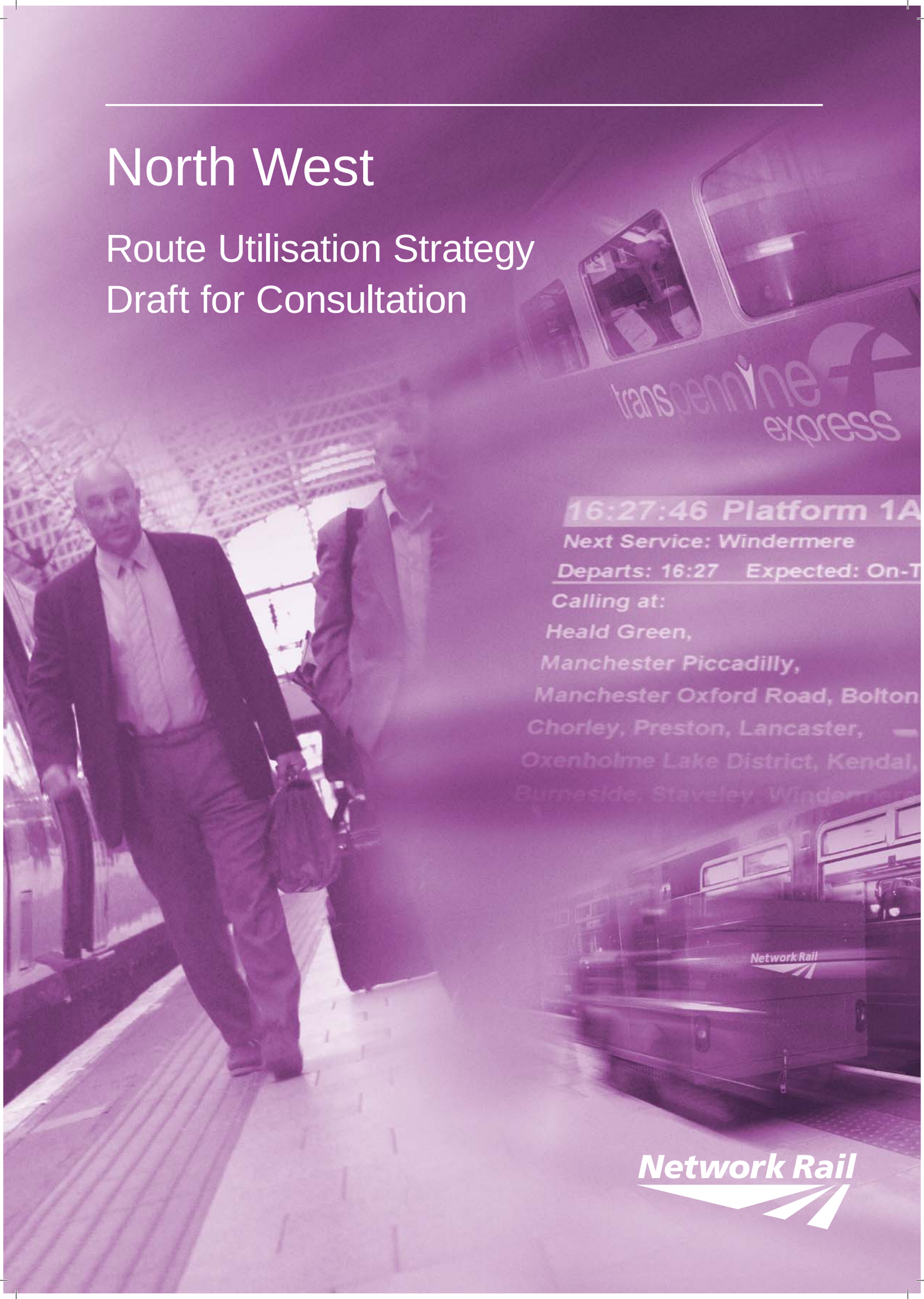
North West

Route Utilisation Strategy
Draft for Consultation



Network Rail

Foreword

This is a draft for consultation of the Route Utilisation Strategy covering the railway in the north west of England. It sets out Network Rail's strategy for the future of the railway in this part of Britain, including the priorities for growing the railway where this is required.

The strategy has been produced in a highly consultative and inclusive way, involving train and freight operators, passenger representatives, local authorities and others. As such, it can be viewed not just as a product of Network Rail, but of the entire rail industry.

On page 17 is a map showing exactly the routes covered by this strategy, but broadly it includes Greater Manchester and Lancashire, and the lines between Manchester and Merseyside. The Merseyside network itself, operated by Merseyrail, and lines in Cumbria and the West Coast Main Line are covered by separate strategies.

The railway in the North West is a successful one, and many routes are busy. Punctuality of train services from the major train operators is high and improving; and passenger numbers are increasing as a result. This strategy looks at where this growth in passenger demand may require increases in capacity. For example, the strategy examines the case for more or longer trains on certain busy routes across the area. The additional platform proposed for Manchester Airport, which will allow improved services, is also fully endorsed by this strategy.

The strategy also considers interchange between the railway and the Manchester Metrolink tram system. Presently, good interchange only exists at Piccadilly and Victoria stations. Further opportunities to create interchanges at Eccles, Cornbrook and Altrincham are explored.

There are also parts of the network in the North West where changes in passengers' travelling habits and in the location of population and industrial centres have led to stations falling into very low usage. For this reason, there are three stations which are recommended for closure. In each case, passenger numbers are extremely low. Reducing the costs of the railway is a hugely important priority as only by doing so will resources be released in order to meet demand on more popular routes. The delivery of a cost effective and affordable railway to the country means it is necessary to make these tough choices and to recommend closure for stations used by so few people. The station closure process is a lengthy one, involving consultation with local communities and passenger representatives, and so all relevant parties will have the opportunity to have their views taken into account. The final decision requires the approval of the Secretary of State for Transport.

This draft strategy is now open to consultation from all interested parties, with comments required by 5 January 2007. We look forward to receiving this feedback, and would hope to be able to publish a final Route Utilisation Strategy for the North West in early spring 2007.

John Armitt
Chief Executive

Executive summary

This document is a draft for consultation of the North West Route Utilisation Strategy (RUS). This RUS is the fifth in a series covering the rail network of Great Britain being developed by Network Rail and its partners in the rail industry.

The aim of the RUS is to provide a 10-year strategy for the efficient development of the railway to meet the reasonable demands of passengers and freight. The inputs to this process include rail infrastructure and rolling stock capabilities, the role of the railway in supporting the local, regional and national economies, and the relationship of rail to other transport modes. The RUS sits within the long-term strategic planning framework for the railway set out in the Department for Transport's recently published North West Regional Planning Assessment.

This RUS covers Manchester, the city lines into Liverpool Lime Street, and the various radial routes extending into Cheshire, Derbyshire and Lancashire. This is a complex railway network carrying a mix of traffic types and serving a number of established and growing markets. The changing pattern of demand presents the challenge of maintaining the efficient use of resources while addressing the needs of new and existing markets.

Manchester, Liverpool and Central Lancashire are experiencing significant economic growth, and have been identified as the key drivers for regional development. In Manchester, for example, 45,000 new jobs have been created over the last 5 years, and local stakeholders believe 210,000 new jobs over the next 15 years is a reasonable aspiration. With this comes the challenge of providing appropriate transport to support this growth.

Heavy rail has an important role to play in facilitating commuting into Manchester, Liverpool and Central Lancashire from residential areas throughout the North West of England. In addition, it provides important links to other business centres such as Leeds, Sheffield and London. It also has a key role in providing surface access to the three main airports in the region. Of these, Manchester Airport is the largest airport outside the South East, and attracts passengers from across the North of England, the Midlands, Scotland and North Wales.

In recent years, the employment centre of Manchester has become increasingly dispersed, with the majority of new jobs created based nearer Victoria and Salford than around Piccadilly. This means that Piccadilly's role as the principal terminus station for commuters is diminishing while the significance of Victoria, Salford Central and Salford Crescent is growing.

The RUS uses two passenger growth scenarios. Under the reference scenario, many routes will see little growth over the next ten years; under the alternative scenario, there will be significant growth on many routes. The difference between the two scenarios, particulaly in terms of the degree of peak crowding, is marked. On some flows, reported growth over the past two years has exceeded both scenarios.

The Freight RUS predicts significant growth in freight flows to the North West. In particular, growth in intermodal traffic is predicted to grow by eight trains per day. Coal and limestone flows are also predicted to grow in line with the increasing demand from coal-fired power stations.

Analysis of the railway's current ability to carry passengers and freight, and its ability to cope with predicted demand over the next ten years, identified the following generic gaps:

- some links between the major city regions in the North West would benefit from improved service provision
- many corridors serve only one side of Manchester city centre but passenger destinations are evenly distributed
- rail is insufficiently integrated with Metrolink
- rail services to airports are insufficient for the market
- forecast freight growth will exceed current network capability
- regular heavy stone trains cannot be accommodated without use of special operating arrangements
- passenger demand for seats exceeds supply during the peaks on some corridors
- platforms at Salford Crescent and Manchester Piccadilly (13/14) are congested at times and may restrict forecast growth
- facilities at some stations, including parking, discourage off-peak travel
- there are numerous stations with low footfall
- performance is worsened by significant levels of reactionary delay
- much of the rolling stock in the area is not well-suited to its current use.

The RUS discusses around 80 options to address these gaps. These include:

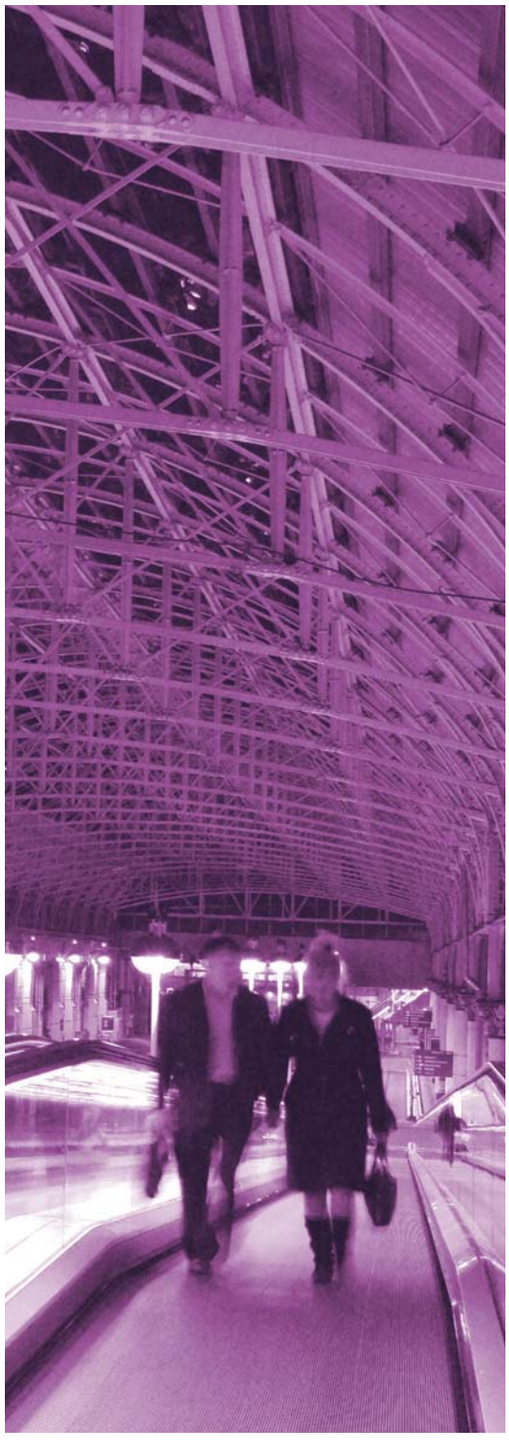
- strengthening key regional links, notably between Manchester, Liverpool and Preston/Blackpool
- improving rail-rail interconnection capability around central Manchester, making it easier for passengers to travel to the optimum central station for their ultimate destination
- enhancing integration of rail with other transport modes, in particular Metrolink and the airports
- enhancing freight capacity and capability in the vicinity of Liverpool Docks and Trafford Park
- alleviating peak crowding on the busiest rail corridors, and at Salford Crescent and Manchester Piccadilly
- solutions to a range of capacity, capability and performance issues across the infrastructure, where these relate clearly to a RUS gap.

The RUS also proposes closure of three very lightly used stations – Reddish South, Denton and Ardwick.

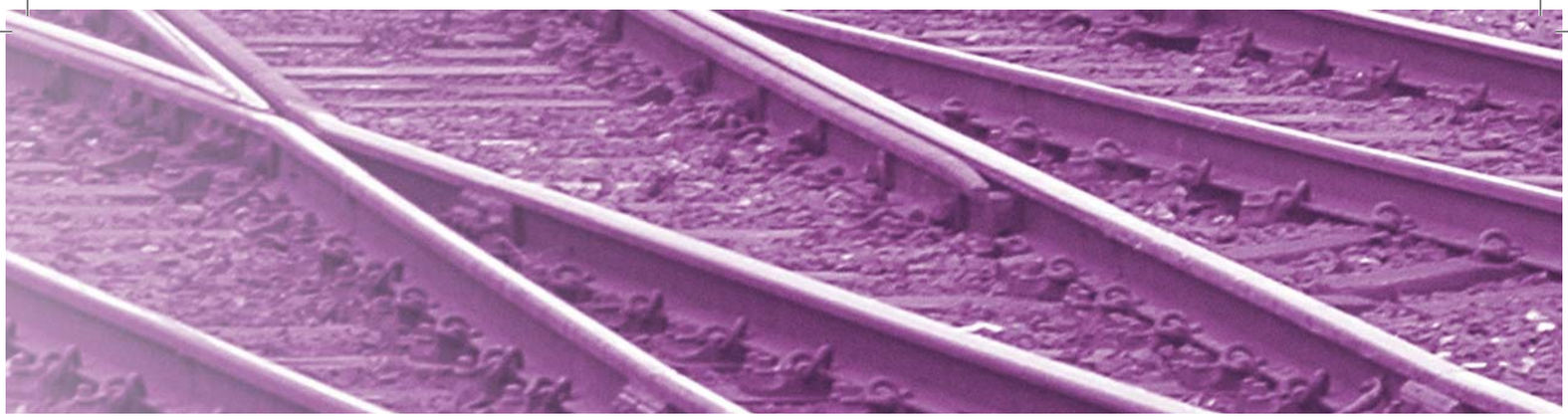
The options have undergone an initial appraisal. More detailed analysis will be required on a number of the options before they are recommended as part of the final strategy. Initial analysis suggests that large scale infrastructure interventions cannot be justified, due to the majority of the signalling being fit for purpose beyond the end of the RUS period. However, there may be an opportunity towards the end of the 10-year period for electrification, initiated by the replacement of rolling stock in Merseyside.

The RUS has been developed in conjunction with: Northern Rail; TransPennine Express; English, Welsh and Scottish Railway; Freightliner; The Association of Train Operating Companies; Greater Manchester Passenger Transport Executive; Merseytravel; and the Department for Transport. These organisations have worked together through an industry Stakeholder Management Group, being joined in the regular meetings by the Office of Rail Regulation as an observer. Other stakeholders have been invited to briefings during the various stages of development of this RUS.

This consultation document details the work undertaken so far. Consultation with stakeholders is an important part of the RUS process. We would therefore welcome comments on this document, and details about how to contact us can be found in Chapter 7.



Contents



1. Background

1.1 Introduction to Route Utilisation Strategies

1.1.1

Following the Rail Review in 2004 and the Railways Act 2005, The Office of Rail Regulation (ORR) modified Network Rail's network licence in June 2005 to require the establishment of Route Utilisation Strategies (RUSs) across the network. Simultaneously, the ORR published guidelines on RUSs. A RUS is defined in Condition 7 of the network licence as, in respect of the network or a part of the network[1], a strategy which will promote the route utilisation objective. The route utilisation objective is defined as:

> "the effective and efficient use and development of the capacity available, consistent with funding that is, or is reasonably likely to become, available during the period of the route utilisation strategy and with the licence holder's performance of the duty".

[1] The definition of network in Condition 7 of Network Rail's network licence includes, where the licence holder has any estate or interest in, or right over a station or light maintenance depot, such station or light maintenance depot.

Extract from ORR Guidelines on Route Utilisation Strategies, June 2005

1.1.2
The "duty" referred to in the objective is Network Rail's general duty under Licence Condition 7 in relation to the operation, maintenance, renewal and development of the network. ORR guidelines also identify two purposes of RUSs, and state that Network Rail should balance the need for predictability with the need to enable innovation.

Such strategies should:

> "enable Network Rail and persons providing services relating to railways better to plan their businesses, and funders better to plan their activities; and set out feasible options for network capacity, timetable outputs and network capability, and the funding implications of those options for persons providing services to railways and funders."

Extract from ORR Guidelines on Route Utilisation Strategies, June 2005

1.1.3
The guidelines also set out principles for RUS development and explain how Network Rail should consider the position of the railway funding authorities, the likely changes in demand and the potential for changes in supply. Network Rail has developed a RUS Manual which consists of a consultation guide and a technical guide. These explain the processes we will use to comply with the Licence Condition and the guidelines. These and other documents relating to individual RUSs and the overall RUS programme are available on our website at www.networkrail.co.uk.

1.1.4
The process is designed to be inclusive. Joint work is encouraged between industry parties, who share ownership of each RUS through its industry Stakeholder Management Group. There is also extensive informal consultation outside the rail industry by means of a Wider Stakeholder Group.

1.1.5
ORR guidelines require options to be appraised. This is initially undertaken using the Department for Transport (DfT) appraisal criteria and, in Scotland, the Scottish Executive's STAG appraisal criteria. To support this appraisal work RUSs seek to capture implications for all industry parties and wider societal implications in order to understand which options maximise net industry and societal benefit, rather than that of any individual organisation or affected group.

1.1.6
RUSs occupy a particular place in the planning activity for the rail industry. They utilise available input from processes such as the DfT's Regional Planning Assessments and Wales Planning Assessment, and Transport Scotland's Scotland Planning Assessment. The recommendations of a RUS and the evidence of relationships and dependencies revealed in the work to reach them in turn form an input to decisions made by industry funders and suppliers on issues such as franchise specifications, investment plans or the High Level Output Specification.

1.1.7
Network Rail will take account of the recommendations from RUSs when carrying out its activities. In particular they will be used to help to inform the allocation of capacity on the network through application of the normal Network Code processes.

1.1.8
ORR will take account of established RUSs when exercising its functions.

1.2 This consultation paper

1.2.1
The first RUS undertaken by Network Rail was the South West Main Line (SWML) RUS, which served as a pilot for the new process established following the Rail Review.
The consultation document for this RUS was published in October 2005 with the final RUS published in March 2006. Since then, three further RUSs have been published –

- Cross London – consultation document published in December 2005; final RUS published in August 2006.
- Freight – consultation document published in September 2006; final RUS expected in February 2007.
- Scotland - consultation document published in August 2006; final RUS expected in February 2007.

1.2.2
This is therefore the fifth RUS consultation published by Network Rail. It sets out the relevant background information on the North West RUS area, outlines the issues that it currently faces and those that are predicted to arise over the next 10 years. It then outlines the recommended options to be developed to address these gaps and the next steps that should be taken in each case. The document should therefore be considered as work in progress in this respect.

1.2.3
The responses from stakeholders to this consultation document will shape the final North West RUS and Network Rail would accordingly welcome your feedback on it.
The key dates and contact details for the consultation process are outlined in Chapter 7.


Purple
Zone

2. Context and scope

2.1 Objectives

2.1.1 The North West RUS is required for a number of reasons. The primary drivers are to inform:

- development of the government's High Level Output Specification (HLOS)
- optimisation of the output specification for rail infrastructure renewals and enhancements
- identification of ways in which capacity could be used more efficiently, in the context of the railway and wider public transport

2.1.2 The North West RUS will therefore:

- propose options to achieve the most efficient and effective use of the rail network
- identify cost effective opportunities to improve the network where appropriate
- enable Network Rail to develop an informed renewals, maintenance and enhancements programme in line with the Department for Transport's aspirations and the reasonable requirements of train operators and other key stakeholders
- assist the two Passenger Transport Executives (PTEs) in determining whether to seek any increments or decrements to services
- enable Local and Regional Transport Plans and freight plans to reflect a realistic view of the future rail network
- provide an anchor point for neighbouring RUSs that are either underway or are due to start in the near future

2.2 Stakeholders

2.2.1

The North West RUS Stakeholder Management Group met at key stages during the development of this RUS. Northern Rail, TransPennine Express, English, Welsh and Scottish Railway, Freightliner, the Association of Train Operating Companies, Greater Manchester PTE, Merseytravel and the DfT were represented on this group. The Office of Rail Regulation attended as observers.

2.2.2

Wider stakeholder briefings were held at which the context, scope and broad options were outlined, and input on local issues was obtained. These were attended by representatives from local authorities, statutory bodies, Community Rail Partnerships, rail user groups and other stakeholders.

In April 2006, a two-day exhibition was held in Manchester. This enabled stakeholders to review the results of the baseline exercise at their own pace, and to share their ideas and insights. This provided valuable input into the gap analysis and subsequent optioneering.

In addition, a number of one-to-one meetings were held with various stakeholders to elicit their views.

2.3 Linkage to other studies and work streams

The North West Regional Planning Assessment (RPA) was published in October 2006, providing a medium-to-long-term planning framework for rail. Within this framework the North West RUS is intended to provide a more detailed strategy covering the ten year horizon.

The draft Regional Spatial Strategy, Regional Economic Strategy and outputs from the Northern Way (the three northern Regional Development Agencies) emphasise the important role of public transport, including heavy rail, in supporting regeneration, inter-regional economic activity and sustainability, and hence provide further valuable context for the RUS.

Network Rail is part way through a programme of Route Utilisation Strategies, and it is intended to cover the whole of Great Britain over the next three years. The North West RUS follows the Freight RUS, and is ahead of a number of neighbouring studies, including: Yorkshire and Humber; Lancashire and Cumbria; Merseyside; Wales; and the West Coast Main Line, some of which are yet to begin. A high-level Network-wide RUS is also planned. The North West RUS draws on input and analysis from the Freight RUS, and seeks to identify the interface issues with other RUSs to facilitate the gradual assembly of the national picture.

The West Coast Main Line (WCML) passes through the RUS geography, and although it is not directly within the scope of the study, it has a fundamental influence on operations and train services. The Strategic Rail Authority (SRA) published the West Coast Main Line Strategy in 2003 which was most recently updated by the DfT in May 2006. Under this strategy, the fruits of extensive investment in the WCML in recent years, and opportunities emerging from the refranchising of West Midlands, East Midlands and Cross Country services, culminate in the December 2008 timetable. This timetable is still under development. From the perspective of the North West RUS, informed assumptions have been made about general timetable structure, but detailed timetable modelling has not been possible.

The government recently approved stage 3a of Metrolink. This will involve the extension of Metrolink services from Victoria to Rochdale via Oldham, and Piccadilly to Droylsden and Chorlton. The Rochdale service is expected to replace the current heavy rail service and the infrastructure transferred to Metrolink before the end of the RUS period.

The Greater Manchester authorities are considering road demand management measures that could form part of a Transport Innovation Fund bid in 2007. The objective is sustainable travel that respects the environment and is attractive to use. To achieve this, improvements would be needed to trains and stations - including car parks and information systems - so as to encourage mode shift. It is recognised that road demand management, if it were to go ahead, could give rise to a step change in rail demand. Furthermore, depending on timing, it could start to make an impact before the end of the RUS time horizon. As there is no developed proposal at this stage, the RUS has not attempted to address it, but it is clear that future developments in this area could trigger the need for a strategic review.

In 2006 the DfT produced its review of the Northern franchise. This found that resources were efficently used and there was little scope for cost reduction.

The Manchester Hub study of 2000 examined a variety of significant changes to the infrastructure. This study was considered during the RUS option generation.

2.4 North West RUS geography

In terms of rail infrastructure, this RUS covers the geographical area defined by Network Rail's Strategic Route 20. This is depicted in geographical and schematic format in figures 2.1 and 2.2 respectively. It includes central Manchester, lines into Liverpool Lime Street and the various radial routes extending into Cheshire, Lancashire and Derbyshire.

2.5 Scope of services

Passenger and freight services that spend all or part of their journey within the RUS geography are included within the scope with the exception of West Coast and Cross Country services. Central Trains' Liverpool to the West Midlands service and the TransPennine Express 4-trains per hour specification for the Manchester – Leeds service are similarly excluded as they will be looked at in other RUSs.

2.6 New stations

There are many proposals to open new stations within the area covered by the RUS.

These will be dealt with on a case by case basis through normal industry processes to assess their impact on the network and compatibility with the recommendations of the RUS, when it is concluded.

2.7 North West RUS timeframe

As with most other RUSs, a 10-year time horizon has been chosen. The RUS therefore covers the period to 2017. However, any issues arising from the study that extend beyond this period have been highlighted where appropriate.

Figure 2.1 – North West RUS geography

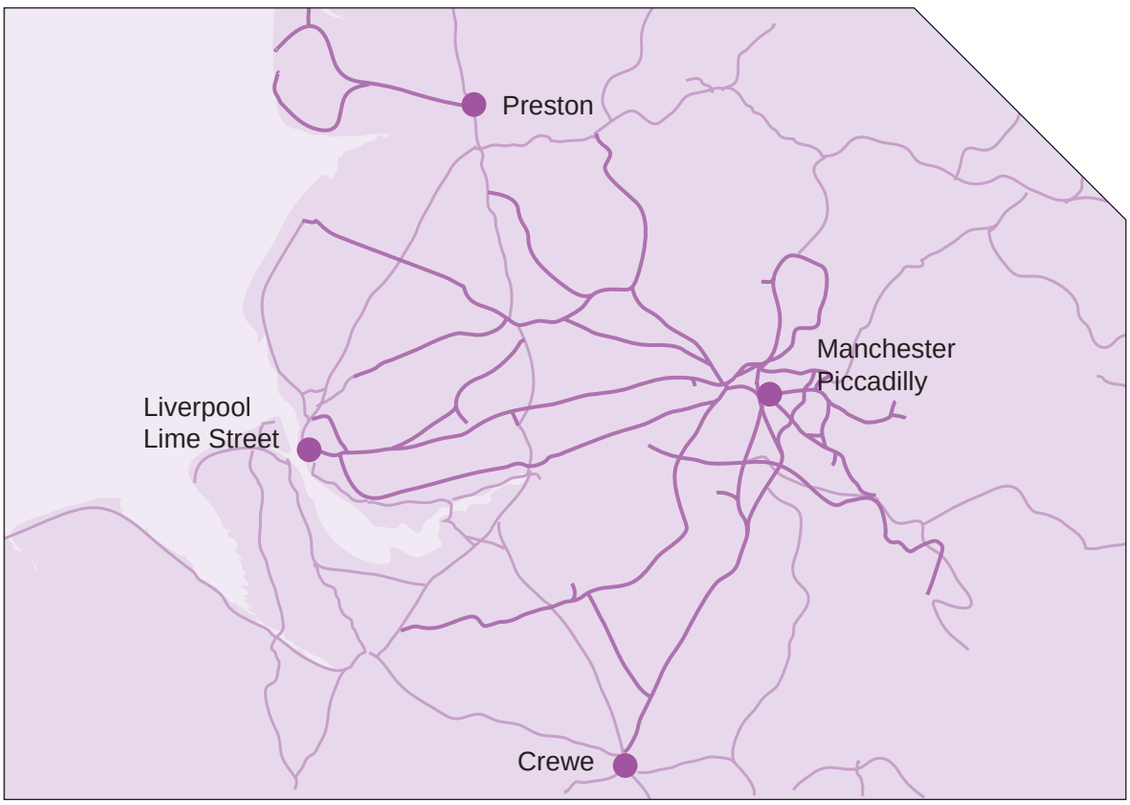
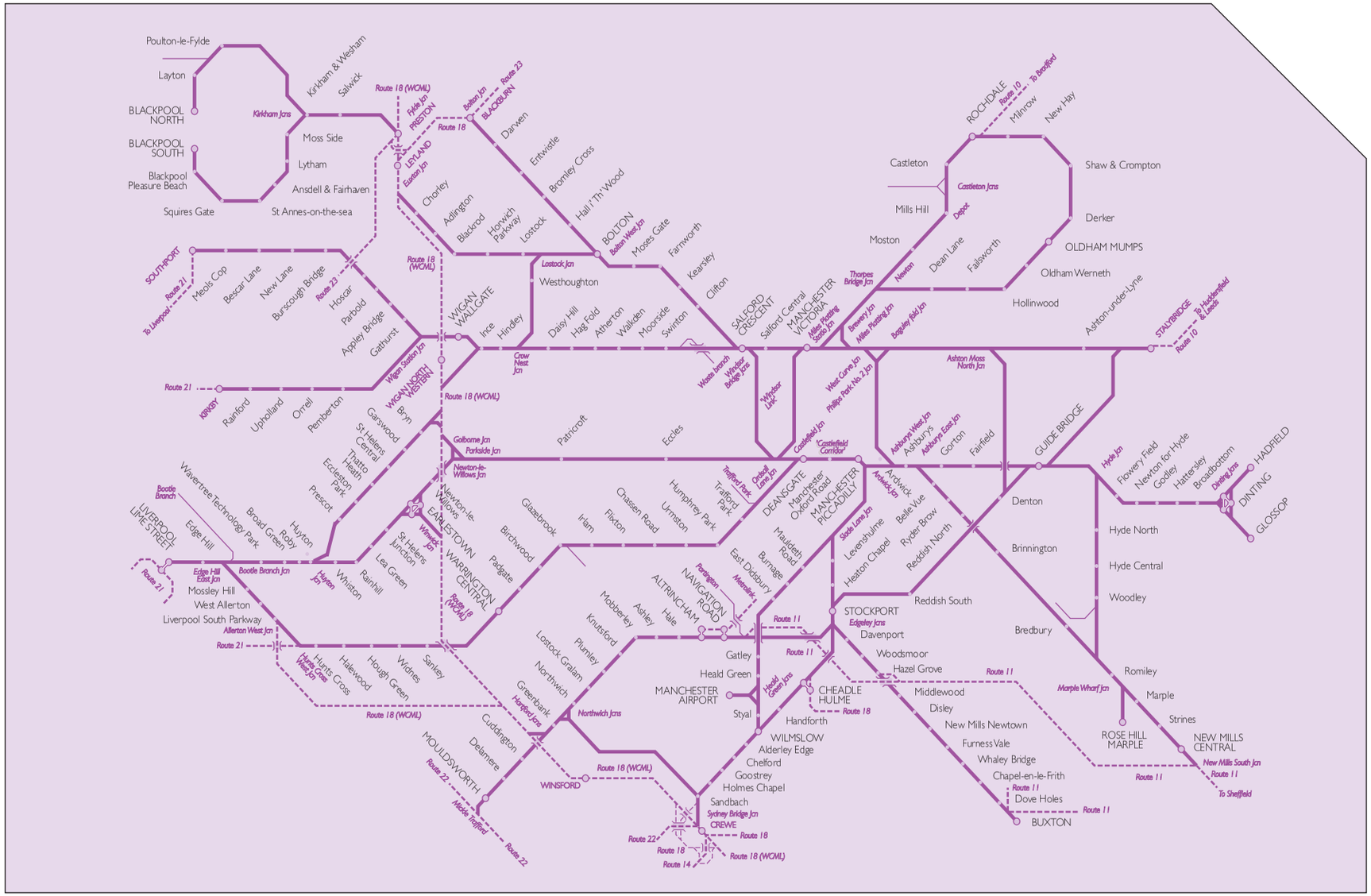


Figure 2.2 – North West RUS schematic



3. Baseline

3.1 Introduction

3.1.1

The North West is a diverse area, ranging from the large metropolises around Manchester and Liverpool, to the relatively sparsely populated areas in rural Lancashire and Cheshire. The infrastructure reflects this, with modern signalling, multi-platform stations and four-track sections in the urban centres, contrasting with single line sections with single platform stations and elderly mechanical signalling in some rural areas.

