trips to Birmingham International for access to Birmingham Airport and the NEC. There may be opportunities to increase rail's market share to the airport by provision of earlier or later trains to Birmingham International. Demand for rail is high on this route, which is reflected by the high passenger loadings in the morning peak. Demand for commuting by rail from Northampton to Coventry and Birmingham could be greater but is restricted by the uneven service at intermediate stations and lack of services from Northampton to Birmingham New Street in the morning peak. Adderley Park is close to Birmingham city centre and buses are more competitive than rail. The construction of a new interchange station near the airport as part of the High Speed 2 route is likely to increase demand on this corridor to access the new station.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share is large.

F1.4.4 Recommendations for conditional outputs:

- Provide sufficient capacity to accommodate demand from Coventry and intermediate stations to Birmingham International and Birmingham New Street.
- Provide sufficient capacity to accommodate demand to Coventry from Birmingham and intermediate stations.
- Provide even interval services from intermediate stations between Coventry and Birmingham.
- Improve journey times from Milton Keynes Central and Northampton to Coventry and Birmingham New Street.
- Provide improved services from Northampton to Coventry and to Birmingham New Street in the peak.
- Consider opportunities to provide earlier or later train services to Birmingham International.

F.1.4.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the GJT from Rugby and Coventry on this corridor into Birmingham will have the largest impact on labour supply and reducing deprivation by providing access to employment. There are limited opportunities to improve the service on this corridor as the frequency of services is good. The impact of improvements from these stations to Birmingham on Gross Value Added (GVA) through labour supply improvements is estimated to be around £586,000 per annum per minute of GJT (though mostly driven by improvements to Coventry), and the value of time for existing passengers is valued at around £532,000 per annum per minute of GJT.

Table 4 Population, demand and current services for stations on the Northampton/Coventry corridor to Birmingham New Street to inform conditional outputs												
Corridor	Station name	Total Journeys into Birmingham New Street* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) (mph)	Notes
Northampton/ Coventry to Birmingham New Street	Northampton	239	2,714	6,900	51,000	55,500	50	3 (2)	65 (61)	88	46 (34)	
	Long Buckby	51	235	1,000	900	2,500	40	3 (2)	54 (49)	76	45 (32)	
	Rugby	309	1,751	4,500	27,400	15,000	31	4 (3)	39 (36)	59	47 (31)	
	Coventry	2,352	5,428	9,700	74,800	95,000	19	7 (7)	26 (21)	36	44 (32)	
	Canley	136	221	5,800	66,100	60,500	18	2 (2)	29 (28)	52	36 (20)	
	Tile Hill	274	436	1,100	18,200	40,100	15	3 (3)	23 (22)	42	40 (22)	
	Berkswell	99	235	1,100	4,200	19,900	14	2 (2)	21 (21)	48	39 (17)	
	Hampton-in-Arden	55	115	1,400	1,100	14,200	10	2 (2)	19 (16)	43	33 (14)	
	Birmingham International	1,940	4,329	1,000	17,300	59,000	8	9 (9)	13 (10)	21	38 (23)	
	Marston Green	269	574	4,300	50,300	82,200	7	3 (4)	10 (9)	29	40 (14)	
	Lea Hall	189	454	9,900	71,700	115,900	5	2 (2)	13 (9)	36	23 (8)	
	Stechford	140	361	10,000	80,800	134,000	4	2 (2)	7 (6)	33	33 (7)	
	Adderley Park	13	53	10,700	71,500	166,800	2	1 (2)	10 (5)	36	12 (3)	
Total		**6,066**	**16,907**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Birmingham New Street between 0800 and 0900

Table 5 Population, demand and current services for stations to Coventry to inform conditional outputs

Corridor	Station name	Total Journeys into Coventry* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) (mph)	Notes
Birmingham New Street to Coventry	Birmingham	2,352	46,940	5,900	73,200	163,200	19	7 (7)	26 (21)	36	44 (32)	
	Stechford	14	361	10,000	80,800	134,000	15	1 (1)	23 (23)	54	40 (17)	
	Lea Hall	15	454	9,900	71,700	115,900	14	1 (1)	20 (24)	52	43 (16)	
	Marston Green	40	574	4,300	50,300	82,200	13	3 (3)	20 (18)	38	38 (20)	
	Birmingham International	233	4,329	1,000	17,300	59,000	11	7 (7)	12 (9)	22	55 (29)	
	Hampton-in-Arden	17	115	1,400	1,100	14,200	9	2 (2)	15 (12)	38	36 (14)	
	Berkswell	37	235	1,100	4,200	19,900	6	2 (2)	15 (9)	35	23 (10)	
	Tile Hill	34	436	1,100	18,200	40,100	4	3 (3)	5 (5)	26	46 (9)	
	Canley	15	221	5,800	66,100	60,500	2	2 (2)	3 (3)	29	34 (4)	
Total		**2,757**	**53,666**									
Milton Keynes Central/ Northampton to Coventry	Milton Keynes Central	85	5,558	3,300	42,600	52,300	44	2 (2)	47 (29)	68	56 (39)	
	Northampton	96	2,714	6,900	51,000	55,500	31	3 (2)	34 (33)	59	54 (31)	
	Long Buckby	26	235	1,000	900	2,500	21	3 (2)	22 (22)	47	63 (27)	
	Rugby	248	1,751	4,500	27,400	15,000	12	4 (3)	10 (11)	31	69 (22)	
Total		**455**	**10,258**									

*Year to March 2012 - rounded to nearest 10,000
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Coventry between 0800 and 0900

F.1.5 Leamington Spa/Dorridge corridor

This corridor caters for both long distance flows from London as well as local commuter services into Birmingham.

Housing growth of 5,000 new dwellings is planned for in the Leamington Spa catchment area.

Birmingham City Council are promoting an environmental enterprise district in Tysleley which is expected to create additional jobs.

A committed car park expansion is planned for at Yardley Wood.

F.1.5.1 Current services:

- Three services per hour from Leamington Spa/Dorridge to Birmingham Snow Hill (and beyond) with extra services starting from Leamington Spa in the peak calling at most intermediate stations.
- Two services per hour from London Marylebone to Birmingham Snow Hill with additional services in the peak. Services call at Banbury, Leamington Spa, Warwick Parkway and Solihull with a skip stopping pattern between Warwick and Dorridge.
- One service every two hours from Leamington Spa to Birmingham Moor Street calling at some intermediate stations.
- One service per hour from Southampton Central/Reading to Newcastle calling at Leamington Spa and Birmingham New Street. These services currently go via the Solihull corridor.
- One service per hour from Bournemouth to Manchester Piccadilly calling at Leamington Spa, Coventry, Birmingham International and Birmingham New Street.
- There is a plan to improve the service from Stratford-upon-Avon in the off-peak to Solihull by the extension of one current Dorridge starting train an hour back to Stratford-upon-Avon via Hatton calling at Stratford-upon-Avon Parkway.

F.1.5.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey speed is slow due to the stopping patterns on the route.
- **Rolling stock:** A mix of rolling stock of 90mph to 100mph are used by the suburban services on this route. The intercity servcies are capable of 125mph.

F.1.5.3 Criteria for conditional outputs:

- **Willingness to commute:** GJTs for all stations between Leamington Spa and Small Heath are less then 60 minutes except Hatton and Lapworth. Warwick has a large catchment area and GJTs of less than 60 minutes to Birmingham stations
- **Jobs at destination:** Birmingham is a large employment and financial centre. Solihull, Birmingham Airport and the NEC and Stratford-upon-Avon are key employment areas and attract commuting trips by rail. Warwick and Stratford-upon-Avon are important tourist destinations in the area.
- **Population catchments:** Most stations on the route have large catchment populations including Leamington Spa and Banbury.
- **Market for rail:** Demand for rail is high especially from the mid Chilterns area and the suburbs of Birmingham.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** There is increasing demand for rail in the morning peak and throughout the day.

Service level conditional outputs for the West Midlands - Birmingham

F.1.5.4 Recommendations for conditional outputs:

- Provide sufficient capacity to accommodate demand to Birmingham.
- Improve journey time between Warwick and Birmingham.

F.1.5.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the GJT from Leamington, Warwick and stations serving the large populations of Solihull and Dorridge on this corridor into Birmingham will have the largest impact on labour supply and reducing deprivation by providing access to employment. There are opportunities to improve the GJT from Warwick to Birmingham, particularly in the off-peak and by improving journey times all day. An even pattern service at an average speed of 40mph could reduce the GJT from Warwick to Birmingham by around 13 minutes. The impact of improvements from these stations to Birmingham on Gross Value Added (GVA) through labour supply improvements is estimated to be around £209,000 per annum per minute of GJT and the value of time for existing passengers is valued at around £456,000 per annum per minute of GJT.

Table 6 Population, demand and current services for stations on the Leamington Spa/Dorridge corridor to Birmingham stations to inform conditional outputs

Corridor	Station name	Total Journeys into Birmingham stations* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) (mph)	Notes
Leamington Spa/Dorridge to Birmingham	Banbury	137	1,943	6,200	25,200	2,000	43	4 (4)	51 (46)	71	50 (36)	two trains per hour via Coventry Corridor
	Leamington Spa	397	2,009	11,700	32,600	19,400	23	5 (5)	35 (29)	51	39 (27)	two trains per hour via Coventry Corridor
	Warwick	150	526	5,100	19,600	34,300	21	1.5 (4)	39 (24)	59	32 (21)	
	Warwick Parkway	110	486	0	15,200	13,400	20	2 (4)	29 (20)	51	41 (23)	
	Hatton	23	44	0	2,900	5,600	17	0.5 (3)	48 (27)	65	21 (15)	
	Lapworth	17	36	0	2,100	8,700	13	0.5 (2)	33 (19)	62	23 (12)	
	Dorridge	470	575	3,400	10,900	17,300	10	4.5 (5)	20 (18)	35	30 (17)	
	Widney Manor	289	312	3,300	26,300	41,300	8	3 (5)	17 (16)	36	29 (14)	
	Solihull	1,088	1,424	3,300	43,800	73,000	7	5 (6)	12 (8)	26	33 (15)	
	Olton	352	358	9,200	62,600	122,100	5	3 (5)	10 (7)	29	29 (10)	
	Acocks Green	335	372	10,100	79,900	145,000	4	3 (4)	7 (6)	28	33 (8)	
	Tyseley	106	182	9,700	96,900	140,000	3	2 (6)	6 (4)	23	28 (7)	
	Small Heath	51	100	13,200	87,800	145,600	2	2 (5)	4 (3)	24	27 (5)	Also served by Stratford services
Total		**3,527**	**8,368**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Birmingham Snow Hill/Moor Street and Birmingham New Street between 0800 and 0900

F.1.6 Stratford-upon-Avon corridor

This corridor caters for local commuter services into Birmingham and Stratford-upon-Avon.

A new station of Stratford-upon-Avon Parkway was opened in 2013.

F.1.6.1 Current services:

- Three services per hour from Whitlocks End to Birmingham Moor Street and beyond. One service per hour starts from Stratford-upon-Avon with an additional hourly peak service. Services call at most stations including the new station, Stratford-upon-Avon Parkway which opened in 2013.

F.1.6.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey speed is relatively slow due to the stopping patterns on the route.
- **Rolling stock:** Diesel rolling stock of 90mph.

F.1.6.3 Criteria for conditional outputs:

- **Willingness to commute:** GJTs for all stations between Earlswood and Small Heath are less than 60 minutes. Stations to the south of The Lakes have a GJT of more than 60 minutes. The opening of the new station at Stratford-upon-Avon Parkway has improved access to the rail network in the Stratford-upon-Avon area. The GJT between Stratford-upon-Avon and Stratford-upon-Avon Parkway and Birmingham will be improved by the introduction of the additional off-peak services to Birmingham via Dorridge.
- **Jobs at destination:** Birmingham is a large employment and financial centre.
- **Population catchments:** Some stations on the route have a large catchment population. Several stations have very small catchment areas.
- **Market for rail:** Demand varies on the route, with highest demand from stations closer to the city centre and with a good frequency. Stations towards the end of the route have low demand partly due to the low population catchment and infrequent services. Stratford-upon-Avon is a significant leisure attraction.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** There is increasing demand for rail in the morning peak and throughout the day.

F.1.6.4 Recommendations for conditional outputs:

- Provide sufficient capacity to accommodate demand from stations on this corridor to Birmingham.

F.1.6.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the GJT from Stratford-upon-Avon and large suburbs of Birmingham on this corridor into Birmingham will have the largest impact on labour supply and reducing deprivation by providing access to employment. Two trains per hour on an even pattern and a journey time speed of 40mph (reflecting a fast outer suburban service) could reduce the GJT to Birmingham by around 20 minutes from Stratford-upon-Avon, and small speed improvements could be made to inner suburban services to make small improvements in GJT.

The impact of these improvements from these stations to Birmingham on Gross Value Added (GVA) through labour supply improvements is estimated to be around £45,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £266,000 per annum per minute of GJT.

Table 7 Population, demand and current service for stations on the Stratford-upon-Avon corridor to Birmingham Snow Hill/Birmingham Moor Steet to inform conditional outputs												
Corridor	Station name	Total Journeys into Birmingham stations* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) (mph)	Notes
Stratford-upon-Avon	Stratford-upon-Avon	284	856	6,900	6,900	4,000	25	1 (2)	50 (41)	81	30 (18)	
	Wilmcote	6	21	0	2,600	11,700	22	1 (1)	48 (44)	82	27 (16)	
	Wootton Wawen	4	12	900	1,100	4,100	18	1 (1)	43 (33)	79	26 (14)	
	Henley-in-Arden	56	109	1,100	1,800	3,100	17	1 (2)	36 (29)	69	28 (14)	
	Danzey	4	7	1,400	0	5,800	14	1 (2)	33 (31)	70	25 (12)	
	Wood End	5	13	0	2,800	11,100	12	1 (1)	28 (27)	66	25 (11)	
	The Lakes	4	12	0	5,200	21,100	11	1 (1)	26 (25)	64	24 (10)	
	Earlswood	3	37	0	8,500	24,800	10	1 (2)	23 (20)	60	26 (10)	
	Wythall	25	53	800	17,100	56,700	9	1 (2)	21 (20)	54	25 (10)	
	Whitlocks End	118	81	2,300	38,100	66,300	8	3 (4)	18 (17)	39	26 (12)	
	Shirley	302	313	7,600	49,700	84,100	7	3 (4)	16 (14)	36	26 (11)	
	Yardley Wood	321	352	10,700	72,000	118,100	6	3 (4)	13 (11)	33	26 (10)	
	Hall Green	300	342	12,600	82,500	144,500	4	3 (4)	9 (9)	30	28 (8)	
	Spring Road	135	154	11,100	86,500	146,400	4	3 (4)	7 (6)	28	32 (8)	
	Tyseley	106	182	9,700	96,900	140,000	3	2 (7)	6 (4)	23	28 (7)	Also served by Dorridge services
	Small Heath	51	100	13,200	87,800	145,600	2	2 (5)	4 (3)	24	27 (5)	
Total		1,724	2,644									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Birmingham Snow Hill/Moor Street between 0800 and 0900

F.1.7 South Birmingham and Redditch/Bromsgrove Corridor

The South Birmingham and Redditch/Bromsgrove route is a mixed traffic railway with long distance connections from the South West to Birmingham, suburban services into Birmingham New Street and through freight services.

Services from Hereford are also routed via the Cross City South corridor.

Services from Worcester that are routed via the Cross City South corridor are included in this section. Services that are routed via Kidderminster/Stourbridge to Birmingham Snow Hill/Birmingham Moor Street are addressed in the Kidderminster/Stourbridge corridor in Section F.1.8.

The committed Bromsgrove electrification and Redditch capacity enhancement schemes will increases service frequency to Birmingham from stations south of Longbridge.

There is planned large scale housing development and the development of a large employment site in Longbridge. Longbridge forms one of Birmingham City Council's growth zones focusing on the Information Communication Technology sectors.

The South Worcestershire Development Plan (SWDP) seeks to create 25,000 new jobs in the Worcester area by 2030.

Significant housing development is also planned in the Bromsgrove and Redditch areas. The committed Control Period 5 enhancement to Bromsgrove and Redditch services help to accommodate expected increase in demand for rail.

Birmingham City Council is promoting a life sciences economic zone focussed on Selly Oak and the Hospital.

Improved car parking is being provided at Longbrige and King's Norton.

F.1.7.1 Current services:

- Six services arrive at Birmingham New Street between 07:00 and 08:00, with four services starting from Longbridge and two from Redditch, calling at most or all stations. Off-peak and interpeak frequency is six trains per hour on this route.
- One service per hour from Hereford to Birmingham New Street calling at most stations south of Bromsgrove. Additional services starting from Great Malvern operate in the peak.
- Long Distance services from the South West to Birmingham New Street are also routed via the Cross City corridor but do not call between Cheltenham Spa and Birmingham New Street.
- One service per hour from Cardiff Central to Nottingham calling at Bromsgrove in the peak only and University.
- Control Period Five (CP5) Redditch capacity enhancement: By the end of CP5, the number of services to Redditch will be increased from two trains per hour to three trains per hour.
- Control Period Five (CP5): Extension of electrification to Bromsgrove. Construction of new Bromsgrove station. Extension of Cross City South services from Longbridge to Bromsgrove delivering up to three trains per hour.

F.1.7.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey time on Cross City services is relatively slow because the trains call at most stations on the route. The average speed of the train journey is 25 mph. Service frequency is good on this route on the Cross City service. Journey speed on the Hereford/Worcester services is slow due to infrastructure constraints and the stopping pattern.
- **Rolling stock**: Rolling stock on the Cross City stopping services is electric stock capable of 90mph. On the Worcester and Hereford services diesel stock are used.

F.1.7.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJTs for all stations between Redditch and Selly Oak to Birmingham New Street are less than 60 minutes with the exception of Redditch. The planned service enhancement from Redditch will help to reduce GJTs from Redditch to less than 60 minutes. Similarly, Bromsgrove with the planned service enhancement will see GJTs reduced to less than 60 minutes. The frequency of the Cross City services is good. GJTs to Birmingham New Street from all stations between Hereford and Droitwich Spa are greater than 60 minutes. GJTs from Hereford to Worcester stations is greater than 60 minutes, however GJTs from Great Malvern and Droitwich Spa to Worcester stations are less than 60 minutes. GJTs from Worcester stations to Birmingham are over 60 minutes. Reducing GJT's below 60 minutes contributes towards economic growth.
- **Jobs at destination**: Birmingham is a large employment and financial centre and the University and Hospitals are important employment centres. Worcester is an important urban centre in the West Midlands and drives commuting trips into the centre. A new town centre is being developed at Longbridge as well as employment and housing development to attract a large number of jobs to the area.
- **Population catchments**: The route has a large population catchment. Most stations have more than 40,000 people living within 3 kilometres of the train station. The largest catchment areas are the suburbs of Birmingham such as Selly Oak and Bournville. Hereford and Worcester have large population catchments. Worcester has demand for commuting trips into the centre in the morning peak.
- **Market for rail:** This is a key commuting route into Birmingham. Demand for rail is high on this route, which is reflected by the high passenger loadings in the morning peak. There is a significant market for services to and from University station. Demand for rail to Worcester is high especially in the morning peak. Some large catchments are not being served by rail including Moseley to/from King's Norton and Birmingham. The limited parking capacity at Worcester Shrub Hill and lack of car parks at Worcester Foregate Street have suppressed rail demand by restricting access to the rail station, reducing the attractiveness of rail to some passengers.
- **Deprivation:** There are pockets of deprivation on this route. **http://casa.oobrien.com/booth/**.
- **Rail's market share:** Rail's market share is large. Roads are congested on the A435 (from Birmingham to Moseley and Kings Heath). There are opportunities for rail to increase market share.

F.1.7.4 Recommendations for conditional outputs:

- Provide sufficient capacity to accommodate demand on the South Birmingham and Redditch/Bromsgrove corridor.
- Increase frequency between Worcester and Birmingham.
- Reduce journey times between Hereford and Worcester.
- Consider increasing car park capacity to accommodate rail demand.

F.1.7.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the GJT from Redditch, Worcester, Droitwich Spa and Bromsgrove on this corridor into Birmingham will have the largest impact on labour supply and reducing deprivation by providing access to employment. Increasing the frequency of services and improving journey speeds to 40mph could reduce the GJT to Birmingham by up to 20 minutes from. The impact of these improvements from these stations to Birmingham on Gross Value Added (GVA) through labour supply improvements is estimated to be around £105,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £264,000 per annum per minute of GJT. . Improving the journey times from inner suburban stations on the route could also drive significant benefit, but there is limited opportunity because of the high frequency service and short distances between stops on the route.

