Merseyside

Route Utilisation Strategy

March 2009

Foreword

I am delighted to present Network Rail's Route Utilisation Strategy (RUS) for Merseyside. As with previous RUSs, this sets out the strategic vision for a particular part of the rail network.

Merseyside has an extensive rail network covering the city of Liverpool and the communities in and around the city. Essentially, this consists of routes to and from the city centre to the wider region and, despite current economic conditions, more and more passengers will want to use the railway in Liverpool over the period covered by the RUS.

The area covered by the RUS is primarily aligned with the operations of the Merseyrail franchise, although some wider issues are included. This is the longest franchise currently in place, lasting until July 2028, and is overseen by Merseytravel, the local Passenger Transport Executive and Integrated Transport Authority.

Following analysis of the existing network, assessment of the likely demand from passengers over the next decade, and taking into account any current plans to enhance network capacity, five main gaps were identified. These are: capacity at stations in central Liverpool; overcrowding on a number of services, particularly into Liverpool at peak times; poor connectivity and journey times on parts of the network; insufficient car parking and poor interchanges; and the impact of infrastructure constraints on performance and reliability.

Problems with station capacity are particularly acute at Liverpool Central and the RUS proposes a number of actions to address this. In the next two years there are some relatively simple and unobtrusive measures that can deliver some additional capacity. However, further into the future more disruptive work would be necessary, and the RUS recommends that, in addition to the immediate action, the industry needs to agree on the longer-term strategy for the station.

In the short term, the RUS recommends some new or upgraded infrastructure to provide additional stabling and maintenance facilities, and to increase the number of services from Chester and Wigan to Liverpool. Further ahead, in the period to 2020, the RUS recommends interventions to allow longer or more trains to run on key routes, and considers development of the electrified network. Beyond that date, it is clear further work will be required to deliver additional capacity, though this will be affected by plans for regenerating areas of Merseyside.

This RUS was initially published as a Draft for Consultation in November 2008. A wide range of issues were raised during the consultation period and these have now influenced several aspects of the strategy. I would like to thank everyone who responded to the consultation for their contribution.

The development of this strategy has been led by Network Rail, but it has been the result of joint working across the whole rail industry. A large number of organisations have been fully involved, notably including our customers, the passenger and freight operators. I would like to thank them all for their contributions.

Iain Coucher
Chief Executive

Executive summary

Introduction

The area covered by the Merseyside Route Utilisation Strategy (RUS) is relatively densely populated and has an extensive rail network which covers the majority of residential areas and serves the UK's sixth largest city. This network is largely radial in nature connecting central Liverpool with the rest of the Merseyside City Region. Passenger services are regular and typically call at all stops on a branch of the network, thereby providing a frequent service to and from most stations.

There is no major rail freight on the routes within the geography of this RUS with the movement of freight traffic to and from the docks having been considered in the North West RUS. However, freight and passenger services interact on some sections of the network.

The main passenger train operator on the RUS, 'Merseyrail' has the longest rail franchise in Great Britain (25 years – until July 2028) and is overseen by 'Merseytravel' (the local Passenger Transport Executive and Integrated Transport Authority) which specifies and funds services throughout the Merseyside network.

This RUS has been developed through a process of extensive stakeholder involvement, and represents the views of the industry Stakeholder Management Group (SMG). This approach has been established for a number of years and is common to all the RUSs.

Dimensions

The Merseyside RUS area consists of Network Rail Strategic Route 21 but also includes some geography on the periphery or just outside that route, some of which has been examined in other RUSs, but needs further consideration from a Merseyside perspective. The main passenger operator is Merseyrail, but the RUS also includes services operated by Arriva Trains Wales and Northern. These operators cover the following routes, with Liverpool City Centre as a focus:

- the 'Northern Line' – serving the north (Southport, Ormskirk and Kirkby) and south (Hunts Cross) via Liverpool Central and Moorfields
- the 'Wirral Line' – serving the west and south (New Brighton, West Kirby, Chester and Ellesmere Port) via Wirral Line loop
- the interaction of services on the wider rail network with the Northern and Wirral Lines, eg. Chester, Ellesmere Port, Bidston and Hunts Cross.

This RUS excludes the City Line serving stations east of Lime Street; except where specific issues have been referred to the Merseyside RUS. City Line services are provided by Northern and were covered by the North West RUS.

The Merseyside RUS primarily focuses on the next 10 years to 2020, (which aligns to Network Rail's Control Periods 4 and 5), but has also considered the implications of growth in demand over the next 30 years in the context of the Government's 2007 White Paper "Delivering a Sustainable Railway".

Process

The RUS analyses the current capability and capacity of the railway in order to measure its ability to cater reliably for existing demand and thereby highlight any areas where the level of service provision or infrastructure does not meet current requirements. These apparent deficiencies are termed “gaps”. Passenger and freight demand forecasts are then produced for the next 10 years, and are used to assess whether any further gaps are likely to occur in the short and medium-term future. These forecasts take account of committed schemes which are known to be coming on stream in the next few years. A view of demand is also considered for the longer term to understand the gaps that are likely to occur over the 10 – 30-year time horizon.

A set of interventions has been generated to address known and predicted gaps. These options have been analysed in order to ensure the most effective and best value for money solutions.

A full working copy of the RUS Draft for Consultation was issued on 28 November 2008 for all interested stakeholders to assess. A 12-week consultation period was undertaken to seek feedback to the emerging strategy from stakeholders, particularly those of local authorities and regional bodies. Following the conclusion of this consultation period and consideration of feedback, this final RUS has been prepared and published.

The Merseyside RUS process is overseen and directed by the SMG which comprises representatives from passenger operators, freight operators, the Department for Transport (DfT), Network Rail, Association of Train Operating Companies (ATOC), Passenger Focus, Merseytravel – the Passenger Transport Executive (PTE), Integrated Transport Authority (ITA) and the Office of Rail Regulation (ORR) as observers.

Gaps

The RUS identified five generic gaps:

Gap One: Capacity, stations.
Some of the central Liverpool underground stations are overcrowded at certain times of the day and week, and forecast growth will worsen this situation. The challenges are greatest at Liverpool Central, particularly on the Northern Line platforms both in terms of capacity and access, where the site is severely constrained.

Gap Two: Capacity, trains and infrastructure.
Sustained historical passenger growth has led to standing on a number of services in the Merseyside RUS area, particularly into Liverpool at peak times. This is expected to worsen as passenger numbers increase over time, eventually leading to overcrowding. The level of infrastructure on parts of the network could be insufficient to meet future demand.

Gap Three: Connectivity and journey time.
Several parts of the RUS area have a level of service that is inferior to other similar parts of Merseyside and the United Kingdom, and some conurbations and potential freight customers have no access to the rail network.

Gap Four: Getting to the train.
Nearly a quarter of passengers on the Merseyrail electric network use a car to get to the station. Car parks at many locations are full, and on-street parking around stations is common. Bus interchange is also poor at certain locations across the RUS area.

Gap Five: Train punctuality and performance.
Overall punctuality is very good, though a number of infrastructure constraints exist on the network which can cause regular and significant delay to passenger and freight services.

These have been identified as:

- intensely used line sections
- busy ‘flat’ railway junctions
- tight turnarounds at terminal stations.

Demand forecasting

Despite current economic problems in the UK, it is anticipated that the rail passenger and freight market in Merseyside will continue to grow over the next decade.

The rail passenger market in Merseyside is highly dependent on the economic performance of Liverpool at the centre of the City Region, and the main economic sectors in the city which influence rail travel are in an apparently strong position. The retail sector has received a decade of sustained inward investment, the office sector is heavily dependent on public sector employment rather than banking and finance, and there is an ongoing modal shift from car to rail.

It is forecast that overall passenger numbers will grow by almost 40 percent by 2020, equivalent to 2.8 percent per annum. This is a conservative estimate and is extremely unlikely to be an overestimate of future demand despite the economic downturn. Growth in passenger numbers during weekday peak periods is expected to be around or slightly higher than the overall figure.

Liverpool has experienced over two million extra rail travellers associated with its designation last year as the 2008 European Capital of Culture. It is believed a legacy will remain despite the current economic climate.

Passenger growth in central Liverpool is expected to grow at around four percent per annum until 2010, because a number of major city centre office and retail developments that have recently opened near the main railway stations. The ‘Liverpool One’ leisure and retail complex that opened in September 2008 has been successful in encouraging visitors and shoppers into the city centre, and they are staying in the centre longer because of the enhanced facilities.

Strategy

Liverpool Central station is presented separately from the rest of the strategy as it is a major priority for local stakeholders, particularly Merseyrail.

Liverpool Central is the busiest station on the Merseyrail network with over 15 million passengers alighting, boarding or interchanging each year. The main underground island platform on the Northern Line handles the vast majority of passengers and it is an extremely poor facility relative to modern standards.

The proximity of the station to Liverpool's growing retail centre means that significantly more passengers use the island platform on a Saturday than on a weekday, and it is already over capacity at regular intervals on Saturdays. Weekdays are also becoming increasingly busy, although any interventions that are required to meet future Saturday demand will be sufficient for the weekday peak.

We expect further passenger growth, and even a moderate number of additional passengers will mean that the platform will be significantly over capacity for several consecutive hours on a Saturday by around 2015, and will have begun to spread into the weekday evening peak period.

In the absence of any interventions to increase capacity, there would be a severe impact on the train service, with some or all trains unable to call at Liverpool Central at certain times. This would be a major loss of railway facilities at the time of maximum demand which would be extremely inconvenient to passengers, and lead to crowding problems at adjacent railway stations.

The RUS has therefore identified a potential package of phased interventions:

Immediate

Up to 30 percent additional capacity will be required within the next three years. This can be delivered through better crowd management and some relatively unobtrusive infrastructure work to improve passenger flow around the platform, at a cost of £5 million – £10 million.

Short – medium term

By around 2015 another 10 – 20 percent additional capacity will be required (40 – 50 percent more than currently). This can be delivered through some more disruptive infrastructure work on the platform, at a cost of £10 million – £15 million.

Long term

Between 2020 and 2025 the number of passengers will have grown to a level that cannot be accommodated by improvements to the existing station facilities. In the same time period overcrowding of the station during weekday peak periods will prevent the required increase in weekday peak service frequency. This means that either a new underground platform or a new station will be required, at a potential cost of hundreds of millions. The rail industry will be required to form a consensus on the key strategic issues facing Liverpool Central station.

This RUS recommends an immediate package of investment during CP4, and outlines the requirement for the Network Rail and local stakeholders to develop and agree a preferred package of major investment, which will be submitted to the DfT for consideration in the High Level Output Specification (HLOS) for CP5.

The rest of the strategy for the Merseyside RUS is:

Short-term strategy
2009 – 2014 (Control Period 4)
The new Merseyrail rolling stock fleet is scheduled to enter service from around 2014, and should provide an additional 14 three-car units in traffic, which should be used to lengthen trains serving Liverpool in the peak. In the interim period the availability of spare rolling stock from the South East should be used to enable shorter-term strengthening of peak services.

Current stabling facilities will need to be upgraded to accommodate a larger fleet in the short term, subject to agreement of how any investment can be used to benefit the replacement fleet. The new fleet will have different maintenance requirements to the current fleet and the joint industry team developing the rolling stock replacement will define the scope for improved or new maintenance and stabling infrastructure.

The inter-peak frequency of services from Chester to Liverpool should be increased from half hourly to quarter hourly, thereby matching the peak frequency. This would allow faster journey times on some services (by missing out some calls in the additional services) and better performance because of longer turnarounds at Chester. This is currently the least punctual service group on the network, mainly because of short turnaround times. As an increment to this a scheme will be developed to raise the linespeed and increase performance robustness further.

The inter-peak frequency of services from Wigan to Liverpool should be increased from three to four trains per hour, providing rolling stock is available from the existing peak operation.

Investment will need to be made at Liverpool Central (see above).

Subject to confirmation of traffic and negotiation of any third party funding, an infrastructure upgrade may be required to improve the freight route to Wirral Docks avoiding the West Coast Main Line.

A feasibility study should be carried out to develop a better understanding of the business case for a new electrified chord to Skelmersdale – the second largest conurbation in the north west without a rail connection. This could allow through services to central Liverpool.

Medium-term strategy
2014 – 2019 (Control Period 5)
Some of the recommendations are reliant on the new rolling stock being available for the area. Consequently the rolling stock strategy and subsequent procurement are vital to the medium-term strategy for Merseyside.

Further train lengthening will be required as well as an increased peak train service frequency on the Southport Line.

Development of the freight flows in the area could include a potential new freight route into Liverpool Docks.

Subject to development of satisfactory business cases and availability of funding, extension of the electrified network could take place to encourage more passenger flows and improve connectivity. This could include potential new electrified services to Skelmersdale, on the Bidston – Wrexham line and beyond Ormskirk to Burscough Bridge and Southport.

Long-term context

2019 – 2039 (Control Period 6 and beyond)

The Government's 2007 White Paper suggests a doubling of both passenger and freight traffic nationally over a 30-year period. This is largely consistent with the longer term for Merseyside, however it is recognised that there may be wide variations between individual routes or parts of routes according to local circumstances. In the event of significant growth it is clear that the long-term strategy should focus on making the best use of the existing network in the first instance, and then look to opportunities to develop the wider rail network.

Further increases in the peak service frequency will be required on the Southport and Ormskirk branches of the Northern Line and the West Kirby and Chester branches of the Wirral Line, and infrastructure improvements will be required to allow this.

In addition, further train lengthening will be required during the shoulder peak and inter peak periods.

A key driver for the longer-term strategy will be the delivery and success of the various major regeneration plans in the Merseyside area. These include the proposed £5.5 billion Liverpool Waters development and the £4.5 billion Wirral Waters development.

Ultimately, there could be options for reopening currently disused lines or disused tunnels, where feasible, or construction of some completely new sections of railway. The latter could be unconstrained by traditional limitations on maximum speed, loading gauge and other output characteristics.

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, publishing 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."

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 funding implications of those options for persons providing services to railways and funders."

Extract from ORR Guidelines on Route Utilisation Strategies, June 2005

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.

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 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 (SMG). There is also extensive informal consultation outside the rail industry by means of a Wider Stakeholder Group (WSG).

1.1.5
The ORR guidelines require options to be appraised. This is initially undertaken using the Department for Transport's (DfT) appraisal criteria. To support this appraisal work RUSs seek to capture implications for all industry parties and wider social 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 (HLOS).

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 Document structure

1.2.1

This document starts by outlining, in **Chapter 2**, the dimensions of the RUS, and the planning context within which it has been developed. It also describes the linkage to associated work streams and studies which relate to the RUS.

1.2.2

Chapter 3 describes the railway today covering passenger and freight demand and the capability of the infrastructure to meet that demand. Gaps which already exist between demand and capacity are identified.

1.2.3

In **Chapter 4** the committed and uncommitted schemes proposed for the future are explained.

1.2.4

Chapter 5 considers the drivers of change, including future passenger and freight demand.

1.2.5

In **Chapter 6** gaps between forecast demand and current capability are identified. Options for bridging the gaps pinpointed in the previous chapters were originally appraised in the Draft for Consultation (published in November 2008) and have been updated based on consultation responses for this the final RUS document.

1.2.6

Chapter 7 covers the consultation process, including a summary of the responses received to the Draft for Consultation and how these have been taken into account in developing the strategy.

1.2.7

Chapter 8 describes the recommended strategy for the period 2009 – 2020.

1.2.8

Chapter 9 outlines the proposals for the longer term (30 years).

1.2.9

Chapter 10 explains the next steps and mechanisms for concluding any ongoing analysis options.

1.2.10

Supporting data is contained in the appendices to this document which, owing to their size, are only available at: **www.networkrail.co.uk**


skirk
Merseyrail

2. Dimensions

2.1 Purpose

2.1.1

The Merseyside RUS is required for a number of reasons. The primary drivers are to address:

- the optimisation of the output specification for rail infrastructure renewals and enhancements
- the identification of ways in which capacity could be used more efficiently, in the context of the railway and wider public transport
- the development of the Government's periodic HLOS
- specific socio-economic developments, growth and employment.

2.1.2

The Merseyside RUS will therefore:

- propose options to achieve the most efficient and effective use of the existing 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 DfT's aspirations and the reasonable requirements of train operators and other key stakeholders
- assist Merseytravel 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.

2.2 Stakeholders

2.2.1

The Merseyside RUS Stakeholder Management Group met on numerous occasions at key stages during the development of this RUS. This brought together key bodies including Merseyrail, Merseytravel, Arriva Trains Wales, Northern, Network Rail, ATOC, Passenger Focus, and the DfT. ORR attended as an observer.

2.2.2

Wider stakeholder briefings were held in Liverpool 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 November 2007, a two-day baseline exhibition event was held in Liverpool. This enabled stakeholders to review the results of the baseline exercise at their own pace, and share their ideas and insights. This provided valuable input into the gap analysis and subsequent optioneering. The baseline information can be found in Appendix A at **www.networkrail.co.uk**

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

2.3 Merseyside RUS geography

The Merseyside RUS considers the Merseyside “journey to work” area; this encompasses the whole of Network Rail’s strategic Route 21 (Merseyside). The RUS area also considers adjacent parts of Route 20 (North West Urban), Route 23 (North West Rural), and Route 22 (North Wales and Borders), where service patterns interface. This is depicted in geographical and schematic format in Figures 2.1 and 2.2 respectively. The geographic focus of the RUS is Liverpool which is the sixth largest city in the UK, with large numbers of people using the rail network to access both employment and leisure activities. The RUS also considers passenger flows to Southport, Preston, Wigan, Warrington, Chester and Wrexham, as well as considering flows from Cheshire, Lancashire and North Wales.

Figure 2.1 – Merseyside RUS geography

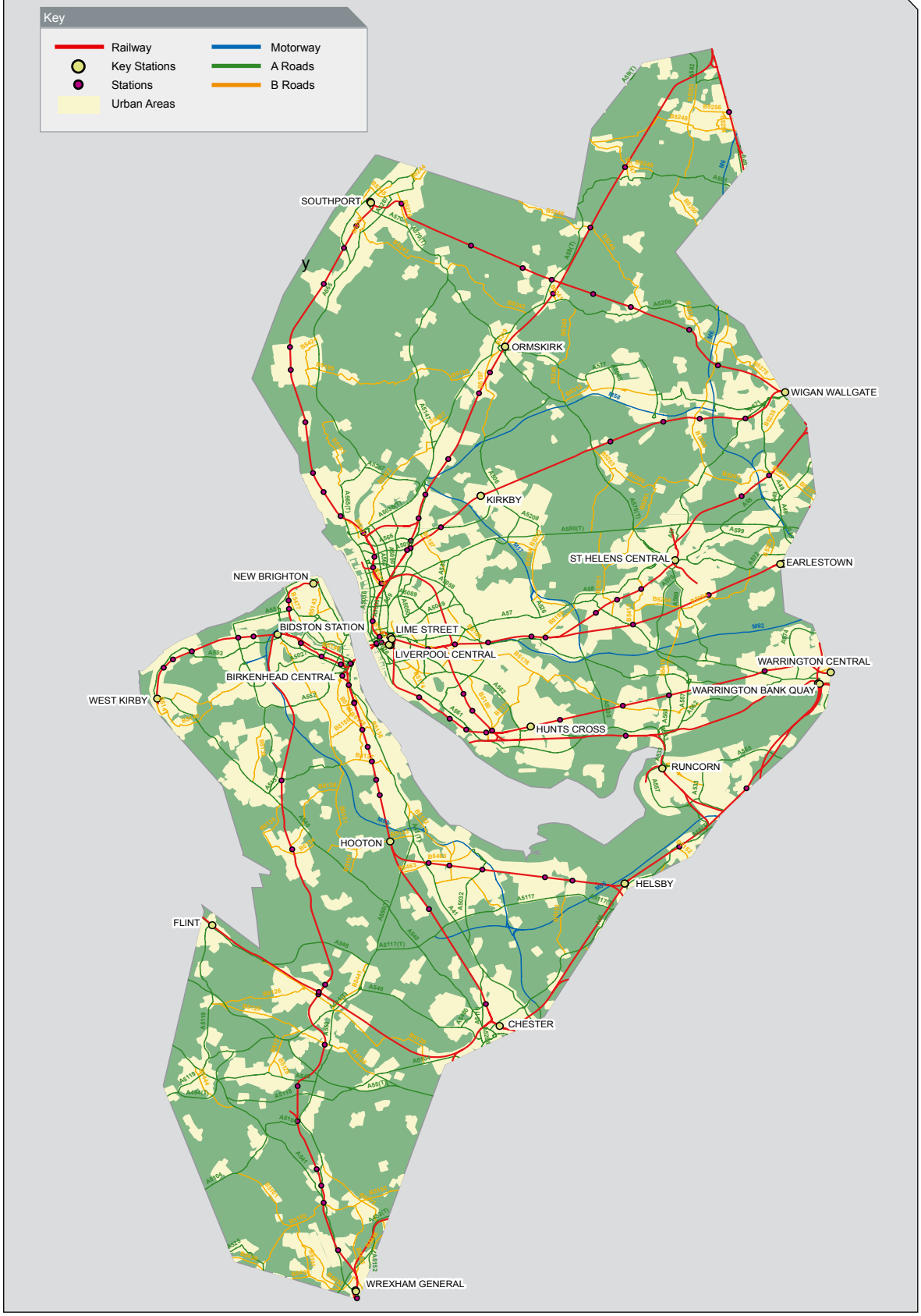
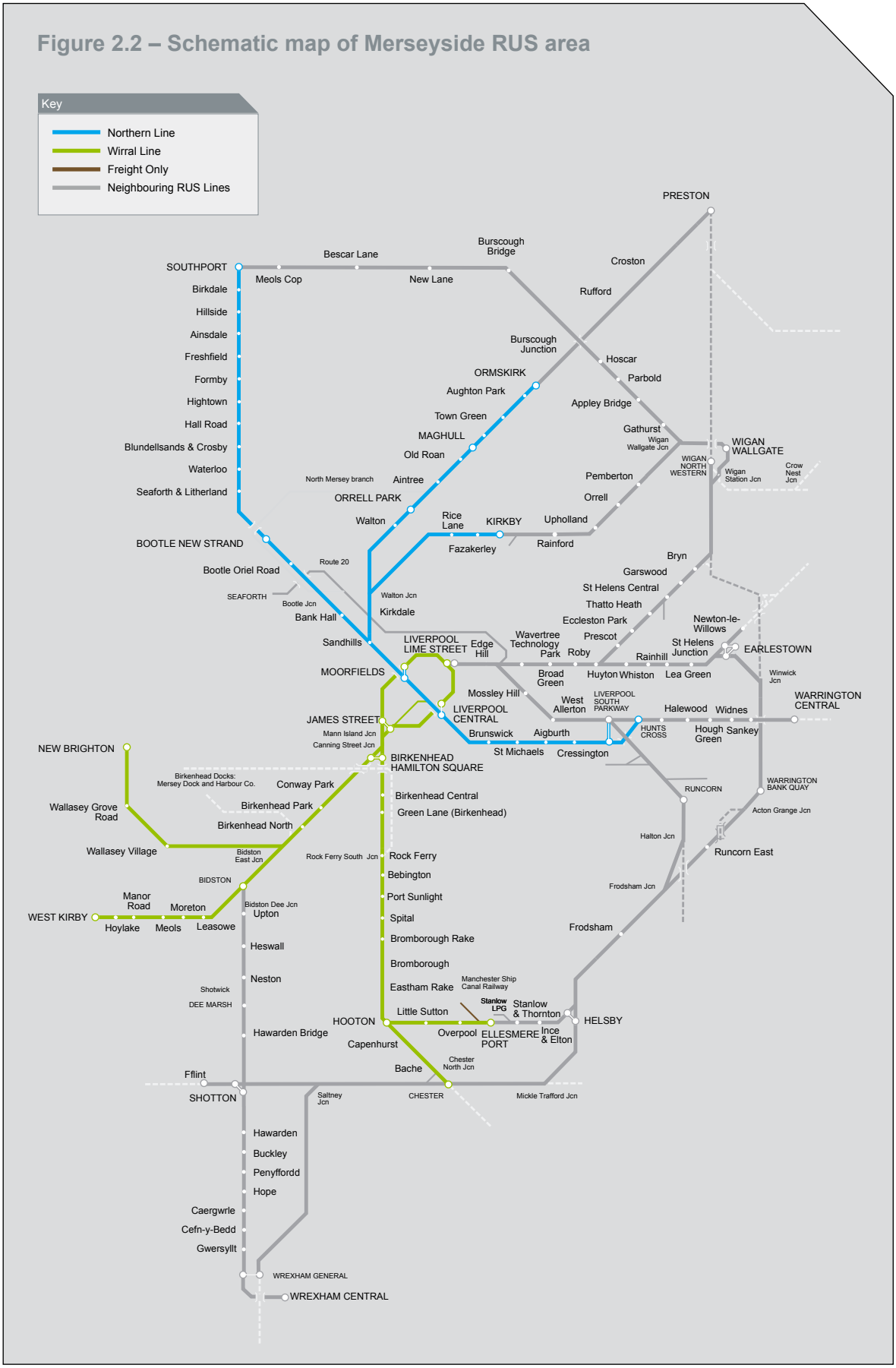


Figure 2.2 – Schematic map of Merseyside RUS area



2.4 Scope of services

The scope of services considered by the Merseyside RUS is all Merseyrail services and their interactions with other operators and the wider rail network. The study also considers some services operated by Arriva Trains Wales and Northern. The study includes services between Liverpool and North Wales, Chester, Preston and Southport. Also considered are any freight services operating within the RUS geography.

2.5 Linkage to other RUSs

Network Rail is continuing to work through a programme of RUSs which, once complete, will cover the whole of Great Britain. The Merseyside RUS follows several other RUSs, including the North West, Lancashire and Cumbria and Wales RUSs, and draws on input and analysis within these studies. The Merseyside RUS also considers input and analysis from the Freight RUS, as well as emerging strategy from the high level network-wide Network RUS which is currently being progressed. The Network RUS is assessing national electrification issues and the national rolling stock and depot strategy for the whole rail nework. A number of cross boundary issues that were raised and partly analysed by the Wales RUS and the Lancashire and Cumbria RUS are developed further in the Merseyside RUS. In particular, it considers further analysis of the Burscough curves and Wrexham to Bidston line issues and the possible reintroduction of passenger services on the Halton Curve.

2.6 Linkage to other studies and work streams

This RUS, to be successful and coherent, cannot be considered in isolation. The RUS is related to a number of other strategies and policies which include:

The **North West Regional Planning Assessment** (RPA) which was published in October 2006. The RPA provides a medium to long-term planning framework for rail. Within this framework the Merseyside RUS is intended to provide a more detailed strategy covering a 30-year horizon. DfT involvement in development of this RUS ensures broad alignment between these related studies.

The draft **Regional Spatial Strategy** (RSS), **Regional Economic Strategy** (RES) and outputs from Northern Way (the three northern Regional Development Agencies) which emphasised 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.

The **Liverpool Central Station Passenger Movement and Capacity** (Stadia Access) study report commissioned by Merseytravel in June 2003.

The **Liverpool Central Station Investment Appraisal** from 2004.

The **Liverpool City Centre Rail Demand and Capacity Study** (Appendix B at **www.networkrail.co.uk**) which was completed in 2008 and took a view of demand forecasting for Liverpool City Centre. It also considered the impact of this demand on the central stations.

The **Merseyside Local Transport Plan** 2006 – 2011.

Liverpool Central Dynamic Passenger Modelling and Capacity Study – due for completion spring 2009.

Passenger Focus **'Getting to the Train' Surveys** – results recently published in March 2009.

Halton Curve Demand Study – Merseytravel commissioned study in 2008.

Bootle Branch Study – Merseytravel commissioned.

Burscough Curve Re-instatement – Demand study commissioned by Merseytravel.

Wrexham and Bidston DC electrification study – Merseytravel commissioned study completed in 2008.

Network RUS – this RUS is evaluating national electrification options, including the Wrexham to Bidston line and is due for publication in summer 2009.

2.7 Merseyside RUS timeframe

The RUS covers the period to 2019 in detail and describes broad strategic issues through to 2039.

3. Current capacity, demand and delivery

3.1 Introduction

3.1.1

The RUS area spans a mixture of highly populated urban areas and more sparsely populated rural areas. The infrastructure reflects this mix with mechanical signal boxes and single-line sections in the more rural areas, contrasting with modern signalling and multi-platform stations in the more populous areas.

3.1.2

The RUS baseline exercise considers current passenger and freight demand, infrastructure capability and performance.

For the purposes of the baseline and analysis work, the RUS area has been broken into a number of geographical sections; these are defined in Figure 3.1.

Figure 3.1 – Merseyside RUS route sections

Corridor Name	Details
Northern Line	Liverpool to Hunts Cross, Kirkby, Ormskirk and Southport
Wirral Line	Liverpool to New Brighton, West Kirby, Chester, Ellesmere Port and Liverpool James Street to Liverpool Central (stock interchange line)
Chester and North Wales	Bidston to Wrexham, Chester to Flint, Ellesmere Port to Helsby, Chester to Acton Grange Jn/Halton Jn (some of these lines were considered in the Wales RUS, but issues were passed to the Merseyside RUS for further consideration)
The following two corridors were considered by the Lancashire and Cumbria and North West RUSs and will only be reviewed in the Merseyside RUS where a proposed intervention may have an impact:	
Greater Manchester and Greater Lancashire	Southport to Wigan, Ormskirk to Preston, Kirkby to Wigan, Edge Hill to Earlestown/ Ince Moss Jn, Liverpool South Parkway to Warrington
WCML	Liverpool Lime Street to Runcorn and south along the West Coast Main Line, Acton Grange Jn to Earlestown/Wigan and Preston

3.1.3
The principal infrastructure capability and capacity characteristics considered are:

- planning headways (which is a measure of the minimum planned time between trains)
- line speeds
- junction speeds
- electrification
- loading gauge (which defines the size of vehicles and loads of wagons that can be carried)
- route availability (which defines the axle weight of vehicles that can be operated)
- loop lengths
- platform lengths
- station facilities
- car parking
- interchange (integration with other public transport modes)
- Capacity Utilisation Index (a measure of how much plain line capacity is consumed usually in the busiest hour).