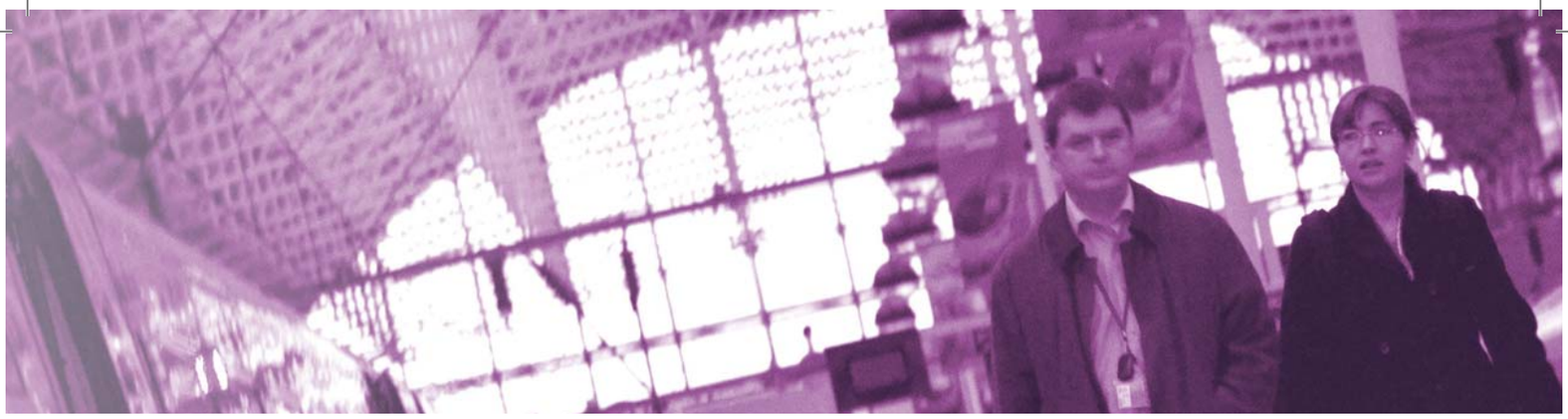
3.1.2

The RUS baseline exercise considers current passenger and freight demand, infrastructure capability and capacity, and performance. A more detailed treatment of this exercise is presented in Appendices A and B.

Table 3.0 RUS corridors

Corridor Name	Details
Stockport	Manchester – Stockport – Hazel Grove – Sheffield / Buxton / Cheadle Hulme – Crewe / Macclesfield
Marple	Manchester – Romiley – Marple - New Mills Central / Rose Hill Marple
Hadfield	Manchester – Newton for Hyde – Hattersley - Glossop – Hadfield
Stalybridge	Manchester – Ashton – Stalybridge - Greenfield – Huddersfield – Leeds
Oldham	Manchester – Failsworth – Oldham – Shaw – Rochdale
Calder Valley	Manchester – Mills Hill – Rochdale – Todmorden - Bradford
Bolton	Manchester – Farnworth – Bolton – Lostock – Wigan – Southport / Blackrod – Preston - Blackpool / Bromley Cross – Blackburn
Atherton	Manchester – Atherton - Wigan – Kirkby
Chat Moss	Manchester – Eccles – Patricroft – Newton le Willows - Warrington Bank Quay – Chester / Huyton – Liverpool
CLC	Manchester – Urmston – Irlam – Warrington Central – Liverpool
Northwich	Manchester – Altrincham - Hale – Knutsford – Northwich
Styal	Manchester – East Didsbury – Heald Green – Airport – Wilmslow – Crewe
St Helens Central	Liverpool – Huyton – St Helens Central – Wigan – Preston

These corridors align with those used by the PTEs for their multi-model transport studies.



3.1.3
The principal infrastructure capability and capacity characteristics considered are:

- signalling headways (which are a measure of the minimum time gap between trains)
- line speeds
- junction speeds
- electrification
- loop lengths
- platform lengths
- station facilities
- car parking
- integration with other public transport modes
- loading gauge (which defines the size of vehicles that can be carried)
- route availability (which defines the axle weight of vehicles that can be carried)
- capacity Utilisation Index (which is a proxy for the extent to which available capacity is consumed by the services that operate in a particular hour period).

3.2 Current train operators

3.2.1 Northern Rail
Northern Rail operates the majority of the services and stations in this area, and is the only operator to run services on all 13 corridors. The current Northern Rail franchise was formed in December 2004 and runs until August 2013. The final two years of the franchise (2011 - 2013) are subject to performance targets being achieved.

3.2.2 First TransPennine Express
TransPennine Express (TPE) operates inter-urban services with limited stops, notably across the Pennines towards Leeds and Sheffield, and northwards to Preston and beyond. The key hubs for TPE in the RUS area are Manchester Airport and Manchester Piccadilly. The current franchise was awarded in February 2004 and runs until 2012 with an option for a further three year extension dependent on performance.

3.2.3 Arriva Trains Wales
Arriva Trains Wales (ATW) operates services from Wales into Manchester Piccadilly via both Stockport and Warrington. The franchise is due to run until 2018.

3.2.4 Central Trains
Central Trains operates services between both Liverpool Lime Street, and Sheffield via Manchester Piccadilly and the West Midlands via Runcorn. The franchise is due to expire in November 2007, with the revised West and East Midlands franchises currently being tendered by the Department for Transport.

3.2.5 Merseyrail Electrics
Merseyrail operates services on the electrified Merseyrail system focused on Liverpool. They interface with the RUS area at Liverpool Lime Street, Southport, Kirkby and Hunts Cross. The franchise is due to expire in July 2028.

3.2.6 Virgin Cross Country
Cross Country Trains, a member of the Virgin Rail Group, operates services from the south of England, the Midlands and Scotland to Manchester Piccadilly, Bolton and Stockport. It also serves a number of stations on the periphery of the RUS area and on the WCML.

The original franchise was awarded for a 15 year period from 1997 to 2012. This was subsequently superseded by a management contract arrangement which is reviewed on an annual basis. This will be replaced in 2007 by a new franchise currently being developed by the DfT.

3.2.7 Virgin West Coast

West Coast Trains, a member of the Virgin Rail Group, operates services from London Euston to Manchester Piccadilly and Liverpool Lime Street in the RUS area, as well as a number of stations on the WCML. The original franchise was awarded for a 15 year period from 1997 to 2012. This was subsequently superseded by a management contract arrangement which is reviewed on an annual basis.

3.2.8 Freight operators

Four freight operators currently operate services within the RUS area. English Welsh and Scottish Railway (EWS) operate bulk (predominantly coal and aggregate), domestic waste, intermodal and wagonload traffic both within the RUS area, as well as to and from other parts of the UK. Freightliner operates intermodal traffic from Trafford Park to a number of seaports in southern and eastern England, while Freightliner Heavy Haul operates a number of bulk flows including aggregates, coal and cement traffic. Direct Rail Services (DRS) operates a small number of services on the periphery of the area and along the WCML.

3.3 Current passenger market profile

3.3.1 Background

The North West RUS covers a mixed-use railway with a substantial commuter market for rail services into the main centres of Manchester, Liverpool and to a lesser degree Preston. There are strong leisure and business flows between Manchester and Liverpool, and also from the Northwest to London, Birmingham, North Wales and Yorkshire. Both Manchester Airport and John Lennon Airport are significant destinations for leisure and business rail passengers.

The area covered by the RUS has a population of around 5.5 million and is one of the most densely populated areas outside London. Over 60 per cent of the population is concentrated in the main conurbations of Greater Manchester and Merseyside (excluding the Wirral). The remainder of the population is more sparsely distributed throughout Cheshire, Lancashire and Derbyshire. The RUS area economy has traditionally relied on its manufacturing base. Whilst this sector still plays an important role generating economic activity in the area, there has been a shift towards the service industry. However, employment is not evenly spread and some parts of the RUS area, particularly the main urban areas of Manchester and Merseyside, suffer from high levels of unemployment and deprivation.

In the RUS area rail plays an important role particularly for commuting into the main city centres. Data from the 2001 Census shows that the mode share of journey to work by rail and metro for both Greater Manchester and Merseyside was about 20 per cent, higher than the West Midlands and West Yorkshire. The National Travel Survey 1991-2001 shows that rail in the North West area is generally used for longer journeys, with around 75 per cent of all rail trips being over 10 miles.

In order to assist the RUS process, Network Rail commissioned Steer Davis Gleave (SDG) to forecast passenger demand and undertake economic appraisal. SDG have used a combination of rail industry models, namely RIFF-Lite and MOIRA. RIFF-Lite is used to estimate growth forecasts and MOIRA is designed to predict how timetable changes will affect passenger demand. MOIRA is based on industry ticket sales data from LENNON[1]. The results of the current demand study are in Appendix A.

3.3.2 Historic growth

Passenger rail journeys to, from and within the North West RUS area grew by around 13 per cent, from 46 million to 52 million, between 1999/00 and 2004/05. However, these figures do not represent total rail journeys in the RUS

[1] Latest Earnings Networked Nationally Over Night

area as they exclude certain tickets sold by Passenger Transport Executives (PTEs) and some other non-recorded rail products. For 2004/05, these additional journeys have been estimated to be around 9 million, which means that total rail journeys to, from and within the North West area came to 61 million[2]. Nearly half of all these journeys are made between stations that are both within the RUS area.

Between 1999/00 and 2004/05 there has been a 20 per cent increase in rail journeys made wholly within the RUS area, excluding any growth in PTE tickets. Some examples of growth over this period are shown in Table 3.1.

Historic data shows that between 1999/2000 and 2004/2005, there was an overall reduction of around 15 per cent in journeys between the North West RUS area and London and the South East. Several factors are thought to have influenced this reduction such as blockades due to engineering work as part of the West Coast Route Modernisation (WCRM) programme, the effect of temporary speed restrictions imposed on the network following the Hatfield derailment, the rebuilding of Manchester Piccadilly station between October 2000 and June 2002, and changes in regulatory fares policy from January 2004. However, the first few periods of 2005/06 show that patronage between Manchester and London and the South East is higher than the equivalent periods in 2004/05 suggesting that this trend may be reversing. There are reports from operators and stakeholders of continued strong growth into 2006/07. Furthermore, the completion of the West Coast infrastructure improvements and introduction of the new 2008 West Coast timetable which includes additional services and improved journey times should strengthen future demand between the North West and London and the South East. Table 3.2 shows historic growth by

Table 3.1: Historic growth in journeys – top 10 directional flows within RUS area

Flows within RUS area	1999/2000	2004/2005	Growth
Bolton to Manchester Stations	434,000	587,000	35%
Liverpool Stations to Manchester Stations	285,000	413,000	45%
Stalybridge to Manchester Stations	248,000	400,000	61%
Stockport to Manchester Stations	244,000	322,000	32%
Manchester Stations to Liverpool Stations	217,000	299,000	38%
Rochdale to Manchester Stations	202,000	283,000	40%
Wigan Stations to Manchester Stations	238,000	283,000	19%
Warrington Stations to Manchester Stations	208,000	274,000	32%
Preston to Manchester Stations	148,000	249,000	68%
Marple to Manchester Stations	163,000	224,000	37%

Source: SDG Stage 1 report, Analysis of LENNON data, 1999/00 and 2004/05

Note: Manchester Stations includes Manchester Piccadilly, Manchester Oxford Road, Deansgate and Manchester Victoria. Liverpool Stations includes Liverpool Lime Street and Liverpool Central. Wigan Stations includes Wigan North Western and Wigan Wallgate. Warrington Stations includes Warrington Bank Quay and Warrington Central.

[2] Based on data provided by the Greater Manchester PTE and Merseytravel and an examination of other non-LENNON products

direction on flows to and from the RUS area.

3.3.3 Most and least used stations

The level of passenger demand at stations in the RUS area varies considerably. Some stations are very well used and others have very low levels of patronage. The 15 most and least used stations are presented in Tables 3.3 and 3.4. The figures in the tables constitute LENNON data plus an allocation of PTE ticket sales (see Appendix A). Some stations listed rank highly as a result of non-RUS traffic, the most obvious of which is West Coast traffic at Preston, Warrington, Wigan and Crewe, and Merseyrail traffic at Southport and Liverpool. The most used stations are the cluster of central Manchester stations: Manchester Piccadilly, Manchester Oxford Road, Deansgate and Manchester Victoria, referred to as Manchester Stations. (Whilst Liverpool Stations does have a figure almost as high, a significant number of these journeys are on the Merseyrail system, outside the scope of this RUS). For some of the least used stations, low levels of historic patronage has led to a reduced service calling at these stations which in turn leads to lower levels of patronage.

Table 3.2: Historic growth in journeys – top 10 directional flows to/from RUS area

Flows to/from RUS area	1999/2000	2004/2005	Change
Manchester Stations to London	856,000	789,000	-8%
London to Manchester Stations	759,000	774,000	2%
Liverpool Stations to London	480,000	350,000	-27%
London to Liverpool Stations	403,000	335,000	-17%
Leeds to Manchester Stations	179,000	281,000	57%
Huddersfield to Manchester Stations	167,000	236,000	41%
Manchester Stations to Leeds	143,000	217,000	52%
Sheffield to Manchester Stations	153,000	209,000	37%
Crewe to London	233,000	205,000	-12%
Preston to London	265,000	177,000	-33%

Source: SDG Stage 1 report, analysis of LENNON data, 1999/00 and 2004/05

Table 3.3: Most used stations 2004/05

Most used	Annual journeys
Manchester Stations	22,900,000
[1] Liverpool Stations	20,200,000
Preston	3,100,000
Chester	2,200,000
Bolton	2,000,000
[1] Southport	2,000,000
Wigan Stations	1,800,000
Blackpool North	1,700,000
Stockport	1,700,000
Manchester Airport	1,600,000
Crewe	1,500,000
Warrington Stations	1,500,000
Blackburn	1,000,000
Macclesfield	700,000
Rochdale	700,000

Source: SDG analysis based on LENNON and PTE tickets 2004/05

Note: (1) Includes journeys on Merseyrail Electrics

Table 3.4: Least used stations 2004/05

Least used	Annual journeys
Denton	LENNON sales too low to register
Reddish South	LENNON sales too low to register
Ardwick	LENNON sales too low to register
Salwick	1,900
Hoscar	2,100
Bescar Lane	2,800
Moss Side	2,800
New Lane	3,000
Ashley	3,400
Clifton (Manchester)	3,500
Styal	3,700
Dove Holes	5,100
Entwistle	9,200
Mobberley	10,000
Belle Vue	11,000

Source: SDG analysis based on LENNON and PTE tickets 2004/05

3.3.4 Key passenger flows

The dominance of passenger flows to both Manchester Stations and Liverpool Stations reflects the economic importance of these cities within the North West area. These stations represent the key hubs, allowing access to employment, shopping and recreational facilities, and connections to long distance services. Table 3.5 shows the top ten flows within the RUS area and Table 3.6 the top ten flows to and from the RUS area.

Each figure in the tables represents the sum of the flow in both directions.

Table 3.5: Top 10 flows within RUS area, 2004/05

Manchester Stations	Bolton	919,000
Manchester Stations	Liverpool Stations	716,000
Manchester Stations	Wigan	491,000
Manchester Stations	Stockport	480,000
Manchester Stations	Stalybridge	468,000
Manchester Stations	Rochdale	443,000
Manchester Stations	Manchester Airport	402,000
Liverpool Stations	Huyton	384,000
Manchester Stations	Glossop	378,000
Manchester Stations	Warrington Stations	370,000

Source: SDG Stage 1 Report, 2004/05 LENNON and PTE data included

Table 3.6: Top 10 flows to and from the RUS area, 2004/05

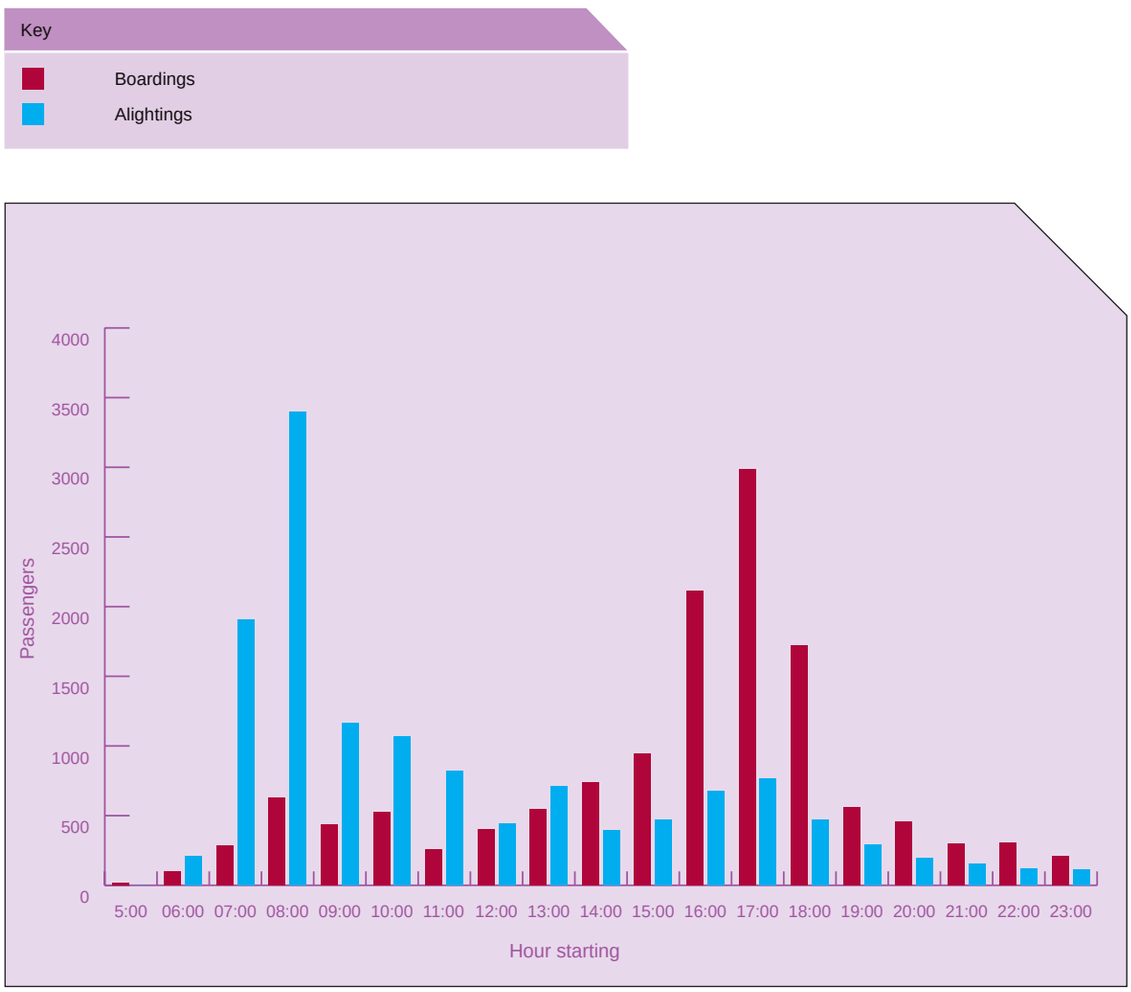
Manchester Stations	London	1,566,000
Liverpool Stations	London	686,000
Manchester Stations	Leeds	500,000
Manchester Stations	Sheffield	337,000
Manchester Stations	Huddersfield	317,000
Crewe	London	301,000
Preston	London	293,000
Manchester Stations	Birmingham	265,000
Chester	Llandudno Junction	236,000
Stockport	London	225,000

Source: SDG Stage 1 Report, 2004/05 LENNON and PTE data included

3.3.5 Boarding and alighting at key stations

Passenger demand at the key stations in the RUS area fluctuates sharply throughout the day reflecting the usage of these stations for commuting and leisure purposes. Figures 3.1 to 3.3 show the profile of alighting and boarding passengers at Manchester Piccadilly, Manchester Victoria and Liverpool Lime Street across the day based on survey data provided by the relevant train operating companies. Manchester Victoria has the most sharply peaked profile of alightings with 34 per cent of all alightings occurring in the high peak hour between 08:00 and 08:59 and over half during the three-hour morning peak period. By comparison, peak hour alightings account for 25 per cent and 22 per cent of total daily alighters at Manchester Piccadilly and Liverpool Lime Street respectively.

Figure 3.1: Alighters and boarders at Manchester Piccadilly



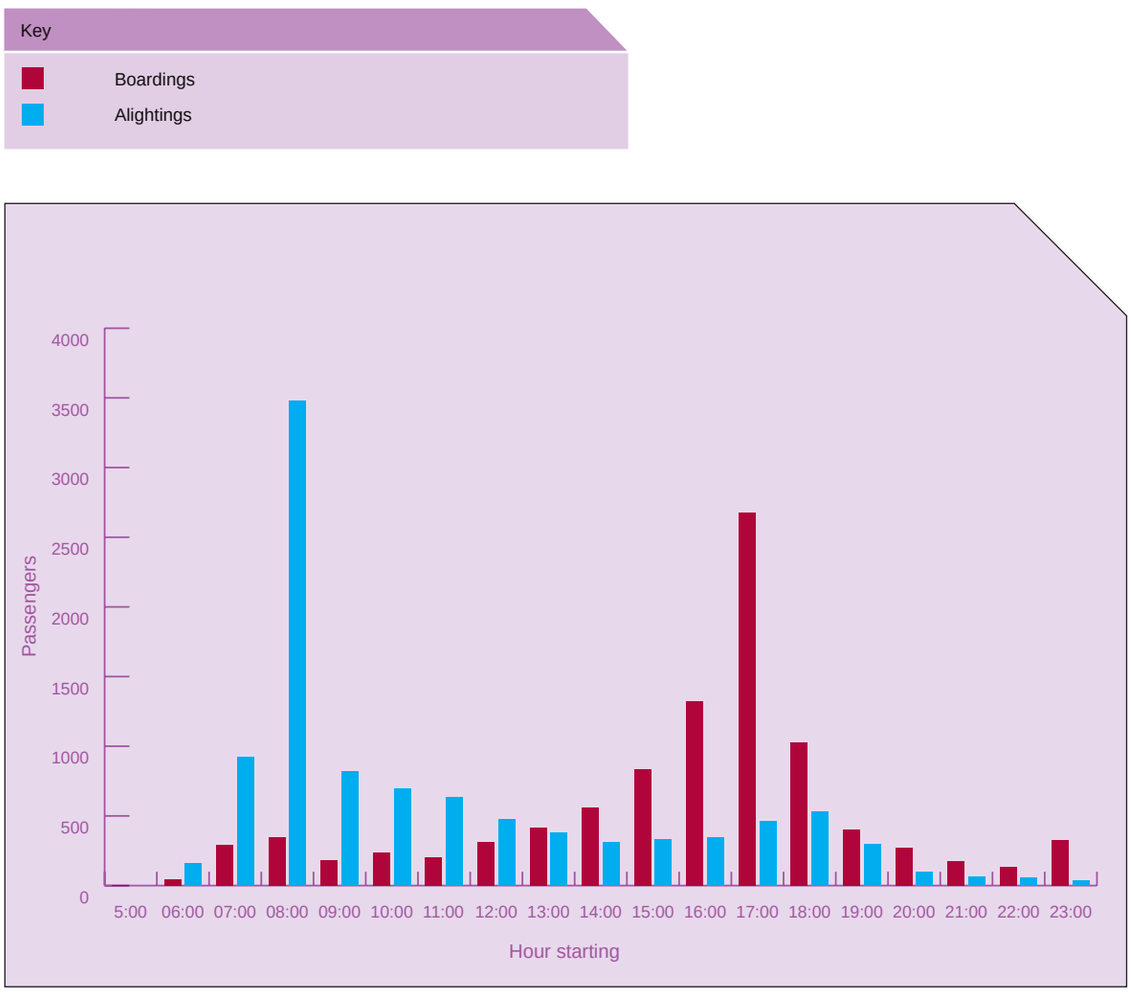
Source: SDG Stage 1 Report, Survey data 2004/05

3.3.6 Overcrowding

The level of rail demand in the RUS area varies considerably by time of day, journey purpose and route. As shown in Figures 3.1 to 3.3, demand at key North West stations is generally at its highest level during the 'high' peak between 0800 and 0859. Given this information, the analysis has focused mainly on the morning peak. It has been identified that a number of corridors where crowding into the main central Manchester stations and Liverpool Lime Street is an issue.

The analysis is based primarily on count data provided by the relevant Train Operating Companies (TOCs)[3]. This has been supplemented when necessary by data from MOIRA. It should be noted that there are a number of issues relating to the use of count data. For example, it relies heavily on the consistency of train count methods, guard counts etc, which are prone to human error. On the other hand, whilst demand models can be used to predict the total level of annual demand on particular flows, they are less

Figure 3.2: Alighters and boarders at Manchester Victoria

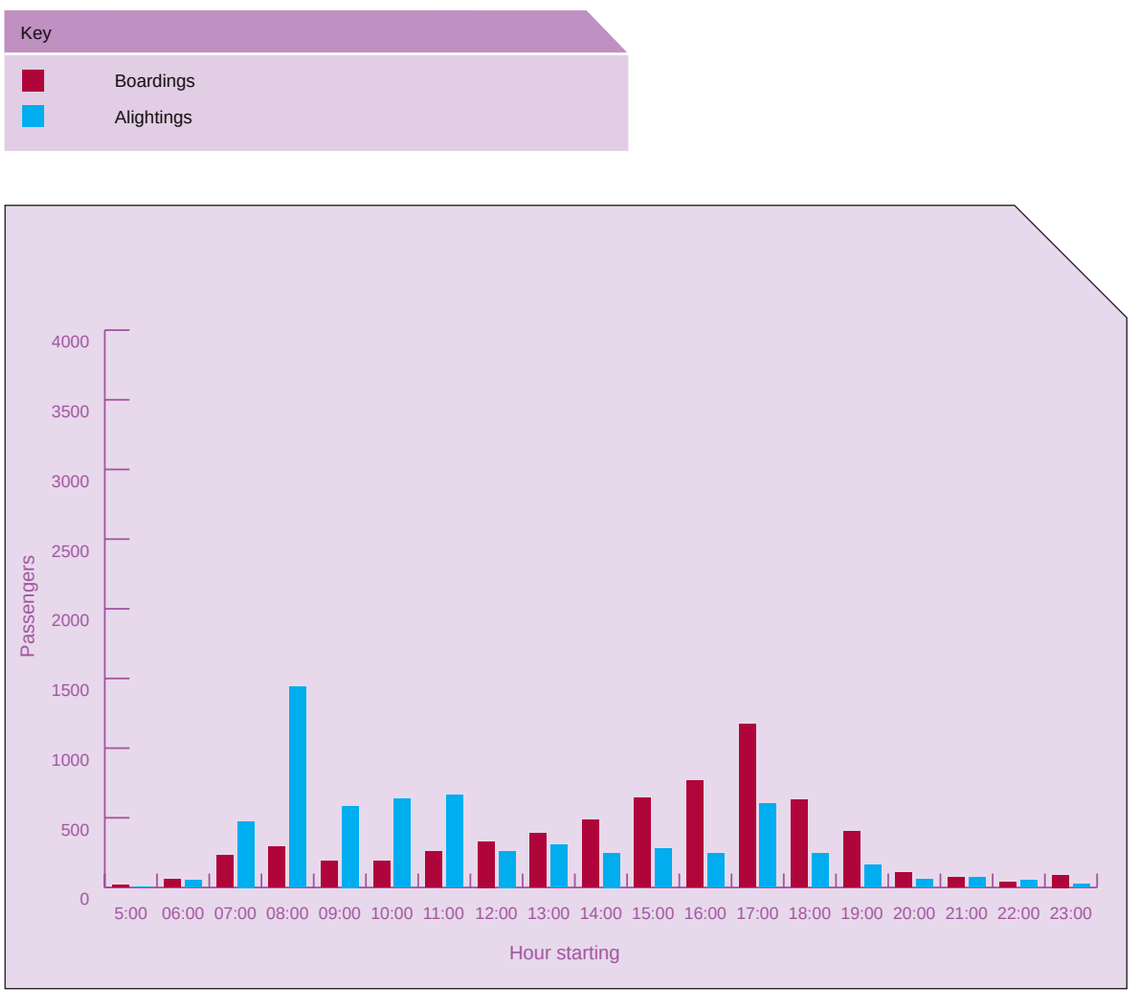


Source: SDG Stage 1 Report, Survey data 2004/05

[3]Northern Rail operate the majority of services in the RUS area and it should be noted that count data provided by Northern Rail has been seasonally adjusted and represents the busiest period of the year.

able to reflect the pattern of daily demand particularly during the peaks. Count data has hence been used to identify current issues by providing a snap shot of daily demand in the RUS area; however, its limitations should be noted.

Figure 3.3: Alighters and boarders at Liverpool Lime Street



Source: SDG Stage 1 Report, Survey data 2004/05

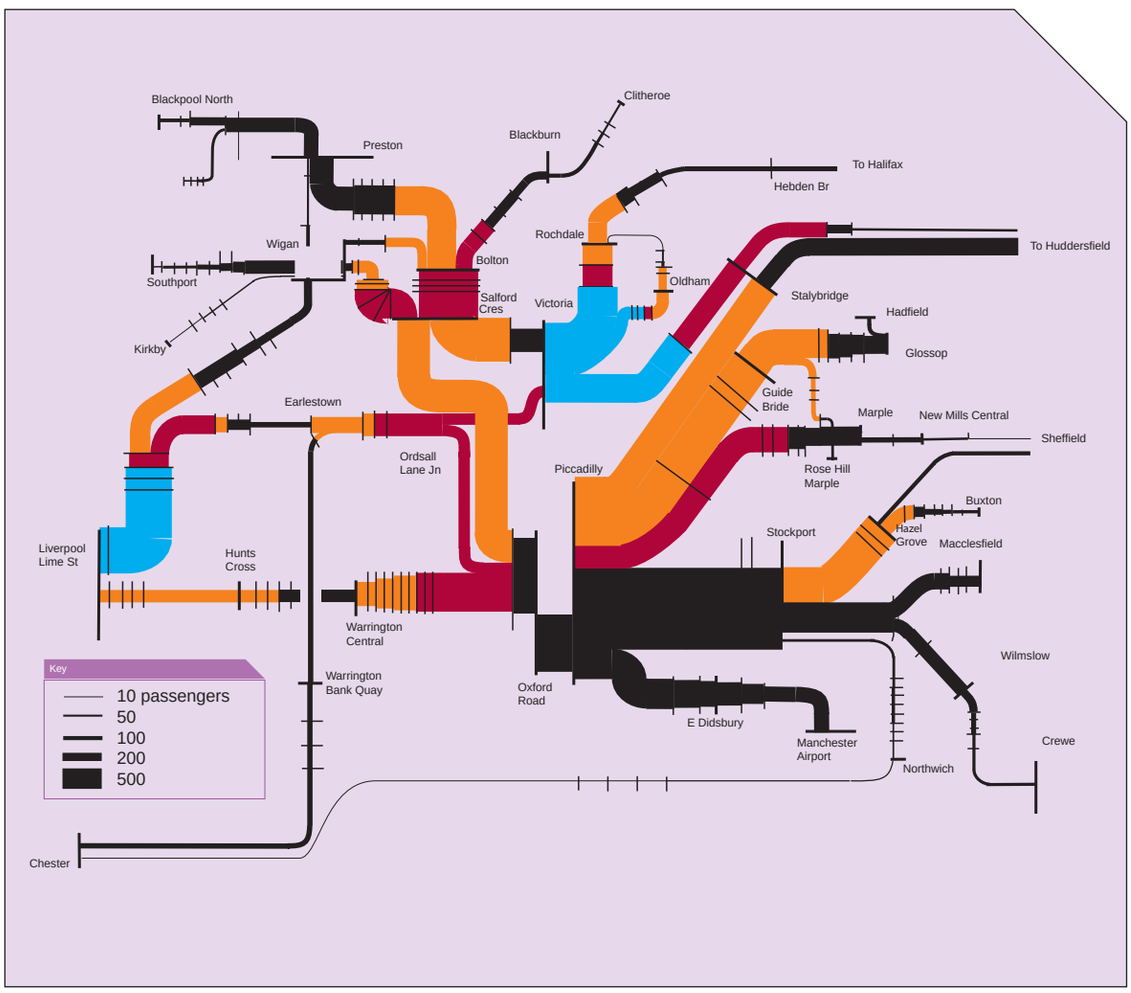
Figure 3.4 below shows the passenger flows arriving at Manchester and Liverpool between 0800 and 0859. The width of the lines represents the number of passengers on each corridor and the colour of the lines indicates the average loading over the hour on those corridors. The lines on the appropriate side of Earlestown and Warrington Central represent the respective flows towards Liverpool and Manchester.