Table 8 Population, demand and current service for stations on the Redditch and Hereford corridor to Birmingham to inform conditional outputs

Corridor	Station name	Total Journeys into Birmingham stations* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) (mph)	Notes
Longbridge/ Redditch	Redditch	456	953	4,700	33,600	22,800	16	2 (2)	35 (35)	64	27 (15)	3 trains per hour in CP5, all day
	Alvechurch	76	161	2,200	2,400	21,000	12	2 (2)	30 (30)	58	25 (13)	3 trains per hour in CP5, all day
	Barnt Green	110	256	2,100	5,200	45,500	10	2 (2)	24 (23)	51	26 (12)	3 trains per hour in CP5, all day
	Longbridge	338	751	8,500	45,400	49,800	8	6 (6)	20 (19)	31	23 (15)	
	Northfield	397	743	10,600	56,600	86,700	7	6 (6)	18 (18)	28	22 (14)	
	King's Norton	398	1,102	8,400	65,400	94,000	5	6 (6)	15 (15)	25	21 (13)	
	Bournville	434	983	8,600	70,200	124,000	4	6 (6)	13 (13)	23	20 (11)	
	Selly Oak	953	2,270	12,100	62,900	147,100	3	6 (6)	10 (10)	20	20 (10)	
	University	915	2,595	9,100	65,000	157,400	2	6 (6)	7 (6)	15	21 (9)	
	Five Ways	147	1,345	7,900	60,200	187,900	1	6 (6)	3 (3)	13	18 (4)	
Total		**4,225**	**11,157**									
Hereford	Hereford	84	1,081	5,100	29,600	7,000	55	1 (1)	91 (87)	132	36 (25)	
	Ledbury	28	194	1,100	5,300	2,000	41	1 (1)	73 (70)	115	34 (21)	
	Colwall	5	66	0	3,400	11,100	37	1 (1)	67 (64)	108	33 (20)	
	Great Malvern	78	502	3,900	16,100	5,100	34	1 (2)	64 (59)	93	32 (22)	
	Malvern Link	54	267	4,400	14,200	6,600	33	1 (2)	61 (56)	89	32 (22)	
	Worcester stations	459	2,572	8,600	52,000	13,300	26	1 (2)	47 (43)	70	33 (22)	
	Droitwich Spa	91	489	4,700	12,900	3,000	20	1 (2)	43 (32)	60	28 (20)	
	Bromsgrove	313	523	2,300	15,200	14,900	14	1 (2)	27 (21)	53	31 (16)	
Total												

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Birmingham between 0800 and 0900

Table 9 Population, demand and current service to Worcester to inform conditional outputs

Corridor	Station name	Total Journeys into Worcester stations* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) (mph)	Notes
Longbridge/ Redditch	Hereford	90	1,081	5,100	29,600	7,000	29	1 (1)	41 (40)	84	42 (21)	
	Ledbury	44	194	1,100	5,300	2,000	15	1 (1)	24 (24)	64	37 (14)	
	Colwall	19	66	0	3,400	11,100	11	1 (1)	18 (17)	57	36 (11)	
	Great Malvern	183	502	3,900	16,100	5,100	8	1 (2)	11 (11)	38	43 (12)	
	Malvern Link	86	267	4,400	14,200	6,600	7	1 (2)	8 (8)	35	51 (12)	
	Droitwich Spa	226	489	4,700	12,900	3,000	6	1 (2)	9 (7)	27	39 (13)	
	Bromsgrove	55	523	2,300	15,200	14,900	12	1 (2)	19 (17)	55	38 (13)	
	University	30	2,595	9,100	65,000	157,400	23	1 (2)	35 (30)	69	40 (20)	
Total		**734**	**5,718**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Worcester Foregate/Worcester Shrub Hill between 0800 and 0900

F.1.8 Worcester/Kidderminster/Stourbridge corridor

Worcester services to Birmingham Moor Street/Birmingham Snow Hill are routed via this corridor. The Worcester services to Birmingham New Street via Bromsgrove are discussed in Section F.1.7 Cross City South Corridor.

The South Worcestershire Development Plan (SWDP) seeks to create 25,000 new jobs in Worcester area by 2030.

A committed car park expansion is planned at Rowley Regis and Stourbridge Junction.

F.1.8.1 Current services:

- Two services per hour from Worcester to Birmingham Snow Hill and beyond with off-peak calls at most stations en route.
- Two serices per hour from Kidderminster to Birmingham Snow Hill and beyond calling at most stations en route.
- Two services per hour from Stourbridge Junction to Birmingham Snow Hill and beyond calling at all stations en route.
- Six services per hour from Stourbridge Junction to Stourbridge Town.
- Morning peak services from Kidderminster to London Marylebone calling at most stations between Kidderminster and Birmingham Snow Hill.

F.1.8.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey speed is slow due to the stopping patterns on the route.
- **Rolling stock:** A mix of diesel rolling stock of 70 to 90mph.

F.1.8.3 Criteria for conditional outputs:

- **Willingness to commute**: GJTs to Birmingham for all stations between Kidderminster and Langley Green are less than 60 minutes. GJTs from Kidderminster and Stourbridge Junction stations to Worcester stations are less than 60 minutes.
- **Jobs at destination:** Birmingham is a large employment and financial centre. Worcester is an important urban centre in the West Midlands and drives commuting trips into the centre. Smethwick Galton Bridge offers opportunities for interchange
- **Population catchments:** Population catchments are large on this route, with large suburban towns. Worcester has a large population catchment with high demand for commuting trips into the centre in the morning peak.
- **Market for rail**: Demand for rail to Birmingham is high especially in the morning and evening peak. This is reflected by the high volume of passengers using the rail services. Demand to Worcester by rail is increasing and there is potential for rail to increase its market share especially in the peak.
- **Deprivation:** There are pockets of deprivation on the route. **http://casa.oobrien.com/booth**/.
- **Rail's market share:** There is increasing demand for rail in the morning peak and throughout the day.

F.1.8.4 Recommendations for conditional outputs:

- Provide sufficient capacity to accommodate demand from this corridor to Birmingham and Worcester.
- Improve GJTs from Worcester , Kidderminster and Stourbridge Junction to Birmingham.

Service level conditional outputs for the West Midlands - Birmingham

F.1.8.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the GJT from Kidderminster and Stourbridge on this corridor into Birmingham will have the largest impact on labour supply and reducing deprivation by providing access to employment. Small journey time improvements could be made through line speed improvements and possibly frequency improvements.

The impact of these improvements from these stations to Birmingham on Gross Value Added (GVA) through labour supply improvements is estimated to be around £180,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £300,000 per annum per minute of GJT. Improving the journey times from inner suburban stations on the route could also drive significant benefit, but there is limited opportunity because of the high frequency service and short distances between stops on the route..

Table 10 Population, demand and current services for stations on the Worcester/Kidderminster/Stourbridge route to Birmingham stations to inform conditional outputs

Corridor	Station name	Total Journeys into Birmingham (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) (mph)	Notes
Worcester/ Stourbridge	Droitwich Spa	108	489	4,700	12,900	3,000	20	3 (3)	43 (32)	60	28 (20)	includes the Hereford to Birmingham New Street service
	Hartlebury	2	22	0	1,900	21,200	23	0 (1)	54 (45)	101	25 (13)	
	Kidderminster	416	1,451	6,400	33,900	13,100	19	4 (4)	39 (36)	58	29 (20)	
	Blakedown	23	83	0	5,900	25,800	16	2 (3)	39 (33)	56	24 (17)	
	Hagley	79	463	3,100	12,900	36,200	14	2 (3)	31 (30)	53	27 (16)	
	Stourbridge stations	1,077	1,149	6,800	45,000	57,800	12	6 (6)	27 (26)	40	27 (18)	
	Lye	54	87	7,800	54,500	84,400	11	2 (2)	27 (25)	49	24 (13)	
	Cradley Heath	525	672	7,700	57,200	100,400	10	6 (6)	21 (20)	34	27 (17)	
	Old Hill	112	172	8,500	61,400	96,300	8	2 (2)	19 (19)	42	26 (11)	
	Rowley Regis	518	803	10,100	60,700	120,500	7	6 (6)	15 (14)	27	27 (15)	
	Langley Green	81	161	7,700	63,200	123,600	5	2 (2)	18 (12)	36	18 (9)	
	Smethwick Galton Bridge	68	495	5,100	66,400	127,500	4	6 (6)	8 (6)	18	29 (13)	
	The Hawthorns	176	387	4,900	69,300	134,500	3	6 (6)	8 (6)	19	23 (10)	
	Jewellery Quarter	66	343	6,400	76,600	143,800	1	6 (6)	3 (3)	15	16 (3)	
Total		**3,305**	**6,778**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Birmingham between 0800 and 0900

Table 11 Population, demand and current service to Worcester to inform conditional outputs

Corridor	Station name	Total Journeys into Worcester stations* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) (mph)	Notes
Kidderminster to Worcester	Droitwich Spa	226	489	4,700	12,900	3,000	6	3 (4)	9 (7)	27	39 (13)	
	Hartlebury	12	22	0	1,900	21,200	11	0 (2)	25 (16)	92	27 (7)	
	Kidderminster	249	1,451	6,400	33,900	13,100	15	2 (2)	21 (19)	48	43 (19)	
	Blakedown	8	83	0	5,900	25,800	18	2 (2)	26 (23)	54	42 (20)	
	Hagley	29	463	3,100	12,900	36,200	20	2 (2)	29 (27)	57	41 (21)	
	Stourbridge Junction	80	1,149	6,800	45,000	57,800	22	2 (2)	32 (30)	59	41 (22)	
	Lye	4	87	7,800	54,500	84,400	23	0 (1)	42 (36)	76	33 (18)	
	Cradley Heath	31	672	7,700	57,200	100,400	24	2 (2)	38 (36)	66	39 (22)	
	Old Hill	6	172	8,500	61,400	96,300	26	0 (1)	51 (43)	84	30 (18)	
	Rowley Regis	26	803	10,100	60,700	120,500	27	2 (2)	45 (41)	72	36 (23)	
	Langley Green	2	161	7,700	63,200	123,600	29	0 (1)	56 (47)	90	31 (19)	
	Smethwick Galton Bridge	14	495	5,100	66,400	127,500	30	2 (2)	50 (47)	77	36 (23)	
	The Hawthorns	11	387	4,900	69,300	134,500	31	2 (2)	53 (50)	81	35 (23)	
	Jewellery Quarter	9	343	6,400	76,600	143,800	32	2 (2)	57 (54)	85	34 (23)	
Total		**706**	**6,778**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Worcester Foregate/Worcester Shrub Hill between 0800 and 0900

F.1.9 Wolverhampton and Shrewsbury corridor

Services on this corridor cater for demand for both long distance and regional urban journeys to Shrewsbury, Wolverhampton and Birmingham. Wolverhampton is also served by services from the Stoke-on-Trent and Stafford corridor and this is discussed in Section F.1.10.

There is planned housing and employment growth in Telford.

The i54 Enterprise Zone in Wolverhampton areas will help to boost economic growth and generate employment in the area.

F.1.9.1 Current services:

- Two services per hour from Shrewsbury to Birmingham New Street in the morning and evening peaks calling at most stations on the route, serving commuting and suburban markets. This reduces to hourly in the off-peak.
- One service per hour from Aberystwyth/Holyhead to Birmingham International calling at Telford, Wellington, Wolverhampton and Smethwick Galton Bridge between Shrewsbury and Birmingham New Street.
- Two services per hour from Wolverhampton to Birmingham New Street calling at all stations.

F.1.9.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey speed on this corridor is low compared to other corridors in the West Midlands, averaging at 30 to 40 miles per hour. Services that start at Wolverhampton call at all stations and hence have a slower journey speed.
- **Rolling stock**: A mix of diesel and electric stock of 90 and 100mph.

F.1.9.3 Criteria for conditional outputs:

- **Willingness to commute:** GJTs to Birmingham New Street from stations between Shrewsbury and Bilbrook are greater than 60 minutes. GJTs from Shrewsbury to Wolverhampton are 70 minutes. Reducing GJT significantly to within 60 minutes would provide economic benefits.
- **Jobs at destination:** Birmingham is a large employment and financial centre. Wolverhampton is a key employment centre in the Black Country and drives interurban trips. A large number of passengers also commute from Wolverhampton to Birmingham. Shrewsbury and Telford are the gateway to mid Wales and key urban centres that attract commuting and leisure trips.
- **Population catchments:** Shrewsbury, Telford and Wolverhampton have large population catchments.
- **Market for rail:** This is key commuting route into Birmingham. A large number of passengers travel from Wolverhampton to Birmingham for commuting, business and leisure purposes. Demand for rail from Shrewsbury and adjacent areas are increasing on this corridor. Ironbridge is a leisure attraction not currently served by passenger rail services.
- **Deprivation:** There are pockets of deprivation on the route. **http://casa.oobrien.com/booth**/.
- **Rail's market share:** A small shift in market share can have a big impact on demand.

F.1.9.4 Recommendations for conditional outputs:

- Improve journey times from Shrewsbury and Telford to Wolverhampton and Birmingham. Provide an even service pattern.
- Provide sufficient capacity to accommodate demand between Wolverhampton and Birmingham.
- Provide sufficient capacity to accommodate demand between Shrewsbury, Wolverhampton and Birmingham.

F.1.9.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the GJT from Telford and Wolverhampton on this corridor into Birmingham will have the largest impact on labour supply and reducing deprivation by providing access to employment. Small generalised journey time improvements could be made through speed improvements and possibly frequency improvements from Telford. There is limited opportunity to improve the service from Wolverhampton because of the very high frequency of existing services.

The impact of these improvements from these stations to Birmingham on Gross Value Added (GVA) through labour supply improvements is estimated to be around £607,000 per annum per minute of GJT (around ¾ driven by Wolverhampton), and the value of time for existing passengers is valued at around £716,000 per annum per minute of GJT. Improving the journey times from inner suburban stations such as Coseley, Dudley Port, Sandwell and Dudley, and Smethwick Galton Bridge on the route could also drive significant benefit.

Table 12 Population, demand and current services for stations on the Shrewsbury/Wolverhampton corridor to Birmingham New Street to inform conditional outputs

Corridor	Station name	Total Journeys into Birmingham stations* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station(census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) (mph)	Notes
Shrewsbury/ Wolverhampton to Birmingham	Shrewsbury	201	1,730	5,900	33,400	13,700	42	2 (3)	61 (55)	87	42 (29)	
	Wellington	138	560	6,100	20,100	19,100	32	2 (3)	48 (41)	73	40 (26)	
	Oakengates	10	52	4,100	30,400	35,700	29	1 (2)	51 (50)	87	34 (20)	
	Telford Central	271	1,033	5,400	29,000	37,500	28	2 (3)	40 (34)	66	42 (26)	
	Shifnal	35	122	1,800	2,200	16,800	25	1 (2)	41 (41)	75	37 (20)	
	Cosford	12	61	0	6,400	1,200	22	1 (2)	41 (36)	73	32 (18)	
	Albrighton	37	105	0	3,500	5,900	20	1 (2)	40 (33)	70	30 (17)	
	Codsall	53	121	2,800	9,100	34,900	17	1 (2)	39 (36)	66	26 (16)	
	Bilbrook	55	129	4,700	14,600	47,000	17	1 (2)	39 (25)	64	25 (16)	
	Wolverhampton	2,936	4,189	5,600	63,800	102,100	13	10 (12)	19 (16)	27	39 (28)	
	Coseley	221	367	7,600	60,600	106,500	9	3 (4)	21 (13)	39	26 (14)	
	Tipton	125	253	8,000	62,300	110,500	8	2 (3)	17 (16)	41	28 (12)	
	Dudley Port	164	383	8,300	55,300	114,900	7	2 (3)	15 (14)	39	28 (11)	
	Sandwell & Dudley	330	700	4,100	56,100	128,800	5	4 (4)	10 (9)	28	30 (11)	
	Smethwick Galton Bridge	91	495	5,100	66,400	127,500	4	4 (5)	8 (5)	17	29 (13)	
	Smethwick Rolfe Street	99	369	10,300	71,200	126,400	3	2 (3)	12 (6)	29	16 (7)	
Total		**4,777**	**10,669**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Birmingham New Street between 0800 and 0900

Table 13 Population, demand and current services for stations to Wolverhampton to inform conditional outputs												
Corridor	Station name	Total Journeys into Wolverhampton* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station(census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) (mph)	Notes
Stoke-on-Trent to Wolverhampton and Birmingham to Wolverhampton	Stoke-on-Trent	90	2,444	9,000	48,400	96,100	32	2 (2)	32 (30)	61	59 (31)	
	Stafford	217	1,842	3,200	33,500	10,100	15	4 (5)	14 (12)	32	65 (28)	
	Penkridge	35	195	1,200	5,200	2,300	10	1 (1)	13 (10)	39	46 (16)	
	Coseley	65	367	7,600	60,600	106,500	3	3 (3)	6 (6)	26	33 (8)	
	Tipton	63	253	8,000	62,300	110,500	5	2 (2)	13 (9)	34	22 (8)	
	Dudley Port	44	383	8,300	55,300	114,900	6	2 (2)	14 (11)	35	24 (10)	
	Sandwell & Dudley	56	700	4,100	56,100	128,800	8	4 (4)	13 (11)	32	35 (14)	
	Smethwick Galton Bridge	32	495	5,100	66,400	127,500	9	4 (4)	14 (11)	30	38 (18)	
	Smethwick Rolfe Street	27	369	10,300	71,200	126,400	10	2 (2)	19 (19)	44	30 (13)	
	Birmingham	2,936	46,940	5,900	73,200	163,200	13	10 (10)	19 (17)	27	39 (28)	
Total		**3,476**	**51,544**									
Shrewsbury to Wolverhampton	Shrewsbury	110	1,730	5,900	33,400	13,700	30	2 (3)	43 (38)	70	42 (25)	
	Wellington	64	560	6,100	20,100	19,100	20	2 (3)	30 (23)	55	39 (21)	
	Oakengates	13	52	4,100	30,400	35,700	17	1 (2)	33 (31)	66	30 (15)	
	Telford Central	183	1,033	5,400	29,000	37,500	16	2 (3)	22 (18)	47	42 (20)	
	Shifnal	18	122	1,800	2,200	16,800	12	1 (2)	23 (23)	56	32 (13)	
	Cosford	9	61	0	6,400	1,200	9	1 (2)	22 (18)	53	25 (11)	
	Albrighton	17	105	0	3,500	5,900	8	1 (2)	22 (15)	51	21 (9)	
	Codsall	19	121	2,800	9,100	34,900	5	1 (2)	20 (9)	45	14 (6)	
	Bilbrook	25	129	4,700	14,600	47,000	4	1 (2)	20 (7)	43	12 (6)	
Total		**456**	**3,913**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Wolverhampton between 0800 and 0900

F.1.10 Stoke-on-Trent/Stafford corridor

This corridor has a mixture of long distance and regional urban services to meet demand for business, leisure and commuting to Stoke-on-Trent, Wolverhampton and Birmingham. Local services that start at Wolverhampton are discussed in Section F.1.9.

Stakeholders aspire for direct connections from Kidsgrove and Stone into Birmingham.

Significant housing and employment growth is projected with 20,000 houses and 332 hectares of employment land planned for in Stone, Kidsgrove, Stoke-on-Trent and Newcastle-under-Lyme by 2026.

According to the Black County Core Strategy document Wolverhampton has a projected growth of 3,230 new houses along with 220,000m² of additional office floor space and 100,000m² of Comparison Retail floor space. Dudley is poorly served currently by rail. There is an opportunity for Dudley Port to be served by Metro light rail and provide rail interchange at the station to improve access to the Brierley Hill area.

Stakeholders aspire for direct connections from Kidsgrove and Stone into Birmingham.

F.1.10.1 Current services:

- Two services per hour from Liverpool Lime Street to Birmingham New Street calling at Crewe, Stafford, Penkridge (alternate stops) Wolverhampton, Coseley, Smethwick Galton Bridge and Birmingham New Street for interurban and suburban markets.
- One service per hour from Manchester Piccadilly to Bristol Temple Meads calling at Stoke-on-Trent, Stafford, Wolverhampton and Birmingham new Street providing a fast service on the Stafford corridor.
- One service per hour from Manchester Piccadilly to Bournemouth calling at Stoke-on-Trent, Stafford, Wolverhampton and Birmingham New Street providing a fast service on the Stafford corridor.
- One service per hour from Wolverhampton to London Euston and irregular Manchester Piccadilly to London Euston via Stafford and Wolverhampton services on this route.
- One service per hour from Preston/Glasgow Central/Edinburgh Waverley to Birmingham via Wolverhampton. From December 2013, this service is combined with the hourly Wolverhampton to London Euston service, to continue to London Euston.

F.1.10.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey speed varies on this corridor due to rolling stock characteristics and calling patterns. Journey speed on services which start at Wolverhampton is moderate due to services calling at all stations
- **Rolling stock:** A mix of 125mph and 100mph electric stock is used.

F.1.10.3 Criteria for conditional outputs:

- **Willingness to commute:** GJTs from Stoke-on-Trent to Wolverhampton and Birmingham New Street are greater than 60 minutes. GJTs from Stafford to Birmingham New Street are 50 minutes, 32 minutes to Wolverhampton and 43 minutes to Stoke-on-Trent. Penkridge has a GJT of 58 minutes and 27 minutes to Birmingham and Wolverhampton. GJTs from Kidsgrove and Stone to Stoke-on-Trent more than 60 mintues to Birmingham New Street. Connections between Stone and Birmingham are poor.
- **Jobs at destination:** Birmingham is a large employment and financial centre. Stoke-on-Trent, Stafford and Wolverhampton are major employment centres on the corridor and attract a large number of commuting trips into the city centre.
- **Population catchments:** Both Stafford and Wolverhampton have large population catchment. Passengers also rail head at Penkridge.

Service level conditional outputs for the West Midlands - Birmingham

- **Market for rail:** This is key commuting route into Birmingham. A large number of passengers travel from Stafford and Wolverhampton to Birmingham for commuting, business and leisure purposes. There is opportunity to increase passenger demand from Stone to Birmingham if better connections were provided.
- **Deprivation:** There are pockets of deprivations on this route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share is large compared to other regions and is increasing.

F.1.10.4 Recommendations for conditional outputs:

- Provide sufficient capacity to accommodate demand between Stafford and Birmingham.

F.1.10.5 Analysis of conditional outputs against strategic goals:

See Wolverhampton and Shrewsbury corridor Section F.1.9.

Table 14 Population, demand and current services for stations on the Stoke-on-Trent route into Birmingham New Street to inform conditional outputs

Corridor	Station name	Total Journeys into Birmingham Stations* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station(census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) (mph)	Notes
Stoke-on-Trent	Stone	2	85	1,000	10,400	2,100	37	1 (1)	60 (57)	109	37 (20)	No direct trains to Birmingham
	Kidsgrove	2	158	6,100	18,200	39,900	50	2 (2)	76 (72)	117	40 (26)	No direct trains to Birmingham
	Stoke-on-Trent	259	2,444	9,000	48,400	96,100	44	2 (3)	50 (48)	80	53 (33)	
	Stafford	366	1,842	3,200	33,500	10,100	28	4 (6)	33 (29)	51	51 (32)	
	Penkridge	85	195	1,200	5,200	2,300	23	1 (2)	33 (28)	58	41 (23)	
Total		**714**	**4,725**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Birmingham New Street between 0800 and 0900

Table 15 Population, demand and current services for stations to Stoke-on-Trent to inform conditional outputs												
Corridor	Station name	Total Journeys into Stoke-on-Trent* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station(census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised speed) (mph)	Notes
Stoke-on-Trent	Manchester Piccadilly	536	34,230	5,700	58,400	141,600	38	5 (5)	45 (39)	60	51 (38)	
	Birmingham New Street	259	46,940	5,900	73,200	163,200	44	2 (2)	50 (48)	80	53 (33)	
	Stafford	126	1,842	3,200	33,500	10,100	16	3 (3)	19 (17)	43	51 (23)	
	Wolverhampton	90	4,189	5,600	63,800	102,100	32	2 (2)	32 (31)	61	59 (31)	
	Stockport	59	3,313	7,900	72,200	110,000	32	5 (5)	32 (25)	50	60 (39)	
	Macclesfield	53	1,324	7,500	27,800	6,400	20	3 (3)	18 (16)	41	67 (30)	
	Derby	51	3,351	4,300	61,600	75,700	36	1 (1)	53 (51)	92	41 (24)	
	Crewe	51	2,351	6,400	34,000	18,300	15	2 (2)	40 (22)	54	23 (17)	
	Kidsgrove	26	158	6,100	18,200	39,900	6	3 (3)	10 (8)	35	38 (11)	
	Stone	18	85	1,000	10,400	2,100	7	1 (1)	10 (10)	49	43 (9)	
Total		**1,268**	**97,784**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Stoke-on-Trent between 0800 and 0900

F.1.11 Rugeley Trent Valley/Walsall corridor

Services on this corridor cater for regional urban demand from Rugeley and Walsall to Birmingham New Street.