3.2 Current passenger train operators

The key passenger train operator over the RUS area is Merseyrail:

3.2.1 Merseyrail

Merseyrail is the main train operator within the RUS geography, and operates services on the electrified Merseyrail system focused around Liverpool City Centre. The franchise is a concession granted by Merseytravel, not the DfT, and is due to run until July 2028.

The following train operators run services on the lines adjoining the RUS area:

3.2.2 Arriva Trains Wales

Arriva Trains Wales (ATW) operates services from Wales into Chester and Bidston where it directly interacts with the Merseyrail network. ATW also operate services to Manchester Piccadilly via both Stockport and Warrington. The franchise is due to run until 2018.

3.2.3 Northern

Northern operates services into Southport, Ormskirk, Kirkby, Ellesmere Port and on the City Lines from Wigan North Western, Manchester Piccadilly, Manchester Airport, Warrington Central and Warrington Bank Quay into Liverpool Lime Street. The current Northern franchise was formed in December 2004 with the merger of First North Western and Arriva Trains Northern and, subject to achievement of performance targets, runs until September 2013.

3.2.4 TransPennine Express

TransPennine Express (TPE) operates inter-urban services with limited stops, notably from Liverpool Lime Street to Manchester Piccadilly, West Yorkshire and the North East. The current franchise was awarded in February 2004 and runs until 2012 with an option for a five-year extension dependent on performance.

3.2.5 London Midland

London Midland operates services from Liverpool Lime Street to the West Midlands. The franchise was awarded in November 2007 and, subject to achievement of performance targets, runs until September 2015.

3.2.6 East Midlands Trains

The East Midlands Trains franchise was formed in November 2007 and, subject to achievement of performance targets, runs to March 2015. Part of the Stagecoach Group PLC, East Midlands Trains runs services from Liverpool Lime Street to Manchester and the East Midlands.

3.2.7 Virgin Trains

Virgin Trains operates long distance services on the West Coast Main Line from Liverpool Lime Street to London Euston, as well as to a number of stations on the West Coast Main Line. The franchise was awarded for a 15-year period from 1997 to March 2012.

Figure 3.2 – Service frequency by TOC*

TOC	Service	Frequency
Merseyrail	West Kirby – Liverpool Loop	4 tph
	New Brighton – Liverpool Loop	4 tph
	Chester – Liverpool Loop	2 tph (4 in peak)
	Ellesmere Port – Liverpool Loop	2 tph (4 in peak)
	Southport – Liverpool Central	4 tph (6 in peak)
	Hunts Cross – Liverpool Central	4 tph
	Ormskirk – Liverpool Central	4 tph
	Kirkby – Liverpool Central	4 tph
Northern	Preston – Ormskirk	Less than hourly
	Manchester Victoria – Kirkby	1 tph
	Manchester Victoria/Warrington Bank Quay – Liverpool Lime Street	2 tph
	Wigan North Western – Liverpool Lime Street	Up to 3 tph
	Wigan Wallgate – Southport	2 tph
	Manchester Airport – Liverpool Lime Street	1 tph
	Manchester Oxford Road – Liverpool Lime Street	2 tph
Arriva Trains Wales	Shrewsbury – Chester	1 tph
	Wrexham – Bidston	1 tph
	Chester – Manchester Piccadilly via Warrington	1 tph
	Llandudno Jn – Chester	2 tph
Virgin Trains	London Euston – Liverpool	1 tph (2 in peak)
London Midland	Birmingham New Street – Liverpool	2 tph
East Midlands Trains	Norwich – Liverpool	1 tph
TransPennine Express	North East/West Yorkshire – Manchester Piccadilly – Liverpool	1 tph

*June 2008 timetable

3.3 Integrated Transport Authority

3.3.1 Merseytravel

Merseytravel is the operating name of the Merseyside Integrated Transport Authority (ITA) and Executive. Merseytravel has wider powers than most other ITAs and is the specifier of the franchise for the Merseyside area rather than the DfT.

Merseytravel coordinates public transport through partnership initiatives, with the aim of delivering a fully integrated and environmentally friendly public transport network. Merseytravel also invests in developing new stations and refurbishing older ones.

3.4 Freight operators

The following freight train operators run services over the lines adjacent to the area covered by this RUS:

3.4.1 DB Schenker

DB Schenker (formally EWS) is the largest rail freight operator in the UK and also has a licence to operate European services.

3.4.2 Freightliner Heavy Haul Limited

Freightliner Heavy Haul is a significant conveyor of bulk goods, predominantly coal, construction materials and petroleum. There is a regular flow of traffic from Ellesmere Port to Fiddlers Ferry power station.

3.4.3 Freightliner Limited

Freightliner Limited is the largest rail haulier of containerised traffic, predominantly in the deep sea market.

3.5 Passenger market profile

3.5.1 Background

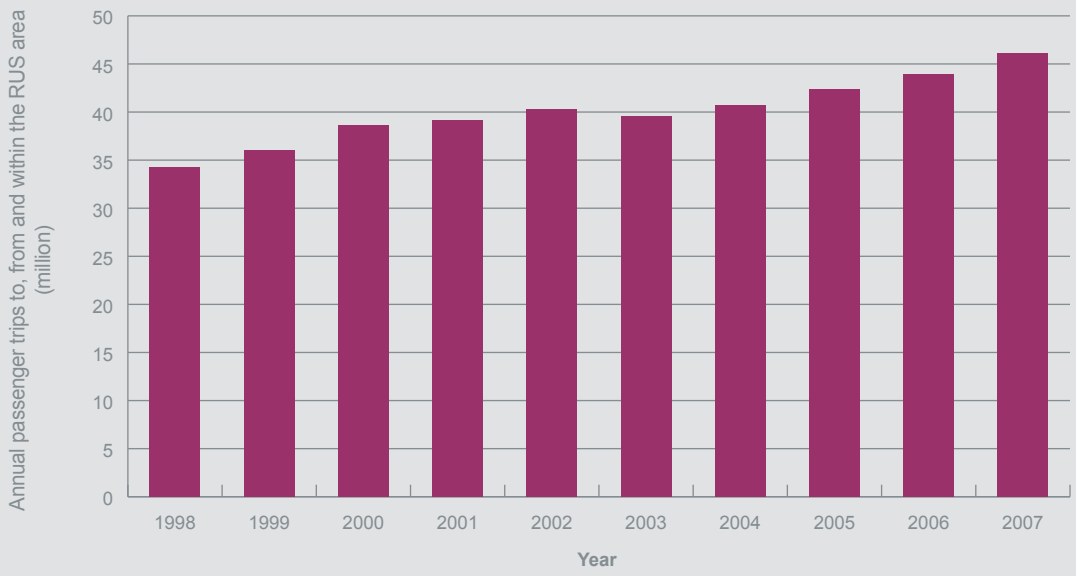
The geographical area covered by this strategy is quite small relative to other RUS areas but, despite this, there is a population of around 2.2 million people. The most densely populated areas are in or around the city of Liverpool which is the centre of the Merseyside sub-region and a major UK city. Other larger towns and cities towards the geographical periphery of Merseyside such as St Helens, Chester and Southport also have large resident populations, and the majority of the RUS area can be described as residential.

The economy of Liverpool in particular still shows signs of the post-war decline that afflicted Merseyside and the north west region as a whole, with most economic indicators lower than the national average. However, there has been a significant and sustained recovery in recent years as a result of an extensive programme of investment in all facets of infrastructure and commerce. An example of this is the flagship £1 billion Liverpool One retail development close to the site of Liverpool Central station, which has recently opened to the public. Liverpool was the 2008 European Capital of Culture, and as well as increased visitor numbers in the short term, local stakeholders believe that this status will leave a legacy of affluence and improved economic performance.

Investment in Liverpool and a growing economy has stimulated an increased demand for rail travel, and the fast and frequent rail service provided on the majority of the network is ideal for the passenger market. Passengers regularly travel by train for a variety of purposes including commuting to and shopping in central Liverpool, as well as to visit other major attractions in Southport and Chester.

Figure 3.3 illustrates the number of passenger trips made to, from and within the RUS area over the last 10 years[1]. Over this period the number of journeys has increased from around 34 million per annum to over 46 million per annum, which is an increase of 34 percent or 3.3 percent per annum.

Figure 3.3 – Historical passenger demand



3.5.2 Passenger demand – whole RUS area

A comprehensive understanding of the demand for the different rail market segments provides the basis for determining the optimal combination of services and infrastructure investment. The passenger demand baseline for the RUS has been produced using 2007 LENNON ticket sales data, supplemented with Merseytravel ticket sales and passenger count data. Figure 3.4 following details a summary of the split of passenger trips by area and Figure 3.5 shows the busiest stations.

Of the 46.1 million journeys made nearly 56 percent started or ended in central Liverpool, of which 21.8 million (48 percent) are between the Merseytravel area and central Liverpool and the remaining 3.9 million (8 percent) between other parts of the UK and central Liverpool.

Approximately 7.8 million trips starting or ending in central Liverpool were made on weekdays during peak periods, which is around 30 percent of the total. This proportion is similar to a number of other majority conurbations outside of London, and is indicative of a sizable commuter market.

1 Based on the growth rate recorded in the Merseytravel Annual Passenger Services Monitor.

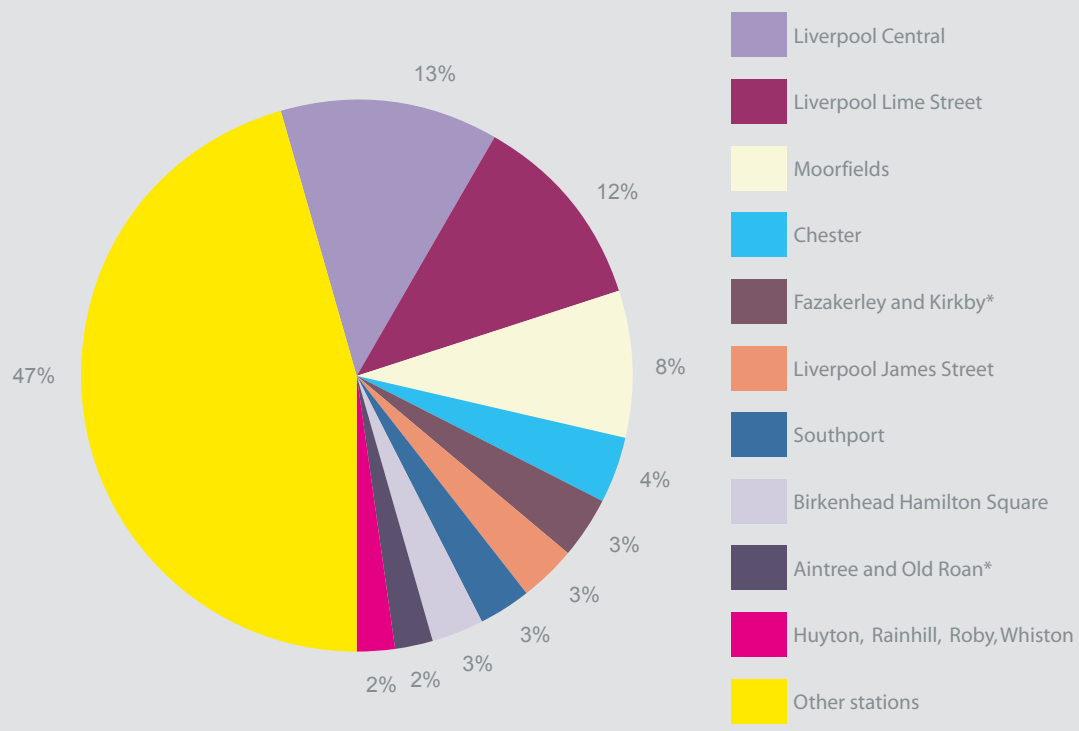
Of the remaining 20.4 million trips (44 percent of all trips) that do not start or end in central Liverpool, 11.9 million (26 percent of all trips) were between stations in Merseyside, and 8.5 million (18 percent of all trips) were between other parts of the UK and Merseyside.

Fifty-three percent of all journeys start or end in the 10 busiest stations in the RUS area, with the remaining 107 stations accounting for just 47 percent of journeys. The busiest station is Liverpool Central with approximately 15 million trips per annum.

Figure 3.4 – Annual passenger journeys

Journey between	Annual passenger journeys (peak in brackets) (million)
Merseyside – Liverpool	21.8 (6.9)
Rest of UK – Liverpool	3.9 (0.9)
Rest of Merseyside – Rest of Merseyside	11.9 (4.0)
Rest of UK – Rest of Merseyside	8.5 (2.4)
Total	**46.1 (14.2)**

Figure 3.5 – Top 10 busiest stations



*Grouped together due to the close proximity and shared catchment area

3.5.3 Passenger demand – short distance market

The geographical scope of the RUS covers the Liverpool commuter and retail catchment area which includes most places within a 15 to 20-mile radius. All stations within this area are served by branches of the Northern Line, Wirral Line and City Line. Figures 3.6 – 3.11 provide a summary of the number of trips between central Liverpool and the stations on these lines.

The Northern Line is the busiest in the RUS area with approximately 12.3 million trips made between stations on the line and central Liverpool each year. The branches to Southport and Ormskirk carry the most Liverpool passengers with 4.2 million and 3.7 million respectively, whereas the branches to Hunts Cross and Kirkby are slightly less well used with 2.3 million and 2.1 million passengers.

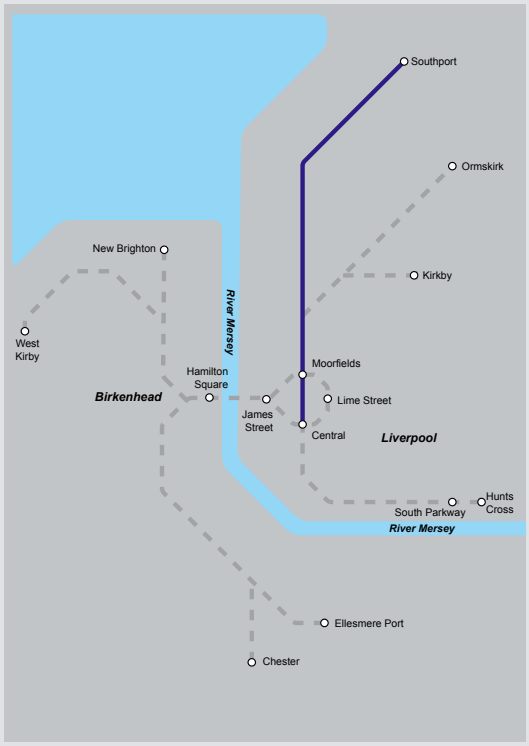
The Wirral Line is the next busiest with around 6.2 million passenger journeys between stations on the line and central Liverpool. The Chester and West Kirby sections are the most heavily used with 2.8 million and 2.5 million Liverpool journeys respectively.

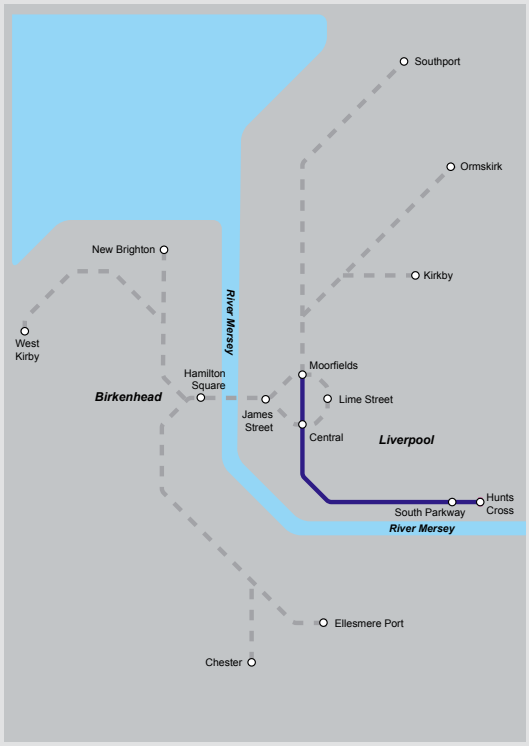
The City Line has the fewest number of trips between the RUS area and central Liverpool with approximately 3.4 million per annum. The branch line from Newton-le-Willows and Warrington Bank Quay is the most heavily used with around 1.8 million journeys.

Figure 3.6 – Annual passenger trips between the Northern Line and central Liverpool

Branch on the Northern Line	Annual trips to and from central Liverpool (million)
Southport – Liverpool	4.2
Ormskirk – Liverpool	3.7
Kirkby – Liverpool	2.1
Hunts Cross – Liverpool	2.3
Total	**12.3**

Figure 3.7 – Illustration of the Northern Line





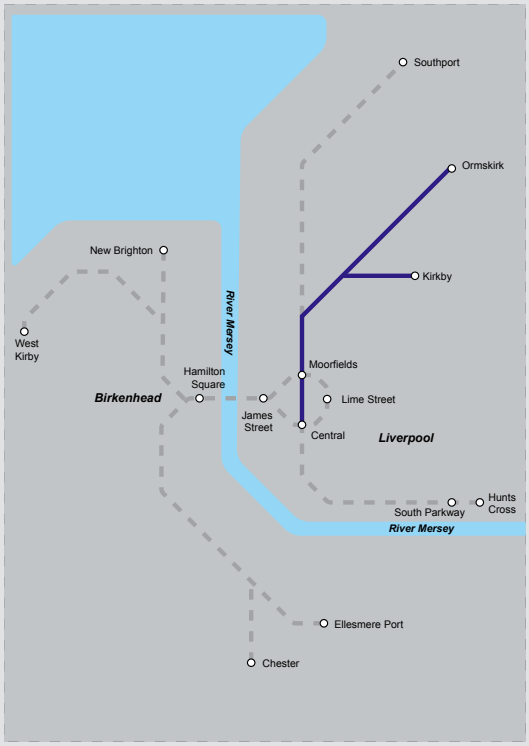


Figure 3.8 – Annual passenger trips between the Wirral Line and central Liverpool

Branch on the Wirral Line	Annual trips to and from central Liverpool (million)
New Brighton – Liverpool	0.8
West Kirby – Liverpool	2.5
Chester – Liverpool	2.8
Ellesmere Port – Liverpool	0.1
Total	**6.2**

Figure 3.9 – Illustration of the Wirral Line

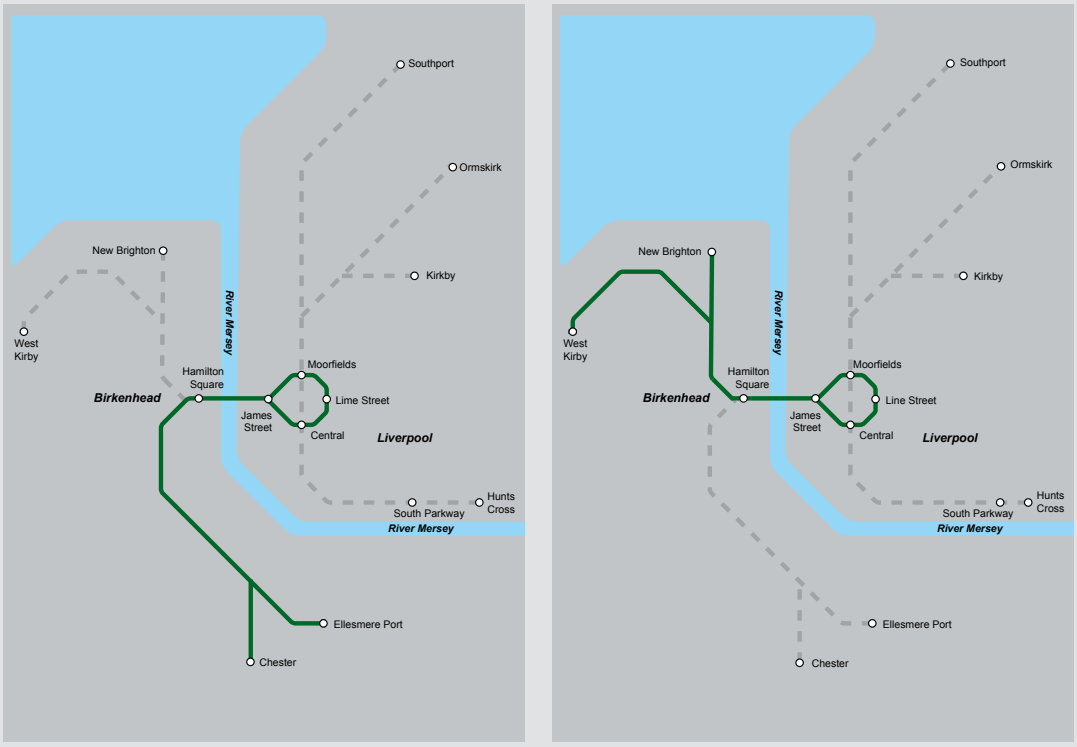


Figure 3.10 – Annual passenger trips between the City Line and central Liverpool

City Line route into Liverpool	Annual trips to and from central Liverpool (million)
Wigan – Liverpool	0.8
Newton-le-Willows/Warrington Bank Quay – L'pool	1.8
Warrington C/Runcorn – Liverpool	0.8
Total	**3.4**

3.5.4 Passenger demand – regional and long-distance travel

The most trips made, excluding stations in the RUS area, were between Liverpool and Greater Manchester at approximately 1.2 million annually. This is around 30 percent of all journeys between Liverpool and the rest of the UK, and when trips to and from Lancashire and the rest of the North West Region are included this figure increases to 45 percent.

There are also a significant number of trips made between Liverpool and London and the South East (0.5 million) and Yorkshire and Humber (0.4 million). Figure 3.11 details the split of journeys between Liverpool and stations outside the RUS area.

Figure 3.11 – Annual passenger journeys between Liverpool and the rest of the UK

Origin/destination outside of Merseyside	Annual passenger journeys (million)
Greater Manchester	1.2
London and South East	0.5
Yorkshire and Humber	0.4
West Midlands	0.3
Rest of North West	0.3
Preston/Lancashire	0.3
Wales excluding the Wrexham Line	0.2
Wrexham Line Stations	0.1
Scotland	0.1
Rest of UK	0.6
Total	**3.8**

3.6 Freight market profile

3.6.1 Background

Within the UK, rail's market share is growing year on year, up from 10 percent to 12 percent 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 impact on the economics of longer distance lorry journeys. Environmental issues and global warming have also become more significant factors, particularly following the Stern report on climate change published in 2006.

Some freight operators believe that the future freight demand published in the 2007 Freight RUS has been underestimated. An updated set of freight growth figures will be published in due course. In the meantime, the growth forecasts published in the Freight RUS have been used.

There is a significant level of freight traffic on lines adjacent to the RUS area and this continues to grow (see Figure 3.12).

3.6.2 Major flows

Coal

Coal remains the dominant fuel used for generating electricity in the UK. With the continuing increase in gas and oil prices, and the long lead times for planning and construction of any new 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 (near Widnes), but also serve power stations at Ironbridge and Ratcliffe. In addition, the new coal terminal at Ellesmere Port loads three coal services per day that operate to Fiddlers Ferry.

There has been large investment around the country in Flue Gas Desulphurisation (FGD) plants at a number of power stations, including Fiddlers Ferry. FGD plants work by removing the sulphur dioxide from the emissions and make the plants more environmentally friendly. These FGD plants require an input of limestone and produce gypsum as a by-product potentially creating new freight flow opportunities.

Intermodal

The total volume of container traffic in the UK is increasing and rail is increasing its modal share of this market. Existing services link the Channel Tunnel and the ports of Southampton, Felixstowe, Tilbury with Ditton and Garston in Liverpool. The rail-linked container terminal at Seaforth provides links from shipping lines calling at Liverpool into the UK rail network. Large intermodal containers are increasingly favoured by shipping companies, with the percentage of 9'6" high containers increasing from 28 percent of deep sea containers arriving in UK ports in 2002 to 35 percent in 2004. This has implications on the gauge clearance of routes into intermodal terminals.

There are aspirations for additional intermodal freight terminals, as well as further development of existing terminals, in the Merseyside area. These include:

- an extension of Ditton on the WCML between Allerton Junction and Runcorn
- Port of Weston – near Runcorn (Folly Lane).

Automobiles

Within the Merseyside area there are two major car production plants, one at Halewood (Jaguar/Land Rover) and one at Ellesmere Port (GM). There is also an automobile terminal at Speke which forms a key point for imported cars as well as those produced for export, via Washwood Heath to Southampton.

Metals

There are a number of steel and metal for recycling flows on the RUS area. Dee Marsh receives a stable flow of three steel trains per day from South Wales. The Port of Liverpool also deals with metals for recycling and paper in addition to the intermodal traffic.

Other

Other freight flows include traffic between Knowsley (Kirkby) and Warrington (and other locations) and St Helens Freight terminal. Warrington Arpley Yard is also a key hub for freight traffic in this area. During 2008, paper traffic from UPM Shotton restarted to Barking and currently operates two trains per week.

Discussions are ongoing with end customers regarding potential new connections at Ince and Capenhurst (see Figure 3.13).

The reinstatement of the Olive Mount chord (near Broad Green), as recommended in the North West RUS, took place in December 2008. This chord provides an additional link between the Chat Moss Line and the Bootle Line. This allows freight trains originating from the West Coast Main Line to enter Liverpool docks without reversing and conflicting with services in the Edge Hill area. This scheme has delivered a capacity benefit (by enabling more trains to serve Seaforth), a performance benefit (by minimising conflicting movements across passenger lines), and increased the loading gauge to W10 (allowing larger containers to be transported).

Figure 3.12 – Freight terminals by commodity

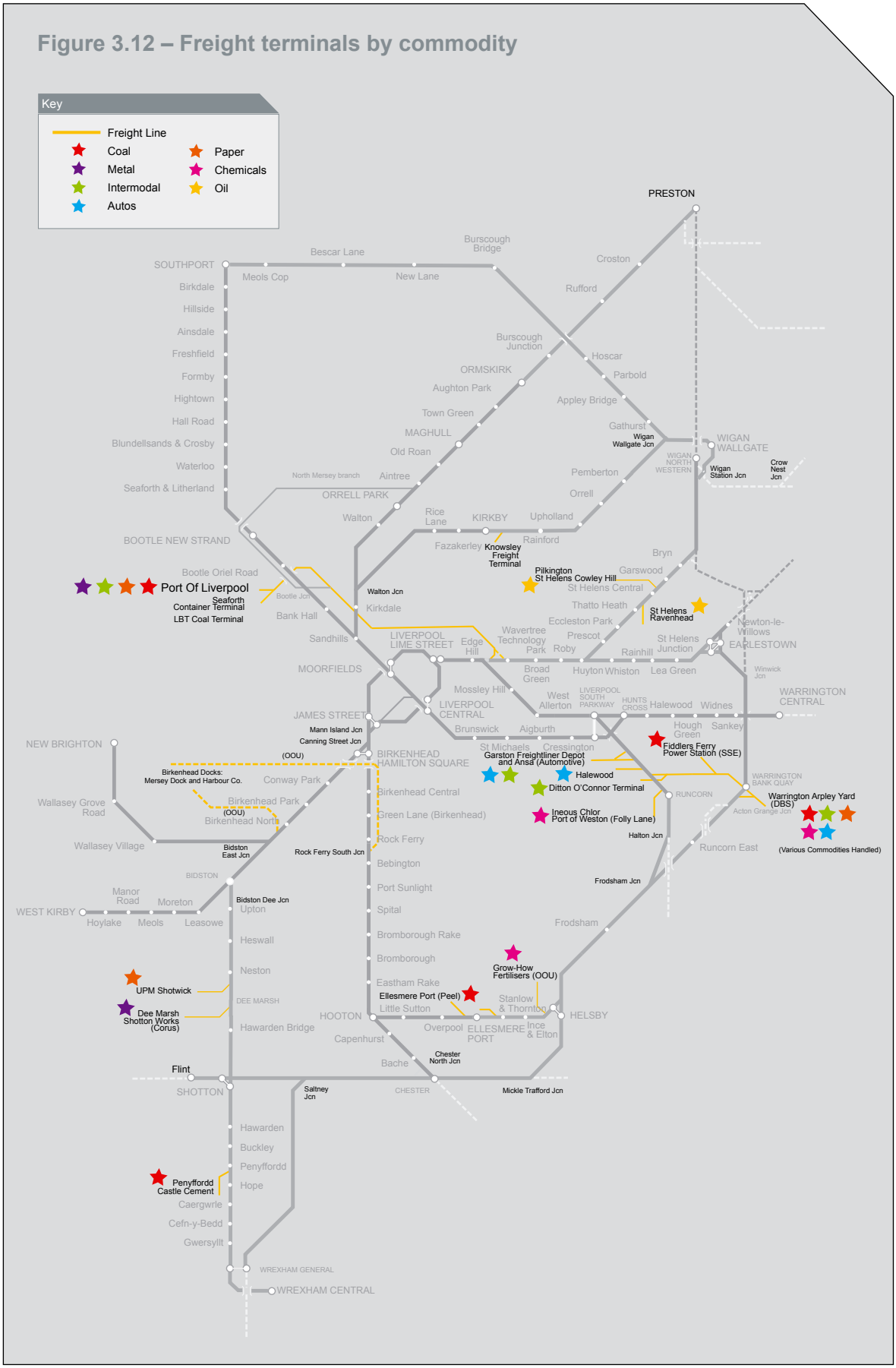


Figure 3.13 – Current average freight flows per day on sections of the network

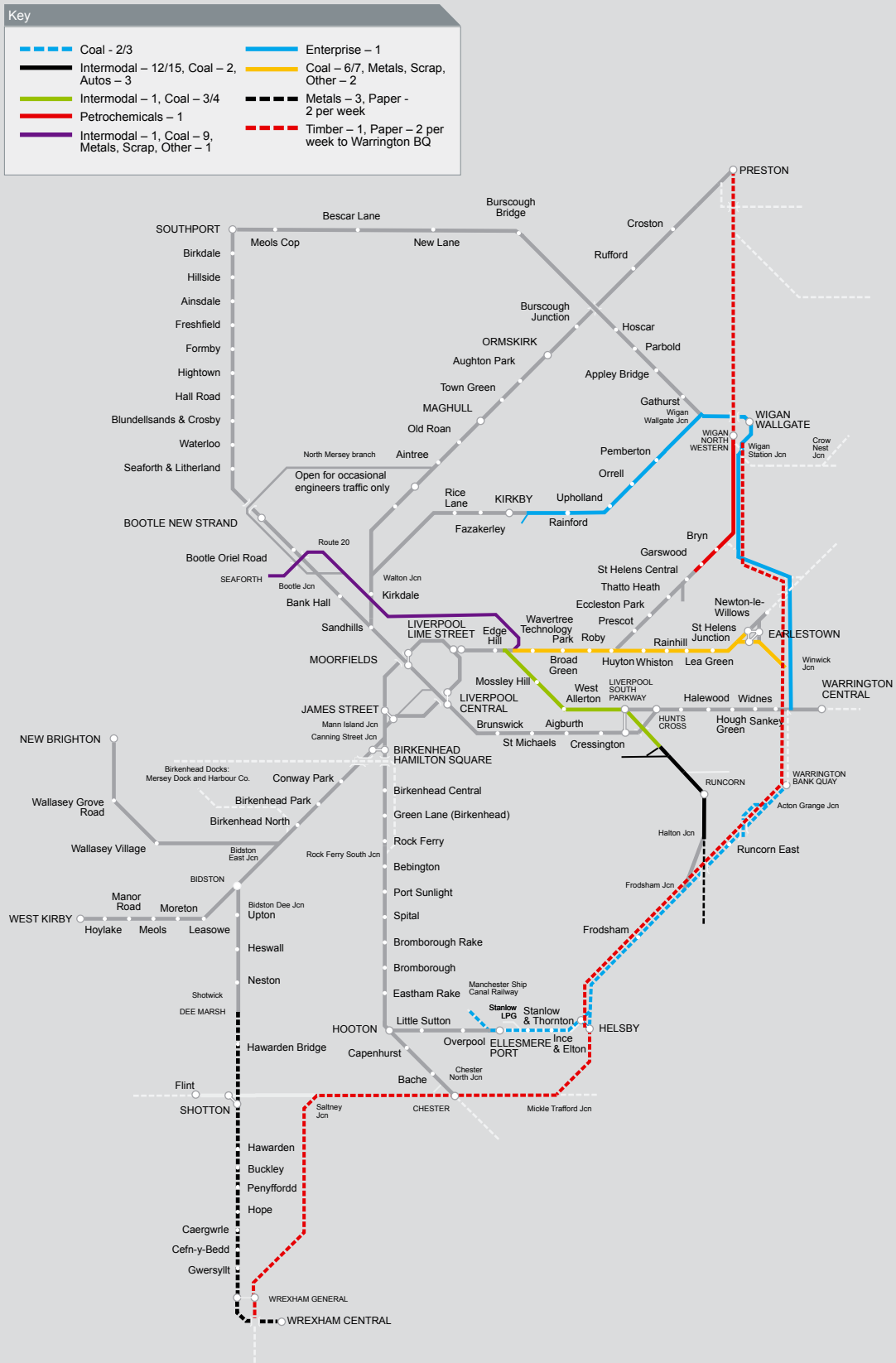


Figure 3.14 – Planning headways

Source: Network Rail 2006/07 Rules of the Plan

3.7 Merseyside rail network

3.7.1 Planning headways

The headway is a measure of how closely (in time) one train can follow another. Within the RUS area, the headways vary depending on the type of signalling equipment and track layouts. Through the central loop line, headways are two minutes or less. In some of the more remote areas (eg. Bidston to Dee Marsh) there are long absolute signalling block sections where headways are up to 22 minutes. There are also a number of single-line sections, which impose constraints due to lack of track capacity, eg. Ormskirk to Midge Hall. Any single lines that exist restrict the number of services that can run on the route and can be a performance risk (see Figure 3.14).