Figure 3.4 shows that peak hour loadings on some corridors in the RUS area generate higher levels of crowding than others, particularly on the approaches to Manchester Victoria and Liverpool Lime Street. Figures 3.5 to 3.7 illustrate the current loadings and capacity (total seats provided) during the one hour morning peak for the Bolton, Calder

Figure 3.4: RUS area train loadings during the one hour AM peak

Key

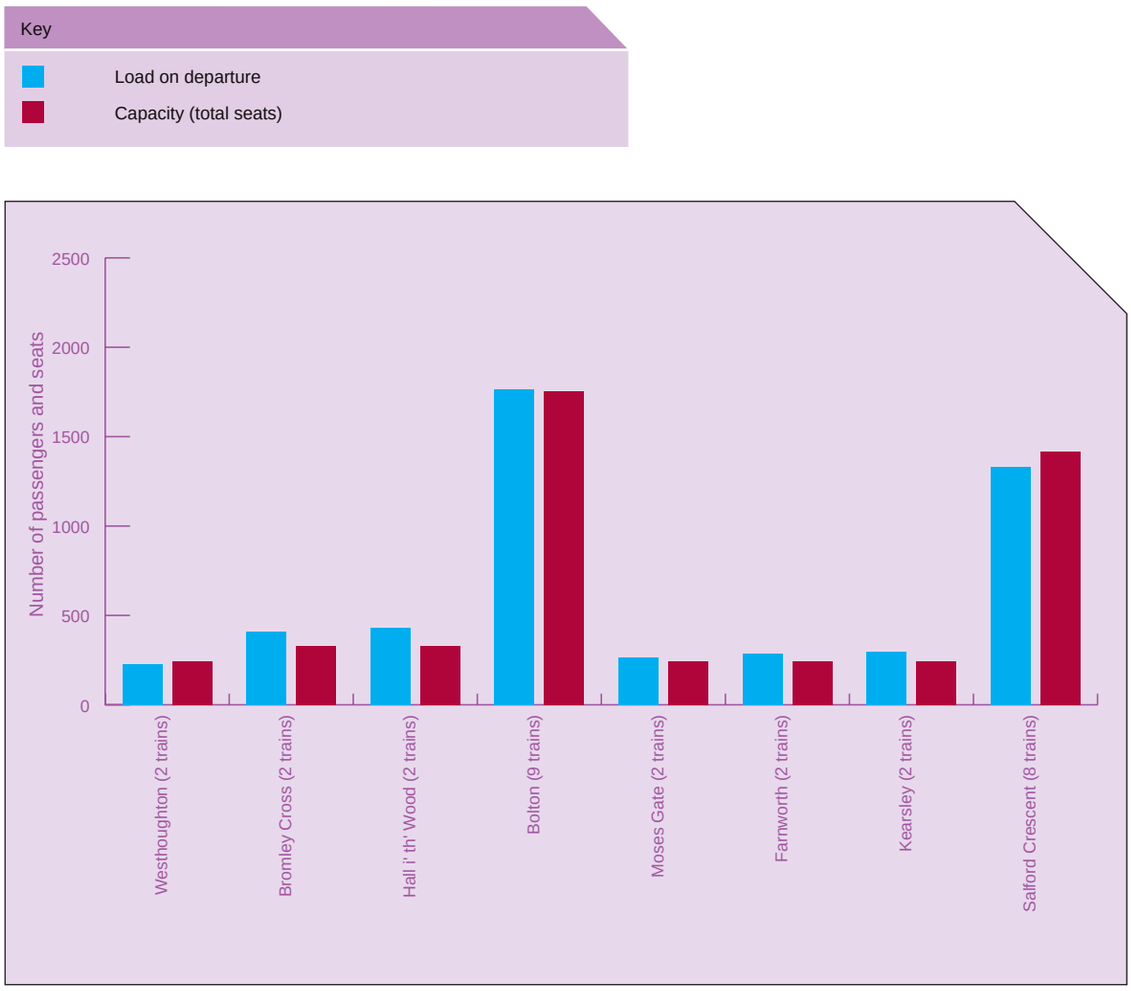
- Less than 75% loaded
- 75% to 100% loaded
- 100% to 125% loaded
- over 125% loaded



Source: TOC count data and demand model data

Valley and Chat Moss corridors in the RUS area. The number of services stopping at stations along these corridors during the one hour morning peak varies and is shown in brackets next to the station name.

Figure 3.5: Bolton corridor: one hour morning peak loadings and capacity

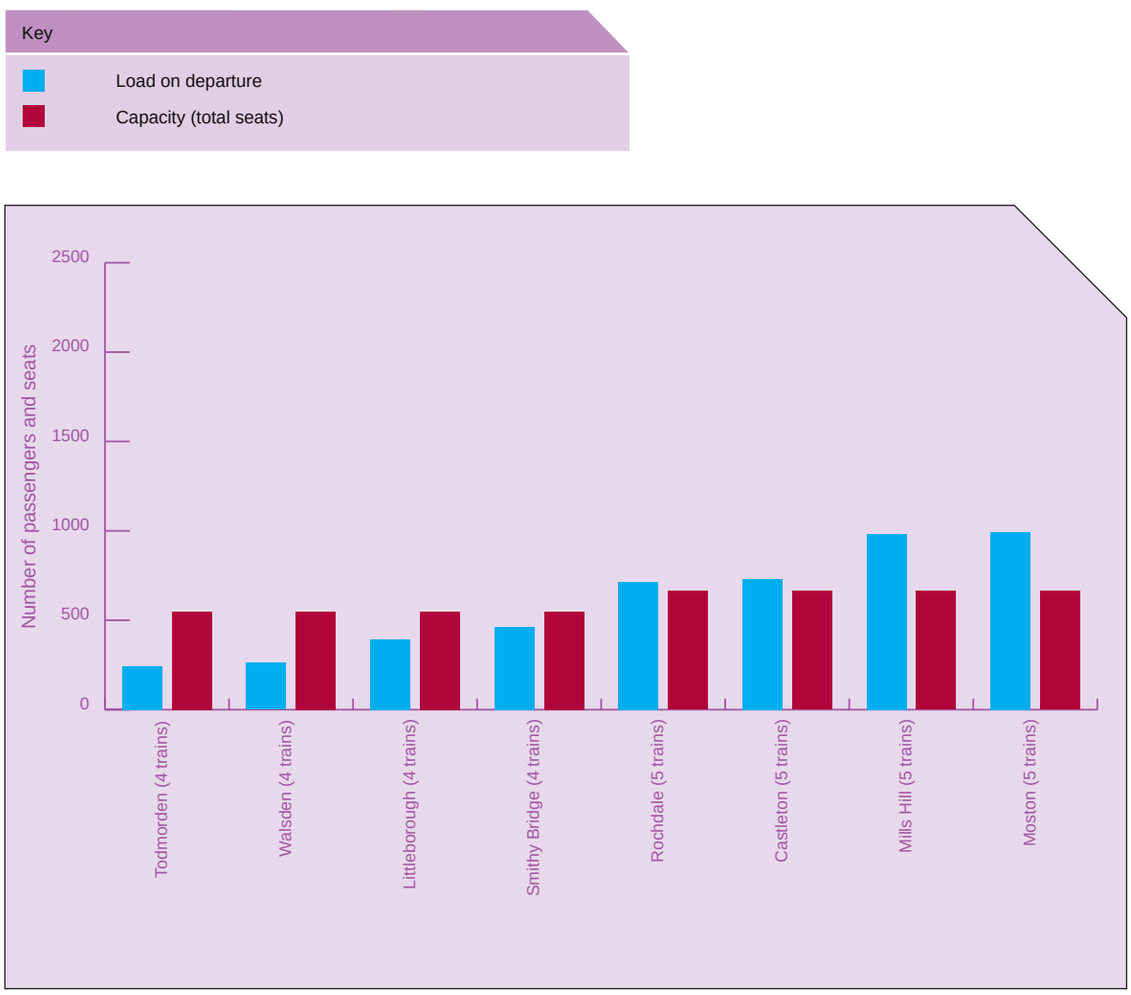


Source: TOC count data and demand model data, 2005

Load factors represent the total number of passengers on departure from each station heading towards the main RUS area stations (Manchester Piccadilly, Victoria and Liverpool Lime Street) divided by the total number of available seats. Load factors have been calculated for the morning peak period, 0700 to 0959 and the high peak period, 0800 to 0859.

Based on available data the stations with the highest departing load factors on each corridor are shown in Table 3.7. This table shows that the average peak load factor, during the high peak hour, is greatest on the Chat Moss, CLC, Callder Valley and Stalybridge corridors.

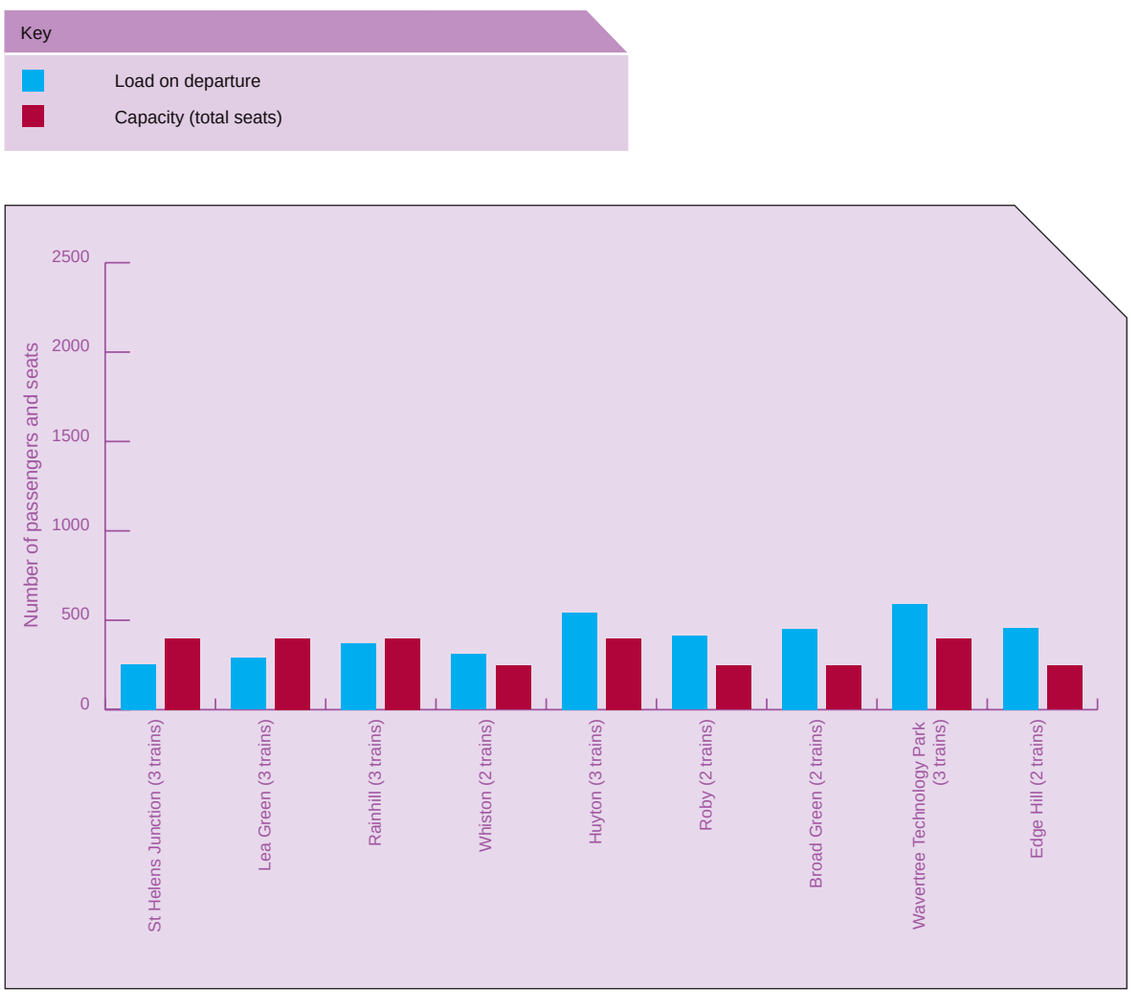
Figure 3.6: Calder valley corridor: one hour morning peak loadings and capacity



Source: TOC count data and demand model data, 2005

It should be noted that the load factors presented are only indicative of the level of passenger crowding over a given period, i.e. one or three hours in the morning peak. Passenger loadings on individual trains could be higher than those shown. Hence, the load factors that have been calculated for our analysis only provide an indication of stations where crowding may be an issue, rather than identifying specific trains that are heavily loaded during the peak period.

Figure 3.7: Chat Moss corridor: one hour morning peak loadings and capacity



Source: TOC count data and demand model data, 2005

Table 3.8 shows the load factor and number of available seats at stations approximately 15 to 20 minutes away from the main station in each corridor. During the high peak hour (0800-0859) load factors are at or above 140 per cent on the Chat Moss corridor towards Liverpool and on the Calder Valley corridor. This implies that around a third of passengers may be standing for over 15 to 20 minutes. The least crowded corridors are Northwich (which in the high peak hour has a load factor of 60 per cent on departure from Stockport), and Styal (which has a load factor of 25 per cent on departure from Manchester Airport).

Table 3.7: RUS area maximum load factors by corridor

Corridor	AM 3 hour peak maximum loading	AM 1 hour high peak maximum loading	Load factor (max) at
Stockport	65%	90%	Disley
Marple	120%	135%	Ryder Brow
Hadfield	60%	95%	Gorton
Stalybridge	130%	145%	Ashton-under-Lyne
Oldham	80%	135%	Dean Lane
Calder Valley	125%	150%	Moston
Bolton	100%	130%	Kearsley/Hall i' th' Wood
Atherton	110%	115%	Atherton/Moorside
Chat Moss (towards Manchester)	110%	115%	Patricroft/Eccles
Chat Moss (towards Liverpool)	130%	185%	Edge Hill
CLC (towards Manchester)	115%	175%	Humphrey Park/Trafford Park
CLC (towards Liverpool)	65%	95%	Edge Hill
Northwich	55%	70%	Ashley/Hale
Styal	40%	50%	Mauldeth Road/East Didsbury
St Helens Central	120%	120%	Wavertree Technology Park

Source: TOC count and demand model data 2005, to nearest 5%

Table 3.8: RUS area load factors by corridor (approximately 20 minutes from the main stations)

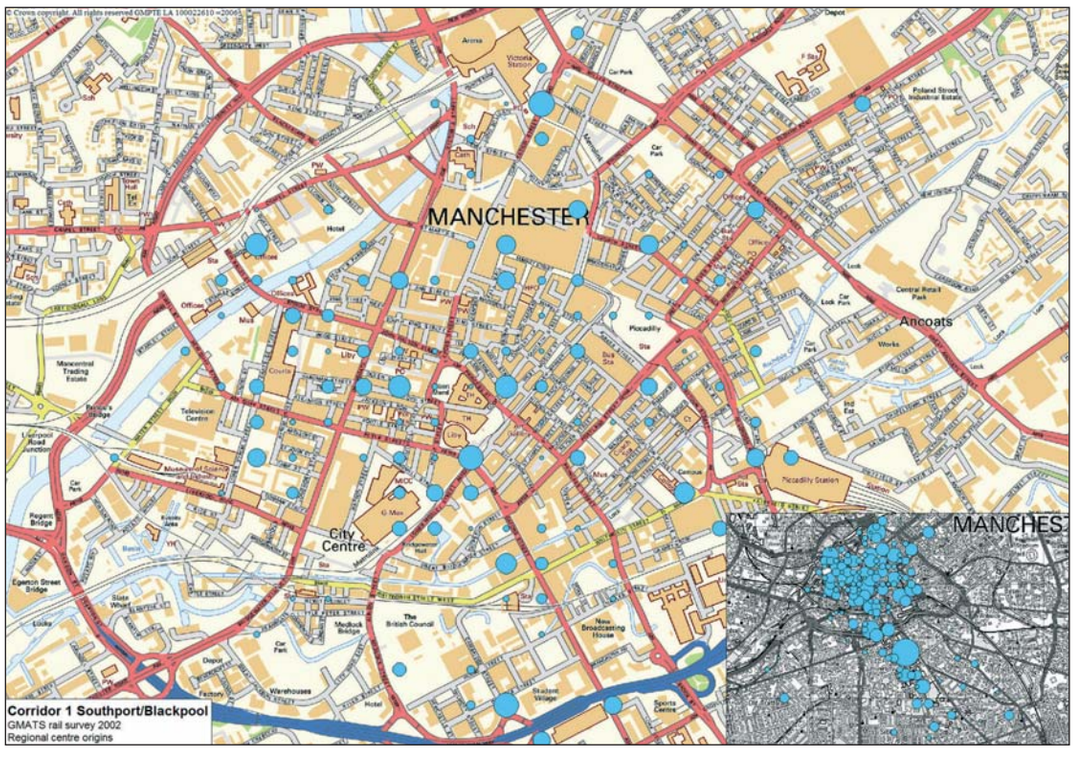
Corridor	Load on departure from RUS area stations	Base		Base	
	(approx 15 to 20 mins from main station)	**Number of seats**	**AM 3 hour peak** load factor	**Number of seats**	**AM 1 hour high peak** load factor
Stockport	Stockport (towards Manchester)	6,950	50%	2,700	75%
Marple	Guide Bridge (towards Manchester)	550	65%	250	90%
Hadfield	Guide Bridge (towards Manchester)	2,250	55%	850	90%
Stalybridge	Stalybridge (towards Manchester)	2,350	85%	1,300	90%
Oldham	Hollinwood (towards Manchester)	750	70%	250	125%
Calder Valley	Mills Hill (towards Manchester)	1,050	120%	650	150%
Bolton	Bolton (towards Manchester)	3,700	100%	1,750	100%
Atherton	Moorside (towards Manchester)	1,050	110%	650	105%
Chat Moss	Patricroft (towards Manchester)	250	110%	250	110%
Chat Moss	Huyton (towards Liverpool)	950	100%	400	135%
CLC	Glazebrook (towards Manchester)	250	90%	150	95%
CLC	Hunts Cross (towards Liverpool)	900	50%	350	80%
Northwich	Stockport (towards Manchester)	450	35%	100	60%
Styal	Manchester Airport (towards Manchester)	4,050	20%	1,500	25%
St Helens Central	Huyton (towards Liverpool)	1,200	95%	550	100%

Source: Analysis based on available count data and demand model data 2005, to nearest 5%, seats rounded to the nearest 50 seats

3.3.7 Passengers' ultimate destinations

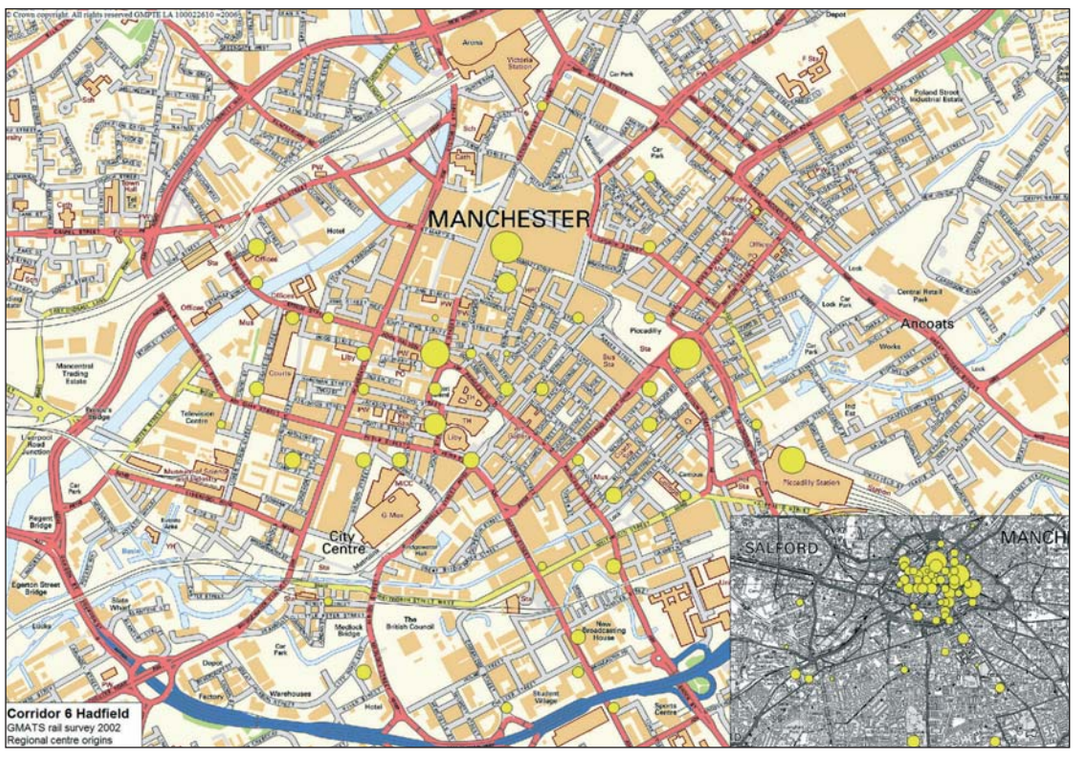
Figures 3.8 and 3.9 show the ultimate destinations of people travelling by rail into Manchester city centre along the Bolton and Hadfield corridors. Passengers on the Bolton corridor have the ability to change trains at Salford Crescent and thereby reach all five central stations. The diagram shows that the destinations across the city centre are evenly distributed. Figure 3.9 shows the destinations of passengers travelling along the Hadfield line, where Piccadilly is the train destination. The distribution is generally slightly closer to Piccadilly, suggesting that there are some people who live on this corridor who either do not need to travel to the same range of locations as those on the Bolton corridor, or choose to use another form of transport. However, there are still significant numbers for whom another station would be more convenient. Similar analysis along the other corridors indicates that passengers travelling from the various points of the compass around Manchester have ultimate destinations with a similar distribution (as shown in Appendix B). This even spread around the five central stations suggests that efficient distribution of passengers throughout the city centre would be facilitated if each of the five central stations were conveniently accessible from any of the corridors. The benefits of this would be dependent on the time penalties incurred (e.g. from interchange), compared with the alternative of having to walk or catch a bus or tram. Railway topology means this is not possible in all cases, but current services also limit this objective.

Figure 3.8 Central Manchester passenger destinations – Bolton corridor



Source: GMPTE

Figure 3.9 Central Manchester passenger destinations – Hadfield corridor



Source: GMPTE

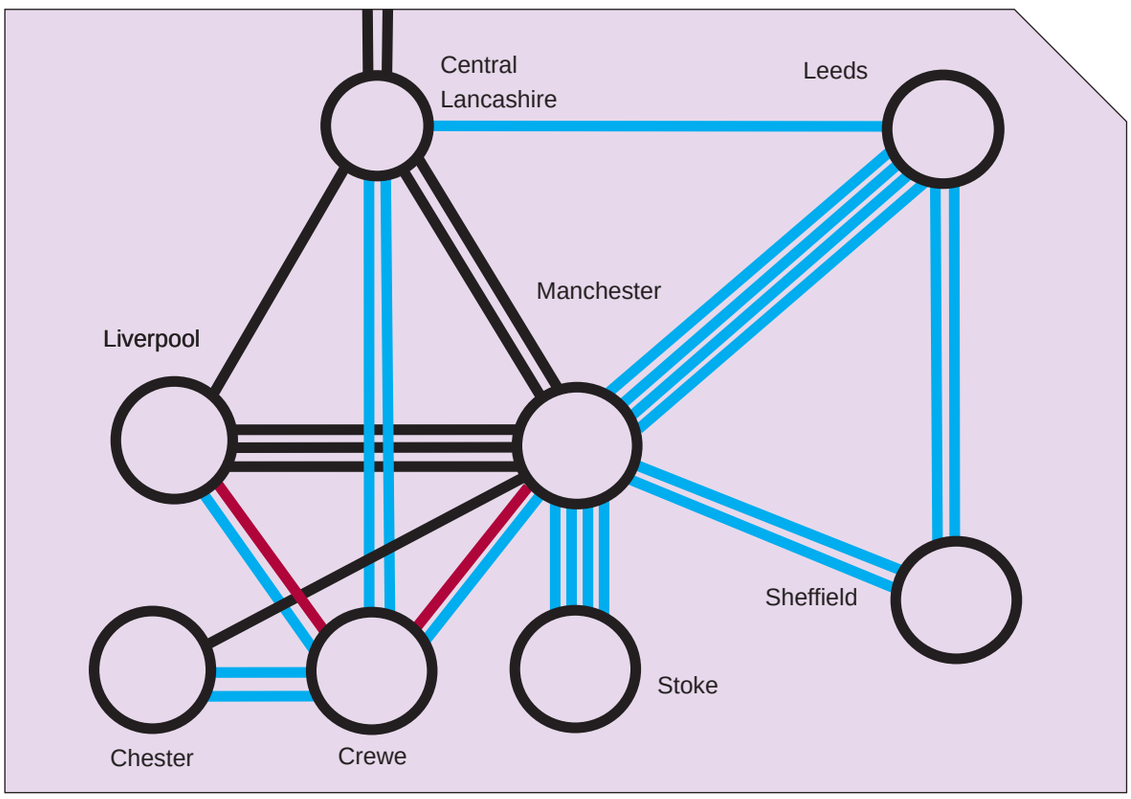
3.3.8 Regional links

The Regional Spatial Strategy (RSS) and Regional Economic Strategy (RES) both identify a need for stronger regional links. One of the priorities in the RES is to 'enhance public transport services between Liverpool/ Manchester/Central Lancashire/Leeds/ Sheffield'. Currently, the second largest flow within the RUS area is between Manchester and Liverpool, reflecting the importance of this link. Similarly, the flows between Manchester and Leeds, Sheffield and Huddersfield are among the largest five flows from within the RUS area to other areas. The RPA similarly indicates a need for improved inter-regional connectivity. These links can be strengthened by improving generalised journey times. This can either be achieved by reducing journey times, or by increasing the frequency of services, or a combination of the two.

Figure 3.10 below indicates the fast links between the three RUS city regions and key conurbations outside the area. Each line represents a fast hourly service. The blue lines indicate services that are more properly dealt with by other strategies. The red lines indicate additional hourly services that the West Coast December 2008 (WC2008) timetable is expected to provide. The Manchester – Crewe, Manchester – Stoke, and Liverpool – Crewe routes are all dealt with by the WC2008 timetable work. The Manchester – Leeds, Manchester – Sheffield, and Leeds – Sheffield routes will all be considered by the Yorkshire & Humber RUS.

The diagram shows that that Liverpool – Central Lancashire only has an hourly service, as has Chester – Manchester. The RSS identifies each of these four locations as a key transport interchange and a driver of growth in the area,

Figure 3.10. Fast regional links



Note: for ease of analysis, Preston is used as a proxy for Central Lancashire

and states that the economy would benefit from improved links between them. In the same way, Manchester – Central Lancashire has a nominal twice hourly service, but one of the trains is better described as a semi-fast than a fast service.

The diagram shows that there are more services between Manchester and Leeds per hour than between Liverpool and Manchester. This is despite the fact that the latter flow carries more passengers. If passengers travelling between Liverpool and Manchester were offered the same frequency that passengers between Manchester and Leeds enjoy, they would benefit from a significant improvement in generalised journey time.

Table 3.9 below sets out journey times by rail and car arriving before 9am between the three key regional centres.

The journey time advantage rail has over road during the peak is due to the priority route that rail uses, compared to the congestion that can be found on roads such as the M62. However, the disadvantage of rail is that the origin and destination of passengers is unlikely to be immediately adjacent to a station, adding additional time to the total journey. In order to reduce this, either the additional journey time at either end can be reduced, or the train journey itself can be shortened. Appendix B includes a table of comparative journey times by rail, bus, and car.

Table 3.9: Comparative journey times

From	To	Train (mins)	Car (mins)
Manchester (Oxford Road)	Liverpool (Lime Street)	47	61
Manchester (Victoria)	Preston	46	69
Liverpool (Lime Street)	Preston	54	75

Source: www.transportdirect.info

3.4 Current freight market profile

3.4.1 Background

Within the UK, rail transport has historically had a small share of the total freight market. However, rail's market share is growing year on year, up from 10% to 12% of total freight tonne kilometres (weight of freight multiplied by distance carried) in the 10 years following privatisation. It is continuing to grow as the Working Time Directive together with other cost drivers take effect on the economics of longer distance lorry journeys.

There is a substantial level of freight traffic in the RUS area. The market is dominated by a few flows: intermodal traffic to and from Trafford Park, coal out of Liverpool Bulk Handling Terminal, and construction materials originating in the Hope Valley. Other significant flows are intermodal traffic out of Seaforth, and domestic waste traffic from Greater Manchester.

3.4.2 Major flows

Figure 3.11 illustrates the current number of planned trains per day on each part of the network.

Coal

Coal remains the dominant fuel used for generating electricity in the UK. With the continuing increase in gas and oil prices, and the time that would be required to build nuclear power stations, it looks set to remain competitive over the RUS period. Coal services from Liverpool Bulk Handling Terminal primarily serve Fiddlers Ferry power station, but also service power stations at Ironbridge and Ratcliffe. In addition, the new coal terminal at Ellesmere Port loads two coal services per day that operate to Fiddlers Ferry.

Intermodal

Large intermodal containers are increasingly favoured by shipping companies, with the percentage of 9'6'' high containers increasing from 28% of deep sea containers arriving in UK ports in 2002 to 35% in 2004. Existing services link Trafford Park to ports at Southampton, Felixstowe, Tilbury and the Isle of Grain.