According to the Black County Core Strategy document Walsall has a projected growth of 450 new houses along with 220,000m² of additional office floorspace and 85,000m² of Comparison Retail floorspace

Linespeed improvements are planned between Walsall and Rugeley in Control Period 5.

The electrification of the line between Rugeley and Walsall is planned in Control Period 5.

F.1.11.1 Current services:

- One service per hour from Rugeley Trent Valley to Birmingham New Street with additional services in the peak and on Saturday, calling at all stations between Rugeley Trent Valley and Walsall and Tame Bridge Parkway between Walsall and Birmingham New Street.
- Two services per hour from Walsall to Wolverhampton via Birmingham New Street calling at most stations between Tame Bridge Parkway and Birmingham New Street.

F.1.11.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey speed on the Rugeley Trent Valley services is relatively slow.
- **Rolling stock**: Electric Multiple units of 100mph are used on the services which start at Walsall. Diesel rolling stock is used on the Rugeley services.

F.1.11.3 Criteria for conditional outputs:

- **Willingness to commute:** GJTs to Birmingham New Street from all stations between Rugeley Trent Valley and Bloxwich are greater than 60 minutes. Reducing GJT to below 60 minutes will help to support economic growth. Stations between Walsall and Birmingham have GJTs of less than 60 minutes.
- **Jobs at destination:** Birmingham is a large employment and financial centre. Walsall is a key urban centre in the West Midlands and attracts commuting trips in the peak.
- **Population catchments:** The route has large population catchment.
- **Market for rail:** Demand for rail is high on this corridor which is reflected by ticket sales and passenger loadings in the peak. Connectivity to the north from Walsall by rail is poor and requires interchange at Birmingham New Street or Rugeley Trent Valley.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share is high

F.1.11.4 Recommendations for conditional outputs:

- Provide sufficient capacity to accommodate demand.
- Improve journey times between Rugeley , Cannock and Birmingham.
- Improve service frequency between Walsall and Rugeley off-peak weekdays.
- Improve connectivity on the route to the north.

F.1.11.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the GJT from Rugeley, Cannock, Bloxwich, Walsall and Tame Bridge Parkway on this corridor into Birmingham will have the largest impact on labour supply and reducing deprivation by providing access to employment. Two trains per hour and an average journeys speed of 40mph could reduce the GJT by up to 20 minutes. The impact of these improvements from these stations to Birmingham on Gross Value Added (GVA) through labour supply improvements is estimated to be around £122,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £240,000 per annum per minute of GJT.

Table 16 Population, demand and current service for stations on the Rugeley Trent Valley/Walsall corridor to Birmingham New Street to inform conditional outputs

Corridor	Station name	Total Journeys into Birmingham stations* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) (mph))	Notes
Rugeley Trent Valley/Walsall	Rugeley Trent Valley	22	114	2,300	13,700	6,100	26	1 (2)	53 (53)	82	29 (19)	
	Rugeley Town	63	151	3,600	13,400	7,200	25	1 (2)	58 (50)	80	26 (19)	
	Hednesford	98	178	3,400	31,700	18,600	21	1 (2)	56 (42)	73	22 (17)	
	Cannock	147	253	6,600	36,800	26,000	19	1 (2)	40 (38)	68	28 (17)	
	Landywood	62	117	7,400	11,600	54,100	17	1 (2)	41 (38)	67	25 (15)	
	Bloxwich North	38	45	7,500	36,100	74,300	15	1 (2)	38 (32)	63	24 (14)	
	Bloxwich	29	39	7,300	51,300	75,500	14	1 (2)	32 (30)	61	26 (14)	
	Walsall	625	1,216	9,300	54,000	95,600	11	4 (4)	24 (23)	42	28 (16)	
	Bescot Stadium	54	132	7,200	60,900	92,900	9	2 (2)	24 (22)	48	23 (11)	
	Tame Bridge Parkway	306	491	9,100	54,800	94,200	8	4 (4)	18 (17)	34	27 (14)	
	Hamstead	56	238	10,500	59,800	126,300	6	2 (2)	16 (15)	42	21 (8)	
	Perry Barr	170	645	9,000	77,500	127,600	4	2 (2)	13 (12)	39	20 (7)	
	Witton	63	265	7,000	72,000	149,800	4	2 (2)	11 (10)	37	20 (6)	
	Aston	61	445	4,000	75,100	156,400	3	2 (2)	7 (6)	16	24 (11)	
	Duddeston	30	180	6,400	72,600	161,200	2	2 (2)	6 (4)	20	15 (5)	
Total		**1,825**	**4,511**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Birmingham New Street between 0800 and 0900

Table 17 Population, demand and current service for stations to Walsall to inform conditional outputs

Corridor	Station name	Total Journeys into Walsall* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) (mph)	Notes
Rugeley Trent Valley	Rugeley Trent Valley	4	114	2,300	13,700	6,100	15	1 (2)	32 (33)	63	29 (15)	
	Rugeley Town	21	151	3,600	13,400	7,200	14	1 (2)	28 (26)	58	30 (14)	
	Hednesford	32	178	3,400	31,700	18,600	10	1 (2)	20 (17)	49	29 (12)	
	Cannock	28	253	6,600	36,800	26,000	8	1 (2)	16 (14)	44	29 (11)	
	Landywood	12	117	7,400	11,600	54,100	6	1 (2)	17 (14)	45	20 (8)	
	Bloxwich North	5	45	7,500	36,100	74,300	4	1 (2)	13 (9)	42	18 (5)	
	Bloxwich	4	39	7,300	51,300	75,500	3	1 (2)	8 (7)	40	21 (4)	
	Bescot Stadium	5	132	7,200	60,900	92,900	2	2 (2)	5 (4)	31	24 (4)	
	Tame Bridge Parkway	13	491	9,100	54,800	94,200	3	4 (4)	8 (7)	23	23 (8)	
	Hamstead	17	238	10,500	59,800	126,300	6	2 (2)	12 (12)	37	28 (9)	
	Perry Barr	17	645	9,000	77,500	127,600	7	2 (2)	15 (15)	40	28 (11)	
	Witton	15	265	7,000	72,000	149,800	8	2 (2)	15 (17)	42	32 (11)	
	Aston	14	445	4,000	75,100	156,400	9	2 (2)	19 (19)	44	27 (12)	
	Duddeston	8	180	6,400	72,600	161,200	10	2 (2)	22 (22)	48	28 (13)	
Total		**194**	**3,295**									
Wolverhampton	Wolverhampton	27	4,189	5,600	63,800	102,100	7	2 (2)	60 (45)	82	7 (5)	
Total		**27**	**4,189**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Walsall between 0800 and 0900

F.2 Non-Birmingham flows

This section identifies key cross-West Midlands flows and non-Birmingham flows in the West Midlands that the subsequent route studies are required to consider to meet demand for these flows.

Demand for travel across Birmingham city centre, particularly to Birmingham International for access to Birmingham Airport and the National Exhibition Centre (NEC) will be considered in the Route Study. The rest of this Appendix considers other key passenger flows in the West Midlands.

F.2.1 Leamington Spa to Coventry

This route is currently served by one service per hour between the South Coast and Manchester. There are also important freight flows across this route. There is a plan to electrify the route.

Business parks and large housing developments are planned in the south of Birmingham. Major office development is also planned at Friargate which is located next to Coventry station.

The Coventry and Warwickshire City Deal is proposing to boost growth in high value advanced manufacturing and engineering through investment in skills; access to innovation and space for growth.

The City Council is working with the Coventry and Warwickshire Local Enterprise Partnership to develop the Coventry Gateway, a major new employment area in the southeast of Coventry. The site has recently gained planning permission and will create up to 14,000 new jobs.

F.2.1.1 Current services:

- One service per hour from Bournemouth to Manchester Piccadilly calling at Leamington Spa, Coventry, Birmingham International and Birmingham New Street.

F.2.1.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey speed is fast.
- **Rolling stock:** Fast accelerating diesel rolling stock operate on this route.

F.2.1.3 Criteria for conditional outputs:

- **Willingness to commute:** GJT from Leamington Spa to Coventry is 50 minutes.
- **Jobs at destination:** Coventry is a key destination on the corridor.
- **Population catchments:** The route has large population catchment. The Kenilworth catchment area is not served by rail.
- **Market for rail:** Demand for rail is high on this corridor. The catchment area of Kenilworth is not served by rail and rail's market share in the area can potentially increase by providing direct rail connection.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share is high. Potential to increase rail's market share to the catchment area of Kenilworth.

F.2.1.4 Recommendations for conditional outputs:

- Provide additional capacity between Leamington Spa and Coventry

F.2.2 Coventry to Nuneaton

This route is currently served by one train per hour and also serves passengers travelling from Coventry to Leicester, via an interchange at Nuneaton. This route also forms part of the Electric Spine proposals. (A plan to electrify a number of routes in England in CP5). The GJT on this route is between 40 and 58 minutes currently. This will reduce once the Coventry to Nuneaton project is completed, providing two trains per hour.

The electric spine proposals, if implemented will see the route electrified.

Major office development is also planned at Friargate which is located next to Coventry station.

The Coventry and Warwickshire City Deal is proposing to boost growth in high value advanced manufacturing and engineering through investment in skills; access to innovation and space for growth.

The City Council is working with the Coventry and Warwickshire Local Enterprise Partnership to develop the Coventry Gateway, a major new employment area in the southeast of Coventry. The site has recently gained planning permission and will create up to 14,000 new jobs.

New stations are planned at Ricoh Arena and Bermuda Park

F.2.2.1 Current services:

- One service per hour from Coventry to Nuneaton calling at Bedworth. There is a funded project to increase this frequency to two trains per hour calling at new stations at Ricoh Arena, and Bermuda Park in addition to Bedworth.

F.2.2.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey speed is slow
- **Rolling stock:** Early generation diesel stock with a speed of 75mph.

F.2.2.3 Criteria for conditional outputs:

- **Willingness to commute:** GJTs from Coventry to Bedworth and Nuneaton are 51 and 58 minutes respectively.
- **Jobs at destination:** Coventry is a key destination on the corridor. Nuneaton provides connectivity to the East Midlands.
- **Population catchments:** Some areas are not served by rail currently and the new stations planned for will enable a larger area to be served by rail.
- **Market for rail:** Demand for rail is high on this corridor given its level of services.
- **Deprivation: T**here are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share is relatively high and there is potential to increase rail's market share by improved services.

F.2.2.4 Recommendations for conditional outputs:

- Provide capacity between Coventry and Nuneaton to accommodate demand.

Table 18 Population, demand and current services for stations to Coventry to inform conditional outputs

Corridor	Station name	Total Journeys into Coventry* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised speed) (mph)	Notes
Leamington to Coventry	Banbury	48	1,943	6,200	25,200	2,000	29	1 (1)	28 (27)	68	62 (26)	
	Leamington Spa	222	2,009	11,700	32,600	19,400	9	1 (1)	10 (10)	50	55 (11)	
Total		**270**	**3,952**									
Nuneaton to Coventry	Nuneaton	99	997	5,200	35,600	24,600	10	1 (1)	29 (19)	58	21 (11)	
	Bedworth	15	61	8,700	18,100	54,000	6	1 (1)	13 (12)	51	26 (7)	
Total		**114**	**1,058**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Coventry between 0800 and 0900

F.2.3 Coventry to Leicester

There are no direct services between Coventry and Leicester, so an interchange is required at Nuneaton. The GJT is around 110 minutes, which is not competitive with road, as this route parallels the M69 motorway. Reducing GJT to below 60 minutes will help to support economic growth. Population catchments on this route are large, with both Coventry and Leicester attracting significant commuter flows.

The recommended conditional outputs are:

- Improved connectivity between Coventry and Leicester.
- Improved frequency and/or journey times between Coventry and Leicester.

F.2.4 Walsall to Wolverhampton

Walsall and Wolverhampton are the key urban centres in the Black County and are approximately seven miles apart. Currently the services are routed via Birmingham New Street and not competitive with road. The GJT between Walsall and Wolverhampton is large at 78 minutes. Reducing GJT to below 60 minutes will help to support economic growth.

The recommended conditional outputs are:

- Improved journey times between Walsall and Wolverhampton.

Appendix G: Service level conditional outputs for the Yorkshire and Humber

Appendix G: Service level conditional outputs for Yorkshire and Humber

This appendix details the service level conditional outputs for West, East, North and South Yorkshire.

G.1 Service level conditional outputs for West Yorkshire

This section is an interpretation of the Regional Urban conditional outputs into and within West Yorkshire disaggregated by the rail corridors into Leeds.

Leeds is a key centre for business, legal and financial services outside London. There are over 400,000 jobs in Leeds, with three times as many private sector jobs as public sector jobs. The University of Leeds and Leeds Metropolitan University have over 60,000 students combined and Leeds is the commercial and cultural centre of West Yorkshire. The Government recently announced that the High Speed Rail network would include a station at Leeds. As the economy of Leeds has developed, the conditions required for the success of rail have become more favourable, and passenger growth has increased significantly in the past decade. Leeds is the centre of a West Yorkshire rail network that is required to meet the needs of the Long Distance, Freight and Regional Urban markets.

Leeds is part of the first wave of core cities to achieve City Deal status. This will give more accountability to the region in exchange for more powers to encourage jobs and growth in the area.

Bradford has strong cultural and economic links with Leeds. There are approximately 200,000 jobs in Bradford, and twice as many private sector jobs as public. The University of Bradford has around 13,000 students and Bradford College has over 25,000 students.

Several large towns and cities in Yorkshire and beyond drive commuting, leisure and business trips to and from Leeds and to a lesser extent Bradford. In particular, centres such as Hull, Harrogate, Huddersfield, Wakefield, Doncaster and Sheffield drive interurban rail trips across the region. Other towns form part of a commuter and interurban network centred on Leeds.

This section is organised into a description of the conditional outputs relating to each of the following corridors around Leeds:

- Airedale and Wharfedale (Ilkley, Bradford Forster Square, Skipton and Settle).
- **Harrogate.East** of Leeds (York, Scarborough, Middlesbrough, Selby and Hull).
- Castleford (Castleford, Knottingley and Goole).
- Barnsley and Sheffield.
- Moorthorpe to Doncaster and Sheffield.
- Huddersfield (Batley, Dewsbury, Huddersfield, Manchester).
- Calder Valley (Brighouse, Halifax, Bradford, Rochdale, Hebden Bridge and Manchester).

G.1.1 Ilkley to Leeds

The Ilkley line to Leeds serves stations from Ilkley to Leeds via Guiseley. The line serves a strong commuting market into Leeds from several towns. Demand on the line is high partly driven by significant investment and the provision of high quality and frequent services, particularly in the peak.

G.1.1.1 Current services:

- Two services per hour from Ilkley to Leeds stopping at all stations to Leeds with two extra services in the peak.

G.1.1.2 Journey times and rolling stock:

- **Journey times/speeds:** Train journey times are relatively fast compared with other suburban corridors.
- **Rolling stock:** Services are run by fast accelerating electric stock on this route.

G.1.1.3 Criteria for conditional outputs:

- **Willingness to commute:** All stations with a direct service have a generalised journey time (GJT) into Leeds of less than 60 minutes and more than 20 minutes, so willingness to travel is sensitive to changes in frequency and journey time.
- **Jobs at destination:** Leeds is a key centre of employment in West Yorkshire.
- **Population catchments:** The population catchments for all stations are large relative to stations on other corridors.
- **Market for rail:** Demand is high from all stations into Leeds particularly from Ilkley and Guiseley.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** This line has a relatively high market share due to the high quality outer suburban service into Leeds.

G.1.1.4 Recommendations for conditional outputs:

- Improve off-peak frequencies into Leeds on this route to match the frequency of services in the peak.
- Improve journey times on the route; however, the gains to be made by improving rolling stock are limited.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

G.1.1.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from all stations to Leeds on this corridor will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements could be made through journey time and frequency improvements. The impact of these improvements from these stations to Leeds on Gross Value Added (GVA) through labour supply improvements is estimated to be around £84,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £576,000 per annum per minute of GJT.

Table 1 - Population, demand and current service for stations on the Ilkley, Skipton, Bradford and Settle routes into Leeds to inform conditional outputs												
Corridor	**Station name**	**Total Journeys into Leeds* (thousands)**	**Total Journeys to and from station (ORR station usage 2011-2012) (thousands)**	**Population <1km from station (census 2011)****	**Population between 1 and 3km from station (census 2011)**	**Population between 3 and 5km from station (census 2011)**	**Distance in miles from Leeds**	**Frequency off peak (peak***) (trains per hour)**	**Average journey time (best) (minutes)**	**Generalised Journey Time (minutes)**	**Average speed (Generalised Speed) - mph**	**Notes**
Ilkley	Ilkley	1,150	1,374	5,700	4,300	3,800	16	2 (4)	32 (28)	51	30 (19)	
	Ben Rhydding	160	181	3,300	7,900	5,300	15	2 (4)	30 (26)	47	30 (19)	
	Burley-in-Wharfedale	350	445	3,000	8,600	21,800	13	2 (4)	24 (20)	42	32 (18)	
	Menston	390	505	3,000	18,300	19,700	12	2 (4)	19 (17)	40	37 (17)	
	Guiseley	780	962	5,900	19,500	36,900	10	2 (4)	18 (14)	36	34 (17)	
	Baildon	50	220	4,500	32,100	72,200	12	indirect	indirect	59	indirect	
Total		**2,880**	**3,687**									
Skipton	Skipton	210	949	1,800	8,800	5,400	26	2 1/2 (5)	41 (35)	60	38 (26)	
	Cononley	50	152	0	6,900	17,900	23	2 (4)	41 (36)	59	34 (23)	
	Steeton & Silsden	510	751	2,100	10,700	28,100	20	2 (5)	33 (32)	52	37 (23)	park and ride station
	Keighley	920	1,682	6,700	25,300	25,200	17	2 1/2 (5)	31 (24)	45	33 (23)	
	Crossflatts	260	353	4,000	18,100	37,500	14	2 (4)	29 (24)	46	30 (19)	
	Bingley	910	1,212	6,200	16,100	44,300	14	2 1/2 (5)	25 (21)	40	33 (21)	
	Saltaire	430	686	8,700	43,600	81,500	12	2 (4)	18 (17)	39	38 (18)	
	Shipley	1,300	1,532	8,000	50,500	82,300	11	4 1/2 (7)	15 (14)	27	43 (24)	
Total		**4,590**	**7,317**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Leeds between 0800 and 0900

Table 1 (continued) - Population, demand and current service for stations on the Ilkley, Skipton, Bradford and Settle routes into Leeds to inform conditional outputs

Corridor	Station name	Total Journeys into Leeds* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Leeds	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) - mph	Notes
Bradford via Shipley	Bradford	3,150	5,035	7,600	88,400	110,200	10	6 (6)	22 (19)	34	26 (17)	
	Frizinghall	140	390	8,600	77,800	103,200	12	2 (2)	22 (18)	46	32 (15)	
Total		**3,290**	**5,425**									
Settle and Giggleswick	Horton-in-Ribblesdale	3	19	0	0	0	47	1/4 (1)	75 (72)	161	38 (18)	
	Settle	22	139	1,500	1,100	1,400	41	1/4 (1)	57 (54)	147	43 (17)	
	Clapham	2	7	0	1,000	0	48	1/4 (0)	115 (76)	181	25 (16)	
	Giggleswick	2	12	0	2,600	1,400	41	1/4 (0)	112 (65)	172	22 (14)	
	Long Preston	5	13	0	1,600	1,100	37	1/2 (1)	84 (57)	129	27 (17)	
	Hellifield	8	27	1,600	0	0	36	1/2 (1)	58 (53)	121	37 (18)	
	Gargrave	7	22	1,000	0	2,600	30	1/2 (1)	67 (45)	118	27 (15)	
Total		**49**	**239**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Leeds between 0800 and 0900

G.1.2 Ilkley to Bradford

The Ilkley line to Bradford serves stations from Ilkley to Bradford Forster Square via Baildon. Whilst demand on this line is not as high as into Leeds, the speed, frequency and quality of services means that rail competes with other modes into Bradford.

G.1.2.1 Current services:

- Two services per hour from Ilkley to Bradford Forster Square stopping at all stations to Bradford.

G.1.2.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey times are relatively fast compared with other suburban corridors.
- **Rolling stock**: Services are run by fast accelerating electric stock on this route.

G1.2.3 Criteria for conditional outputs:

- **Willingness to commute**: All stations with a direct service have a generalised journey time (GJT) into Bradford of less than 60 minutes and more than 20 minutes, so willingness to travel is sensitive to changes in frequency and journey time.
- **Jobs at destination:** Bradford is a key centre of employment in West Yorkshire.
- **Population catchments**: The population catchments for all stations are large relative to stations on other corridors.
- **Market for rail:** Demand into Bradford from this line tends to be lower than into Leeds from all stations except Baildon.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** This line has a relatively high market share due to the high quality outer suburban service into Leeds.