A large amount of the current signalling equipment is modern colour light signals, using three-aspect signalling, controlled by the Merseyrail signalling centre located at Sandhills. However, there are some stretches of signalling that are controlled by the older absolute block signalling which means that the trains cannot travel so close to each other because of the long sections of line (see Figure 3.15).

The following routes are absolute block sections in the RUS area:

- Wigan Wallgate to Meols Cop
- Wigan Wallgate to Rainford Jn signal box
- Garswood to Huyton
- Mickle Trafford signal box to Norton signal box
- Hooton South Jn to Ellesmere Port
- Ellesmere Port to Helsby Jn
- Wrexham Exchange Jn to Dee Marsh Jn signal box
- Dee Marsh Jn signal box to Bidston Dee Jn.

3.7.2 Linespeeds

The prevailing line speed in most route sections is either between 30mph and 45mph, or 50mph to 60mph. All of the electric passenger rolling stock, however, is capable of 75mph, with the interurban diesel units capable of 90mph and above. There is a mix of speeds in the RUS area and a number of routes along which the linespeed varies. This can be inefficient in terms of capacity and journey time, depending on rolling stock types and stopping patterns. This is especially true for the interurban services, which do not stop as regularly as local services. Notable areas of low linespeed (between 5 – 25mph) are between Wigan Wallgate and Wigan Wallgate Jn, from Canning Street towards Conway Park, between Dee Marsh and Shotton and between Southport and Meols Cop (see Figure 3.16).

3.7.3 Key junction speeds

The majority of the junction turnout speeds are 20mph and below. Deceleration from linespeed and subsequent acceleration back to linespeed after crossing a junction costs time and capacity. Some of the lower junction speeds are as a direct result of track geometry and curvature. A highly utilised junction with a low linespeed is a potential performance risk (see Figure 3.17).

3.7.4 Electrification

The Merseyrail network is electrified using 650/750V DC conductor rails. The conductor rail network is split into two distinct systems: Wirral Lines and Northern Lines, both of which have their own traction power supplies. The power supplies feeding the conductor rail network also provide power for tunnel lighting, loop and river bed pumping installations, depots and underground stations, including lifts and escalators. The West Coast Main Line to Liverpool and the North is AC 25,000V overhead line electrified (see Figure 3.18).

Figure 3.15 – Signalling boundaries

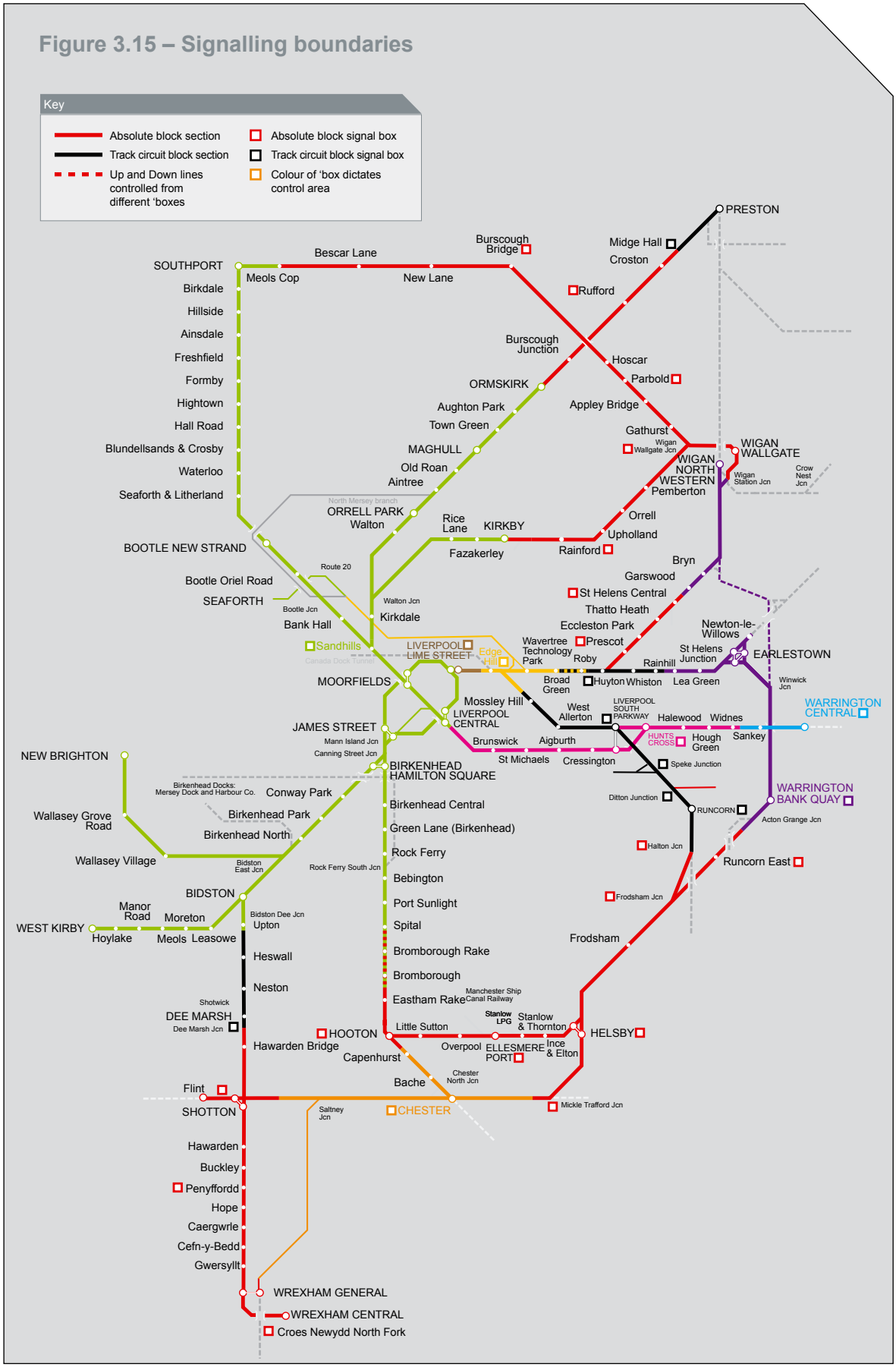


Figure 3.16 – Linespeeds

Source: Network Rail Sectional Appendix (LNW North) 2008

Figure 3.17 – Key junction speeds

Figure 3.18 – Electrification

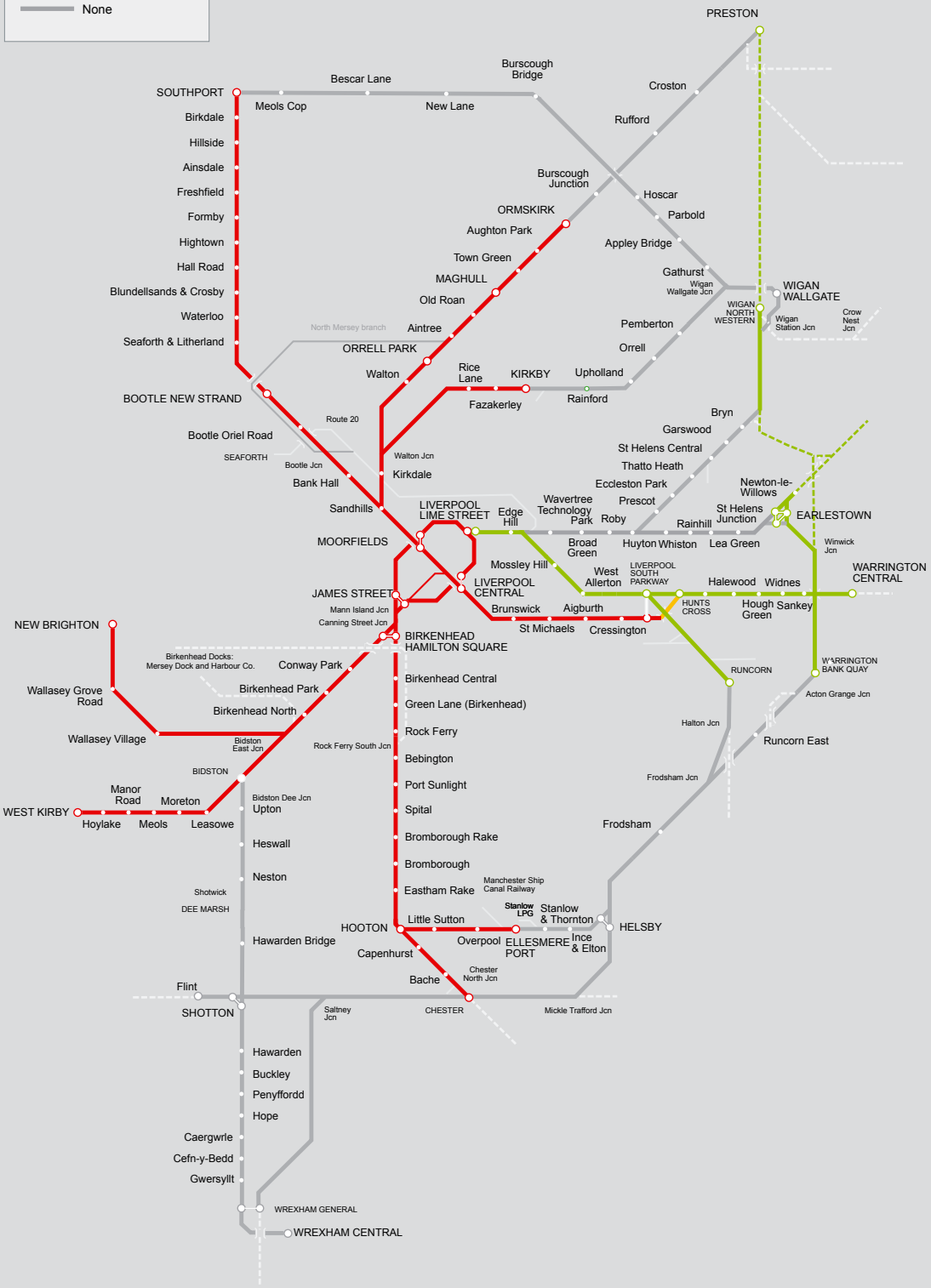
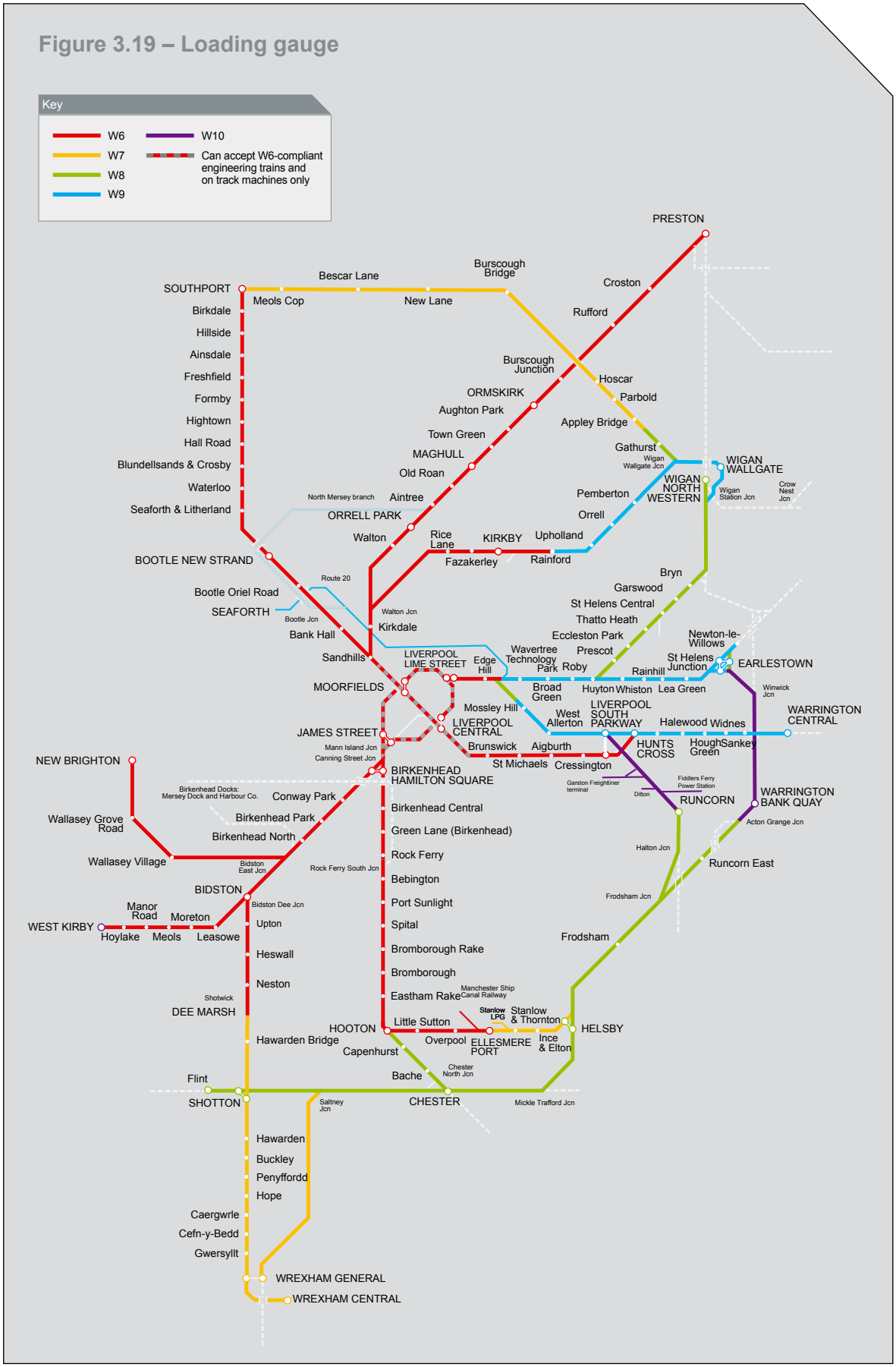


Figure 3.19 – Loading gauge



3.7.5 Loading gauge

The loading gauge relates to the height and width of traffic on a route. The gauge evolves as new types of flows emerge. In the RUS area, gauge ranges between W6 to W10 with the majority of the route – W6. The largest of these, W10, allows the carrying of the largest containers on conventional sized wagons. As can be seen in Figure 3.19 most of the sections are quite restrictive, and therefore not very attractive for both current and future freight traffic. In general, freight companies encourage the need for improved loading gauge clearance to support terminal access for rail freight.

3.7.6 Route Availability

The Route Availability (RA) of a specific route is determined by the carrying capability of both its structures and its track. It is a proxy for axle load. Most of the RUS area is RA7–9, although there is a small section of RA6 between Birkenhead and New Brighton. When RA9 – 10 traffic is required to run, routes are controlled by special dispensations which dictate the route taken and often contain speed restrictions over specific structures (see Figure 3.20).

3.7.7 Loop lengths

There are a small number of loops in the RUS area. The longest loop in the area is the Up goods loop at Frodsham Junction signal box at 473 metres. This means that there are no loops in this area that are currently long enough to take any freight train running at the Freight Operator's target train length of 775 metres.

3.7.8 Platform lengths

Across the RUS area there are a range of platform lengths. The shortest platform length on a corridor is normally the constraint on train length. The only ways around this constraint are to lengthen the platform, adopt selective door operation or skip stop longer trains. The Merseyrail electric network is able to handle six-car units throughout; on the lines adjacent to the RUS area the platform lengths are more variable. The RUS area has been divided into (a) Merseyrail lines and (b) Other lines due to the different length of vehicles serving the lines. On the Merseyrail lines vehicles are 20 metres in length and trains are formed of three or six vehicles. On the other lines vehicles may be up to 23 metres in length and one train is normally formed of two or four vehicles (see Figure 3.21).

Figure 3.20 – Route Availability

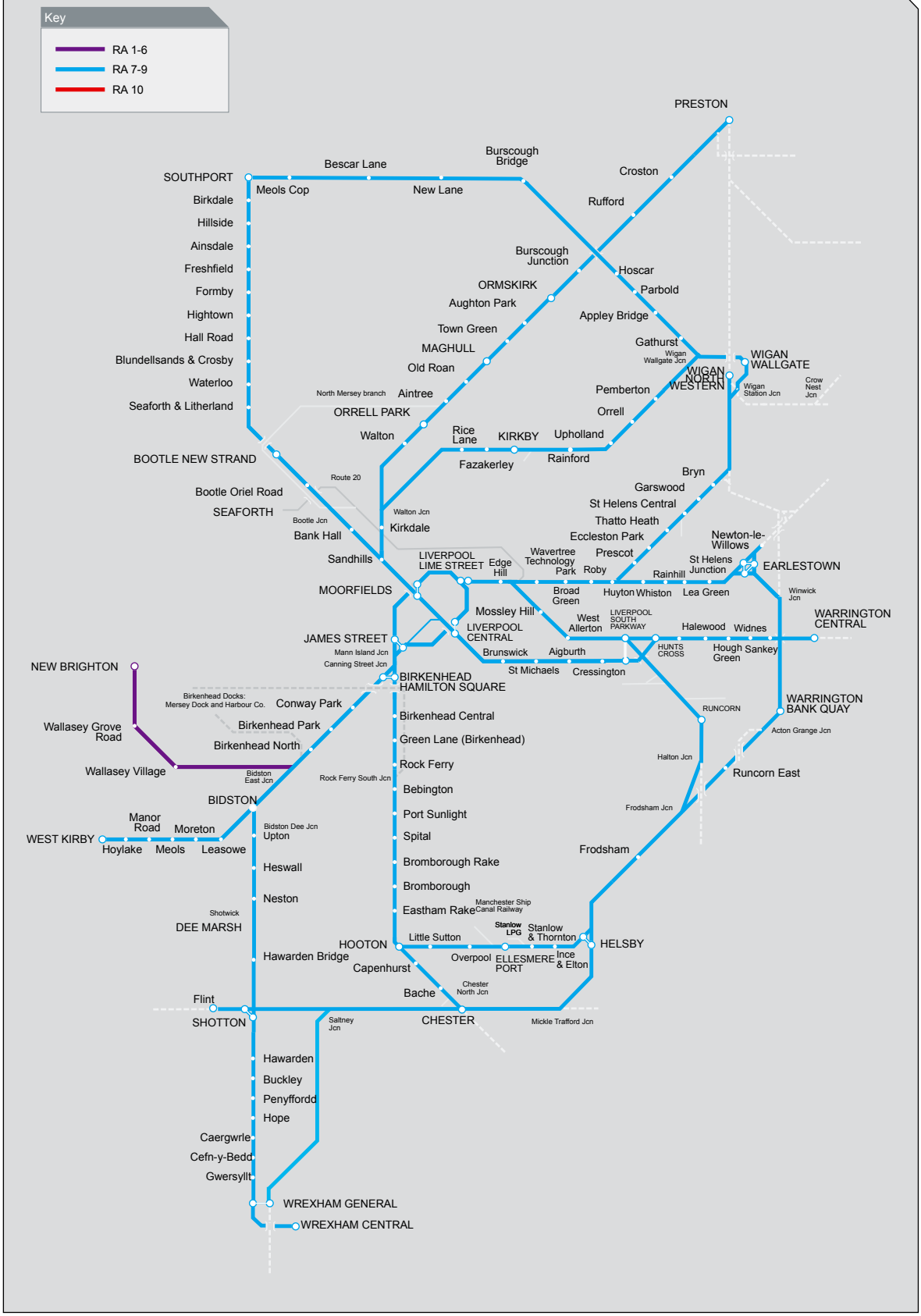


Figure 3.21 – Platform lengths

Figure 3.22 – Car parks

3.7.9 Station facilities

Across the RUS area there are a variety of different sized stations serving different purposes. As a rule, the bigger the station the better the facilities; smaller stations can suffer from a lack of facilities and this can discourage rail use. Of particular concern to passengers are disabled access, car parking and customer information systems. There has been a concerted effort to improve security around the network in order to reduce fare evasion and anti-social behaviour. Seven of the busiest stations have electronic gates installed: Central, Lime Street, Moorfields, Hamilton Square, James Street, Southport and Conway Park.

Network Rail is currently working with TOCs, Merseytravel and Local Authorities to improve station facilities at a variety of locations. Network Rail is also working closely with stakeholders on the National Station Improvement Programme (NSIP). This work stream is dependent on the Network Rail regulatory settlement for the period 2009 – 2014. The final determination was announced in October 2008. The industry has made good progress in advance of this decision in identifying the station portfolio.

3.7.10 Car parking

In general terms, the RUS area has approximately half the number of car parking spaces per stations as the West Midlands area, and twice as many car park spaces per station as the Manchester area. It should be noted that almost half of the stations have no car park facilities, whilst only a few stations have car parks with more than 100 spaces. The RUS has not collected data on alternative parking facilities near the stations; however, station car parks generally fill up early. This leads to a significant amount of on-street parking which can cause inconvenience to local residents. Disabled spaces are shown in brackets in Figure 3.22.

Merseytravel commissioned research in 2007 into modal split of passengers travelling to railways stations. This showed that approximately 20 percent of people drive to and park at stations across the Merseyrail network, while a further 10 percent of people are dropped off by car.

3.7.11 Walking and cycling

The ability to reach a station on foot or by cycling is accepted as the most sustainable way to access the rail network. This can be encouraged through providing safe routes to the stations for cycling and walking and the provision of adequate cycling storage at the stations. It is important that this is secure to prevent vandalism and theft. Merseyrail allow passengers to arrive with a bicycle at any time and will transport it for free.

The Merseytravel modal research showed that 60 percent of passengers access stations by walking, while only one percent cycle (see Figure 3.23).

Figure 3.23 – Cycle facilities

3.7.12 Integration with other public transport modes

Car ownership in the RUS area is lower than the national average, but increasingly growing. Therefore it is important to enable alternative modes of access to stations. Establishing a fully integrated transport network is a key priority for the “Merseyside Local Transport Plan 2006 – 2011” and the rail industry. It is also important to facilitate onward travel from the destination station. Improving public transport integration is important both in terms of commuting and alleviating social deprivation. Enabling rail users to access the network via sustainable modes of transport is essential in future environmental strategy and will help improve air quality, reduce traffic in city centres and tackle climate change. The map in Figure 3.24 highlights those stations that have a bus interchange or accessible bus stops. There is currently an issue with poor bus/rail interchange facilities on the network, together with poor bus/rail connections. The modal share study showed that six percent of passengers arrived at stations by bus (see Figure 3.24).

3.7.13 Journey times

For the RUS a sample of journeys were analysed and the journey time recorded for the various modes. In all journeys analysed, the rail travel time is less than the equivalent journey time by bus and in the majority of journeys compared, the travel time by rail compared favourably to the travel time by car, and in many cases was faster. However there were some notable examples where rail currently compares poorly to road. These are:

- North Wales to Liverpool City Centre
- Chester to Liverpool City Centre
- Helsby to Liverpool City Centre.

According to data for the Merseyside Local Transport Plan, rail accounts for five percent of journeys to work in the whole of the Merseyside area, while rail accounts for 15 percent of journeys to work into Liverpool City Centre. In both cases the dominant mode of transport is by car.

3.7.14 Rolling stock unit diagrams

The current Class 507/508 three-car Merseyrail electric fleet consists of 59 units. The diagrammed requirement is (September 2008 timetable):

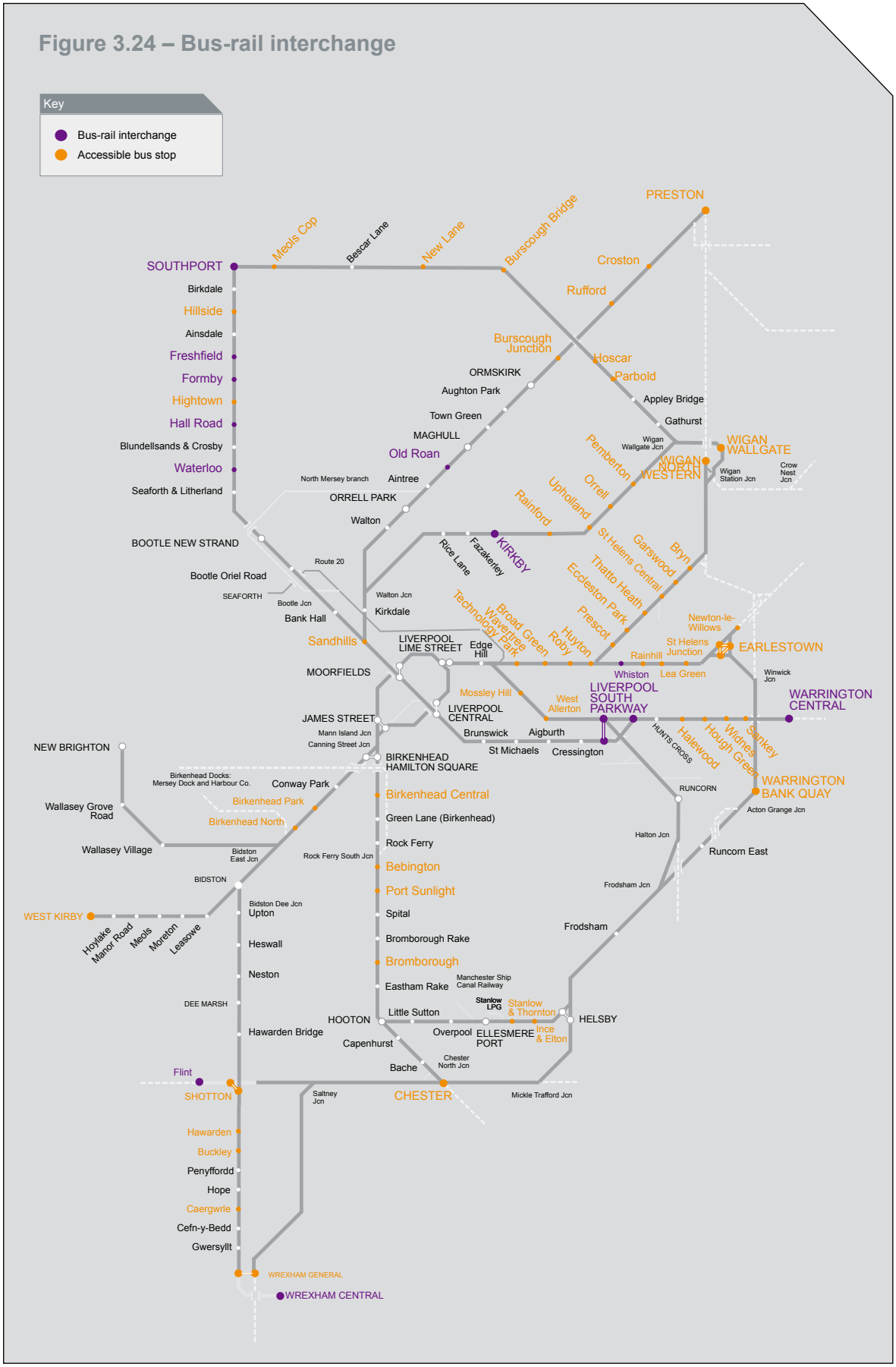
- Monday to Friday: there are 49 traffic diagrams in service with two traffic spare diagrams and eight planned to be out of service (for heavy maintenance and tyre turning work)
- on Saturdays: there are 31 traffic diagrams in service with 18 traffic spare diagrams and eight units on maintenance
- on Sundays: there are 20 traffic diagrams in service with 29 traffic spare diagrams and eight units on maintenance.