There are aspirations for additional intermodal freight terminals in the North West:

- Port Salford on the Chat Moss west of Patricroft
- Parkside on the Chat Moss east of Newton-le-Willows
- Partington on the branch from Skelton Jn
- Ditton on the WCML between Allerton Jn and Runcorn

Aggregates

The aggregate services using the RUS routes include services to and from the following sources and destinations:

Sources:	**Destinations:**
Tunstead	Ashburys
Peak Forest	Hope Street
Dowlow	Northenden
Hindlow	Bredbury
	Pendleton
	Bletchley
	Leeds
	Northwich

Domestic waste

The domestic waste services from Greater Manchester originate from sites at:

Bredbury

Dean Lane

Northenden

Brindle Heath

These are destined for Roxby near Scunthorpe.

Figure 3.11: Current freight paths on sections of the network

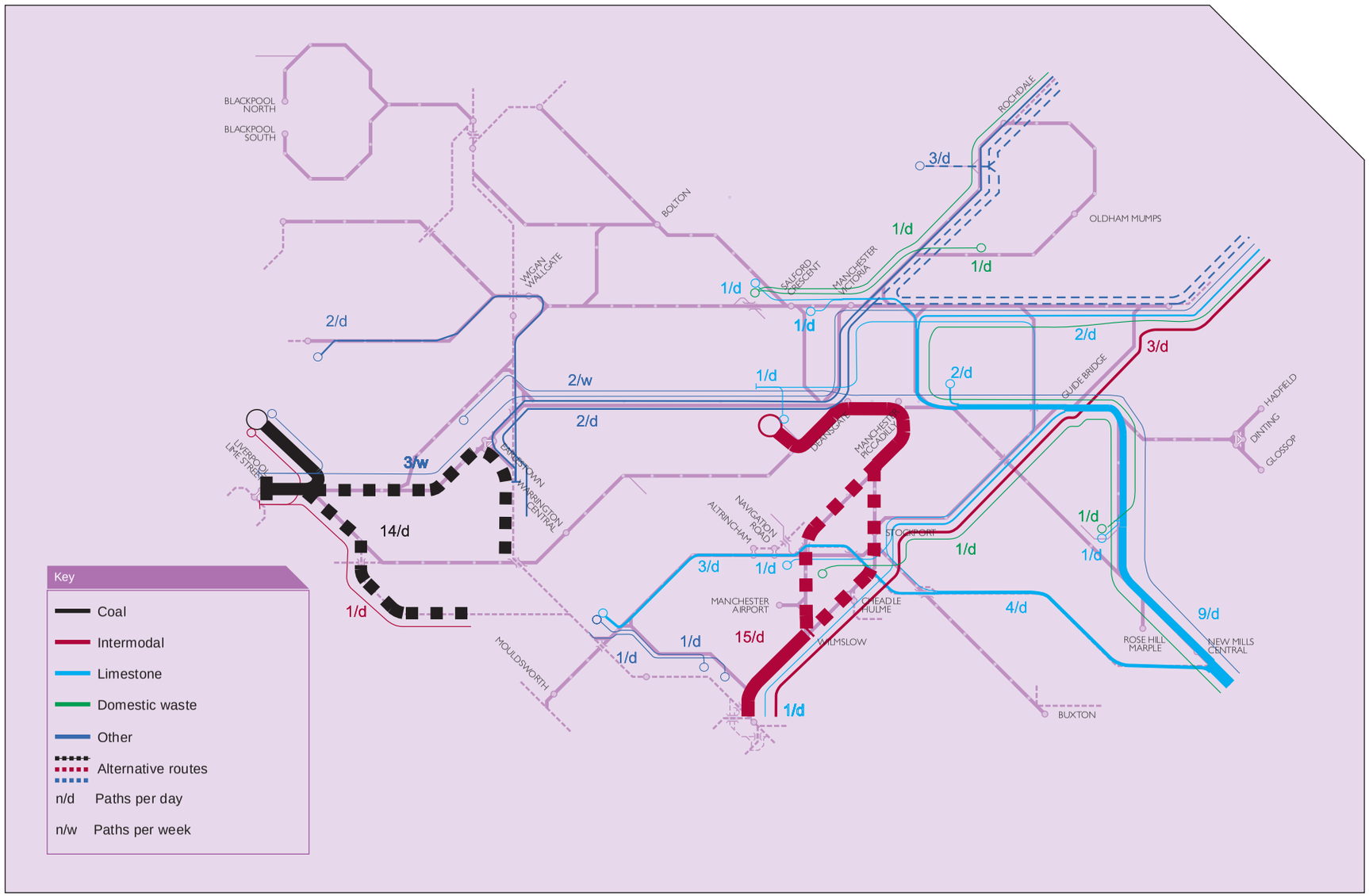
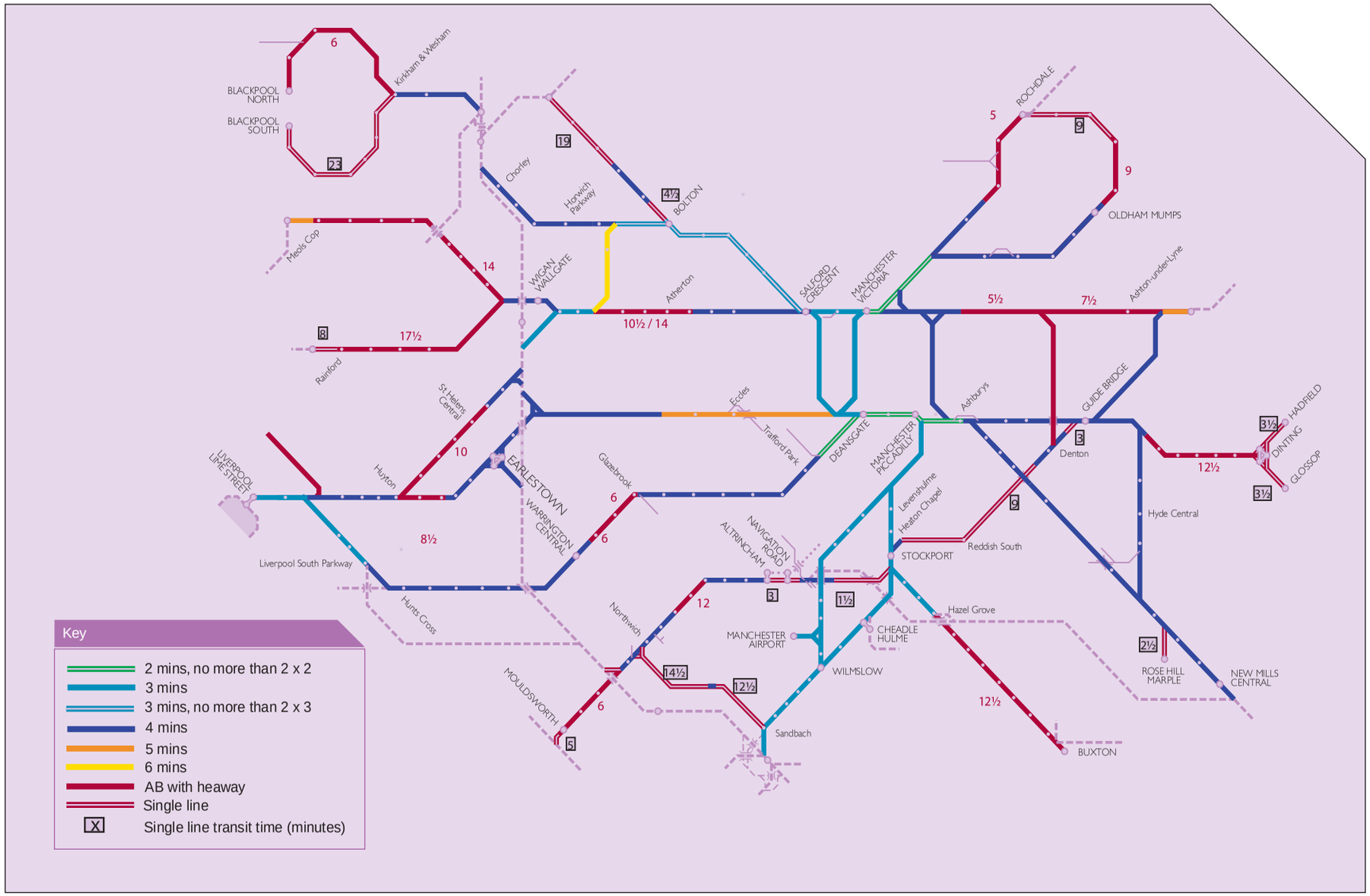


Figure 3.12: Headways



3.5 Infrastructure capacity and capability

Each topic in this section is explored in more detail in Appendix B.

3.5.1 Signalling headways

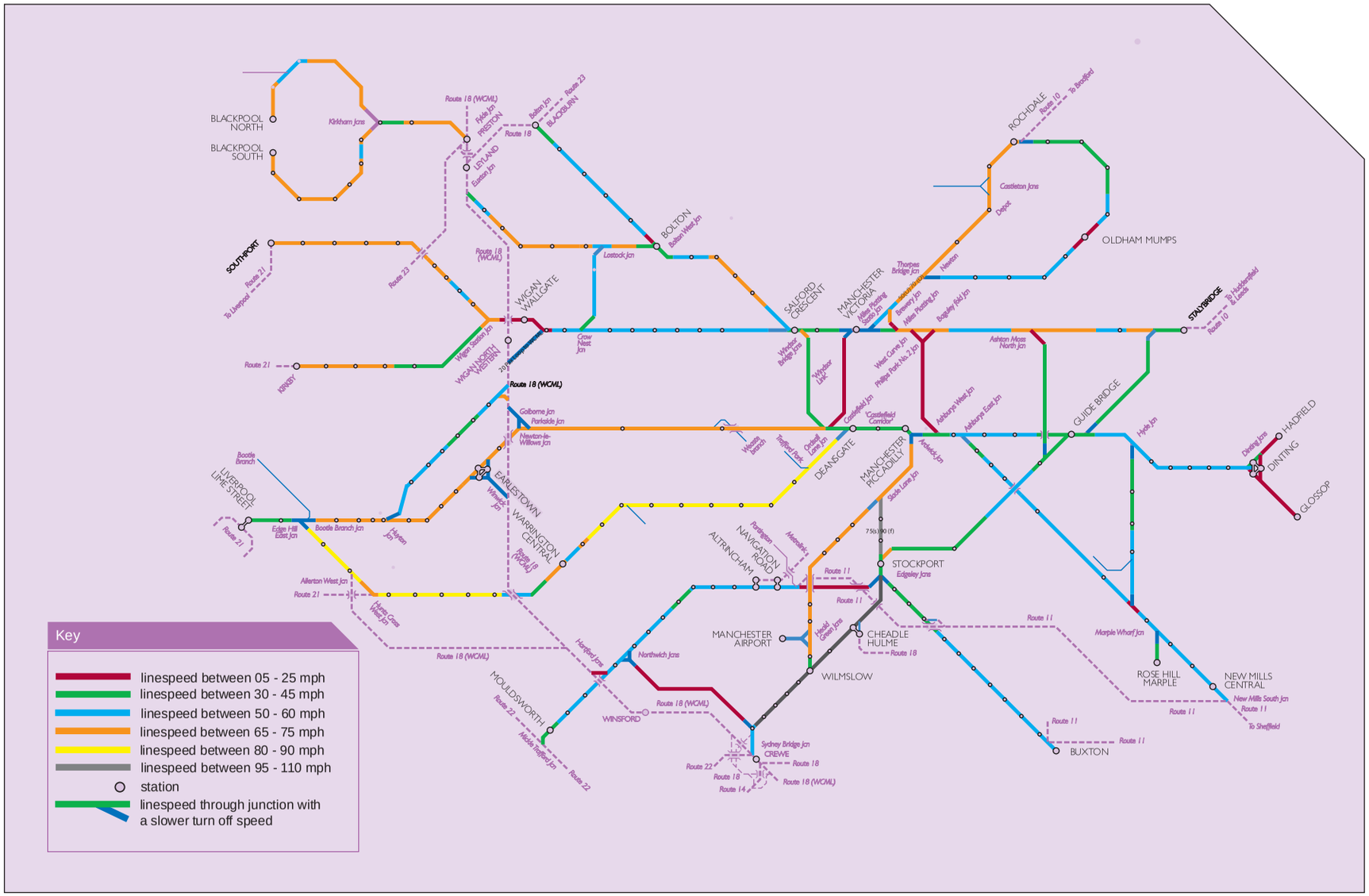
The headway is a measure of how closely (in time) one train can follow another. Within the RUS area, headways vary from 2 minutes along the Castlefield corridor, to 17½ minutes out to Kirkby, and even more on some single line sections. Notable amongst the single lines is the busy section between Bolton and Blackburn, the section on the Oldham loop and the line to Blackpool South. Single lines restrict the number of services that can run and are generally a performance risk.

There are a number of lines where the headways vary along the route. In some cases, this suits the service pattern and unit type. However, in others, it can limit capacity, reducing the ability to change the timetable, recover from perturbation, and use as a diversionary route. This is the case on the Atherton line, around Rainhill, and along the Calder Valley.

3.5.2 Linespeeds

Figure 3.13 below shows that the prevailing linespeed in most route sections is between 50mph and 75mph. All of the rolling stock, however, is capable of at least 75mph, with the electric units and the interurban diesel units capable of 90mph and above. There are a number of routes along which the linespeed varies. This can be inefficient in terms of capacity and journey time, depending on unit types and stopping patterns. This is especially true for the interurban services, which do not stop as regularly as local services. Notable sections where higher linespeeds could result in significant journey time savings include the Chat Moss line, the Atherton line, the Calder Valley line and the routes from Salford Crescent to Blackburn and Blackpool.

Figure 3.13: Prevailing linespeed



3.5.3 Junction turnouts

The majority of the junction turnout speeds are 25mph and below as can be seen in Figure 3.13. Deceleration from linespeed and subsequent acceleration back to linespeed after crossing a junction costs time and capacity. In some cases, the requirement for approach control impacts journey time and decreases capacity further. An example of this is Guide Bridge, where services capable of 100mph are brought almost to a stop before going over the 15mph junction. Another case is Heaton Norris Junction, where freight trains must slow down to 25mph to access the Denton line, blocking both of the 'up' lines in the process of traversing the junction.

3.5.4 Electrification

There is very limited electrification within the RUS area when benchmarked against a comparable conurbation such as the West Midlands. Through the middle of the area runs the electrified West Coast Main Line, with electrified branches off to Liverpool and Manchester. None of these three lines have fully electrified diversionary routes. Electrified services also run on local routes from Manchester southwards along the Styal line and to Hazel Grove, and to Hadfield/ Glossop in the east. Having only these routes electrified, however, means that there are few economies of scale for the electric train fleet.

3.5.5 Loop lengths

Very few of the loops in this area are long enough to take the longest 775m freight trains. For example, on the line to Trafford Park from Crewe, the only loops long enough to handle the longest intermodal trains are at Chelford, controlled by Manchester South. After this, a freight train must keep going until it gets to Trafford Park, which is controlled by Manchester Piccadilly, passing through the busy Piccadilly platforms 13 and 14 en route. Freight trains can be looped at Longsight down goods, but the low entry and exit speeds mean that this rarely happens.

A number of loops, such as the one near Glazebrook, are sometimes used to allow faster trains to pass stopping services during perturbation. Often these are located around historical needs and hence may not be ideally sited for today's railway. Another example is at Diggle where the loop is too short for most freight trains, and does not have the right layout to have best use made of it by passenger trains.

3.5.6 Platform lengths

Platforms across the RUS area are largely a mixture of two-, three- and four-car lengths. The platform lengths vary along a line of route, which means either the train length is constrained by the shortest platform, or skip-stopping is deployed. Often the shortest platforms are on the periphery of the RUS area.

3.5.7 Station facilities

Large, busy stations tend to have a comprehensive range of facilities. The facilities at medium and small stations are more variable (see Appendix B). For example, Salford Crescent has very limited facilities for passenger comfort given its key role as an interchange station.

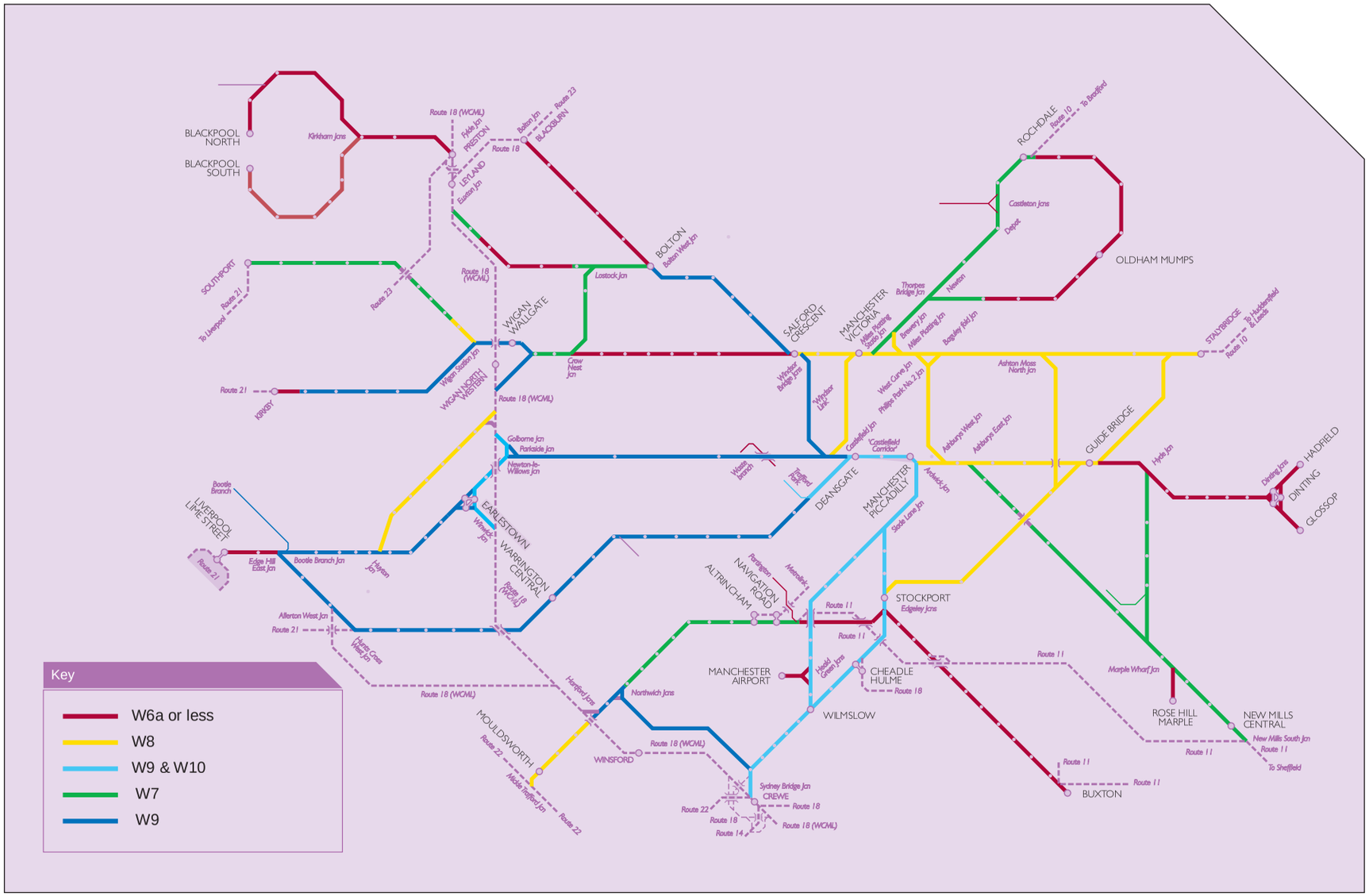
3.5.8 Car parking

The RUS area has approximately one quarter as many station car parking spaces as exist in the West Midlands, a similar conurbation. Almost half of the stations have no car park, whilst only 11 have car parks with more than 100 spaces. The RUS has not collected data on alternative parking facilities near the station; however, station car parks generally fill early.

3.5.9 Integration with other public transport modes

There are a number of locations where the railway intersects or runs close to other modes of public transport. In the Manchester area, interchange with the Metrolink system is especially important, as this fixed-network gives easy access to multiple destinations in and around the city centre. There are six locations where Metrolink interacts most closely with the rail network: Piccadilly; Victoria; Altrincham; Deansgate; Eccles and Cornbrook.

Figure 3.14: Gauge clearance



At Piccadilly, Victoria and Altrincham, the interface with Metrolink is already exploited to allow passengers to interchange. However, at the other three locations, interchange opportunities are currently limited. At Deansgate although the train and Metrolink are situated in close proximity, there are currently only a limited number of rail services that stop due to timetable limitations along the Castlefield corridor. At Eccles, the train station and the Metrolink stop are only 300m apart with bus connections to Trafford Park and the Trafford Centre also nearby. However, there are few interchange opportunities due to limited signage between the two and the fact that there is only one train per hour in each direction that stops at Eccles. At Cornbrook, there is a Metrolink stop adjacent to the railway, but no train station.

3.5.10 Gauge

In the RUS area, gauge ranges from W6a to W9 and W10. The last of these, W10, allows the carrying of 9'6'' high intermodal boxes on standard size wagons. As can be seen in Figure 3.14, there are sections where only one route is cleared to W10 from the south into Trafford Park freight terminal. Consequently, if this route is blocked, large boxes cannot be carried on standard wagons into and out of the site.

The current pattern of gauge across the RUS area is a constraint on freight use. The route to Liverpool docks, identified as a key driver of regional economic growth, is only cleared for W9 traffic, which limits its attractiveness as a port for intermodal containers. In addition, the east – west route across the Pennines, is restricted to W8 traffic.

The mixture of gauges means diversionary routes are often long and circuitous, or trains have to be cancelled when the main route is unavailable. For example, the route across the Pennines via Stalybridge is cleared for W8 traffic, while the other two routes (Calder Valley and Hope Valley) are only cleared for W7 traffic.

3.5.11 Route Availability

The Route Availability (RA) of a specific route is determined by the carrying capability of both its structures and its track. Most of the RUS area is RA8, although there are some sections of RA7. However, traffic up to RA10, notably aggregate traffic from the Peak District, operates over specified sections of the route subject to certain restrictions. Each train must apply for permission to run, and cannot be diverted from the specified path without additional authorisation, which reduces flexibility during perturbation.

3.6 Network utilisation

The Capacity Utilisation Index (CUI) is an indicative (and somewhat limited) measure of how much of the planning capacity of a section of railway is being utilised by the current timetable. In general, 50% means there is room for growth. 75% upwards means that growth is increasingly at the expense of performance. Figure 3.15 shows the CUI for each section of the RUS area from 0800 – 0900hrs using the December 2005 timetable. It should be noted that this type of diagram does not reflect capacity constraints at junctions.

The highest levels of CUI shown on the map are shown in red. The single line to Blackpool South takes 23 minutes to traverse with a minimum 4 minute turnaround. With an hourly service to and from Colne, this means that the line is in use for 50 minutes out of every hour. In the case of the Warrington to Deansgate section, the high CUI is caused by the stopping train leaving Liverpool immediately after a fast train; the next fast is then timetabled to be immediately behind the stopper by the time they reach Deansgate. The third red section is between Piccadilly and Slade Lane junction, which is due to 3 minute headways and the high volume of movements, some of which cross the formation. Other sections of interest due to the number of services or potential impact on the rest of the network are: the line between Salford Crescent and Bolton; the lines going south from Manchester Piccadilly; the line from Guide Bridge to Ashburys; and the line into Liverpool Lime Street.

Figure 3.15: Capacity Utilisation Index

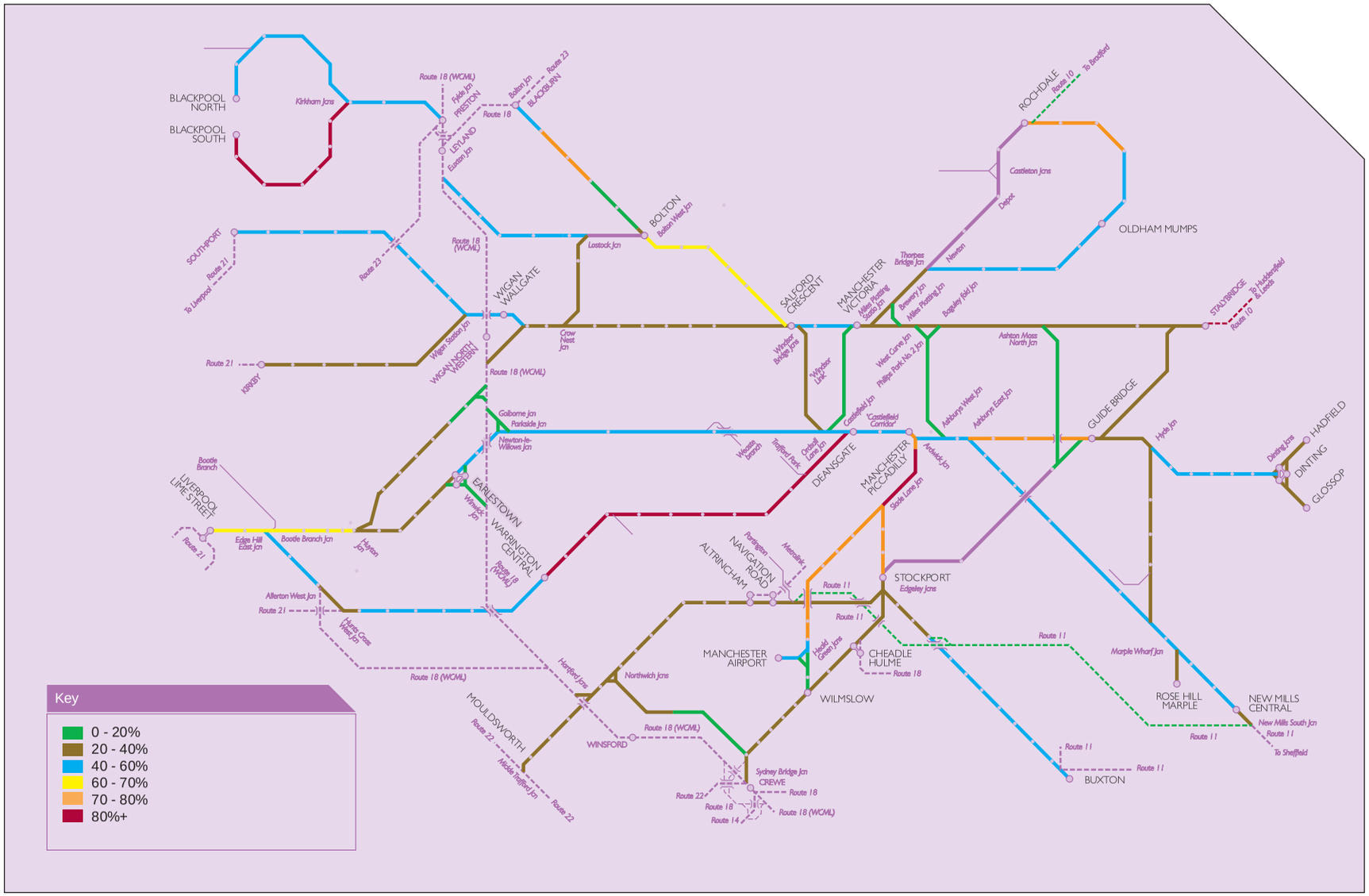
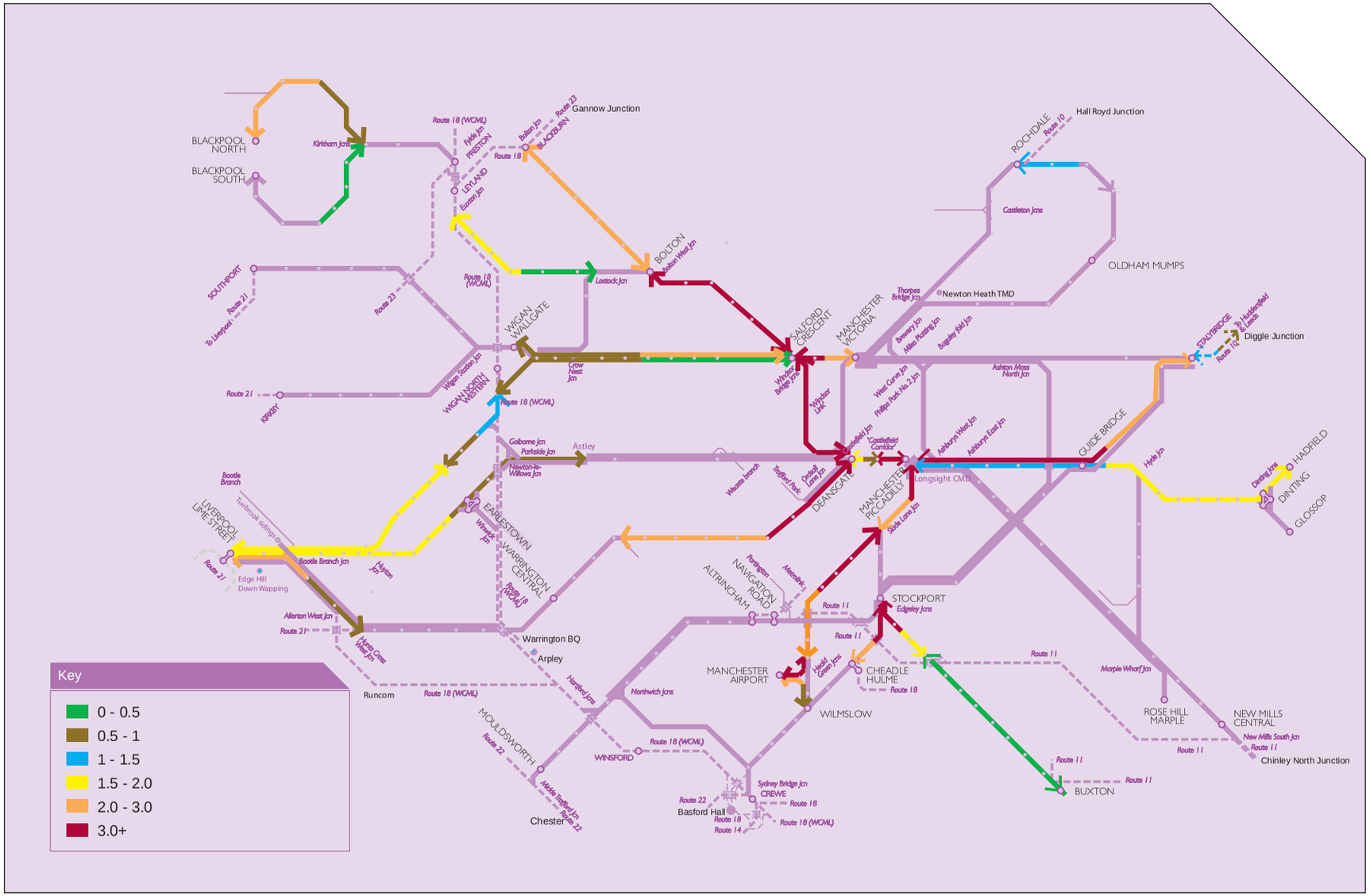


Figure 3.16: Ratio of reactionary delay to primary delay in a section



3.7 Current network performance

3.7.1 Methodology

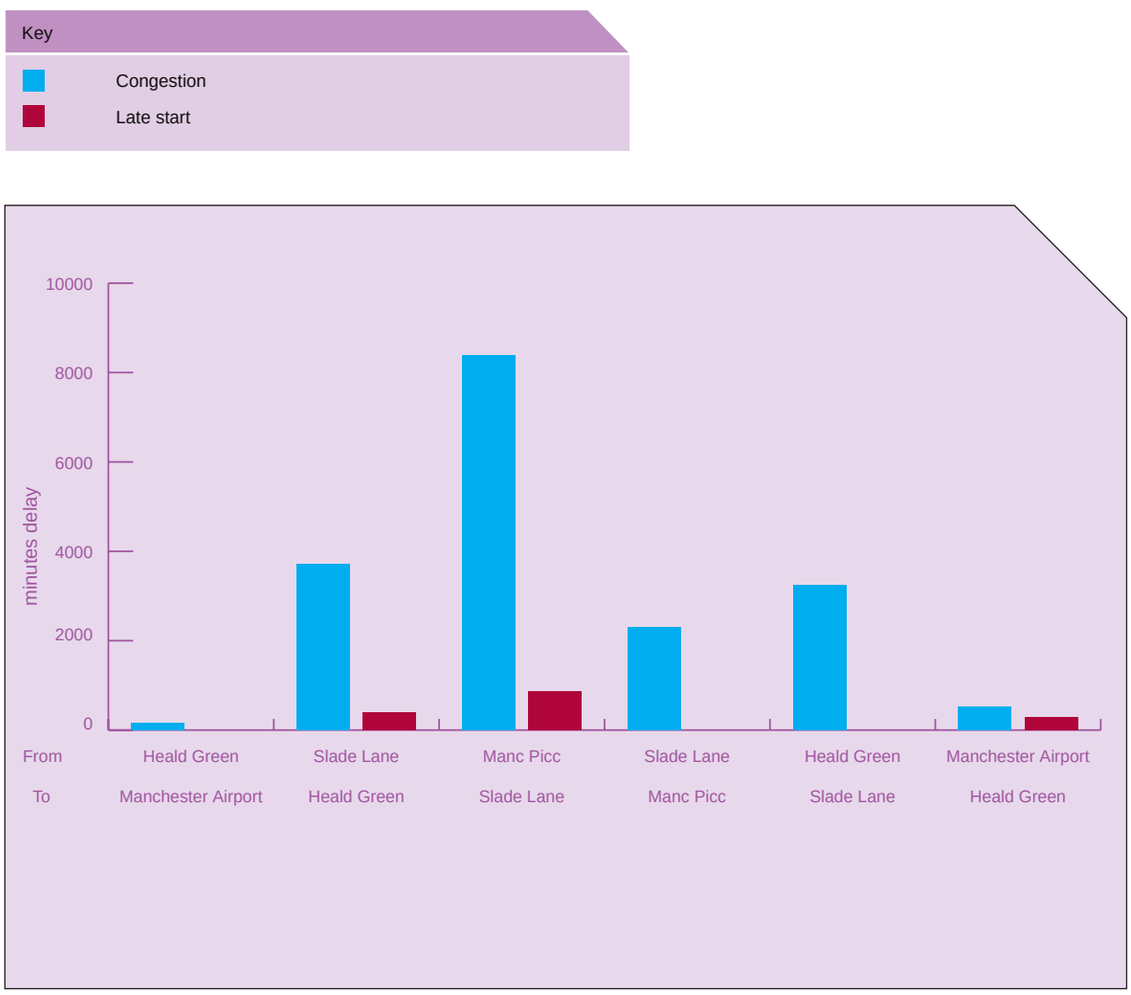
A performance sub-group was set up by the Stakeholder Management Group to identify the sections that suffer performance problems caused by 'RUS issues'. RUS performance issues were agreed to be areas which could not easily be dealt with through established industry processes.