G1.2.4 Recommendations for conditional outputs:

- Improve journey times on the route; however, the gains to be made by improving rolling stock are limited.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

Table 2 - Population, demand and current services for stations on the Ilkley and Skipton routes to Bradford to inform conditional outputs												
Corridor	**Station name**	**Total Journeys into Bradford* (thousands)**	**Total Journeys to and from station (ORR station usage 2011-2012) (thousands)**	**Population <1km from station (census 2011)****	**Population between 1 and 3km from station (census 2011)**	**Population between 3 and 5km from station (census 2011)**	**Distance in miles from Bradford**	**Frequency off peak (peak***) (trains per hour)**	**Average journey time (best) (minutes)**	**Generalised Journey Time (minutes)**	**Average speed (Generalised Speed) - mph**	**Notes**
Ilkley	Ilkley	190	1,374	5,700	4,300	3,800	13	2 (2)	32 (32)	60	25 (13)	
	Ben Rhydding	20	181	3,300	7,900	5,300	12	2 (2)	30 (29)	56	25 (13)	
	Burley-in-Wharfedale	40	445	3,000	8,600	21,800	10	2 (2)	24 (23)	51	26 (12)	
	Menston	50	505	3,000	18,300	19,700	9	2 (2)	21 (20)	48	25 (11)	
	Guiseley	100	962	5,900	19,500	36,900	7	2 (2)	18 (17)	44	25 (10)	
	Baildon	100	220	4,500	32,100	72,200	4	2 (2)	13 (12)	39	19 (7)	
Total		**500**	**3,687**									
Skipton	Skipton	80	949	1,800	8,800	5,400	18	2 (2)	37(36)	62	29 (18)	
	Cononley	10	152	0	6,900	17,900	15	2 (2)	33(32)	56	27 (16)	
	Steeton & Silsden	160	751	2,100	10,700	28,100	12	2 (2)	29 (28)	51	25 (14)	park and ride station
	Keighley	550	1,682	6,700	25,300	25,200	9	2 (2)	24 (23)	46	22 (12)	
	Crossflatts	70	353	4,000	18,100	37,500	6	2 (2)	21 (20)	43	18 (9)	
	Bingley	290	1,212	6,200	16,100	44,300	6	2 (2)	18 (17)	39	19 (9)	
	Saltaire	150	686	8,700	43,600	81,500	3	2 (2)	15 (14)	36	13 (5)	
	Shipley	340	1,532	8,000	50,500	82,300	3	5(5)	9 (8)	21	18 (8)	
	Frizinghall	110	390	8,600	77,800	103,200	2	6(6)	6 (5)	17	17 (6)	
Total		**1,760**	**7,707**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Bradford between 0800 and 0900

G.1.3 Settle, Skipton, Shipley and Bradford Forster Square into Leeds

The Skipton, Shipley and Bradford Forster Square line to Leeds serves stations from Skipton to Leeds via Keighley and stations from Bradford Forster Square to Leeds via Shipley.

Kirkstall Forge and Apperley Bridge are proposed new stations, and are currently intended to be served by two trains per hour from the Bradford Forster Square route. Further improvements may be considered based on the success of the new stations.

Shipley provides a strategic interchange between the Bradford, Ilkley and Skipton lines and commuters tend to rail head to Shipley because of the high frequency of services.

Bradford and Leeds share close cultural and economic links. There are over three million rail trips per annum between Leeds and Bradford.

Settle and Giggleswick are within the travel to work area of Leeds and Bradford and are served by longer distance services from Carlisle and Lancaster (respectively). They serve small population catchments.

G.1.3.1 Current services

- Approximately one service every two hours from Carlisle, Lancaster to Leeds calling at key stations on the route to Leeds.
- Two services per hour from Skipton to Leeds calling at all stations to Leeds with two extra services in the peak.
- Two services per hour from Bradford Forster Square to Leeds calling at all stations to Leeds.
- The Bradford to Leeds market is also served by four trains per hour on the New Pudsey route.

G.1.3.2 Journey times and rolling stock:

- **Journey times/speeds:** Train journey times are relatively fast compared with other suburban corridors. Journey times between Bradford and Leeds are relatively poor compared with other large city pairs.
- **Rolling stock**: Suburban services are run by fast accelerating electric stock on this route. Services from Lancaster and Carlisle are run by early generation diesel stock that causes issues with passenger satisfaction.

G.1.3.3 Criteria for conditional outputs:

- **Willingness to commute:** All stations with a direct service have a generalised journey time (GJT) into Leeds and Bradford of less than 60 minutes and more than 20 minutes, so willingness to travel is sensitive to changes in frequency and journey time.
- **Jobs at destination**: Leeds is a key centre of employment in West Yorkshire.
- **Population catchments:** The population catchments for all stations are large relative to stations on other corridors, with the exception of Cononley and this is reflected in the low demand from this station.
- **Market for rail:** Demand on the route into Leeds is high particularly from Keighley, Bingley and Shipley and these stations are sufficiently close to Leeds to benefit from improved frequency. Shipley forms a strategic interchange from the Bradford Forster Square and Skipton routes.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share**: This line has a relatively high market share due to the high quality of outer suburban service into Leeds.

G.1.3.4 Recommendations for conditional outputs:

- Improve off-peak frequencies into Leeds on this route to match the frequency of services in the peak.

- Improve journey times on the route; however, the gains to be made by improving rolling stock are limited.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- Bradford is a large city with close cultural and economic links with Leeds and other large towns and cities. There are over three million rail trips per annum between Leeds and Bradford. Bradford is served by four trains per hour on the New Pudsey route and two trains an hour on the Shipley route. Journey times between Bradford and Leeds are relatively poor compared with other large city pairs. Journey times and the pattern of services should be improved between Leeds and Bradford.
- The stations within 50 miles of Leeds on the Settle and Giggleswick routes towards Lancaster and Carlisle serve relatively small communities, and this is reflected in the patronage at these stations. Significant improvements in GJT would be required to improve the willingness to travel to Leeds for employment. Therefore, specific conditional outputs to improve the frequency and journey times to Leeds have not been made. There is further discussion of these routes in Appendix D - North West.

G.1.3.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from all stations on the route from Skipton and Bradford to Leeds on this corridor will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements could be made through journey time and frequency improvements. The impact of these improvements from these stations to Leeds on Gross Value Added (GVA) through labour supply improvements is estimated to be around £390,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £1,576,000 per annum per minute of GJT.

G.1.4 Skipton line into Bradford

The Skipton line to Bradford serves stations from Skipton to Bradford via Keighley.

G.1.4.1 Current services:

- Two services per hour from Skipton to Bradford Forster Square calling at all stations to Bradford

G.1.4.2 Journey times and rolling stock:

- **Journey times/speeds**: Train journey times are relatively fast compared with other suburban corridors.
- **Rolling stock**: Suburban services are run by fast accelerating electric stock on this route.

G.1.4.3 Criteria for conditional outputs:

- **Willingness to commute**: All stations with a direct service have a generalised journey time (GJT) into Leeds and Bradford of less than 60 minutes and more than 20 minutes, so willingness to travel is sensitive to changes in frequency and journey time.
- **Jobs at destination:** Bradford is a key centre of employment in West Yorkshire.
- **Population catchments:** The population catchments for all stations are large relative to stations on other corridors, with the exception of Cononley and this is reflected in the low demand from this station.
- **Market for rail:** Demand from this route into Bradford is high from stations such as Keighley and Shipley, but demand is lower than on Leeds services.
- **Deprivation:** There are pockets of deprivation on the route. **http://casa.oobrien.com/booth**/.
- **Rail's market share:** This line has a relatively high market share due to the high quality of outer suburban service into Leeds.

G.1.4.4 Recommendations for conditional outputs:

- Improve journey times on the route; however, the gains to be made by improving rolling stock are limited.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

G.1.5 Harrogate

The Harrogate route includes stations from York via Knaresborough, Harrogate, Horsforth and Headingley. The route provides services into Leeds. York and Harrogate are important employment centres in their own right and attract trips for business and leisure purposes on the corridor.

The Northern RUS recommended that shuttles from Horsforth to Leeds were required in the peak to cater for demand.

In the off-peak and shoulder peaks, services into Leeds tend to be infrequent and stop at all stations.

G.1.5.1 Current services:

- One service per hour from York to Leeds calling at all stations to Leeds.
- One service per hour from Knaresborough to Leeds calling at all stations into Leeds.
- One peak service from Knaresborough to Leeds calling at key stations into Leeds.
- One peak service from Harrogate to Leeds calling at all stations into Leeds.
- One peak service from Harrogate to London Kings Cross calling at key stations into Leeds.

G.1.5.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey times are relatively slow compared with other suburban corridors.
- **Rolling stock:** Suburban services tend to be run by early generation diesel stock with poor acceleration characteristics, causing issues with passenger satisfaction.

G.1.5.3 Criteria for conditional outputs:

- **Willingness to commute:** All stations between Harrogate and Leeds have a GJT into Leeds of less than 60 minutes and more than 20 minutes, so willingness to travel is very sensitive to changes in frequency and journey time.
- **Jobs at destination:** Leeds is a key centres of employment.
- **Population catchments:** The population catchments for Knaresborough, Starbeck, Harrogate, Horsforth, Headingley and Burley Park are large relative to other stations.
- **Market for rail:** Demand into Leeds is high particularly from Harrogate, Horsforth, Headingley and Burley Park.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Gains in market share could be made on this line through improved competitiveness with other modes.

G.1.5.4 Recommendations for conditional outputs:

- Increase the frequency of services from key stations into Leeds in the off-peak and shoulder peaks.
- Improve train journey times through improved rolling stock capability and infrastructure improvements.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money

G.1.5.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Harrogate on the route into Leeds will have the largest impact on labour supply and reducing deprivation by providing access to employment. Four trains per hour on an even pattern with an average speed of 40mph could reduce the GJT by around 10 to 15 minutes to Leeds. The impact of these improvements from these stations to Leeds on Gross Value Added (GVA) through labour supply improvements is estimated to be around £60,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £230,000 per annum per minute of GJT.

Table 3 - Population, demand and current services for stations on the Harrogate route into Leeds to inform conditional outputs												
Corridor	Station name	Total Journeys into Leeds* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Leeds	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) - mph	Notes
Harrogate	Poppleton	6	62	2,100	17,700	46,200	29 via York	1 (1)	54 (46)	96	32 (18)	Quicker via York
	Hammerton	2	25	0	1,400	3,600	30	1 (1)	60 (58)	98	30 (18)	
	Cattal	4	53	0	1,300	3,700	29	1 (1)	59 (56)	96	29 (18)	
	Knaresborough	73	326	6,600	10,100	24,100	22	2 (3)	28 (42)	71	47 (19)	
	Starbeck	38	161	7,800	31,300	27,900	20	2 (3)	33 (39	66	37 (19)	
	Harrogate	365	1,369	8,700	42,700	10,400	18	2 (5)	37 (32)	57	30 (19)	
	Hornbeam Park	104	270	0	16,200	37,100	17	2 (3)	35 (30)	57	30 (18)	
	Pannal	71	130	1,800	10,300	24,400	15	2 (3)	43 (29))	53	21 (17)	
	Weeton	30	60	0	1,100	5,700	12	2 (3)	20 (24)	48	35 (15)	
	Horsforth	799	961	6,700	28,300	75,100	6	2 (5)	16 (14)	35	21 (10)	
	Headingley	313	394	12,900	96,800	111,100	3	2 (4)	12 (11)	32	16 (6)	
	Burley Park	560	653	28,800	86,200	131,000	2	1 (1)	10 (9)	30	14 (5)	
Total		2,350	4,464									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Leeds between 0800 and 0900

Table 4 - Population, demand and current services for stations on the East of Leeds route into Leeds to inform conditional outputs

Corridor	Station name	Total Journeys into Leeds* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Leeds	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) - mph	Notes
York	Northallerton	40	572	6,500	5,700	2,900	56	1 (2)	55 (51)	90	61 (37)	
	Thirsk	20	188	1,100	6,300	0	48	1 (2)	57 (49)	90	50 (32)	
	York	1,075	7,581	12,200	71,500	37,500	26	5 (5)	27 (23)	42	57 (37)	
	Ulleskelf	1	6	0	1,700	6,800	17	0 (0)	45 (34)	109	22 (9)	this is < 1 in off- peak
	Church Fenton	19	73	0	3,000	5,000	15	1 (2)	38 (27)	74	24 (12)	
	Micklefield	164	193	1,100	2,000	22,000	10	2 (4)	18 (19)	42	32 (14)	
	East Garforth	334		6,200	13,100	13,800	8	2 (4)	17 (15)	38	29 (13)	
	Garforth	678		5,400	8,600	27,900	7	2 (4)	13 (10)	28	34 (15)	
	Cross Gates	422	499	9,500	37,600	54,000	4	2 (4)	9 (8)	30	29 (9)	
Total		**2,740**	**9,114**									
Scarborough	Scarborough	127	906	16,900	17,600	10,100	68	1 (1)	78 (76)	116	52 (35)	
	Seamer	11	92	3,300	8,500	19,900	65	1 (1)	69 (53)	109	56 (36)	
	Malton	41	292	3,700	5,100	2,400	47	1 (1)	52 (53)	92	54 (30)	
Total		**179**	**1,290**									
Hull	Hull	210	2,213	7,300	53,500	81,100	52	1 (1)	28 (24)	100	111 (31)	
	Hessle	1	31	4,300	11,400	48,000	47	0 (0)	75 (61)	129	38 (22)	
	Ferriby	1	49	2,300	4,800	12,900	44	0 (0)	73 (58)	128	36 (21)	
	Brough	37	342	4,300	4,800	6,100	41	1 (1)	50 (44)	85	50 (29)	
	Broomfleet	0	2	0	0	7,200	36	0 (0)	77 (41)	150	28 (15)	
	Gilberdyke	1	51	2,500	1,200	0	35	0 (0)	78 (66)	112	27 (19)	
	Eastrington	0	1	0	1,400	4,900	33	0 (0)	92 (60)	148	21 (13)	
	Howden	31	95	0	2,400	2,700	29	0 (1)	60 (34)	89	29 (20)	
	Wressle	0	1	0	0	5,400	27	0 (0)	64 (49)	140	25 (11)	
	Selby	215	485	7,500	10,000	6,300	21	2 (3)	32 (24)	54	39 (23)	
	South Milford	88	108	3,000	5,100	0	13	1 (2)	22 (26)	59	35 (13)	
Total		**584**	**3,377**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Leeds between 0800 and 0900

G.1.6 East of Leeds

The East of Leeds route includes stations from York, the East Coast Main Line, Scarborough, Selby and Hull. The route provides services into Leeds as well as long distance services into and across Leeds. Part of this route will be electrified as part of the North Cross-Pennine Electrification scheme, and the journey time on some services will improve as a result.

All services into Leeds on this corridor serve the long distance and commuting market into Leeds and understanding trade-offs between meeting different conditional outputs will be particularly important.

G.1.6.1 Current services:

- One service per hour from York to Blackpool North calling at key suburban stations.
- One service per hour from Selby to Manchester Victoria calling at key suburban stations. One additional service in the peak.
- One service per hour from Selby to Wakefield calling at all stations.
- One service per hour from Hull to Manchester Piccadilly calling at Brough, Selby and South Milford into Leeds.
- Additional stops in other long distance services at Church Fenton, Ulleskelf, Micklefield, East Garforth, Garforth and Cross Gates, in the peak to cater for demand.

G.1.6.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey times are relatively slow for stopping services compared with other corridors.
- **Rolling stock:** Suburban services tend to be served by early generation diesel stock with poor acceleration characteristics that causes issues with passenger satisfaction. Interurban services are served by a mix of high quality, fast accelerating later generation diesel stock, some of which will be converted to electric traction after the electrification of the North Cross-Pennine route.

G.1.6.3 Criteria for conditional outputs:

- **Willingness to commute**: All suburban stations between Selby and Leeds and Micklefield and Leeds have a GJT into Leeds of less than 60 minutes and more than 20 minutes, so willingness to travel is very sensitive to changes in frequency and journey time.
- **Jobs at destination**: Leeds is a key centre of employment in West Yorkshire.
- **Population catchments**: The population catchments for York, Selby, Garforth, East Garforth, South Milford, Brough and Hull are large relative to stations on other corridors and Brough has a wide catchment for other smaller communities on the Hull route. All other stations serve small communities and this is reflected in the demand from these stations into Leeds.
- **Market for rail**: Demand is very high from York, and high from Garforth and Selby.
- **Deprivation**: There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share**: This line has a relatively high market share due to the high quality of outer suburban service into Leeds.

G.1.6.4 Recommendations for conditional outputs:

- Improve off-peak frequencies from Cross Gates, Garforth, South Milford and Selby into Leeds on this route to match the frequency of services in the peak, however, it is important to note that including stops in interurban services in the off-peak could have a significant impact on journey times, particularly for longer distance business and leisure passengers.
- Hull is a large city just over 50 miles from Leeds. The Long Distance Market Study recommends that the conditional output for Hull to Leeds should be the equivalent of a frequency of two trains per hour as fast as possible. This would provide the opportunity to increase the frequency of services from Brough to Leeds to two trains per hour all day.

- Improve journey times on the route through rolling stock and infrastructure improvements.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- York is a large city 26 miles from Leeds. Partly due to its position on the rail network, York is well served by five trains per hour to Leeds with a minimum journey time of 23 minutes. After the introduction of the Northern Hub and North Cross-Pennine electrification schemes journey times may improve on some services. Therefore, specific conditional outputs to improve the frequency and journey times from York to Leeds have not been made.
- Northallerton, Thirsk, Scarborough, Seamer and Malton are typically served by one through train per hour in the off-peak and some extra peak trains. These stations serve communities that are a considerable distance from Leeds. The GJT from these stations to Leeds is more than 60 minutes, and significant changes would have to be made for people to be more willing to commute to Leeds. Therefore, specific conditional outputs to improve the frequency and journey times to Leeds have not been made, however, the provision of direct connectivity to Leeds commensurate with the current service is a conditional output. This is particularly important in the context of North Cross-Pennine electrification and continuing through services to York, Leeds and beyond.

G.1.6.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Selby, York and Garforth into Leeds will have the largest impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements could be made from each of these stations into Leeds. The impact of these improvements from these stations to Leeds on Gross Value Added (GVA) through labour supply improvements is estimated to be around £236,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £394,000 per annum per minute of GJT.

G.1.7 Goole, Knottingley and Castleford

The Goole, Knottingley and Castleford route serves Goole, Rawcliffe, Snaith, Hensall, Whitley Bridge, Knottingley, Pontefract, Castleford and Woodlesford. The route provides services into Leeds.

Castleford and Woodlesford are served by this route and the Barnsley to Sheffield route.

G.1.7.1 Current services:

- One service per hour from Knottingley to Leeds calling at all stations into Leeds, additional peak service, some services extended from Goole, stopping at intermediate stations.
- One service per hour from Sheffield to Leeds calling at Castleford and Woodlesford into Leeds.
- One service in the peak from Castleford to Leeds, stopping at Castleford and Woodlesford into Leeds.

G.1.7.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey times are relatively fast from Castleford and Woodlesford and slow from other stations compared with other suburban corridors.
- **Rolling stock**: Suburban services are run by early generation diesel stock with poor acceleration characteristics and causing issues with passenger satisfaction.

G.1.7.3 Criteria for conditional outputs:

- **Willingness to commute**: All stations from Knottingley have a GJT into Leeds of less than 60 minutes or could be improved to less than 60 minutes through small frequency and journey time improvements, so willingness to travel from these stations to Leeds is sensitive to changes in frequency and journey time. The GJT from Goole to Leeds is very high and improving the GJT to less than 60 minutes would require a very fast and frequent service.
- **Jobs at destination:** Leeds is a key centre of employment in West Yorkshire.
- **Population catchments**: The population catchments at Goole and of all stations between Knottiongley and Leeds are large relative to stations on other corridors. Stations between Goole and Knottingley serve small communities.
- **Market for rail:** Demand into Leeds is high from all stations between Knottingley and Leeds.
- **Deprivation**: There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share**: Gains in market share could be made on this line through improved competitiveness with other modes.

G.1.7.4 Recommendations for conditional outputs:

- Increase the frequency of services in the off- peak and shoulder peaks to match the current peak frequencies for all stations between Knottingley and Leeds.
- Improve train journey times through improved rolling stock capability and infrastructure improvements.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- Stations at Rawcliffe, Snaith, Hensall and Whitley Bridge serve small communities. Goole is a larger town but the GJT would have to be significantly improved to below 60 minutes to encourage commuting into Leeds. Therefore, specific conditional outputs to improve the frequency and journey times to Leeds have not been made.

G.1.7.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from all stations between Knottingley and Woodlesford into Leeds will have the largest impact on labour supply and reducing deprivation by providing access to employment. Two trains per hour and an average speed of 40mph could reduce the GJT from Knottingley and Pontefract by 20-25 minutes, and provision of four trains per hour from Woodlesford and Castleford and an average speed of 40mph could reduce the GJT from these stations by around 10-15 minutes.

The impact on Gross Value Added (GVA) of these improvements from these stations to Leeds through labour supply improvements is estimated to be around £42,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £222,000 per annum per minute of GJT.

Table 5 - Population, demand and current service for stations on the Castleford, Knottingley and Goole route into Leeds to inform conditional outputs

Corridor	Station name	Total Journeys into Leeds* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Leeds	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised Speed) - mph	Notes
Castleford (Castleford, Knottingley and Goole)	Saltmarshe	0	4	0	2,500	12,700	36	<1 (0)	79 (75)	144	27 (15)	
	Goole	5	294	7,900	8,400	2,500	33	<1 (1)	79 (76)	117	25 (17)	
	Rawcliffe	0	0	1,200	0	7,600	29	<1 (1)	77 (64)	180	22 (10)	
	Snaith	1	2	1,500	2,400	4,300	26	<1 (1)	77 (59)	177	20 (9)	
	Hensall	0	0	0	3,100	2,300	22	<1 (1)	84 (52)	173	16 (8)	
	Whitley Bridge	1	1	0	4,400	2,800	21	<1 (1)	77 (48)	171	16 (7)	
	Knottingley	159	166	5,700	10,500	31,300	16	1 (2)	46 (37)	75	21 (13)	
	Pontefract	187	234	8,600	22,100	38,600	14	1 (2)	35 (33)	70	24 (12)	
	Castleford	404	417	8,300	20,600	31,800	11	2 (4)	22 (21)	46	30 (14)	
	Woodlesford	355	345	3,100	11,900	33,100	6	2 (4)	8 (12)	37	45 (10)	
Total		**1,112**	**1,463**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Leeds between 0800 and 0900

G.1.8 Barnsley and Sheffield

The Barnsley and Sheffield corridor includes stations to Sheffield via Wakefield Kirkgate, Barnsley and Meadowhall. The route provides services into Leeds and Sheffield.

Castleford and Woodlesford are served by this route and the Knottingley route, and conditional outputs for these stations are expressed in the Knottingley corridor section.

Wombwell, Elsecar, Chapeltown and Meadowhall are in the commuting catchment of Sheffield and the conditional outputs for these stations are reflected in the South Yorkshire section.