Most services are three-car formation, but additional services and certain strengthening to six-car formations are operated at peak times as required to satisfy customer loadings.

The spare traffic diagrams at weekends are utilised to run additional services or strengthen in conjunction with special events (eg. Open Golf, Aintree race meetings or football matches), or where it is known there will be increased traffic flows.

The rolling stock diagram overview is a particularly important consideration for the Merseyside RUS. Issues such as train strengthening and rolling stock replacement are key areas that will help any identified gaps, eg. addressing issues such as overcrowding.

Figure 3.24 – Bus-rail interchange



3.7.15 Rolling stock

The main rolling stock deployed on services in the RUS area is the Class 507 and 508 multiple units which are 750-volt, DC, third-rail electric trains, which can run at a maximum speed of 75mph. These three-car suburban units were built between 1978 and 1980 and have played a major part in the success of the Merseyrail transport system. At the end of the 1990s a programme of refurbishment was undertaken, costing £32.5 million, whereby the 59-train fleet was overhauled. This boosted passenger comfort, actually reducing capacity in each vehicle by 14 seats, by removing the old 3+2 seating and introducing new 2+2 high back facing seating. At the same time wheelchair access was introduced together with spaces for cycles which are now carried free of charge to encourage the use of cycles in the Merseyside area. The existing Merseyrail electric rolling stock will be at the end of its useful life by 2014 and will need to be replaced. This is discussed further in Chapter 4 – section 4.5.

3.7.16 Rolling stock depots and stabling

There are five depots in or adjoining the RUS area which maintain and service rolling stock. These are located at:

- Kirkdale, which undertakes minor repairs and rolling stock cleaning activities and is the main location for the stabling of the Merseyrail electrics fleet
- Birkenhead North, which focuses on routine maintenance and major overhaul of the Merseyrail electric fleet and has limited stabling facilities
- Chester, which is an Arriva Trains Wales depot. This depot has been considered by the Wales RUS
- Liverpool Train Care Centre at Edge Hill, which is operated by West Coast Train Care and (with other depots), maintains the Class 390 'Pendolino' fleet for WCML services operated by Virgin Trains
- Allerton, which is a currently 'out of use' DB Schenker facility and used as a storage yard. It has the potential to provide additional depot and stabling facilities in the North West area due to its central location.

There are a number of stabling locations across the RUS area, these are listed below in Figure 3.25. There is no spare capacity for stabling additional units at the maintenance depots.

The draft identified some stabling capacity at peripheral locations on the network. However, if fully utilised, this would not allow any space for shunting and preparing units and these locations have now been identified as unsuitable for further stabling due to operational constraints.

Figure 3.25 – Stabling locations and capacity

Location	Capacity currently utilised	Current spare capacity	Extra stabling capacity
Southport station/sidings	10 x 3-cars	Nil	Nil
Kirkdale depot	29 x 3-cars	Nil	Nil
West Kirby station	2 x 3-cars	Nil	Nil
New Brighton station	6 x 3-cars	Nil	Nil
Rock Ferry station	4 x 3-cars	Nil	Nil
Birkenhead North maintenance depot	6 x 3-cars stabled outside depot	Nil	Could stable 4 more 3-cars if a redundant siding was brought back into use.
Birkenhead Central sidings	2 x 3-cars	Nil	Could stable an additional 4 more 3-cars if the old carriage shed was brought back into use

Figure 3.26 – Capacity Utilisation Index

3.8 Use of the network

3.8.1 Utilisation

The Capacity Utilisation Index (CUI) is an indicative, but limited, measure of how much of the planning capacity of a section of railway is being utilised by the current timetable. In general, 50 percent means there is room for growth, 75 percent upwards means that growth is increasingly at the expense of performance and 100 percent means that in terms of train planning there is minimal capacity for growth. Figure 3.26 shows the CUI for each section of the RUS area for the busiest hour between 06:00 – 09:00 using the December 2006 timetable.

On the Merseyside RUS area, in the busiest hour, the majority of the CUI is at 40 to 60 percent plain line utilisation, but there are some areas where this is higher. Of particular note is the line between Birkenhead Hamilton Square and Chester where, for the majority of the route, the utilisation exceeds 80 percent. Other areas of higher utilisation include the line between Walton and Ormskirk and the single-line section between Fazakerley and Kirkby where utilisation is between 60 to 70 percent.

It should be noted that this type of diagram does not reflect capacity constraints at junctions which become a limiting factor to unlocking capacity. On the Merseyside RUS area there are numerous key junctions that fall into this category including Sandhills, Hunts Cross West Junction, Bidston East Junction and Walton Junction. These locations are all constrained by crossing moves due to the nature of the flat junction layouts (see Figure 3.26).

3.8.2 Station crowding

The Stakeholder Management Group (SMG) and wider stakeholders identified that the central underground stations are overcrowded at certain times of day. Particular issues were identified at Liverpool Central as well as at Moorfields and James Street. Liverpool Lime Street low level and Birkenhead Hamilton Square were not believed to have overcrowding issues.

3.8.3 Performance

The SMG established a sub-group to identify and understand the main performance issues within the RUS area. As expected, the group identified that in general terms performance over the RUS area was good, with high levels of Public Performance Measure (PPM) consistently achieved. However, it was recognised that areas of poorer performance levels correlated with capacity utilisation which encompasses a number of key factors such as restrictive layouts, single lines and short turnarounds at termination points.

The train operating companies, with support from Network Rail, continuously strive to optimise their performance within the constraints of the routes. The (franchise-wide) PPM is 95.4 percent for the Northern Line and 94.3 percent for the Wirral Line.

Figure 3.27 breaks down the PPM Moving Annual Average (MAA) for the individual service groups in the RUS area for the last 12 months.

During certain periods of 2008/09, Merseyrail continued to set new records of PPM achievement. Period 2, 2008 PPM was 97.03 percent – which was the highest period result ever delivered by Merseyrail, increasing the MAA to a record high of 95.00 percent.

3.8.4 Constraints by corridor

The Merseyside RUS area network is virtually self-contained and performance problems on the route do not tend to propagate onto other routes. The overall service provides a guaranteed regular frequency 'all stations' stops service which is very reliable and performs well. However, there are general performance issues which include:

- timetabling – increased passenger loadings are putting pressure on the 30-second dwell time at stations, particularly in the peak periods
- special events – there are a high number of special events held in what is a particularly small area. These include events such as race meetings at Aintree and Chester, golf tournaments at Birkdale and Hoylake, major football events and tall ships races. 2008 also saw Liverpool as the European Capital of Culture. These events lead to further pressure on train loadings and the need to run additional services

Figure 3.27 – Performance

Operator	Corridor	Public Performance Measure (Moving Annual Average %)
Merseyrail	Liverpool – Chester	88.74
Merseyrail	Liverpool – Ellesmere Port	94.56
Merseyrail	Liverpool – New Brighton	96.93
Merseyrail	Liverpool – West Kirby	95.83
Merseyrail	Southport – Hunts Cross	92.31
Merseyrail	Liverpool – Ormskirk	96.51
Merseyrail	Liverpool – Kirkby	97.12

- seasonal – in winter there is a risk of ice forming on the DC conductor rail during cold snaps. Railhead treatment trains apply anti-icing fluid to the rail throughout this season to try to combat the risk
- environment – a significant part of the Merseyrail system lies within the relatively hostile underground environment which can lead to performance delays. Much work has been undertaken to combat these poor environmental conditions underground
- rail/wheel interface – excessive flange-wear has caused damage to vehicles in the past which has impacted on the number of units available for entering into service. Significant work has been undertaken by technical rail/wheel interface specialists to identify the root cause of this phenomenon
- leaf-fall – lineside vegetation impacts on certain route sections during the Autumn period. The Merseyrail electric fleet of class 507 and class 508 units all have 'sanders' fitted to reduce the risk
- signalling failures – there have been performance issues in the past with track circuit failures within the signalling equipment
- re-fencing – completion of re-fencing over the Merseyrail network has played a significant part in reducing instances of route crime which is a cause of significant delay in certain areas. Overbridges have been fenced and crime hotspots have been identified to enable pro-active policing of these areas.

Some of the key pinch-points and causes of delay by line of route are now discussed.

Wirral Line

On the Wirral Line there are a number of bespoke performance issues in addition to the general issues outlined previously:

- the Wirral Line loop has tight curvature and close clearances and is susceptible to water ingress
- there are tight turnarounds at Chester of four minutes which can cause delay to services
- there is only one platform currently available at Chester which can accommodate DC electrified trains
- Hooton is a high-risk location for flooding. Pumps have been installed to try and reduce the risk
- lineside vegetation on the Rock Ferry to Chester line impacts on performance during the autumn period.

Northern Line

On the Northern Line there are a number of bespoke performance issues in addition to the general issues outlined above:

- Liverpool Central station has narrow platforms which restricts the flow of passengers boarding and alighting from trains, both during peak times and during perturbation
- Hunts Cross West Junction forms a constraint on the network due to numerous conflicting moves between DC and diesel services. There are eight timetabled moves involving Merseyrail electric trains and eight timetabled moves by other operators per hour across the flat junction. In normal service this works well but in times of perturbation delays from the conflicting moves is inevitable, especially in the peak hours
- trespass and stone-throwing incidents in the Sandhills area have been an increasing problem. Regular meetings with British Transport Police have resulted in effective targeting of resources to eliminate this risk to performance
- vegetation between Brunswick and Hunts Cross impacts on performance during the autumn period.

North Wales/Chester/Liverpool

On the North Wales to Chester and Liverpool lines there are a number of bespoke performance issues in addition to the general issues outlined:

- there is no diversionary route in times of perturbation which means services cannot be re-routed if there is an incident
- there is also a 10-mile single-line section (between Saltney Junction and Wrexham North Junction) and a busy single-lead junction at Saltney Junction which can magnify the impact of any train delays
- animal incursions have been an ongoing issue that affects performance. A programme of identifying 'hot spots' and undertaking fencing renewals has been completed. In addition, a programme of 'dry stone wall' renewals has recently been completed
- trespass and vandalism has been another area of concern. There have been numerous incidents on the line. In order to mitigate this risk, British Transport Police have undertaken visits to local schools to educate younger children of the dangers of trespassing on the railway
- vegetation on the Wrexham to Bidston lines is an issue and static sandite applicators were installed in preparation for autumn at Hawarden and Shotton. In addition a devegetation programme has been undertaken
- the timetable between Wrexham and Bidston has tight turnarounds and is not robust in periods of perturbation. The track configuration at Bidston Dee Junction can cause delays between Arriva Trains Wales and Merseyrail services when even a small delay to any service can be quickly compounded due to the current track layout. This issue, coupled with the low linespeed on the route, can create the tight turnrounds.

Other lines

Wigan North Western to Liverpool services can be affected by:

- points failures at Huyton
- vandalism and cable theft
- conflict with freight services at Edge Hill.

Manchester Victoria to Kirkby line can be affected by:

- signalling token machine failures at Rainford
- trespass and vandalism issues.

The Preston to Ormskirk line can be affected by:

- level crossing misuse
- delays due to signalling token failures on the 13-mile stretch of single line.

3.8.5 Current engineering access

The standard cyclical engineering access strategy for key junctions and major component renewals, consisting of a programme of extended (29-hour) possessions, is in place.

In addition, there is a weekly access plan available to the engineer of broadly six to seven hours at weekends and four to five hours midweek between service shut-down and start-up of service. The tunnel sections are managed with nightly complete shutdowns when required. This regime is regarded as being effective from an engineering perspective and has minimal disruption to passengers. It is also suitable to deliver the maintenance compliance.

A cross industry review of the engineering access strategy is currently under way, together with evaluation of the Seven Day Railway concept being led within Network Rail by Operations and Customer Services. This is intended to be gradually implemented, where appropriate, though the impact on the Merseyrail area may be less than elsewhere due to the self-contained nature of the network. Details of Network Rail's proposals to

implement and monitor the Seven Day Railway are published in the Control Period 4 Delivery Plan (supporting documents).

3.9 Summary of generic gaps

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

3.9.1 Capacity – stations

Some of the central Liverpool underground stations on the Merseyrail network are overcrowded at certain times of the day, and forecast growth will worsen this situation. The challenges are greatest at Liverpool Central, particularly the Northern Line platforms both in terms of capacity and access, where the site is severely constrained.

3.9.2 Capacity – trains and infrastructure

The current passenger demand exceeds the available capacity during the peak period on most corridors. The peak period includes not only the morning and evening commuter periods of travel but also the Saturday afternoon leisure market for shoppers/tourists/sporting events.

In addition, forecast growth on most corridors exceeds the current network capacity. The level of infrastructure on parts of the network could be insufficient to meet the requirements of passengers and freight users over the lifetime of the RUS. In addition to track capacity, particular generic issues include the adequacy of the electric power supply and depot and stabling facilities.

3.9.3 Connectivity and journey time

Several parts of the RUS area are receiving a level of service that is inferior to other similar parts of Merseyside and the UK. Merseyrail and Merseytravel both aspire to strengthen inter-regional flows between the city regions and other centres. In particular transport links with the following areas have been identified as sub-gaps:

- connectivity between Chester and Liverpool
- connectivity and journey times between North Wales and Merseyside including John Lennon Airport
- connectivity and journey times between Wigan, St Helens and Liverpool
- connectivity between Skelmersdale and Liverpool
- connectivity between Liverpool suburbs and the city centre
- connectivity between the Ormskirk area and Liverpool
- connectivity between Birkenhead Docks and the Midlands
- connectivity between Canada Docks and the rail network.

3.9.4 Getting to the train

Nearly a quarter of passengers on the Merseyrail electric network use a car to get to the station. Car parks at many locations are full, and on-street parking around stations is common. Bus interchange is also poor at certain locations across the RUS area.

3.9.5 Train punctuality and performance

A number of timetabling and infrastructure constraints exist on the network which can cause regular and significant delay in passenger and freight services.

These have been identified as:

- intensely used sections of routes
- busy junctions
- tight turnarounds at terminus stations.

These generic gaps are discussed in more detail in Chapter 6.

4. Planned and proposed schemes

4.1 Introduction

This chapter describes the major railway enhancement and renewals schemes which are either planned (committed schemes) or proposed (uncommitted schemes) within the forecasting horizon of the RUS focussing on the next 10 years.

Where schemes are committed, this RUS takes them as given and they therefore form part of the baseline. If schemes are not committed the RUS cannot assume that they will go ahead. Instead the RUS will only consider what the effect of implementation of such projects may have on the strategic recommendations the RUS makes. It should be noted that established RUSs remain live documents, and they will be reviewed and, if necessary, updated whenever significant changes in circumstance arise.

4.2 Committed enhancement schemes

The following are the major committed schemes (see Figure 4.1) affecting the RUS:

Figure 4.1 – Committed enhancement schemes

Project	Main promoter	Implication for RUS	Stage of development
Bootle Oriel Road station	Merseytravel	Major refurbishment of station as part of the Local Transport Plan, providing improved station facilities and step-free access	Completed
James Street station upgrade	Merseytravel/ Network Rail	Improvements to station facilities and concourse	Completed
Liverpool Central	Merseytravel	Renew cladding on the Northern Line	In progress. To be delivered by Network Rail
Sandhills station	Merseytravel	Station revitalisation programme including the introduction of new lift access to the platforms, a new booking office, waiting accommodation and step free access	Completed
Moorfields station	Network Rail/ Merseytravel	Improvements to station facilities, including improved signage and improved station environment and new toilet facilities	Completed in January 2009
Southport station	Network Rail/ Merseytravel	Improvements to station facilities including upgraded concourse, new roof, improved CIS and new staff facilities	Completed in Summer 2008

Project	Main promoter	Implication for RUS	Stage of development
Passenger facilities upgrade	Merseytravel	Upgrades at: Bidston, New Brighton, Ormskirk, Wallasey Grove, Wallasey Village	New Brighton – Completed December 2008 Expected completion dates: Bidston – April 2009 Ormskirk – September 2009 Wallasey Grove – December 2008 Wallasey Village – January 2009
Access for All	Merseytravel/ DfT	Improved access at stations including Fazakerley, Hooton and Waterloo through the provision of step free access	Expected completion dates: Fazakerley – July 2009 Hooton – December 2009 Waterloo – March 2010
Car parks	Merseytravel	Car parks at Kirkby, Blundellsands and Crosby, Bromsborough and Hall Road	Completed: Kirkby – December 2008 Expected completion dates: Others – March 2010
Customer Information System (CIS)	Merseyrail/ Network Rail	New CIS monitors at five stations: Ainsdale, Blundellsands and Crosby, Hoylake, Manor Road and Moreton	Expected completion date: March 2010
CCTV	Network Rail	CCTV cameras renewal at underground stations: Hamilton Square, James Street, Moorfields, Lime Street (Underground) and Liverpool Central	Completed: December 2008

4.3 Proposed enhancement schemes

The following are the uncommitted schemes (see Figure 4.2) which, if implemented, would have a significant impact within the RUS area.

Figure 4.2 – Uncommitted enhancement schemes

Project	Main promoter	Implication for RUS	Stage of development
Liverpool Central station upgrade	Network Rail	Improve platform capacity along with access and circulation to enable Liverpool Central to handle more passengers	Passenger modelling being undertaken to determine the impact of options to improve station capacity
Liverpool Central concourse upgrade	Merseytravel/ Merseyrail	Improve concourse area environment, moving of ticket office to improve passenger circulation, part of the 5-phase Liverpool Central Masterplan	Feasibility commenced Completion – December 2010
Liverpool James Street station	Network Rail	Improve access between street level and platform level	
New station at Headbolt Lane	Merseytravel	New station and extension of third-rail electrification from Kirkby to Headbolt Lane	GRIP 3
National Station Improvement Programme (NSIP)	Network Rail supported by DfT and Third Party	The scope for stations within the RUS area currently includes: Passenger facility upgrade at Huyton and Waterloo Provision of toilets at Hall Road, Hooton, Rice Lane, Rock Ferry, Walton and Kirkdale Liverpool Central contribution to larger scheme	All schemes currently at feasibility stage, GRIP 3
Car parks	Merseytravel	New car parks at Bidston, Bebington, and second tier of car parking at Liverpool South Parkway. Park & Ride scheme at Hightown	In early stages of development
CIS	Merseytravel/ DfT	Potential new CIS at: Aigburth, Bromborough Rake, Eastham Rake, Ellesmere Port, Port Sunlight, Kirkby, Fazakerley, St Michaels and Cressington	Schemes all at GRIP 3 with feasibility work complete Awaiting matched funding from DfT to progress in 2009/10
Chester Gateway Project	Cheshire County Council	Improvement works to Chester station including possible car park extension	Feasibility study ongoing
Kirkby station	Merseytravel	Passenger facility upgrade	To be delivered subject to planning approval
Maghull North	Merseytravel	New station at Maghull North to serve the prison and local community	Feasibility currently underway. Construction planned for 2010

Project	Main promoter	Implication for RUS	Stage of development
West Kirby	Merseyrail	Platform, station frontage and stairway improvements	Outline design – March 2010
Access for All	Merseytravel/ DfT	Longer-term aspiration to make entire network fully accessible. Feasibility studies commissioned for, Port Sunlight, St Michaels, Birkenhead North, Birkenhead Park, Formby and Wallasey Village	Network Rail is undertaking GRIP 3 feasibility studies for each site
Improved Bus/Rail interchange	Merseytravel	Working with local bus operators to improve interchange with the rail network	Ongoing
Birkenhead Hamilton Square	Merseytravel	Provision of customer toilets	2009

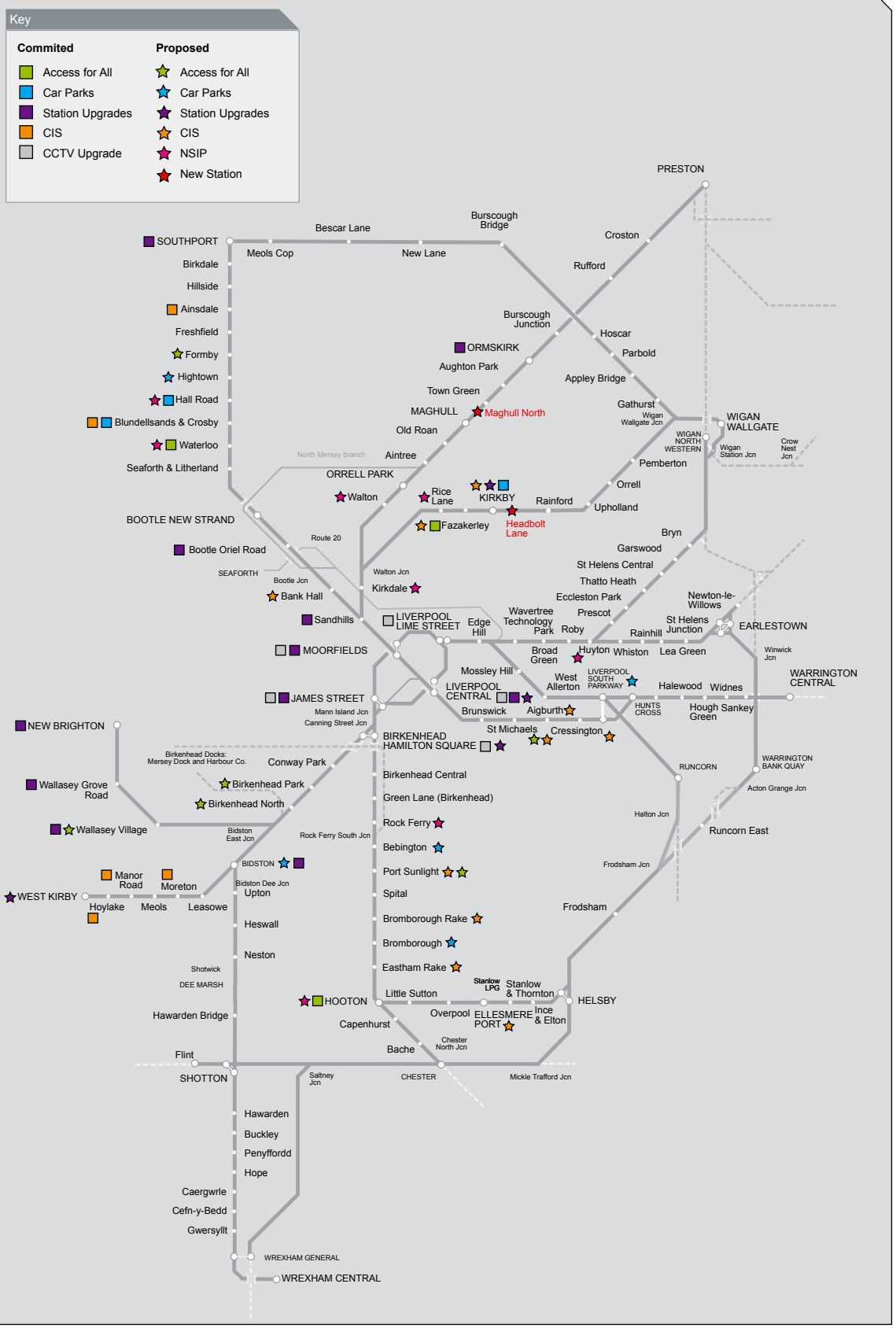
4.4 Infrastructure renewal schemes

Figure 4.3 lists the major planned infrastructure renewal schemes within the RUS area. The timing of renewal projects is important as they represent the best opportunity to include enhancements within the scope of the project.

Figure 4.3 – Infrastructure renewal schemes

Project	Main promoter	Implication for RUS	Stage of development
Mann Island Junction	S&C renewal	Crossover south of Birkenhead Hamilton Square	Planned for 2012/13
Paradise Junction	S&C renewal	Crossover in the Loop between Liverpool Central and Moorfields	Planned for 2012/13
Liverpool (Allerton and Speke) Resignalling	Renew signalling equipment and potential improvements to layout	Reduced maintenance and operational costs and potential for increased headways	Planned for 2016
Liverpool Lime Street Resignalling	Renew signalling equipment and potential improvements to layout	Reduced maintenance and operational costs	Planned for 2018
Liverpool Edge Hill Resignalling	Renew signalling equipment and potential improvements to layout	Reduced maintenance and operational costs and potential for increased headways	Planned for 2019
Merseyrail Area Resignalling	Renew signalling equipment and potential improvements to layout	Reduced maintenance and operational costs	Planned for 2024

Figure 4.4 – Planned and proposed schemes



4.5 Rolling stock

The proposed rolling stock replacement creates an opportunity, which will not occur for another 30 years. This involves the choice of new rolling stock which could provide a significant opportunity to address a number of gaps that exist in this RUS area.

The replacement, whether new or redeployed from elsewhere, could be capable of operating on both AC (overhead) and DC (third-rail) power supply. This could unlock additional journey opportunities and increase operational flexibility. These benefits 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 further electrification schemes on the network. Once the DfT strategy is declared (expected during 2009), the RUS recommends that consideration is given to rolling stock provision and the extent of electrification in the area in an integrated manner.

Any new rolling stock may be in two, three, or four-car formations with the appropriate seating arrangements and capacity, luggage room, whether there will be toilets on board and whether the units will be air conditioned. The ability to work on tight track curvature should be considered in the design process.

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.

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. 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 body sides. Train formation has yet to be determined but is likely to be three-car formations given the nature of the network. The aims should be to enable:

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

4.6 Depots and stabling

Nationally there is a strategy being developed in order to accommodate additional vehicles as part of the HLOS. This will affect depots across the RUS area which may need to be enhanced or have additional facilities provided.

It is recognised that the current capacity and facilities available at the depots may not be able to accommodate the new vehicles procured as part of the fleet replacement due around 2014. It is also recognised that there is no more capacity at the existing depots for the stabling of any more units. Therefore, depending on the specification of the new units, facilities at current depots will need to be reviewed as an integral part of the fleet replacement programme.

The Network RUS is examining the rolling stock and maintenance depot strategy for the whole of the UK network and is due for consultation in 2009.

5. Drivers of change

5.1 Strategic context

5.1.1 Short to medium term

At the time of writing, the economy is experiencing a greater level of uncertainty than at any point over the last 20 years, with turmoil in the global financial markets and a UK recession is predicted to continue in the short term. Despite this, it is anticipated that the rail passenger and freight market in Merseyside will perform relatively well over the next decade, and evidence from the Merseyrail's recently completed Autumn 2008 passenger counts suggests that strong passenger growth has occurred for the year to date.

The rail passenger market in Merseyside is highly dependent on the economic performance of Liverpool at the centre of the city region, and the main economic sectors in the city which influence rail travel are in an apparently strong position.

The retail core in particular is beginning to reap the benefit from the extensive package of inward investment over the last decade, with a number of newly opened developments, including the flagship Liverpool One, attracting significant numbers of new rail passengers to the city. Furthermore, a number of other retail and leisure developments are committed or under construction, including the Central Village development, which, when completed, has the potential to attract large numbers of new rail passengers.

Office based employment in the city centre would also appear to be relatively well insulated against the difficulties faced by financial institutions as a higher than average proportion of people work for, or on behalf of, the public sector. In addition, the shift towards city centre office based employment appears to be less well developed in Liverpool than in other regional cities, and as such a continuing modal shift towards rail is expected.

New attractions continue to be opened in the region which generate new rail travel to the area. One such example is the new "U Boat Experience" at Woodside Ferry Terminal which opened in February 2009.

Finally, the rail freight market may also benefit from proposed investment in the port facilities in Liverpool and on the Wirral.

5.1.2 Longer term

There are a number of ambitious proposals for new developments throughout Merseyside which would have an extremely large impact on the demand for rail travel and rail freight. These include the enormous Liverpool Waters and Wirral Waters developments, and although these are yet to be committed, should be considered when developing long-term growth scenarios.

5.2 Forecast passenger growth (short and medium term)

5.2.1 Background

In August 2007 Network Rail appointed consultants Arup to produce an underlying passenger demand forecast for Merseyside.[1] This work was completed in March 2008 and presented to the RUS SMG.

Arup developed two demand scenarios, thereby providing an expected range of future passenger numbers. Despite welcoming this approach, the Group identified the need for a third (central) scenario, to provide a single "most likely" forecast for use in the RUS. The SMG suggested that this forecast was based on a cross industry review of Arup's key assumptions, using the most recently available economic data to support it. Given the need for cross industry working it was viewed that it would be more efficient for Network Rail to lead this work.

The following sections present the review of the original forecasts as well as the updated central forecast. Arup's report is available in full on the Network Rail website.

5.2.2 Review of Arup forecasts

Although the RUS considers the 30-year period to 2039, the passenger demand forecasts are for the 12-year period from 2007/08 to 2019/20 as this is viewed as around the maximum length of time that an accurate passenger demand forecast can be produced for. Beyond this, the view of passenger demand has been produced by developing a set of potential scenarios rather than a specific forecast. This is discussed in more detail in the long-term growth section later in the chapter.

The two scenarios Arup developed were named "central" and "higher". To avoid confusion the revised scenario presented in this chapter will be referred to as the "central scenario" and the forecasts produced by Arup will be referred to as "low" and "high", respectively.

Both the low and high scenarios projected an optimistic view of passenger growth in the short term with growth up to 2010 forecast to range between three and four percent per annum over the whole of Merseyside, and between four and five percent per annum in central Liverpool. This growth projection is largely driven by the expected occupation rates of the substantial number of new office and retail developments in Liverpool City Centre that were predominantly being completed at the time of writing. The nature of these developments indicates that the majority of passengers travelling to them will do so in the peak.

The consensus amongst industry stakeholders was that the forecast range to 2010 was of the right order of magnitude, and that a demand projection towards the lower end of the range would be prudent, given that the new developments were only just beginning to open and occupancy rates are as yet unknown.