Reactionary delays were used as the main measure of performance. Reactionary delay gives an indication of the impact that a train has on other services due to it not running in its timetabled path. This then leads to other trains also not running to time. This provides a measure of timetable resilience. In particular, reactionary figures indicate how accommodating the timetable is of any unplanned disruptive events and how quickly it can recover once the root cause of the individual disruptive event has been resolved. A more detailed description of the methodology is included in Appendix B.

3.7.2 Results of the study

The study showed that certain areas are affected more by delay than others. Some sections are 'resonators' of delay – if a train is already delayed when it enters the section, it often becomes further delayed, and itself causes delay to other trains. Other sections are 'generators' – if delay occurs in that

Figure 3.17: Reactionary delay between Piccadilly and Manchester Airport



Source: TRUST data

section, that delay will often cause further delay that manifests itself in other sections. Figure 3.16 gives an indication of which of the sections identified by the sub-group are resonators of delay, with higher numbers signifying proportionately more reactionary impact on trains in the section.

Unsurprisingly, the main resonators are where there are most trains. The geography of the railway in the North West is such that services from all over the area tend to head into or pass through a central hub based around Manchester city centre. Due to the congested nature of this hub, services interact in such a way that a delayed train from one area can cause delay to trains going to other areas, and hence cause additional reactionary delay. This is especially true for trains heading into or through Manchester Piccadilly. This effect is accentuated by the surrounding busy flat junctions, which increase the likelihood of delay from one corridor impacting on services on other corridors. Notable among these junctions are Castlefield, Slade Lane, and Windsor Bridge.

The sections around Salford Crescent were identified as having particularly high levels of reactionary delay. Analysis showed that Salford Crescent is a ‘resonator’ of delay. The route where this is most prevalent is between Salford Crescent and Bolton. The high number of delay minutes in both directions reflects the interaction of services travelling in multiple directions across flat junctions at both Salford Crescent and Bolton. Piccadilly and Victoria are also significant origins of delay because of the high capacity utilisation, number of conflicting moves and general congestion.

The Blackpool – Manchester Airport service has been identified as causing additional delay around Salford Crescent. This is largely due to delay at either end of the route. This in turn means that the trains do not arrive at Salford Crescent in time to be put in their timetabled path. At the airport, delay is often due to the inflexibility caused by only having 2 platforms, meaning that trains have to be regulated into the wrong order (as seen in Figure 3.17). At the Blackpool end, the train has a turnaround time of only 6 minutes, leaving little time to recover from previous delays. It interacts here with the service to Liverpool, which has an equally tight turnaround. At Kirkham Junction it interacts with the relatively poor-performing service between Blackpool South and Colne. At Manchester Airport, the stock for the Blackpool service and Barrow service interwork.

Delay originating from across the Pennines is is magnified by the complicated interactions in Manchester. In particular, the inability to terminate at Victoria without blocking a platform (and hence reducing capacity and increasing the chances of additional delay) can be restrictive.

The lines into Liverpool Lime Street are comparatively well performing and were analysed to serve as a benchmark. The analysis showed however that these lines experience significant reactionary delay due to the congested nature and lack of operational flexibility in the station itself. The main difference in performance is that trains delayed here do not tend to have such a large impact on other services, and tend to be able to recover time before they reach areas where correct timing is critical.

There is a number of single lines that accentuate reactionary delay due to the inability to regulate trains along them. Notable amongst these are the sections between Blackburn and Bolton, Shaw and Rochdale and towards Blackpool South.

At a number of locations on the route, short turnarounds at terminal destinations allow little time to recover from earlier delays. Examples of this include Hadfield, Blackpool and Manchester Airport. These are hence both resonators and generators.

3.8 Key network constraints

3.8.1 Stockport: Capability, capacity, and performance

The linespeeds along the sections between Edgeley and Hazel Grove and along the Buxton line are significantly lower than the capability of the trains running over them. The long block sections and speed restrictions on the Buxton line reduce timetabling flexibility and impact on performance across the network. The restrictive layout at Buxton means that the second platform can only be accessed via a shunt move. Freight trains have to carry out a shunt manoeuvre, limiting the length of aggregate trains that are able to use this as a diversionary route from the Hope Valley.

The lack of a south facing bay at Stockport means that terminating a train from Northwich or Buxton requires a shunt move to turn around. To the north of Stockport, the speed across Heaton Norris Junction towards Denton reduces capacity on the line between Stockport and Slade Lane junction, especially when long freight trains cross the junction.

There are a number of conflicting moves across the busy Piccadilly throat as shown by the high CUI, increasing delay and making it increasingly difficult to timetable trains into Piccadilly. At platforms 13 and 14, along with Oxford Road and Deansgate on the Castlefield corridor, an industry working group, the 'Resilient Timetable', is examining claims that station dwell times exceed allowances during peak hours. The station dwell times, its two track nature, and the flat junctions at either end restrict the capacity of this corridor to 12 trains an hour. As the corridor operates at or near capacity all day, there is little opportunity for service recovery.

3.8.2 Hadfield: Performance and capacity

Performance problems on this route are made worse by the tight turnrounds at Piccadilly, Hadfield and Glossop and the relatively slow single line sections at Hadfield and Glossop. The interactions on the line between Guide Bridge and Piccadilly can lead to additional delays in other parts of the network. Capacity on the line is limited by the interactions between arriving and departing trains on Dinting viaduct and the long absolute block section between Dinting and Guide Bridge.

3.8.3 Stalybridge: Capability, capacity, and performance

Trains to and from the bay platform and between Huddersfield and Victoria must cross the layout at Stalybridge at only 15 mph. This reduces capacity, can affect performance and impacts on journey times. Between Stalybridge and Huddersfield, the mix of fast and slow passenger services with freight trains uses up significant capacity on this route. At Guide Bridge, there is an aspiration for higher speeds, especially for the Manchester – Leeds services.

3.8.4 Oldham: Performance

The long single line section between Shaw and Rochdale makes recovery from delay more difficult.

3.8.5 Calder Valley: Capacity and capability

The Calder Valley is used as an alternative route to Leeds. However, journey times are longer than the route via Stalybridge due to it being less direct and the linespeed being generally lower. Additionally, capacity is limited by headways, which restricts additional/diverted services. The ability to run longer trains is limited by platform lengths at a number of stations.

The trains from Leeds that terminate at Victoria do so in the bay. This necessitates crossing the whole layout, and can have a potentially serious impact on performance in times of perturbation. These services are prevented from serving Salford Central and Salford Crescent (and the destinations accessible

from those stations with a single change) due to having nowhere to terminate that would not significantly reduce the capacity of the line.

3.8.6 Bolton: Capability, capacity, and performance

The area around Salford Crescent is a very busy section of the network, operating at or close to capacity throughout the day. This makes it difficult to recover from perturbation. There is a busy junction at either end of the station, with services from all over the area converging and interacting, meaning that delay tends to increase and spread when brought here. The wide range of destinations means that the station is an obvious choice for interchange. However, the two narrow platforms mean that dwell times can be unrealistic, there is no ability to regulate between platforms, and there are limited station facilities.

Capacity on this corridor is also limited by other factors. Between Salford Crescent and the WCML at Euxton, there is only one short loop, restricting the ability of faster trains to pass slower ones. There are two sections of single line, between Bolton and Blackburn and towards Blackpool South. As well as restricting capacity, these single lines limit the ability of the network to recover from perturbation.

The route from Blackpool North to Manchester is operated by trains capable of 100mph. However, the prevailing linespeed is only 75mph.

3.8.7 Atherton: Capacity and capability

Between Walkden and Crow Nest, there is a long absolute block section. The prevailing linespeed along this route of only 50mph is significantly below the capability of the trains. These two factors limit the number of trains that can run along the line.

3.8.8 Chat Moss: Capability, capacity, and performance

Capacity on this corridor linking Liverpool and Manchester is limited by the absolute block section between Rainhill and Huyton and the throat and platforms at Lime Street. These constraints also affect the ability to recover from perturbation.

The prevailing linespeed is lower than the capability of many of the units. However, a higher linespeed with the current timetable would only have the effect of causing the fast trains to catch up with the slower ones sooner, and the lack of loops (apart from one at Earlestown) prevents overtaking. The effect is that generalised journey times from Liverpool to Manchester are not as competitive with the car as they could be. Additionally, trains to and from Liverpool cannot stop at Salford Central due to the lack of platforms on the Liverpool lines, further increasing journey times for those with an ultimate destination near Salford Central.

There are a number of important freight flows to and from Seaforth docks. However, access to the docks involves run round moves in freight yards, reducing the capacity available for trains to access the docks. Additionally, W9 traffic is restricted to a single route to the docks, and W10 traffic cannot access the docks at all.

3.8.9 CLC: Capability, capacity, and performance

This corridor, along with the Chat Moss corridor, is an important link between Liverpool and Manchester. However, the faster trains between the two regional centres need to be balanced with the demands for journeys to and from the intermediate stations. This leads to a very high CUI at Castlefield, where slower trains are caught by faster trains. This can cause performance problems at the busy junction if one of them is delayed, transferring delay into central Manchester, and impacting on services from elsewhere. Neither are there loops on this corridor to enable the reordering of trains on the approach to Manchester. The lack of spare capacity also means that there is limited scope for reducing the journey times to become more competitive with the car.

Performance problems on this line are exacerbated by the lack of operational flexibility at Liverpool Lime Street throat and tight dwell times in the peak at Piccadilly, Oxford Road and Deansgate. Additionally, the layout at Hunts Cross is such that the Merseyrail services cross the CLC services on the flat, with potential to spread delay.

There are a number of important freight flows to and from Seaforth docks that operate on this route as far as Allerton. However, access to the docks involves running round in freight yards and moves across the layout, reducing the capacity available to get trains to the docks. Additionally, W9 traffic is restricted to a single route to the docks, and W10 traffic cannot access the docks at all.

There is no access to Trafford Park from the west due to gauge and capacity restrictions. The extended journey time in running to Allerton that would be necessary with the current network would mean that even if it were possible, it would be inefficient. This means that W10 traffic must come through the Castlefield corridor. However, there would be serious performance implications should more trains be pathed along this corridor, and train length is limited by the length of signalling sections along the corridor and the capability of the terminals. It is also not practical to hold a freight train on the approach to Trafford Park.

3.8.10 Northwich: Capability, capacity, and performance
The three single line sections on this corridor constrain capacity and limit the ability to recover from perturbation.

There are far fewer trains serving Altrincham than there are trams, and the journey times by rail from Altrincham to Piccadilly are slightly longer than by Metrolink. A prevailing linespeed that is lower than the capability of the trains means that journey times are often uncompetitive with road.

3.8.11 Styal: Performance and capability
There are significant performance problems with the Manchester Airport services, partly caused by having only two platforms which constrains train regulation. Therefore, trains that are sufficiently late are terminated early at Piccadilly in order to avoid exacerbating the problem at the airport. The termination of these services reduces the quality of the service from Manchester centre to the airport, as does the time consuming diversionary route and the fact that some of the rolling stock is not appropriate for airport passengers.

3.8.12 St Helens Central: Capacity
The absolute block sections between Huyton and Wigan limit the scope for service recovery, and constrain capacity.

3.9 Current engineering access

A cyclical engineering access strategy for key junctions on the network was jointly developed by Railtrack, maintenance contractors, and train operators, some five years ago. This strategy identified a programme of regular extended possessions which sought to ensure value for money and minimise overall disruption to train services. This possession strategy was centred on a series of large (in both geographic coverage and time span), cyclical access opportunities.

The aim of this strategy was to provide the opportunity to undertake all major scheduled maintenance activity for the specific area on a regular, planned basis. This approach reduced the number of short, inefficient, but generally non-disruptive possessions. This pattern of possessions has been reviewed on an annual basis since then and the concept has gradually been extended.

A cross-industry review of engineering access strategy known as “Efficient Engineering Access” is currently under way. This may result in alterations to the current maintenance plan. In the meantime the current strategy has resulted in an evolving engineering access regime that matches existing engineering requirements as closely as possible. There are a few locations where there is continued pressure on the access available, notably around the junctions in central Manchester and

junctions providing access to depots. In these cases, engineering needs must be balanced with train diagramming demands and start-of-service performance.

There are routes in the RUS area where adequate alternative diversionary routes for passenger services are available during times of engineering access on the core route. There are, however, fewer opportunities for the diversion of freight services, due to the capability constraints of gauge and weight. Notable examples are the single W10 route to Trafford Park, access to Seaforth Docks, and RA10 aggregate trains from the Peak District. While freight operators cannot readily divert their traffic to the roads in the same way as passenger operators, some of the freight services have flexibility surrounding the timing and duration of their journeys. The possession planning constraints are also significantly different.

3.10 Summary of generic gaps

The following gaps were identified during the analysis of the baseline data:

3.10.1 Some links between the major city regions in the North West would benefit from improved service provision

Both the RES and RSS aspire to strengthen intra-regional flows between the key regional centres of Manchester, Liverpool and Central Lancashire (notably Preston) in order to support growth and development in the region.[5] The RES goes further, including links to the city regions of Leeds and Sheffield as well.[6] The RPA identifies the RUS as a potential delivery route for improved service provision on these key routes. Currently, the second largest flow within the RUS area is between Manchester and Liverpool, reflecting its importance. However, there are only three fast trains per hour, compared to four between Manchester and Leeds. The flows between Manchester and Leeds, Sheffield and Huddersfield are among the largest five flows from within the RUS area to other areas.

3.10.2 Many corridors serve only one side of Manchester city centre but passenger destinations are evenly distributed

The distribution of passengers' ultimate destinations in Manchester indicates that each of the five central stations has the potential to serve as the most convenient station for a significant proportion of travellers arriving down each of the corridors. Current services and interconnection opportunities are limited in how they support this objective.

3.10.3 Rail is insufficiently integrated with Metrolink

There are limited opportunities to interchange between rail and the Metrolink system. Travel times are consequently extended on journeys that require both modes.

3.10.4 Rail services to airports are insufficient for the market

Both Liverpool John Lennon and Manchester airports predict significant passenger growth, and surface access by train is also forecast to grow. There is an aspiration for an improved rail service to Liverpool South Parkway. Current services are irregular, and not all passing trains stop there. In Manchester, there is no interchange between Calder Valley services and airport services. Blackpool airport is served by a single, hourly, all stops service.

3.10.5 Regular heavy stone trains cannot be accommodated without use of special operating arrangements

There are no RA10 routes for stone trains, meaning that each train must obtain special permission to run. This effects typically ten trains per day. This additionally means that the train cannot be diverted if required.

[5] http://rpg.nwra.gov.uk/planning/spatial.php
[6] www.nwda.co.uk/res

3.10.6 Passenger demand for seats exceeds supply during the peaks on some corridors
Count data shows that at certain times in the peaks, demand for seats can exceed supply. The data shows that this is more acute on some corridors than others.

3.10.7 Platforms at Salford Crescent and Manchester Piccadilly (13 and 14) are congested at times.
The platforms are narrow and cluttered. At times they become crowded and the congestion is exacerbated by conflicting passenger movements on/off the same train and to/from the entrance/exit.

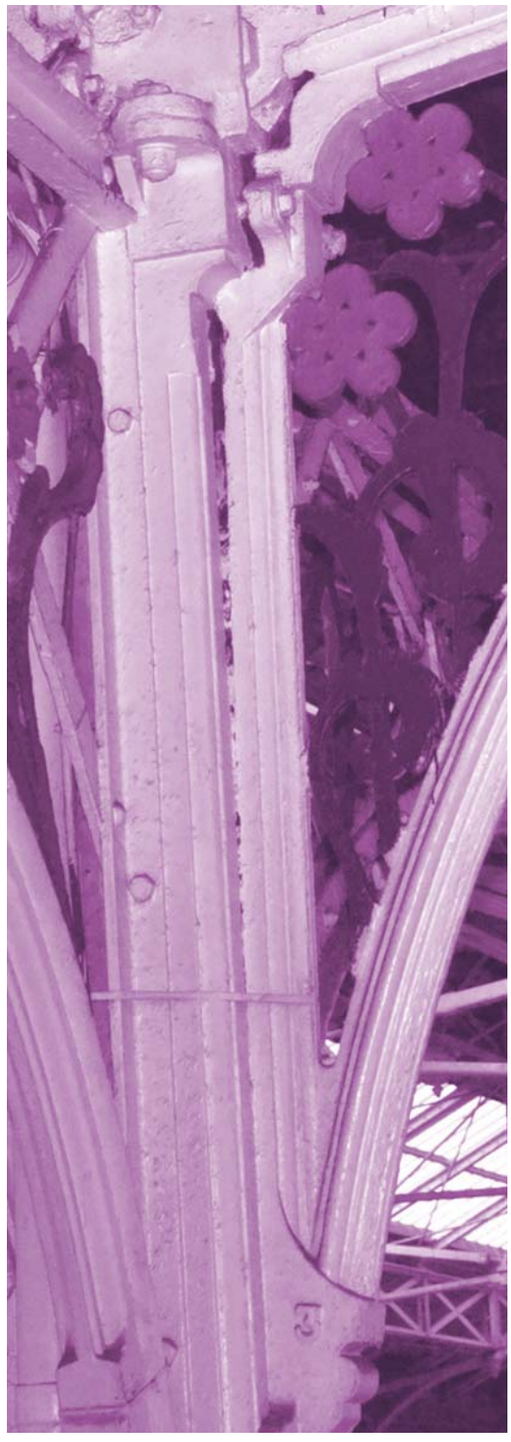
3.10.8 Facilities at some stations, including parking, discourage off-peak travel
There is surplus capacity on most passenger services outside the peak hours. There are various causes for this. The limited car parking provision at stations across the RUS area can restrict access to the railway for off-peak travellers. Some peak travellers may be affected, but they are also likely to be constrained by on-train crowding. Off-peak travel might also be affected by the limited facilities at some stations - see Appendix B for further details.

3.10.9 There are numerous stations with low footfall
There are a number of stations in the RUS area with particularly low footfalls. Significant money is spent at these stations for a limited number of beneficiaries, whilst at the same time, stopping services at the station lengthens the journey time for those already on the train. A list of these stations in provided in Appendix B.

3.10.10 Performance is worsened by significant levels of reactionary delay.
The performance analysis identified particular issues on the following corridors:

- Stockport
- Hadfield
- Stalybridge
- Oldham
- Bolton
- Chat Moss
- CLC
- Northwich
- Styal.

3.10.11 Much of the rolling stock in the area is not well-suited to its current use
There are a number of sections where the capability of the infrastructure does not match the capability of the units. There are also areas where the characteristics of the rolling stock, such as the ability to access and egress the trains or the acceleration profile, are not best suited for the type of journey.



4. Planned schemes

4.1 Background

This chapter lists the significant investment in the railway network that is currently anticipated to be completed by 2016 as part of planned track and signalling renewals and through potential enhancement schemes. Renewals often provide the most cost-effective oppurtunity to realise infrastructure enhancements as the incremental costs of progressing these in conjunction with planned works is generally significantly lower than progressing them as stand alone projects.

4.2 Planned major renewal schemes

A number of major switch & crossing renewal schemes are currently being developed. The formation of RUS options, as described in Chapter 6, has exploited the opportunities arising from these schemes when appropriate. These are highlighted in table 4.1.

The industry will continue to consider the ongoing switch & crossing and signalling renewal proposals to identify and assess any further enhancement opportunities. Details of future renewal proposals covering all engineering disciplines are contained in the Route Plans that are published each year as part of Network Rail's Business Plan.

Table 4.1: Planned switch & crossing and signalling renewal schemes with enhancement potential

Location	Potential enhancement opportunity	Operational output
Longsight Middle	Faster linespeed at Longsight Down Goods loop	Improved performance
Philips Park West Junction	Speed up Ardwick branches and ensure fit for passenger traffic	Reduced journey time
Longsight South Junction	Speed up Longsight Down Goods	Improved performance
Lostock Junction	Speed up Lostock junction	Improved performance
Rainhill resignalling (Chat Moss line)	Improved signalling headways and provision of 90 mph running	Address capacity constraints and reduce journey time
Huyton and Prescot signaling renewals	Improved signalling headways	Address capacity constraints.
Stalybridge signalling renewals	Renewal of equipment, speeding up of junctions, possible provision of north side bay	Accommodate future remote control, improve performance and capacity
Rochdale Interlocking	Rewiring of Rochdale interlocking -works in conjunction with Metrolink including the opportunity to improve the linespeed	Reduction in journey time
Blackpool North No.2 signal box	Speed up layout at Blackpool North station	Reduction in journey time
Northwich and Greenbank signal renewals	Improve linespeed and allow the freight-only platform at Northwich to be used by passenger trains allow turnbacks at Greenbank in the platform	Allows higher linespeeds and a new service to run from Crewe to Northwich
Edge Hill and Liverpool Lime Street resignalling	Improvement to Edge Hill layout and possibly creating additional platform faces	Allows more parallel moves in and out of platforms, and potentially more platforms, improving capacity and performance

4.3 Proposed enhancement schemes

4.3.1

The schemes highlighted in Table 4.2 are at various stages of development and are currently under discussion with project promoters. Details of the implications of each scheme for the RUS and issues that need to be taken into account are also provided.

4.3.2

Network Rail will continue to liaise with the promoters of these projects and any new projects that arise.

Table 4.2: Potential enhancement schemes

Project	Main promoter	Implication for RUS
Manchester Airport third platform	Manchester Airport	Increased capacity due to additional platform. Project will also deliver performance benefits.
Bootle branch gauge clearance	Mersey Docks and Harbour Company	Increased gauge to W10 to allow larger freight containers to run on Bootle branch between Seaforth and Edge Hill. Possible inclusion of diversionary route via Earlestown
Chorley Buckshaw Village – new station	Chorley and Lancashire Councils	Creation of 300 car park spaces at new station but line capacity issues due to the extra stop between Bolton and Euxton junction.
Liverpool Lime Street Gateway	English Partnership / Third party developer	Provision of improved passenger access and facilities at the station.
Liverpool Lime Street station improvements	Merseytravel	Provision of improved station facilities and internal environment.
New intermodal terminals	Third party and / or Network Rail	Provision of new intermodal terminals at Port Salford, Parkside and Trafford Interchange.
Metrolink Phase 3a – conversion of Oldham Loop to Metrolink	GMPTE	Transfer of the Oldham loop to Metrolink operation, altering the pattern of heavy rail services through Victoria, and requiring suitable alterations at Rochdale.
Station improvement schemes	Merseytravel	Improved station facilities at Newton-le-Willows, St Helens, Prescot and improved station access at Rainhill.
Station improvement schemes	GMPTE	Provision of improved station facilities.
Salford Central station improvements	GMPTE	Provision of improved station facilities.
Warrington Central station improvements	TPE	Provision of improved station facilities.
Olive Mount Chord	Third party / Network Rail	Increased capacity by reinstatement of chord line between Liverpool Docks and Earlestown.
Salford Crescent third platform	Network Rail/GMPTE	Increased capacity due to additional platform on the through line at Salford Crescent.
Manchester Piccadilly platform 0	Network Rail	Increased capacity by conversion of stabling siding into an operational passenger platform.
Manchester Piccadilly platforms 13 and 14	Network Rail	Increased passenger capacity at platforms 13 and 14 and effective crowd management measures.
Manchester Victoria Fish Dock redevelopment	Network Rail	Provision of improved station facilities

5. Drivers of change

5.1 Strategic context[1]

The last ten years has seen a renaissance in the Greater Manchester economy. This area now has the best performing economy outside London and continued growth is expected. Over the last five years 45,000 additional jobs have been created and local stakeholders consider it not unreasonable that a further 210,000 jobs will be created over the next 15 years.

Many of the people who work in central Manchester and Salford commute over considerable distances, as well as travelling to other business centres and retail and leisure activities. Good connectivity is critical to continuing economic success. As the economy expands, however, the number of people travelling becomes greater and the local and long distance highway networks become increasingly congested. Public transport will therefore be essential to achieving growth. Without it, it has been estimated that up to 30,000 new jobs would not materialise.

The Greater Manchester Integrated Transport Strategy (GMITS) seeks to tackle this need for increasing movement of people and goods through enhancing Metrolink, facilitating better bus services, encouraging increased heavy rail capacity, and through strategies to support walking and cycling. In addition the Greater Manchester authorities are considering road demand management measures that could form part of a Transport Innovation Fund bid in 2007. The objective is sustainable travel that respects the environment and is attractive to use. To achieve this, improvements are needed to trains and stations, including car parks and information systems.

As the number of jobs in Manchester and Salford increases, the employment area is becoming increasingly dispersed and more difficult to serve from a single terminus station such as Manchester Piccadilly, which is in the south east of the central area. Metrolink trams and Metroshuttle buses help to distribute commuters and shoppers around the centre and improved connections between modes will be important in the future. However, three of the largest development areas (Spinningfields, Greengate and central Salford) are to the north and west of the central area, close to Salford Crescent, Salford Central and Manchester Victoria stations. These stations are not well served from certain directions with existing service patterns, and station facilities are limited.

Heavy rail has an important role to play in facilitating commuting into Manchester from residential areas throughout the north west of England and providing the important links to other business centres such as Liverpool, Leeds, Sheffield, Preston and London. It also has a vital role in connecting Manchester Airport to its hinterland, which stretches across the whole of northern England and into the Midlands, Scotland and North Wales. The airport is the largest in Britain outside the Southeast England, with patronage expected to grow from 22 million in 2005 to 50 million in 2030, and with airport employment growing in the same proportion.

Merseyside has also experienced economic growth, and the population has started to see growth for the first time in decades. The Merseyside Economic Review 2006 (Mersey Partnership) reported that growth in Merseyside's Gross Value Added (GVA) has exceeded UK rates over the past three years

[1] Data supplied by GMPTE and Merseytravel

and that take up of office space in Liverpool was at a record level in 2005. One of three key drivers of this growth has been Liverpool city centre. These trends are expected to continue, as evidenced by large developments such as the £900 million Liverpool One retail development, and the £400 million Kings Waterfront arena/conference centre. These in turn will increase the number of Liverpool commuters (currently 47,000 people daily), shoppers and leisure travellers. The Merseyside Strategic Model predicts that the economic regeneration already taking place will result in a 12 per cent increase in car journeys to Liverpool city centre, and hence there could be an increased role for rail if an element of modal shift is achieved. In the short term, Liverpool's status as European Capital of Culture in 2008 will increase demand for access to the city centre.

The other key drivers of growth on Merseyside are Liverpool John Lennon Airport and the Mersey Ports. The airport is projected to grow from 5.3 million passengers in 2006 to 6.5 million in 2008 and 10 million in 2016, with the current staffing of 2,500 expected to grow in the same proportion. Liverpool South Parkway is a relatively new and important gateway to the airport, connecting it to both the local market and the national market via the rail network. The Port of Liverpool is projected to handle between 38 per cent and 64 per cent more tonnage by 2016. Rail has a key role in moving freight to and from the Port of Liverpool and manufacturing industry on Merseyside.

The third city region in the RUS area is Central Lancashire. Development in this region will be concentrated in the city of Preston and the towns of Blackpool, Blackburn and Burnley.

The Draft Regional Spatial Strategy identifies Preston as one of the key areas driving economic growth in the area, complementing Manchester and Liverpool. Preston is expected to become an increasingly important public transport focus for Blackpool, Burnley and Blackburn, as well as the smaller towns and villages in the surrounding area.

The Blackpool Masterplan aims to improve the offering for tourists, chiefly through Regional Casino development. If this goes ahead, the number of journeys to Blackpool itself and the airport is predicted to increase significantly. The masterplan includes options to extend the tram network towards St Annes.

