

November 2010

West Midlands and Chilterns

Route Utilisation Strategy

Draft for Consultation

NetworkRail





Contents

3	<i>Foreword</i>
4	<i>Executive summary</i>
9	<i>1. Background</i>
11	<i>2. Dimensions</i>
20	<i>3. Current capacity, demand, and delivery</i>
59	<i>4. Planned changes to infrastructure and services</i>
72	<i>5. Planning context and future demand</i>
90	<i>6. Gaps and options</i>
149	<i>7. Emerging strategy and longer-term vision</i>
156	<i>8. Stakeholder consultation</i>
157	<i>Appendix A</i>
172	<i>Appendix B</i>
178	<i>Glossary</i>

Foreword

Regional economies rely on investment in transport infrastructure to sustain economic growth.

With the nation's finances severely constrained, any future investment in transport infrastructure will have to demonstrate that it can deliver real benefits for the economy, people's quality of life, and the environment.

This draft Route Utilisation Strategy (RUS) sets out the priorities for rail investment in the West Midlands area and the Chiltern route between Birmingham and London Marylebone for the next 30 years. We believe that the options recommended can meet the increased demand forecast by this RUS for both passenger and freight markets and help support and grow the economy of the West Midlands and Chilterns areas.

In the longer term, a new high speed line to the region and beyond could improve journey times and free up capacity on a number of existing routes.

The West Midlands sits at the heart of the national rail network and more people than ever rely on rail to travel to and through the region. Stations such as Birmingham New Street play a key role in providing an interchange for services across the UK, while the Chiltern route serves long distance and commuter markets between the West Midlands, Buckinghamshire, and London Marylebone. The region's rail network also plays an important role in moving freight from south coast ports to the rest of the country.

There has been significant passenger growth in the RUS area over the past decade with passenger numbers holding up despite the worsening economic climate. The rail industry has responded well with measures to support train lengthening, performance improvement, and journey time improvements.

Work is already underway on several large projects to increase the capacity of the network in the West Midlands. The rebuilding of Birmingham New Street is underway and will deliver a world class station with a concourse three-and-a-half times bigger, allowing it to handle long-term passenger growth. The Cross City line extension to Bromsgrove and an increase in service frequency between Birmingham New Street and Redditch will deliver significant improvements on one of the busiest commuter routes in the region. On the Chiltern route, the Evergreen 3 project will deliver more capacity and significant journey time improvements

between Birmingham and London Marylebone, as well as new journey opportunities between Oxford and London.

This RUS predicts that overall passenger demand in the region will increase by 32 per cent over the next 10 years. While Network Rail's Delivery Plan for Control Period 4 will accommodate much of this demand up to 2019, this RUS does identify gaps and recommends measures to address these.

Where the RUS has identified requirements for interventions to be made, it seeks to do so by making the most efficient use of capacity. It recommends train lengthening on several peak services to and from Birmingham as well as several long distance routes which pass through the West Midlands. Some additional services are also recommended on several regional routes which pass through Birmingham along with further development of the option of re-routing long distance services between Reading and Newcastle via Coventry. The RUS also highlights the potential to link a number of local/interurban services across Birmingham, providing improved connectivity and new journey opportunities.

The RUS considers how infrastructure improvements in the Worcester area could improve capacity. In addition, it supports work to explore a new station at Aldridge near Walsall.

Delivering sufficient capacity for freight to travel through the region is crucial in supporting the economy and, while the majority of the network can accommodate forecast growth over the next decade, the RUS recommends that further consideration is given to developing the proposal to reopen the Round Oak – Walsall line to relieve freight capacity on the route between Birmingham and Bromsgrove.

In the longer term, a new high speed line to the region and beyond could improve journey times and free up capacity on a number of existing routes.

Network Rail and our industry partners believe that this RUS provides a robust strategy for the West Midlands and Chilterns rail network in the coming years and I would like to take this opportunity to thank industry colleagues who have worked with us to develop this RUS.

There is a 12-week consultation period and we welcome your comments and feedback on our analysis and the options we have recommended to feed into the final RUS which will be published in May 2011.

Paul Plummer
Director, Planning and Development

Executive summary

Introduction

The West Midlands and Chilterns rail network covers an extensive geographical area and serves a diverse range of markets including local commuting into the key employment locations, interurban travel between major urban centres, and long distance journeys within the RUS area and beyond its geographical boundaries.

Scope and background

The West Midlands and Chilterns Route Utilisation Strategy (RUS) is the penultimate of the first generation geographical RUSs developed by the rail industry. It considers the requirements that will be placed upon the rail network over a planning horizon of 30 years, and makes recommendations based on a detailed analysis of passenger and freight demand.

The West Midlands and Chilterns RUS interfaces with other parts of the rail network which have been covered in other RUSs, primarily the East Midlands, Great Western, and West Coast Main Line RUSs. Its geographical scope broadly consists of the West Midlands region and the Chiltern Main Line which traverse a large number of significant towns and cities. It includes the route between London Marylebone and Aylesbury Vale Parkway, incorporating part of London Underground Limited's Metropolitan Line.

The West Midlands rail routes are at the centre of the national rail network, with Birmingham central stations acting as hubs supporting interchange to many destinations across the United Kingdom. Services across the West Midlands are promoted and developed by West Midlands Integrated Transport Authority (Centro).

The Chiltern Main Line serves long distance markets between the West Midlands and London Marylebone and supports local commuter and interurban travel to key destinations on the route.

A considerable number of freight flows also operate across the network and to significant freight terminals within the RUS area.

All passenger and freight services that spend all or part of their journey on the routes contained within the RUS area are considered by this strategy.



Committed schemes

The RUS baseline comprises a number of committed schemes which will deliver improvements to the current infrastructure and services in the RUS area. These schemes have formed part of the 'do-minimum' scenario in the RUS against which detailed appraisal work for further capacity interventions has been undertaken.

Network Rail's Delivery Plan for Control Period 4 (CP4) is a significant part of this baseline which aims to provide the infrastructure required to deliver the safety, reliability and capacity targets set by the Government's High Level Output Specification and funded through the Statement of Funds Available. The plan includes measures to support train lengthening, service enhancements and performance and journey time improvements. Train operators are responsible for the development of operational plans based on a mixture of rolling stock cascade and the introduction of new rolling stock to strengthen services on busier routes.

Within the RUS area significant improvements in capacity and connectivity will be delivered through the extension of Cross City services to Bromsgrove

Passenger journeys to and from Birmingham are predicted to increase by 32 per cent in the peak by 2019.

and more frequent services to Redditch, and the major Birmingham Gateway scheme which will rebuild Birmingham New Street station, doubling its capacity and improving passenger interchange and overall experience.

The CP4 Delivery Plan includes funding to facilitate the implementation of a Strategic Freight Network (SFN).

Capacity and journey time improvements will be delivered on the Chiltern Main Line through the Evergreen 3 project, which will provide faster journey times between Birmingham and London Marylebone (via Bicester), improved service frequencies at some intermediate stations and new direct journey opportunities from Oxford to London Marylebone.

Major signalling renewals are also planned for a large proportion of the West Midlands area during CP4. These will deliver improved planning headways through modern signalling technology. Modest capacity improvements have been incorporated into the programme through cost-efficient enhancements linked to the renewal activity.

Passenger and freight demand

There has been considerable growth in passenger rail journeys in the RUS area over the past decade, and passenger demand has remained relatively resilient during periods of economic recession. This growth is attributed to several factors including increasing population, road congestion in cities and urban centres, and structural changes in travel and employment markets. In light of these factors, and taking into account the investment being made in the rail network during CP4, it is anticipated that this growth will continue during the timescale of the RUS.

Analysis indicates that growth in passenger demand up to 2019 within the RUS area is forecast to continue. Passenger journeys to and from Birmingham are predicted to increase by 32 per cent in the peak by 2019, and demand on services to London Marylebone is forecast to increase at a similar rate.

The aim of the RUS analysis is to assess that there is sufficient capacity available to meet the forecast demand. A comparison has been undertaken between the anticipated level of demand in 2019 and the committed capacity proposed to be delivered in CP4 across the RUS area. The results show that there is generally sufficient capacity to accommodate demand across the RUS area up to 2019, with some localised crowding predicted during peak hours.

There are significant levels of freight traffic in the RUS area. In recent years, rail's freight market share has consistently grown and accounts for an 11 per cent share of the UK surface freight market. The RUS aims to assess that freight demand is accommodated during the planning horizon being considered. The RUS analysis work takes into account the freight forecasts for 2019 and 2030 which were developed by the rail industry for the SFN, and the baseline for each option includes these requirements.

It is anticipated that the fastest growing sector will be the non-bulk market with annual growth rates forecast as 11 per cent for domestic non-bulk and six per cent for port-driven non-bulk. The bulk sector is also forecast to grow, albeit at a slower rate.

Gaps

Following a comparison between forecast RUS demand and the committed baseline, a number of gaps were identified on the routes radiating out of central Birmingham. These gaps have been endorsed by the Stakeholder Management Group (SMG) and consolidated in line with the type of options that would be analysed to address them. The identified gaps related to capacity, journey time and connectivity, and station facilities within the RUS area.

Options

Where a committed scheme or initiative was not in place to address an identified gap, the RUS proposes and appraises a number of options as potential solutions. In assessing such options, the RUS seeks to make the most efficient use of capacity. Options include train lengthening (beyond the CP4 Delivery Plan commitments), timetable recast, and service enhancements. In some cases one option addresses a number of gaps across different RUS corridors. The results of this option analysis work is summarised below:

Train lengthening

Where a gap is based on a mismatch between passenger demand and supply in terms of train service provision, the option of train lengthening has been considered in the first instance. The results of this option work has shown that in general the capacity interventions which are proposed in the CP4 Delivery Plan will provide sufficient capacity during peak hours to cater for the demand forecast up to 2019, with standing levels being within train capacity.

The RUS does identify some areas where localised crowding will occur over and above the outputs specified in the CP4 Delivery Plan. Economic appraisal work to assess the value for money of train lengthening has identified that a medium value-for-money business case exists for train lengthening on one Hereford to Birmingham morning and evening service, and three morning and evening Shrewsbury to Birmingham services. The RUS also notes the train lengthening recommendations made in other RUSs on services which pass through the RUS area, principally on the following service groups:

- Manchester – Bournemouth: two to nine additional vehicles
- Manchester – Bristol/Paignton: up to one additional vehicle
- Edinburgh – Plymouth: six to nine additional vehicles
- Birmingham New Street – Leicester/Stansted Airport: eight additional vehicles.

Timetable interventions and additional services

The RUS has considered the option of a timetable intervention to address some of the capacity or connectivity gaps that have been identified.

In order to address peak and all day demand requirements between Tamworth and Birmingham, the option to provide an additional service between Tamworth and Birmingham New Street has been considered. Analysis has demonstrated that a business case supports an additional two trains per hour between Tamworth and Birmingham New Street throughout the day. Further assessment

showed that this service can be extended through to Worcester to provide cross-city connectivity and additional capacity in each hour to address the growth in demand on the route between Birmingham and Worcester. An infrastructure intervention at Tamworth would be required to facilitate this additional service.

It is proposed that infrastructure interventions on the line between Wichnor Junction and Water Orton West Junction are developed to provide performance resilience in light of the passenger growth anticipated on the route.

A timetable intervention has been considered to address the connectivity gap between Coventry and Birmingham International stations and the East Midlands, Yorkshire and North East areas. To address this gap and provide direct connectivity to Birmingham International Airport, the RUS has assessed the business case to re-route the current Reading to Newcastle service (in both directions) from its existing routeing via Solihull to the Coventry corridor.

The results of this work show that the option offers value for money but is particularly sensitive to performance impact on the Coventry corridor and the West Coast Main Line. A number of planned schemes, some of which will be delivered in CP4, will improve performance on these lines and the RUS recommends further development of this option based on a consideration of the impact of these schemes on the business case. If this option is to be progressed the redoubling of the route between Kenilworth and Milverton Junction (near Leamington Spa) would be required as there is not sufficient capacity to accommodate the proposed re-routed service on this route when taking into account the SFN freight growth forecasts.

The RUS supports further timetable assessment work where sufficient evidence is not currently available to complete a comprehensive analysis. The need for earlier/later services and increased Sunday services were identified by stakeholders as generic gaps across the RUS area.

The RUS recognises that the initiatives being considered within the Network Availability Implementation Plan, which forms part of the CP4 Delivery Plan, will help to address these gaps. This plan considers new methods and strategies which will help to improve late evening and weekend services across the network, both in terms of reducing disruption to current services and, in some cases, providing opportunities to run additional services at times that address suppressed customer demand.

On some routes the RUS recommends that further timetable analysis is considered following planned timetable changes or other interventions. On the Chiltern Main Line between Birmingham and London Marylebone, the analysis undertaken in the RUS suggests that the planned Evergreen 3 timetable interventions will provide overall sufficient

capacity to meet demand up to 2019. However, the analysis indicates that there may be some on-train crowding issues into both Birmingham Moor Street and London Marylebone in the peak. Further consideration of the timetable on this corridor is therefore recommended following a period of operation of the Evergreen 3 timetable.

The RUS supports further consideration of timetable options on the Aylesbury line where national rail services and London Underground Limited services both operate. To be effective, this should be a joint exercise involving Network Rail, Transport for London, London Underground Limited, and the relevant train operators. It should take into account rolling stock changes and resignalling plans on the line.

The final West Midlands and Chilterns RUS will also note the results of relevant timetable interventions which are recommended by the West Coast Main Line RUS. The West Coast Main Line RUS consultation document is due to be published in December 2010, and the analysis being undertaken includes a series of options to improve capacity, journey time and connectivity at a number of locations including between Manchester and Birmingham.

Infrastructure enhancements

As part of the development of the RUS, infrastructure options are considered where they are shown to be required in order to address a specific gap which has been identified. In the Worcester area a gap has been identified relating to services that currently terminate at Worcester Shrub Hill but cannot serve Worcester Foregate Street which is closer to Worcester city centre. As part of the work to consider extending these services to Worcester Foregate Street, an option to remodel the junctions in the Worcester area is considered, together with interventions to improve headways and reduce platform occupation time at Worcester Foregate Street.

The RUS recognises that there is an opportunity to implement these improvements as part of the Droitwich Spa and Worcester area signalling renewal projects which are planned to occur between 2014 and 2022. The recommendation is therefore that these options are considered as part of this work, and a number of interim measures are proposed.

The RUS has considered the aspiration by Centro to develop a new station at Aldridge, to accommodate passenger demand which is currently unserved by rail in this area. The RUS analysis demonstrates that a new station could be best served by an extension of the Birmingham New Street to Walsall electric service, which would require infrastructure work to extend electrification to a new station facility at Aldridge. The RUS supports further business case work to be developed by Centro.

Options to address freight gaps

The freight forecasts developed by the Strategic Freight Network for 2019 and 2030 have been analysed to identify any gaps in the West Midlands and Chilterns RUS area. Passenger interventions developed by this RUS and those being considered by the West Coast Main Line RUS (to be published in December 2010) have also taken into account the need to accommodate these forecasts.

Analysis has indicated that forecast freight growth can be accommodated on the baseline infrastructure and timetable up to 2019, with the exception of the route between Bromsgrove and Kings Norton via the Lickey Incline. This route poses operating issues for current freight services due to its steep prevailing gradient, and its capability to support additional and heavier freight trains will be limited following the planned extension of Cross City passenger services to Bromsgrove in CP4.

As there is no further capacity available to support freight growth on the Lickey Incline, the RUS recommends that the scheme being developed by Centro to re-open the line between Round Oak and Walsall as an alternative freight route is considered for further development in CP5. It is recognised that there are opportunities to deliver infrastructure interventions in the Droitwich Spa and Worcester areas as part of planned signalling renewal projects which will improve the capability to operate freight services on this route. Additional infrastructure would also be required at Abbotswood Junction (north of Ashchurch for Tewkesbury).