The demand forecasts for 2011 – 2020 were significantly lower, ranging between around 1 percent and 1.5 percent per annum. This is largely a result of fairly static government economic projections for Merseyside and an absence of any committed city centre developments post 2010.

Industry stakeholders were concerned that the forecast range was overly conservative, and Merseytravel and Merseyrail in particular contended that this was out of step with recent experience.

1 This was the first part of a two-part study. The second was to assess whether the underground station facilities in Liverpool can accommodate the forecast level of demand.

The 2011 – 2018 forecasts were reviewed as follows:

Major developments post 2010:
Development proposals were scrutinised to identify whether any further schemes had been committed and to understand whether it is legitimate to assume zero passenger growth from new developments if schemes are proposed rather than committed.

Following a review of development plans for central Liverpool it was not possible to identify any further committed developments post 2010. There are several proposed schemes including St John's Market and the new magistrates court; however it is not clear how likely these schemes are, and to date it appears that no work has been completed which examines the number of people they will attract.

Employment growth:
Official government figures for Merseyside published in the Trip End Model Presentation Programme (TEMPRO 5.3) indicate virtually zero long-term employment growth for Merseyside and Liverpool. This appears to be inconsistent with a seemingly buoyant local economy and alternative economic projections were examined to help understand whether zero employment growth is plausible.

There is no official consensus on future employment growth in Merseyside and the three main public bodies with an economic remit (Central Government, the North West Development Agency, and the Mersey Partnership) subscribe to different employment growth forecasts. The employment projections published in TEMPRO are the most pessimistic of the available recent forecasts, and the prediction of approximately zero change appears to be inconsistent with current and expected growth in other economic indicators, and the level of office and retail development in Liverpool.

Of the alternative forecasts that are available, the most intuitively appealing has been produced on behalf of the North West Development Agency by consultants Volterra.[2] The forecast takes a bottom-up approach examining historical and projected growth in the set of economic variables which drive employment growth. This approach is transparent and as such is straightforward for Network Rail to understand how the figures were produced. Under this alternative forecast employment is forecast to grow at around 1 percent per annum in Liverpool and around 0.7 percent per annum in the Merseyside RUS area. This is broadly consistent with the Merseyside Economic Partnership's central view of employment growth.

The forecasting model:
The forecasting model is based on the approach set out in the Passenger Demand Forecasting Handbook version 4.1 (PDFH). This is the industry standard tool for developing underlying demand forecasts; however there is a significant body of evidence to suggest that PDFH has underestimated recent high levels of growth into some urban centres outside of London.[3] Arup produced a retrospective PDFH based forecast for 1999/00 – 2005/06 to test its accuracy when applied to Merseyside. This technique is commonly used in RUSs and works by comparing actual passenger numbers with the level that would have been forecast using PDFH. Arup's analysis indicated that PDFH would have produced accurate results; however stakeholders have questioned whether the analysis was sufficiently detailed and whether the selected start point caused Arup to arrive at the wrong conclusion.

The period from 2001/02 – 2005/06 has been selected to avoid bias from the UK-wide reduction in passenger numbers following the worsening of punctuality after Hatfield in October 2000.

2 North West Rail Productivity Study: Employment Forecasts. Volterra Consulting Ltd, March 2008.

3 Investigation into Recent Rapid Growth in Rail Industry Demand. Final Report July 2007 ATOC/SDG.

Merseyrail believe that the majority of the electric network in Merseyside was largely unaffected by the temporary speed restrictions which caused performance to drop nationally following Hatfield, and that the number of passengers using the services of their predecessor owned by Arriva was largely unaffected.

Network Rail has examined train operator annual average punctuality since 1998/99 and there appears to be little or no correlation between Merseyrail/Arriva punctuality, and passenger numbers on the electric network (the Northern and City Lines). Furthermore, Arup's selected start year of 2000/01 has the lowest recorded level of punctuality for the Merseyrail franchise, and one of the highest annual levels of passenger demand. On this basis it would appear that 2000/01 is not the appropriate start year.

The apparent discrepancy between punctuality and passenger numbers make it difficult to be confident in selecting any given year as the appropriate start point. On this basis Network Rail has re-run the testing exercise using two alternative start years of 1997/98 and 2000/01, to provide a range of the likely discrepancy between forecast and actual demand. In addition, the City Line was excluded from the exercise since the Merseytravel figures do not include the longer distance operators.

Comparison with actuals:
Figure 5.1 shows the number of passengers recorded in the Merseytravel Annual Passenger Services Monitor compared with the number of passengers that would have been predicted using the forecasting model. This shows that for the Wirral and Northern Lines combined, the model would have underestimated demand by 1.4 percent per annum using 1997/98 as a start point and by 0.8 percent per annum using 2000/01 as a start point. This is an annual average underprediction of around 1.1 percent for 1997/98 – 2006/07 and given that this is a nine-year period it is reasonable to view this as reflective of at least the medium term trend.

The issue of underprediction has been encountered several times when producing RUSs for other larger urban areas outside of London. The most common explanation has been that a sustained programme of building new office and retail developments in the larger city centres has shifted the concentration of jobs and retail opportunities to areas which are often easier to access by public rather than private transport. This has therefore increased the number of rail trips made by head of population without being reflected in the underlying drivers of demand in the PDFH framework, such as population, GDP and net employment growth. This appears to be the most likely explanation for Merseyside given the extensive regeneration of Liverpool City Centre over the last 10 years.

Figure 5.1 – Retrospective forecast versus actual passenger trips

5.2.3 Development of the central scenario

The central forecast has been produced as follows:

- the new development trip rate from Arup's low scenario has been used for 2007 – 2010. No allowance has been made for trips that are generated by new developments that are completed post 2010
- the employment growth projection from TEMPRO has been replaced with the alternative figures produced by Volterra. This means that the average level of employment growth in the model is around 0.7 percent per annum for Merseyside, thereby increasing the resultant passenger demand forecast by 0.2 percent per annum across the RUS area
- an additional 1.1 percent passenger growth per annum has been added to cover the apparent underprediction of the forecasting model. This uplift was not applied to 2007 – 2010 to avoid double counting with the uplift for new developments applied to the same period. Based on the back casting exercise and evidence from other studies, Network Rail expects passenger growth to reduce to the level indicated by PDFH by around 2022, and the uplift has been reduced gradually from 2017/18 to reflect this
- the growth rate for financial year 2007/08 is the actual recorded rate as passenger demand data became available within the timeframe of this work.

Figure 5.2 details the central forecast by market and time period and Figure 5.3 provides a comparison of the central forecast with the existing low and high scenarios, for the RUS area as a whole and for central Liverpool during peak periods.

Passenger growth for the whole RUS area is expected to be slightly less than in the high scenario, with total growth to 2020 estimated at around 39 percent. This is equivalent to 2.8 percent per annum. The change in passenger growth rate once all the new developments have been completed in 2010 is predicted to be around 0.6 percent, which is less of a step change than in either the low or high scenarios.

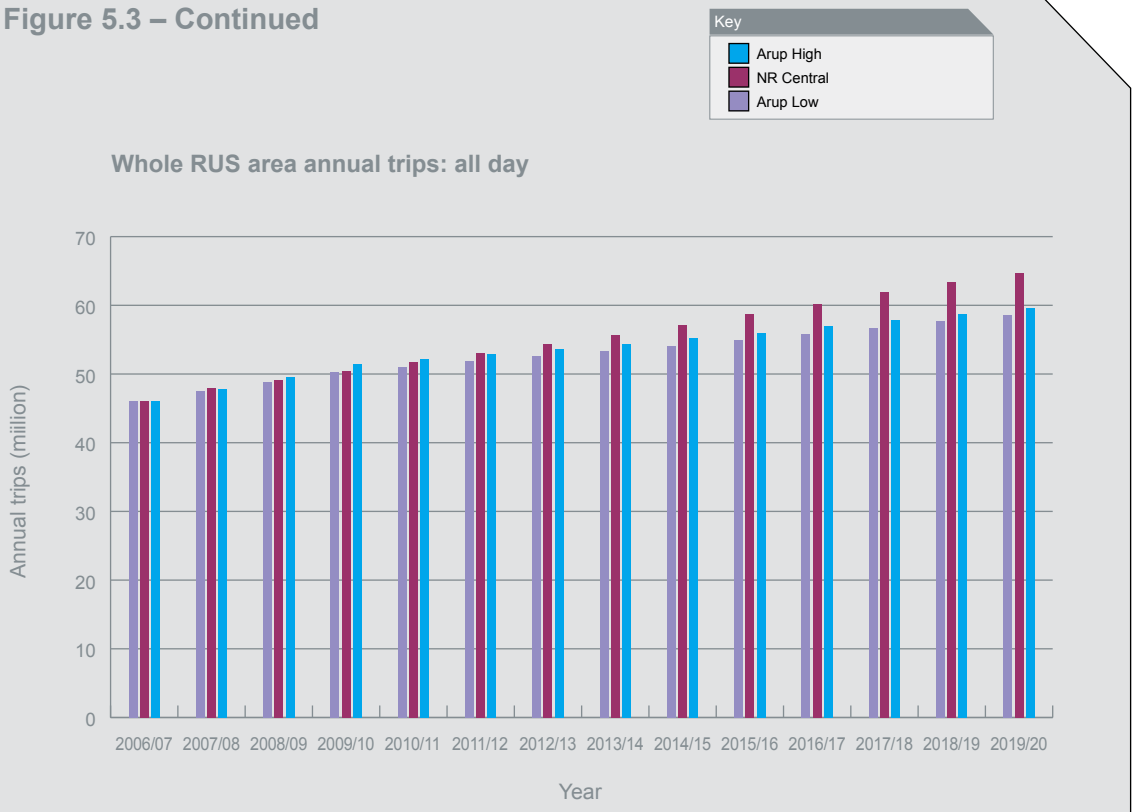
Understanding the total growth in trips to and from central Liverpool in the peak is key to identifying the main future capacity constraints, as this is when the network is most heavily used. By 2020, the total level of peak period growth expected in central Liverpool under the revised central forecast is broadly consistent with the existing central scenario, equivalent to 2.9 percent growth per annum. Similar to the forecast for the whole of Merseyside, the change in passenger growth post 2010 is expected to be less than under the existing low and high scenarios.

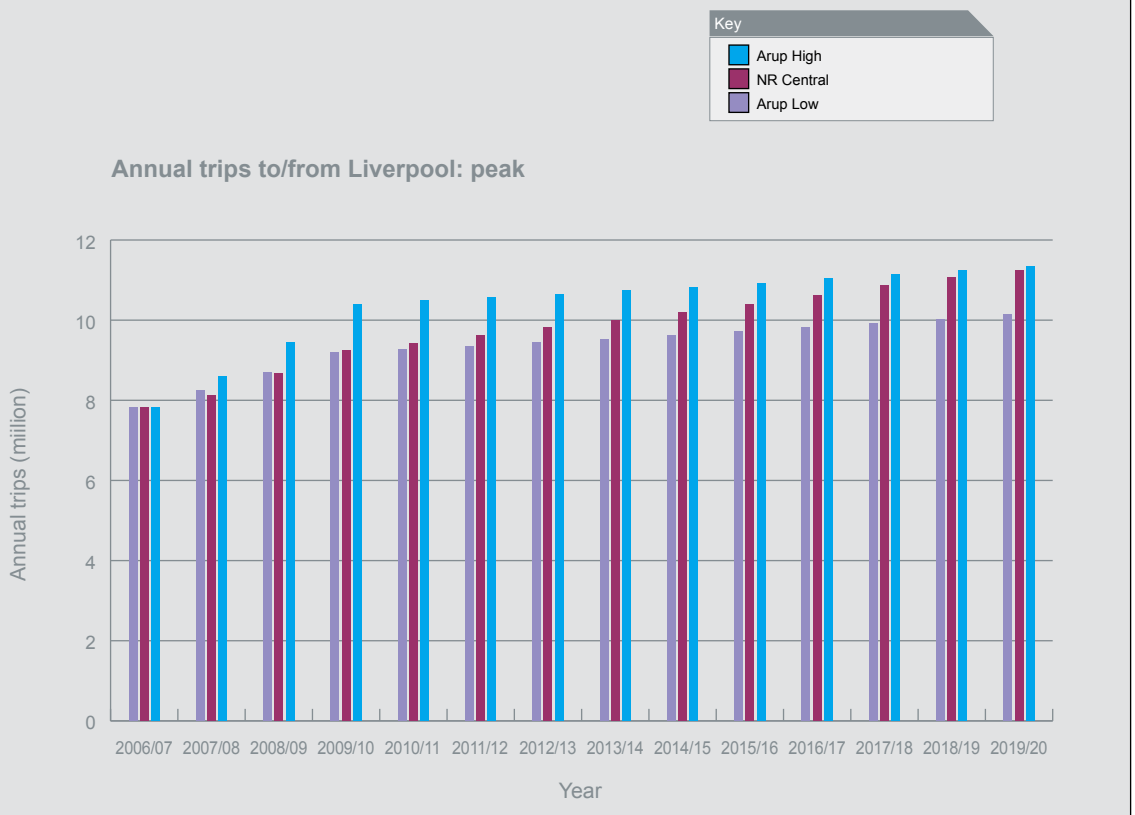
Figure 5.2 – Revised central forecast (figures in brackets are for the peak only)

	Million passenger trips				Total growth			Annual growth		
Market	**2007**	**2010**	**2015**	**2020**	**2007–2010**	**2007–2015**	**2007–2020**	**2007–2010**	**2010–2015**	**2015–2020**
Merseyside – Liverpool	21.9 (6.9)	24.5 (8.2)	27.4 (9.1)	30.4 (9.9)	12.3% (19.7%)	25.3% (31.6%)	39.0% (44.2%)	4.0% (6.2%)	2.2% (1.9%)	2.1% (1.8%)
Other – Liverpool	3.9 (0.9)	4.1 (1.0)	4.7 (1.1)	5.3 (1.3)	6.8% (7.5%)	22.0% (22.8%)	38.0% (38.9%)	2.2% (2.4%)	2.7% (2.7%)	2.5% (2.5%)
Merseyside – Merseyside	11.9 (4.0)	12.6 (4.2)	14.3 (4.7)	16.2 (5.2)	6.2% (5.2%)	20.6% (17.8%)	36.2% (31.4%)	2.0% (1.7%)	2.6% (2.3%)	2.5% (2.2%)
Other – Merseyside	8.5 (2.4)	9.2 (2.6)	10.7 (3.0)	12.3 (3.3)	7.7% (7.5%)	25.5% (25.2%)	45.0% (44.6%)	2.5% (2.4%)	3.1% (3.1%)	2.9% (2.9%)
Total	**46.1 (14.2)**	**50.5 (16.0)**	**57.1 (17.9)**	**64.2 (19.9)**	**9.4% (12.8%)**	**23.9% (26.1%)**	**39.3% (40.4%)**	**3.1% (4.1%)**	**2.5% (2.3%)**	**2.4% (2.2%)**

Figure 5.3 – Comparison of central forecast with Arup high and low scenarios

Figure 5.3 – Continued





5.2.4 Benchmarking against recent evidence

The Merseyrail Autumn 2008 passenger counts have been used to benchmark the RUS central growth forecast. This is particularly important for the weekday peak and Saturday demand forecasts which underpin some of the recommendations in the following chapters.

As discussed earlier, the RUS central forecast was produced by estimating growth for a series of three or five-year increments; 2007, 2010, 2015, 2020. The passenger counts indicate that the passenger growth forecast for 2007 – 2010 in the central scenario has almost entirely occurred in the first two years (2007 – 2009). The main increase has occurred in the year to 2008, where passenger numbers during the weekday peak and Saturdays have grown by 15 percent and 7 percent respectively. This is extremely high for a single year.

On balance it is likely that this is an overestimate of passenger growth, as passenger numbers had been slightly suppressed due to fleet problems immediately before the 2007 counts. Other data sources such as the Merseytravel Annual Passenger Monitor also suggest that the market for rail has been growing quickly; however it is not clear how much of this growth is part of a longer-term trend and how much is a one-off increase generated by the opening of the Liverpool One development, and Liverpool's status as the 2008 European Capital of Culture. On this basis it is the industry's view that whilst in the very short term actual passenger growth may be closer to the RUS high scenario rather than the central scenario, the central forecast is appropriate for the period to 2020.

5.3 Forecast passenger growth (long term)

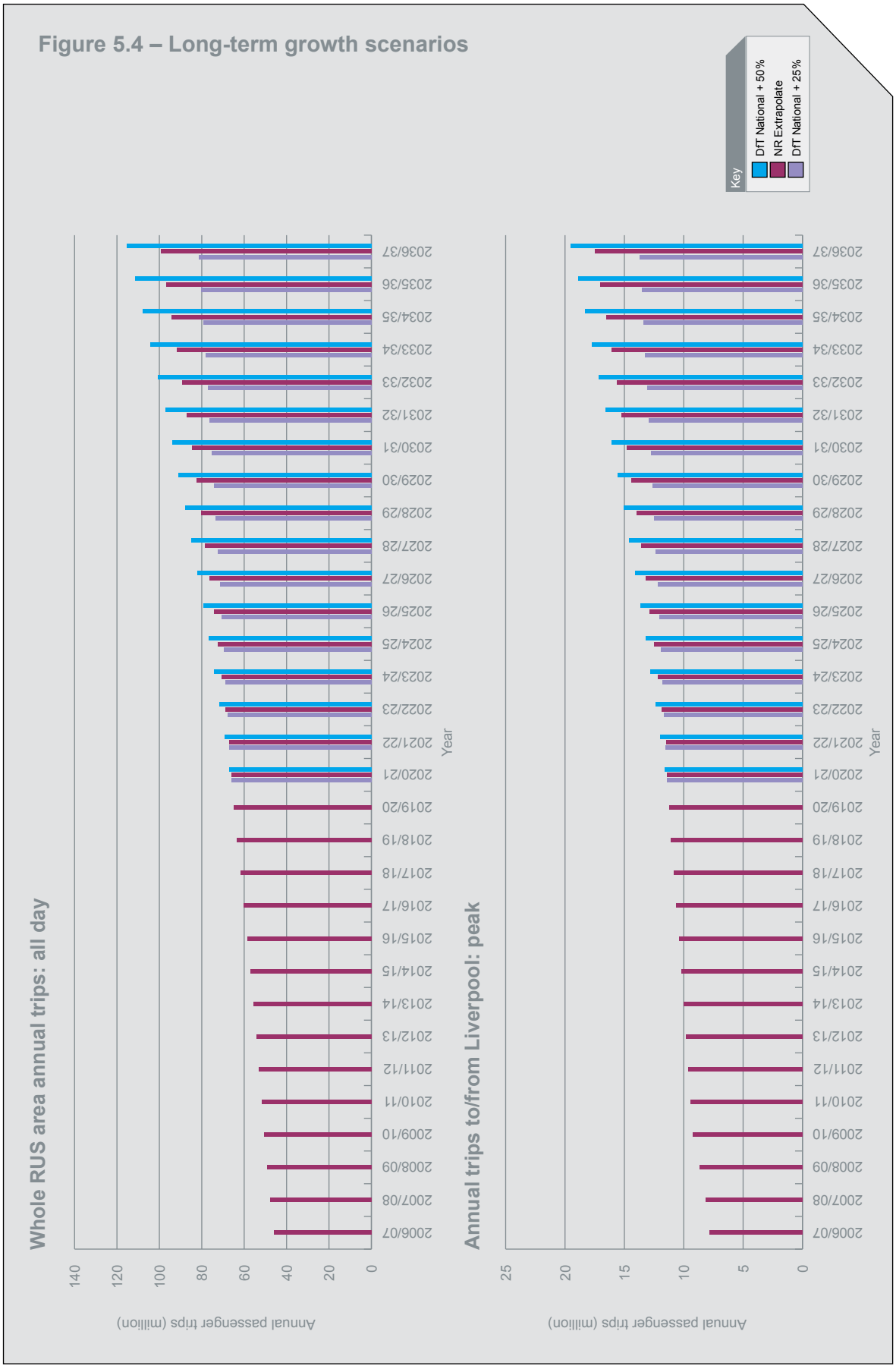
Although forecasting models can be extremely powerful in the short and medium term, they become less accurate as time progresses and the main demand drivers in these models such as UK demographics, economic performance and the availability of competing modes become difficult to predict. It is for this reason that passenger numbers beyond 2020 have not been explicitly forecast and instead a series of alternative scenarios have been produced to inform the potential impact of demand growth in the Merseyside area.

A central long-term scenario has been developed by extrapolating the forecast RUS average annual growth rate to 2010, over the remainder of the period to 2037. This is broadly consistent with the long-term scenario which the DfT published in the White Paper "Delivering a Sustainable Railway" (July 2007) which suggests an approximate doubling of passenger demand over 30 years. Under Network Rail's central long-term scenario there would be around 2.2 times as many passengers in 2037 than currently.

In addition to the central scenario, pessimistic and optimistic long-term scenarios have been produced to indicate a potential range for demand growth. The pessimistic scenario is based on 25 percent less growth than the DfT long-term scenario and assumes an absence of the new city centre developments and the increased road congestion that are believed to produce a modal shift towards rail. The optimistic scenario is based on 50 percent more growth than the DfT long-term scenario and assumes an acceleration in the rate of city centre developments and road congestion.

Figure 5.4 opposite illustrates the long-term growth scenarios.

Figure 5.4 – Long-term growth scenarios



5.4 Freight growth

The key driver of freight growth in the Merseyside area is the continuing demand for containerised traffic between the Liverpool and Wirral docks and the main UK intermodal terminals. The Freight RUS central scenario published in 2007 indicated that by 2014/15 an additional 5 to 10 freight trains per day in each direction would be in operation via the West Coast Main Line. Continued growth in freight traffic is expected after 2015; however the industry is yet to reach a consensus on the likely level. Freight growth forecasts for the period beyond 2015 will be published in 2009.

In addition to growth in intermodal traffic, Wirral Metropolitan Borough Council and Peel Ports are in the process of developing a new proposal to transport biomass by rail from the Wirral to power stations in the Midlands. It is believed that there is already a market for approximately one freight train per day via the Bidston – Wrexham line.

5.5 Future gaps

5.5.1 Passenger demand

The projected increase in the demand for travel by rail is a key factor behind gaps one and two identified in the next chapter.

Demand for travel by rail to new retail developments in the city centre will place an increased strain on the ability of the central railway stations to accommodate a regular large influx of passengers. This pressure is likely to be particularly acute at Liverpool Central station, which is the closest Northern Line station to a number of these developments. Figure 5.5 below illustrates this by showing the proportion of newly generated rail passengers expected to access the new developments from each station.

Liverpool Central is already busy at peak times during the week and on Saturday afternoons in particular, and investment will be required to allow the station to accommodate large numbers of additional passengers.

Figure 5.5 – Forecast newly generated rail trips allocated by station

Development	Station	Percentage split of passengers using each station
Kings Waterfront	James Street	34%
	Central	66%
Central Village	Central	95%
	Lime Street	5%
Paradise Street	Central	79%
	James Street	21%
Mann Island	James Street	58%
	Moorfields	42%

At present the existing fleet of rolling stock is sufficient to accommodate passenger numbers; however growing demand for travel to and from work will increase passenger loads on the busiest services at peak times during the week. Within the first few years of the RUS timeline the existing level of peak capacity provision will be insufficient to accommodate growth and additional rolling stock will be required. Over the lifetime of the RUS, services on some lines will be operating at maximum length, meaning that additional peak services and associated infrastructure work will be required to meet growth.

Historically, the capability of the current rail infrastructure and the high service frequency in the Merseyside area has been adequate for the passenger market. However, significant and sustained demand growth means that new journey opportunities, through an increased frequency of services and improved infrastructure, are now required to meet the needs of the 21st century rail market.

Whereas historically, delivering rail enhancements in subsidised parts of the network involved a significant investment per passenger, demand growth means that this is no longer necessarily the case, and a number of ambitious projects have the potential to deliver tangible economic benefits and meet government value for money criteria.

5.5.2 Freight demand

Additional freight paths into both sides of the port may be constrained by inadequate or lack of available freight routes into the docks.

Stakeholders have been consulted to understand where and when this may be the case and the RUS has been developed to ensure that a lack of available infrastructure does not act as a constraint to the growth in freight traffic.

5.5.3 Integrated Transport Authority

On 9 February 2009, a number of provisions contained within the Local Transport Act 2008 were enacted. One of the first alterations was to change the name of the Merseyside Passenger Transport Authority to an Integrated Transport Authority, but still operating under the brand name of Merseytravel. This change has not affected Merseytravel's remit at this stage.

Integrated Transport Authorities will be given a stronger role in developing future transport strategies for their areas. They may also gain additional responsibilities for the planning and delivery of bus services as well as possible new responsibilities for transport functions over wider areas. These aspects will ultimately be determined locally through a governance review of transport arrangements and powers.

6. Gaps and options

6.1 Introduction

This chapter presents an analysis of the RUS gaps and the series of options that have been developed to address them.

6.1.1 Generic gaps

The term “gap” refers to a situation where the current network – rail services and infrastructure, together with committed enhancements – is inadequate to meet the current or future requirements of passengers, freight users and funders. Five generic gaps have been identified that are common to the Merseyside RUS area:

Gap One: Capacity, stations

Some of the central Liverpool underground stations on the Merseyrail network are overcrowded at certain times of the day, and forecast growth will worsen this situation. The challenges are greatest at Liverpool Central, particularly on the Northern Line platforms both in terms of capacity and access, where the site is severely constrained.

Gap Two: Capacity, trains and infrastructure

Sustained historic passenger growth has led to overcrowding on a number of services in the Merseyside RUS area, particularly into Liverpool at peak times. This is expected to worsen as passenger numbers increase over time. The level of infrastructure on parts of the network could be insufficient to meet the requirements of passengers and freight users over the lifetime of the RUS. In addition to track capacity, specifically at “flat” junctions, particular issues include the adequacy of the electric power supply and stabling facilities at depots.

Gap Three: Connectivity and journey time

Some routes in the RUS area, and some other routes identified in adjacent RUSs, have a level of service that is inferior to other similar parts of Merseyside and the United Kingdom, and some conurbations and potential freight customers have no access to the rail network.

Gap Four: Getting to the train

Nearly a quarter of passengers on the Merseyrail electric network use a car to get to the station. Car parks at many locations are full, and on-street parking around stations is a common problem. Bus interchange is also poor at certain locations across the RUS network and in some cases passengers drive to locations where parking is available, rather than their closest station.

Gap Five: Train punctuality and performance

A number of timetabling and infrastructure constraints exist on the network which can cause regular and significant delay to passenger and freight services.

6.1.2 Option development and appraisal

The options that have been developed to address short and medium-term gaps (to 2020) have been subject to an economic appraisal which is compliant with the DfT’s Transport Analysis Guidance (webTAG). Where appropriate, Benefit Cost Ratios (BCRs) are reported, which indicate the value for money of the scheme. DfT funding criteria permits recommendation for funding through the RUS process if the BCR is at least 1.5, which is indicative of medium value for money. However, schemes involving infrastructure investment are typically required to offer high value for money indicated by a BCR of at least 2.

The figures presented in this chapter result from high-level feasibility work (equivalent to GRIP 1), and represent the most likely value for money based on a range of key sensitivities. Value for money has not been quantified when

an option is clearly inferior to another that is below the DfT funding threshold.

Options for the longer term (2019 – 2039) have not been subject to economic appraisal as it is not possible to make objective value judgements on all the necessary components of schemes that would be delivered so far into the future.

6.2 Gap One: Capacity, stations

6.2.1 Liverpool Central

Liverpool Central is the busiest station on the Merseyrail network with over 15 million passengers alighting, boarding or interchanging there in 2007.

The Northern Line platforms comprise a single island structure with tracks either side accessed by two banks of escalators and one lift which are all located at the north end of the facility. The island nature of the structure and close proximity of all access and egress facilities constrain the space available to passengers waiting for trains. This results in a conflict between boarding and alighting passengers.

Liverpool Central has experienced sizable growth in passenger numbers over recent years, particularly as a result of Liverpool's thriving retail core situated close to the station. As a result, the station is extremely popular with shoppers and significantly more passengers use the island platform on a Saturday than on a weekday, with four of the five busiest single hours occuring on a Saturday. The station is almost as busy for one hour during the weekday pm peak, however the analysis has focussed on Saturdays when the main capacity issues occur as any interventions that are required to meet demand on Saturdays will also be sufficient for the weekday peak.