5.2 Forecast passenger growth

5.2.1 Background

Future rail passenger demand in the RUS area has been forecast to 2017/18 using a combination of rail industry models. A detailed description of methodology and results are given in Appendix C. 'RIFF-Lite' has been used to generate future year growth forecasts. The framework behind this model is the standard rail industry forecasting methodology which recommends taking into account forecasts of GDP, employment, populations, road journey times, air travel and the impact of rail fare policies. Additional drivers have also been included such as changes in future performance of the rail network.

The MOIRA model can be used to predict how timetable changes will affect passenger demand. The model contains timetable and ticket sales data derived from 2004/05 LENNON data. An overlay has been added to this model to reflect PTE products and any other non-recorded LENNON data.

5.2.2 Growth scenarios

Following stakeholder consultation it was agreed that central Government forecasts resulted in future demand for rail that did not appear to be consistent with levels of historic growth in demand for rail services in the RUS area. Stakeholders agreed that in order to examine the impact of possibly higher future growth rates it would be useful to deploy two growth scenarios, described as follows:

'**Reference scenario**' - based on central Government data sources i.e. DfT's forecasts of population and employment and Oxford Economic Forecasting GDP projections; and

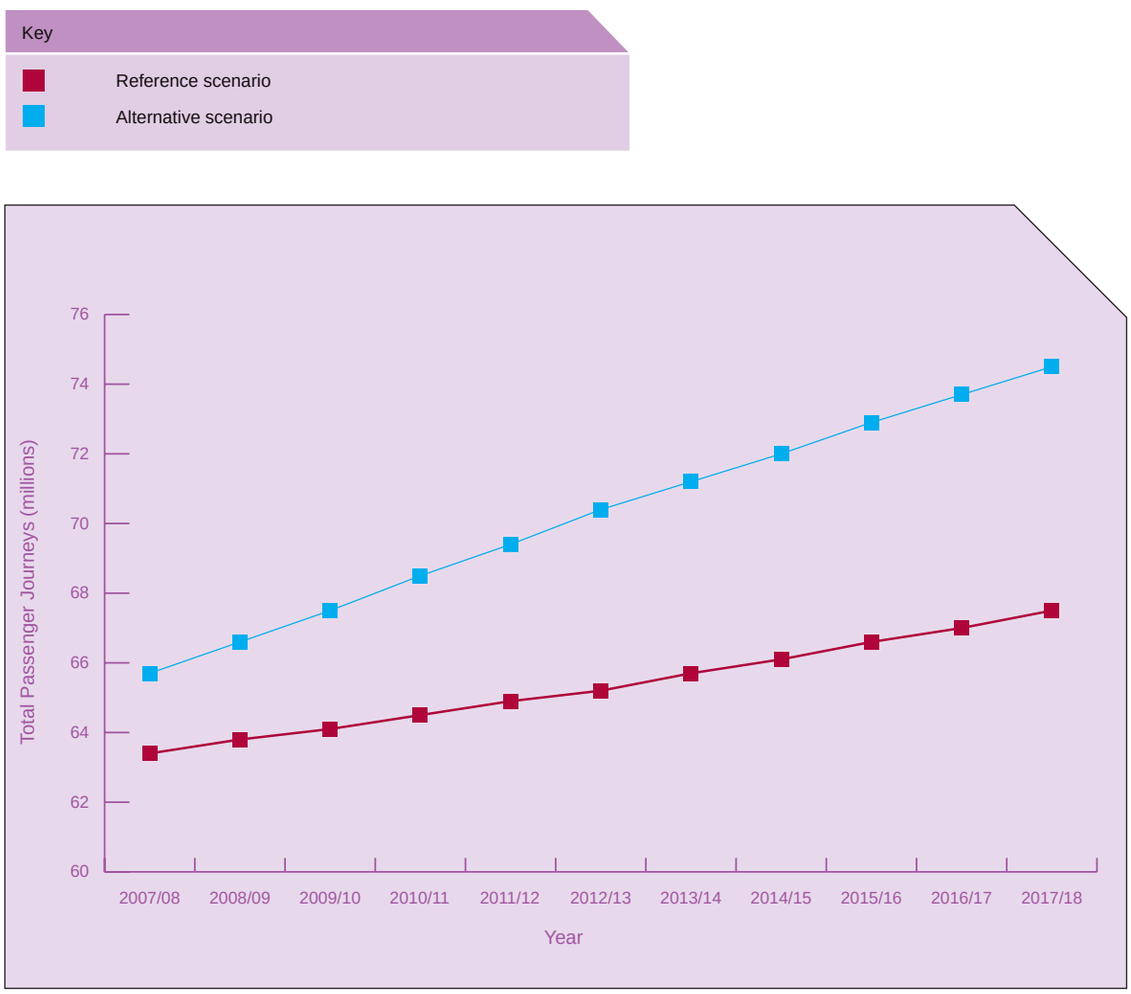
'**Alternative scenario**' - based on information provided by regional stakeholders, the Northern Way[1] growth strategy and contributions to this from the City Regions

The key differences between the two growth scenarios are the assumptions for GDP, employment, population and airport passenger growth. All other drivers of rail demand, e.g. car ownership, are the same for both scenarios.

5.2.3 Modelling assumptions

In forecasting passenger demand, certain known committed schemes have been included. These were as follows:

Figure 5.1: Passenger growth forecasts (unconstrained)



Source: SDG analysis and Stage 2 report

[1] 2005, 'Moving Forward: the Northern Way' Northwest Regional Development Agency, Yorkshire Forward and the NorthEast Regional Development Agency. Generally referred to as the 'Northern Way'

- changes in service frequency between London and Birmingham to Liverpool/ Manchester as a result of the 2008 West Coast timetable;
- opening of Liverpool South Parkway which links regional and national rail services to John Lennon Airport, including some changes to service patterns; and
- TransPennine Express introduction of class 185 rolling stock.

5.2.4 Growth forecasts

Over the period of the RUS, from 2007 to 2017, the reference scenario forecasts total unconstrained[2] growth to, from and within the RUS area to be around 6 per cent. The alternative scenario results in around 14 per cent growth over the same period, as shown in Figure 5.1. Total forecast growth within the RUS area is also fairly similar ranging between 4 and 13 per cent over the RUS period for the reference and alternative scenarios respectively. The reference scenario predicts extremely low growth overall from the base year of 2004/05 throughout the RUS period. The alternative scenario equates to approximately 1.6% per year in the early years averaged across the area. However, the growth experienced on the largest flows wholly within the RUS area over the single year to 2005/06, after excluding the effect of significant service interruptions, was approximately 10 per cent (albeit with variation by flow). This is significantly higher than the forecast scenarios used in the RUS. On some corridors, actual levels of patronage have grown at such a rate during the last two years that they are already approaching the levels of the entire 10-year growth forecast in the (higher growth) alternative scenario. Consultees' views on the factors behind this growth trend would be welcome. Among the possible causes are recent train service performance improvement, worsening road congestion, the introduction of better quality/new rolling stock, and/or a concerted campaign of marketing, pricing and service quality by operators. Such factors might not have been included in the forecasts set out in this chapter. It is therefore important to identify any that apply and in order to predict whether the effect is a one-off or a more permanent change.

Table 5.1: Forecasts of top ten flows within RUS area

			Reference	Alternative
Total Journeys		**2004/05**	**2017/18**	**2017/18**
Manchester Stations	Bolton	919,000	949,000	1,116,000
Manchester Stations	Liverpool Stations	716,000	697,000	845,000
Manchester Stations	Wigan	491,000	480,000	598,000
Manchester Stations	Stockport	480,000	532,000	607,000
Manchester Stations	Stalybridge	468,000	444,000	569,000
Manchester Stations	Rochdale	443,000	486,000	545,000
Manchester Stations	Manchester Airport	402,000	626,000	805,000
Liverpool Stations	Huyton	384,000	397,000	431,000
Manchester Stations	Glossop	378,000	351,000	450,000
Manchester Stations	Warrington Stations	370,000	391,000	426,000

Source: SDG analysis, PTE data included

Note: All forecasts figures shown are unconstrained

2 Unconstrained forecasts do not include any adjustments for the impact of crowding. At an aggregate level the difference between the unconstrained forecasts and constrained forecasts is fairly negligible.

5.2.5 Forecast key passenger flows

Forecasts of passenger demand on the top ten key flows within the RUS area are shown in Table 5.1. Driven by the forecast growth in demand for air travel from Manchester Airport, the largest increase is between Manchester Airport and Manchester Stations. The growth on this flow is forecast to range from 3.5% under the reference scenario to around 5.5% per annum under the alternative scenario. Figure 5.2 shows the forecast rates of growth per annum for the top ten flows.

Figure 5.2: Forecast annual growth rate on the top ten flows within RUS area

Source: SDG Stage 2 forecasts

Forecast passenger demand on the top ten flows to and from the RUS area is shown in Table 5.2. Growth on the two largest flows to and from the RUS area (between London and Manchester/Liverpool) is forecast to range between two and three per cent per annum for the reference and alternative scenarios respectively. Figure 5.3 shows some variation between the two growth scenarios. For example, under the reference case there is insignificant change in demand between Manchester Stations and Sheffield compared to one per cent per annum growth estimated under the alternative scenario.

Table 5.2: Forecasts of top ten flows to/from RUS area

			Reference	Alternative
Total journeys		**2004/05**	**2017/18**	**2017/18**
London	Manchester Stations	1,566,000	1,987,000	2,328,000
London	Liverpool Stations	686,000	900,000	1,020,000
Leeds	Manchester Stations	500,000	502,000	581,000
Sheffield	Manchester Stations	337,000	337,000	389,000
Huddersfield	Manchester Stations	317,000	322,000	372,000
London	Crewe	301,000	405,000	403,000
London	Preston	293,000	456,000	459,000
Birmingham Stations	Manchester Stations	265,000	262,000	305,000
Llandudno Junction	Chester	236,000	289,000	294,000
London	Stockport	225,000	309,000	332,000

Source: SDG analysis, PTE data included

5.2.6 Forecast crowding

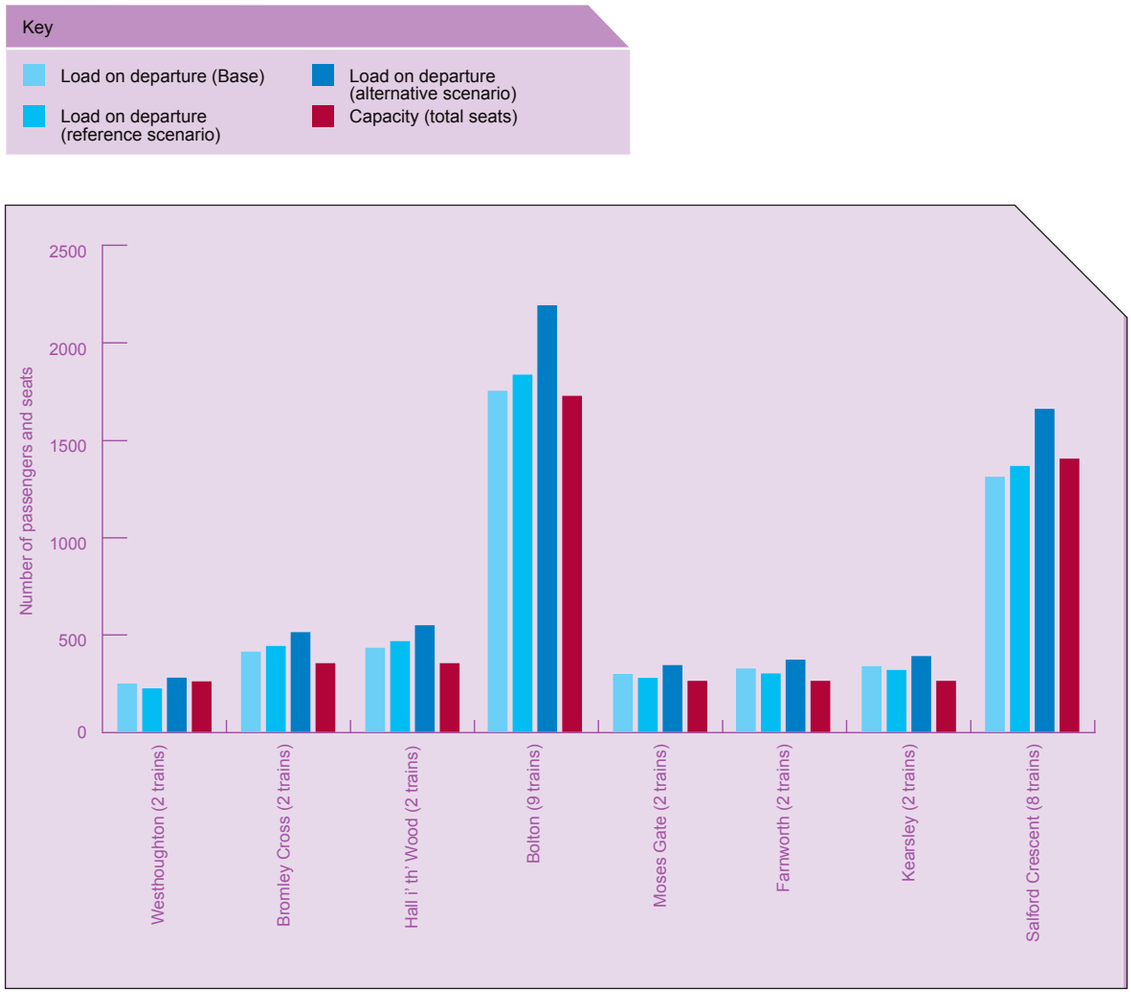
In the base year crowding has been identified on a number of corridors in the RUS area. Assuming current capacity remains the same then the level of crowding during the one hour morning peak is generally likely to increase over time, particularly if rail passengers' preferred arrival times do not change.

Figure 5.3: Forecast annual growth rate on the top ten flows to/from RUS area

Source: SDG Stage 2 forecasts

Figures 5.4 to 5.6 show the impact of unconstrained demand growth on the three corridors used for illustrative purposes in Chapter 3, i.e. the Bolton, Calder Valley and Chat Moss corridors. The figures show that the level of peak hour crowding under the reference scenario is predicted to increase over the next ten years on the Bolton corridor, whilst at some stations on the Calder Valley and Chat Moss corridors crowding levels remain constant or fall. The reduction in future crowding levels on these corridors is driven, in part, by low and negative employment forecasts in this scenario for both Greater Manchester and Merseyside. Employment is a key driver of commuter demand during peak periods. The alternative scenario uses different forecasts based on Northern Way population and employment predictions. Under this scenario crowding levels increase along the three corridors implying that passenger conditions are likely to worsen during the busiest periods of the day. At some stations under both scenarios, passenger trains are heavily loaded, e.g. Mills Hill and Moston.

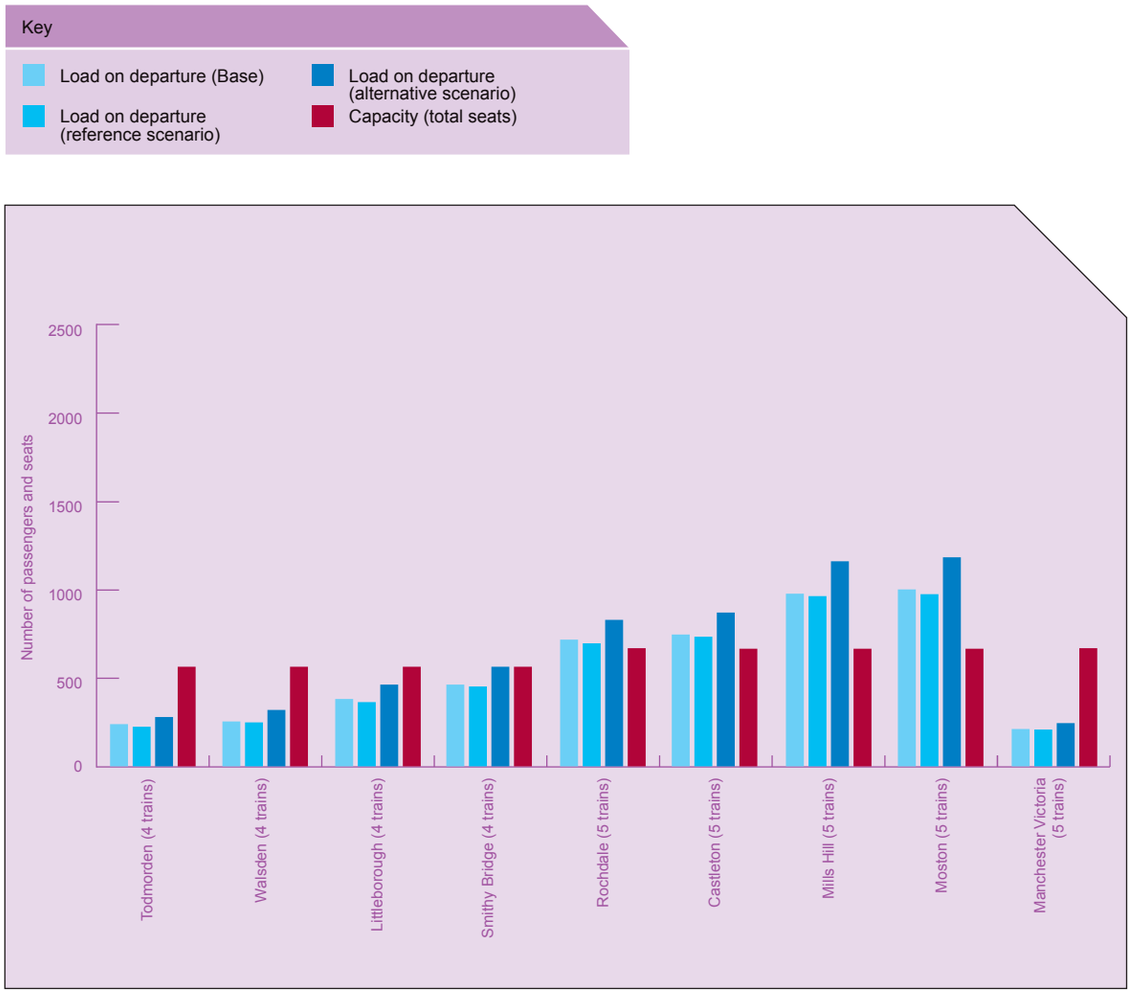
Figure 5.4: Predicted one hour AM peak (0800-0859) passenger demand 2017/18 – Bolton corridor



Source: Network Rail analysis based on available count data and demand model data (2005)

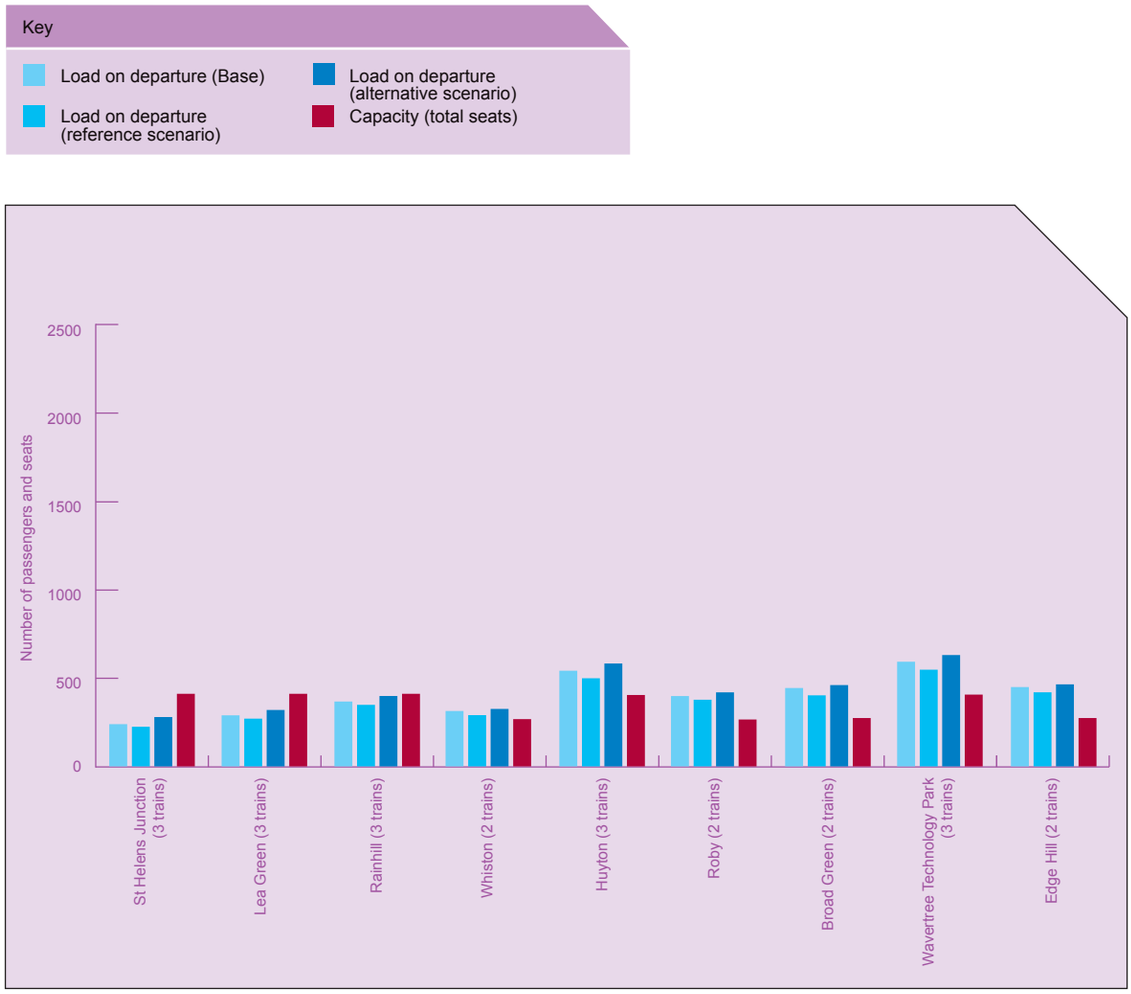
Table 5.3 builds on our analysis of the base year crowding and shows the predicted load factors for the morning three hour peak and one hour high peak for each corridor for both the reference and alternative scenarios. The analysis is unconstrained – i.e. the extent to which crowding would suppress demand is not taken into account. The stations at which the highest load factor is predicted are identified. This table shows that the average peak load factor during the high peak hour is greatest on the Chat Moss, CLC, Calder Valley and Stalybridge corridors.

Figure 5.5: Calder Valley corridor: one hour AM peak loadings and capacity 2017/18



Source: Network Rail analysis based on available count data and demand model data (2005)

Figure 5.6: Chat Moss corridor: one hour AM peak loadings and capacity 2017/18



Source: Network Rail analysis based on available count data and demand model data (2005)

Figure 5.7 gives a different perspective of morning peak crowding. Red indicates where there is standing now. Blue indicates how this situation worsens under the alternative scenario by 2017/18.

Table 5.3: RUS area maximum load factors by corridor

Corridor	Current		Future 2017/18				
	AM 3 hour peak maximum loading	AM 1 hour high peak maximum loading	AM 3 hour peak maximum loading		AM 1 hour high peak maximum loading		Maximum load factor reached at
			Ref	Alt	Ref	Alt	
Stockport	65%	90%	65%	80%	90%	110%	Disley
Marple	120%	135%	120%	120%	135%	135%	Ryder Brow
Hadfield	60%	95%	50%	70%	80%	110%	Gorton
Stalybridge	130%	145%	115%	150%	125%	160%	Ashton-under-Lyne
Oldham	80%	135%	-	-	-	-	Dean Lane
Calder Valley	125%	150%	120%	145%	150%	180%	Moston
Bolton	100%	130%	100%	125%	140%	160%	Kearsley/Hall i' th' Wood
Atherton	110%	115%	90%	130%	90%	130%	Atherton/Moorside
Chat Moss (towards Manchester)	110%	115%	95%	120%	100%	125%	Patricroft/Eccles
Chat Moss (towards Liverpool)	130%	185%	120%	130%	175%	190%	Edge Hill
CLC (towards Manchester)	115%	175%	110%	135%	165%	205%	Humphrey Park/Trafford Park
CLC (towards Liverpool)	65%	95%	55%	65%	90%	105%	Edge Hill
Northwich	55%	70%	65%	65%	80%	85%	Ashley/Hale
Styal	40%	50%	40%	55%	50%	65%	Mauldeth Road/East Didsbury
St Helens Central	120%	120%	110%	125%	110%	130%	Wavertree Technology Park

Source: Network Rail Analysis based on available count data and MOIRA 2005

Note: Forecast for the Oldham corridor is not included as the Oldham loop is expected to transfer to Metrolink during the RUS period

Figure 5.7: AM high peak standing

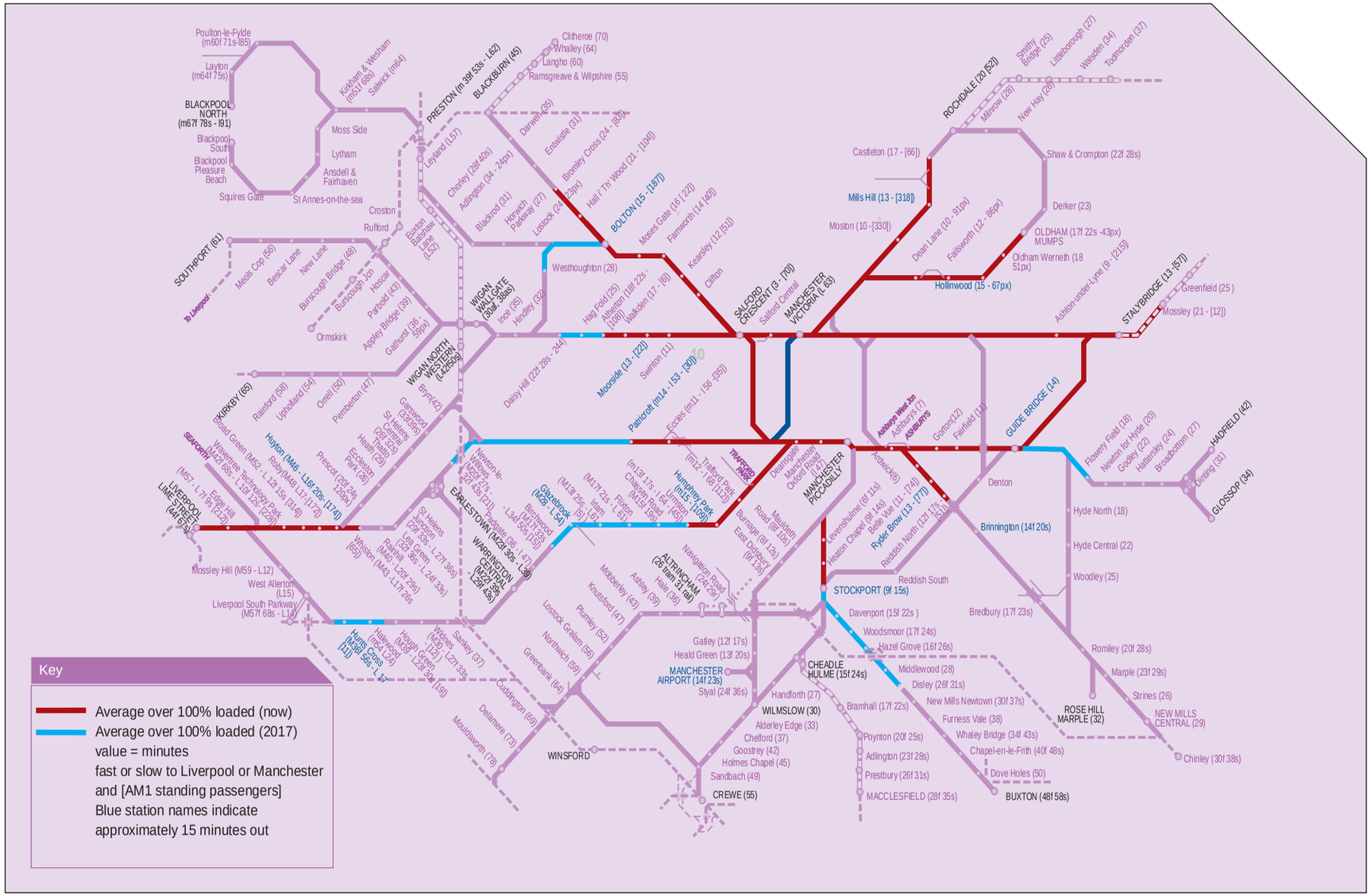


Figure 5.8 is a plot of high peak loading factors on departure against time to destination for each station on the lines from the east into Manchester. It hence presents a different view of a subset of the data in the Figure 5.7. Two sets of data are plotted: the position in 2004/05, and the forecast for 2017/18 based on the alternative scenario. It can be seen that 20 minutes out, there is very little crowding now, and the situation does not worsen significantly in future. The points on the graph represent averages over the peak hour, and hence individual trains may see a higher level of crowding.

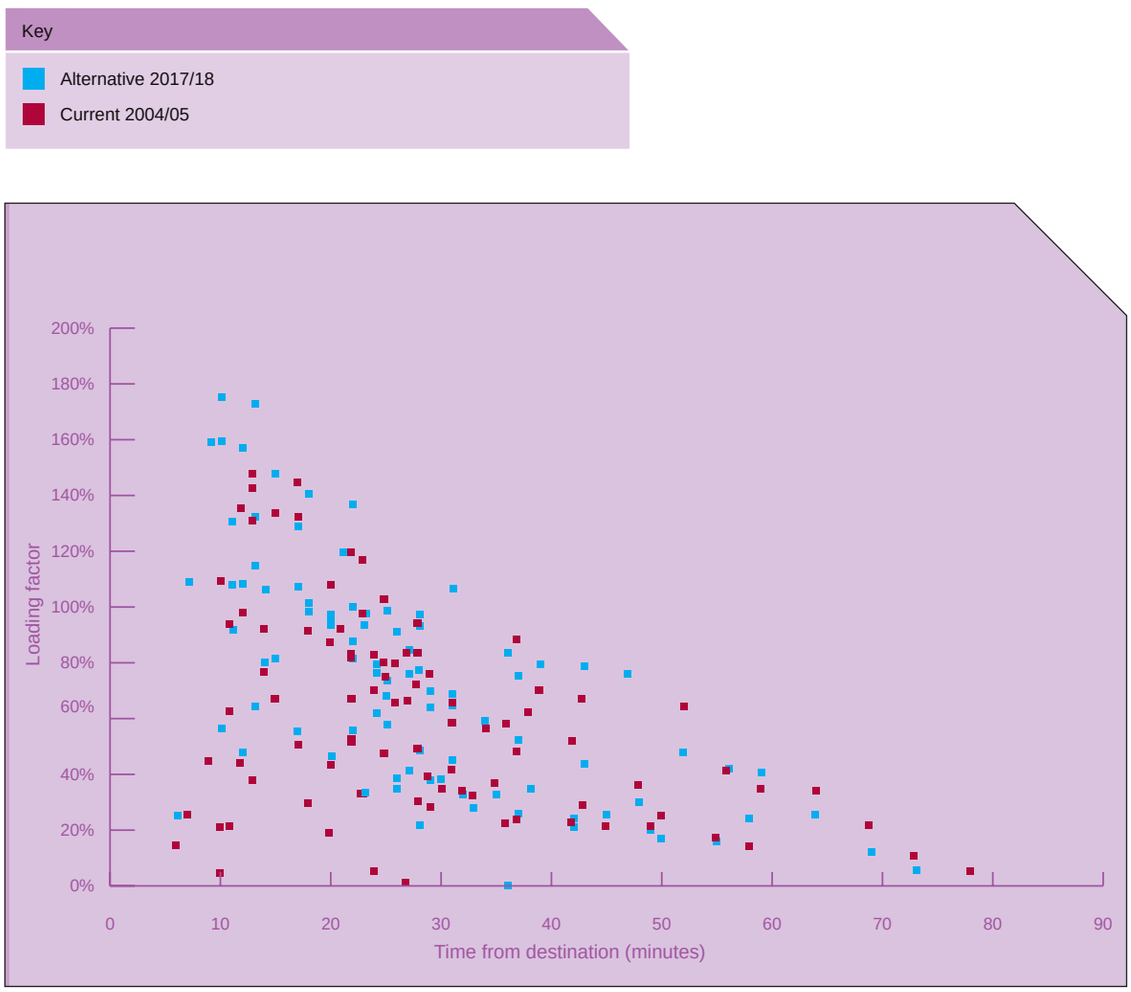
5.3 Forecast freight growth

The key drivers of freight growth in the North West in the next 10 to 15 years are likely to be UK energy policy in terms of continued use of coal fired power stations, in aggregates growth out of the Peak District and growth of containerised traffic between English ports and North West intermodal terminals.