The RUS analysis work also considers freight forecast growth beyond 2019, and has identified the need for signalling interventions between Kingsbury and Water Orton and improved access to Kingsbury Terminal. The RUS recommends that work to develop these interventions is undertaken in CP5 in light of anticipated passenger growth on this route (eg. the aspiration outlined in the Yorkshire and Humberside RUS for a third long distance high speed service between Yorkshire and Birmingham).

Operational impact of RUS recommendations at Birmingham New Street

The RUS has undertaken analysis to consider the impact of all interventions recommended in this RUS and other established RUSs on platform capacity at Birmingham New Street. This work has indicated that there is sufficient capacity to accommodate these changes. Further analysis may be required during the consultation period to assess the impact of any recommendations made by the West Coast Main Line RUS.

Longer-term vision

In the longer term beyond 2019, the RUS recognises that a number of major developments are currently being considered to address future capacity requirements both within the RUS area and for the national rail network as a whole. The RUS notes the potential capacity benefits that would be provided and also takes into consideration the wider implications that may result if these developments become committed schemes.

The RUS recognises that there are a number of candidate electrification infill schemes which were proposed for further analysis in the Network RUS: Electrification Strategy. The RUS acknowledges the diversionary benefits that further electrification would offer. The option analysis undertaken to support rail demand in the Aldridge/Brownhills area considers extending electrification as the preferred option to be considered as part of the stakeholder development work.

The RUS notes the opportunities that may be delivered as part of the East-West Rail project in the medium to long term. The delivery of new passenger services and the option of diverting freight services may assist in releasing capacity on established routes and create alternative freight routeing opportunities.

The RUS recognises the work being developed by Centro to connect the Camp Hill lines with Birmingham Moor Street. This development would facilitate aspirations to introduce new stations along the route which would help to address wider transport requirements in the West Midlands. It would create opportunities to divert some services from Birmingham New Street into Birmingham Moor Street which would release capacity at Birmingham New Street and deliver train service reliability and performance benefits.

It is appreciated that substantial capacity implications would arise if plans for a high speed rail line between London, Birmingham and the North were implemented. The work being undertaken by High Speed 2 Limited is recognised, and it is acknowledged that the strategy outlined in this RUS for the current rail network will need to be reviewed when the high speed line is finally committed.



1. Background

1.1 Introduction to Route Utilisation Strategies

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 (and further amended in April 2009) to require the establishment of Route Utilisation Strategies (RUSs) across the network. Simultaneously, the ORR published guidelines on RUSs. A RUS is defined in Condition 1 of the revised network licence as, in respect of the network or a part of the network¹, 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 on the network, consistent with the funding that is, or is 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, April 2009

The ORR guidelines explain how Network Rail should consider the position of the railway funding authorities, their statements, key outputs and any options they would wish to see tested. The RUS should address:

- **network capacity and railway service performance**
- **train and station capacity including crowding issues**
- **the trade-offs between different uses of the network (eg. between different types of passenger and freight services)**
- **rolling stock issues including deployment, train capacity and capability, depot and stabling facilities**
- **how maintenance and renewals work can be carried out while minimising disruption to the network**
- **opportunities from using new technology**
- **opportunities to improve safety.”**

Extract from ORR Guidelines on Route Utilisation Strategies, April 2009

The guidelines also set out principles for RUS scope, time period and processes to be followed and assumptions to be made. Network Rail has developed a RUS manual which consists of a consultation guide and a technical guide. This explains the processes used to comply with the licence condition and the guidelines. This manual and other documents relating to individual RUSs and the overall RUS programme are available on Network Rail's website at www.networkrail.co.uk

The process is designed to be inclusive. Joint working is encouraged between industry parties, who share ownership of each RUS through its industry Stakeholder Management Group (SMG). The SMG includes Passenger Focus and London TravelWatch to represent the passengers' interests.

There is also extensive informal consultation outside the rail industry by means of a Wider Stakeholder Group (WSG). The roles and members of both the SMG and WSG are detailed further in **Chapter 2**.

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

RUSs occupy a particular place in the planning activity for the rail industry. They use available input from processes such as the DfT's Regional Planning Assessments, the Wales Rail Planning Assessments and for the period to 2014, the 2007 High Level Output Specification. 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 and investment plans.

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

The ORR will also take account of established RUSs and those in preparation when exercising its functions.

¹ The definition of network in Condition 1 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. Background

1.2 Document structure

This document starts by outlining in **Chapter 2** the dimensions of the West Midlands and Chilterns RUS, and the geographical context within which it developed. It also describes the linkage to other associated work streams and studies which relate to the RUS.

Chapter 3 summarises the current capabilities and usage of the strategic routes within the RUS area detailing passenger and freight demand and the capability of the infrastructure to meet that demand. Gaps which already exist between demand and capacity are identified.

In **Chapter 4** the committed and uncommitted schemes proposed for the future are explained along with the known train service amendments for future timetable revisions.

Chapter 5 summarises the main planning documents of relevance to the RUS together with

their vision for the role of the railway over the next 30 years and analyses the rail passenger demand and freight traffic that is likely to arise.

In **Chapter 6** gaps between forecast demand and current capability are identified. Options for bridging the gaps pinpointed in the previous chapters are listed, discussed and given an initial appraisal of their likely costs and benefits.

The conclusions emerging from option analysis are presented in **Chapter 7**, together with a view of how future strategy might take shape. This chapter also describes the longer-term scenario and expands on developments up to 2019 and beyond.

Chapter 8 describes the consultation process and details how stakeholders can respond to this document.

Supporting data is contained in the appendices to this document. All information is available at www.networkrail.co.uk



2. Dimensions

2.1 Introduction

This chapter describes the dimensions of the West Midlands and Chilterns Route Utilisation Strategy (RUS). It outlines its purpose, geographical scope, stakeholders, and the time horizon which it will consider. It also describes the planning context in which it is set and its relationship to other studies.

2.2 Purpose

The strategies that emerge from RUSs have a number of purposes; they inform:

- the optimisation of the output specification for rail infrastructure renewals and enhancements
- the identification of ways in which capacity could be utilised more efficiently, in the context of the railway and wider public transport
- the development of the Government's High Level Output Specification (HLOS) for the next control period, as applicable to the West Midlands and Chilterns RUS area
- the development of a future service specification and timetable structure for the West Midlands and Chilterns RUS area.

The West Midlands and Chilterns RUS will therefore:

- propose options to achieve the most efficient and effective use of the existing rail network for both passenger and freight services and identify cost-effective opportunities to improve it where appropriate
- enable Network Rail to develop an informed renewals, maintenance and enhancements programme in line with the Department for Transport's (DfT) aspirations and the reasonable requirements of train operators and other key stakeholders
- enable local transport plans and freight plans to reflect a realistic view of the future rail network.

The need for the industry to make more effective use of existing resources is especially important in light of the changing economic climate. The industry faces the challenge of balancing the need to respond to growing rail demand, with the need to further promote more sustainable transport systems in a way that provides value for money.

2.3 Stakeholders

The West Midlands and Chilterns RUS has been managed through a Stakeholder Management Group (SMG), which has acted as the steering group for the strategy. The SMG met at key stages during the development of this RUS. The group included train operating companies (Arriva Trains Wales, Chiltern Railways, CrossCountry, First Great Western, London Midland, Virgin Trains and Wrexham, Shropshire and Marylebone Railway), freight operating companies (specifically DB Schenker and Freightliner), Network Rail, the Association of Train Operating Companies (ATOC), Rail Freight Group (RFG), the DfT, Transport for London (TfL), London Travel Watch, Centro (West Midlands Integrated Transport Authority), Passenger Focus and Office of Rail Regulation (as an observer).

During the baseline and gap analysis process, separate sub-groups were set up alongside the main SMG to focus on key issues:

- a Passenger Demand Modelling Sub-group (PDMS) was convened to identify current demand for passenger services in the RUS area, and provide an informed view of future passenger growth. The group included members from Network Rail, ATOC, Centro, Passenger Focus and representation from the relevant train operating companies.
- several option appraisal sub-groups were established to provide more comprehensive analysis during the gap identification and optioneering process. Groups were set up and met on a number of occasions to focus on:
 - the central Birmingham urban passenger network
 - the Chiltern passenger network
 - freight operations and network
 - individual corridor based options review
 - performance

The groups were responsible for defining the baseline infrastructure and train service provision. They also specified the committed changes and assumptions that would be incorporated into the baseline analysis.

2. Dimensions

Consideration was given to growth forecasts, franchise commitments, potential housing and regeneration programmes and future rail demand. Once a baseline was established, the group identified and analysed the gaps in detail and proposed potential options to be evaluated.

A Wider Stakeholder Group (WSG) was also established, which included representatives from local authorities, statutory bodies, community rail partnerships, rail user groups and other stakeholders. Several stakeholder briefings were held throughout the RUS process, the purpose of which was to inform the WSG of the developments and progress of the RUS, and to obtain input on local based issues.

In April 2008, introductory briefings took place in Birmingham and Aylesbury where the context, scope and objectives of the RUS were outlined along with the standard RUS processes and programme. In July 2008, baseline exhibition events were held in Birmingham and High Wycombe to enable stakeholders to review the results of the baseline exercise, and share their ideas and insights on the current and future network. This, along with subsequent feedback and further documentation submitted, provided valuable input into the process of gap identification. The baseline information from these exhibitions is available at www.networkrail.co.uk

An interim update was provided through the form of a workshop in July 2009, organised by Passenger Focus. At this event stakeholders were given the opportunity to review the identified gaps being taken forward for further analysis and appraisal, and suggest any further areas for consideration. Further briefings are scheduled after the launch of the Draft for Consultation and will also be arranged for the final RUS publication.

In addition, several one-to-one meetings were held with various stakeholders, both with SMG and WSG members, to discuss their aspirations, obtain their input and update them on RUS developments.

2.3.1 West Midlands Integrated Transport Authority

Centro, the West Midlands Integrated Transport Authority (ITA), is responsible for setting public transport within the region. Centro promotes and develops public transport services across the West Midlands and encourages their use. Centro makes a contribution to the planning of rail initiatives within the region, particularly the provision of facilities at stations, the specifications of service levels and the delivery of a fully integrated and sustainable public transport network. It is actively involved in planning station enhancements at the 63 stations that it supports.

2.4 Geographic scope

In geographical terms, the West Midlands and Chilterns RUS will consider the area covered by the West Midlands Region and parts of the South East Region. The scope area includes the rail routes within Network Rail's Strategic Route M (West Midlands and Chilterns). This is depicted in geographical and schematic format in **Figures 2.1** and **2.2** respectively.

For the purpose of analysis within the RUS, the area has been divided into the following individual corridors, as shown in **Figure 2.3**:

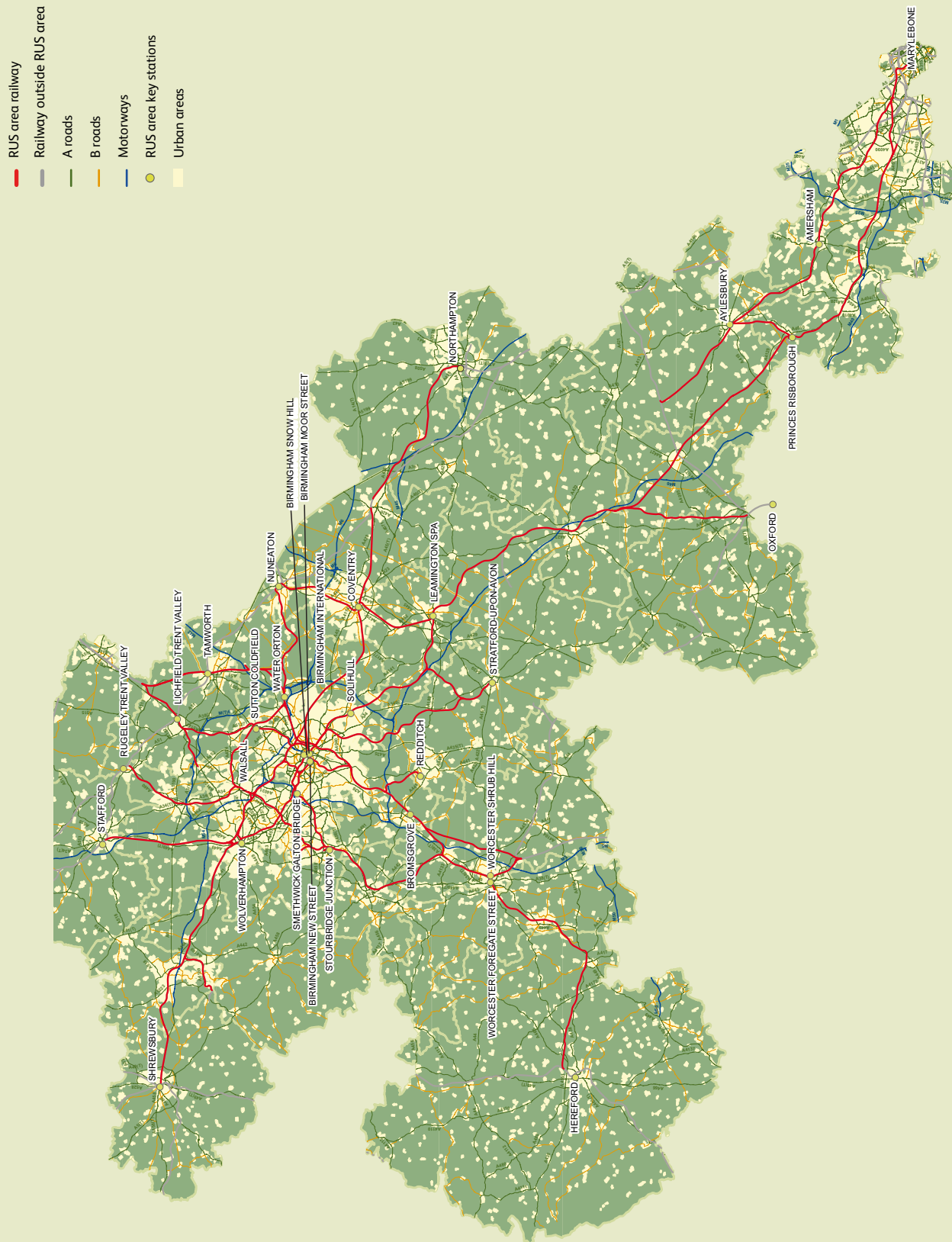
- Aylesbury line
- Cannock and Walsall corridor
- Coventry corridor
- Cross City and Lickey Incline
- Derby, Nuneaton and Camp Hill corridors
- Leamington Spa and Chiltern corridor
- Leamington Spa and Nuneaton line
- Shrewsbury line
- Stafford and Wolverhampton corridor
- Stourbridge line
- Stratford-upon-Avon line
- Sutton Park line
- West Midlands Orbital – this comprises the disused or mothballed routes between Round Oak and Pleck Junction, Ryecroft Junction and Lichfield City, and Aston South Junction to Vauxhall Junction including Duddeston.

The relationship between each corridor, and the routes beyond the RUS area, will be considered during the analysis.

There are two major stations within the RUS area: Birmingham New Street and London Marylebone. These stations serve a large number of passengers each day, offering services to key destinations within the RUS area, and providing a link into the wider rail network through the interchange opportunities they provide.

Due to its central geographical location, services from most of the United Kingdom run into Birmingham New Street station, and it acts as a major interchange station as well as a terminus for some local services. Birmingham New Street is managed by Network Rail and is one of the busiest stations outside London in terms of passenger numbers. In addition to direct interchange between services that run into Birmingham New Street, passengers can also make connections with services from the other two main central stations which are in close proximity: Birmingham Moor Street and Birmingham Snow Hill.