Barnsley is served by two limited stop services per hour into Leeds with relatively good journey times. Commuters from Barnsley generally look to Sheffield as opposed to Leeds and so further conditional outputs for the South Yorkshire commuting area are reflected in the South Yorkshire section.

G.1.8.1 Current services:

- Two services per hour from Nottingham/Sheffield to Leeds calling at key stations into Leeds.
- One service per hour from Sheffield to Leeds calling at all stations into Leeds via Castleford and Woodlesford.

G.1.8.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey times are relatively fast from Wakefield and Barnsley but trains serving Darton and Normanton are routed via Castleford and Woodlesford and have very poor journey times into Leeds as a result.
- **Rolling stock:** Suburban services are run by early generation diesel stock with poor acceleration characteristics and causing issues with passenger satisfaction.

G.1.8.3 Criteria for conditional outputs:

- **Willingness to commute**: All stations from Barnsley have a GJT into Leeds of less than 60 minutes or could be improved to less than 60 minutes through small frequency and journey time improvements, so willingness to travel from these stations to Leeds is sensitive to changes in frequency and journey time.
- **Jobs at destination**: Leeds and Sheffield are key centres of employment in Yorkshire and Wakefield, Barnsley and Meadowhall serve employment centres in their own right.
- **Population catchments**: Wakefield is a large town with a large station catchment, Normanton and Darton serve relatively large communities.
- **Market for rail:** Demand into Leeds is very high from Wakefield into Leeds, demand from Normanton is relatively high despite the poor journey times and demand from Darton is low.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Gains in market share could be made on this line through improved competitiveness with other modes.

G.1.8.4 Recommendations for conditional outputs:

- Improve the frequency/journey times to Leeds from Darton and Normanton to increase willingness to commute and improve competitiveness with road.
- Improve train journey times through improved rolling stock capability and infrastructure improvements from other destinations into Leeds.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

- Wakefield is a large city ten miles from Leeds. Partly due to its position on the rail network, Wakefield is very well served by five trains per hour with a minimum journey time of 14 minutes. Therefore, specific conditional outputs to improve the frequency and journey times to Leeds have not been made. However, further frequency improvements may be made as a result of connecting Wakefield with stations further afield.
- Sheffield is a large city and business to business connectivity between Leeds and Sheffield is very important. The Long Distance Market Study recommends a significant improvement in services between Leeds and Sheffield.

G.1.8.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Wakefield and Barnsley into Leeds will have the largest impact, However, there are limited opportunites to improve the GJT from Wakefield to Leeds. A frequency of two trains per hour and an average journey speed of 40mph could reduce the GJT from Darton to Leeds by approximately 30 minutes, and from Normanton to Leeds by approximately 15-20 minutes. The impact of these improvements from these stations to Leeds on Gross Value Added (GVA) through labour supply improvements is estimated to be around £10,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £46,000 per annum per minute of GJT.

Table 6 - Population, demand and current services for stations on the Barnsley and Sheffield route to Leeds to inform conditional outputs												
Corridor	Station name	Total Journeys into Leeds (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Leeds	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised Speed) - mph	Notes
Barnsley and Sheffield	Sheffield	562	8,424	15,600	100,000	128,500	38	3 (3)	54 (39)	74	42 (31)	1 via Barnsley taking around an hour and one via Moorthopre taking just over 40 minutes
	Meadowhall	68	2,057	5,500	39,800	82,800	34	2 (2)	55 (53)	77	38 (27)	
	Chapeltown	10	310	7,300	18,800	47,600	30	1 (1)	63 (60)	95	29 (19)	
	Elsecar	6	131	5,700	11,700	37,500	27	1 (1)	63 (55)	97	26 (17)	
	Wombwell	12	196	3,300	23,100	37,700	26	1 (1)	62 (51)	87	25 (18)	
	Barnsley	174	1,448	9,500	42,900	33,200	22	2 (2)	36 (36)	63	36 (21)	
	Darton	28	153	3,400	13,100	27,400	18	2 (2)	44 (40)	84	25 (13)	
	Normanton	203	210	1,300	17,200	40,600	11	1 (1)	35 (18)	59	19 (11)	
	Wakefield	1,859	2,715	7,100	36,800	43,000	10	5 (6)	17 (14)	30	36 (20)	
Total		2,920	15,644									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Leeds between 0800 and 0900

G.1.9 Moorthorpe to Doncaster and Sheffield

The Moorthorpe and Doncaster routes include stations from Sheffield via Rotherham and Moorthorpe and from Doncaster via South Elmsall. The routes provide services into Leeds.

Thurnscoe, Goldthorpe, Swinton, Rotherham, Adwick and Bentley are in the commuting catchment of Sheffield and the conditional outputs for these stations are reflected in the South Yorkshire section.

Fitzwilliam, Sandal & Agbrigg and Outwood are served by a half hourly pattern into Leeds in the off-peak and passenger demand is met with four trains in the peak hour on an irregular pattern.

The route splits after Fitzwilliam into the route from Moorthorpe and from South Elmsall.

G.1.9.1 Current services:

- One service per hour from Sheffield to Leeds via Rotherham stopping at all stations to Leeds.
- One service per hour from Doncaster to Leeds stopping at all stations between Doncaster and Leeds (two extra in the peak).
- Interurban/intercity services between Doncaster, Sheffield and Leeds.

G.1.9.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey times are relatively slow compared with other corridors.
- **Rolling stock:** Suburban services from Sheffield tend to be run by early generation diesel stock with poor acceleration characteristics and causing issues with passenger satisfaction. Suburban services from Doncaster are run by fast accelerating electric stock.

G.1.9.3 Criteria for conditional outputs:

- **Willingness to commute**: All stations from South Elmsall and Moorthorpe have a GJT into Leeds of less than 60 minutes or could be improved to less than 60 minutes through small frequency and journey time improvements, so willingness to travel is sensitive to changes in frequency and journey time. The GJT from Doncaster to Leeds is just under 60 minutes and small improvements could make a significant impact on willingness to commute.
- **Jobs at destination**: Leeds and Sheffield are key employment centres in Yorkshire, Rotherham and Doncaster serve employment centres in their own right.
- **Population catchments:** The population catchments for all stations are large relative to stations on other corridors. Doncaster is a large town and the station serves a large employment centre.
- **Market for rail**: Demand from Sandall & Agbrigg and Outwood to Leeds is high. South Elmsall and Moorthorpe attract over 100,000 passenger journeys per annum to Leeds, despite having a GJT of over 60 minutes. There are over 200,000 rail trips per annum between Doncaster and Leeds.
- **Deprivation**: There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share**: Gains in market share could be made on this line through improved competitiveness with other modes.

G.1.9.4 Recommendations for conditional outputs:

- Increase the frequency of services from one to two trains per hour from South Elmsall and Moorthorpe to Leeds.
- Increase the off-peak frequency from Fitzwilliam, Sandall & Agbrigg and Outwood to four trains an hour in the off-peak and shoulder peaks to match the peak frequency into Leeds.

- Improve train journey times through improved rolling stock capability and infrastructure improvements from other destinations into Leeds.
- Doncaster is served by three trains per hour. The conditional output for Doncaster should be to form part of the interurban network into and across Leeds with four trains per hour and improved journey times.
- Sheffield is a large city and business to business connectivity between Sheffield and Leeds is very important. The Long Distance Market Study recommends a significant improvement in services between Sheffield and Leeds.

G.1.9.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Doncaster, Adwick, Moorthorpe, Fitzwilliam, Sandal & Agbrigg and Outwood into Leeds will have the largest impact on labour supply and reducing deprivation by providing access to employment. By meeting the conditional outputs, the GJT from all of these stations into Leeds could be reduced by between 10 and 20 minutes. The impact of these improvements from these stations to Leeds on Gross Value Added (GVA) through labour supply improvements is estimated to be around £173,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £266,000 per annum per minute of GJT.

Table 7 - Population, demand and current services for stations on the Moorthorpe route into Leeds to inform conditional outputs

Corridor	Station name	Total Journeys into Leeds* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station(census 2011)	Distance in miles from Leeds	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised Speed) - mph	Notes
Moorthorpe / Sheffield	Rotherham Central	26	655	3,900	46,400	43,900	33	1 (1)	64 (15)	93	31 (21)	
	Swinton	20	389	5,400	25,700	38,300	28	1 (1)	57 (22)	86	30 (20)	
	Bolton-upon-Dearne	7	60	4,600	18,000	37,700	26	1 (1)	50 (28)	86	31 (18)	
	Goldthorpe	6	58	5,800	12,800	29,000	25	1 (1)	48 (36)	84	32 (18)	
	Thurnscoe	6	67	5,200	9,900	11,300	24	1 (1)	45 (43)	81	32 (18)	
	Moorthorpe	122	200	4,300	11,700	11,800	21	1 (1)	38 (45)	74	33 (17)	
	Fitzwilliam	189	201	2,200	13,100	18,100	17	2 (4)	31 (47)	51	33 (20)	
	Sandal & Agbrigg	196	183	7,200	21,600	42,900	12	2 (4)	24 (51)	45	30 (16)	
	Outwood	382	361	4,200	25,900	58,500	8	2 (4)	16 (63)	37	29 (12)	
Total		**970**	**2,174**									
	Doncaster	199	3,884	5,700	42,300	38,500	30	3 (5)	41 (44)	59.35	44 (30)	
	Bentley	29	162	6,400	33,000	36,900	28	1 (3)	49 (40)	72.75	35 (23)	
	Adwick	20	258	3,400	14,700	19,400	26	1 (3)	42 (35)	69.3	37 (22)	
Doncaster	South Elmsall	219	363	6,700	8,200	9,300	21	1 (3)	39 (34)	65	33 (20)	
Total		**470**	**4,667**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Leeds between 0800 and 0900

G.1.10 Huddersfield, Dewsbury and Batley into Leeds

The Huddersfield route includes stations from Manchester Victoria and Manchester Piccadilly via Huddersfield. The route provides services into Leeds as well as long distance services into and across Leeds and Manchester.

Services on this corridor serve an intercity market across the North West, Yorkshire and the Humber and the North East, a commuting market into Leeds and an off-peak leisure market on the route, understanding trade-offs between meeting different conditional outputs will be particularly important.

This route will be electrified, and the service will improve as part of the plans for the Northern Hub and North Cross-Pennine electrification programme.

There will be an additional Liverpool Lime Street to York via Manchester Victoria train each hour from May 2014.

Greenfield, Mossley, Stalybridge and Ashton are in the suburban catchment of Manchester and conditional outputs for these stations are expressed in Appendix D (North West).

G.1.10.1 Current services:

- Two services per hour from Manchester Airport to Middlesbrough/Newcastle stopping at Huddersfield and Dewsbury all day.
- One service per hour from Liverpool Lime Street to Scarborough stopping at Stalybridge and Huddersfield all day and Dewsbury in the peak.
- One service per hour from Manchester Piccadilly to Hull stopping at Huddersfield only all day and Dewsbury in the peak.
- One service per hour from Manchester Victoria to Huddersfield stopping service from Manchester Victoria (one extra in the peak).
- One service per hour from Huddersfield to Leeds stopping at all stations to Leeds.
- One service per hour from Calder Valley to Leeds via Brighouse stopping at key stations to Leeds in the off-peak and all stations into Leeds in the peak.

G.1.10.2 Journey times and rolling stock:

- **Journey times/speeds**: Suburban journey times are relatively slow compared with other corridors, interurban services are slow compared to other services serving an intercity market
- **Rolling stock:** Suburban services tend to be run by early generation diesel stock with poor acceleration characteristics and causing issues with passenger satisfaction. Interurban services tend to be run by fast accelerating 100mph diesel stock. Electrification is expected to cascade electric stock onto services on this route.

G.1.10.3 Criteria for conditional outputs:

- **Willingness to commute:** All stations have a GJT into Leeds of less than approximately 60 minutes and more than 20 minutes, so willingness to travel is very sensitive to changes in frequency and journey time.
- **Jobs at destination:** Manchester and Huddersfield are key employment centres on the route.
- **Population catchments:** The population catchments at Batley and Dewsbury are large. Huddersfield is a large town in West Yorkshire and the station serves a large catchment population.
- **Market for rail**: Demand from Huddersfield to Leeds is very high. Demand from many other stations on the route is also high particularly from Dewsbury, Mirfield, Batley and Morley.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Gains in market share could be made on this line through improved competitiveness with other modes.

G.1.10.4 Recommendations for conditional outputs:

- Increase the frequency of services at Mirfield, Batley and Morley from two to three trains per hour to Leeds.
- Improve train journey times through improved rolling stock capability and infrastructure improvements.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- Partly due to its position on the rail network, Huddersfield is very well served by five trains per hour with a minimum journey time of 20 minutes. The Northern Hub and electrification programmes may further improve this service and thus no conditional outputs for Huddersfield to Leeds have been proposed.
- The GJT into Leeds from Ashton, Mossley, Greenfield, Marsden and Slaithwaite is large and significant improvements would be required to increase willingness to commute to Leeds. Therefore, specific conditional outputs to improve the frequency and journey times to Leeds have not been made.
- The Long Distance Market Study recommends a significant improvement in the service between Manchester and Leeds.

G.1.10.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Huddersfield, Mirfield, Dewsbury and Batley into Leeds will have the largest impact on labour supply and reducing deprivation by providing access to employment. By meeting the conditional outputs, the GJT from all of these stations into Leeds could be reduced by approximately 10 minutes. The impact of these improvements from these stations to Leeds on Gross Value Added (GVA) through labour supply improvements is estimated to be around £323,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £1,090,000 per annum per minute of GJT.

Table 8 - Population, demand and current service for stations on the Manchester via Huddersfield route into Leeds to inform conditional outputs												
Corridor	Station name	Total Journeys into Leeds* (thousands)	Total Journeys to and from station (ORR stationusage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Leeds	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (mins)	Generalised Journey Time (mins)	Average speed (Generalised Speed) - mph	Notes
Manchester/ Huddersfield/ Dewsbury	Manchester	799	39,900	20,300	100,000	177,300	42	4 (4)	55 (72)	73	46 (35)	
	Ashton	4	581	9,800	57,600	99,900	36	0 (0)	60 (58)	109	36 (20)	
	Stalybridge	87	1,118	9,000	60,500	65,400	35	1 (3)	35 (43)	68	60 (31)	
	Mossley	1	310	6,800	23,400	72,800	33	0 (0)	49 (57)	97	40 (20)	
	Greenfield	4	306	2,600	15,600	31,300	30	0 (0)	49 (51)	93	37 (19)	
	Marsden	46	189	2,500	1,100	8,300	24	0 (0)	34 (43)	82	42 (18)	
	Slaithwaite	41	208	3,600	9,700	31,700	21	0 (0)	29 (45)	77	44 (17)	
	Huddersfield	3,702	4,200	13,200	54,900	51,300	17	5 (5)	26 (20)	37	39 (27)	
	Deighton	14	54	4,400	31,400	71,600	15	1 (1)	38 (34)	62	24 (14)	
	Mirfield	255	334	5,000	17,700	68,300	12	2 (2)	29 (25)	53	25 (14)	
	Ravensthorpe	14	24	4,000	33,300	68,100	11	1 (2)	33 (29)	57	19 (11)	
	Dewsbury	1,226	1,483	8,800	50,600	55,100	9	4 (6)	28 (24)	31	20 (18)	
	Batley	262	277	9,000	44,100	73,800	8	2 (2)	21 (16)	40	22 (12)	
	Morley	328	348	8,600	30,200	80,600	5	2 (2)	10 (10)	37	28 (8)	
	Cottingley	77	97	4,800	46,200	98,300	3	1 (2)	15 (7)	36	10 (4)	
Total		**6,860**	**49,429**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Leeds between 0800 and 0900

G.1.11 Calder Valley – Brighouse, Halifax, Bradford, Rochdale, Hebden Bridge, Manchester

The Calder Valley route includes stations from Manchester Victoria via Bradford Interchange and Halifax. The route provides services into Leeds and Bradford and interurban services across the Pennines.

The rail market from Walsden, Littleborough, Smithy Bridge, Rochdale, Castleton, Mills Hill and Moston into Manchester is significantly more important than to Leeds, so conditional outputs for those stations on this route are expressed in Appendix D the North West.

The Northern Hub may improve the service on this corridor.

G.1.11.1 Current services:

- One service per hour from Manchester Victoria to Leeds via Brighouse stopping at all stations to Leeds on the Calder Valley via Brighouse.
- Two services per hour from Manchester Victoria to Leeds via Bradford Interchange stopping at key interurban stops on the route, and suburban stops into Leeds.
- One service per hour from Blackpool North to York via Bradford Interchange stopping at key interurban stops on the route, and suburban stops into Leeds in the peak.
- One service per hour from Huddersfield to Leeds via Brighouse and Bradford Interchange stopping at all stations into Leeds.

G.1.11.2 Journey times and rolling stock:

- **Journey times/speeds**: Interurban and suburban journey times are relatively slow compared with other corridors.
- **Rolling stock**: Services are be run by early generation diesel stock with poor acceleration characteristics and causing issues with passenger satisfaction.

G.1.11.3 Criteria for conditional outputs:

- **Willingness to commute:** All stations from Todmorden to Bramley have a GJT into Leeds and Bradford of less than approximately 60 minutes or could be improved to less than 60 minutes through small frequency and journey time improvement. Preston, Blackburn, Accrington and Burnley all have GJTs into Bradford and Leeds far in excess of 60 minutes and significant improvements in GJT would be required to increase willingness to commute.
- **Jobs at destination:** Leeds and Bradford are key employment centre in Yorkshire, and Halifax serves an employment centre in its own right.
- **Population catchments**: Todmorden, Sowerby Bridge, Hebden Bridge, Halifax, New Pudsey and Bramley serve large catchments.
- **Market for rail**: Demand from Halifax, Hebden Bridge, and New Pudsey to Leeds and Bradford is very high compared with demand from other routes into Leeds. Demand from Sowerby Bridge, Todmorden and Bramley to Leeds is also high.
- **Deprivation:** There are pockets of deprivation on the route. **http://casa.oobrien.com/booth**/.
- **Rail's market share**: Gains in market share could be made on this line through improved competitiveness with other modes.

G.1.11.4 Recommendations for conditional outputs:

- Improve the frequency and/or pattern of services to four trains per hour on an even interval from Hebden Bridge, Halifax, New Pudsey and Bramley into Leeds and Bradford.
- Improve train journey times through improved rolling stock capability and infrastructure improvements.

- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- Littleborough , Walsden and Mytholmroyd serve small communities with low demand into Leeds and Bradford. Therefore, specific conditional outputs to improve the frequency and journey times to Leeds and Bradford have not been made.
- Burnley, Accrington, Blackburn and Preston are more important to the North West urban market and Long Distance markets and are considered in the Appendix D North West.
- Bradford is a large city with close cultural and economic links with Leeds and other large towns and cities. There are over three million rail trips per annum between Leeds and Bradford. Bradford is served by four trains per hour on the New Pudsey route and two trains an hour on the Shipley route. Journey times between Bradford and Leeds are relatively poor compared with other large city pairs. Journey times and the pattern of services should be improved between Leeds and Bradford.

G.1.11.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Hebden Bridge and Halifax into Leeds will have the largest impact on labour supply and reducing deprivation by providing access to employment. By meeting the conditional outputs, the GJT from all of these stations into Leeds could be reduced by approximately 20 minutes. The impact of these improvements from these stations to Leeds on Gross Value Added (GVA) through labour supply improvements is estimated to be around £87,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £290,000 per annum per minute of GJT.

Table 9 - Population, demand and current services for stations on the Calder Valley route to Leeds to inform conditional outputs												
Corridor	Station name	Total Journeys into Leeds* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Leeds	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) - mph	Notes
Calder Valley	Moston	2	140	10,400	72,100	121,500	44	4 (4)	92 (86)	121	29 (22)	
	Mills Hill	4	341	9,900	48,100	109,800	44	4 (5)	89 (80)	117	30 (23)	
	Castleton	1	153	6,000	35,000	87,400	42	4 (5)	82 (76)	112	30 (22)	
	Rochdale	31	1,106	10,600	52,800	47,000	40	3 (3)	72 (70)	96	33 (25)	
	Smithy Bridge	4	163	4,600	33,200	39,400	39	2 (2)	73 (68)	100	32 (23)	
	Littleborough	8	384	4,800	11,300	29,200	37	2 (2)	68 (65)	97	32 (23)	
	Walsden	19	93	1,100	8,600	3,600	33	1 (2)	62 (62)	97	32 (20)	
	Todmorden	196	568	3,100	5,700	3,200	31	3 (3)	58 (57)	83	32 (23)	
	Hebden Bridge	345	761	2,400	8,300	2,500	27	4 (4)	52 (49)	69	31 (23)	
	Mytholmroyd	66	159	2,400	6,000	11,800	25	2 (3)	51 (47)	74	30 (20)	
	Sowerby Bridge	169	322	5,800	34,600	37,200	21	2 (4)	33 (29)	67	39 (19)	
	Halifax	1,111	1,857	2,500	44,100	48,900	18	4 (4)	28 (24)	52	38 (21)	
	New Pudsey	615	797	7,600	52,500	89,400	6	4 (4)	10 (10)	27	35 (13)	irregular pattern
	Bramley	260	337	7,800	59,800	93,000	4	3 (3)	10 (9)	29	21 (7)	irregular pattern
Total		**2,831**	**7,180**									
Blackburn and Burnley	Preston	45	4,385	11,000	65,700	61,200	63	1 (1)	104 (104)	142	375 (26)	
	Blackburn	26	1,370	11,000	62,100	23,100	50	1 (1)	111 (89)	126	275 (24)	
	Accrington	13	346	13,000	27,200	20,700	45	1 (1)	81 (78)	118	33 (23)	
	Burnley Manchester Road	31	232	7,100	37,000	26,500	39	1 (1)	72 (69)	109	33 (22)	
Total		**115**	**6,333**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Leeds between 0800 and 0900

Table 10 -Population, demand and current services for stations on the Calder Valley route to Bradford to inform conditional outputs												
Corridor	Station name	Total Journeys into Bradford* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Bradford	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) - mph	Notes
Calder Valley	Moston	1	140	10,400	72,100	121,500	37	4 (4)	70 (60)	106	31 (21)	
	Mills Hill	1	341	9,900	48,100	109,800	34	4 (5)	65 (55)	101	32 (20)	
	Castleton	1	153	6,000	35,000	87,400	32	2 (3)	60 (50)	96	32 (20)	
	Rochdale	40	1,106	10,600	52,800	47,000	30	3 (3)	52 (45)	75	35 (24)	
	Smithy Bridge	1	163	4,600	33,200	39,400	29	2 (2)	54 (50)	82	33 (21)	
	Littleborough	10	384	4,800	11,300	29,200	27	2 (2)	52 (41)	79	31 (21)	
	Walsden	10	93	1,100	8,600	3,600	23	1 (2)	42 (40)	76	33 (18)	
	Todmorden	90	568	3,100	5,700	3,200	21	3 (3)	38 (33)	61	34 (21)	
	Hebden Bridge	150	761	2,400	8,300	2,500	17	4 (4)	28 (26)	48	36 (21)	
	Mytholmroyd	30	159	2,400	6,000	11,800	16	2 (3)	39 (26)	57	24 (17)	
	Sowerby Bridge	90	322	5,800	34,600	37,200	12	2 (4)	34 (20)	49	21 (14)	
	Halifax	670	1,857	2,500	44,100	48,900	8	4 (4)	13 (13)	28	38 (18)	
Total		**1,094**	**6,041**									
Blackburn and Burnley	Preston	10	4,385	11,000	65,700	61,200	53	1 (1)	87 (83)	123	36 (26)	
	Blackburn	20	1,370	11,000	62,100	23,100	41	1 (1)	66 (66)	104	37 (24)	
	Accrington	5	346	13,000	27,200	20,700	36	1 (1)	59 (60)	96	36 (22)	
	Burnley Manchester Road	10	232	7,100	37,000	26,500	30	1 (1)	50 (49)	88	36 (20)	
Total		**45**	**6,333**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Bradford between 0800 and 0900

G.2 Service level conditional outputs for the East Riding of Yorkshire

This section is an interpretation of the Regional Urban conditional outputs into and within the East Riding of Yorkshire disaggregated by the rail corridors into Hull.