5.3.1 UK energy policy

The continued heavy use of fossil fuels to generate electricity for the UK will lead to growth in coal traffic to English power stations. This includes flows to service power stations at Rugeley and Fiddlers Ferry.

Figure 5.8: High peak loading



Source: Network Rail analysis based on available count data and demand model data 2005

Connected to the continued use of the larger coal-fired power stations at Rugeley and Fiddlers Ferry and their confirmed fitment of Flue-gas Desulphurisation (FGD) equipment, is the need for limestone trains to support the FGD process and gypsum trains to remove the residue. This is likely to equate to two further trains per day to each power station. The limestone is expected to originate in the Peak District and traverse the RUS area.

5.3.2 Aggregate growth

The aggregate sector has seen recent growth in terms of extra trains to support the FGD process at power stations, and longer trains to existing aggregate sites using the full capability of modern locomotives. It is anticipated by the major aggregate and cement suppliers that demand will continue to grow in urban centres. The Freight RUS forecasts in excess of five additional daily trains leaving the Peak District by 2014. This creates capacity issues on the Hope Valley which may lead to traffic coming through the RUS area instead.

5.3.3 Intermodal growth

This has the largest single commodity growth predicted in the period in the North West. The level of growth to the North West will in part be dependent upon the clearance of the port of Southampton to the WCML for W10 gauge to allow the largest containers to be conveyed. The Freight RUS predicts intermodal growth to the North West of eight trains per day. The current traffic to Trafford Park, Garston and Widnes is likely to continue with proposed new terminals at Parkside, Port Salford, Partington and Ditton having the potential to drive further growth to and from the North West. This growth induced by the new terminals would predominantly reach the region via the WCML and the Chat Moss line. Within the RUS area, the level of growth will also be dependent on W10 gauge clearance to Seaforth, to allow the increasingly popular 9'6" high containers to be carried on standard wagons.

5.3.4 Engineering access

The limited extent of clearances for heavy axle load vehicles and for W9 and W10 container traffic brings particular difficulties with respect to engineering access – both planned and unplanned. The flexibility from having more than one suitably cleared route between the WCML and Trafford Park ceases at Slade Lane junction, beyond which there is only one cleared route. There is only one cleared route between the WCML and Seaforth. The need for all the heavy aggregates trains to run under special (route-specific) operating instructions makes unplanned diversions of this traffic very difficult.

5.4 Future gaps

5.4.1 Growth in passenger demand

Many of the gaps identified in the baseline chapter are associated with passenger demand. These are widened as a consequence of forecast growth. Under the reference scenario, which predicts negative growth for some of the corridors, crowding gaps become narrower over the RUS period. Under the alternative scenario crowding gaps become much more pronounced.

5.4.2 Forecast freight growth will exceed current network capability

Additional freight trains to Trafford Park are restricted by the capacity of the Castlefield corridor to handle any additional trains. There is no access to the terminals from the west. Furthermore, there are only a very limited number of loops on which to hold a freight train bound for Trafford Park.

On Merseyside, access to and from Seaforth docks involves a reversal in the freight yards, which reduces capacity for trains to the docks. There is only one W9 route and no W10 route. A capacity study facilitated by Network Rail found that there are only five daily return train paths available for growth in rail freight traffic to and from the port, but that at least eight will be required by 2016 on current growth trends, rising to eleven on high growth trends.

6. Gaps and options

6.1 Introduction

Previous chapters have presented what the railway system in the North West currently delivers and what it needs to deliver over the next ten years. The 'gaps' between these were identified from analysis of the baseline data, the demand forecast for passenger and freight traffic and input from stakeholders. This chapter defines a variety of options to meet the gaps, then assesses each option for effectiveness, value for money, deliverability and affordability given known constraints.

The WC2008 timetable, starting in December 2008, is being developed by Network Rail in advance of the normal industry timetable process and is based on a specification developed by the DfT that includes services to be operated by the current West Coast Trains franchise; the new West Midlands franchise; and the new Cross Country franchise. At this stage the pattern of long distance trains serving Manchester, Preston and Liverpool has been fixed, but work continues to develop local services that both meet the needs of the regional rail users and are compatible with the long distance services. This work on local services will continue and as a consequence the RUS has not yet been able to determine the potential impact of WC2008 on rolling stock utilisation and operational performance. Analysis of rolling stock utilisation and operational performance in the RUS options has hence been more qualitative than quantitative.

There are many instances where a particular option addresses more than one gap – this has been encouraged to get the most benefit from synergies.

Similarly, each gap is linked to many options. Some are complementary. Others are mutually exclusive in the sense that they are alternative means of achieving the same end, or that one intervention is being utilised in alternative ways to achieve different ends.

When consultation responses have been considered, the options that pass the assessment will be combined into a coherent and internally consistent strategy incorporating pertinent comments from the consultation.

6.2 Key themes

6.2.1 Gap analysis

Gaps that already exist were listed in Section 3.10 and gaps that are anticipated to arise during the RUS period were listed in Section 5.4.

Table 6.1: Generic gaps identified from Chapters 3 and 5

Some links between the major city regions in the North West would benefit from improved service provision
Many corridors serve only one side of Manchester city centre but passenger destinations are evenly distributed
Rail is insufficiently integrated with Metrolink
Rail services to airports are insufficient for the market
Forecast freight growth will exceed current network capability
Regular heavy stone trains cannot be accommodated without use of special operating arrangements
Passenger demand for seats exceeds supply during the peaks on some corridors
Platforms at Salford Crescent and Manchester Piccadilly (13/14) are congested at times and may restrict forecast growth
Facilities at some stations, including parking, discourage off-peak travel
There are numerous stations with low footfall
Performance is worsened by significant levels of reactionary delay
Much of the rolling stock in the area is not well-suited to its current use

Given the complex topology in the area, some of the gaps have a wide radius of impact and are hence significant at a network level. Other gaps are more specific and can be related to particular circumstances within one of the corridors identified in Chapter 3. The options defined and analysed in this chapter are therefore organised in most cases by corridor, and related to one of the generic gaps.

The key themes arising from analysis of the generic gaps (documented in Appendix D) are set out below.

- There is a need to examine the key regional links between Manchester, Liverpool and Central Lancashire, both in terms of frequency and journey time. These links are outlined in Section 6.2.2 and options are considered by corridor in Section 6.3 against the “regional links” generic gap.
- Rail-rail interconnection capability around Central Manchester is inflexible, making it difficult for passengers starting their journey from different points of the compass around Manchester to travel to the optimum central station for their ultimate destination. Options are discussed by corridor in Section 6.3 against the “Manchester connectivity” generic gap.
- Integration of rail with other transport modes is limited and does not take advantage of the places where rail and the other transport systems (particularly Metrolink and airports) intersect. Options are discussed by corridor in section 6.3 against the “integration with Metrolink” and “airport access” generic gaps.
- Freight capacity and capability are restricted around Liverpool Docks. Intermodal freight growth may be difficult to accommodate at Trafford Park until new freight facilities are built or in the unlikely case that the new facilities do not materialise. There are no RA10 routes for stone trains. Options are discussed by corridor in Section 6.3 against the “freight capacity/capability” generic gap.
- Passenger demand significantly exceeds the number of seats during the peak on a number of the thirteen rail corridors covered by the RUS. Forecast growth means that, in the absence of intervention, this situation will be exacerbated over the RUS period. Two locations in central Manchester experience serious passenger congestion on station platforms at busy times. Options are discussed by corridor in Section 6.3 against the “peak crowding” and “platform crowding” generic gaps.
- Conversely, there is surplus capacity on most passenger services outside the peak hours. A large number of stations have relatively low footfall. Possible causes and remedies are outlined in Section 6.2.4 and 6.2.5, then specific options are discussed under the appropriate corridors against the “station facilities/car parks”, “uncompetitive journey time” and “low footfall stations” generic gaps.
- In some locations, performance is particularly affected by the utilisation of available network capacity and by tight turnround margins between journeys. Options to address the causes of reactionary delay are discussed by corridor in Section 6.3 against the “performance” generic gap.
- There is scope for more effective deployment of rolling stock, particularly if elements of the fleet could be exchanged with others outside the area. This is discussed in Section 6.4.3.

6.2.2 Improving links between regional centres

The baseline study (Chapter 3) identified five key links:

Liverpool – Manchester

Options are considered in this RUS under the Chat Moss and CLC corridors.

Liverpool/Manchester – Crewe and the south

The regional connections south from Manchester and Liverpool will be strengthened as a result of the WC2008 timetable. Options after 2008 will be considered by the West Coast Main Line RUS.

Liverpool – Central Lancashire

Options are considered in this RUS under the St Helens Central corridor.

Manchester – Central Lancashire

Options are considered in this RUS under the Bolton corridor.

Manchester – West Yorkshire/South Yorkshire

Options to reduce journey time on the Calder Valley corridor west of Todmorden are considered in this RUS because of interaction with other services. With this exception, Manchester – Leeds and Manchester – Sheffield services will be considered by the Yorkshire & Humber RUS.

6.2.3 Addressing peak crowding

As explained in Chapter 5, there is little certainty about the level of growth forecast over the RUS period. The reference scenario predicts extremely low growth (overall) from the base year of 2004/05 throughout the RUS period. The alternative scenario growth rate equates to approximately 1.6% growth per year. However, the growth experienced on the largest flows wholly within the RUS area over the single year to 2005/06, after excluding the effect of significant service interruptions, was approximately 10 per cent (albeit with variation by flow). On some corridors, actual levels of patronage have grown at such a rate during the last two years that they are already approaching the levels of the entire 10 year growth forecast in the (higher growth) alternative scenario. It is not yet clear how much of this growth was in the peak period, and of course it might not continue, but naturally the viability of the various solutions to relieve crowding depends largely on the growth rate. In principle, there are three broad responses to crowding:

Do nothing

If there is growth, the crowding will worsen. This can lead to the peak spreading as people choose to travel earlier or later on less-crowded trains. However, in the North West RUS area it is likely that much of the growth would shift to other modes because of their relative attractiveness (on some corridors rail offers a poor shoulder-peak service as resources are concentrated in the high peak) and the employment and lifestyle factors that limit commuters' ability to vary their working hours. Unless these alternative modes have less congestion than rail or are much more efficient, it is unlikely to create socio-economic benefits if demand is transferred away from trains.

Increase price

In theory, raising fares during the peak should encourage people to travel at other times, or by other modes, or not to travel at all. But as described above, people are more likely to change mode than travel time and unless the alternative modes have less congestion than rail, the transfer is unlikely to generate a net benefit in socio-economic terms.

Increase capacity

Capacity can be increased by (a) changing the internal configuration of rolling stock; (b) increasing the length of trains; or (c) running more frequent trains. Options were developed for these on each corridor affected by crowding and are outlined in section 6.3 (full details in Appendix D). The emerging conclusions are summarised in Section 6.4.1.

6.2.4 Addressing constraints to off-peak travel

Although many of the off-peak trains in the RUS area are lightly loaded, it has proved difficult to formulate many options to reduce services. Off-peak trains have little resource cost as the rolling stock is required for the peak (Section 6.4.3). The DfT published a review of the Northern franchise in March 2006, which concluded that there were few opportunities for cost escapement because resources were peak-driven and efficiently used, and that reducing either peak demand (through pricing action) or supply (through service reductions) produced a significant net negative economic effect. The RUS therefore seeks to identify ways to encourage off-peak traffic so that more of these services become financially viable. Among the factors that discourage use of the railway are station facilities and the availability of car parking, both of which are the subject of national initiatives and a number of specific options are proposed for inclusion in the strategy.

6.2.5 Stations

Station facilities may be worth improving where there is already a critical mass of users. Car parking provision has an effect on the local area in terms of on-street parking, congestion and impact on other nearby parking facilities, as well as roads accessing the car park from the trunk road and motorway network and abstraction from car parks at other comparable stations. The provision of additional car parking facilities would also have the effect of moving existing demand between corridors, or between stations on the same corridor as well as potentially releasing suppressed demand. The identification of those stations that would be best suited for new or extended car parks along each corridor, or pair of parallel corridors, would be a substantial study in itself, and the RUS has not undertaken this work. However, Network Rail will continue to work with stakeholders on the issue of car parking provision.

Appendix B lists 44 stations in the RUS area with fewer than 100 journeys (50 return trips) each day. Of these, twelve stations have fewer than 10 return trips a day including three too low to register on ticketing records. The RUS recommends the closure of these three stations – Denton, Reddish South and Ardwick – under the appropriate corridors in Section 6.3.

6.3 Option definition and analysis

This section describes specific options defined to address the gaps, organised by corridor. Appendix D lists the options considered against each gap and details the option analysis. The principal options considered are shown in Figure 6.1.

6.3.1 Stockport corridor

The generic gaps identified on this corridor are: Manchester connectivity, Airport access, Freight capacity/capability, Peak crowding, Platform crowding, Low footfall stations and Performance (especially on the Buxton line).

Option 1: Stockport – Victoria service

Gaps addressed: Manchester connectivity.

Description: Divert up to two tph between Stockport and Piccadilly (and possibly beyond) to run non-stop via Denton, Ashton Moss and Victoria. Could be linked to Northwich corridor option 2. Appears unlikely to be compatible with emerging WC2008 timetable at Heaton Norris.

Recommendation: No further development. Reconsider only if option 1 at 6.3.3 is implemented and proves a success.

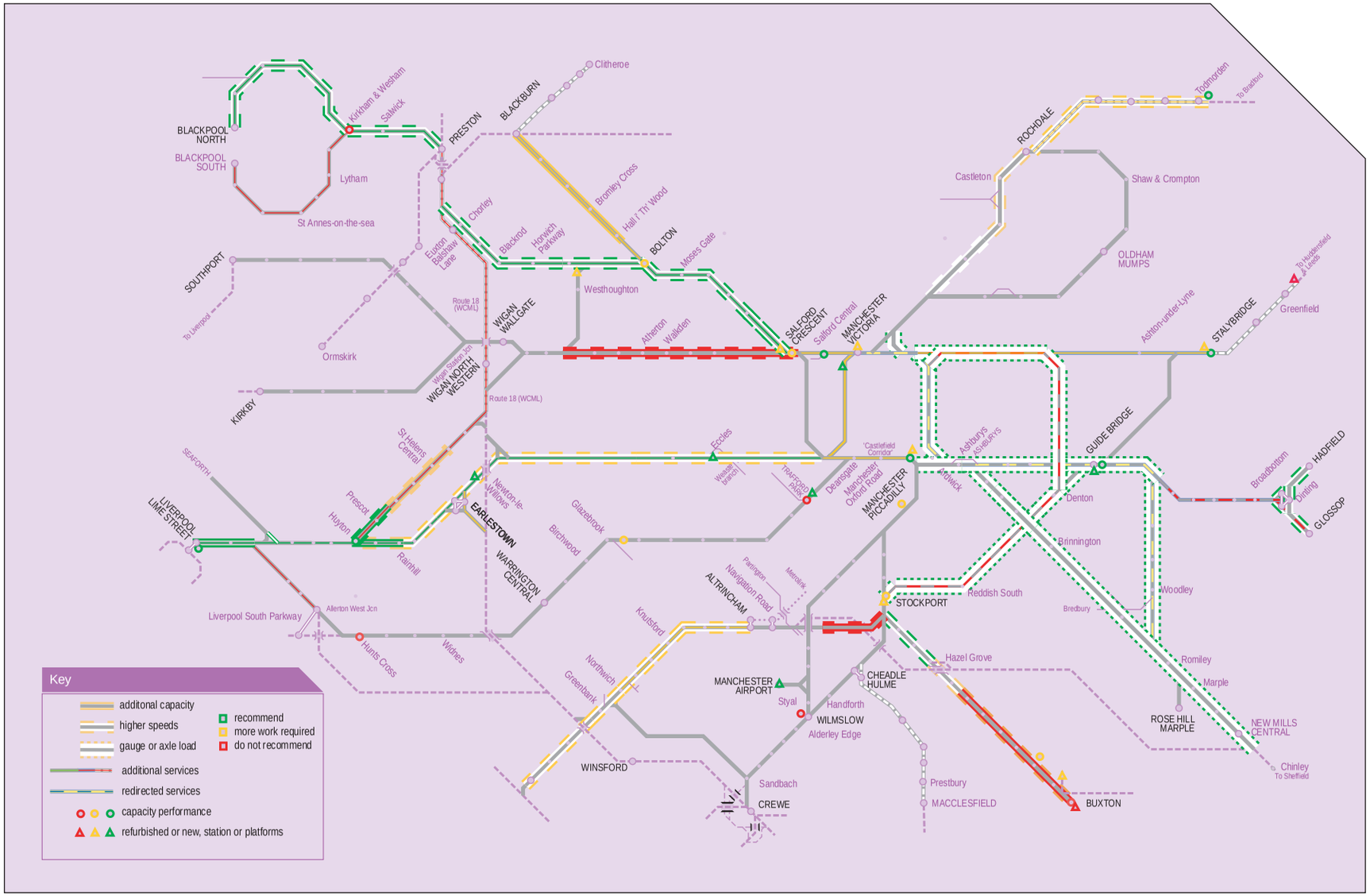
Option 2: Wilmslow crossover

Gaps addressed: Performance; Airport access.

Description: Provide a partial diversionary route to Manchester Airport by adding an additional crossover at Wilmslow.

Recommendation: Exclude from strategy; diversionary benefits are unlikely to be deliverable.

Figure 6.1: Options considered



Option 3: Buxton relief siding

Gaps addressed: Freight capacity/capability.

Description: Lengthen the refuge siding to allow longer freight trains to shunt when accessing Peak Forest from Hindlow.

Recommendation: Develop further.

Option 4: Longer freight trains to Trafford Park

Gaps addressed: Freight capacity/capability, Performance.

Description: Enable longer intermodal services on the routes accessing Trafford Park terminal.

Recommendation: Develop further when the WC2008 timetable is known.

Option 5: Buxton remodelling

Gaps addressed: Peak crowding, Performance.

Description: Enhance layout at Buxton when resignalled to improve operational flexibility.

Recommendation: Develop further for possible implementation with signalling renewal (beyond RUS timescale).

Option 6: Buxton line longer peak train

Gaps addressed: Peak crowding.

Description: Lengthen peak trains.

Recommendation: Develop further. The case for strengthening will depend on a demonstration that crowding levels will generate benefits to meet the appraisal criteria. Strengthening could be implemented during the RUS period dependent on growth and funding sources; see Section 6.4.1.

Option 7: Improve circulation on platforms 13/14 at Piccadilly

Gaps addressed: Platform crowding, Performance.

Description: Simplify platform layout, improve signage and remove obstructions.

Recommendation: Develop further; appears likely to meet appraisal criteria.

Option 8: Close Reddish South and Denton

Gaps addressed: Low footfall stations.

Description: Reddish South and Denton receive a minimal (once a week) service because anticipated demand has not justified increasing it. The operating cost of providing a service at these stations exceeds the revenue and socio-economic benefit they generate, even before periodic renewal costs are considered.

Recommendation: Include in strategy. Would be subject to formal closure procedure at a later date.

Option 9: Castlefield corridor frequency reduction

Gaps addressed: Performance.

Description: Remove some services from the heavily-used route between Piccadilly and Deansgate, by (a) complete removal, (b) diverting to terminate at Piccadilly platforms 1-12, or (c) diverting to Victoria.

Recommendation: Develop further when WC2008 timetable is known.

Option 10: Castlefield corridor headway

Gaps addressed: Performance

Description: Shorter signal sections between Piccadilly and Deansgate.

Recommendation: Develop further for possible implementation with signalling renewal (beyond RUS timescale).

Option 11: Piccadilly additional platform(s)

Gaps addressed: Performance.

Description: Construct one or more additional platforms on the north side of the station.

Recommendation: Develop further when the WC2008 timetable is known.

Option 12: Better access to Longsight goods line

Gaps addressed: Performance.

Description: Higher entry and exit speeds at Longsight goods line.

Recommendation: Develop further.

Option 13: Heaton Norris line speed

Gaps addressed: Performance.

Description: Higher speed at Heaton Norris Junction in the Denton direction.

Recommendation: Develop further when the WC2008 timetable is known.

Option 14: Edgeley – Hazel Grove line speed

Gaps addressed: Performance.

Description: Higher speed between Edgeley Junction and Hazel Grove.

Recommendation: Include in strategy.

Option 15: Extend hours of operation of Chapel signal box

Gaps addressed: Performance.

Description: Chapel box is only open in the morning. If it were open in the evening it would reduce headways and improve performance on the Buxton line in the evening.

Recommendation: Develop further.

Option 16: Buxton line headway

Gaps addressed: Performance.

Description: Shorter signal sections on Buxton line.

Recommendation: Develop further for possible implementation with signalling renewal (beyond RUS timescale).

Option 17: Buxton line speed

Gaps addressed: Performance.

Description: Achieve standard speed profile.

Recommendation: Develop further.

Other options affecting this corridor:

Marple corridor option 2: **East Manchester Route Availability**

Northwich corridor option 2: **Terminate Northwich trains at Stockport**

6.3.2 Marple corridor

The generic gaps identified on this corridor are: Manchester connectivity, Freight capacity/capability, Peak crowding, Low footfall stations and Performance.

Option 1: Marple line services to Victoria

Gaps addressed: Manchester connectivity.

Description: Divert two tph (one Marple train and one Rose Hill) to run via Guide Bridge, Ashburys and Miles Platting to Victoria, with suitable station improvements at Victoria (such as the Fish Dock redevelopment scheme in section 4.3).

Recommendation: Develop further to establish whether there is real demand to have trains accessing both the north and south side of Manchester instead of a concentrated service to Piccadilly. Dependent on Hadfield corridor option 1.

Option 2: East Manchester route availability

Gaps addressed: Freight capacity/capability; Performance.

Description: Increase capability to RA10 on routes used by stone trains: Peak Forest – New Mills – Guide Bridge – Stockport/Victoria.

Recommendation: Include in strategy.

Option 3: East Manchester freight diversionary route

Gaps addressed: Freight capacity/capability, Performance.

Description: W10 gauge clearance and loop to allow intermodal trains to/from Trafford Park to divert via Denton.

Recommendation: Develop further; appears likely to meet appraisal criteria.

Option 4: Bredbury line longer peak trains

Gaps addressed: Peak crowding.

Description: Lengthen peak trains.

Recommendation: Develop further. The case for strengthening will depend on a demonstration that crowding levels will generate benefits to meet the appraisal criteria. Strengthening could be implemented during the RUS period dependent on growth and funding sources; see Section 6.4.1.

Option 5: Close Ardwick station

Gaps addressed: Low footfall stations.

Description: Ardwick receives a low level of service (five trains a day: well above the legal minimum) because anticipated demand does not justify increasing it. The operating cost of providing a service at this station exceeds the revenue and socio-economic benefit it generates, even before long term renewal costs are considered.

Recommendation: Include in strategy. Would be subject to formal closure procedure at a later date.

Other options affecting this corridor:
Stockport corridor option 11: **Piccadilly additional platform(s)**

Hadfield corridor option 1: **Develop Guide Bridge as an interchange**

6.3.3 Hadfield corridor

The generic gaps identified on this corridor are: Manchester connectivity, Peak crowding, Station facilities/car parks and Performance.

Option 1: Develop Guide Bridge as an interchange
Gaps addressed: Manchester connectivity, Station facilities/car parks.

Description: Improve station facilities and car parking.

Recommendation: Develop further.

Option 2: Hadfield line rolling stock
Gaps addressed: Peak crowding.

Description: Redeploy rolling stock so that Hadfield route has more seats per train within the existing constraint of platform lengths.

Recommendation: Develop further; appears likely to meet appraisal criteria. Alternative to Hadfield corridor option 3

Option 3: Hadfield line additional peak train
Gaps addressed: Peak crowding.

Description: Increase peak service from three to four tph, requires shorter signal sections to reduce headway and more units and crews.

Recommendation: Develop further for possible implementation with signalling renewal (beyond RUS timescale). Alternative to Hadfield corridor option 2

Option 4: Glossop triangle line speed
Gaps addressed: Performance.

Description: Higher speeds on branches to Hadfield and Glossop to increase turnround time.

Recommendation: Include in strategy.

Other options affecting this corridor:
Marple corridor option 1: **Marple line services to Victoria**

Marple corridor option 2: **East Manchester Route Availability**

Marple corridor option 3: **East Manchester freight diversionary route**

Stalybridge corridor option 5: **Guide Bridge junction speed**

6.3.4 Stalybridge corridor

The generic gaps identified on this corridor are: Manchester connectivity, Peak crowding, Station facilities/car parks and Performance.

Option 1: Stalybridge interchange development
Gaps addressed: Manchester connectivity, Peak crowding, Station facilities/car parks, Performance.

Description: Increase Stalybridge – Victoria service to two tph and call additional TransPennine trains at Stalybridge to connect. Enhance layout at Stalybridge when resignalled to increase speed across junction and to/from the bay platform, or relocate/add bay on north side of station. Improve car parking.

Recommendation: Develop further; part or all of the option appears likely to meet appraisal criteria. Yorkshire & Humber RUS should consider TransPennine stopping pattern.

Option 2: Huddersfield longer peak train
Gaps addressed: Peak crowding.

Description: Lengthen peak trains.

Recommendation: Develop further.

The case for strengthening will depend on a demonstration that crowding levels will generate benefits to meet the appraisal criteria. Strengthening could be implemented during the RUS period dependent on growth and funding sources; see Section 6.4.1.

Option 3: Stalybridge longer peak train
Gaps addressed: Peak crowding.

Description: Lengthen peak trains.

Recommendation: Develop further. The case for strengthening will depend on a demonstration that crowding levels will generate benefits to meet the appraisal criteria. Strengthening could be implemented during the RUS period dependent on growth and funding sources; see Section 6.4.1.

Option 4: Stalybridge extra peak train
Gaps addressed: Peak crowding.

Description: Introduce one additional two-car peak train from Stalybridge.

Recommendation: Develop further. Dependent on Stalybridge corridor option 1.

Option 5: Guide Bridge junction speed
Gaps addressed: Performance.

Description: Higher speed across Guide Bridge West Junction to/from the Stalybridge direction.

Recommendation: Develop further; appears likely to meet appraisal criteria.

Option 6: Diggle loop
Gaps addressed: Performance.

Description: Lengthen loop when resignalled, or relocate crossover to permit use as a turnback siding.

Recommendation: Yorkshire & Humber RUS should consider options, as scale of potential works and/or changes to the timetable to address the gap would have a significant impact on the Manchester – Leeds corridor.

Other options affecting this corridor:
Stockport corridor option 1: **Stockport – Victoria service**

Stockport corridor option 11: **Piccadilly additional platform(s)**

Hadfield corridor option 1: **Develop Guide Bridge as an interchange**

Marple corridor option 1: **Marple line services to Victoria**

Marple corridor option 2: **East Manchester Route Availability**

6.3.5 Oldham corridor

The principal issue on the Oldham corridor is peak crowding, which has not been addressed as the route is expected to transfer to Metrolink operation during the period of the RUS and will therefore cease to be part of the national rail network.

6.3.6 Calder Valley corridor

The generic gaps identified on this corridor are: Regional links, Manchester connectivity, Airport access, Peak crowding and Performance.

Option 1: Todmorden local service
Gaps addressed: Regional links.

Description: When Metrolink operates Oldham loop, Leeds services could be accelerated if Rochdale local trains are extended to an improved turnback at Todmorden.

Recommendation: Develop further. Lancashire & Cumbria RUS should consider the case for extending beyond Todmorden to Burnley (to improve Manchester – Central Lancashire links), and Yorkshire & Humber RUS should consider the case for extending beyond Todmorden towards Bradford.

Option 2: Calder Valley line speed
Gaps addressed: Regional links.

Description: Higher speed at Castleton and between Rochdale and Hebden Bridge.

Recommendation: Develop further. Case depends on Calder Valley option 1.

Option 3: Through trains to Salford Crescent

Gaps addressed: Manchester connectivity, Airport access, Performance.

Description: Extend Calder Valley trains through Victoria to terminate in new capacity at Salford Crescent, allowing interchange with airport services.

Recommendation: Develop further; appears likely to meet appraisal criteria if Bolton corridor option 5 is implemented. Alternative to Calder Valley option 4.

Option 4: Through trains to Salford Central

Gaps addressed: Manchester connectivity, Performance.

Description: Extend Calder Valley trains through Victoria to terminate in new east-facing bay at Salford Central.

Recommendation: Develop further. Alternative to Calder Valley option 3.

Option 5: Rochdale line longer peak train

Gaps addressed: Peak crowding.

Description: Lengthen peak trains.

Recommendation: Develop further. The case for strengthening will depend on a demonstration that crowding levels will generate benefits to meet the appraisal criteria. Strengthening could be implemented during the RUS period dependent on growth and funding sources; see Section 6.4.1.

Other options affecting this corridor:

Marple corridor option 2: **East Manchester Route Availability**

6.3.7 Bolton corridor

The generic gaps identified on this corridor are: Regional links, Manchester connectivity, Airport links, Peak crowding, platform crowding and Performance.

Option 1: Blackpool line timetable recast

Gaps addressed: Regional links.

Description: Between Manchester and Blackpool, increase from one semi-fast and one slow tph to one fast and two slow tph. Would give two fast tph Manchester – Preston (approximately half-hourly pattern).

Recommendation: Develop further. Dependent on Bolton corridor option 5.

Option 2: Blackburn additional train off-peak

Gaps addressed: Regional links.

Description: Increase from one to two tph between Victoria and Blackburn. Would require significant additional infrastructure to operate reliably.

Recommendation: Develop further, but currently appears unlikely to constitute value for money. Dependent on Bolton corridor option 5.

Option 3: Manchester – Blackpool line speed

Gaps addressed: Regional links.

Description: Higher speed between Manchester and Euxton Junction, and between Preston and Blackpool North, including both raising the overall line speed and addressing PSRs.

Recommendation: Develop further, appears likely to meet appraisal criteria.

Option 4: Kirkham remodelling

Gaps addressed: Regional links.

Description: Layout changes to increase speed for through trains and improve interchange and parking.

Recommendation: Develop further, but currently appears unlikely to constitute value for money if undertaken ahead of renewal (outside RUS timescale).