Figure 2.1 – Geography of West Midlands and Chilterns RUS area



2. Dimensions

Figure 2.2 – Schematic map of RUS area

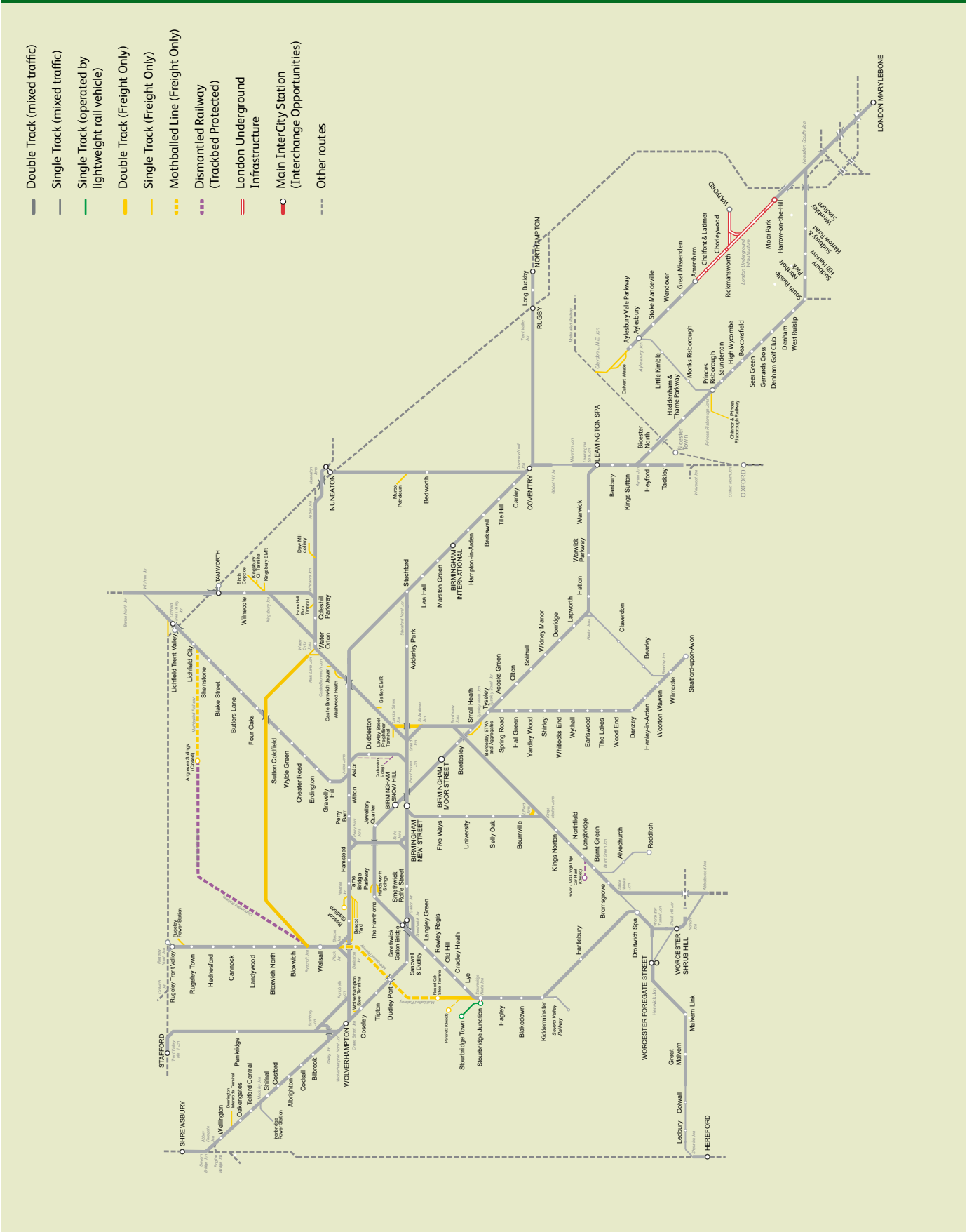
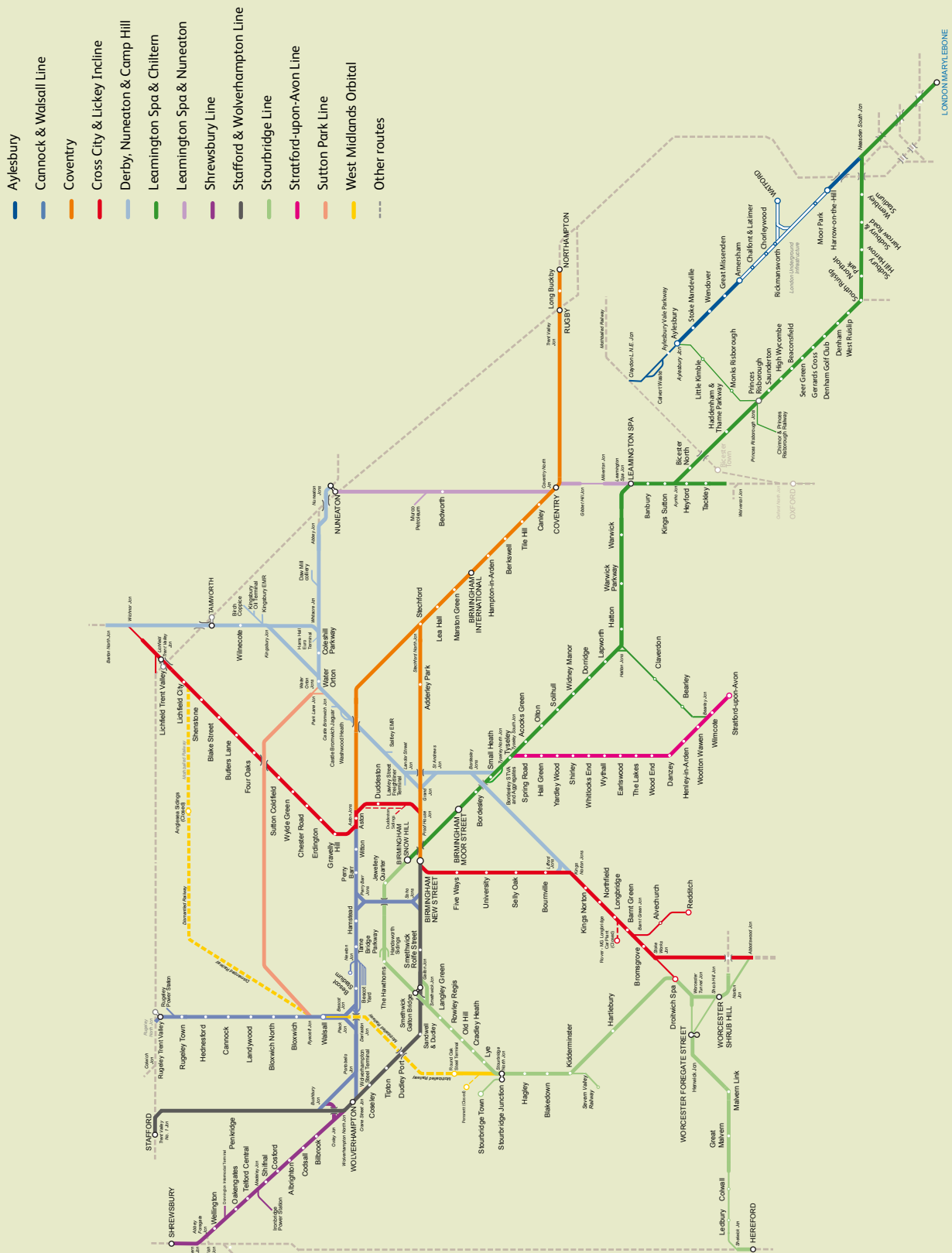


Figure 2.3 – Corridors



2. Dimensions

London Marylebone is a key rail terminal with a direct link to London Underground's Bakerloo lines. Operated by Chiltern Railways, it is smaller than many of the other London terminal stations but a recent expansion in the number of platforms has facilitated an increase in services and the number of passengers using the station. The main services into the station are also operated by Chiltern Railways. It is also served by up to four trains per day from Wrexham, operated by the Wrexham, Shropshire and Marylebone Railway Company.

2.5 Scope of services

The RUS will consider all passenger and freight services that make all or part of their journey within the RUS area, to the extent necessary to achieve the route utilisation objective regardless of whether or not the physical infrastructure falls within the boundaries of the West Midlands and Chilterns RUS area.

The RUS will consider passenger flows into the central Birmingham stations – Birmingham New Street, Birmingham Moor Street and Birmingham Snow Hill – and London Marylebone. These stations support key market flows within the RUS area, namely local commuter, interurban and long distance passenger flows. The RUS will analyse the service flows which support these markets and consider the impact of future demand.

Analysis will focus on local commuter services between key locations in the West Midlands and the Birmingham central stations, and between London Marylebone and locations on the Aylesbury and Chilterns lines. The RUS also considers interurban

services that operate between Birmingham and other key urban centres including Rugby, Stafford, Worcester, Wolverhampton, Derby, Cardiff and Leicester. Long distance services will also be examined, including services to London Marylebone from Stratford-upon-Avon, Kidderminster and Birmingham, and inter-city services passing through Birmingham New Street, including those from Penzance, Bristol, Liverpool, Manchester, London Euston, Bournemouth, Edinburgh, Glasgow and Newcastle.

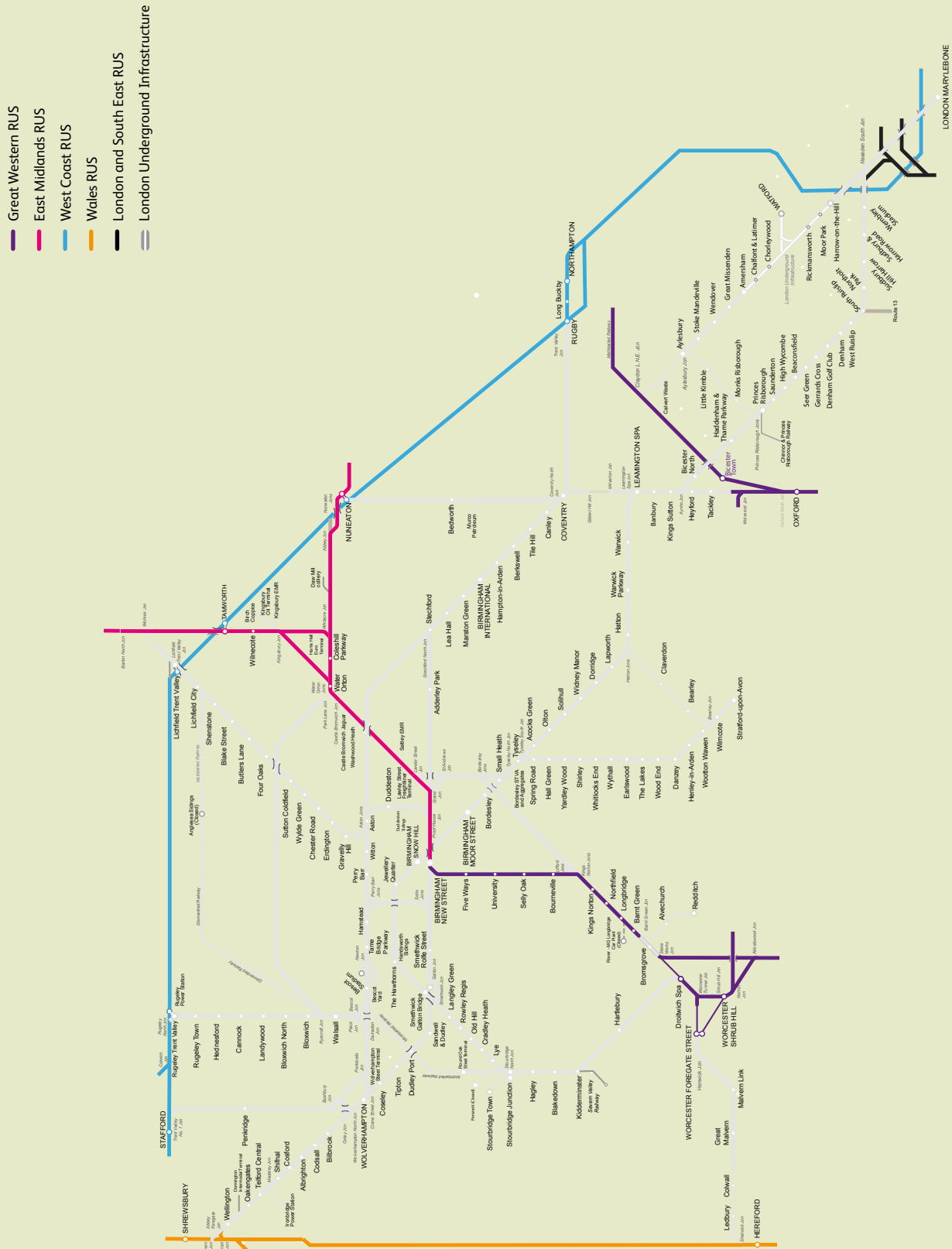
2.6 Linkage to other RUSs

Network Rail is continuing to work through a programme of RUSs which, once complete, will cover the rail network of Great Britain. The West Midlands and Chilterns RUS is the penultimate geographical RUS and interfaces with other parts of the network which have been or are being covered in other RUSs, including the East Midlands, Great Western, London and South East, Wales, and West Coast Main Line RUSs. The relationship between them is outlined below, and shown geographically in **Figure 2.4**.

The East Midlands RUS, established in April 2010, covers the lines on the Midland Mainline strategic route not assessed by the West Midlands and Chilterns or Yorkshire and Humber RUSs. This interacts with the West Midlands and Chilterns RUS area at Nuneaton and Wichnor Junction and the two RUSs interface on the routes from Birmingham to Peterborough, Cambridge and Stansted. The East Midlands RUS has also considered freight capacity for intermodal journeys from the West Midlands to Yorkshire and the North East markets.



Figure 2.4 – Interfaces with other RUSs



2. Dimensions

The Great Western RUS, established in May 2010, interfaces with the West Midlands and Chilterns RUS on the Bristol, Great Malvern and Birmingham routes. The Great Western RUS has led the analysis on services from the West Midlands to the South West and South Coast. It has also assessed crowding on interurban services between the South West, South Coast, West Midlands, Manchester and the North East.

The London and South East RUS, launched in 2009 as part of the second generation portfolio of RUSs, provides a broader investigation into London terminal capacity. The draft is due to be published in December 2010 and the final document during summer 2011.

The Wales RUS, established in January 2009, interfaces with the West Midlands and Chilterns RUS on the lines from Birmingham to central Wales via Shrewsbury, and Birmingham to Hereford.

The West Coast Main Line RUS was launched in late 2008 and is currently in development. The West Coast Main Line (WCML) passes through parts of the West Midlands and Chilterns RUS geography, and although it is not directly within the scope of the study, it has an influence on operations and train services. Due to the relationship between the two RUSs, their development has been closely aligned to provide synergy between the two strategies.

Due to the interfaces between the West Midlands and Chilterns, East Midlands, and Great Western RUS, these strategies have been interlinked in programme, scope area and services with particular regard to the interurban services currently operated by the CrossCountry franchise.

Due to services operating across several routes, cross-boundary issues have arisen. The West Midlands and Chilterns RUS has led the analysis on the following services:

- Nottingham to Cardiff
- Birmingham to Derby
- Birmingham to Manchester
- Birmingham to Liverpool
- Coventry to Derbyshire, Yorkshire and North East.

The West Midlands and Chilterns RUS considers input and analysis nationally from the Freight RUS established in May 2007 and the Strategic Freight Network (SFN). It also considers emerging strategies from the Network RUS concerning national electrification issues, rolling stock and depots, station development and scenarios and long distance forecasts.

The original programme of RUSs is scheduled to be completed by 2011. As part of the on-going RUS programme, second generation RUSs are being developed so that recommended strategies remain valid and cover the long-term planning framework

as set out in Government policy. These strategies will not seek to confine themselves to a particular geographic area and will also not reappraise the recommendations made in established RUSs where these remain valid. Recommendations made in any RUSs will be reviewed when any changes occur which may significantly affect the recommendations of the original strategy.