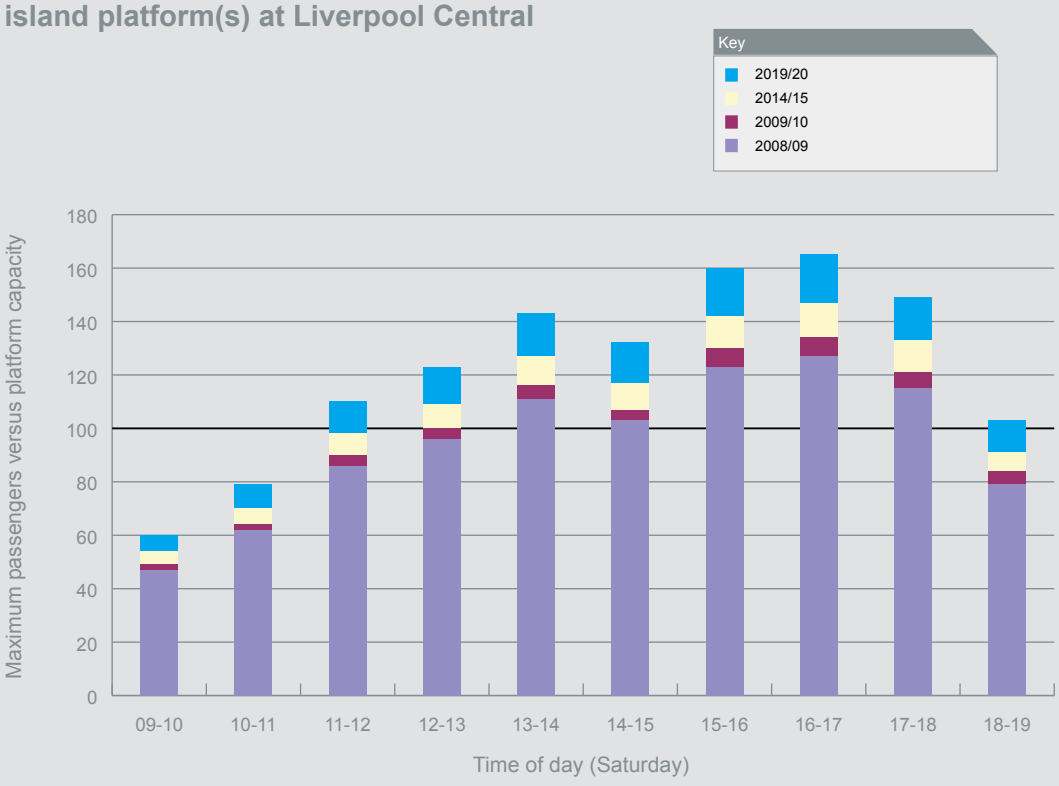
Since the analysis presented in the Draft for Consultation was completed, Merseyrail has finished processing its Autumn 2008 passenger counts. These counts indicate that overall annual Northern Line passenger growth on Saturdays has been lower than expected at around two percent. Closer analysis however, shows that the number of passengers using the Northern Line between 11:00 and 15:00 has fallen by approximately six percent, whereas the number of passengers using the Northern Line between 15:00 and 19:00 has increased by around 10 percent. The 2008 counts suggest that most passengers arrive in central Liverpool at a similar time of day to 2007, whereas more people are returning home from central Liverpool later in the day. This indicates that passengers are visiting Liverpool city centre for a longer period of time than previously and local stakeholders believe this is a result of the newly opened and adjacent Liverpool One retail development. This is a significant trend as passengers waiting for a train typically spend longer on the platform than alighting passengers, and as a result the concentration of the volume of departing passengers into a smaller time period has increased the pressure on the infrastructure. The impact of this is discussed in the following sections.

The capacity of the island platform has been estimated using the London Underground Limited standard measure of 0.8 square metres per person, giving a total static capacity of 488 passengers. Based on the most recently available passenger counts the platform is over capacity at regular intervals between 13:00 and 18:00 on a Saturday, particularly between 15:00 and 18:00 when the majority of passengers return home from central Liverpool. By 2010 crowding during this

period is expected to worsen as the popularity of the Liverpool One development increases, and by 2015 the island will be over capacity for a large majority of the period between 13:00 and 18:00, as well as during some of the weekday pm peak. Figure 6.1 below illustrates the projected maximum number of passengers on the platform in each hour on Saturdays against the capacity of the platform.

By around 2015 the station will not be able to accommodate the projected number of Northern Line passengers between 12:00 and 18:00 on a Saturday. In the absence of any interventions to increase capacity, there would be a severe impact on the train service, with some or all Northern Line trains unable to call at Central, which in turn would lead to crowding problems at adjacent stations. This would be a major loss of rail service provision at a time of maximum demand and the loss of time to passengers caused by the additional walking distance to the major retail developments would have an estimated economic disbenefit of £2.8 million each year, excluding any loss of revenue to Merseyrail. Based on this conservative estimate the capacity interventions that are detailed in the following sections are likely to offer high value for money.

Figure 6.1 – Passengers versus the capacity of the Northern Line island platform(s) at Liverpool Central



Network Rail has commissioned a major study to model pedestrian flows around the station and platforms. The study is due for completion in summer 2009 and it is informed by the industry's views on the types of interventions that are necessary, which were developed during the RUS process. These will include outputs recommended in the Liverpool Central Masterplan developed jointly between Merseytravel, Merseyrail and Network Rail. The Masterplan sets out practical options for addressing issues and meeting stakeholder aspirations. The new study will analyse the output of individual options as well as combinations of options to determine the most effective way to address the issues.

Prior to the completion of the passenger modelling, the RUS is able to recommend approximately how much additional capacity is required, when this capacity will be required, which schemes highlighted by the Liverpool Central Masterplan can deliver this, and the magnitude of the funding required to deliver these schemes.[1] The recommendations of the RUS are as follows:

Immediate issues

The most immediate concern is conflicting passenger movement at the north end of the Northern Line platform next to the escalators and lift where boarding, alighting and waiting passengers are all required to use the narrowest section of the platform. This is particularly problematic on Saturdays when the station is at its busiest and most services operate in three-car formation in the absence of weekday peak strengthened trains.

A package of small measures is proposed to partially mitigate this problem through managing passenger demand more effectively:

1) deployment of additional crowd management staff
2) potential strengthening of units to six-car formation so that waiting passengers use the whole length of the platform. This could be resourced using the vehicles which are additional in the weekday peak
3) repositioning of the stop boards so that trains in three-car formation come to a halt by the widest part of the platform[2]
4) repositioning of the customer information screens away from the escalators to the widest part of the platform.

The first two are interim measures on the part of Merseyrail and would only be expected to continue until a more permanent infrastructure solution is completed. The latter two measures are likely to be deliverable in the near future and depending on adequate resolution of track circuit issues, should be of nominal cost.

By 2010 it is estimated that the equivalent of up to 30 percent more platform capacity will be required to accommodate passenger numbers during the busiest times on Saturdays. A number of options are available to deliver some or all of this capacity, through either provision of more physical capacity or better management of passenger flows. These are as follows:

5) repositioning of pipes and cables which are currently attached to the roof columns so that the protective panelling can be removed, thereby minimising the footprint of the columns on the platform
6) an upgrade of the station concourse which would improve passenger flow and include a new passenger waiting area beyond the ticket barriers designed for passengers who have a 5 to 15-minute wait for a train
7) an additional lift to the platforms with a widened access route, designed to improve the flow of passengers leaving the platform, and remove the need for some of the existing roof columns.

The passenger flow study will identify the precise impact of these options and identify which are required; however it is anticipated that an appropriate package of measures can be delivered for between £5 – £10 million.

1 The study of Liverpool Central will produce a more detailed set of cost estimates.

2 During the consultation period Network Rail has moved the stop boards approximately 20 metres down the platform as an interim measure.

Short to medium-term issues

By 2015 it is estimated that up to 10 – 20 percent further additional capacity will be required to accommodate passenger numbers during the busiest hour on Saturdays, which is 40 – 50 percent greater than currently. This level of capacity increase would be likely to require significant infrastructure work to expand the size of the island platform and a number of options are available to do this:

8) relocate the plant room from underneath the escalators and convert the space into additional platform waiting area

9) remove the roof and supporting columns and replace with a design that does not require columns on the platform

10) redesign and relocate the escalators to provide improved access and egress and more space on the platform for passengers. This would be in addition to replacement of the roof

11) remove the Newington Street Bridge pier, move the track and widen the platform.

A package of these options would be relatively complex to deliver as well as disruptive to the operation of the station during construction, and as such it is not envisaged that they can be implemented before 2010. Despite this, they would provide more capacity than the measures outlined in the previous section and it is recommended that the final detailed strategy for the station combines the optimal mix of interventions that can be delivered before 2010 and between 2010 and 2015. This mix will be informed by the passenger flow study, however it is likely that an appropriate package of platform enhancements can be delivered for between £10 – £15 million. The maximum additional capacity that can be provided by a phased package of the immediate and short to medium-term measures detailed above is around 50 percent.

Long-term issues

It is therefore unlikely that the station will be able to accommodate significant additional passenger numbers if growth continues at the projected rate beyond 2015. By 2020 it is anticipated that even an enhanced island platform will be full, as it is estimated that up to 15 – 20 percent further additional capacity will be required to accommodate passengers during the busiest part of Saturdays, which is up to 65 percent greater than currently. It is clear that this cannot be delivered through any combination of the measures detailed above.

Furthermore, by around 2020 during the busiest part of the weekday peak, train services on the Ormskirk and Southport branches will be almost fully loaded and operating in the maximum six-car formation. This means that an increase in the frequency of services using the Northern Line platforms will be required. Within the next 20 to 25 years it will not be possible to operate the required weekday peak service frequency as passenger numbers will be too large to meet the necessary station dwell times given the existing island platform layout.

It is envisaged that the only way to deliver the longer-term capacity and peak train frequency requirement will be to widen the bore of the existing tunnel and construct an additional platform, or to build a new station on an alternative site.

Phasing of the investment

Given that major investment will be necessary within the foreseeable future, it is important to set out the industry's view on how an upgrade of Liverpool Central is intended to be phased.

- **Control Period 4 (CP4) interventions**
  Work will continue during CP4 to implement the elements of the upgrade package identified under the "immediate issues" section. The first four do not require any significant additional feasibility work prior to introduction, and the latter three, which involve some physical redevelopment works, will be informed by

the Liverpool Central capacity study. It is envisaged that this immediate package of investment will be financed through smaller discretionary funds available to Network Rail, local and regional government, and other industry partners.

- **Control Period 5 (CP5) interventions**
  The Liverpool Central demand study will provide a more detailed understanding of the most suitable package of options detailed in the "short medium-term" and "long-term" issues sections. Upon completion of this study the industry will agree a preferred set of options and develop a detailed scheme for potential inclusion in the HLOS for CP5.

This option development process is intended to result in a consensus on whether the level of investment and interventions required to meet the problems identified in the Liverpool Central demand study, together with the disruption to passengers necessary to deliver a short to medium-term solution, is justified; or whether it would be more efficient to bring forward the major investment that will be required to meet passenger demand at this station in the longer term. As part of the decision making process it will also be important to consider what infrastructure can be delivered before the station is significantly over capacity, and what mitigation work would be required at Moorfields to accommodate demand as the upgrade work will disrupt services at Liverpool Central.

The Draft for Consultation invited stakeholders to comment on the package of potential interventions at Liverpool Central and a number of responses have been received through the consultation process. A synopsis of these responses is provided in chapter 7.

For completeness the list of the potential enhancements is detailed in Figure 6.2.

Figure 6.2 – Enhancement options for Liverpool Central station (Northern Line)

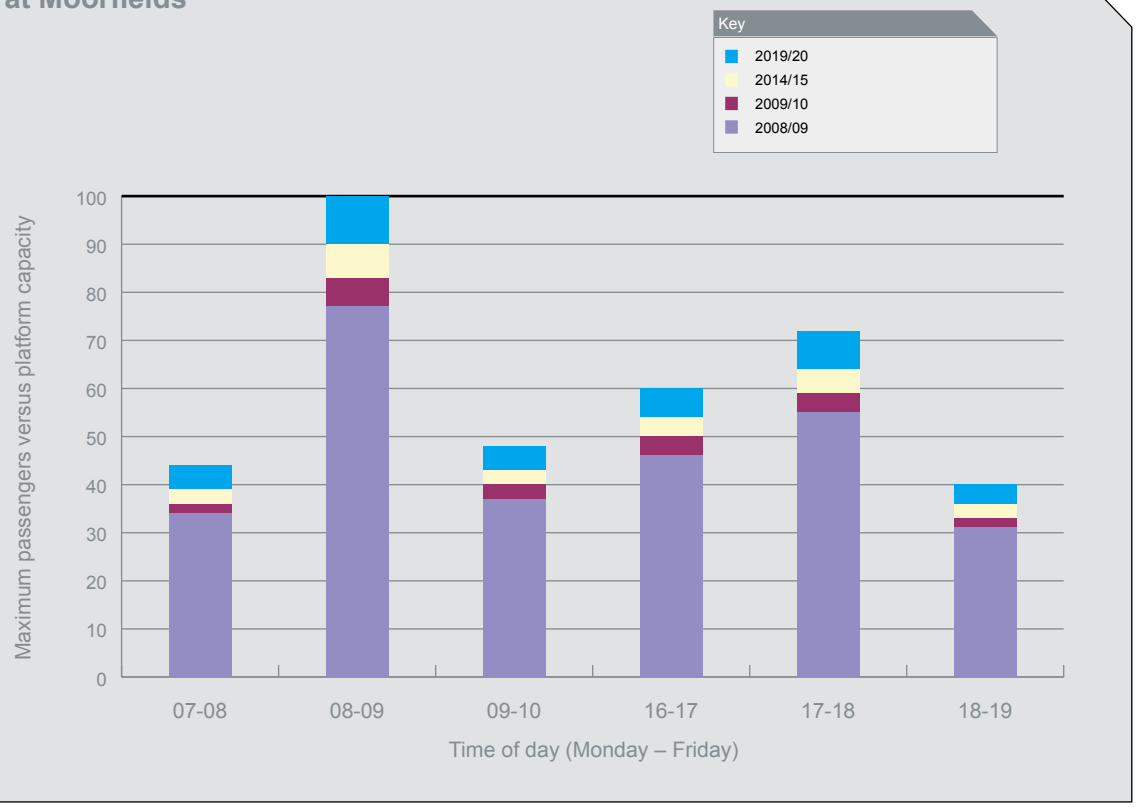
Option	Description	Estimated equivalent additional platform passenger capacity provision
1	Additional crowd management staff	n/a
2	Additional six-car train formations	n/a
3	Reposition the three-car stop boards	n/a
4	Reposition the customer information screens	n/a
5	Reduce existing column footprint	< 5%
6	Refurbished and reconfigured concourse including a new passenger waiting area	10% – 20%
7	New lift to platforms with widened access route	5% – 10%
8	New plant room allowing use of platform space under the escalators	Circa 10%
9	New roof which does not require supporting columns on the platform	5% – 10%
10	Redesign and relocate escalators (in addition to a new roof)	Tbc
11	Remove Newington Street Bridge pier, slew track and widen platform	10% – 15%
12	Additional platform	> 50%
13	New station	As much as required

6.2.2 Moorfields

The forecasting and station capacity study produced by Arup identified that the Northern Line platforms at Moorfields may become over capacity during the next few years. Using the London Underground Limited standard measure of 0.8 square metres per person, the Northern Line platforms at Moorfields can both accommodate 450 passengers.

Unlike Liverpool Central, the station is more popular with commuters than shoppers and the station is busier during the weekday peaks than at weekends. The busiest single hour is 08:00 – 08:59; however as the majority of passengers are alighting rather than waiting for services, the platform clears quickly and is currently never more than 80 percent full. Based on the central growth forecast the platform is not expected to be over capacity before 2020 despite strong passenger growth over the last year, and no action is recommended. Figure 6.3 below illustrates this.

Figure 6.3 – Passengers versus the capacity of island line platform(s) at Moorfields



6.2.3 James Street

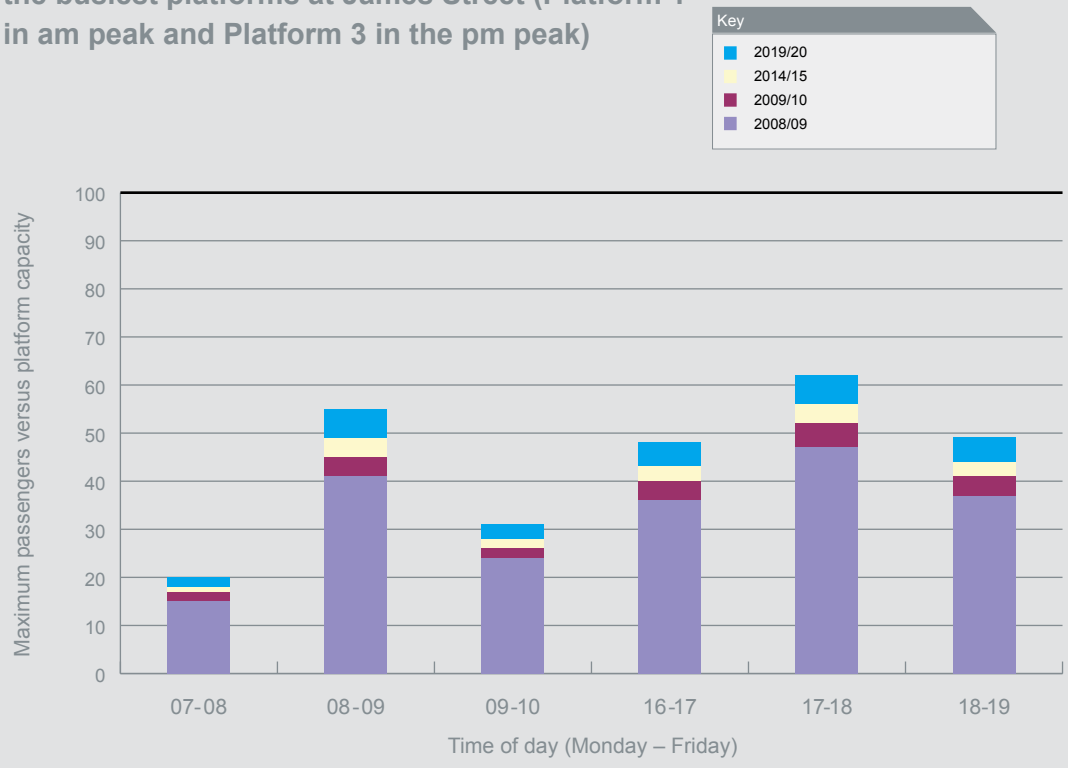
The demand and station capacity study also highlighted potential capacity issues at James Street station. Using the London Underground Limited standard measure of 0.8 square metres per person, Platform 3 at James Street can accommodate 600 passengers.

The busiest time is between 17:00 and 17:59 on weekdays where Platform 3 accommodates a large number of commuters returning home. However, the platform is currently around 50 percent full, and it is not expected to become over capacity before 2020. This is illustrated in Figure 6.4.

Crowding at James Street is worst when the loop line is shut, thereby forcing Wirral Line trains to terminate there. When this occurs on a planned basis, for example for engineering work, passengers can make alternative arrangements, but when it occurs on an unplanned basis the crowding can be severe, even during a relatively short closure.

The capacity study identified that the ticket barriers and concourse area are likely to be over capacity in normal use within the next few years. Given the characteristics of the facility it is not possible to verify this using the type of analysis available within a RUS, and it is therefore recommended that a study into the concourse upgrade is taken as far as GRIP 3 (development of options).

Figure 6.4 – Passengers versus the capacity of the busiest platforms at James Street (Platform 1 in am peak and Platform 3 in the pm peak)



6.3 Gap Two: Capacity, trains and infrastructure

6.3.1 Peak train capacity, short and medium term

Peak overcrowding

This gap only applies to the Merseyrail electric network as crowding on the City Line was addressed in the North West RUS.

All Merseyrail services are operated using the same type of (Class 507/508) rolling stock, in either three-car or six-car formations. Trains in three-car formation have 192 seats and space for 111 passengers standing. Trains in six-car formation have twice that capacity (384 and 222).

An analysis of the current and future level of on-train crowding has been produced using the growth forecasts detailed in the previous chapter and passenger count data from autumn 2008, which was the most recently available at the time of writing. Figures 6.5 and 6.6 provide a summary of this analysis.

Two measures have been used to assess the level of crowding on trains, these are: the total number of passengers relative to the number of seats at the busiest point on the network, and the maximum time that passengers stand for before they either reach their destination or a seat becomes available. The DfT typically classifies regional rolling stock as overcrowded when the total number of passengers on a service exceeds the number of seats by 40%, thereby giving a load factor of 140%.[3] The DfT also classifies rolling stock as overcrowded when passengers have to stand for 20 minutes or more; however the Merseytravel crowding standard permits a maximum standing time of 15 minutes before a train is considered overcrowded. It is the view of the industry that the latter is more appropriate for the Merseyside RUS.

2008/09

A number of individual trains had some passengers standing in 2008 and several lines had more passengers than seats available for the whole of the busiest hours in the morning or evening.

The Southport branch had more passengers than seats available on services arriving in central Liverpool between 08:00 and 10:00 and leaving Liverpool between 16:00 and 17:00. On the busiest trains passengers were standing for a longer period of time than the maximum permitted under the Merseytravel standard, and on one train this has exceeded the maximum national standard.

The Ormskirk branch had more passengers than seats available on services arriving in Liverpool between 08:00 and 09:00 and departing Liverpool between 16:00 and 17:00; however no passengers were found to be standing for longer than the maximum time permitted under the Merseytravel standard.

The Chester branch had more passengers than seats available on services departing central Liverpool between 17:00 and 19:00, and one train had more passengers standing for longer than the maximum time permitted under the Merseytravel standard.

The West Kirby branch had more passengers than seats available on services arriving in central Liverpool between 08:00 and 09:00, and one train had more passengers standing for longer than the maximum time permitted under the Merseytravel standard.

The Kirkby branch had more passengers than seats available on services arriving in central Liverpool between 08:00 and 09:00; however standing only occurred at the very south of the branch on the section that is shared by other service groups, and no passengers were found to be standing for longer than the maximum permitted under the Merseytravel standard.

The Ellesmere branch had more passengers than seats available on services departing central Liverpool between 17:00 and 18:00; however similarly to the Kirkby branch, standing only occurred at the very north of the branch on the section that is shared by other

3 The theoretical maximum capacity of Merseyrail rolling stock implies a load factor of around 158%.

service groups, and no passengers were found to be standing for longer than the maximum permitted under the Merseytravel standard.

2013/14

In the absence of capacity interventions it is anticipated that by 2013/14 nearly all branches on the Merseyrail network will have more passengers than seats available for at least the busiest hour of the day.

The Southport branch will have more passengers than seats for two hours during the am peak and two hours during the pm peak, with passengers standing on a number of trains for well in excess of the maximum time permitted under the national standard.

The Ormskirk branch will also have more passengers than seats for two hours during the am peak and two hours during the pm peak, with passengers on a number of trains standing for longer than the maximum permitted under the Merseytravel standard.

The Chester branch will have more passengers than seats for an hour during the am peak and two hours during the pm peak, and a number of trains will have passengers standing for longer than is permitted under both the Merseytravel and national standards.

The West Kirby branch will have more passengers than seats for one hour during the am peak and one hour during the pm peak, and one train will have passengers standing for longer than is permitted under the national standard.

All other branches with the exception of the New Brighton branch will have more passengers than seats for at least the busiest peak hour; however it is not anticipated that standing will breach either the Merseytravel or national standards.

2019/20

In the absence of any capacity interventions by 2019/20 all branches of the Merseyrail network will have more passengers than seats available for at least the busiest hour in both the am and pm peak periods and the Merseytravel and national crowding standards will be exceeded on nearly all branches.

The Southport branch will have more passengers than seats available for the entire three-hour peak period in the mornings and evenings. Passengers on a number of services during this time the busiest two hours in the both am and pm peaks will stand for longer than the maximum permitted under the national standard, and train loadings for the busiest hour in each period will exceed the maximum theoretical capacity of the rolling stock.

The Ormskirk branch will have more passengers than seats available for the entire morning peak period and two hours during the evening. Passengers on a number of services during this time will stand for longer than is permitted under the Merseytravel crowding standard, and train loadings between 08:00 and 09:00 will exceed the maximum theoretical capacity of the rolling stock.

The Chester branch will have more passengers than seats available for the entire evening peak period and two hours during the morning. Passengers on a number of services during this period will stand for longer than is permitted under the Merseytravel crowding standard. In the evening peak some passengers may stand for almost the whole journey between Liverpool and Chester.

Option(s)

Figure 6.7 details the package of additional rolling stock capacity that is required to alleviate crowding and meet future demand, and Figure 6.8 provides a summary of the business case for this. The recommendations are based on the seating and standing capacity of the current Merseyrail rolling stock, and if the type of stock is changed the number of additional units that is required may alter.

The most efficient way to provide more peak capacity in the short and medium term is to progressively strengthen existing three-car trains to run in the maximum six-car formation. The alternative option of increasing the frequency of peak services is an unnecessary performance risk given the prevalence of three-car units currently operating in the peak.

The business case for providing additional six-car operation has been examined and investment in an additional unit to operate on a specific branch is only recommended if it has at least a medium value-for-money outcome. This is the minimum required for a scheme of this type.

It is recommended that services are operated in six-car formation for an increasing period of time in the am and pm peaks. The largest increase in the period of six-car operation is recommended on the Southport, Hunts Cross and Ormskirk branches, with up to an additional hour and 30 minutes required in each peak. A lower increase in the period of six-car operation is recommended for the Chester and West Kirby branches, with up to an additional 45 minutes required in each peak.

An additional 14 (three-car) units in traffic are required to deliver this increased package of six-car operation, with six units deployed on Southport – Hunts Cross services, four units deployed on the Chester branch, three units deployed on the Ormskirk branch and one on the West Kirby branch. On this basis, it is recommended that when the Merseyrail fleet is replaced in 2013/14 it is large enough to allow the equivalent of 14 more three-car units in traffic than currently. Given that the network is expected to start to become overcrowded by the time that the fleet is replaced, it is recommended that additional capacity is provided in the interim by deploying Class 508 units that are being phased out of the fleet in the London area.

This package of additional rolling stock deployment will meet the Merseytravel peak capacity standards until at least 2014, and will generate significantly more benefit and revenue than the incremental procurement and operating costs, and the scheme offers a high value for money indicated by a BCR of greater than 2.0.

It is anticipated that a further three units in traffic will be required by 2019/20 to meet the Merseyrail peak capacity standard; however at present it has not been possible to identify a suitable incremental business case for the procurement of these additional units when the fleet is replaced in 2013/14. On this basis these additional units have not been included in the strategy, however it is recommended that when a new fleet is procured there is an option to add further rolling stock at a later date.

Merseyrail has conducted an analysis of whether it is possible to stable and maintain incremental additional rolling stock, see Figure 3.25. This work suggests that the current infrastructure does not have the capacity to stable any additional rolling stock prior to any fleet replacement. It is therefore recommended that ahead of any new rolling stock procurement a review of depot capacity and stabling is initiated including initially reinstating the shed at Birkenhead Central followed by reinstating the ‘out of use’ sidings at Birkenhead North maintenance depot. These two specific elements would resolve the capacity problems at Birkenhead North by enabling the train cleaning operation to return to Birkenhead Central (where it used to take place until the late 1990s) and increase the stabling ability at this strategic location. As well as providing an interim solution to the capacity problem, these facilities would be useful for a wholly new fleet. The business case for the recommended package of train lengthening is robust against the likely cost of this infrastructure.

Ultimately, the new fleet will have different maintenance requirements to the current fleet and the joint industry team developing the rolling stock replacement will define the scope for improved or new maintenance and stabling infrastructure.

The current level of power supply may be a constraint to this package of operating longer and additional electric rolling stock, particularly on the Chester branch. Network Rail is currently investigating the extent of this constraint, but it is anticipated that the business case for the recommended train lengthening will also be robust against the cost of providing additional power to the electric network.

Figure 6.5 – Peak train load factors in the absence of additional rolling stock (ratio of passengers to seats expressed as a percentage)

Year	2008/09						2013/14						2019/20					
Time Period	AM peak			PM peak			AM peak			PM peak			AM peak			PM peak		
Branch/ Time	7 – 8	8 – 9	9 – 10	4 – 5	5 – 6	6 – 7	7 – 8	8 – 9	9 – 10	4 – 5	5 – 6	6 – 7	7 – 8	8 – 9	9 – 10	4 – 5	5 – 6	6 – 7
Southport	77	102	110	116	76	86	90	120	129	136	89	100	100	134	144	152	100	112
H Cross	65	82	60	74	85	69	76	96	70	87	100	80	85	108	78	97	112	90
Ormskirk	77	108	88	105	86	59	90	127	103	123	100	69	101	141	115	138	112	77
Kirkby	38	101	76	85	85	59	44	118	89	99	99	69	49	132	100	111	111	77
Chester	56	79	94	97	102	101	65	92	110	113	119	18	73	103	123	126	133	132
Ellesmere	47	96	66	87	105	73	55	113	77	102	123	86	61	126	86	114	138	96
W Kirby	49	102	85	81	89	51	57	119	100	95	104	60	64	133	111	106	117	67
N Brighton	46	79	62	72	77	48	53	93	72	84	91	57	60	104	81	94	101	63

Key: **Orange** = more passengers than seats available on all services in an hour.
Red = more passengers than the theoretical rolling stock capacity for all services in an hour.

Figure 6.6 – Maximum time (in minutes) passengers stand in the absence of additional rolling stock

Year	2008/09						2013/14						2019/20					
Time Period	AM peak			PM peak			AM peak			PM peak			AM peak			PM peak		
Branch/ Time	7 – 8	8 – 9	9 – 10	4 – 5	5 – 6	6 – 7	7 – 8	8 – 9	9 – 10	4 – 5	5 – 6	6 – 7	7 – 8	8 – 9	9 – 10	4 – 5	5 – 6	6 – 7
Southport	-	25	16	16	12	8	11	32	19	20	14	24	14	32	25	28	16	30
H Cross	4	3	-	-	11	-	5	9	-	7	13	3	8	12	5	11	16	14
Ormskirk	9	14	9	13	12	6	11	19	11	18	16	12	14	19	14	18	16	12
Kirkby	-	8	-	-	-	-	-	12	8	7	6	-	-	12	8	12	9	-
Chester	4	13	10	-	15	7	10	27	15	2	25	16	12	19	19	13	41	20
Ellesmere	-	2	-	12	9	-	-	10	10	14	14	-	-	15	12	18	16	2
W Kirby	-	18	-	-	7	-	-	21	8	2	17	-	3	23	15	15	19	-
N Brighton	-	6	2	-	5	-	-	12	8	2	7	-	-	12	12	5	9	-

Key: **Orange** = in excess of Merseytravel 15-minute standard.
Red = in excess of national 20-minute standard.