Hull is a centre for employment in East Yorkshire, but has a smaller travel to work area than larger cities in Yorkshire such as Leeds and Sheffield. There are approximately 115,000 jobs in Hull, 35,000 of which are in the public sector (Centre for Cities – 2011). Beverley is an employment centre in its own right and is the administrative centre of the East Riding of Yorkshire.

The Humber has two enterprise zones identified, the Humber Green Port Corridor Enterprise Zone and the Humber Renewable Energy Super Cluster, both specialising in renewable energy, green technologies and marine industries.

The University of Hull has around 23,000 undergraduate and postgraduate students (Higher Education Statistics Agency statistics).

For the purposes of this case study, this section is organised into a description of the conditional outputs relating to each of the following corridors around Hull:

- York and Leeds via Selby
- Sheffield and Doncaster and Goole
- Scarborough and Beverley

G.2.1 York and Leeds via Selby:

For stations between Selby and Leeds, conditional outputs are more adequately represented by the West Yorkshire section of the Market study. Many stations on this route serve small communities.

York provides connectivity with the East Coast Main Line north from this route. Stakeholders aspire to increase the frequency of services between York and Hull to hourly and improve journey times on the route.

G.2.1.1 Current services

- One service per hour from Manchester Piccadilly to Hull via Leeds, Selby and Brough.
- York to Hull via Selby: Selby, Howden, Gilberdyke and Brough – less than hourly.
- London King's Cross to Hull via Selby, Howden and Brough – less than hourly.

G.2.1.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey times from on the route to Hull are consistent with other routes but improvements could be made.
- **Rolling stock**: Rolling stock on the stopping services tends to be run by early generation diesel stock with poor acceleration and causes issues with passenger satisfaction.

G.2.1.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT for Gilberdyke, Brough, Ferriby and Hessle into Hull are all less than 60 minutes.
- **Jobs at destination:** Hull is an important centre for culture and employment, but has a smaller travel to work area than Leeds and Sheffield and there is less employment than these cities.
- **Population catchments**: Wressle, Howden, Gilberdyke, Eastrington and Broomfleet serve small communities and this is reflected in the low demand from these stations and the service offer. Brough, Ferriby and Hessle serve slightly larger communities and there is modest demand into Hull as a result.
- **Market for rail:** Demand is relatively low from all stations into Hull.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share is relatively small into Hull, and gains can still be made. However, the constraint to travel by road is not as strong as in larger cities in Yorkshire, so rail is naturally less competitive.

G.2.1.4 Recommendations for conditional outputs:

- Some improvements to the frequency of service through stopping patterns from Ferriby and Hessle in the off-peak may encourage higher patronage.
- Improve journey times through improved rolling stock characteristics and possibly infrastructure improvements.
- Increase capacity to meet demand through lengthening or increase frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- The Long Distance Market Study recommends a significantly improved service between Leeds and Hull to improve business to business connectivity.

Table 11 - Population, demand and current services for stations on the York and Leeds via Selby route to Hull to inform conditional outputs

Corridor	Station name	Total Journeys into Hull* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Hull	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) - mph	Notes
York and Leeds via Selby	Leeds	210	25,020	13,600	95,400	123,600	52	1 (1)	62 (54)	100	50 (31)	
	Cross Gates	1		9,500	37,600	54,000	47	0 (0)	78 (46)	130	36 (22)	
	Garforth	2		5,400	8,600	27,900	45	0 (0)	70 (46)	124	38 (22)	
	East Garforth	0	276	6,200	13,100	13,800	44	0 (0)	68 (Ind)	125	38 (21)	
	Micklefield	0	193	1,100	2,000	22,000	42	0 (0)	70 (43)	122	36 (21)	
	South Milford	1	108	3,000	5,100	0	39	0 (0)	67 (41)	116	35 (20)	
	Selby	23	485	7,500	10,000	6,300	31	2 (2)	34 (30)	72	55 (26)	
	Wressle	0	1	0	0	5,400	25	<1 (1)	44 (34)	120	34 (12)	
	Howden	10	95	0	2,400	2,700	22	1 (2)	35 (23)	75	38 (18)	
	Eastrington	0	1	0	1,400	4,900	19	<1 (1)	40 (24)	114	29 (10)	
	Gilberdyke	20	51	2,500	1,200	0	17	1.5 (3)	31 (18)	58	33 (18)	
	Broomfleet	1	2	0	0	7,200	15	<1 (1)	38 (22)	92	24 (10)	
	Brough	97	342	4,300	4,800	6,100	11	4 (4)	19 (11)	36	33 (18)	
	Ferriby	37	49	2,300	4,800	12,900	8	1 (3)	19 (11)	48	24 (9)	
	Hessle	13	31	4,300	11,400	48,000	5	1 (3)	16 (7)	44	18 (7)	
Total		**413**	**26,876**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Hull between 0800 and 0900

G.2.2 Sheffield, Goole and Doncaster

Demand on this route into Hull is very low, and conditional outputs are better described for services into South Yorkshire. Doncaster provides connectivity to the south on the East Coast Main Line. The Long Distance Market Study recommends a significantly improved service between Manchester, Sheffield and Hull to improve business to business connectivity.

Table 12 - Population, demand and current services for stations on the Sheffield and Doncaster corridor to Hull to inform conditional outputs

Corridor	Station name	Total Journeys into Hull* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Hull	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) - mph	Notes
Conisbrough, Doncaster and Hull	Swinton	1	389	5,400	25,700	38,300	49	<1 (0)	87 (64)	133	34 (22)	
	Mexborough	1	327	7,000	20,200	40,600	48	<1 (0)	80 (61)	130	36 (22)	
	Conisbrough	0	88	3,800	13,500	25,600	46	<1 (0)	83 (63)	126	33 (22)	
	Doncaster	45	3,884	5,700	42,300	38,500	41	2 (2)	58 (51)	88	42 (28)	
	Kirk Sandall	1	172	5,500	10,800	36,400	37	1 (1)	67 (46)	100	33 (22)	
	Hatfield & Stainforth	1	109	3,000	12,900	14,900	34	1 (1)	58 (37)	96	35 (21)	
	Thorne	4	301	8,200	4,300	11,900	31	1 (1)	56 (35)	90	33 (21)	
	Goole	62	294	7,900	8,400	2,500	24	2 (1)	36 (26)	69	40 (21)	
Total		**115**	**5,564**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Hull between 0800 and 0900

G.2.3 Scarborough and Beverley

This route provides services from Scarborough and Bridlington to Hull. Demand is relatively high from some stations compared with other routes around Hull, and the higher frequency from stations within the travel to work area is appropriate, particularly in the peak.

The rail market is also driven by tourism on the route particularly in the off-peak and at weekends.

Stakeholders aspire for a more frequent service between Scarborough, Bridlington and Hull to meet the tourism and commuting market into Scarborough.

G.2.3.1 Current services:

- One service per hour from Bridlington to Sheffield calling at Driffield, Cottingham and Beverley.
- Scarborough to Hull service : All stations between Scarborough and Hull via Bridlington – less than hourly.
- Extra peak service from Beverley to Hull via Cottingham.

G.2.3.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey times on the route are relatively fast compared with some suburban services but could be improved given the distance between stations on the route.
- **Rolling stock:** Services tend to be run by early generation pacer and sprinter stock with poor acceleration and causes issues with passenger satisfaction.

G.2.3.3 Criteria for conditional outputs:

- **Willingness to commute**: The GJT from all stations between Driffield and Cottingham is less than 60 minutes.
- **Jobs at destination**: Hull is an important centre for culture and employment in the East Riding of Yorkshire, but has a smaller travel to work area than Leeds and Sheffield and does not have as much employment as these cities. Scarborough and Beverley are also employment centres in their own right.
- **Population catchments**: Scarborough, Bridlington, Driffield, Beverley and Cottingham, serve relatively large communities.
- **Market for rail**: Demand is relatively high from Cottingham, Beverley, Driffield and Bridlington, Driffield, Beverley and Cottingham compared with stations on other routes into Hull, but still low compared with some suburban routes into Leeds and Sheffield.
- **Deprivation:** There are pockets of deprivation on the route. **http://casa.oobrien.com/booth**/.
- **Rail's market share**: Rail's market share is relatively small into Hull, and gains can still be made.

G.2.3.4 Recommendations for conditional outputs:

- Improve journey times through improved rolling stock characteristics and possibly Infrastructure improvements.
- Some changes to off peak frequencies through changing stopping patterns may attract higher off peak patronage.
- Increase capacity to meet peak demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

Table 13 - Population, demand and current services for stations on the Scarborough corridor via Beverley to Hull to inform conditional outputs

Corridor	Station name	Total Journeys into Hull* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Hull	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) - mph	Notes
Scarborough via Beverley	Scarborough	62	906	16,900	17,600	10.100	54	<1 (1)	112 (85)	145	29 (22)	
	Seamer	4	92	3,300	8,500	19,900	51	<1 (1)	104 (80)	139	29 (22)	
	Filey	8	123	4,600	0	3,600	44	<1 (1)	74 (68)	130	36 (20)	
	Hunmanby	2	22	1,100	2,500	4,600	42	<1 (1)	69 (63)	125	36 (20)	
	Bempton	1	11	800	3,800	17,200	35	<1 (1)	59 (54)	116	35 (18)	
	Bridlington	141	430	10,000	15,500	0	31	2 (2)	45 (42)	75	41 (25)	
	Nafferton	11	30	0	4,400	8,200	22	1 (2)	33 (31)	67	39 (19)	
	Driffield	123	254	4,300	7,000	1,200	20	1 (2)	31 (25)	59	38 (20)	
	Hutton Cranswick	17	38	1,300	0	1,200	16	1 (2)	29 (22)	58	34 (17)	
	Beverley	356	611	9,400	13,900	4,500	8	2 (3)	16 (13)	38	31 (13)	
	Cottingham	75	201	6,300	31,800	82,600	4	2 (3)	10 (6)	31	24 (8)	
Total		**802**	**2,719**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Hull between 0800 and 0900

G.3 Service level conditional outputs for North Yorkshire

This section is an interpretation of the Regional Urban conditional outputs into and within North Yorkshire disaggregated by the rail corridors into York.

York is a smaller employment centre than Leeds and Sheffield, but tends to be centred on higher value industries. There are around 105,000 jobs, 31,000 of which are in the public sector (Centre for cities – 2011).

The University of York and York St Johns University have around 21,000 undergraduate and postgraduate students (Higher Education Statistics Agency statistics).

York is a key international and national tourist destination that drives longer distance demand to and from the city, York has excellent links into the intercity rail network.

On many routes into York, Regional Urban demand is driven by commuting into Leeds or other towns and cities and the market drivers are better described there. However, this section represents issues that are not adequately covered by other sections such as the Regional Urban market into York from the Harrogate route and shows information on demand into York and other statistics to support the long term planning process going forward.

For the purposes of this case study, this section is organised into a description of the conditional outputs relating to each of the following corridors around York:

- Harrogate
- East Coast Main Line North and Middlesbrough
- Scarborough via Malton
- East Coast Main Line South, Sheffield (via Sherburn in Elmet)
- Hull via Selby
- Bradford and Huddersfield and Leeds

G.3.1 Harrogate

The Harrogate route provides services into Leeds and York; conditional outputs for the Leeds end of this route are described in the West Yorkshire section of this appendix. However, despite the draw of Leeds as a centre of employment and culture in the region, demand from Harrogate to York is relatively high.

G.3.1.1 Current services:

- One service from Leeds to York via Harrogate stopping at all stations.

G.3.1.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey times from stations between Harrogate and Poppleton are relatively slow compared with other suburban services.
- **Rolling stock:** The services are run by early generation diesel stock with poor acceleration and causes issues with passenger satisfaction.

G.3.1.3 Criteria for conditional outputs:

- **Willingness to commute**: The GJT for all stations between Harrogate and Poppleton is either between 20 and 60 minutes or could be improved through small frequency and journey time improvements to less than 60 minutes.
- **Jobs at destination:** York is an important centre for culture and employment in North Yorkshire and is a major tourist destination, but has a smaller travel to work area than Leeds and Sheffield and does not have as much employment as these cities.
- **Population catchments**: Harrogate, Starbeck and Knaresborough all serve relatively large communities.

- **Market for rail:** Demand is relatively high from Harrogate to York compared with other routes into York, but demand is relatively low compared with some suburban routes into Leeds and Sheffield.
- **Deprivation:** There are pockets of deprivation on the route. **http://casa.oobrien.com/booth**/.
- **Rail's market share**: Rail's market share is relatively low into York, and gains can still be made. Congestion in York improves rail's natural competitiveness.

G.3.1.4 Recommendations for conditional outputs:

- Improve journey times through improved rolling stock characteristics and possibly infrastructure improvements.
- Increase frequency from one to two trains per hour from Harrogate to York. This recommendation ties in with recommendations made for services into Leeds in the West Yorkshire section of this appendix.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

Table 14 - Population, demand and current services for stations on the Harrogate corridor to York to inform conditional outputs												
Corridor	Station name	Total Journeys into York* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from York	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) - mph	Notes
Harrogate	Burley Park	12	653	28,800	86,200	131,000	28 via Leeds	1 (2)	60 (60)	86	28 (20)	
	Headingley	9	394	12,900	96,800	111,100	29 via Leeds	1 (2)	61 (58)	87	28 (20)	
	Horsforth	24	961	6,700	28,300	75,100	31	1 (2)	62 (53)	88	30 (21)	
	Weeton	4	60	0	1,100	5,700	27	1 (2)	65 (45)	86	25 (19)	
	Pannal	8	130	1,800	10,300	24,400	24	1 (2)	58 (40)	82	25 (17)	
	Hornbeam Park	27	270	0	16,200	37,100	21	1 (2)	58 (36)	77	22 (17)	
	Harrogate	266	1,369	8,700	42,700	10,400	21	1 (2)	56 (32)	73	22 (17)	
	Starbeck	43	161	7,800	31,300	27,900	18	1 (2)	43 (27)	68	26 (16)	
	Knaresborough	88	326	6,600	10,100	24,100	17	1 (2)	31 (23)	62	32 (16)	
	Cattal	21	53	0	1,300	3,700	10	1 (2)	22 (15)	53	28 (12)	
	Hammerton	11	25	0	1,400	3,600	9	1 (2)	18 (11)	49	29 (11)	
	Poppleton	25	62	2,100	17,700	46,200	3	1 (2)	11 (4)	42	16 (4)	
Total		**538**	**4,464**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into York between 0800 and 0900

G.3.2 East Coast Main Line North from Middlesbrough, Northallerton and Thirsk

The market for travel on these lines is more interurban in nature and better described through the Long Distance Market Study or through the Regional Urban market for Leeds and Middlesbrough. However, demand on these corridors into York is relatively high and there is planned housing growth on both routes that may support the commuting markets into York and Leeds. In the context of North Cross-Pennine electrification, the continuation of through services to Leeds and beyond is important to stakeholders.

G.3.2.1 Recommendations for conditional outputs:

- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- Continue to provide direct connectivity to York, Leeds and beyond, this is especially important in the context of electrification of the North Cross-Pennine route.

G.3.3 Scarborough via Malton

The market for travel on this line is more inter-urban in nature and better described through the Long Distance Market Study or through the Regional Urban market for Leeds and Scarborough. However, demand on these corridors into York is relatively high and there is planned housing growth on both routes that may support the commuting markets into York and Leeds. In the context of North Cross-Pennine electrification, the continuation of through services to Leeds and beyond is important to stakeholders.

G.3.3.1 Recommendations for conditional outputs:

- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- Continue to provide direct connectivity to York, Leeds and beyond, this is especially important in the context of electrification of the North Cross-Pennine route.

Table 15 - Population, demand and current services for stations on the East Coast Main Line North Scarborough and Middlesbrough corridor to York to inform conditional outputs												
Corridor	Station name	Total Journeys into York* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from York	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) - mph	Notes
East Coast Main Line North	Darlington	172	2,256	11,200	41,300	20,400	44	4 (4)	28 (29)	48	95 (55)	
	Northallerton	124	572	6,500	5,700	2,900	30	1 (3)	25 (27)	51	72 (35)	
	Thirsk	67	188	1,100	6,300	0	22	1 (3)	33 (16)	51	40 (26)	
Total		**364**	**3,016**									
Scarborough	Scarborough	221	906	16,900	17,600	10,100	42	1 (1)	50 (26)	87	51 (29)	
	Seamer	34	92	3,300	8,500	19,900	39	1 (1)	45 (43)	80	52 (30)	
	Malton	129	292	3,700	5,100	2,400	21	1 (1)	27 (50)	62	47 (21)	
Total		**384**	**1,290**									
Middlesbrough	Middlesbrough	97	1,423	4,800	36,300	59,400	51	1 (1)	67 (40)	100	45 (31)	
	Eaglescliffe	5	135	3,400	19,500	52,600	45	1 (1)	61 (41)	99	44 (27)	
	Yarm	41	133	3,100	10,900	15,900	42	1 (1)	53 (53)	91	48 (28)	
Total		**205**	**2,427**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into York between 0800 and 0900

G.3.4 East Coast Main Line South from Doncaster and from Sheffield via Sherburn-in-Elmet

The market for travel on these lines is more interurban in nature and better described through the Long Distance Market Study.

G.3.4.1 Recommendations for conditional outputs:

- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

Table 16 - Population, demand and current services for stations on the East Coast Main Line South corridor and from Sheffield via Sherburn-in-Elmet to York to inform conditional outputs

Corridor	Station name	Total Journeys into York* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from York	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) - mph	Notes
East Coast Main Line South	Doncaster	229	3,884	5,700	42,300	38,500	33	2.5 (2)	33 (29)	57	59 (34)	
	Retford	15	406	6,500	9,600	2,600	50	<1 (1)	68 (16)	107	44 (28)	
Total		**244**	**4,290**									
Sheffield via Sherburn-in-Elmet	Sherburn-in-Elmet	28	32	2,500	4,200	4,200	13	<1 (1)	36 (12)	71	22 (11)	
Total		**28**	**32**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into York between 0800 and 0900

G.3.5 Hull via Selby

The market for travel on this line is better described through the Regional Urban market for Hull and the East Riding of Yorkshire.

There are aspirations to improve the frequency of services and improve journey times on this route.

G.3.5.1 Recommendations for conditional outputs:

- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

Table 17 - Population, demand and current services for stations on the Hull via Selby corridor to York to inform conditional outputs

Corridor	Station name	Total Journeys into York* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from York	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) - mph	Notes
Hull via Selby	Hull	72	2,213	7,300	53,500	81,100	49	<1 (1)	85 (61)	120	35 (25)	
	Hessle	1	31	4,300	11,400	48,000	45	<1 (1)	103 (52)	140	26 (19)	
	Ferriby	0	49	2,300	4,800	12,900	42	<1 (1)	102 (48)	137	25 (18)	
	Brough	13	342	4,300	4,800	6,100	39	<1 (1)	72 (41)	102	32 (23)	
	Gilberdyke	3	51	2,500	1,200	0	33	<1 (1)	82 (35)	99	24 (20)	
	Eastrington	1	1	0	1,400	4,900	30	<1 (1)	70 (37)	137	26 (13)	
	Howden	15	95	0	2,400	2,700	27	<1 (1)	77 (28)	91	28 (18)	
	Wressle	1	1	0	0	5,400	24	<1 (1)	59 (28)	120	19 (12)	
	Selby	75	485	7,500	10,000	6,300	18	<1 (1)	35 (18)	69	32 (16)	
Total		**209**	**3,300**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into York between 0800 and 0900

G.3.6 Huddersfield, Bradford and Leeds.

The market for travel on these lines is better described through the Regional Urban market for Leeds.

G.3.6.1 Recommendations for conditional outputs:

- Increase capacity to meet demand through lengthening or increased frequency.