2.7 Linkage to other studies

In order to successfully fulfil its role in industry planning, the RUS should fit into a wider planning framework relating not only to rail schemes, but also extending to other major strategies and policies covering key issues such as housing, economic development, social inclusion and environmental awareness. For it to be an effective strategy it should be broadly aligned and consistent with these.

During the development of this RUS several changes have taken place in the way that local and regional planning is administered in the UK. Following the establishment of the coalition Government in May 2010, the approach to public spending and local planning has been reviewed, with the aim of reviving and developing the UK economy. A key policy has been to free local government from central and regional control and devolve greater powers to councils and local communities. Associated with this is the proposed abolition of the former Regional Development Agencies and the formal documents which they produced, such as the Regional Spatial Strategies (RSS). It is proposed that local authorities will take collective responsibility for determining the appropriate level of growth anticipated in their areas.

Following the abolition of the former regional strategies in May 2010, the RUS is no longer able to draw directly on their recommendations. In these circumstances the representation of local councils and governing bodies in the Wider Stakeholder Group has been essential for understanding the changes as they have evolved. Whilst the key themes and outputs of the former regional documents are still considered to have some relevance for understanding the local planning context, the RUS has looked directly to the local authorities for guidance on key issues such as travel behaviour and anticipated housing growth in the regions they cover.

The following regional and local planning documents (some of which have now been formally abolished) have provided supportive information during the development of the RUS:

- Airport Master Plan to 2030 – November 2007 (Birmingham International Airport)
- Air Transport White Paper – December 2003 (DfT)
- Connecting Communities – June 2009 (ATOC)
- Delivering a Sustainable Transport System – November 2008 (DfT)

- High Level Output Specification 'Delivering a Sustainable Railway' – July 2007 (DfT)
- North-South links in Buckinghamshire – 2008 (Chiltern Railways)
- Rail Technical Strategy – July 2007 (DfT)
- Rolling Stock Plan – January 2008 (DfT)
- South East Plan – May 2009 (South East England Regional Assembly)
- Surface Access Strategy 2006-2012 – November 2007 (Birmingham International Airport)
- Thames Valley Regional Planning Assessment – June 2007 (DfT)
- Transport 2025 vision 'Transport vision for a growing city' – November 2006 (Transport for London)
- West Midlands Regional Planning Assessment – July 2006 (DfT)
- West Midlands Regional Spatial Strategy – January 2008 revised version (Government Office for the West Midlands)
- West Midlands Region Rail Development Plan – June 2009 (Centro).

Local development frameworks were established with RSSs and intended to be a folder of local development documents prepared by district councils and unitary authorities to outline spatial planning strategy for each local area. Whilst the RSS is now abolished, the current guidance in relation to the local development framework is that they will continue subject to a review and with reference to regional policy removed.

2.8 West Midlands and Chilterns RUS time horizon

The West Midlands and Chilterns RUS takes a 30-year perspective to be consistent with the long-term vision adopted in recent UK Government transport planning strategy documents, notably the DfT's Rail White Paper 'Delivering a Sustainable Railway' and Rail Technical Strategy (2007).

The RUS covers the 10-year period to 2019 in detail and then describes broad, high level strategic issues and interventions through to 2040. The outputs will form the rail industry's preferred strategy for railway regulatory Control Period 5 (2014 to 2019) and 6 (2019 to 2024).



3. Current demand, capacity and delivery

3.1 Introduction

In this chapter, the current function and capability of the rail network in the West Midlands and Chilterns Route Utilisation Strategy (RUS) area is described. Profiles are provided for passenger and freight operations, as well as information about the current infrastructure, capacity and capability; how it performs and how it is maintained.

3.2 Train operating companies

At present, eight passenger train companies operate in the West Midlands and Chilterns RUS area:

- Arriva Trains Wales is the principal operator within Wales, with services via Shrewsbury extending through the West Midlands to Birmingham International via Birmingham New Street. The franchise is due to run until 2018
- Chiltern Railways provides long distance services between London Marylebone and the West Midlands, with services operating to Birmingham Snow Hill (via Birmingham Moor Street), Kidderminster and Stratford-upon-Avon at different frequencies throughout the day. They also operate services between Marylebone and Aylesbury Vale Parkway via Amersham and between Princes Risborough and Aylesbury. The current franchise commenced in 2002 and has a term of up to 20 years. Chiltern Railways secured a seven-and-a-half years' extension to their original franchise of twelve-and-a-half years in return for the investment commitments made as part of the Evergreen 3 project
- CrossCountry is the main provider of long distance and interurban services on those routes which do not serve London, linking Scotland and the North East with the East and West Midlands, the South West and the South Coast. These include services between Plymouth and Edinburgh, Cardiff and Nottingham, Birmingham and Stansted airport, Reading and Newcastle and Manchester and Bournemouth. These services traverse the RUS area and Birmingham New Street is a significant element of their operation for CrossCountry passengers wishing to interchange with other operators' services. The current CrossCountry franchise was awarded in November 2007 and is due to run until April 2016
- First Great Western operates services on the periphery of the RUS area. Within the RUS area they provide a long distance service between Hereford and London Paddington via Worcester, and local services between Banbury and Oxford. They operate via Worcester to Great Malvern from Bristol and beyond. Their core service operates from London Paddington through Reading to Oxford, Bristol, the West of England, and South Wales and relies on the punctuality of long distance passenger and freight services using the Leamington Spa, Worcester and Cheltenham corridors. The franchise commenced in April 2006 for a period of 10 years, with a possible break point after seven years
- London Midland is the principal operator of interurban and suburban services across the West Midlands. Local commuter services operate from central Birmingham stations to key destinations in and around the West Midlands region including Worcester, Leamington Spa, Stratford-upon-Avon, Coventry, Wolverhampton, Walsall, Hereford, Redditch, and Stafford. London Midland operates longer distance services between Birmingham New Street and Liverpool Lime Street, and between Birmingham New Street and London Euston. The franchise was awarded in November 2007 for a period of eight years
- London Underground Limited (LUL) runs services on the Metropolitan line from London through Harrow-on-the-Hill to Amersham and Chesham. Much of the line is shared with the main line railway service operated by Chiltern Railways which runs from London Marylebone to Aylesbury
- Virgin Trains operate long distance passenger services between London, the West Midlands, the North West, North Wales, Glasgow, and Edinburgh. Within the RUS area they operate three trains per hour on weekdays, between London Euston and the West Midlands, via the West Coast Main Line, two to Birmingham New Street with one continuing on to Wolverhampton. One train per hour is also operated between Birmingham New Street and Glasgow or Edinburgh. The franchise was awarded for a 15-year period from 1997 to March 2012

- Wrexham, Shropshire and Marylebone Railway Company introduced services from the Welsh Borders region to London Marylebone in Spring 2008. They currently operate four daily limited stop services Monday to Saturday between Wrexham General and London Marylebone, and three trains on a Sunday. WSMR has an 'open access' licence which currently runs for seven years.

In addition to the operators outlined above, Vintage Trains also run services in the RUS area. This is a small open access operator which operates seasonal summer steam services, primarily between Birmingham Snow Hill and Stratford-upon-Avon.

Several Community Rail Partnerships provide marketing and promotional support to parts of the rail network covered by the West Midlands and Chilterns RUS. Those which are members of the Association of Community Rail Partnerships are listed below:

Partnership	Route
Cambrian Line Promotion Group	Aberystwyth to Shrewsbury
Cotswold Line Promotion Group	Hereford to Worcester
Shrewsbury to Chester Rail Partnership	Shrewsbury to Wrexham and Chester

3.3 Current passenger market profile

The area covered by the West Midlands and Chilterns RUS covers a large geographical area which has a population of around seven million, of which five million live within the West Midlands region and around two million live in the areas in relatively close vicinity to the Chiltern line and the line from Aylesbury to London Marylebone. The rail network in the RUS area links the West Midlands to London and also provides wider connectivity to other large UK cities including Leeds, Liverpool, Manchester, Bristol, Southampton, Glasgow and Edinburgh.

The main passenger markets for rail within the RUS area can be identified as local commuting, interurban, and long distance. The journey demand levels and travel patterns within these markets reflect the concentrations of population and economic and social activity.

3.3.1 Local commuter market

Local commuter services within the RUS area are designed to meet commuter, shopping and leisure needs, particularly into the key centres of economic and social activity. Local rail commuting focuses on the major employment centres within the area and has seen significant growth in recent years. The key employment locations are concentrated in the Metropolitan area which includes the cities

and urban centres of Birmingham, Wolverhampton, Coventry, Solihull, Dudley and Walsall.

London Midland is the principal operator of local commuter services in the West Midlands. This commuter rail network is extensive and busy, with services on some corridors running as often as every 10 minutes. For most other corridors there are at least two trains per hour, although some smaller stations can receive a lower frequency of service. Recent analysis has shown that the busiest commuter corridors are the Coventry, Wolverhampton, Stourbridge and Cross City lines.

Chiltern Railways also serves local commuter demand for travel, particularly into the key centres of Birmingham and London Marylebone. The provision of an all day frequency of two trains per hour between Birmingham Snow Hill and London Marylebone supports local commuting as well as longer distance business and leisure travel. In the peak hours, the extension of the Chiltern service to Kidderminster and Stourbridge Junction is significant for local commuting into Birmingham. The local services operated between High Wycombe and London Marylebone, and between Aylesbury and London Marylebone via Amersham, provide important access to employment in London. The demand for these services is reflected in the substantial growth in commuter numbers on Chiltern services in recent years, particularly into London Marylebone during the morning peak.

The significant growth in local commuter travel within the West Midlands and into London Marylebone can also be attributed to the long term investment and service improvements provided by the rail industry, supported by local authorities and the Integrated Transport Authority. In recent years faster and more frequent trains have been delivered on many of the busier West Midlands commuter routes, with associated improvements in station facilities and customer information. Recent investment on the Chiltern route, under the stewardship of Chiltern Railways, has concentrated on the development of new stations, providing additional platforms and car parking, and improving track and signalling on the route. These improvements have resulted in faster journey times, more regular timetables and additional services which support current demand and encourage passenger growth.

3.3.2 Interurban market

Interurban services operate to destinations within and beyond the RUS area boundaries and aim to support business, wider commuting and leisure travel. The considerable growth in this market in recent years is seen as a reflection of changing employment structures and travel patterns. Traditionally interurban rail services have primarily supported business and leisure travel, but in recent years they have also become more popular for

3. Current demand, capacity and delivery

commuters due to enhanced frequencies and faster journey times, and the increasing desire to avoid road congestion in towns and cities.

The interurban market between London and the surrounding urban centres has grown consistently in the last few decades, reflecting economic and demographic trends. The areas of the South East covered by this RUS are significant residential areas for London commuters, with London being the largest employment centre and one which can be accessed quickly by rail.

Interurban travel to major cities outside London has also grown in recent years, with Birmingham New Street station acting as a significant interchange point at the centre of the interurban network within the RUS area. CrossCountry is a key operator of regional services connecting major cities and towns outside London. The majority of CrossCountry's services pass through Birmingham New Street providing regional links to key destinations including Derby, Nuneaton, Leicester, Stansted Airport, Cheltenham, Cardiff and Nottingham. London Midland also offers semi-fast interurban services, with half-hourly services operating from Birmingham New Street to Liverpool Lime Street, one an hour to Hereford via Bromsgrove, and two services an hour operating to Northampton. There are also two trains per hour to Shrewsbury, provided by London Midland and Arriva Trains Wales. The journey times between Birmingham and these cities and towns are generally competitive with or better than those available by car and bus due to road congestion.

Interurban services are also operated from the other central Birmingham stations in the RUS area, with Chiltern Railways providing connectivity to Birmingham from other urban centres via the Chiltern Main Line. Commuting into Birmingham from Banbury and Leamington Spa, in particular, has increased in recent years with Birmingham acting as a key employment centre.

3.3.3 Long distance market

The Chiltern Main Line, referred to in this strategy as the Leamington Spa and Chiltern Corridor, connects the UK's two largest cities and serves a long distance passenger market. In addition to the local and interurban travel outlined earlier, services on the Chiltern route also support long distance business, leisure and commuter travel. Chiltern Railways operates half-hourly services from London Marylebone to Birmingham Snow Hill and Birmingham Moor Street stations, and five trains per hour from London Marylebone to Stratford-upon-Avon. Wrexham, Shropshire and Marylebone Railway Company provide four trains per day to London from Wrexham, Shrewsbury, Telford, Cosford and Tame Bridge Parkway via the Chiltern route.

In addition to the services between Birmingham and London, the RUS area also supports long distance

travel beyond its geographical boundaries. Due to its central location, the West Midlands area acts as a hub of the national rail network with many long distance services passing through Birmingham New Street, which is a primary interchange station for many destinations across the network. CrossCountry operates a network of long distance services between cities outside London, linking Plymouth and Penzance to Edinburgh via Bristol, Leeds and York, Bournemouth and Bristol to Manchester Piccadilly, and Reading to Newcastle. First Great Western also provides services from Hereford and Worcester to Oxford and London Paddington.

3.3.4 Leisure and tourism market

The tourist and leisure attractions within the RUS area attract a substantial number of visitors, and rail provides an increasingly attractive mode of access both to local, interurban and longer distance travellers. Within the West Midlands region visitor attractions include Shakespeare's Stratford-upon-Avon, Warwick Castle, Cadburys World, Edgbaston cricket ground, the Bullring Centre and various special events at the National Exhibition Centre, National Indoor Arena and other major venues. Within the South East region, leisure travel has also increased in recent years with passengers regularly travelling by train to visit major tourist attractions and places of interest in London, as well as other locations accessible via the Chiltern and Aylesbury routes such as Bicester shopping village, the Chiltern Area of Outstanding Natural Beauty, and events at Wembley Stadium and Arena.

3.3.5 Airport Access

Rail also provides surface access to some key UK airports, both within the RUS area and beyond its geographical boundaries. These include:

- **Birmingham International Airport (BHX)** – In a standard hour, nine direct services are operated via Birmingham New Street station to Birmingham International station, which is located via the Air-Rail Link people mover system, only 500 metres from the passenger terminals. These services are provided by a number of train operators, and provide air passengers from both the local area and locations outside the RUS area, with direct access to Birmingham International Airport.
- **East Midlands Airport** – There are no direct links to East Midlands Airport from within the RUS area but connections can be made from services which call at Derby and Nottingham. A Skylink bus connects these stations to the airport on a 30-minute frequency.
- **Liverpool John Lennon Airport** – London Midland provides two direct services an hour from Birmingham New Street to Liverpool South Parkway. There is an express bus service which runs from the station to the airport.

- **London Heathrow Airport** – There is currently no direct surface access from the RUS area to Heathrow Airport, and this has been highlighted as a specific issue in the Thames Valley Regional Planning Assessment for the Chiltern route. Current access is provided by connecting services at London Paddington station or by London Underground services. An alternative mode of access is provided via bus or coach links from High Wycombe and Reading.
- **Manchester Airport** – There are no direct links to Manchester Airport station from within the RUS area but connections can be made from services which call at Crewe and Manchester Piccadilly stations.
- **Stansted Airport** – CrossCountry provides an hourly service from Birmingham New Street station to Stansted Airport via Leicester, Peterborough and Cambridge. Stansted Airport station is located under the terminal building.

3.4 Current passenger service provision

The following diagrams depict a standard (off-peak) hour service provision, divided into the following segments:

- Aylesbury corridor (**Figure 3.1**)
- Coventry corridor (**Figure 3.2**)
- Cross City North and Walsall corridors (**Figure 3.3**)
- Cross City South and Derby and Nuneaton corridors (**Figure 3.4**)
- Leamington Spa, Stratford-upon-Avon and Chiltern corridors (**Figure 3.5**)
- Birmingham Snow Hill-Worcester corridor (**Figure 3.6**)
- Wolverhampton and Shrewsbury corridor (**Figure 3.7**).