Figure 6.7 – Additional units in traffic required

Year	2008/09		2013/14 – recommended intervention					2019/20 – required to meet Merseytravel crowding standards				
Time Period	Length of 6-car operation		Additional 3-car unit arrivals/ departures		Length of 6-car operation		Additional 3-car units in traffic	Additional 3-car unit arrivals/ departures		Length of 6-car operation		Additional 3-car units in traffic
Branch/ Time	AM peak	PM peak	AM peak	PM peak	AM peak	PM peak		AM peak	PM peak	AM peak	PM peak	
Southport	1¼ hrs	1¼ hrs	5	6	2½ hrs	2½ hrs	6	7	7	3 hrs	3 hrs	6
H Cross	1 hr	1¼ hrs	3	3	1¾ hrs	2 hrs		3	3	1¾ hrs	2 hrs	
Ormskirk	1 hr	1 hr	5	6	2¼ hrs	2½ hrs	3	5	6	2¼ hrs	2½ hrs	3
Kirkby	¼ hr	-	-	-	¼ hr	-	-	-	-	¼ hr	-	-
Chester	¼ hr	¼ hr	2	3	¾ hr	1 hr	4	4	7	1¼ hrs	1¾ hrs	5
Ellesmere	-	¼ hr	-	-	-	¼ hr	-	-	2	-	¾ hr	2
W Kirby	½ hr	½ hr	1	-	¾ hr	½ hr	1	1	2	¾ hr	1 hr	1
N Brighton	-	-	-	-	-	-	-	-	-	-	-	-
Total	**n/a**	**n/a**	**15**	**18**	**n/a**	**n/a**	**14**	**20**	**27**	**n/a**	**n/a**	**17**

Figure 6.8 – Business case for recommended train lengthening option

Summary of appraisal results *All figures in £m NPV 2002 prices & values*	Chester 4 Additional units	Southport /Hunts Cross 6 Additional units	Ormskirk 3 Additional units	West Kirby 1 Additional units	All Lines 14 Additional units
Appraisal over 60 years					
User benefits (crowding & quality)	14.7	25.7	13.7	3.8	57.9
Non-user benefits	19.6	33.0	13.7	3.4	69.7
Total benefits	34.3	58.7	27.4	7.2	127.6
Platform lengthening capex	-	-	-	-	-
Depot costs	-	-	-	-	-
Leasing costs	15.1	22.7	11.4	3.8	53.0
Opex	7.6	8.8	3.0	1.0	20.3
Less fares revenue	-11.5	19.4	-8.0	-2.0	-40.9
Other government impacts	2.3	3.9	1.6	0.4	8.2
Total costs	**13.6**	**16.0**	**7.9**	**3.2**	**40.7**
NPV	**20.7**	**42.7**	**19.5**	**4.0**	**86.9**
BCR	**2.53**	**3.66**	**3.46**	**2.27**	**3.14**

6.3.2 Peak train capacity, long term

A view of the post 2020 capacity requirement has been developed by estimating the impact of the long-term central growth scenario on peak train loads after the implementation of the lengthening option recommended above.

Northern Line

The Northern Line will require an increasing amount of six-car operation, and an increase in the frequency of services once all trains in a given time slice have reached the maximum six-car length.

The Southport branch will require an additional service in the pm peak at the very start of the long-term time horizon as all services will be extremely heavily loaded and operating at maximum length. This will increase the frequency on the branch to be the same as in the am peak when it is already six trains in the busiest hour.

By around 2027 the majority of the high am and pm peak services[4] on the Ormskirk and Southport branches will be at maximum length and fully loaded. This means that over the next 15 – 25 years the number of high and shoulder am and pm peak services on both the Ormskirk and Southport branches will need to be increased at regular intervals to accommodate demand.

The maximum number of services is theoretically 20 trains per hour through the tunnel, but given the various infrastructure constraints elsewhere 16 is a practical maximum to achieve acceptable performance (the current busiest hour has 14 trains). Achieving this frequency increase could be done without major infrastructure work outside of Liverpool[5]; however, performance on the route may suffer and consideration may have to be given to grade separating Sandhills Junction, and potentially closing/bridging some level crossings. Furthermore, it is unlikely that the dwell times at Liverpool Central in the peak can be kept sufficiently short to accommodate 16 trains per hour, and the separate study of Liverpool Central will be required to inform this.

It is anticipated that this practical maximum frequency will be reached in 20 – 25 years. Any further increase in capacity would require infrastructure work such as signalling upgrades, a new platform at Central, or a completely new station, as well as the grade separation at Sandhills and several level crossing closures or bridges. Given the cost and scale of this work, other solutions such as routing services into Liverpool Lime Street via the North Mersey Branch, or investment in an alternative mode of public transport, may be more efficient.

Wirral Line

The Wirral Line is not expected to face the same capacity challenge as the Northern Line. However it will require increasing six-car operation to meet demand over the next 30 years.

The maximum number of services on the Wirral Line loop is theoretically 20 trains per hour, but given the various infrastructure constraints elsewhere 18 is a practical maximum to achieve acceptable performance (the current busiest hour has 16 trains). Within the next 25 – 30 years the Chester and West Kirby branches will operate at maximum length in the busiest am and pm peak hours and will need one additional service each to cope with demand. Shorter distance shuttle services would be the most efficient way to deliver this. The city loop is able to deal with the increased frequency of trains (including the additional services recommended in other options), although by the end of the 30-year RUS period the frequency in the busiest part of the day will be required to be around 18 trains per hour.

4 The “high peak” refers to all services arriving in central Liverpool between 08:00 and 08:59, and departing central Liverpool between 17:00 and 17:59. The “shoulder peak” refers to the hours either side of the high peak.

5 Based on more through trains and fewer terminating trains at Liverpool Central.

6.4 Gap Three: Connectivity and journey time

Figure 3.2 in Chapter 3 sets out the frequency of journey opportunities on the various radial routes from Liverpool. This revealed a number of disparities, some of which stakeholders and funders agreed the RUS should address as 'gaps'.

6.4.1 Connectivity between Chester and Liverpool

Gap

The frequency of services between Chester and Liverpool is half-hourly for the majority of each weekday and all of Saturday, with a typical journey time of 43 minutes. This is viewed as inappropriate relative to the size of both conurbations, and stakeholders believe it is a source of suppressed demand and sporadic crowding on inter-peak services.

The return journey time from Liverpool only allows for a four-minute turnaround time at Chester with no scope for recovery elsewhere on the route. This means that the impact of delay on services in the morning peak operation, when the Wirral Line loop is most intensively used, is either continuing lateness throughout the day, or cancellation of services to allow trains to meet the next scheduled departure time. The Chester branch is currently the worst performing service group on the Merseyrail network.

Option(s)

The options considered to address this gap therefore tested the practicality and value for money of improvements to train frequency and journey time. It is recommended that the frequency of services between Chester and Liverpool is increased from two to four per hour in the inter-peak, thereby matching the high peak frequency and providing a quarter-hourly Chester – Liverpool service between 07:00 and 19:00, and six trains per hour for all stations between Hooton and Birkenhead Central (inclusive). During the inter-peak every second service would not call between Chester and Hooton in the direction of Liverpool, with the other two services not calling between Hooton and Chester in the direction of Chester. This would reduce the return journey time by around three minutes thereby providing an improved performance buffer for services. The frequency at Bache and Capenhurst would remain half hourly, and all am peak arrivals in Liverpool and pm peak departures from Liverpool would have the same stopping pattern as currently. This would also improve connections with services from North Wales into Chester.

The scheme is expected to generate around 190,000 additional passengers per annum, and only a relatively moderate investment of public funding would be needed as all the rolling stock can be resourced from spare units that are already used to operate the additional services in the peak. Overall the scheme is likely to offer high value for money indicated by a BCR of 2.5.

As an increment to this option it is recommended that the line speed between Bache and Hooton is raised from 60mph to 75mph. It is anticipated that this could be done almost entirely through planned track renewals due to be completed in 2010/11; however it is recommended that a small scheme is developed to optimise the scope of the infrastructure work and fund any resultant small cost increases. This would improve the turnaround time of inter-peak services to around 8½ to 9 minutes and provide a performance buffer for peak services. Alternatively, Merseyrail could choose to use the reduced journey time to increase the service frequency at Bache and Capenhurst, if it is perceived to offer better value for money.

It is anticipated that the longer turnaround times generated by the improved service frequency and line speed upgrade will increase punctuality to the level of the other Merseyrail service groups. However, in the longer term an additional electrified platform at Chester station may produce a significant further performance benefit, particularly as more peak services operate in six-car formation

resulting in an increasing number of coupling and uncoupling manoeuvres at the station. It is therefore recommended that a review of the infrastructure at Chester is undertaken once the frequency increase and line speed improvements have been implemented.

Analysis suggests that the additional two services per hour through the Wirral Line loop will not be particularly detrimental to train punctuality. However, any performance risk could be mitigated by replacing the current half hourly inter-peak Ellesmere Port – Chester services with a quarter hourly Ellesmere Port – Hooton shuttle, with a five-minute connection time with the quarter hourly Chester – Liverpool services. This option is not recommended at this stage as the value for money is inferior to the previous scheme.

Options to increase the frequency of Chester – Liverpool services and significantly reduce the journey time by either not calling at stations between Hooton and Birkenhead Central, or using additional infrastructure between Hooton and Rock Ferry have also been assessed. However, these are not recommended because it is not possible to achieve an even service interval with a mixture of stopping and semi-fast services, so the benefit of improved journey times would be partially offset by the disbenefit from losing an even quarter hour frequency. Furthermore, the level of benefit generated is not sufficient to support major infrastructure expenditure. Figure 6.9 summaries the business case for all the options tested.

Figure 6.9 – Transport economic efficiency table for Chester branch options

30-year appraisal unless stated	£m (2002 market prices)			
	C1: 1/4 hourly Chester – Liverpool with performance buffer	C2: 1/4 hourly Chester – Liverpool & 1/4 hourly Ellesmere – Hooton	C3: 1/4 hourly Chester – Liverpool mixed service pattern	C4: As option C3 but with infrastructure (60-year appraisal)
Costs (present value)				
Investment cost	0.0	0.0	0.0	39.2
Operating cost	21.1	12.8	25.7	35.1
Revenue	-7.6	-3.0	-6.9	-8.4
Other government impacts	1.8	0.7	1.7	2.1
Total costs	**15.3**	**10.6**	**20.4**	**68.0**
Benefits (present value)				
Rail users' benefits	32.3	13.5	30.6	43.3
Non-users' benefits	5.7	3.0	5.9	9.8
Total quantified benefits	**38.0**	**16.5**	**36.4**	**53.1**
NPV	**22.7**	**5.9**	**16.0**	**-14.9**
BCR	**2.5**	**1.6**	**1.8**	**0.8**

6.4.2 Connectivity and journey times between North Wales and Merseyside including Liverpool John Lennon Airport

Gap

There are no direct rail services between North Wales and the majority of Merseyside, particularly Liverpool. Passengers wishing to travel between the two are required to change at Bidston, Chester or Crewe, which is time consuming and difficult for some passengers.

Option(s)

Extending the Merseyside third-rail electric network from Bidston to Shotton and Wrexham would allow the current diesel shuttle service to be replaced by through electric trains using the Wirral Line to Birkenhead and central Liverpool. However, analysis has demonstrated that the cost of electrification is so high that this option would be neither value for money nor affordable.

Network Rail will conduct a more detailed study of two alternative proposals which are: electrification using overhead wires, so that through services could still be operated with dual-voltage rolling stock; and an extension of current Wrexham – Bidston diesel services to Birkenhead North, thereby providing a better connection into the Merseyrail network. The electrification scheme will be considered under the option sifting in the Network RUS Electrification work stream. The enhanced diesel scheme is an aspiration of Arriva Trains Wales, and it will be necessary for the additional work to reconcile how both Merseyrail and Arriva Trains Wales can operate services at Birkenhead North.

Merseytravel is investigating the potential demand for new services between Chester and Liverpool Lime Street via a reinstated curve at Halton, south of Runcorn. Although this is a longer route from Chester to Liverpool than the existing line via Hooton, it would have the benefits of serving Liverpool South Parkway (for the airport) and permitting through services from North Wales. Merseytravel is conducting a more detailed analysis of this proposal than is possible under the scope of a RUS, and is due to complete the work in summer 2009. This study will include an assessment of demand on the Ellesmere Port – Helsby branch.

If any of the studies detailed above are able to demonstrate a suitable case for implementation of any of the proposed options in a manner consistent with the other recommendations in this RUS, then they should be taken forward on a similar basis. These issues will be discussed through the Merseyside Investment Review Group (MIRG) as described in the glossary.

A further alternative is the possibility of through services from Chester or Shotton to Liverpool South Parkway via James Street and the ‘exchange’ line to the Northern Line. This has been considered, but was rejected because of the capacity and performance effects of additional trains on the Northern Line and conflicting movements over the flat junctions.

Enhancements in service frequency and linespeed on the Chester – Hooton – Liverpool route, as recommended in section 6.4.1, would improve connections with services from North Wales at Chester.

6.4.3 Connectivity and journey times between Wigan, St Helens and Liverpool

Gap

The current inter-peak service frequency of three trains per hour between Wigan, St Helens and Liverpool is viewed as inadequate by a number of stakeholders relative to the size of these conurbations. Journey times are also relatively long as two out of every three trains call at all stops on the line.

Option(s)

Analysis suggests that an additional hourly inter-peak service between Wigan, St Helens and Liverpool could achieve a medium value-for-money case providing it can be operated using spare rolling stock required for peak operation and its calling pattern is optimised.

Given the prevalence of stopping services on the route, it is forecast that a semi-fast service with a limited number of stops would be more attractive to new passengers, and this option is recommended. This would provide a quarter hour service frequency to/from Liverpool for around 12 hours per day. Figure 6.10 below illustrates the business case for both a semi-fast and stopping service.

The Lancashire and Cumbrian RUS investigated the business case for an increased frequency of services between Liverpool and Preston, and concluded that it would offer low value for money. It has not been possible to find any evidence that alters this conclusion

Figure 6.10 – Transport economic efficiency table for Wigan – Liverpool options

30-year appraisal	£m (2002 market prices)	
	W1: Additional hourly inter-peak Wigan – Liverpool semi-fast	W2: Additional hourly inter-peak Wigan – Liverpool stopping service
Costs (present value)		
Investment cost	0.0	0.0
Operating cost	12.4	12.4
Revenue	-4.0	-3.1
Other government impacts	0.9	0.7
Total costs	**9.4**	**10.1**
Benefits (present value)		
Rail users' benefits	12.0	11.2
Non-users' benefits	2.6	1.8
Total quantified benefits	**14.7**	**13.1**
NPV	**5.3**	**3.0**
BCR	**1.6**	**1.3**

6.4.4 Connectivity between Tower Hill (east of Kirkby) and Liverpool

Gap

It is not possible to travel directly between Tower Hill, which is adjacent to the Kirkby – Wigan line, and Liverpool. Tower Hill has a population of over 8,000, with additional housing developments underway. The area has no direct service into Liverpool with passengers being required to interchange at Kirkby.

Option(s)

Merseytravel is currently investigating the potential to extend the electrified network from Kirkby through to a new station at Headbolt Lane, one kilometre beyond Kirkby.

Merseytravel's preferred option would be to continue the regular 15-minute service from Kirkby through to Headbolt Lane, with a 30-minute service in the evening. Additionally it is proposed to provide a large Park & Ride facility which will attract car users who currently drive the whole journey into Liverpool.

Network Rail has undertaken a GRIP 3 study into the proposal and costed the scheme at £21.7 million. The case has yet to be made for this proposal and the outcome will be dependent on a demand study being undertaken by Merseytravel.

6.4.5 Connectivity between Skelmersdale and Liverpool

Gap

Skelmersdale lies 12.7 miles north-east of Liverpool and is the second most populous town in the North West Region without a railway station. The nearest rail station at Upholland has no car park or public transport link to Skelmersdale, and it is too far to access on foot. Moreover, there are no direct services to Liverpool. Stakeholders view this as an insufficient rail service relative to the size of the catchment area.

Option(s)

Network Rail has assessed the potential demand from Skelmersdale by comparing the rail markets in other towns around Liverpool with similar characteristics, and estimated the achievable market according to population and journey time into Liverpool. Figure 6.11 below details the sample of comparable towns used in the analysis. It is estimated that approximately 16 trips per head of population would be made between Skelmersdale and central Liverpool, per annum, if Skelmersdale were connected to the Merseyrail network and was provided with a standard quarter hourly service frequency. This is around 20 percent lower than other comparable towns, such as Kirkby and Ormskirk. On this basis around 630,000 trips per annum between Liverpool and Skelmersdale are forecast as well as another 170,000 trips to and from other stations.

Based on the demand forecast presented above and a high-level assessment of the infrastructure and operating costs, extending the electric network from Kirkby has the potential to deliver high value for money.

Two options have been considered at this stage:

- **Option S1:** extension of the existing quarter hourly Liverpool Central to Kirkby service, to terminate at a new station in the centre of Skelmersdale. Rainford will then become an interchange station for services to and from Wigan Wallgate
- **Option S2:** extension of the existing quarter hourly Liverpool Central to Kirkby service to terminate at Upholland. Upholland would then become an interchange station for services to and from Wigan Wallgate. This will require electrification and double-tracking to Upholland.

Option S1 is preferred, as the infrastructure cost saving from the reduced mileage of upgrading the line to Upholland would be more than offset by the loss of passengers (circa 200,000) through not providing a direct service to the centre of Skelmersdale.

Given the size and cost of the scheme, the analysis that can realistically be completed for the RUS is too high level to allow a funding recommendation. The business case is particularly sensitive to the scheme costs and the revenue yield per passenger, and neither of these issues is completely understood. It is therefore recommended that the scheme is developed as far as GRIP 3 to gain a better understanding of the key elements of the business case.

Options S1 and S2 would each be compatible with the proposal described in section 6.4.4.

The option of extending electrification onwards to Wigan has been identified as a gap in the Network RUS and will be evaluated as part of that process. The electrification section of the Network RUS will be published for consultation in spring 2009 before final publication in summer 2009.

Figure 6.11 – Merseyside rail market analysis

Station	Population (thousand)	Liverpool trips (thousand)	Trips per head	GJT by rail
Skelmersdale	39	630	16.2	38
Ormskirk	23	517	22.1	43
Maghull	29	638	22.1	32
Kirkby	40	826	20.4	30
Birkdale	12	123	10.0	52
Ainsdale	13	130	10.3	47
Waterloo	24	600	25.1	29
Fazakerley	15	323	21.2	26
Hightown	5	75	14.9	37
Formby	25	277	11.1	41
Chester	80	238	3.0	59
Hunts Cross	15	446	28.8	29
Newton-le-Willows	21	43	2.0	51
Runcorn	61	128	2.1	38
Wigan	81	117	1.4	62
Crewe	68	145	2.1	56

6.4.6 Connectivity between Liverpool suburbs and the city centre

Gap

The residential areas of Anfield and Everton are not connected to the rail network and stakeholders believe that suburbs of this size require a direct rail connection into central Liverpool. Furthermore, the site of the proposed new football stadium does not have a rail service.

The residential area around the North Mersey branch does not have a direct rail service, however the potential new catchment is relatively small due to the close proximity of existing stations at Aintree, Orrell Park and Seaforth & Litherland.

Option(s)

In order to assess the possibility of providing a passenger service on the North Mersey and Bootle branch, six options have been appraised. The first three options look at providing a passenger service from Liverpool Lime Street to Bootle New Strand with two additional stations en route. Three possible service patterns have been evaluated:

- **Option BNM1:** one train per hour, 60-minute service interval
- **Option BNM2:** two trains per hour, 30-minute service interval
- **Option BNM3:** four trains per hour, 15-minute service interval.

The next three options look at extending the service from Bootle New Strand to Aintree by using the North Mersey branch with the same service patterns as in the first three options, with an extra station.

- **Option BNM4:** one train per hour, 60-minute service interval
- **Option BNM5:** two trains per hour, 30-minute service interval
- **Option BNM6:** four trains per hour, 15-minute service interval.

The demand assessment is taken from the "Stadia Access Report" commissioned by Merseytravel in June 2003. This outlines the potential market based on a selection of service frequencies to and from Liverpool Lime Street. This approach assumes a mature rail market around a station and is therefore, considered to be a fairly optimistic evaluation of demand, even after an allowance for passenger growth since 2003. Figure 6.12 shows the assumptions used in the appraisal of each option, and gives an indication of the economic benefit compared with the operational expenditure required for each option. The table also shows the justifiable spend on infrastructure – all options will require investment in new stations, and the higher frequency options also require signalling and linespeed improvements.

Both a quarter hourly and half hourly service to Bootle New Strand (BNM2 and BNM3) are expected to generate sufficient benefit to support approximately £8 million and £10 million infrastructure investment, respectively. However, it is unlikely that the required level of infrastructure can be delivered for a budget of this magnitude. Despite this, other transport authorities may wish to develop alternative funding proposals, or potentially re-examine the cost of implementation.

An hourly service to Bootle New Strand (BNM1) would not support any infrastructure investment and can be discounted.

The additional benefit gained from extending services to Aintree (BNM4 – 6) is less than the incremental operating costs, and on that basis these options cannot be recommended at present.

Figure 6.12 – Business case for Bootle branch and North Mersey branch services

	Options			Incremental add-ons		
	BNM1 Lime St – Bootle New Strand hourly	**BNM2** Lime St – Bootle New Strand half hourly	**BNM3** Lime St – Bootle New Strand quarter hourly	**BNM4** Extend **BNM1** to Aintree	**BNM5** Extend **BNM2** to Aintree	**BNM6** Extend **BNM3** to Aintree
Annual passenger journeys (thousand)	543	913	1,284	67	112	157
Annual passenger revenue (£ thousand)	362	609	856	44	75	105
60-year present value, excluding capital costs						
Benefits (£ thousand)	1,214	13,451	28,953	0	1,316	2,892
Costs to government less revenue (£ thousand)	-1,499	-7,935	-3,616	-368	8,667	8,723
NPV (£ thousand)	2,714	21,386	32,569	368	-7,351	-5,831
BCR	*	*	*	**0**	**0.15**	**0.33**
Justifiable capital spend (£ million)	**1.16**	**8.05**	**9.93**	**0**	**0**	**0**

6.4.7 Connectivity between the Ormskirk area and Liverpool

Gap

It is not possible to travel directly between central Liverpool and the towns to the north of Ormskirk, particularly Burscough. This means that passengers are required to change at Ormskirk and may have to wait a considerable amount of time for a northbound connection.

Option(s)

The Lancashire and Cumbria RUS published in August 2008 recommended that the frequency of services between Ormskirk, Burscough and beyond be increased to hourly; and also recommended the reinstatement of infrastructure allowing direct services between Southport and Ormskirk.

This RUS has not identified any new evidence which alters the recommendations of the Lancashire and Cumbria RUS regarding the optimal combination of services north of Ormskirk. Merseytravel is currently investigating these services in significantly greater detail than can be achieved during the RUS process, and is scheduled to complete this work in spring 2009. If the study is able to demonstrate a suitable case for implementation in a manner consistent with the other recommendations in this RUS, then it should be taken forward on a similar basis. This is one of the issues discussed through the MIRG as described in Chapter 10.

It is not anticipated that any changes to services north of Ormskirk will have a material impact on the strategy for the core Merseyside RUS area.

6.4.8 Connectivity between Birkenhead Docks and the Midlands

Gap

Wirral Metropolitan Borough Council and Peel Ports believe that there is a market for rail freight between the Wirral and the Midlands. Their preference is for this traffic to be routed via the Bidston – Wrexham line to avoid the busy West Coast Main Line and to minimise operating costs. Services cannot operate out of the Wirral port on this route without some infrastructure upgrade work which includes reconnection to the network at Birkenhead North and capability upgrade between Shotton and Bidston.

Option(s)

It is understood that the level of traffic would be equivalent to one train per day in each direction. Network Rail has assessed the benefit of the removal of an equivalent level of freight by road, and on this basis there would be a justification to invest around £6 million of public funding, if this sum could deliver the outputs

6.4.9 Connectivity between Canada Docks and the rail network

Gap

Since the publication of the Merseyside RUS Draft for Consultation, the rail industry has developed forecasts for freight traffic between 2014 (when the Freight RUS projections end) and 2029. These will be published in the Network RUS in Summer 2009. The forecasts suggest that the existing route into the docks on the Liverpool side of the River Mersey may not be sufficient to accommodate future longer-term growth.

Option(s)

Subject to reaching capacity on the existing route into the dock (the Bootle branch), signalling solutions may be required.

The only alternative rail access that does not have major developments built over it is the route into Canada Docks. On this basis it is recommended that the route is protected from further development until a better understanding of rail freight growth has been developed and assessed.

6.5 Gap Four: Getting to the train

Merseytravel data indicates that although most rail passengers walk to stations on the network, a significant proportion, (around 22 percent and 6 percent respectively), use a car[6] or bus to access stations.

During the consultation period Passenger Focus led a piece of work to improve the industry's understanding of whether a lack of available car parking is a particular barrier to rail use in the RUS area.

Similarly to other RUS areas, around 90 percent of car parks on the network are typically full by the end of the am peak on weekdays; however around half of those wishing to are able to park at the station car parks. This is a higher proportion than most other parts of the country outside of the South East, and passengers appear to be more satisfied with the facilities than elsewhere.

Based on the evidence from this study, as well as other data from Merseytravel and other stakeholders, a lack of available car parking has not been identified as a constraint to any of the recommended options in the RUS. Despite this it is recognised that the potential for passenger growth through the increased inter-peak service frequency on the Chester Line may not be realised without additional car parking facilities. It is recommended that the industry investigates the potential for a larger car park at Hooton, as this station has excellent road links making it well placed to

6 Excluding passengers who are dropped off or collected by car.

capture park and ride passengers, and has sufficient available land.

Merseytravel will continue with their significant endeavours to improve the accessibility of the network by public transport. Where the lack of bus interchange facilities is a constraint to the growth forecast underpinning other recommendations in the RUS, Merseytravel will work with other funders to investigate the opportunities for improving these facilities.

Evidence from the Passenger Focus study also suggests that a number of passengers do not access the rail network at their closest railway station as their preferred location has a lack of available car parking. A multi-modal assessment is required to fully understand this issue, and whilst this is beyond the scope of the RUS it is clear that a more detailed piece of work of this type would be beneficial.

6.6 Gap Five: Train punctuality and performance

6.6.1 Significant causes of delay and reactionary delay

Short and medium term

Although punctuality in the Merseyside RUS area is higher than the national average, significant delays to services occur for a number of reasons. These include: intensively used sections of route, busy junctions, and services with historically tight turnarounds. Analysis of delay caused by location suggested the following priorities.

Option(s)

One of the worst single causes of reactionary delay on the Merseyrail electric network is the four-minute turnaround on the Chester service group, which as described in section 6.4.1 results in irrecoverable lateness and regular cancellations. Analysis undertaken by Merseyrail during the consultation period suggests that the recommended enhancements to the inter-peak service will increase the minimum train turnaround times, and improve the PPM for the Chester Line service group by approximately four percent as a result. It is anticipated that this will increase the PPM for the whole Merseyrail operation by around 0.25 percent. As discussed in section 6.4.1, the performance of the improved Chester Line service group will continue to be monitored and it may be necessary to provide further operational flexibility at Chester station at some point in the future.

There are two other main sources of delay which may require mitigation in the future. It has not been possible through the RUS process to identify a case for investment at these locations, however they are highlighted below for completeness.

Hunts Cross West Junction is one of the main causes of delay on the network with up to 16 conflicting moves an hour between services using the City Line and the Hunts Cross branch. Detailed delay analysis is in progress and it is recommended that the business case for an improved junction layout is examined.

Sandhills Junction is also a significant cause of delay in the RUS area with 12 conflicting moves in a standard hour and more at peak times. Again, detailed delay analysis is being undertaken and it is recommended that the business case for mitigation measures is investigated.

Long term

Beyond 2020 a number of locations on the Northern Line are expected to cause delay as the frequency of peak services is increased to accommodate growing passenger numbers. As stated previously in this chapter, Liverpool Central, Sandhills Junction and level crossings on the Southport branch in particular will require significant infrastructure work to maintain a punctual passenger service.

7. Consultation process

7.1 The Draft for Consultation

This section outlines the key outputs that have informed the development of this strategy.

The Merseyside RUS Draft for Consultation was published in November 2008, along with a press release announcing its publication. The document outlined five generic gaps and the predicted demand for passenger and freight traffic up to 2039. A set of options was proposed for bridging those gaps.

The Draft for Consultation was distributed to a wide range of stakeholders and a period of 12 weeks was given for responses. The consultation period ended on 20 February 2009.

During the consultation period, stakeholders were invited, either collectively or individually, to a briefing session in Liverpool at which specific issues were discussed.

This section explains how responses shaped the development of the strategy.

7.2 Consultation responses

A total of 36 consultation responses were received and these are broken down as follows:

Government and Local Authorities	10
Train operators and ATOC	3
Trade Unions, Government agencies	2
User Groups	13
Members of the public	8

The responses can be found on the Network Rail website at **www.networkrail.co.uk** in the Merseyside RUS area.

7.3 Key themes in the consultation responses

7.3.1 Range of responses

When comparing consultation responses for this RUS against response rates of other RUSs, the volume of responses received was relatively low. However the responses that were received provided useful insight into a wide range of issues. The reponses varied considerably in content, therefore only the key and recurring themes are summarised in this chapter.

7.3.2 General themes

Overall, general reaction from respondents was very positive, with an overwhelming support for the approach taken.

Responses were very supportive of the gaps identified, the options proposed as recommendations, the overall direction of the RUS, and the work being undertaken. Indeed, there were very few responses in disagreement with the proposed strategy outlined in the Draft for Consultation.

The general themes arising from analysis of all the responses are broadly as follows, based on the generic gaps:

Gap 1 – Capacity, Stations:

- it was recognised that the issues concerning Liverpool Central station are fundamental to the future success of Liverpool City Centre area in the coming years. There was strong support for the approach taken by the RUS and recognition by consultees that significant intervention will be needed
- in the Draft for Consultation, the RUS asked for views on how the range of interventions available should be staged, given that some interventions would only have a short lifespan before further capacity was required. Feedback received suggests that the need for these interventions and optimum value for money requires that a longer-term solution should be developed and delivered as a priority
- it was commented that if significant expenditure is required at Liverpool Central station, then a new underground station near to Paradise Junction on the Northern Line should be considered as an alternative as it would directly serve the Liverpool One retail site
- there were concerns raised as to whether capacity at Moorfields was sufficient to meet demand
- there was support for the further study into the concourse capacity at James Street.

Gap 2 – Capacity, Trains and infrastructure:

- there was support for the approach to address the short, medium and long-term capacity problems that are anticipated on the network
- support was expressed for the lengthening of trains as the most effective way to meet passenger demand without putting performance at risk
- there was strong support for the approach taken towards assessing the future rolling stock requirements, though some additional information on train loadings was requested
- an initial review of the current stabling facilities for rolling stock at the key Merseyrail maintenance depots has highlighted that there is no spare capacity available and that improvements need to be undertaken prior to any additional rolling stock being accommodated
- there was considerable support for expanding electrification beyond the current Merseyrail network
- consultees highlighted the importance of improving loading gauge in any future projects.