Table 18 - Population, demand and current services for stations on the Leeds, Bradford and Huddersfield corridor to York to inform conditional outputs												
Corridor	Station name	Total Journeys into York* (thousands)	Total Journeys to and from station (ORR station usage 2011-2012) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from York	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) - mph	Notes
Leeds	Leeds	1,075	25,020	13,600	95,400	123,600	26	5 (6)	33 (29)	42	47 (37)	
	Cross Gates	16	499	9,500	37,600	54,000	21	1 (1)	34 (16)	65	38 (20)	
	Garforth	21		5,400	8,600	27,900	18	1 (2)	24 (14)	51	46 (22)	
	East Garforth	3		6,200	13,100	13,800	17	1 (2)	26 (18)	61	40 (17)	
	Micklefield	29	193	1,100	2,000	22,000	16	1 (1)	20 (11)	58	48 (17)	
	Church Fenton	45	73	0	3,000	5,000	11	<1 (1)	25 (8)	57	26 (11)	
	Ulleskelf	5	6	0	1,700	6,800	9	<1 (1)	37 (9)	87	14 (6)	
Total		**1,193**	**25,792**									
Huddersfield	Huddersfield	95	4,200	13,200	54,900	51,300	43	3 (3)	53 (44)	74	48 (35)	
	Deighton	0	54	4,400	31,400	71,600	41	0 (0)	75 (ind)	113	32 (22)	
	Mirfield	2	334	5,000	17,700	68,300	38	0 (0)	74 (ind)	110	31 (21)	
	Ravensthorpe	0	24	4,000	33,300	68,100	36	0 (0)	72 (ind)	111	30 (20)	
	Dewsbury	48	1,483	8,800	50,600	55,100	35	2 (2)	48 (38)	72	44 (29)	
	Batley	2	277	9,000	44,100	73,800	34	0 (0)	56 (ind)	94	36 (21)	
	Morley	3	348	8,600	30,200	80,600	30	0 (0)	57 (Ind)	95	32 (19)	
	Cottingley	2	97	4,800	46,200	98,300	28	0 (0)	55 (ind)	98	31 (17)	
Total		**155**	**7,213**									
Bradford	Sowerby Bridge	4	322	5,800	34,600	37,200	47	1 (1)	92 (78)	120	31 (24)	
	Halifax	37	1,857	2,500	44,100	48,900	44	1 (1)	76 (71)	106	34 (25)	
	New Pudsey	38	797	7,600	52,500	89,400	32	1 (1)	51 (47)	80	37 (24)	
	Bramley	7	337	7,800	59,800	93,000	29	1 (1)	51 (49)	85	34 (21)	
Total	i	**85**	**3,313**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into York between 0800 and 0900

G.4 Service level conditional outputs for South Yorkshire

This section is an interpretation of the Regional Urban conditional outputs into and within South Yorkshire disaggregated by the rail corridors into Sheffield.

Sheffield is a key centre for employment in South Yorkshire with around 340,000 jobs, 108,000 of which are in the public sector (Centre for cities – 2011). Meadowhall, Rotherham, Barnsley, Chesterfield and Doncaster are employment centres in their own right and drive interurban and suburban rail trips across the region.

Sheffield Hallam University is the fourth largest in the country by numbers of students. Sheffield Hallam and the University of Sheffield have around 60,000 undergraduate and postgraduate students (Higher Education Statistics Agency statistics).

The Sheffield City region has been designated an enterprise zone specialising in advanced manufacturing, creative industries, digital, technologies, logistics, low-carbon technologies and healthcare.

Sheffield is part of the first wave of core cities to achieve City Deal status. This will give more accountability to the region in exchange for more powers to encourage jobs and growth in the area.

The Government recently announced that the High Speed Rail network will include a station at Sheffield (Meadowhall).

This section is organised into a description of the conditional outputs relating to each of the following corridors around Sheffield:

- Barnsley and Penistone
- Moorthorpe, Conisbrough, Doncaster, Scunthorpe, Grimsby, Cleethorpes and Hull
- Retford, Lincoln and Worksop
- Nottingham and Midland Main Line
- Hope Valley, Hazel Grove and Manchester

G.4.1. Barnsley and Penistone

The Barnsley route provides services into Sheffield from Leeds, Wakefield Kirkgate and Barnsley, this route is also considered in the West Yorkshire conditional outputs section. The Penistone corridor provides commuting services into Sheffield and Huddersfield.

G.4.1.1 Current services:

- Two limited stopping services per hour between Leeds, Wakefield, Barnsley, Meadowhall and Sheffield (one carrying on per hour to Nottingham).
- One stopping service per hour from Leeds to Sheffield via Barnsley (all stations stops).
- One stopping service per hour from Huddersfield to Sheffield via Penistone (all station stops with the exception of Elsecar).

G.4.1.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey times from Darton are relatively slow into Sheffield because the hourly service stops at all stations to Sheffield. Journey times from the Penistone corridor into Sheffield are relatively long.
- **Rolling stock:** The stopping services are run by early generation diesel stock with poor acceleration and causes issues with passenger satisfaction.

G.4.1.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT for all stations between Barnsley and Chapeltown is between 20 and 60 minutes. The GJT from Darton, Penistone, Silkstone Common and Dodworth could be improved to less than 60 through frequency and journey time improvements.
- **Jobs at destination:** Sheffield is a large employer and commercial centre for Yorkshire, Meadowhall is a destination for leisure purposes.

- **Population catchments:** Barnsley has a large population, particularly within the catchment of the station, stations between Barnsley and Chapeltown serve mid sized communities, with the exception of Penistone, and stations on the Penistone line tend to serve smaller communities.
- **Market for rail:** Demand is high from Barnsley and Meadowhall, and relatively low from all other stations particularly on the Penistone line.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share:** Rail's market share is relatively small into Sheffield, and gains can still be made.

G.4.1.4 Recommendations for conditional outputs:

- Improve journey times through improved rolling stock characteristics and possibly infrastructure improvements.
- Increase frequency from one to two trains per hour from Darton, Penistone and Elsecar.
- Increase capacity to meet demand through lengthening or increase frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

G.4.1.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Barnsley and Meadowhall on this corridor into Sheffield will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements could be made through journey time and frequency improvements. The impact of these improvements from these stations to Sheffield on Gross Value Added (GVA) through labour supply improvements is estimated to be around £140,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £229,000 per annum per minute of GJT. There are opportunities to significantly improve the service from Darton to Sheffield on this route and there is also value in improving services from suburban stations into Sheffield such as Wombwell, Elsecar and Chapeltown.

G.4.2 Hull, Cleethorpes, Grimsby, Scunthorpe, Conisborough and Moorthorpe

The Moorthorpe route provides services into Leeds and Sheffield via Rotherham, this route is also considered in the West Yorkshire conditional outputs section.

The Conisbrough route provides services into Sheffield and Doncaster, and east of Doncaster from Hull, Grimsby and Cleethorpes. Further analysis of the Regional Urban market on these corridors can be found in the East Yorkshire section of this appendix and the Lincolnshire section of Appendix B East Midlands.

Stakeholders aspire to improve Rotherham's interurban connectivity.

G.4.2.1 Current services:

- One service per hour from Leeds to Sheffield via Wakefield.
- One service per hour from York to Sheffield via Doncaster.
- One service per hour from Leeds to Sheffield via Rotherham, (all stations stops).
- One service per hour from Adwick to Lincoln via Doncaster and Sheffield (all station stops).
- One service per hour from Scunthorpe to Sheffield (all station stops).
- One service per hour from Cleethorpes to Manchester Airport (calling at limited stops).
- One service per hour from Hull/Scarborough to Sheffield service per hour (calling at limited stops).

G.4.2.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey times from stations on stopping services are relatively slow compared with some other suburban routes such as Ilkley to Leeds. Journey times from Doncaster to Sheffield are fast for some services and slow for others, despite having an even pattern leaving Doncaster.

- **Rolling stock**: Suburban services are run by early generation diesel stock with poor acceleration and causes issues with passenger satisfaction. The interurban and Cleethorpes to Manchester Airport services tend to be run by fast accelerating, later generation diesel stock.

G.4.2.3 Criteria for conditional outputs:

- **Willingness to commute**: The GJT from all stations between Rotherham and Thurnscoe, and between Mexborough and Doncaster is either between 20 and 60 minutes or could be improved by small frequency improvements and journey time improvements to less than 60 minutes. South Elmsall has a peak service into Doncaster and Sheffield only, small frequency improvements could be made to improve the GJT significantly from this station.
- **Jobs at destination:** Sheffield is a large employer and commercial centre for Yorkshire, Meadowhall is a destination for leisure purposes, Doncaster is a destination for employment for stations where other employment centres are difficult to get to.
- **Population catchments**: Stations on this route within the willingness to commute boundary tend to serve relatively large communities within the catchments of the stations, Rotherham and Doncaster have large populations and this is reflected in the demand between these stations and Sheffield.
- **Market for rail**: Demand is high from Rotherham and Doncaster, and relatively low from most other stations. Demand could be suppressed because of the poor service offer in terms of journey times and frequency from many of the stations on these routes.
- **Deprivation:** There are pockets of deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share**: Rail's market share is relatively small into Sheffield, and gains can still be made.

G.4.2.4 Recommendations for conditional outputs:

- Increase frequency of services from Thurnscoe, Goldthorpe and Bolton-on-Dearne from one to two trains per hour and journey time improvements to reduce GJT to less than 60 minutes from these stations. This correlates with the conditional outputs expressed in the West Yorkshire section and would provide two trains per hour on this route from Leeds to Sheffield. As a result of the increased frequency from these stations the frequency from Swinton and Rotherham would also improve, further reducing the GJT from these stations to Sheffield.
- Reduce journey times through improved rolling stock characteristics and possibly Infrastructure improvements.
- Increase frequency from South Elmsall to Doncaster and Sheffield. This correlates with recommendations made in the West Yorkshire section.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- The Long Distance Market Study recommends a significant improvement in the service between Leeds and Sheffield.

G.4.2.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Adwick, Bentley, Doncaster, Conisborough, Mexborough, Swinton and Rotherham on this corridor into Sheffield will have a relatively large impact on labour supply and reducing deprivation by providing access to employment. Provision of two trains per hour at an average journey speed of 30mph could improve the GJT from each of these stations to Sheffield by 10 – 20 minutes. The impact of these improvements from these stations to Sheffield on Gross Value Added (GVA) through labour supply improvements is estimated to be around £167,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £359,000 per annum per minute of GJT.

Table 19 - Population, demand and current servicess for stations on the Barnsley and Penistone corridors to Sheffield to inform conditional outputs

Corridor	Station name	Total Journeys into Sheffield* (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Sheffield	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) - mph	Notes
Barnsley	Leeds	562	25,020	13,600	95,400	123,600	38	2 (2)	54 (41)	74	42 (31)	
	Normanton	6	210	1,300	17,200	40,600	30	1 (1)	57 (42)	93	32 (19)	
	Wakefield	98	2,575	7,100	36,800	43,000	27	2 (2)	31 (28)	58	52 (28)	
	Darton	23	153	3,400	13,100	27,400	20	1 (1)	50 (32)	74	23 (16)	
	Barnsley	658	1,448	9,500	42,900	33,200	16	4 (4)	26 (20)	42	37 (23)	
	Wombwell	85	196	3,300	23,100	37,700	12	2 (2)	19 (18)	49	38 (15)	
	Elsecar	68	131	5,700	11,700	37,500	11	1 (2)	18 (17)	49	35 (13)	
	Chapeltown	186	310	7,300	18,800	47,600	8	2 (2)	17 (12)	41	26 (11)	
	Meadowhall	489	2,057	5,500	39,800	82,800	3	9 (8)	9 (5)	17	23 (12)	
Total		**2,173**	**32,100**									
Penistone	Huddersfield	58	4,200	13,200	54,900	51,300	37	1 (1)	76 (73)	109	29 (20)	
	Lockwood	2	42	9,000	51,800	48,300	36	1 (1)	76 (68)	113	28 (19)	
	Berry Brow	1	27	3,800	36,400	62,900	35	1 (1)	74 (65)	110	28 (19)	
	Honley	2	58	2,200	18,100	56,600	34	1 (1)	71 (62)	107	28 (19)	
	Brockholes	4	54	1,100	13,900	34,900	33	1 (1)	68 (59)	104	29 (19)	
	Stocksmoor	1	26	0	11,400	24,900	31	1 (1)	78 (56)	101	24 (18)	
	Shepley	3	67	3,400	5,800	18,000	30	1 (1)	58 (53)	98	31 (18)	
	Denby Dale	13	141	2,600	4,700	9,300	28	1 (1)	55 (48)	93	30 (18)	
	Penistone	38	132	3,700	5,600	5,900	24	1 (1)	46 (41)	84	31 (17)	
	Silkstone Common	8	31	1,300	4,600	20,100	20	1 (1)	35 (34)	78	35 (16)	
	Dodworth	11	34	2,300	15,600	32,100	19	1 (1)	37 (31)	75	31 (15)	
Total		**142**	**4,811**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Sheffield between 0800 and 0900

Table 20 - Population, demand and current servicess for stations on the Hull, Grimsby, Doncaster, Moorthorpe and Conisbrough corridors to Sheffield to inform conditional outputs												
Corridor	Station name	Total Journeys into Sheffield* (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Sheffield	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) - mph	Notes
Moorthorpe	Outwood	4	361	4,200	25,900	58,500	30	1 (1)	58 (56)	95	31 (19)	
	Sandal & Agbrigg	2	183	7,200	21,600	42,900	27	1 (1)	54 (46)	87	30 (18)	
	Fitzwilliam	3	201	2,200	13,100	18,100	22	1 (1)	51 (40)	83	26 (16)	
	Moorthorpe	17	200	4,300	11,700	11,800	18	1 (1)	48 (17)	78	23 (14)	
	Thurnscoe	25	67	5,200	9,900	11,300	15	1 (1)	46 (29)	73	19 (12)	
	Goldthorpe	20	58	5,800	12,800	29,000	14	1 (1)	49 (27)	71	17 (12)	
	Bolton-on-Dearne	20	60	4,600	18,000	37,700	13	1 (1)	49 (24)	68	16 (11)	
	Swinton	175	389	5,400	25,700	38,300	10	3 (3)	22 (11)	45	28 (14)	
	Rotherham Central	364	655	3,900	46,400	43,900	6	3 (3)	15 (11)	35	22 (9)	
Total		**630**	**2,175**									
Doncaster	South Elmsall	0	363	6,700	8,200	9,300	26	Ind	72 (ind)	108	22 (15)	
	Adwick	10	258	3,400	14,700	19,400	22	1 (1)	62 (28)	92	22 (15)	
	Bentley	6	162	6,400	33,000	36,900	20	1 (1)	60 (44)	89	20 (14)	
	Doncaster	1,086	3,884	5,700	42,300	38,500	18	4 (2)	31 (23)	49	36 (23)	
	Conisbrough	28	88	3,800	13,500	25,600	14	2 (2)	32 (27)	58	26 (14)	
	Mexborough	105	327	7,000	20,200	40,600	11	2 (2)	28 (13)	54	24 (13)	
Total		**1,235**	**5,081**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Sheffield between 0800 and 0900

Table 20 (continued) - Population, demand and current servicess for stations on the Hull, Grimsby, Doncaster, Moorthorpe and Conisbrough corridors to Sheffield to inform conditional outputs												
Corridor	Station name	Total Journeys into Sheffield* (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Sheffield	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) - mph	Notes
Scunthorpe/ Grimsby/ Cleethorpes	Cleethorpes	34	265	6,300	33,000	26,300	71	1 (1)	102 (102)	145	42 (29)	
	Grimsby Town	31	447	12,400	51,200	29,100	67	1 (1)	94 (89)	136	43 (30)	
	Habrough	1	33	0	1,100	10,800	59	1 (1)	94 (76)	133	38 (27)	
	Barnetby	5	69	1,400	0	2,200	53	1 (1)	75 (69)	116	42 (27)	
	Scunthorpe	39	395	7,500	36,900	13,400	42	2 (2)	72 (54)	100	35 (25)	
	Althorpe	0	9	2,200	1,700	19,100	38	2 (2)	84 (61)	126	27 (18)	
	Crowle	2	34	0	3,900	2,600	34	2 (2)	83 (55)	122	25 (17)	
	Thorne	15	301	8,200	4,300	11,900	28	2 (2)	59 (46)	96	29 (18)	
	Hatfield & Stainforth	6	109	3,000	12,900	14,900	25	2 (2)	56 (36)	93	27 (16)	
	Kirk Sandall	9	172	5,500	10,800	36,400	22	2 (2)	52 (41)	89	25 (15)	
Total		**141**	**1,834**									
Hull	Hull	54	2,213	7,300	53,500	81,100	59	1 (1)	96 (83)	135	37 (26)	
	Hessle	1	31	4,300	11,400	48,000	54	<1 (1)	102 (90)	149	32 (22)	
	Ferriby	0	49	2,300	4,800	12,900	52	<1 (1)	98 (94)	144	32 (22)	
	Brough	10	342	4,300	4,800	6,100	49	1 (1)	83 (59)	119	35 (25)	
	Gilberdyke	1	51	2,500	1,200	0	42	<1 (1)	80 (59)	128	32 (20)	
	Saltmarshe	0	4	0	2,500	12,700	39	<1 (1)	86 (71)	142	27 (16)	
	Goole	9	294	7,900	8,400	2,500	36	1 (1)	64 (52)	103	33 (21)	
Total		**75**	**2,984**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Sheffield between 0800 and 0900

G.4.3 Lincoln, Retford and Worksop

The Lincoln, Retford, and Worksop route provides a stopping service into Sheffield, and connects Mansfield and Worksop and Sheffield.

G.4.3.1 Current services:

- One service per hour from Lincoln Central to Adwick via Gainsborough, Retford, Darnall and Sheffield.

G.4.3.2 Journey times and rolling stock:

- **Journey times/speeds:** Journey times from stations between Shireoaks and Darnall are relatively slow into Sheffield.
- **Rolling stock**: Rolling stock on the stopping services tends to be run by early generation diesel stock with poor acceleration and causes issues with passenger satisfaction.

G.4.3.3 Criteria for conditional outputs:

- **Willingness to commute:** The GJT for all stations between Worksop and Darnall is either between 20 and 60 minutes or could be improved by small frequency and journey time improvements to be less than 60 minutes.
- **Jobs at destination:** Sheffield is a large employer and commercial centre for Yorkshire. Lincoln and Worksop are employment centres in their own right.
- **Population catchments**: Lincoln, Retford and Worksop, have large population catchments. Shireoaks and Kiveton serve relatively small communities and this is reflected in the number of journeys from these stations. Woodhouse and Darnall are suburbs of Sheffield.
- **Market for rail:** Demand is relatively low from all stations, demand from Worksop is the highest on the line, and this could be suppressed by the poor service from this station.
- **Deprivation:** There are pockets of Deprivation on the route. http://casa.oobrien.com/booth/.
- **Rail's market share**: Rail's market share is relatively small into Sheffield, and gains can still be made. However, in order for services from Darnall and Woodhouse to be competitive with more convenient modes of inner city transport such as car and bus, significant frequency improvements would be required.

G.4.3.4 Recommendations for conditional outputs:

- Improve journey times through improved rolling stock characteristics and possibly infrastructure improvements.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- Increase the frequency of services from Worksop to Sheffield. There may also be opportunities to provide better interurban connections on this route between Nottingham, Mansfield, Worksop and Sheffield.

G.4.3.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Worksop, Kiveton and Woodhouse to Sheffield on this corridor into Sheffield will have the largest impact on labour supply and reducing deprivation by providing access to employment. Provision of two trains per hour at an average journey speed of 40mph could improve the GJT from each of these stations to Sheffield by approximately 15 minutes. The impact of these improvements from these stations to Sheffield on Gross Value Added (GVA) through labour supply improvements is estimated to be around £46,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £43,000 per annum per minute of GJT.

Table 21 - Population, demand and current servicess for stations on the Lincoln, Retford and Worksop corridors to Sheffield to inform conditional outputs												
Corridor	Station name	Total Journeys into Sheffield* (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Sheffield	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) - mph	Notes
Lincoln, Retford and Worksop	Lincoln Central	57	1,655	11,800	34,900	31,500	49	1 (1)	102 (73)	124	29 (24)	
	Saxilby	3	59	2,000	1,800	1,200	42	1 (1)	71 (58)	116	36 (22)	
	Gainsborough	5	155	4,600	8,700	4,200	33	1 (1)	57 (45)	104	35 (19)	
	Retford	25	406	6,500	9,600	2,600	24	1 (1)	49 (31)	81	29 (17)	
	Worksop	157	464	9,700	23,000	2,600	16	1 (1)	28 (21)	64	34 (15)	
	Shireoaks	18	32	2,300	14,100	22,400	14	1 (1)	25 (18)	61	33 (14)	
	Kiveton Park	32	49	0	10,800	14,600	11	1 (1)	25 (14)	56	26 (11)	
	Kiveton Bridge	41	66	3,700	6,400	29,900	10	1 (1)	23 (17)	54	25 (11)	
	Woodhouse	16	28	7,100	34,900	60,300	5	1 (1)	11 (10)	47	29 (7)	
	Darnall	3	12	8,100	34,800	132,300	2	1 (1)	9 (5)	42	14 (3)	
Total		357	2,926									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Sheffield between 0800 and 0900

G.4.4 Nottingham and Midland Main Line

The Nottingham route provides two trains per hour into Sheffield, and the Midland Main Line route provides fast intercity services from London St Pancras International into Sheffield via Leicester, Derby and Chesterfield. These routes are more interurban in nature, with only a few stations all serving large communities.

A new station is planned at Ilkeston.

Further analysis of the regional urban market can be found in Appendix B: East Midlands.

G.4.4.1 Current services:

- One service per hour from Nottingham to Leeds via Sheffield, Alfreton, Chesterfield and Dronfield.
- One service per hour from Norwich to Liverpool Lime Street via Alfreton and Chesterfield and Sheffield.
- Two services per hour from London St Pancras International to Sheffield via Leicester, Derby and Chesterfield.

G.4.4.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey times on the Nottingham route are relatively slow given the low number of stops on the route.
- **Rolling stock**: The Nottingham route is run by is run by 90mph diesel stock. The route from Derby is run by 125mph diesel units.

G.4.4.3 Criteria for conditional outputs:

- **Willingness to commute**: The GJT from Derby, Alfreton, Chesterfield and Dronfield is less than 60 minutes.
- **Jobs at destination:** Sheffield is a large employer and commercial centre for Yorkshire, Meadowhall and Chesterfield are employment centres in their own right.
- **Population catchments**: All stations serve relatively large communities.
- **Market for rail**: Demand is high from Derby, Nottingham and Chesterfield.
- **Deprivation:** There are pockets of deprivation on this route. **http://casa.oobrien.com/booth/**.
- **Rail's market share:** Rail's market share is relatively small into Sheffield, and gains can still be made.

G.4.4.4 Recommendations for conditional outputs:

- The Long Distance Market Study recommends that the frequency and journey time between Nottingham and Sheffield is significantly improved as a result of the value of business to business connectivity between these two places.
- All other stations are well served into Sheffield, although journey time improvements on the Nottingham to Sheffield route could be made.
- Increase the frequency of service from one to two trains per hour from Dronfield to Sheffield.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.