3.5 Current passenger demand

In 2009/10, approximately 73 million passenger rail journeys were made within, to, and from the West Midlands and Chilterns RUS area and it is estimated that about 25 per cent of these journeys were made using Centro tickets¹. Passenger demand in the RUS area increased by around 60 per cent between 1998 and 2009², equating to an average growth rate of 4.5 per cent per annum and **Figure 3.8** plots the growth rates over this period.

This strong historic growth was attributed to several factors, including improved timetable, faster rail journey time, rail performance improvements, and growth in housing and retail developments in Birmingham conurbation area and in the Chiltern region.

Of the 73 million RUS total journeys in 2009/10, around 18 million journeys were made to, from and within the Chiltern region (including London Marylebone) and demand has almost doubled between 1998 and 2009. The infrastructure investment made in the Evergreen I and II projects, rolling stock refurbishment, new stations and station facilities have stimulated rail demand in the Chiltern region.

Of the RUS area total journeys, around 70 per cent were made from entirely within the West Midlands and Chilterns RUS area and the remainder were made to/from areas outside the RUS area, predominately to and from the North West, East Midlands and the South East region.

Despite the recent economic recession which has seen Gross Domestic Product contract for six consecutive quarters during 2008 and 2009, passenger rail demand has remained relatively resilient. In the RUS region the number of rail passenger journeys, as shown in **Figure 3.8**, has continued to grow, albeit at slightly lower rates than the strong ones seen before the recession and this is consistent with other rail sectors across the UK. The reasons for this growth are complex, but several factors less directly linked to the economy have been working in favour of rail, such as a growing population, road congestion in cities and urban centres, fuel costs, car parking charges and structural changes in travel and employment markets.

¹ Centro ticket here refers to the products offered by Centro, the Integrated Transport Authority for West Midlands. There are four main ticket types offered by Centro. These are the zonal season ticket which is for rail use only, the zonal season ticket for all modes, the daily zonal ticket for all modes and the free travel pass for those over 60. These tickets are not included in pre-2009 MOIRA (LENNON rail ticket) data. An exercise undertaken as part of the MOIRA Upgrade project estimates the volume of rail journeys made on Centro tickets and their origin and destinations which are known as Centro inflills. This Centro inflill is available in MOIRA for 2009/10 data. MOIRA is the industry standard forecasting model which contains rail ticket sales data.

² The number of rail journeys made using Centro ticket between 1998 and 2008 is not available. The 60 per cent increase in rail demand between 1998 and 2009 does not include Centro tickets and compares the number of rail journeys excluding Centro tickets in both years to allow a like-for-like comparison over the 11-year period.

3. Current demand, capacity and delivery

Figure 3.1 – Aylesbury corridor – standard off-peak hour service provision

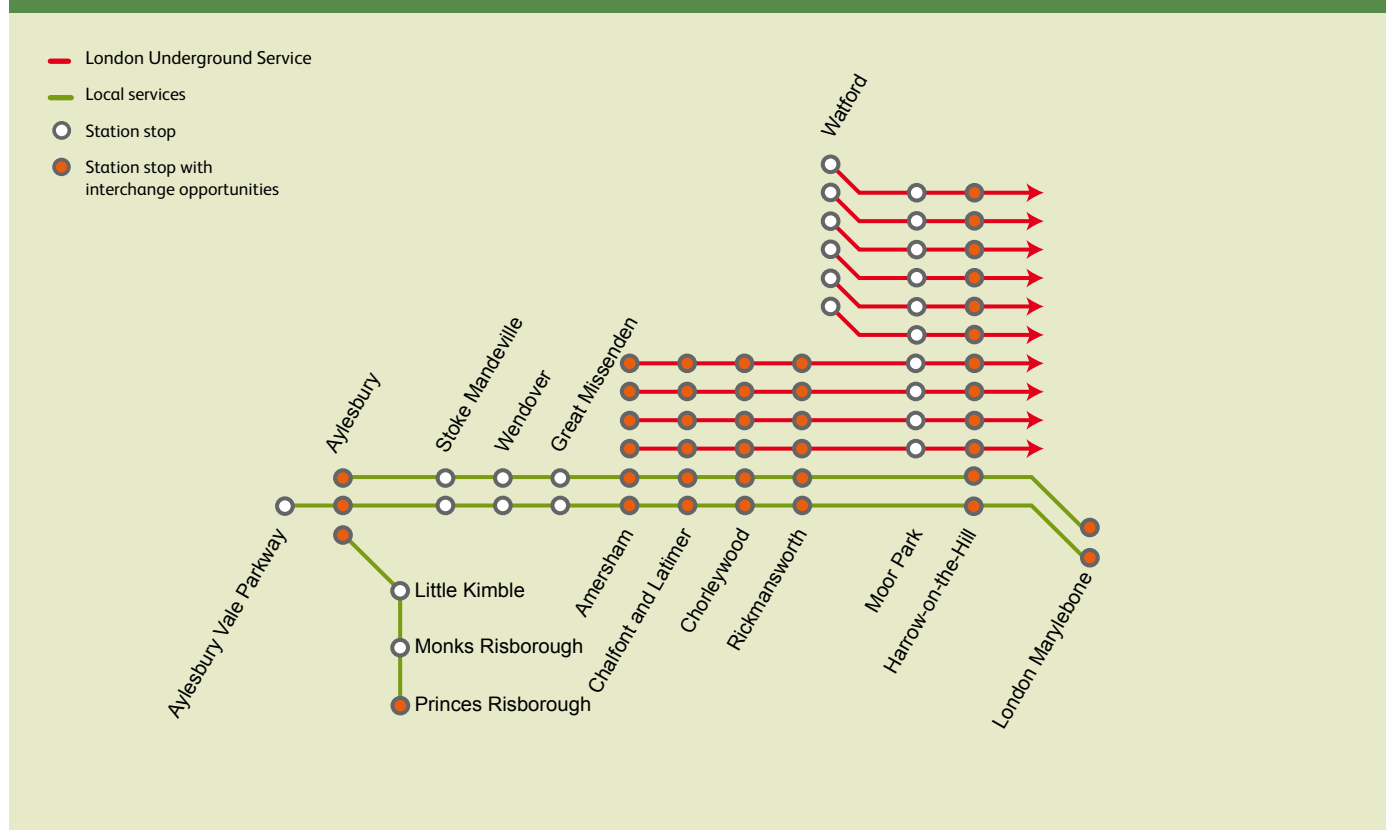


Figure 3.2 – Coventry corridor – standard off-peak hour service provision

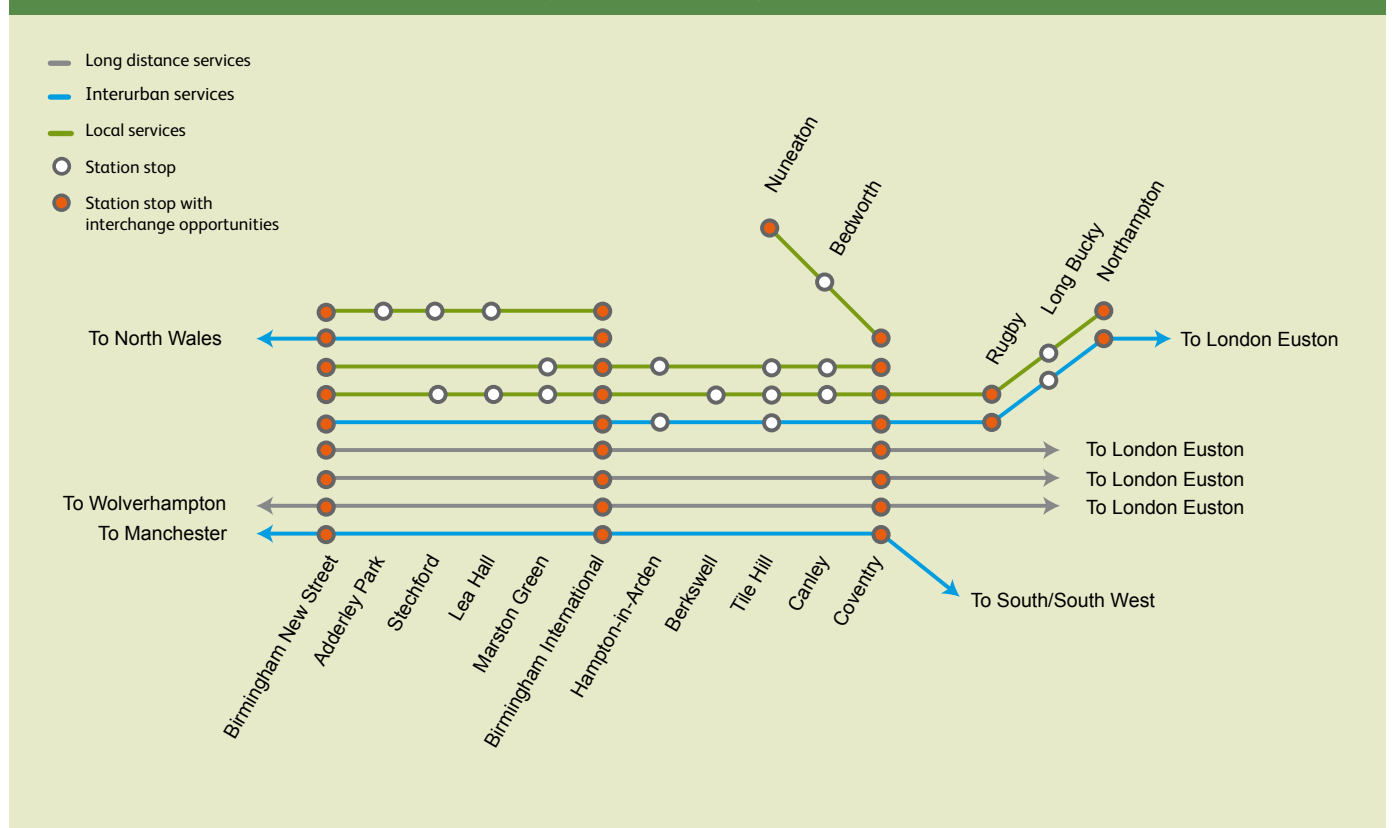


Figure 3.3 – Cross City North and Walsall corridor – standard off-peak hour service provision



3. Current demand, capacity and delivery

Figure 3.4 – Cross City South and Derby and Nuneaton corridors – standard off-peak hour service provision

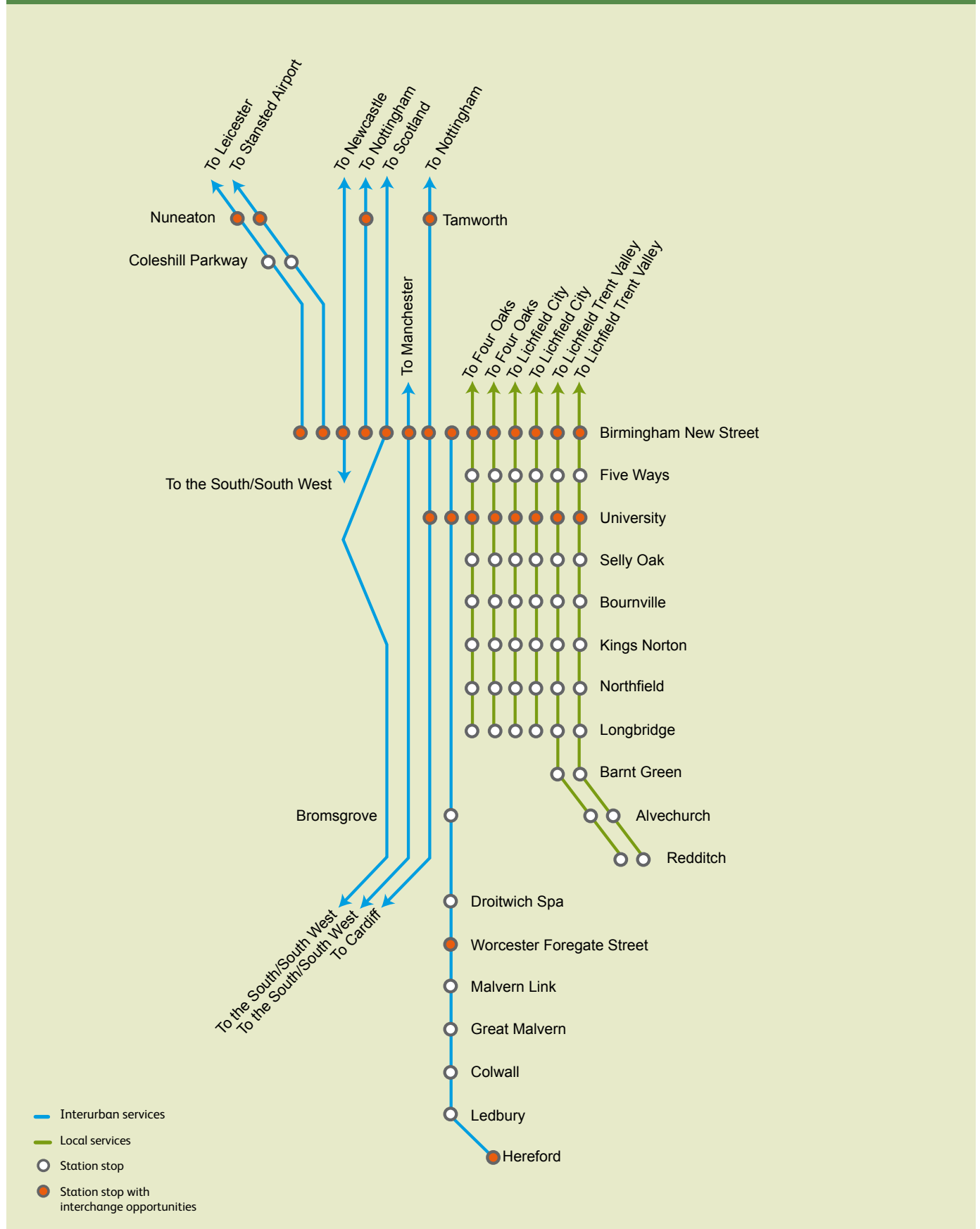
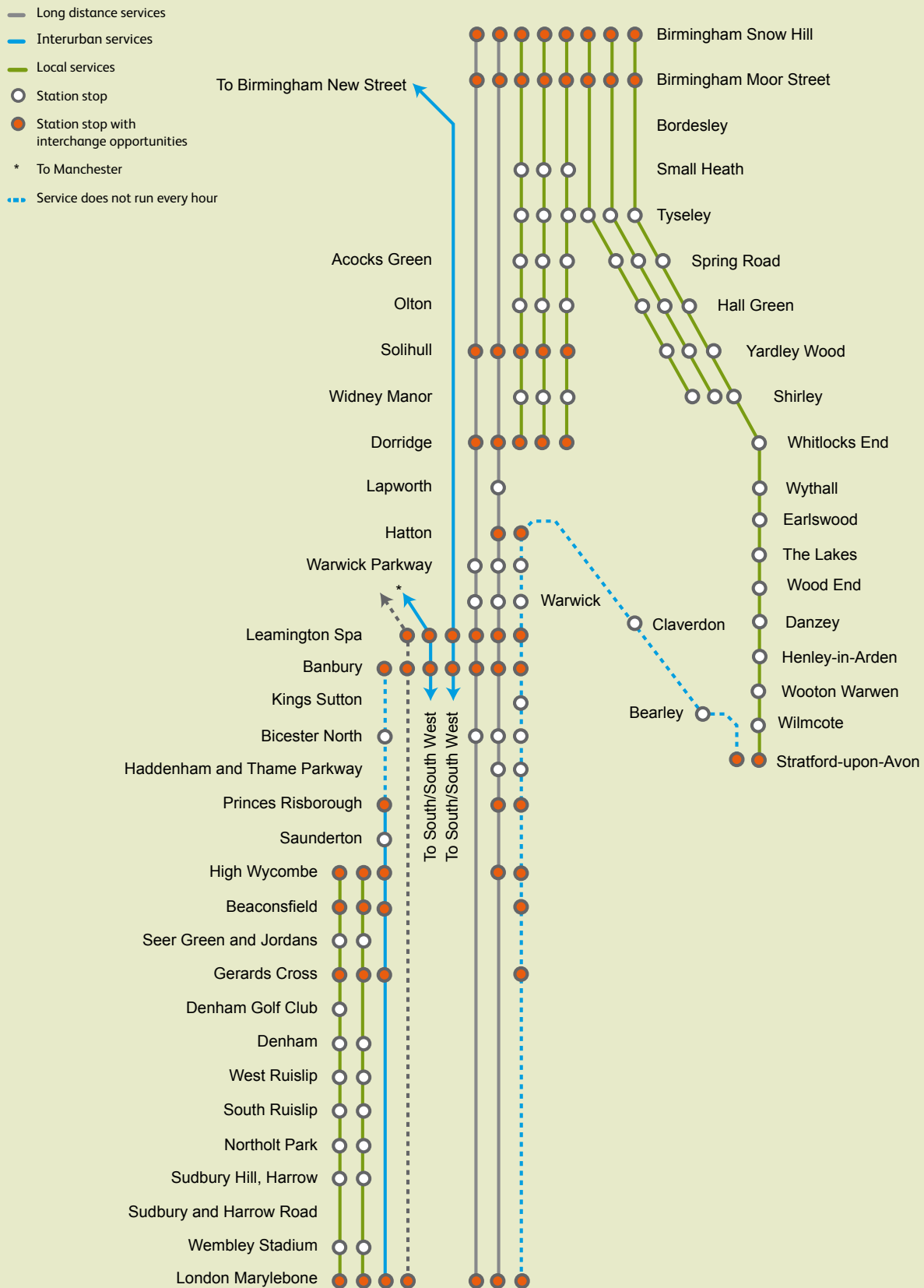