Gap 3 – Connectivity and journey time

- it was considered that improvements to connectivity were important to allow for future growth in the area
- there was strong support for the proposed increase in inter-peak train services between Chester and Liverpool (four trains per hour)
- there was support for improving connectivity between North Wales and Chester to John Lennon Airport, including the reinstatement of the Halton Curve
- there was strong support for the proposed increase in train services between Liverpool and Wigan (up to four trains per hour)
- there was significant support for the proposed new rail connection to Skelmersdale
- there was also support for a proposed new station at Tower Hill, though concerns were expressed as to the cost of the extension and as to whether it would be better as a through station should the proposed connection to Skelmersdale go ahead
- consultees recognised that there is currently no business case for running passenger services over the North Mersey and Bootle branches, but requested the situation is kept under review and revisited in the future
- there was support for the improved links from towns to the North of Ormskirk with Liverpool, including support for the construction of curves at Burscough
- consultees welcomed the potential reinstatement of the connection into Birkenhead Docks and Canada Dock with the Port of Liverpool
- numerous comments were made on the Wrexham to Bidston line. These include possible electrification, proposed line speed improvements, proposals to run diesel services to Birkenhead North, Deeside Industrial Park and new station developments, and the poor reliability of services with trains being turned around at Shotton.

Gap 4 – Getting to the train

- there were numerous requests to improve facilities at stations: eg. upgrading of station facilities, improving access for the disabled, installing real-time passenger information screens and better toilet and cycle facilities
- it was suggested that cycle access to railway stations be given a higher priority
- there were requests for better and larger cycle facilities on trains
- there was concern regarding the limited capacity at car parks, poor car parking security and numerous stations with no car parking facilities at all and the impact this has to local residents through on-street parking
- there was encouragement for partnership working with other transport providers to align timetables on popular routes for the overall benefit of passengers as the satisfaction with interchange between the train and other public transport modes was lower in the RUS area than the national average.

Gap 5 – Train punctuality and performance:

- improvements to the operational flexibility at Chester station were considered important
- increasing the frequency of any services on the Northern Line to Southport will cause further delays to road users at level crossings, due to the length of time the road barriers are in the lowered position. However, substantial investment would be needed to remove the level crossings on this route
- consultees raised that with an increased level of service in the future, certain key junctions and other network constraints may become an increased performance risk.

General comments:

- it was noted that the RUS demand forecasts should be updated to take account of the latest passenger loading data and that the potential impact of the recession would need to be considered
- there was recognition that securing funding streams will be a key issue for moving any strategy forward
- it was considered by some bodies that the actual geographical area covered by the Merseyside RUS could have been expanded. The interfaces with the various train operators at the peripheral areas of the RUS could have been evaluated further
- comments were made that certain issues regarding services on the edge of the Merseyside RUS area had not been properly addressed by adjacent RUS workstreams
- there were requests for more clarity on some of the issues that were not part of the scope of the Merseyside RUS, but affected the Merseyside RUS area: eg. development work on Halton Curve, Burscough Curve, and the Wrexham to Bidston line
- it was noted by some that the Ellesmere Port to Helsby line should have been part of the Merseyside RUS and not the Wales RUS
- it was raised that there would be a major house building programme in West Cheshire as it has been identified as a government 'Growth Point'
- some consultation reponses suggested radical and expensive infrastructure schemes such as opening new or disused tunnels.

The overwhelming majority of responses were constructive and very supportive of the work undertaken.

7.3.3 Further Analysis

As a result of the consultation responses further analysis was carried out on several issues. This resulted in some alterations to the business cases for certain options and the overall recommendations.

In this final version of the Merseyside RUS, there has been detailed scrutiny of the actual demand growth in 2008/09 using Merseyrail's autumn 2008 passenger counts. The RUS demand forecasts have been benchmarked against this data and the associated recommendations have been adjusted where appropriate.

The passenger counts have also been used to assess peak train loads, and the options have been re-assessed against the Merseytravel crowding standards of 15 minutes maximum standing time as well as the DfT national standard which classifies a train as overcrowded when the total capacity of the train, including standing allowance, is exceeded or when passengers stand for more than 20 minutes.

7.4 Other issues

The rolling stock strategy for maintenance and stabling has been updated and the number of additional units that are required in traffic to meet predicted growth by 2013/14 has been revised.

Passenger Focus have recently completed a study which has provided useful data which has been used in the evaluation work, particularly for Gap 4 (Getting to the train) issues.

8. Strategy

8.1 Introduction

The Merseyside RUS network is predominantly used by passenger services and there is very little freight traffic. The most acute issue is accommodating the growth in commuter and leisure journeys into the centre of Liverpool and the impact this has on train and station capacity. The strategy therefore primarily seeks to address the question of growth in passenger demand progressively over time.

The starting point for the RUS process was to analyse the current network baseline position, combined with any committed schemes. Out of this analysis the key themes that emerged were network capacity/utilisation, access to the network, and regional connectivity.

In parallel with the baseline analysis work, a demand study was undertaken to ascertain the likely growth rates over the next 10 years taking into account the expected drivers of change. This demand forecast was then extrapolated to determine a 30-year view of growth.

The combined analysis identified where supply and demand are mismatched now, and where they are expected to be mismatched in the future. Any potential infrastructure constraints to this demand being accommodated were also highlighted. The RUS has also considered regional aspirations laid out in the Regional Spatial Strategies and Local Transport Plans, and has taken into account other potentially fundable stakeholder aspirations. These include aspirations of the DfT, Merseytravel, the Welsh Assembly Government, Local Authorities and regional bodies.

The identified gaps were then subjected to further analysis to establish how they could be best addressed, taking into account any schemes already proposed. In the course of this work, options were developed, tested, sifted and modified, until feasible solutions were identified with acceptable operational performance and that met whole-industry value for money criteria. In some cases there may be further work required to identify all the relevant costs and benefits in order to demonstrate whether a sufficiently strong economic return exists.

In a number of instances, preliminary business case development and appraisal of options has been progressed by external consultants commissioned by bodies such as Merseytravel. The RUS considers these studies and where necessary has applied further scrutiny to any available outputs.

To align with the 2007 Government White Paper “Delivering a Sustainable Railway”, the strategy also looks ahead to interventions which will help deliver sustainable transport to support long-term passenger and freight growth. This aligns to Merseytravel’s view that the railway plays an important role in providing access to both work and education, and as a means of ensuring a modal shift away from cars and reducing air pollution.

8.2 Principles

8.2.1 Dealing with growth

The general principle adopted throughout the Merseyside RUS has been to consider simple and lower cost interventions before turning to more complex and expensive solutions. In the first instance, optimising use of existing rolling stock and infrastructure has been examined. Timetabling solutions have been sought in preference to investment in rolling stock or infrastructure works, subject to there being no unacceptable performance impact. The next step has been to consider progressive lengthening of trains where heavy demand

exists, typically during the peak periods, up to the maximum practical train size. This principle of meeting future demand by providing longer trains rather than by running additional trains is a logical way to accommodate growth where possible. It maximises the value of each passenger train path on the network and helps to ensure that capacity for freight remains available on congested routes.

Only when train lengthening has been fully exploited, is it appropriate to look towards provision of additional services or infrastructure enhancement. Again the range of options is considered in order, from simpler schemes such as platform lengthening, through more far-reaching measures such as signalling and power supply upgrades, or capability works for heavier/longer freight trains, to more comprehensive investment in major infrastructure enhancements.

8.2.2 Performance

The Merseyside RUS area is a largely self-contained network which makes it more resilient than many other areas in terms of performance, especially reactionary delay. However, a number of features have a negative impact on performance. There are a number of flat junctions with conflicting train movements, tight turnarounds at certain terminal stations as well as single-line sections. Their impact may not be pronounced at the current level of service but consideration needs to be given to the performance effects of any options for increased levels of service frequency.

The RUS does not consider primary delay, only reactionary delays. Primary delays are those that arise due to a problem with the infrastructure or the train itself, eg. points failure, vandalism or shortage of traincrew. Reactionary delays occur when other trains have been delayed as a result of the original incident and may have been delayed and missed their timetabled slots. Primary delays are addressed through other industry processes which focus on reducing these incidents at source.

8.2.3 Stations

“Getting to the train” was also identified as a gap in the RUS. Some measures are proposed to improve access to the railway, such as Park & Ride schemes, possible new stations, as well as improved cycling and walking facilities. There will be a continuing need to work with train operators, Merseytravel, Local Authorities and other stakeholders to maximise access opportunities. New station proposals are not considered by the RUS programme unless they are of strategic significance, such as requiring restructuring of the timetable. All other station proposals should be considered in accordance with Network Rail’s “Investment in Stations – a guide for promoters and developers”, issued in June 2008, which forms part of the Network RUS.

In the RUS period there are a number of schemes and programmes to improve general station facilities. These include the NSIP which forms part of the Network Rail CP4 funding settlement. This seeks to improve station facilities and lever in Third Party investment. The ongoing “Access for All” programme aims to improve the accessibility of stations by providing step-free access to platforms. There are also Merseytravel aspirations to improve the environment of stations and the information available at them. This includes improving CIS, booking offices and CCTV.

8.2.4 Rolling stock

The DfT published its Rolling Stock Plan on 30 January 2008. The plan sets out how rolling stock will be used to deliver increased capacity and hence contribute to the outputs required by the Government by 2014. While the Merseyrail network was excluded from the peak capacity metrics, the introduction of new vehicles elsewhere may provide opportunities for the cascade of additional units to the Merseyside RUS area.

Replacement of the Merseyrail electric fleet is planned to take place around 2014 which may present a once in 30 years opportunity to address a number of key gaps. The number of new vehicles required to meet demand growth will need to be considered as part of the fleet replacement as well as the configuration and specification of the trains. The new fleet may have different maintenance requirements and infrastructure impacts which will need to be carefully considered and incorporated into the fleet replacement plans.

8.2.5 Depots and stabling

Network-wide depot issues are being considered as part of the Network RUS; the final publication of this is expected in 2009. However, as far as the Merseyrail commuter services are concerned, any additional vehicles received before the fleet replacement will be maintained at existing facilities at Kirkdale and Birkenhead North. There will be the ability to unlock spare capacity at current stabling locations providing some small infrastructure changes are made. If additional rolling stock is obtained in the short term before fleet replacement, it is recommended that a review of facilities in the area is undertaken with a view to reinstating the shed at Birkenhead Central and the ‘out of use’ sidings at Birkenhead North Maintenance depot, and that train cleaning operations are returned to Birkenhead Central.

Before the procurement and introduction of a new rolling stock fleet, a full reassessment of maintenance depot and stabling facilities will be required.

8.2.6 Power supply

The whole of the Merseyrail electric network is DC electrified and traction power supply is crucial to service developments such as longer or more frequent trains. Looking further to the future, the new rolling stock fleet could have a major impact on the existing power supply infrastructure, as modern rolling stock tends to consume more power than older vehicles due to higher acceleration characteristics and additional facilities such as air conditioning. Any proposals for additional and longer services will need to consider the power supply implications.

Examination of the suitability of the existing power supply arrangements for the recommended increases in vehicles and services is not yet completed and will be undertaken as part of the rolling stock replacement project.

Electrification issues are being examined by the Network RUS which has identified a number of gaps in terms of the wider rail network. This work is considering both large scale schemes and strategic infill sections. The Network RUS electrification section proposals are expected to be released for consultation in spring 2009 with a view to a final publication date of summer 2009.

8.2.7 Engineering access

The agreed access regime, consisting of a combination of extended (29-hour) possessions for major component renewals, coupled with the weekly access of broadly six to seven hours at weekends and four to five hours midweek between service shut-down and start-up, is suitable to deliver maintenance compliance.

The RUS is not proposing any service increases which will lengthen the operational day and so further restrict the maintenance access period, therefore no changes to maintenance and renewals arrangements are being recommended.

There is one possible exception: the RUS recommendation for increases in fleet size

will require a reassessment of maintenance and stabling facilities, as stated in section 8.2.5. The location of these facilities could increase empty coaching stock workings and could potentially further constrain the access for maintenance. In these circumstances the access regime will be reviewed to maintain an appropriate balance between maintenance requirements and service operation.

The “Seven Day Railway’ concept is being developed, led by Network Rail, and is intended to be gradually implemented where appropriate. The impact on the Merseyrail area may be less than elsewhere due to the self-contained nature of the network.

8.3 Liverpool Central station

8.3.1 Background

The most acute issue in the Merseyside RUS is the station capacity in the city centre stations, in particular Liverpool Central. Liverpool Central is the busiest station on the Merseyrail network with over 15 million passengers alighting, boarding or interchanging each year. The main underground island platform on the Northern Line handles the vast majority of these passengers. It has now been in use, largely unaltered, for over 30 years, and there are growing concerns about the size and layout of the platform as the level of usage continues to increase.

The proximity of the station to Liverpool’s growing retail centre means that significantly more passengers use the island platform on a Saturday than on a weekday. The level of growth seen in recent years and projected for the future means that the station will also become increasingly busy in the weekday peak periods. The platform is currently over capacity at regular intervals during the busiest four or five hours on Saturday, and we expect further passenger growth as a major retail development has recently opened nearby. Even a moderate number of additional passengers will mean that the platform will be significantly over capacity for several consecutive hours by around 2015. In the absence of any interventions to increase capacity, there would be a severe impact on the train service, with some or all Northern Line trains unable to call at Liverpool Central, which in turn would lead to crowding problems at adjacent stations. This would be operationally and strategically unacceptable as it would cause a major loss of railway facilities at the time of maximum demand which would be extremely inconvenient to passengers.

8.3.2 Potential interventions

The RUS has identified a potential package of phased interventions:

Immediate

Up to 30 percent additional capacity will be required within the next three years. This can be delivered through better crowd management and some relatively unobtrusive infrastructure work to improve passenger flow around the platform, at a cost of £5 – £10 million.

Short to medium term, and long term

By around 2015 another 10 – 20 percent additional capacity will be required (40 – 50 percent more than currently). This can be delivered through some more relatively disruptive infrastructure work on the platform, at a cost of £10 – £15 million.

A 50 percent increase in additional capacity from the current level is likely to be the most that can be delivered by enhancements within the constraints of the existing station footprint, and it is forecast that between 2020 and 2025 this will not be sufficient to accommodate passenger numbers. In the same time period overcrowding on the platform(s) in the weekday peak periods will prevent the increase in train frequency that will be required to meet demand for rail travel into central Liverpool. These issues mean that either a new underground platform or a new station will be required, at a potentially very high cost.

The RUS recommends the immediate package of investment and also recommends that a preferred package of the potential major interventions is developed and agreed prior to a submission to the Department for Transport for funding through the HLOS for CP5.

8.4 The immediate future 2009 – 2014 (Control Period 4)

8.4.1 Background

Capacity at Liverpool Central station is the key immediate priority for the RUS; however there is also a need to avoid increasing amounts of overcrowding on peak services, particularly those on the Southport, Ormskirk, West Kirby lines and Chester branches.

The strategy in the short term consists of measures to expand capacity on peak services into Liverpool and to increase and improve services on the Liverpool to Chester corridor. These improvements will enable the industry to exceed the current HLOS target for increased passenger kilometres on Route 21 by 2013/14. Additionally, work will need to be undertaken on the development of interventions that are expected to be required in the future.

8.4.2 Strategy

The following interventions are recommended for CP4:

- the new Merseyrail fleet planned to enter service in 2014, should provide an additional 14 three-car units in traffic, which will be used to progressively lengthen trains serving Liverpool to six-car formations in the peak. In the interim period use of any spare rolling stock from the South East should be investigated
- current stabling facilities cannot accommodate any additional units prior to fleet replacement and a review of stabling and maintenance facilities is required with a view to reinstating the maintenance shed at Birkenhead Central and the out of use sidings at Birkenhead North Maintenance depot. Providing, as anticipated, these facilities will also be useful for a new fleet, they should be reinstated as quickly as possible
- the inter-peak frequency of services from Chester to Liverpool should be increased from half hourly to quarter hourly, thereby matching the peak frequency. This would allow faster journey times on some services (by missing out some calls in the additional services) and better performance because of longer turnarounds at Chester. This is currently the least punctual service group on the network, mainly because of short turnaround times. As an increment to this, a scheme should be developed to raise the linespeed to 75mph between Hooton and Chester, at the same time as planned renewals scheduled for completion by 2010/11. This will further improve performance. Ultimately, an additional electrified platform at Chester station may be required to ensure that future timetables are robust, and this should be investigated further once the service frequency and line speed enhancements have taken place. Improved car parking facilities at Hooton should also be investigated as an add-on to the service improvement
- the inter-peak frequency of services from Wigan to Liverpool should be increased from three to four trains per hour, providing rolling stock is available from the existing peak operation
- investment at Liverpool Central station is necessary as outlined in section 8.3.2
- subject to confirmation of traffic and negotiation of any Third Party funding, an infrastructure upgrade could be implemented to improve the freight route to Wirral Docks avoiding the West Coast Main Line
- a feasibility study should be carried out to develop a better understanding of the business case for a new electrified chord to Skelmersdale – the second largest conurbation in the North West without a rail connection
- depending on the outcome of Merseytravel's current studies, further development work could take place on schemes to extend electrification and expand the network.

During CP4 there would be the need to carry out development work of options for delivery of the medium-term strategy set out in section 8.5.

8.5 Medium-term 2014 – 2019 (Control Period 5)

8.5.1 Background

The general approach will be to continue to develop initiatives developed in CP4 in line with predictions of continuing growth in demand.

8.5.2 Strategy

The following interventions form the current strategy for CP5:

- further significant investment in Liverpool Central station as outlined in section 8.3.2
- further train lengthening on the Chester and Ellesmere Port branches of the Wirral Line, subject to a suitable business case
- increased peak service frequency on the Southport branch of the Northern Line in the pm peak.

Subject to suitable business cases being made and availability of funding, further development work and potential implementation could take place on:

- enhanced facilities at James Street station
- potential new electrified service to Skelmersdale allowing through services to central Liverpool
- potential enhanced diesel service or new electrified service on the Wrexham – Bidston line
- potential new service beyond Ormskirk to Burscough Bridge and Southport.

As with CP4, during CP5 there would be the need to undertake development of options for delivery beyond the control period.

9. A longer-term view

9.1 Introduction

9.1.1

The purpose of this section is :

- to provide an initial overview of longer-term strategic issues as an input to the DfT's development of policy options through the Developing a Sustainable Transport Policy (DaSTS) process
- to check that the RUS recommendations are consistent with longer-term requirements
- to identify any future schemes where development will need to start within CP4 or CP5.

9.2 General strategy

The general strategy for the Merseyside RUS area is to cater for the predicted passenger and freight growth during the coming years. There are numerous opportunities during CP6 and beyond to renew and enhance the infrastructure as circumstances and available funding allows.

9.3 Long-term context (Control Period 6 and beyond)

9.3.1 Background

The Government's 2007 White Paper "Delivering a Sustainable Railway" envisages a doubling of both passenger and freight traffic nationally over the next 30 years. This is consistent with the industry view of longer-term growth in Merseyside, though it is recognised that there may be wide variations between individual routes or parts of routes according to local circumstances. It is clear that in the event of significant growth the strategy should focus on making the best use of the existing network in the first instance, and then look at opportunities to develop the wider rail network.

The rate of increase in passenger demand over the past few years on the Merseyrail services into Liverpool has been above the national average. This has been caused by a number of factors including special events and large scale regeneration projects, such as the £1 billion Liverpool One shopping centre. There are further large-scale regeneration programmes proposed for the RUS area including the £5.5 billion Liverpool Waters development and the £4.5 billion Wirral Waters development. The successful delivery of any of the schemes will have a large impact on rail demand characteristics, including desired destinations.

Continued progressive lengthening of rolling stock will continue to be the preferred option in CP6 and beyond, rather than increasing frequency, up to the point where all peak services operate at the six-car lengths, which is the maximum permitted by the fundamental constraints of the network.

9.3.2 Strategy

It is anticipated that the following interventions will form the proposed strategy for CP6 and beyond:

- further increases in the peak service frequency on the Southport and Ormskirk branches of the Northern Line and the West Kirby and Chester branches of the Wirral Line
- train lengthening, during the shoulder-peak and inter-peak periods
- signalling and junction improvements to accommodate increased frequency. This would exploit synergies with planned signalling renewals in 2022
- implementation of any service extensions or further electrification that has a satisfactory business case but has not been implemented in CP5
- once all trains are running at maximum length any future overcrowding would need to be alleviated through additional services. The first line likely to reach this point is the Southport Line. Increased service frequency will put additional pressure on the infrastructure and may require remodelling of junctions, additional platforms and/or new turnback facilities. The infrastructure requirements will be unique to each branch, for instance any significant increase in frequency above the current maximum on the Southport branch could require the removal of a large number of level crossings.

The need for renewal of the existing diesel Sprinter/Pacer fleets in CP6 or earlier might offer particular opportunities to build a case for further electrification in and beyond the RUS area to exploit benefits such as the lighter weight and lower operating costs provided by new designs of electric trains.

The use of dual voltage units could also create options for new journey opportunities both on the DC electrified Merseyrail network and further afield. As part of the wider national picture, the Network RUS is examining a longer-term strategy for further electrification of the national network. That RUS is considering the possible electrification of existing lines, either through major schemes or strategic in-fill. This could have an impact on the Merseyside RUS. For example, there is an aspiration to electrify the Chester to Crewe line, and depending on the new rolling stock fleet procurement, there may be opportunities for the current Liverpool to Chester services to be extended to Crewe. This would affect the future interventions required at Chester station, with a suitable number of electrified platforms needing to be available for these services.

The forthcoming trial in Yorkshire will test tram-train technology in the UK for the first time. If successful the concept could be an important way of meeting increased demand, by allowing trains to leave the heavy rail network and use street running into the centre of Liverpool. This would relieve pressure on the constrained underground central stations and could also provide improved connectivity to city centre destinations. For example, it could be used to link into the current and planned developments in Liverpool's docks.

The possibility of running passenger trains along the North Mersey and Bootle branches was examined by the RUS and cannot yet be recommended. However, future development and regeneration could lead to increased demand for such services. Any passenger services would need to be implemented in a way that ensures current and future freight demand can be accommodated. There is also a possibility in the longer term of using other infrastructure, including the disused Wapping and Waterloo tunnels, to provide new journey opportunities.

9.4 Alternative growth scenarios

The strategy recommended in this RUS is expected to cater adequately for forecast growth in passenger and freight demand in the next decade. In the event that demand growth does not meet the RUS forecasts then clearly it would be possible to delay or abandon interventions where appropriate. Equally, if growth continues at its recent high level and exceeds the forecast over the next decade, then some of the longer-term interventions may need to be accelerated, although it should be emphasised that sufficient additional station capacity must be created in central Liverpool to accommodate each increase in the capacity of the radial network.

10. Next steps

10.1 Introduction

This RUS will become established 60 days after publication unless the ORR issues a notice of objection within this period.

The recommendations of a RUS form an input to decisions made by industry funders and suppliers on, for example, franchise specifications, investment plans and HLOS.

10.2 Network Rail Route Plans

For planning purposes the Great Britain rail network is divided into 26 strategic routes. Network Rail publishes a plan for each strategic route, listing all significant planned investment on the route including scheduled renewals as well as committed and aspirational enhancements. The plans for Strategic Routes 21 (Merseyrail), 20 (North West Urban) and 22 (North Wales & Borders) together cover the geographic scope of this RUS and the neighbouring routes which are referred to in this document. The recommendations of the RUS will be incorporated in these plans, as will the conclusions of work started by this RUS but to be completed through other industry processes as described in section 10.5. The Route Plans are updated regularly and will be reissued to support the CP4 Delivery Plan (section 10.3); the latest plans are available at **www.networkrail.co.uk**.

10.3 Control Period 4

In July 2007 the DfT published the HLOS for England and Wales, setting the outputs it wished to buy from the rail industry during CP4 (2009 – 2014) and stating what funding it could make available to the industry during this period. The outputs and funding, taking into account other parties' requirements of the industry, were refined through the ORR's periodic review of Network Rail's access charges during 2008. This process has now concluded; Network Rail will publish its Delivery Plan for CP4 within a few days of the publication of the Merseyside RUS. The Delivery Plan sets out Network Rail (and, where applicable, whole industry) outputs for safety; train performance; network capacity, capability and availability; and asset performance. It provides a high level summary of train operator actions and a delivery programme for all aspects of the Network Rail outputs.

10.4 Control Period 5

The planning cycle for the following control period (2014 – 2019) is about to commence. The DfT has recently consulted on a process for Developing a Sustainable Transport System (DaSTS). This process will compare interventions between transport modes and will be applied to the development of the HLOS for CP5, which is due to be published in the summer of 2012. RUS conclusions relating to CP5 will form a key input to the rail mode element of this analysis.

10.5 Ongoing analysis and recommendations

Three issues raised in the Lancashire & Cumbria RUS and Wales RUS (published in August and November 2008 respectively) have been considered within this RUS. Analysis and option development in respect of these issues could not be concluded for this final strategy for the Merseyside RUS without further delaying publication of the agreed recommendations by approximately six months.

The options being considered are complex and sensitive to changes in demand forecasts and particularly changes in cost estimates, which have not yet been established to the level of precision required for the RUS to be able to support specific recommendations.

With the principal recommendations identified in the RUS requiring urgent progress and being unaffected by those items not yet concluded, there is strong support, although not unanimous, to publish the final RUS now and not to delay it to allow the outstanding issues to be concluded.

The SMG has agreed that progression of these issues will be managed through existing industry processes with the final recommendations informing the relevant Route Plans as they are periodically revised. The principal cross industry forum that will oversee progress is the Route Investment Review Group (RIRG), which is the industry body for recommending schemes for investment. Merseyside, having a slightly different management structure from other routes, benefits from a dedicated forum – MIRG – which is made up of the key parties involved in the options being considered.

The outstanding issues are:

- through services from the Wrexham – Bidston line to central Merseyside, as discussed in section 6.4.2. DC electrification of the line south from Bidston was considered in the Wales RUS and found not to have the required level of value for money for recommendation. AC electrification is under consideration, but initial estimates also do not constitute acceptable value for money. This work will continue to consider the outputs of the Network RUS electrification strategy which is examining priorities for electrification and ways to reduce the costs associated with it. This element of the Network RUS is expected to be published in summer 2009. As an alternative to electrification, the further work will also consider the extension of diesel services to connect into the Merseyrail network at Birkenhead rather than Bidston
- direct services linking Chester and North Wales with Liverpool via Runcorn and Liverpool South Parkway, requiring the reinstatement of a curve at Halton as discussed in section 6.4.2. Merseytravel has commissioned a demand study, which includes analysis of the Ellesmere Port – Helsby route, to inform further consideration of this proposal

- improvements to services between Liverpool, Ormskirk and Burscough, Preston and/or Southport, as described in section 6.4.7. Options to reinstate infrastructure at Burscough were examined and narrowed down in the Lancashire & Cumbria RUS identifying a preferred option. However, although the RUS believed the option to have a value-for-money business case which could be recommended, it did not fully meet stakeholder aspirations. Merseytravel has therefore commissioned a more detailed demand study which is expected to be available in late spring 2009 and will allow further refinement of the business case.

10.6 Ongoing access to the network

This RUS will also help to inform the allocation of capacity on the network through application of the normal Network Code processes.

10.7 Review

Network Rail is obliged to maintain a RUS once it is established. This requires a review using the same principles and methods used to develop the RUS:

- when circumstances have changed
- when so directed by ORR
- when (for whatever reason) the conclusions may no longer be valid.

Appendices

Appendix A: Glossary

Term	Meaning
ATOC	Association of Train Operating Companies
BCR	Benefit Cost Ratio
CCTV	Closed-Circuit Television
CIS	Customer Information System
Connectivity	The ability to travel between two stations or conurbations within an acceptable journey time or frequency options compared to other modes of transport
CP	Control Period
CUI	Capacity Utilisation Index
DfT	Department for Transport
FOC	Freight Operating Company
Gap	Where the network does not meet the specification or demand required of it, now or in the future
GDP	Gross Domestic Product
GJT	Generalised Journey Time
GRIP	Guide to Railway Investment Projects
Headway	On a particular route is the minimum time necessary between the passage of similar trains which will ensure the second train is travelling under green aspects (ie. not double or single yellow aspects).
HLOS	DfT's High Level Output Specification for the railway industry
IECC	Integrated Electronic Control Centre
Intermodal Trains	Are freight trains which convey traffic which could be conveyed by road, rail or sea (eg. containerised traffic)
Integrated Transport Authority (ITA)	New body replacing the Passenger Transport Authority responsible for an integrated transport strategy
Loading factor	The number of seats occupied on a train service expressed as a percentage of occupied seats
Loading gauge	The profile for a particular route within which all vehicles or loads must remain to ensure that sufficient clearance is available at all structures
LENNON	Latest Earnings Networked Nationally Over Night; records most ticket sales
MIRG	Merseyrail Investment Review Group – A steering group that meets bi-monthly to discuss investment issues.
MOIRA	Industry standard demand forecasting model
NPV	Net present value
NSIP	National Station Improvement Programme
OOU	Out of Use

Term	Meaning
ORR	Office of Rail Regulation
PDFH	Passenger Demand Forecasting Handbook
Perturbation	Is the word used to describe disruption to the planned train service pattern
PPM	Public Performance Measure
PTE	Passenger Transport Executive
Route Availability (RA)	Is 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, although certain routes have abnormal clearance problems (eg. very tight tunnels). A locomotive of RA8 is not permitted on a route of RA6 for example
RDA	Regional Development Agency
RES	Regional Economic Strategy
RIRG	Route Investment Review Group
RPA	Regional Planning Assessment
RSS	Regional Spatial Strategy
RUS	Route Utilisation Strategy
S&C	Switches and Crossings
SMG	Industry Stakeholder Management Group
TEE	Transport Economic Efficiency (TEE Table)
tph	Trains per hour
TOC	Train Operating Company
WAG	Welsh Assembly Government
WSG	Wider Stakeholder Group

Appendix B

Baseline information (available at **www.networkrail.co.uk**)

Appendix C

Liverpool City Centre Rail Demand and Capacity Study
(available at **www.networkrail.co.uk**)

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RUS126/March 2009