G.4.4.5 Analysis of conditional outputs against strategic goals:

Analysis shows that improving the Generalised Journey Time (GJT) from Alfreton and Chesterfield to Sheffield on this corridor into Sheffield will have the largest impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements could be made to journey times to Sheffield. The impact of these improvements from these stations to Sheffield on Gross Value Added (GVA) through labour supply improvements is estimated to be around £80,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £103,000 per annum per minute of GJT.

Table 22 - Population, demand and current servicess for stations on the Nottingham and Midland Main Line corridors to Sheffield to inform conditional outputs												
Corridor	Station name	Total Journeys into Sheffield* (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Leeds	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) - mph	Notes
Nottingham	Nottingham	280	6,437	15,000	85,800	112,700	41	1 (1)	56 (9)	82	44 (30)	
	Alfreton	45	212	3,400	19,200	16,000	23	2 (2)	33 (10)	57	42 (24)	
	Chesterfield	467	1,487	6,300	43,900	32,900	12	5 (5)	17 (27)	28	43 (26)	
	Dronfield	64	153	8,000	15,400	35,100	7	2 (2)	24 (51)	43	18 (10)	
Total		**857**	**8,289**									
Midland Main Line	Leicester	146	4,881	24,600	116,700	116,700	60	2 (2)	68 (29)	99	53 (36)	
	Derby	267	3,351	5,600	76,300	80,900	36	4 (4)	33 (56)	53	66 (42)	
Total		**412**	**8,232**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Sheffield between 0800 and 0900

G.4.5 Manchester, Hazel Grove and the Hope Valley

The Hope Valley route provides services from small communities in the peak district to Sheffield, is the fastest route between Manchester and Sheffield and also provides direct connectivity to Liverpool and Manchester Airport. The Northern Hub programme of works will result in improved services between Manchester and Sheffield, and other destinations in Yorkshire.

G.4.5.1 Current services:

- Sheffield to Manchester stopping service via: Marple, Romiley, Chinley, Dore Sheffield (all station stops, less than hourly).
- One service per hour from Manchester Airport to Cleethorpes calling at Manchester Piccadilly, Stockport and Sheffield.
- One service per hour from Liverpool Lime Street to Nottingham/ Norwich via Manchester Piccadilly, calling at Stockport and Sheffield.

G.4.5.2 Journey times and rolling stock:

- **Journey times/speeds**: Journey times from stations between Chinley and Dore are relatively slow into Sheffield, given the importance of Manchester and Sheffield as centres of business, commerce, culture and employment.
- **Rolling stock:** The stopping services are run by early generation diesel stock with poor acceleration and causes issues with passenger satisfaction. Faster services between Manchester and Sheffield are run by 90/100mph diesel stock.

G.4.5.3 Criteria for conditional outputs:

- **Willingness to commute**: The GJT from Dore is less than 60 minutes. The GJT from all stations between Dore and Chinley is over 60 minutes.
- **Jobs at destination**: Sheffield is a large employer and commercial centre for Yorkshire.
- **Population catchments**: Stations between Dore and Chinley serve relatively small communities.
- **Market for rail**: Demand is low from all stations on the route between Dore and Chinley.
- **Deprivation**: There are pockets of deprivation on the route. **http://casa.oobrien.com/booth**/.
- **Rail's market share**: Rail's market share is relatively small into Sheffield, and gains can still be made. Road access between Stockport, Manchester and Sheffield is through the Peak District, offers poor journey times, and is unreliable in bad weather.

G.4.5.4 Recommendations for conditional outputs:

- Improve journey times through improved rolling stock characteristics and possibly infrastructure improvements.
- Increase capacity to meet demand through lengthening or increased frequency in situations where frequency improvements are more affordable and demonstrate better value for money.
- The Long Distance Market Study recommends that the frequency and journey time between Manchester and Sheffield is significantly improved as a result of the value of business to business connectivity between these two places.

G.4.5.5 Analysis of conditional outputs against strategic goals:

With the exception of Stockport and Manchester, where the market is driven by business to business connectivity; analysis shows that improving the Generalised Journey Time (GJT) from Dore into Sheffield will have the largest impact on labour supply and reducing deprivation by providing access to employment. Small incremental improvements could be made to journey times to Sheffield. The impact of these improvements from these stations to Sheffield on Gross Value Added (GVA) through labour supply improvements is estimated to be around £9,000 per annum per minute of GJT, and the value of time for existing passengers is valued at around £7,000 per annum per minute of GJT.

Table 23 - Population, demand and current servicess for stations on the Manchester via Hazel Grove, and Hope Valley corridors to Sheffield to inform conditional outputs												
Corridor	Station name	Total Journeys into Sheffield* (thousands)	Total Journeys to and from station (ORR station usage 2011-12) (thousands)	Population <1km from station (census 2011)**	Population between 1 and 3km from station (census 2011)	Population between 3 and 5km from station (census 2011)	Distance in miles from Leeds	Frequency off peak (peak***) (trains per hour)	Average journey time (best) (minutes)	Generalised Journey Time (minutes)	Average speed (Generalised Speed) - mph	Notes
Marple	Ashburys	0	86	5,100	93,000	184,700	41	<1 (1)	87 (47)	118	28 (21)	
	Belle Vue	0	20	11,600	92,800	166,500	39	<1 (1)	91 (77)	137	26 (17)	
	Ryder Brow	0	28	11,300	78,600	179,500	39	<1 (1)	88 (76)	130	27 (18)	
	Reddish North	1	151	12,300	67,200	154,600	38	<1 (1)	77 (42)	118	30 (19)	
	Brinnington	0	79	4,600	62,600	131,900	36	<1 (1)	77 (62)	118	28 (18)	
	Bredbury	2	188	6,300	35,700	114,900	35	<1 (1)	77 (59)	112	28 (19)	
	Romiley	3	279	7,700	30,700	83,600	34	<1 (1)	77 (37)	108	27 (19)	
	Marple	11	422	3,000	15,800	41,700	33	<1 (1)	78 (52)	105	25 (19)	
	Rose Hill Marple	0	119	6,900	24,500	51,800	37	0 (0)	86 (ind)	139	25 (16)	
	New Mills Central	9	156	4,100	8,100	12,400	29	<1 (1)	70 (31)	102	25 (17)	
Total		**25**	**1,529**									
Hope Valley	Manchester	574	39,900	20,300	100,000	177,300	42	2 (2)	59 (52)	83	43 (30)	
	Stockport	103	3,313	9,900	71,700	116,800	36	2 (2)	43 (40)	71	51 (30)	
	Hazel Grove	1	610	7,600	42,200	80,400	34	<1 (0)	63 (34)	103	32 (20)	
	Chinley	13	103	2,100	4,200	11,700	25	<1 (1)	50 (26)	83	30 (18)	
	Edale	20	73	0	900	800	20	<1 (1)	46 (19)	82	26 (14)	
	Hope	15	52	0	3,300	900	15	<1 (1)	43 (25)	76	21 (12)	
	Bamford	10	25	0	1,100	5,000	13	<1 (1)	27 (14)	77	28 (10)	
	Hathersage	24	56	0	2,800	1,100	11	<1 (1)	24 (18)	70	28 (10)	
	Grindleford	24	55	0	2,800	1,300	10	<1 (1)	20 (9)	66	29 (9)	
	Dore	36	106	4,300	27,800	59,800	4	1 (3)	8 (6)	46	32 (6)	
Total		**820**	**44,294**									

*Year to March 2012
**Because of the size of some population zones used figures are 0, in this case the total catchment <5km from the station should be used as an indicator
***Number of trains arriving into Sheffield between 0800 and 0900

Appendix H: Methodology for assessing the impact of improving suburban services into an urban centre

Appendix H: Methodology for assessing the impact of improving suburban services into an urban centre

This appendix demonstrates the methodology for assessing the impact of improving Regional Urban services on the strategic goals for rail; and the strengths and weaknesses of this approach. The following two impacts have been assessed:

- The impact of improving services on economic output by improving the supply of labour to employees.
- The impact on quality of life for communities and individuals by improving access to urban centres.

Analysis has also been carried out on the impact of improving services on the environment and access to employment for deprived communities. The impact on the environment tends to be secondary in value to the impact on labour supply and quality of life for communities and individuals and has not been published in the regional appendices. The impact on deprived communities is strongly correlated to the impact on labour supply and becomes a redundant comparator as a result.

Conditional outputs have been recommended based on the following criteria:

- Where there are aspirations to improve services
- A reasonable improvement to services can be made
- All or most of the criteria for conditional outputs from Section 7.2 are met.

The criteria set out in Section 7.2 are intended to have a strong relationship with the value of improving services. Therefore, the analysis has been used to check whether the recommended conditional outputs are valuable and are not intended to fully support a WEBTAG compliant business case.

Assessment of the impact of improving services on economic output

The methodology for assessing the impact of improving services on economic outputs is similar to the Long Distance Market Study. The key difference is that the Long Distance Market Study finds relationships between the connectivity of businesses to each other and the productivity of those businesses and the Regional Urban Market Study finds relationships between the connectivity of the population to businesses and the productivity of those businesses.

This approach estimates the relationship between economic output and access to labour. As the perceived cost of travel between population areas and urban centres reduces, people are more likely to commute to a job that better matches their skills, this allows employers to choose from a greater pool of prospective employees and match those employees to the activities that they will be most productive, increasing the productivity of the business and increasing economic output.

Defining labour supply

The supply of labour to a business is a function of the number of working age people that would be willing to commute to that business.

The labour supply of *a* business in zone *a* = the sum of (the number of working age people in zone *b* * the willingness to commute from zone *b* to zone *a*) for all zones in *B*.

This is measured in numbers of people. For example, if zone *b* has one million people and is sufficiently close to zone *a* such that 50 per cent of those people are willing to commute to zone *a* then 0.5 million people will be added to the labour supply of businesses in zone *a*.

The number of people in the labour supply catchment of each zone can be calculated in this way.

Multi modal data, zoning and allocation of wards to stations

The Census 2001 and 2011 has been used to provide information on the number of people commuting and by what mode. When the analysis was completed, detailed information on zone to zone commuting had not been published by the Office of National Statistics. Information on the number of people commuting from each ward and by what mode had been published. Therefore, the census 2001 was used to understand the number of people commuting from each origin to each destination and by what mode; the census 2011 was used to uplift rail's market share by ward.

Zoning is disaggregated to the level of wards. Each ward level origin destination pair is allocated to an origin and destination station based on distance from the ward to the station and the level of service to and from each station. This means that people are allocated to stations not just based on their proximity to a station but also based on the level of connectivity at that station. For example, someone equidistant between Lockwood and Huddersfield station would choose Lockwood to go to Sheffield and Huddersfield to go to Leeds.

This approach is strong in terms of its ability to allocate on a more sophisticated basis than distance from a station but would be prone to error because it takes little account ofthe accessibility of each station.

Estimating changes in demand

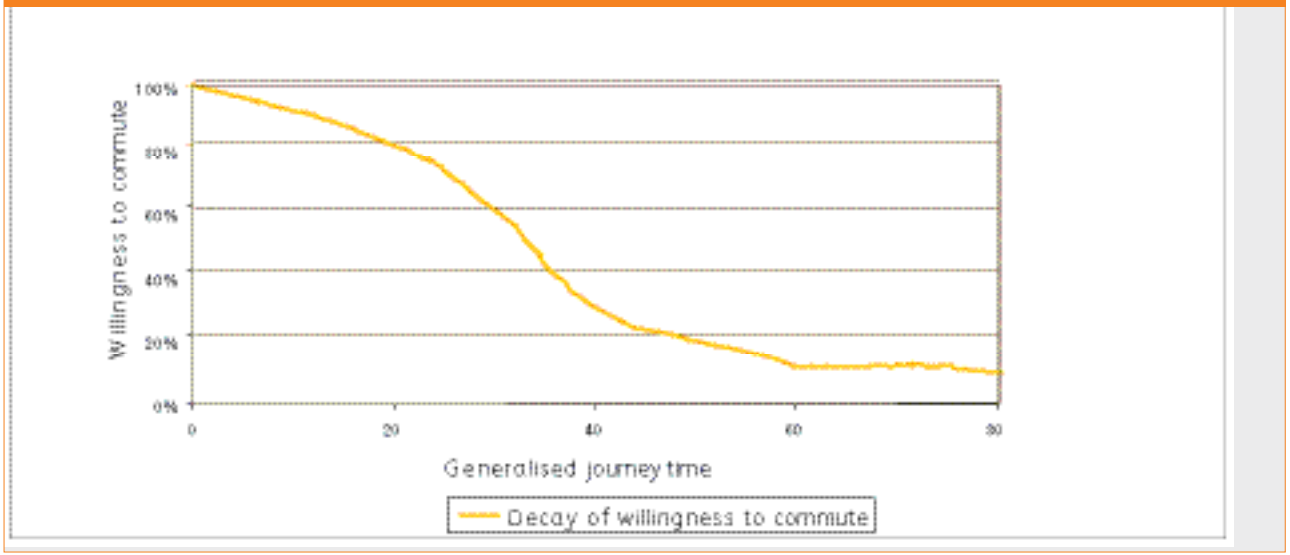
A simple elasticity based approach has been used to estimate the changes in GJT on demand. Elasticity based models are strong at estimating modest changes on relatively mature markets, but poor at estimating large changes where rail has a relatively low market share. For this reason, the analysis of conditional outputs has only been published for rail corridors into large regional centres where rail has a natural competitive advantage over other modes. These regional centres are Leeds, Manchester, Birmingham, Nottingham, Leicester, Newcastle, Liverpool, Sheffield and Bristol.

Willingness to commute (decay curve)

The willingness to commute from one zone to another is modelled as a likelihood function. This likelihood function has been estimated using West Yorkshire as a case study.

Figure 1 shows the willingness to commute from one zone to another as a function of the Generalised time between them. The steepest part of the curve is approximately between 20 and 60 minutes.

Figure 1 – Decay of willingness to commute



Relationship between labour supply, productivity and economic growth

As the generalised time between two zones decreases, the supply of labour to these zones increases. As the supply of labour to a zone increases the productivity of businesses in that zone will increase. Gross Domestic Productm(GDP) per capita is used as a measure of productivity. A relationship between GDP per capita and the supply of labour to a zone has been found. The co-efficient of this relationship is 0.28 pence per capita per extra person of labour supply. This means that every additional person in the labour catchment increases the productivity of employees in that zone by 0.28 pence.

Calculation of the impact of improving rail services on economic output

The impact on economic output of improving services to zone is given by the formula. Change in economic output = change in labour supply to zone a * 0.25 pence * number of employees in zone a.

Assessment of the impact of improving services on quality of life

The impact of rail service improvements on quality of life for individuals and communities are assessed to determine the service level conditional outputs. The assessment quantifies the impact of service improvement on the value of time spent on travelling to existing and new rail passengers.

Improvement in rail service provision is reflected through changes in the generalised journey time (GJT) for travel. The GJT takes into account time spent in a vehicle, service frequency and interchange. The assessment compares the current GJT experienced by rail passengers with the GJT associated with different levels of generalised speed (distance divided by GJT).

The number of existing rail journeys between each place and their corresponding GJT is sourced from MOIRA . Values of time sourced from Department for Transport's transport appraisal guidance were then applied to calculate the benefits in time saving, which represents the quality of life improvement to rail passengers.

Appendix I: Summary of demand forecasting methodology

Each of the passenger market studies contains a detailed explanation of the forecasting methodology undertaken to produce their respective long term demand scenarios. The purpose of this appendix is therefore to provide a brief summary of the methodologies from all three studies, so that the reader can understand the similarities and differences between them.

The aim of the market studies is to develop an understanding of how rail can make a successful long term contribution to the key priorities of current and potential future rail industry funders. Identifying the appropriate role of rail in the context of these long term priorities requires extension of Network Rail's previous demand projections to a 30-year time horizon. This is because many common major railway infrastructure components, such as track systems, have an asset life of around 30 years. Decisions to change the capability of the network therefore require an understanding of the likely usage of it over this time period to maximise the value and useful life of the investment, and to capitalise on the significant opportunity for improved outputs available at the point where infrastructure systems fall due for renewal.

Demand forecasting over such a long term period represents a considerable challenge and a three-stage approach has been undertaken to develop these long term demand projections:

- **Stage one**. The extensive body of industry research on rail demand was reviewed to identify and group the likely factors that determine the number of people who travel by rail. Over 20 sub-categories of factor were identified, (for example the population of Great Britain and its regions, and the cost of travel by rail)
- **Stage two**. A series of potential alternative futures for Great Britain was postulated which would result in differences in these factors. These futures were articulated as four scenarios, (Prospering in Global Stability, Struggling in Global Turmoil, Prospering in Isolation, Struggling in Isolation).

  Stages one and two are common to all three passenger market studies.
- **Stage three**. A short list of factors from stage one was compiled for each market study, intended to cover the factors which are likely to have a dominant impact on passenger demand in each market. (One of the factors on the London and South East Market Study short list, for example, is the projected future change in central and inner London employment).

The future level of each factor in each shortlist was set at a level that is commensurate with the circumstances articulated by each scenario from stage two. For example, central and inner London employment is highest in the Prospering in Global Stability Scenario, next highest in the Prospering in Isolation, Struggling in Global Turmoil and Struggling in Isolation Scenarios.

The selected levels for each factor under each scenario were discussed with the Working Groups.

A demand model or modelling suite was then developed separately for each market study, as the characteristics of each market, and hence the short list of factors, vary.

The Long Distance Market Study uses two models:

- The first model uses estimates of people's propensity to travel over long distances given the characteristics of their household (e.g. household income). The number of each type of household in each location (zone[1]) in the model is varied in accordance with the level of the factors from the shortlist which affect household composition (e.g. National Income). The output of this model is an estimate of the total market for travel between all zones in the model, by all modes of transport
- The second model allocates this demand to the available modes of long distance transport. This mode split is estimated using a number of factors from the shortlist, including the cost of travel by each mode. Again, these factors vary by scenario.

The Regional Urban Market Study also uses a market size model and a market share model as the basis for the long term demand

1 The model comprises 235 zones based around the functioning economic areas in Great Britain

projections. These models, which cover the functioning economic area around Leeds, use a similar approach to the Long Distance modelling, albeit with more disaggregate data and model zoning. Data limitations made it impossible to repeat this modelling exercise for the other city regions covered by the Regional Urban Market Study in the time available. Instead, the range of demand projections from the Leeds model were fitted around the central demand forecasts from the most recent Route Utilisation Strategies (RUSs) for the other city regions. This process was based on both a comparison of the characteristics of these locations with Leeds, and extensive discussions with the stakeholders who represent these places.

The London and South East Market Study used a spreadsheet model to apply the factors from the shortlist to the external factors forecasting framework detailed in the Passenger Demand Forecasting Handbook (PDFH). The resultant, corridor-by-corridor[2], demand projections were fitted around the central demand forecasts from the London and South East Route Utilisation Strategy.

This approach was taken as the London and South East RUS projections were produced using the London Transport Study and Railplan transport modelling suite, which includes all forms of public transport, such as the London Underground and Docklands Light Railway, as well as national rail services. This is the most appropriate software to estimate the London-wide impact of major impending service changes such as Thameslink Key Output Two, and Crossrail.

A review and update of the modelling assumptions used in the RUS forecasts was undertaken in preference to a re-run of the LTS/ Railplan, as the train service specifications for both projects are still in the planning stage.

The ensuing long term demand projections for the three passenger markets are an estimate of the demand for rail travel as a result of background growth (the factors from stage one) plus the impact of changes to services that are scheduled for implementation before the end of Control Period 5 (March 2019). These changes are assumed as committed, in that rail industry funders have committed to make the necessary funding available.

The impact of other potential schemes has not been included in the projections, although the Long Distance Market Study presents an assessment of the potential demand impact if all of the conditional outputs were delivered.

Demand forecasts are often a contentious subject, particularly given their impact on a number of high-value industry financial transactions such as passenger franchise agreements, and the forecasts produced in the three market studies have generated significant debate amongst the various study Working Groups, and amongst stakeholders generally.

Every endeavour has been made to achieve a consensus amongst the study Working Groups, but ultimately, the figures presented represent Network Rail's professional opinion based upon the best available evidence. The Market Study documents are careful to explain the assumptions used where any limitations occur within the available data or selected modelling approach.

The documents also provide guidance as to how the figures should be interpreted, and how they should be used in subsequent stages of the Long Term Planning Process. Since the forecasts do not include the impact of rail service changes which are yet to be committed, they should not be viewed as the maximum potential for growth over the 30 year period considered. Further improvements to service changes will almost certainly result in additional growth in passenger journeys. It is recommended that readers of the market study documents consider this when comparing the demand projections with historic demand growth.

2 Rail corridors into each central London terminus station

Glossary

Term	Meaning
ATOC	Association of Train Operating Companies
Conditional Outputs	Statement of aspirations for the level of service provided
Control Period 5 (CP5)	The 2014 – 2019 period
Control Period 6 (CP6)	The 2019 – 2024 period
DfT	Department for Transport
ERTMS	European Rail Traffic Management System
Generalised journey time	A measure of the rail service offer that takes account of in vehicle time, service frequency and interchange penalty
GB	Great Britain
HLOS	High Level Output Specification
HS2	Proposed high speed link between London and Birmingham beyond to Leeds and Manchester
ITA	Integrated Transport Authority
ITC	Integrated Transport Commission
LEP	Local Enterprise Partnership
LTPP	Long Term Planning Process
NTS	National Travel Survey
ONS	Office for National Statistics
ORR	Office of Rail Regulation (the regulator for the rail industry in Great Britain)
PDFC	Passenger Demand Forecasting Council
PDFH	Passenger Demand Forecasting Handbook
PGS	Prospering in global stability
PII	Prospering in isolation
PSM	Planet Strategic Model
PTE	Passenger Transport Executive
PTEG	Passenger Transport Executive Group
RAC	Royal Automobile Club
RIA	Rail Industry Association
RIPG	Rail Industry Planning Group

Term	Meaning
RDG	Rail Delivery Group
RFOA	Rail Freight Operators Association
RUS	Route Utilisation Strategy
SGT	Struggling in global turmoil
SII	Struggling in isolation
STAG	Transport Scotland's appraisal guidance
Strategic Goals	Statement of priorities
TEMPro	Trip End Model Presentation Program
TOC	Train Operating Company
TS	Transport Scotland
UDM	Urban Dynamic Model
WebTAG	Web-based Transport Appraisal Guidance

Network Rail
Kings Place
90 York Way
London N1 9AG

www.networkrail.co.uk