Figure 3.5 – Leamington Spa, Stratford-upon-Avon and Chiltern corridor – standard off-peak hour service provision



3. Current demand, capacity and delivery

Figure 3.6 – Birmingham Snow Hill – Worcester corridor – standard off-peak hour service provision



Figure 3.7 – Wolverhampton and Shrewsbury corridor – standard off-peak hour service provision

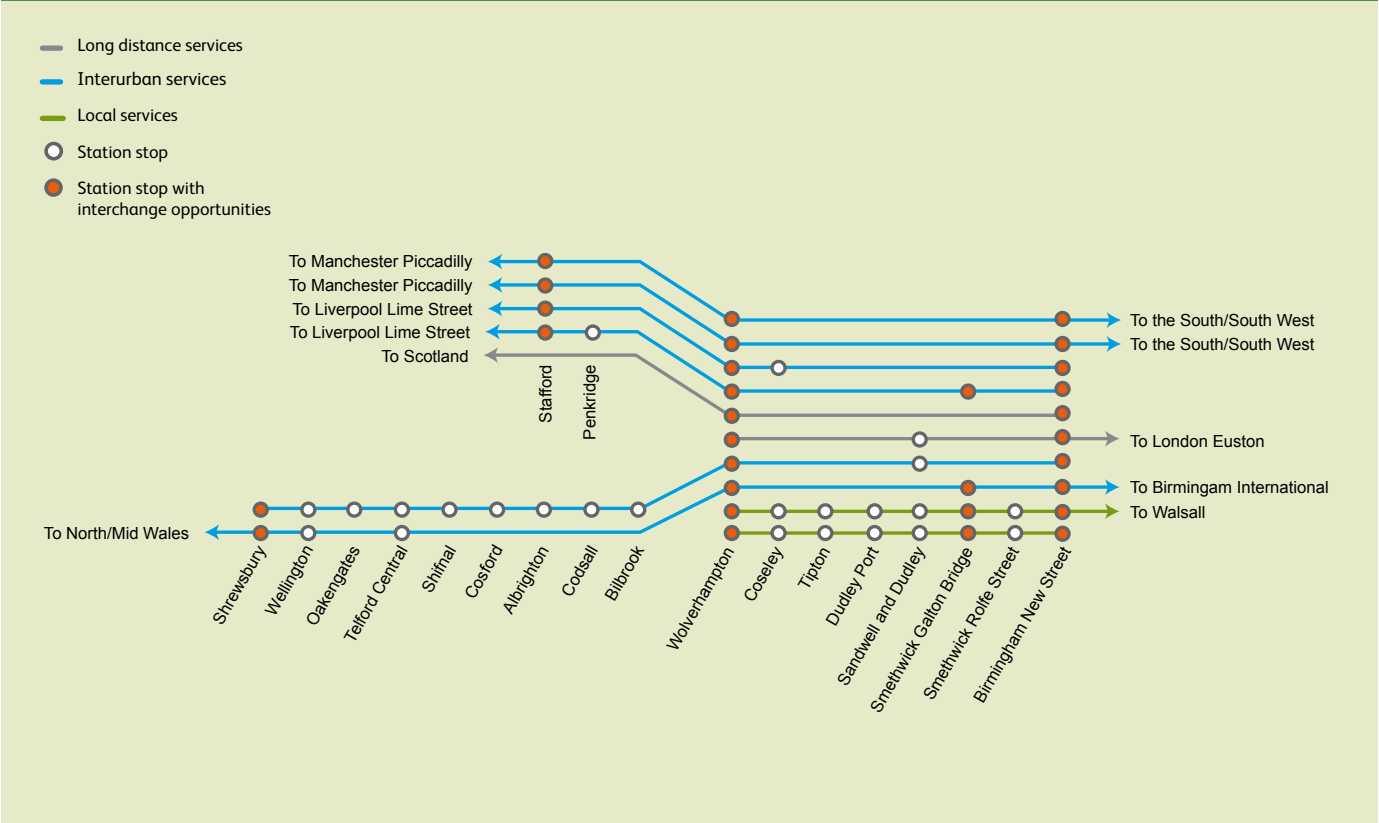
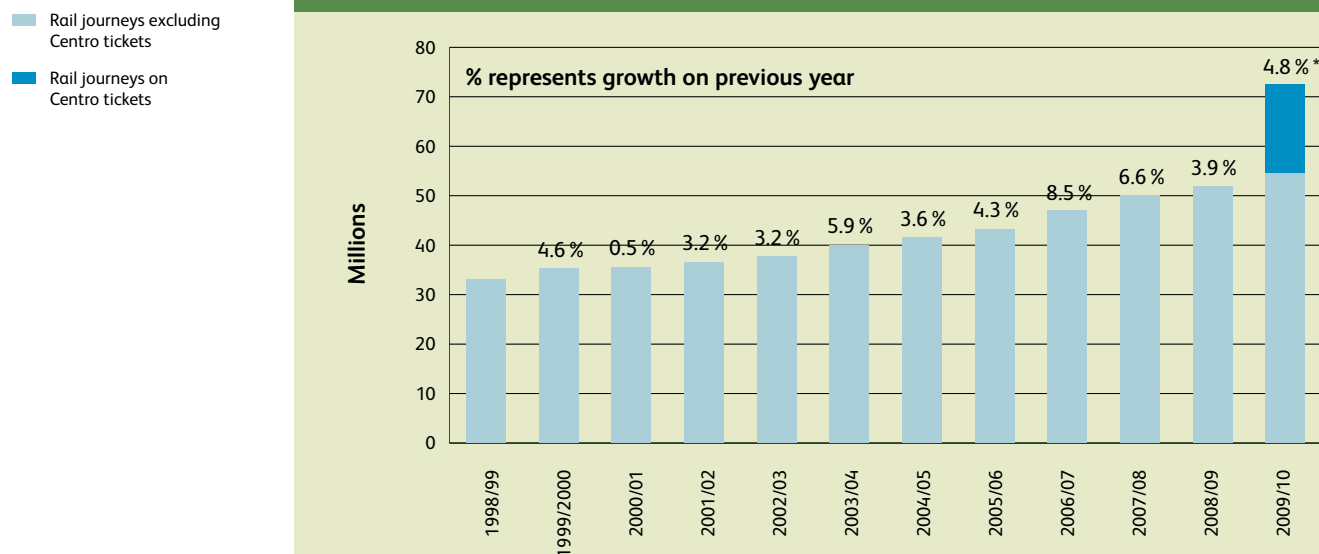


Figure 3.8 – Growth in passenger rail journeys to/from/within the RUS area between 1998/99 and 2009/10



Source: MOIRA OR25 (Midlands version) and RIFF v5.

Note: * The 4.8 per cent increase between 2008/09 and 2009/10 represents growth in rail journeys excluding Centro tickets.

The number of rail journeys made on Centro ticket has not been estimated between 1998 and 2008. The number of rail journey made in 2009/10 is split between rail journeys made on Centro tickets and non-Centro tickets. Figures include journeys made on London travelcards.

3.5.1 Key passenger flows and station footfall

Station footfall

The busiest station in the RUS area, measured in terms of rail passenger volume, is Birmingham New Street followed by London Marylebone. **Table 3.1** shows the top 10 stations in the RUS area.

In 2009, over 26 million rail passenger journeys started or ended at Birmingham New Street station, a 75 per cent increase from 1998³. Another five million passengers interchange at the station. The top 10 origins and destinations of Birmingham New Street passengers are presented in **Table 3.2**. Birmingham Moor Street and Birmingham Snow Hill are the other main railway stations in Birmingham city centre which together have an annual passenger footfall of around seven million.

The high growth in rail demand at Birmingham central stations also reflects the increased modal share of rail particularly during the peak hour. In 2007, about 24 per cent of all journeys into Birmingham city centre in the morning peak hours were made by rail, in contrast to 17 per cent in 1999. During the same period, the modal share of car has decreased to 44 per cent from 52 per cent.⁴ The improved train service, increased road congestion and car parking costs, and structural changes in travel and employment markets have increased rail's modal share of a growing transport market, particularly for commuting purposes.

London Marylebone is the second busiest station in the RUS area with approximately 11 million passengers using the station in 2009. Its top five origins and destinations are presented in **Table 3.3**. These locations are within an hour of London Marylebone highlighting the demand for commuting travel to London.

Key passenger flows

Within the RUS area, the main markets for rail are identified as local commuting to Birmingham and to London Marylebone, interurban and long distance travels to Birmingham and to London Marylebone. The high level of demand to these two places is illustrated in **Table 3.2** and **Table 3.3**.

Tables 3.4 and **3.5** show the top five non-London passenger flows within and outside the RUS area respectively. All of these flows either started or ended at Birmingham central stations, reflecting the key role Birmingham has in supporting the economic and employment growth in the West Midlands region. Moreover, all top five external flows (non-London) from the RUS area are between Birmingham and East Midlands and between Birmingham and Manchester conurbation area, reflecting the size and significance of these major conurbations, with the transport links between them being of regional economic importance.

³ The number of rail journeys made in 2009 includes the estimated journeys made on Centro ticket. The 75 per cent increase reflects a like-for-like comparison between 1998 and 2009 whereas both periods do not include rail journeys on Centro tickets.

⁴ Data is sourced from the Birmingham Cordon Reports by Centro.

3. Current demand, capacity and delivery

Table 3.1 – 10 busiest stations in the RUS area

Stations	Rail passengers (0,000s) in 2009/10
Birmingham New Street	26,460
London Marylebone	10,910
Coventry	4,810
Wolverhampton	4,280
Birmingham International	4,230
Birmingham Snow Hill	4,205
Birmingham Moor Street	3,411
Worcester stations	2,340
High Wycombe	2,150
University	2,060

Source: Data extracted from MOIRA OR25 (Midlands version). Includes estimates of rail journeys made on Centro tickets and excludes interchange. Note: Worcester stations include Worcester Foregate Street and Worcester Shrub Hill.

Table 3.2 – Top 10 passenger flows to or from Birmingham New Street

Stations	Passenger journeys (0,000s) in 2009/10
London Euston	2,315
Coventry	1,710
Wolverhampton	1,675
Birmingham International	1,535
Selly Oak	1,015
University	893
Walsall	494
Sutton Coldfield	440
Leicester	438
Bournville	425

Source: Data extracted from MOIRA OR25 (Midlands version). Includes estimates of rail journeys made on Centro tickets and excludes interchange.

3.5.2 Train loadings

Birmingham

The rapid growth in the local commuter, interurban and long distance markets has significantly increased the number of rail passengers travelling to and from Birmingham during peak periods. As a result several services are currently operating at or beyond the seating capacity of the rolling stock, and in some cases passenger loads exceed the nominal train capacity. Train capacity includes both standard class seats and the standing allowance, which is in accordance with Department of Transport's (DfT) allowance⁵.

Tables 3.6 and 3.7 show the total number of passengers carried as a proportion of the number of standard class seats provided and as a proportion of nominal train capacity, for each corridor, in the high-peak hour (08:00 to 08:59) and in the three-hour peak (07:00 to 09:59). The number of services with passengers standing and in excess of capacity are also presented in the tables. Services are considered as in excess of capacity when passenger loads

exceed the nominal train capacity or when there are passengers standing for more than 20 minutes. This is consistent with DfT's policy. The loading numbers are based on passenger counts conducted by train operating companies in 2009/10 for services that arrive at Birmingham central stations in the three-hour peak.

The build up of demand on the local commuter services against the seating and train capacity in the high-peak hour, for each corridor, is presented in Figures 3.9, 3.10 and 3.11. It should be noted that on the busiest trains, the seat and train capacity utilisation are much higher than the average figure and standing tends to start earlier than illustrated. For example, when the average load factor (compared to seats) in any hour exceeds 70 per cent, this generally indicates that there are individual services with passengers standing. When the average load factor exceeds 90 per cent, it normally implies that on the busiest services there are more passengers than nominal train capacity (including standing allowance).

⁵ In general, standing allowance is estimated at 0.45 square metres per passenger, in accordance with the DfT High Level Output Specification for Control Period 4. For a typical commuter rolling stock, its standing allowance is 40 per cent of standard class seats although this can vary significantly by rolling stock type. The standing allowance of typical interurban and long distance train is around 20 per cent.

Table 3.3 – Top five passenger flows to or from London Marylebone

Station	Passenger journeys (0,000s in 2009/10)
High Wycombe	1,459
Beaconsfield	1,045
Gerrards Cross	910
Amersham	889
Bicester North	836

Source: Data extracted from MOIRA OR25 (Midlands version). Includes estimates of rail journeys made on London travelcards.

Table 3.4 – Top five non-London passenger flows within the RUS area

Station	Passenger journeys (0,000s) in 2009/10
Coventry – Birmingham	1,710
Wolverhampton – Birmingham	1,675
Birmingham International – Birmingham	1,535
Selly Oak – Birmingham	1,015
University – Birmingham	893

Source: Data extracted from MOIRA OR25 (Midlands version). Includes estimates of rail journeys made on Centro tickets. Birmingham includes Birmingham New Street, Moor Street and Snow Hill stations.

Table 3.5 – Top five non-London external passenger flows to/from the RUS area

Station	Passenger journeys (0,000s) in 2009/10
Leicester – Birmingham	438
Derby – Birmingham	336
Manchester – Birmingham	330
Nottingham – Birmingham	289
Stoke on Trent – Birmingham	242

Source: Data extracted from MOIRA OR25 (Midlands version). Includes estimates of rail journeys made on Centro tickets. Birmingham includes Birmingham New Street, Moor Street and Snow Hill.