Option 5: Salford Crescent remodelling/ relocation

Gaps addressed: Regional links, Performance, Peak crowding, Platform crowding, Manchester connectivity, Airport access.

Description: Enhance the interchange capability of Salford Crescent and eliminate the current track and passenger congestion problem by (a) adding a third platform or (b)

relocating the station to a better site away from the bottleneck, possibly with bay platforms.

Recommendation: Develop further; appears likely to meet appraisal criteria.

Option 6: Blackpool Airport service increase

Gaps addressed: Airport access, Performance.

Description: Increase frequency from one to two tph between Blackpool South, Squires Gate (for the airport) and Kirkham or Preston. Would require significant investment in additional infrastructure and rolling stock.

Recommendation: Develope further. Unlikely to constitute value for money if undertaken ahead of renewal (which is beyond RUS timescale).

Option 7: Lostock additional platforms

Gaps addressed: Peak crowding.

Description: New platforms on the Westhoughton line so that stops can be alternated as appropriate between trains on Preston and Wigan routes.

Recommendation: Develop further.

Option 8: Westhoughton line longer peak train

Gaps addressed: Peak crowding.

Description: Lengthen peak trains.

Recommendation: Develop further. The case for strengthening will depend on a demonstration that crowding levels will generate benefits to meet the appraisal criteria. Strengthening could be implemented during the RUS period dependent on growth and funding sources; see Section 6.4.1.

Option 9: Blackburn/Clitheroe longer peak trains

Gaps addressed: Peak crowding.

Description: Lengthen peak trains. Extra coaches would have to be locked out of use north of Blackburn because of short platfroms.

Recommendation: Develop further. The case for strengthening will depend on a demonstration that crowding levels will generate benefits to meet the appraisal criteria. Strengthening could be implemented during the RUS period dependent on growth and funding sources; see Section 6.4.1.

Option 10: Bolton additional platform

Gaps addressed: Performance.

Description: Create a fifth platform at Bolton by extending the down loop at Moses Gate.

Recommendation: Develop further when WC2008 timetable is known.

Other options affecting this corridor:

Chat Moss corridor option 1: **Liverpool – Manchester additional trains**

Chat Moss corridor option 2: **TransPennine trains on Chat Moss line**

6.3.8 Atherton corridor

The generic gaps identified on this corridor are: Peak crowding and Performance.

Option 1: Atherton/Southport longer peak trains

Gaps addressed: Peak crowding.

Description: Lengthen peak trains.

Recommendation: Develop further. The case for strengthening will depend on a demonstration that crowding levels will generate benefits to meet the appraisal criteria. Strengthening could be implemented during the RUS period dependent on growth and funding sources; see Section 6.4.1.

Option 2: Atherton line headway

Gaps addressed: Performance.

Description: Shorter signal sections between Atherton and Walkden.

Recommendation: Develop further for possible implementation with signalling renewal (beyond RUS timescale).

Option 3: Atherton line speed

Gaps addressed: Performance.

Description: Higher speed throughout.

Recommendation: Develop further for possible implementation with signalling renewal (beyond RUS timescale).

Other options affecting this corridor:
Bolton corridor option 5: **Salford Crescent remodelling/relocation**

6.3.9 Chat Moss corridor

The generic gaps identified on this corridor are: Regional links, Manchester connectivity, Station facilities/car parks, Integration with Metrolink, Freight capacity/capability, Peak crowding and Performance.

Option 1: Liverpool – Manchester additional trains
Gaps addressed: Regional links.

Description: Increase from one to two fast tph between Lime Street and Piccadilly via Chat Moss line. Divert ATW Llandudno/Chester – Manchester train to Victoria; sub-option considers a second Chester – Manchester train each hour via Chat Moss line and redirect Lime St – Warrington Bank Quay to Victoria.

Recommendation: Develop further; appears likely to meet appraisal criteria. Alternative to Chat Moss corridor option 2.

Option 2: TransPennine trains on Chat Moss line
Gaps addressed: Regional links.

Description: As option 1, but in addition move long-distance TransPennine trains (two tph) between Lime Street and Piccadilly from CLC line to Chat Moss line. Move fast Chat Moss services to CLC. A sub-option considers a second Chester – Manchester train each hour via Chat Moss Line and redirects Lime Street – Warrington Bank Quay to Victoria.

Recommendation: Develop further. Alternative to Chat Moss corridor option 1.

Option 3: Chat Moss line speed
Gaps addressed: Regional links.

Description: Higher speed between Huyton and Patricroft.

Recommendation: Develop further. Scale of benefits is dependent on Chat Moss corridor option 1 or 2.

Option 4: Lime Street resignalling enhancements
Gaps addressed: Performance

Description: When resignalled, enhance operational flexibility between Lime Street and Edge Hill.

Recommendation: Develop further; appears likely to meet appraisal criteria.

Option 5: Salford Central additional platforms
Gaps addressed: Manchester connectivity.

Description: New platforms on Chat Moss lines.

Recommendation: Develop further; appears likely to meet appraisal criteria. Scale of benefits is dependent on Chat Moss corridor option 1 or 2; this may be critical to case.

Option 6: Develop Newton-le-Willows as an interchange
Gaps addressed: Manchester connectivity.

Description: Improve station facilities and car parking.

Recommendation: Develop further.

Option 7: Eccles interchange with Metrolink
Gaps addressed: Integration with Metrolink.

Description: More trains calling at Eccles and improvements to interchange with Metrolink.

Recommendation: Develop further; appears likely to meet appraisal criteria.

Option 8: Bootle branch W10
Gaps addressed: Freight capacity/capability.

Description: Increase loading gauge to W10 on branch and main/diversionary access routes to accommodate trend towards 9'6" containers in deep sea shipping.

Recommendation: Develop further; main route appears likely to meet appraisal criteria but diversionary route less likely.

Option 9: Olive Mount chord
Gaps addressed: Freight capacity/capability.

Description: Reinstate freight chord onto Bootle branch from Huyton direction.

Recommendation: Develop further; appears likely to meet appraisal criteria.

Option 10: Rainhill headway

Gaps addressed: Freight capacity/capability.

Description: Introduce shorter signal sections when resignalled.

Recommendation: Include in strategy.

Option 11: Extra Chat Moss peak train

Gaps addressed: Peak crowding.

Description: One extra two-car peak train in each direction between Liverpool and Manchester.

Recommendation: Develop further. Linked to decisions about Chat Moss corridor options 4 and 5.

Option 12: Longer Chat Moss peak trains

Gaps addressed: Peak crowding.

Description: Lengthen peak trains to both Liverpool and Manchester.

Recommendation: Develop further. The case for strengthening will depend on a demonstration that crowding levels will generate benefits to meet the appraisal criteria. Strengthening could be implemented during the RUS period dependent on growth and funding sources; see Section 6.4.1.

Other options affecting this corridor:

St Helens Central corridor option 1: **Liverpool – Preston additional trains**

St Helens Central corridor option 2: **Wigan longer peak trains**

6.3.10 CLC corridor

The generic gaps identified on this corridor are: Regional links, Integration with Metrolink, Airport access, Freight capacity/capability, Peak crowding and Performance.

Option 1: CLC Timetable recast

Gaps addressed: Regional links.

Description: A development from Chat Moss corridor option 2, but recast timetable on CLC to give regular interval four tph service at key locations rather than two fast and two slow tph.

Recommendation: Develop further. Incompatible with Chat Moss corridor option 1.

Option 2: Cornbrook or White City new station and interchange

Gaps addressed: Integration with Metrolink.

Description: New station with interchange to Metrolink; all CLC trains to call.

Recommendation: Develop further.

Option 3: Liverpool South Parkway shuttle

Gaps addressed: Airport access.

Description: Increased frequency between Lime Street and Liverpool South Parkway, by (a) CLC line timetable recast or (b) dedicated shuttle service.

Recommendation: Develop further; appears likely to meet appraisal criteria. Solution (a) is dependent on CLC corridor option 1.

Option 4: Trafford Park western access

Gaps addressed: Freight capacity/capability.

Description: Reinstate freight route between Partington and Glazebrook with new chords to eliminate need to reverse trains.

Recommendation: Exclude from strategy due to implementation timescale, cost and the scale of benefit being dependent on the lack of alternative terminals.

Option 5: Longer CLC peak trains

Gaps addressed: Peak crowding.

Description: Lengthen peak trains to both Liverpool and Manchester.

Recommendation: Develop further. The case for strengthening will depend on a demonstration that crowding levels will generate benefits to meet the appraisal criteria. Strengthening could be implemented during the RUS period dependent on growth and funding sources; see Section 6.4.1.

Option 6: Hunts Cross remodelling

Gaps addressed: Performance.

Description: Change layout to separate Lime Street/CLC lines from d.c. electrified lines.

Recommendation: Merseyside RUS should

consider options.

Option 7: Glazebrook additional up loop

Gaps addressed: Performance.

Description: New loop for traffic in the direction of Manchester.

Recommendation: Develop further, but benefits are dependent on the mix of fast and slow trains. Case for this is affected by CLC corridor option 1.

Option 8: Trafford Park additional loop

Gaps addressed: Performance.

Description: New long loop approaching Trafford park from the east.

Recommendation: Exclude from strategy; does not appear to constitute value for money if undertaken ahead of renewal (outside RUS timescale).

Other options affecting this corridor:

Chat Moss corridor option 12: **Lime Street resignalling enhancements**

Chat Moss corridor option 2: **TransPennine trains on Chat Moss line**

6.3.11 Northwich corridor

The generic gaps identified on this corridor are: Integration with Metrolink, Low footfall stations and Performance. These and other less strategic service options are the subject of discussions with local stakeholders through the Mid-Cheshire Community Rail Partnership.

Option 1: Additional Altrincham train and timetable recast

Gaps addressed: Integration with Metrolink.

Description: Extra train each hour Northwich – Knutsford – Altrincham. Rolling stock cost could be neutral if combined with Northwich corridor option 2.

Recommendation: Develop further; appears unlikely to meet appraisal criteria.

Option 2: Terminate Northwich trains at Stockport

Gaps addressed: Performance.

Description: Terminate all services from Northwich/Altrincham to Manchester at Stockport instead of Piccadilly. Would probably require an additional south-facing bay on the west side of Stockport station for capacity or performance reasons.

Recommendation: Develop further when WC2008 timetable is known but cost of infrastructure or impact of performance makes the case unlikely to be positive.

Option 3: Fewer stops on the Northwich line

Gaps addressed: Low footfall stations.

Description: Reduce journey time by distributing some station stops in alternate trains (reducing frequency at lightly-used stations). An add-on to this option is to raise the linespeed at targeted locations.

Recommendation: Develop further; likely to be included in strategy.

Option 4: Stockport – Northenden capacity

Gaps addressed: Performance.

Description: Higher speed between Stockport and Northenden Junction and reduce length of single line section.

Recommendation: Exclude from strategy; does not appear to constitute value for money.

6.3.12 Styal corridor

The generic gaps identified on this corridor are: Airport access and Performance.

Option 1: Manchester Airport additional platform

Gaps addressed: Airport access, Performance.

Description: New third platform at Manchester Airport station.

Recommendation: Include in strategy.

Option 2: Service recast

Gaps addressed: Airport access, Performance.

Description: Restructure all-day timetable to (a) redistribute intermediate stops evenly between trains or (b) create two all-stations trains and six fast trains.

Recommendation: Develop further when

WC2008 timetable is known, but scale of benefits is dependent on Styal corridor option 1.

Option 3: Manchester Airport services southwards

Gaps addressed: Airport access.

Description: Recast services south from the airport. Dependent on Styal corridor options 1 and 2.

Recommendation: Exclude from strategy. WC2008 will develop the services between Airport and Crewe, and the West Coast Main Line RUS should consider the case for services to Airport from south of Crewe.

Other options affecting this corridor:

Stockport corridor option 11: **Piccadilly additional platform(s)**

6.3.13 St Helens Central corridor

The generic gaps identified on this corridor are: Regional links, Peak crowding and Performance.

Option 1: Liverpool – Preston additional trains

Gaps addressed: Regional links.

Description: Increase from one to two fast tph between Liverpool and Preston via Wigan.

Recommendation: Exclude from strategy. Lancashire & Cumbria RUS and Merseyside RUS should consider the case for improved services via Ormskirk as this appears to give a comparable journey time without the need for additional trains on the two-track section of the WCML.

Option 2: Wigan longer peak trains

Gaps addressed: Peak crowding.

Description: Lengthen peak trains.

Recommendation: Develop further. The case for strengthening will depend on a demonstration that crowding levels will generate benefits to meet the appraisal criteria. Strengthening could be implemented during the RUS period dependent on growth and funding sources; see Section 6.4.1.

Option 3: Prescot headway and line speed

Gaps addressed: Performance.

Description: Introduce higher speed and shorter signal sections when resignalled.

Recommendation: Develop further for possible implementation with signalling renewal.

Other options affecting this corridor:

Chat Moss corridor option 12: **Lime Street resignalling enhancements**

6.4 Emerging conclusions

6.4.1 Measures to alleviate peak crowding

Peak crowding was identified as a key theme in the gap analysis (section 6.2.3) and options were developed to address this gap. Considerable work has been undertaken to assess these options. Crowding is measured in three ways:

- targets in franchise agreements (usually set by DfT)
- targets set by other parties such as PTEs
- economic appraisal.

The RUS uses economic appraisal consistent with HM Treasury and DfT guidance. However, the results of the appraisal are very sensitive to the assumptions used, in particular those regarding background demand growth; values of time; and the Benefit/Cost Ratio threshold that is required to show that there is a case for lengthening. The issues are summarised below. Further details can be found in Appendix D.

Background demand growth

As explained in Chapter 5, this RUS uses two growth scenarios. Under the reference scenario, many routes will see little growth over the next ten years; under the alternative scenario, there will be significant growth on many routes. The difference between the two scenarios, in terms of the degree of peak crowding, is marked.

Value of time

Economic appraisal puts financial values on time spent in various conditions, for example standing or sitting in a crowded train. The

industry standard source for values of time under crowded conditions is the Passenger Demand Forecasting Handbook (PDFH).

The PDFH recommends a number of different values of crowded time, for passengers with different journey purposes (commuting, business, leisure) and in different parts of the country (London & southeast, regional). In particular, it gives values of standing for regional commuters that are approximately half those for London & southeast commuters. The choice of values of time is therefore a key issue for appraisal in this RUS.

Benefit/Cost Ratio threshold

A key output from appraisal is the ratio of benefits to cost, or BCR. DfT guidance suggests that few, if any, schemes should go ahead that have a BCR of less than 1.5; and that in order for a scheme to be "high" value for money, it should have a BCR of at least 2.0. However, the linkage between the BCR and the decision to go ahead is not automatic and can be influenced by qualitative factors outside the scope of the quantitative appraisal.

Work to date

Greater Manchester PTE has recently shared analysis which concludes that there is a case for lengthening up to 20 trains (depending on the BCR threshold used) in the morning peak, and a similar number in the evening peak, with some lengthening being justified on most corridors.

This analysis was based on background growth rates broadly similar to those in the RUS alternative scenario; and on values of time that appear to reflect London & southeast PDFH values.

It is clear from the results of the GMPTE analysis, and from RUS appraisal work to date, that using alternative assumptions would substantially reduce the extent to which there is a case for train lengthening. For example, the GMPTE analysis included a sensitivity test in which demand growth was based on TEMPRO (and would therefore be expected to be broadly similar to the RUS reference scenario). In this test, there was a positive case (defined as BCR > 1.0) for lengthening 11 additional trains in the morning peak. If one were to use a threshold BCR of 1.5, the number of trains with a case for lengthening would be likely to reduce still further.

Conclusions and next steps

We do not believe that the distinction, in the PDFH, between crowded values of time for London & southeast commuters and for regional commuters, should be reflected in economic appraisal. The research on which the values are based dates from around 1990; and the levels of crowding which are now experienced, at least on the most crowded regional commuter services, are comparable to those experienced around London. We therefore believe that it is appropriate to use the PDFH 'London & southeast' values of crowded time for appraisals in this RUS.

On this basis, there appears to be a case for lengthening a number of peak trains during the RUS period. However, the scale and timing of the train lengthening that can be justified is very heavily dependent on the other assumptions used in the appraisal, in particular those outlined above. The case is strongest on the corridors which have or are expected to develop a significant level of standing for longer journey times, e.g. over 15 minutes.

Before reaching a conclusion on recommendations to address peak crowding, the RUS will consider these assumptions further in the light of any representations received during the consultation period.

6.4.2 Infrastructure changes

The RUS examines infrastructure changes with a total value of around £200 million, including a number of individually significant schemes across the area: the third platform at Manchester Airport, higher linespeeds between Manchester and Blackpool, possible relocation of Salford Crescent, new platforms at Salford Central, and a new interchange station with Metrolink southwest of Deansgate.

These are accompanied by a number of line speed increases and improvements to station facilities and car parks. Many of these proposals, assessed as options, stand a good chance of inclusion in the strategy when it is published in 2007.

The list might be longer but for two factors: the extensive investment recently carried out under WCRM on some corridors, and the reality that the most cost-effective time to change the infrastructure is when a major signalling renewal is scheduled. There are relatively few such renewals scheduled during the ten-year duration of this RUS, but in each case that does exist, opportunities have been identified to improve performance or capacity:

- at Lime Street it is proposed to improve operational flexibility in the station throat and on the lines towards Edge Hill
- at Rainhill it is proposed to improve signalling headways
- at Stalybridge it is proposed to improve the flexibility and speed of the layout.

A number of other proposals might constitute good value for money when a renewal is scheduled, but are ruled out by the excessive cost of intervening prior to the renewal (or, more likely, triggering the acceleration of the renewal). Examples are improvements to headways on the Atherton, Hadfield and Buxton lines, at Hunts Cross and at Prescot.

A few options are ruled out because they would be unlikely to constitute value for money even if a renewal was scheduled: these include works to access Trafford Park freight terminal from the west, and to double the frequency of trains on the Blackpool South line and between Bolton and Blackburn.

6.4.3 Rolling stock

The rolling stock fleet deployed on services in the RUS area varies widely, from new class 185 trains on TransPennine services (designed for high-capacity inter-urban service with relatively frequent stops) to elderly two-axle class 14x ('Pacer') vehicles on Manchester suburban routes. The baseline study identified areas where rolling stock is not fit for purpose:

- capacity. On some trains, the seating density and layout are inappropriate for their current use.
- access/egress. Trains designed for long distance services often have awkward entrances which lead to excessive dwell time at stations when crowded.
- speed. There is a trade-off between cruising speed and acceleration, but modern stock is capable of much better performance in both cases.
- weight (and fuel/power consumption). Modern trains are often heavier than older ones but if appropriately designed they need not be.

On longer-distance services, peak resourcing tends to continue all day because it is rarely possible to add or detach vehicles in mid-journey. However, on the majority of services in the RUS area, fleet utilisation is very high in the peak and less so in the off-peak. As there are surplus vehicles available between the peaks, it is relatively easy to introduce frequency improvements at this time (other things being equal, and acknowledging that fleet utilisation has to be slightly lower off-peak to enable some increase in maintenance/servicing). Introducing additional capacity during the peak, whether as longer trains or more frequent short trains, will generally require additional rolling stock to be sourced. The standard approach when assessing these options in a RUS is to include the full lease cost of the extra rolling stock unit(s) giving due consideration to the types that might be available from leasing companies or manufacturers if new build is required.

Two factors suggest a different approach could be used in the North West. Firstly, there is considerable unsuitability in the fleet currently deployed; and secondly, many of the options show highest value when a single vehicle is added to an existing train formation. To some extent, the latter factor can be mitigated by redeployment (so an extra two-car set is coupled to an existing two-car set but the resulting four-car train is swapped with a three-car set; in this way an additional two-car set can have the effect of lengthening two trains by one car each), but there is a limit to the flexibility possible in a fleet that is already tightly constrained. A third factor that is not specific to the North West is the emergence of alternative funding options for rolling stock procurement, that might reduce the overall public sector cost of new replacement trains. This would have the effect of improving the key value-for-money indicator (the BCR) used in the RUS for any options requiring additional rolling stock.

The RUS therefore seeks to identify principles for future rolling stock provision, as a contribution to a wider rolling stock strategy to be developed by or on behalf of government. Ideally, a new fleet would be procured to replace the class 14x vehicles. A modern purpose-built fleet would have lightweight, modular, bogie vehicles with gangway connections and wide access points at 1/3 and 2/3 of the way along the bodysides. Train formation would be flexible from a single vehicle upwards. Whether or not such a new build can be justified, there are opportunities for fleet cascades from elsewhere, but proposals for optimising rolling stock over a number of operators and regions would need to be moderated in the short and medium term by the realities of existing franchise and lease agreements (these agreements would not of course constrain the procurement of new rolling stock). The aims should be to enable:

- additional rolling stock to be introduced incrementally on routes in the RUS area
- appropriate rolling stock to be deployed on each service group.

The Merseyrail Electrics fleet is likely to be replaced during the RUS period. The replacement, whether new or redeployed from elsewhere, could be capable of operating on both a.c. (overhead) and d.c. (third rail) power supply. The opportunities this provides are magnified when incremental extension of electrification is considered. The DfT is preparing a long-term traction energy strategy and economic model to be used in determining the case for schemes for further electrification of the network. Once the DfT strategy is declared (expected during 2007), the RUS recommends that integrated consideration is given to rolling stock provision and the extent of electrification in the area. If this approach is consistent with the DfT strategy then options should be considered within the Merseyside RUS.

7. Stakeholder consultation

7.1 Introduction

7.1.1 Purpose

Consultation with stakeholders within and outside the rail industry is essential to the successful development of a Route Utilisation Strategy. Close involvement of stakeholders helps to ensure that:

- the widest range of options is considered
- the resulting decision approaches optimality
- delivery of the solution is faster.

According to Network Rail's network licence:

> 3A.3(a) the licence holder shall develop a draft route utilisation strategy in consultation with:
>
> (i) providers and potential providers of services relating to railways
>
> (ii) funders and potential funders of services relating to railways
>
> (iii) the Rail Passengers' Council or such other public body or bodies as may be performing the Council's duties, other representatives of persons using services for the carriage of passengers by railway, and representatives of persons using services for the carriage of goods by railway
>
> (iv) the Secretary of State [for Transport] and, in relation to a route utilisation strategy that involves Scotland-only services or cross-border services, the Scottish Ministers;

Network Licence Condition 7 as modified 10 June 2005

In order to deliver this obligation in an effective and consistent manner, two consultative groups have been established for the North West RUS.

7.1.2 Industry Stakeholder Management Group (SMG)

The SMG consists of representatives from passenger and freight train operators, ATOC, DfT, PTEs and the Office of Rail Regulation (as an observer).

This group meets regularly, acting as a steering group for the RUS. Although formal presentations are made to the SMG of work done, the emphasis is on informality and openness in discussion.

7.1.3 Wider Stakeholder Group (WSG)

The WSG is a larger, and hence necessarily more formal, group than the SMG. Representatives are invited from:

- Passenger Focus
- Rail Freight Group
- Government Office of the North West
- North West Regional Assembly
- Regional Development Agencies
- Local authorities
- Highways Agency
- Rail user groups
- Ports and airports
- Other bodies

This group exists to ensure that stakeholders beyond the rail industry have the opportunity to contribute to the RUS process and are briefed and prepared to make best use of the formal consultation period. The first meeting was held in September 2005 in Wigan a second meeting was also held in Wigan, in September 2006 and a third meeting will be arranged prior to the final publication of the document.

7.1.4 Individual briefings
Meetings have also been held on an individual basis with a number of key stakeholders to understand their aspirations and concerns.

7.2 How you can contribute

We welcome contributions to assist us in developing this RUS.
Specific consultation questions have not been set as we would appreciate comments on the content of the document as a whole. Particular reference should, however, be made in responses to the options that have been developed as solutions for the identified gaps.

7.3 Response date

7.3.1
This RUS will have a formal consultation period of eight weeks. The deadline for receiving responses is therefore 5 January 2007. Earlier responses would be very much appreciated in order to maximise the time available to consider and respond in the final RUS document.

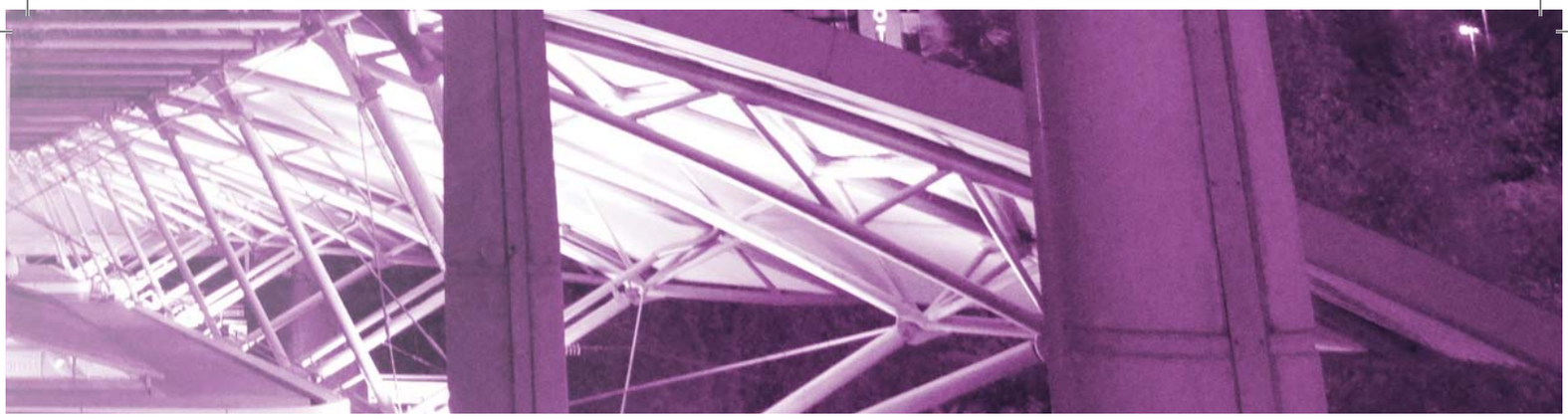
7.3.2
Consultation responses can be submitted either electronically or by post to the addresses below:

northwestrus@networkrail.co.uk

North West RUS Consultation Response
National RUS Consultation Manager
Network Rail
8th Floor
40 Melton Street
London
NW1 2EE

8. Appendices

Appendix A:	**Passenger demand baseline report. Available at www.networkrail.co.uk.**
Appendix B:	**Baseline report. Available at www.networkrail.co.uk.**
Appendix C:	**Passenger demand forecasting report. Available at www.networkrail.co.uk.**
Appendix D:	**Gaps and options. Available at www.networkrail.co.uk.**
Appendix E:	**Consultee list**
Appendix F:	**Glossary of terms**



Appendix E: Consultee list

Stakeholder Management Group
ATOC
EWS
Freightliner
GMPTE
Merseytravel
Northern Rail
ORR
TransPennine Express
Statutory bodies
Department for Transport
Passenger Transport Authorities
North West Regional Assembly
Northwest Regional Development Agency
Office of Rail Regulation
Passenger Focus
Yorkshire Forward
Businesses
Blackpool Airport
Liverpool John Lennon Airport
Manchester Airport
Port of Liverpool

Rail industry
All TOCs and FOCs
Local authorities
Blackburn with Darwen Borough Council
Blackpool Borough Council
Cheshire County Council
Cumbria County Council
Derbyshire County Council
Halton Borough Council
Lancashire County Council
Warrington Borough Council
Elected representatives
MPs in the region
Other bodies
Freight Transport Association
Goyt Valley Rail Users Association
Mid-Cheshire Rail Users Association
North West Public Transport Users Forum
North West Rail Campaign
North West Transport Activists Round Table
Support The Oldham Rochdale Manchester rail line group (STORM)

Appendix F: Glossary of terms

Absolute Block Signalling	A long established form of signalling mainly, but not necessarily, associated with semaphore signals and one signal box for each signalling section. Its purpose is to ensure that only one train is within a given section of line at a time.
ATOC	Association of Train Operating Companies
BCR	Benefit Cost Ratio
CLC	Cheshire Lines Committee (the company that constructed this route)
CUI	Capacity Utilisation Index
DfT	Department for Transport
Dwell time	The time a train is stationary at a station
EWS	English, Welsh and Scottish Railway
FOC	Freight Operating Company
GMPTE	Greater Manchester Passenger Transport Executive
Headway	On a particular route the minimum time necessary between the passage of similar trains which will ensure that the driver of the second train will always be travelling under green aspects. On certain Track Circuit Block lines with four-aspect signals the headway is two minutes whereas on a line with Absolute Block Signalling the headway may be ten minutes or more.
HLOS	High Level Output Specification
Intermodal trains	Freight trains which convey traffic which could be moved by road, rail or sea (e.g. container traffic).
Liverpool stations	Liverpool Lime Street (high and low level) and Liverpool Central stations
Loading factor	The amount of seats occupied on a train service expressed as a percentage of total seats available.
Gauge	The width between the rails. Also used as an abbreviation for loading gauge (see below).
LENNON	Latest Earnings Networked Nationally Over Night; records most ticket sales.
Loading gauge	The profile for a particular rail route within which all vehicles or loads must remain to ensure that sufficient clearance is available at all structures.
Manchester stations	Manchester Piccadilly, Manchester Victoria, Oxford Road and Deansgate stations

MOIRA	Industry standard demand forecasting model
Multiple Unit Trains (DMU & EMU)	Trains composed of self-contained units, which can be coupled together so that they work in unison under the control of the driver at the front of the leading unit. Each unit is normally composed of two or more semi-permanently coupled vehicles and a driving compartment is provided at each end of every unit. There are diesel multiple units (DMU) and electric multiple units (EMU).
ORR	Office of Rail Regulation
Perturbation	Disruption to the planned train service pattern
PPM	Public Performance Measure
PTE	Passenger Transport Executive
Route Availability (RA)	The system which determines which types of locomotive and rolling stock can travel over any particular route. The main criteria for establishing RA usually concerns the strength of underline bridges in relation to axle loads and speed. A locomotive of RA8 is not permitted on a route of RA6 for example.
RDA	Regional Development Agency
RES	Regional Economic Strategy
RPA	Regional Planning Assessment
RSS	Regional Spatial Strategy
RUS	Route Utilisation Strategy
SMG	Industry Stakeholder Management Group
SRA	Strategic Rail Authority
Standard Length Unit (SLU)	One SLU = 6 metres or 21 feet. By describing the length of a train in SLUs, it is easy to establish if it can or cannot be accommodated in a particular loop or siding.
TPH	Trains per hour
Track Circuit Block Signalling (TCB)	A signalling system which requires the entire line to be track circuited. The presence or otherwise of trains is detected automatically by the track circuits. Consequently many of the signals on TCB lines operate automatically as a result of the passage of trains. The associated equipment ensures that only one train is within a given section of line at a time.
TOC	Train Operating Company

Warrington stations	Warrington Bank Quay and Warrington Central stations
WC2008	Timetable for the West Coast Main Line and related routes being developed for implementation in December 2008
WCML	West Coast Main Line
WCRM	West Coast Route Modernisation
Wigan stations	Wigan Wallgate and Wigan North Western stations
WSG	Wider Stakeholder Group
WYPTE	West Yorkshire Passenger Transport Executive

Network Rail
40 Melton Street
London NW1 2EE

Tel: 020 7557 8000

www.networkrail.co.uk

720/November 2006