Table 3.6 – High-peak hour (08:00 to 08:59) load factors on arrival at central Birmingham station, average weekday in 2009/10

Corridor	Passenger market	Load factor: The number of passengers compared to seats	Load factor: The number of passengers compared to train capacity	Number of services	Number of services with passengers standing	Number of services in excess of capacity
Coventry	Local commuting	108 %	75 %	4	3	1
	Interurban and long distance	58 %	49 %	5	0	0
Cross City North	Local commuting	85 %	69 %	6	2	0
Cross City South	Local commuting	85 %	69 %	6	2	0
	Interurban and long distance	72 %	47 %	6	0	0
Cannock and Walsall	Local commuting	76 %	47 %	4	1	0
Derby and Nuneaton	Interurban and long distance	71 %	58 %	7	3	1
Leamington Spa & Chiltern	Local commuting	101 %	77 %	4	2	0
	Interurban and long distance	101 %	70 %	3	1	0
Shrewsbury	Interurban and long distance	93 %	59 %	3	1	0
Stafford & Wolverhampton	Local commuting	83 %	63 %	3	1	0
	Interurban and long distance	80 %	59 %	6	1	0
Stourbridge	Local commuting	109 %	77 %	7	4	1
Stratford-upon-Avon	Local commuting	96 %	74 %	4	3	0

Source: 2009/10 passenger counts conducted by Arriva Trains Wales, Chiltern Railway, CrossCountry, London Midland and Virgin Trains.
Note: Train capacity includes both standard class seats and standing allowance. Services are in excess of capacity when passenger loads exceed the nominal train capacity or when there are passengers standing for more than 20 minutes. This is consistent with DfT policy.

3. Current demand, capacity and delivery

Table 3.7 – Morning three-hour peak (07:00 to 09:59) load factors on arrival at central Birmingham station, average weekday in 2009/10

Corridor	Passenger market	Load factor: The number of passengers compared to seats	Load factor: The number of passengers compared to train capacity	Number of services	Number of services with passengers standing	Number of services in excess of capacity
Coventry	Local commuting	71 %	50 %	13	4	1
	Interurban and long distance	52 %	44 %	14	2	1
Cross City North	Local commuting	64 %	52 %	18	3	0
Cross City South	Local commuting	66 %	54 %	18	2	0
	Interurban and long distance	66 %	43 %	13	1	0
Cannock and Walsall	Local commuting	56 %	36 %	11	1	0
Derby & Nuneaton	Interurban and long distance	61 %	50 %	18	4	1
Leamington Spa & Chiltern	Local commuting	82 %	63 %	10	3	0
	Interurban and long distance	71 %	47 %	6	1	0
Shrewsbury	Interurban and long distance	57 %	37 %	8	1	0
Stafford & Wolverhampton	Local commuting	65 %	51 %	6	1	0
	Interurban and long distance	69 %	50 %	14	1	0
Stourbridge	Local commuting	79 %	56 %	17	6	1
Stratford-upon-Avon	Local commuting	70 %	53 %	10	3	0

Source: 2009 passenger counts conducted by Arriva Trains Wales, Chiltern Railways, CrossCountry, London Midland and Virgin Trains.

Note: Train capacity includes both standard class seats and standing spaces. Services are in excess of capacity when passenger loads exceed the nominal train capacity or when there are passengers standing for more than 20 minutes. This is consistent with DfT policy.

All corridors into Birmingham have some passengers standing in the morning three-hour peak, particularly on the local commuter trains, although standing on most services is for less than 20 minutes and passenger loads are generally below the nominal train capacity (including standing allowance). However on the busiest local commuter services to Birmingham, some passengers stand from as far as Coventry and Stourbridge, which are more than 20 minutes from central Birmingham. It should be noted that the commuter services on some corridors, such as Coventry, use high capacity rolling stock that offers more standing room (such as Class 350 rolling stock) allowing more passengers to be accommodated.

Some of the long distance services to Birmingham are heavily loaded in the peak when they are also used by commuters. In the morning peak hour, there are passengers standing on the long distance services on the Coventry, Stafford and Wolverhampton, and Derby and Nuneaton corridors. The Wolverhampton and Stafford corridor is one of the busiest corridors in the RUS area with

train services connecting key urban centres in the Birmingham, Manchester and Liverpool conurbation areas. On this corridor, some passengers stand from Wolverhampton to Birmingham in the peak. On the Coventry corridor, currently there is one long distance morning peak service with more passengers than the nominal train capacity highlighting the high level of demand for commuting, business and leisure travel including demand to or from Birmingham International Airport and the National Exhibition Centre. On the Derby and Nuneaton corridor, several interurban and long distance services that call at local stations such as Tamworth and Water Orton have passengers standing in the peak hour with one service operating above the nominal train capacity. High levels of seat and capacity utilisation are also observed in the inter-peak and on weekends. Providing sufficient capacity on the interurban and long distance services to meet demand for commuting, business and leisure markets is an issue the RUS needs to address, and this is discussed further in **Chapter 6**.

Figure 3.9 – Passenger loadings and capacity for local community services into Birmingham stations by corridor in the morning high-peak hour in 2009

- Train capacity (seating and standing capacity)
- Seats
- Passenger loadings 2009



3. Current demand, capacity and delivery

Figure 3.10 – Passenger loadings and capacity for local community services into Birmingham stations by corridor in the morning high-peak hour in 2009

- Train capacity (seating and standing capacity)
- Seats
- Passenger loadings 2009

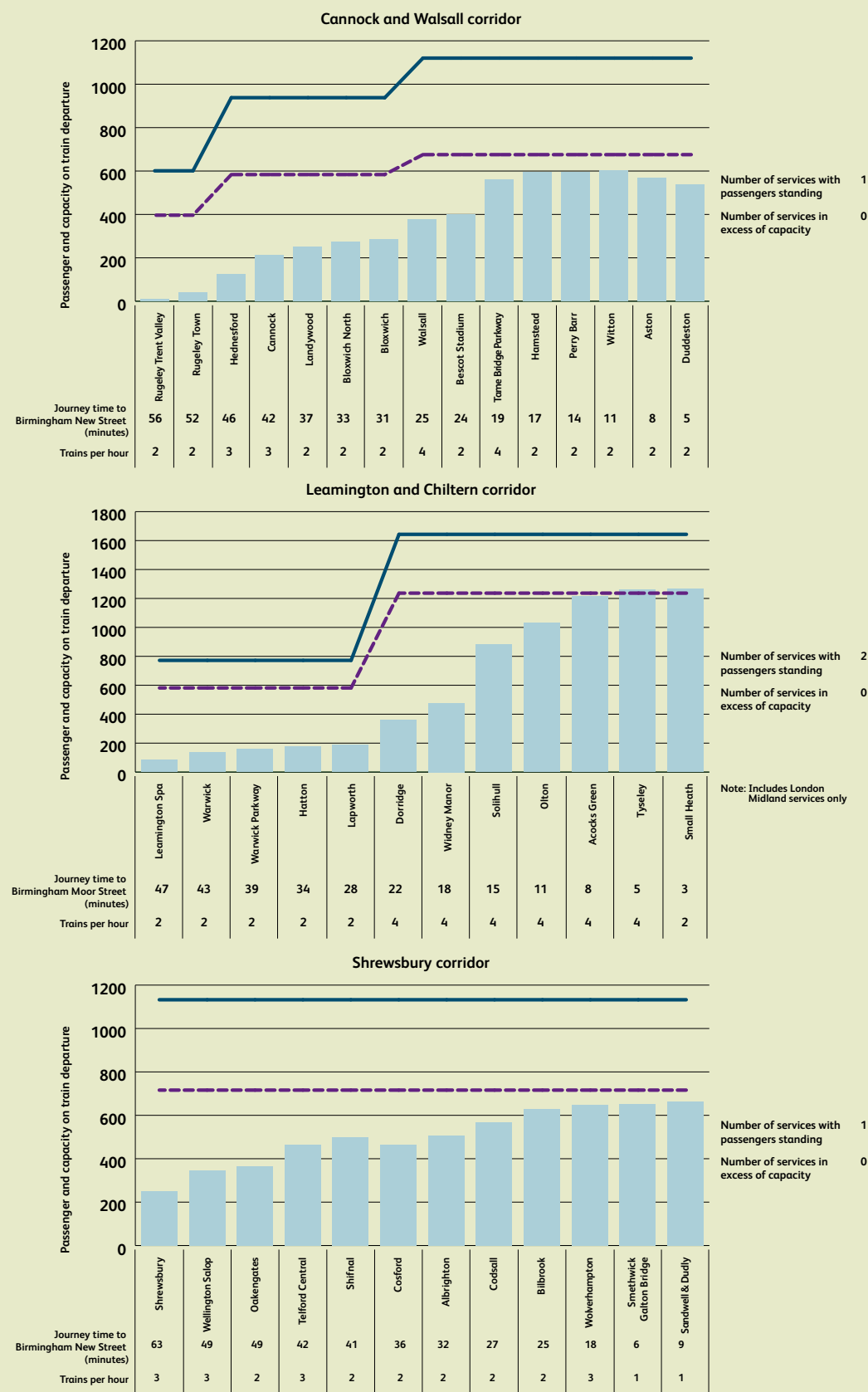
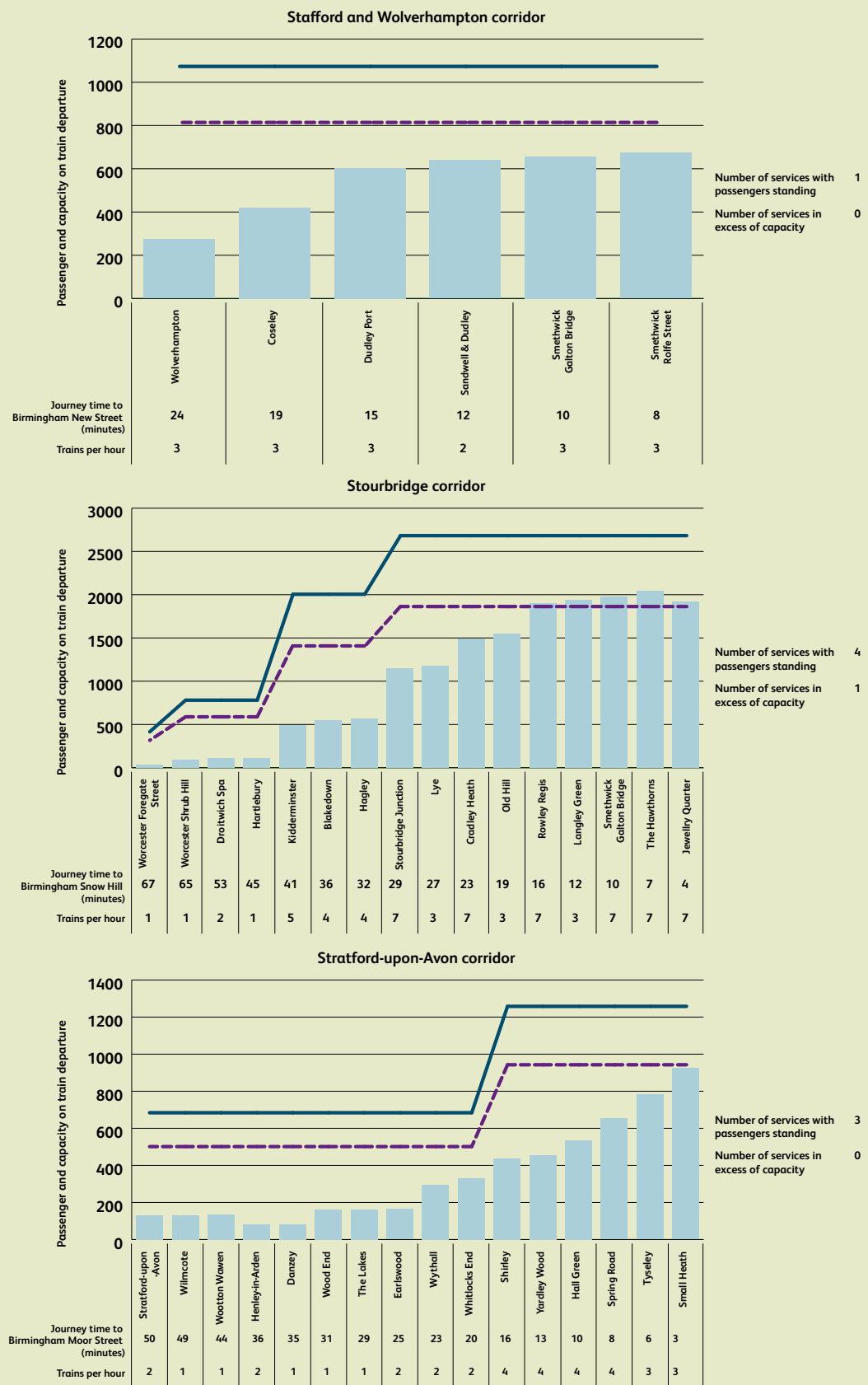


Figure 3.11 – Passenger loadings and capacity for local community services into Birmingham stations by corridor in the morning high-peak hour in 2009

- Train capacity (seating and standing capacity)
- Seats
- Passenger loadings 2009



3. Current demand, capacity and delivery

London Marylebone

The level of rail demand to London Marylebone station varies considerably by time of day and day of the week, with demand at its highest in the morning three-hour peak on a weekday. The proportion of passengers carried as a proportion of seats and nominal train capacity (including standing capacity) in the morning high-peak and three-hour peak, by service groups⁶, are illustrated in **Tables 3.8** and **3.9** respectively, along with the number of

services with passenger standing. They show that the average load factor, relative to nominal train capacity, over the three-hour peak is 81 per cent when all services are included, increasing to 90 per cent in the high peak hour. Aylesbury services via Amersham have the highest utilisation both in terms of seating and train capacity with all three services in the high-peak hour having passengers standing and two of these are in excess of train capacity.

Table 3.8 – Morning high-peak hour (08:00 to 08:59) load factors on arrival at London Marylebone, average weekday in 2009/10

Corridor and service group	Load factor: The number of passengers compared to seats	Load factor: The number of passengers compared to train capacity	Number of services	Number of services with passengers standing	Number of services in excess of capacity
Aylesbury (via Amersham)	113 %	102 %	3	3	2
Leamington Spa and Chiltern: suburban	100 %	79 %	5	2	0
Leamington Spa and Chiltern: long distance	98 %	91 %	7	2	2
Total	102 %	90 %	15	7	4

Table 3.9 – Morning three-hour peak (07:00 to 09:59) load factors on arrival at London Marylebone, average weekday in 2009/10

Corridor and service group	Load factor: The number of passengers compared to seats	Load factor: The number of passengers compared to train capacity	Number of services	Number of services with passengers standing	Number of services in excess of capacity
Aylesbury (via Amersham)	108 %	91 %	10	7	2
Leamington Spa and Chiltern: suburban	91 %	69 %	15	5	2
Leamington Spa and Chiltern: long distance	92 %	86 %	14	5	4
Total	96 %	81 %	39	17	8

Source: Passenger count conducted in Spring 2010 by Chiltern Railways.

Note: These counts do not include passengers on the London Underground Limited Metropolitan lines. Train capacity includes both standard class seats and standing allowance. Services are in excess of capacity when passenger loads exceed the nominal train capacity or when there are passengers standing for more than 20 minutes. This is consistent with DfT policy. For the Aylesbury via Amersham service group, Rickmansworth and stations north of it are more than twenty minutes from London Marylebone. For the suburban service group, in general Northolt Park and stations north of it are 20 minutes from London Marylebone and for the long distance service group, it tends to be Denham and stations north of it. The 20-minute boundary varies by service groups due to different calling patterns.

⁶ On the Leamington and Chiltern corridor, generally services starting from High Wycombe and south of it are grouped to form the suburban services with the remainder being grouped in long distance.

Metropolitan line: Amersham to central London

The Metropolitan line services, relevant to the scope of this RUS, operate between Amersham and Baker Street with some continuing to Liverpool Street in the City of London and beyond, along with the train services operated by Chiltern Railways from Aylesbury to London Marylebone. Chiltern services offer faster journey times than Metropolitan services as fewer stops are made, although Metropolitan services give direct access to Liverpool Street in central London, one of the main employment locations in the City. The infrastructure between Amersham and Harrow-on-the-Hill is owned by London Underground Limited and shared by them and Chiltern Railways.

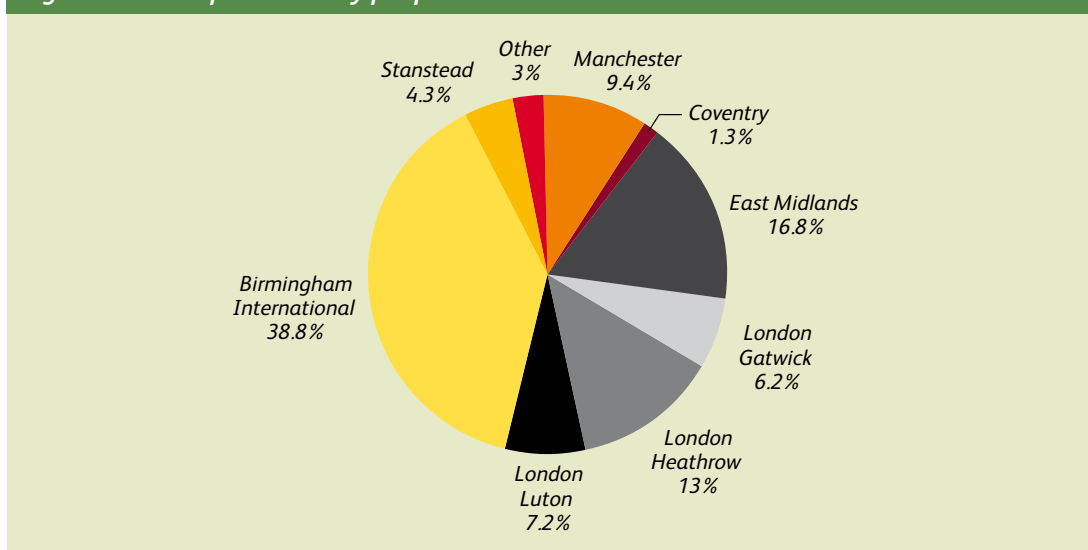
Around 800 passengers use the Metropolitan line at Amersham in each morning three-hour peak (07:00 to 09:59) on a typical weekday. Patronage on the Amersham to central London services increases along the route when it approaches central London. In 2009, overall there was sufficient train capacity, including seats and standing space, on the Amersham to central London Metropolitan line services to meet demand between Amersham and Baker Street. In the morning three-hour peak, average load factor compared to train capacity, of the Amersham services, is less than 50 per cent increasing to 60 per cent after Baker Street. This is an average figure and can mask the busiest trains. In the high-peak hour, the busiest services operate close to train capacity (including standing spaces). The interior of LUL's Metropolitan line trains are designed to accommodate a higher volume of passengers and offer more standing space than the rolling stock used on the national rail services. As part of the wider sub-surface line upgrade, LUL plans to increase capacity on the Metropolitan line through increased service frequency and the introduction of higher capacity rolling stock (known as S-stock). This would help to meet increasing demand.

3.5.3 Birmingham International Airport

In 2009, Birmingham International Airport was the second busiest airport in the UK outside London. In 2009, the airport handled approximately 9.1 million passengers and the volume of air passengers at Birmingham International Airport is forecast to grow to 27 million passengers per year by 2030⁷. The airport is located in the Metropolitan Borough of Solihull, adjacent to the National Exhibition Centre and eight miles south east of Birmingham's city centre. It has a catchment area of approximately nine million living within a 60-minute car journey of the airport. **Figure 3.12** shows where air passengers in the Midlands flew from in 2008 and its proportion. In 2008, it is estimated that about 30 per cent of air passengers in the Midlands flew from Birmingham International Airport and about 30 per cent flew from London airports.

Birmingham International Airport has good public transport links and is connected by bus, coach and rail. The airport terminal can be accessed from Birmingham International station via the Air-Rail Link, which is a shuttle service that connects the rail station with the airport passenger terminals. In 2009, approximately 27 per cent of air passengers travelled to the airport by public transport (where public transport is defined as non-car and non-taxi) and rail accounting for 15 per cent of all journeys. Analysis of passenger survey conducted at the airport in 2008 indicated that routes with direct rail services to the airport (such as Shrewsbury and Stafford and Wolverhampton) tend to have more than 20 per cent of air passengers travelling to the airport using rail, highlighting that good rail linkage helps to stimulate rail's modal share. The new Airport Surface Access Strategy published in 2007 has set a Passenger Public Transport Mode Share target for the airport of 25 per cent by 2012 with a mode share target of 12 per cent of all journeys.

Figure 3.12 – Airports used by people in the Midlands in 2008



Source: Facts and Statistics, 2009 by Birmingham International Airport

⁷ Source: Airport Master Plan published by Birmingham International Airport. Forecast is unconstrained and assume provision of the Runway Extension by 2012

3. Current demand, capacity and delivery

In 2008, there were approximately 7,000 people employed at the airport. Approximately 24 per cent of staff employed at the airport travelled to work by public transport (defined as non-car and non-taxi), but with rail accounting for approximately five per cent only, partly due to a large proportion of staff starting shifts in the early morning when rail services are not available or not as frequent. The new Airport Surface Access Strategy has set an Employee Public Transport Mode Share target for the airport of 25 per cent by 2012 with a rail mode share target of six per cent.

3.6 Freight operating companies

There are currently five freight operators on the route which are listed below. It should be noted that as the freight market is an open market there is always the potential for new operators to enter the market.

3.6.1 DB Schenker

DB Schenker is a logistics company, which is a wholly owned subsidiary of Deutsche Bahn AG. The company comprises a wide range of markets including encompassing air, land and sea freight, and a rail division made up from a variety of European rail freight companies. DB Schenker is the largest freight operator in the UK and also has a licence to operate European services.

3.6.2 Freightliner Group

Freightliner Group has two divisions: Freightliner Limited and Freightliner Heavy Haul. Freightliner Limited is the largest rail haulier of containerised traffic in Great Britain, predominantly for the deep sea market. Freightliner Heavy Haul is a significant conveyor of bulk goods, predominantly coal, construction materials and waste. It also operates infrastructure services.

3.6.3 GB Railfreight

GB Rail Freight, which was purchased by Eurotunnel in 2010, is the third largest British rail freight operator. Railfreight is a significant operator of deep sea container trains and rail infrastructure services. They also run a number of services for bulk market customers including coal and gypsum.

3.6.4 Direct Rail Services Limited

Direct Rail Services operates traffic for the power industry in Great Britain. In the last few years the company has expanded into running services for the domestic intermodal and short sea intermodal markets. Key traffic flows for domestic container products are to Daventry, Grangemouth, Aberdeen and the North West.

3.6.5 Colas Rail

Colas Rail provides rail freight haulage for all market sectors throughout the United Kingdom and Europe.

3.7 Current freight market profile

3.7.1 Overview

Rail freight plays a vital role in Britain's economy. In recent years rail's freight market share has consistently grown and now accounts for an 11 per cent share of all surface freight transport in the UK. The Government has openly welcomed and encouraged this growth in light of significant economic and environmental factors.

There is a significant level of freight traffic in the RUS area. In general freight demand in the West Midlands area and across the route remains steady. Due to its population, the West Midlands Regional Freight Strategy (2007) emphasises the role of the region as a major market for buying and selling goods and services and the importance of sustainable freight for its economic prosperity and quality of life. In addition to the large quantity of freight which is transported to and from terminals and freight yards in the West Midlands, a significant volume of freight passes through the region.

A significant focus for rail freight movements within the RUS area is between the West Midlands and the east of England, the South and the South West. These movements originate at the East Coast ports. Between 1997 and 2006 the West Midlands region has seen a 420 per cent increase in inbound trains from UK deep-sea ports and this growth is expected to continue over the long term.

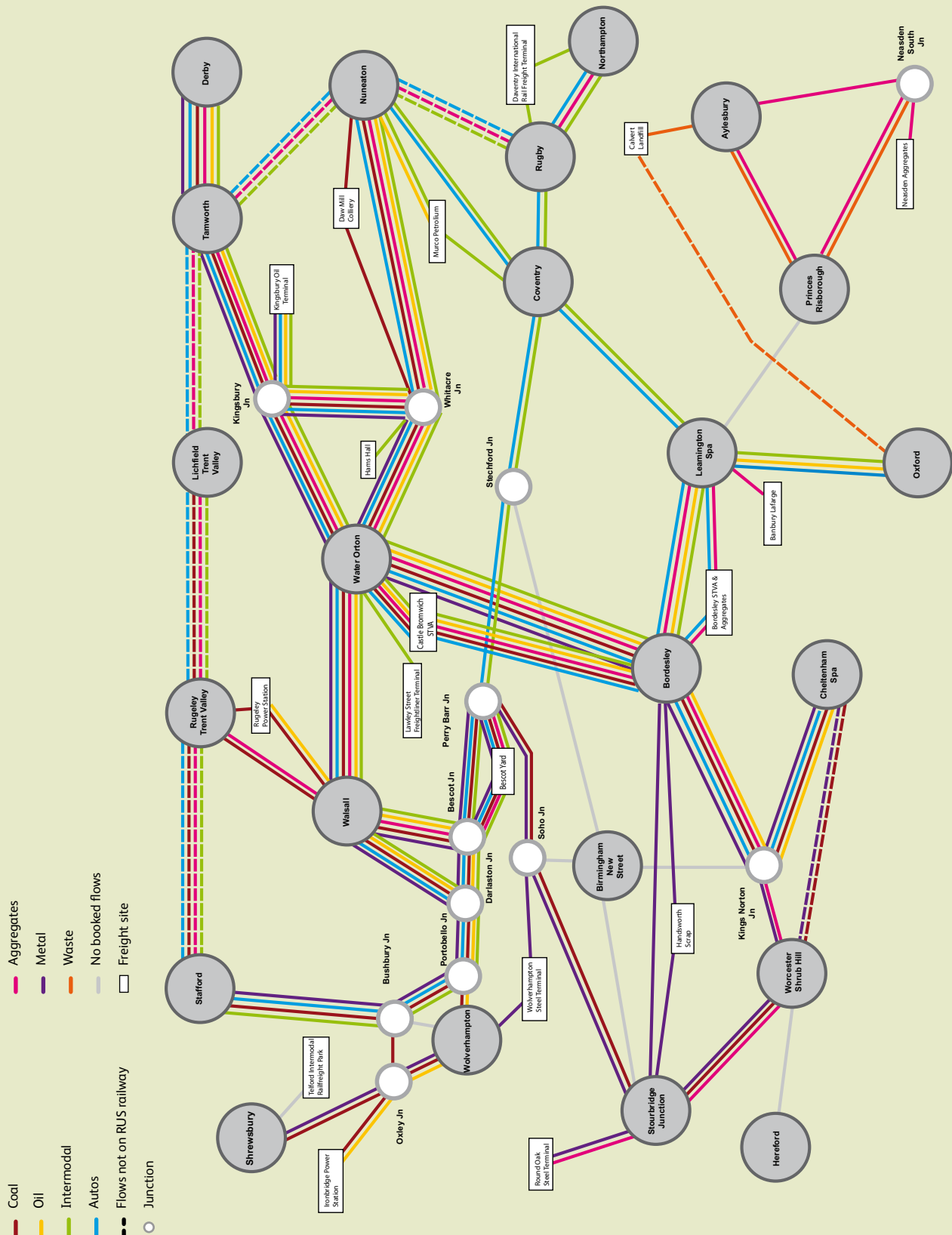
Figures 3.13, 3.14 and 3.15 illustrate the principal freight flows and the locations of freight sites within the RUS area. The key freight markets within the West Midlands and Chilterns RUS area are :

- intermodal
- coal
- metals
- petroleum
- automobiles
- aggregates.

The main freight routes are

- Nuneaton to Birmingham
- Banbury to Leamington Spa
- Coventry and Nuneaton, and onto the West Coast Main Line
- Banbury to Leamington Spa, Solihull, Tamworth and on to the North East
- the Sutton Park Line between Water Orton corridor and Walsall and Bescot
- Bromsgrove to Camp Hill to the Water Orton corridor.

Figure 3.13 – Freight commodity flows



3. Current demand, capacity and delivery

Figure 3.14 – Rail freight operators and flows

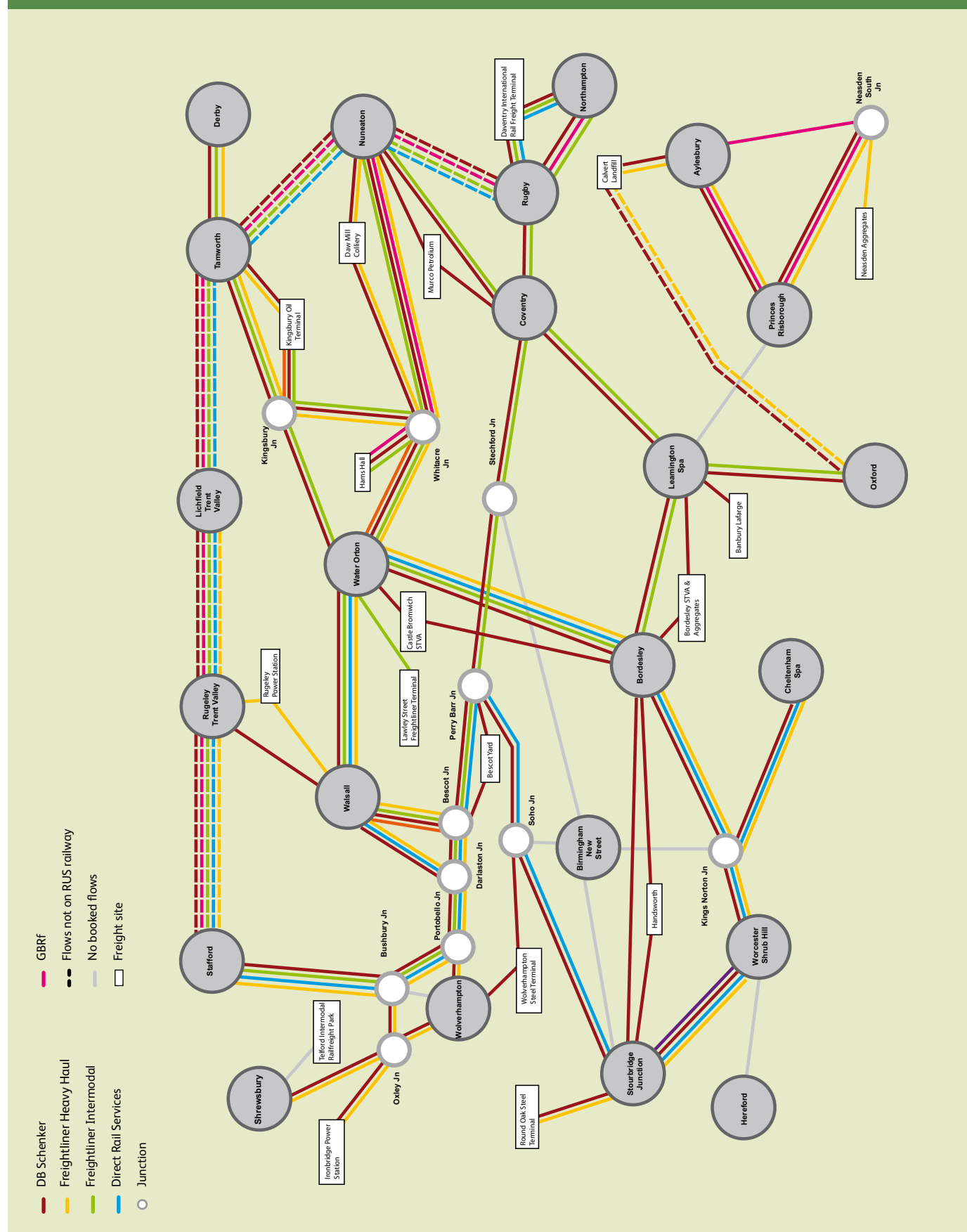
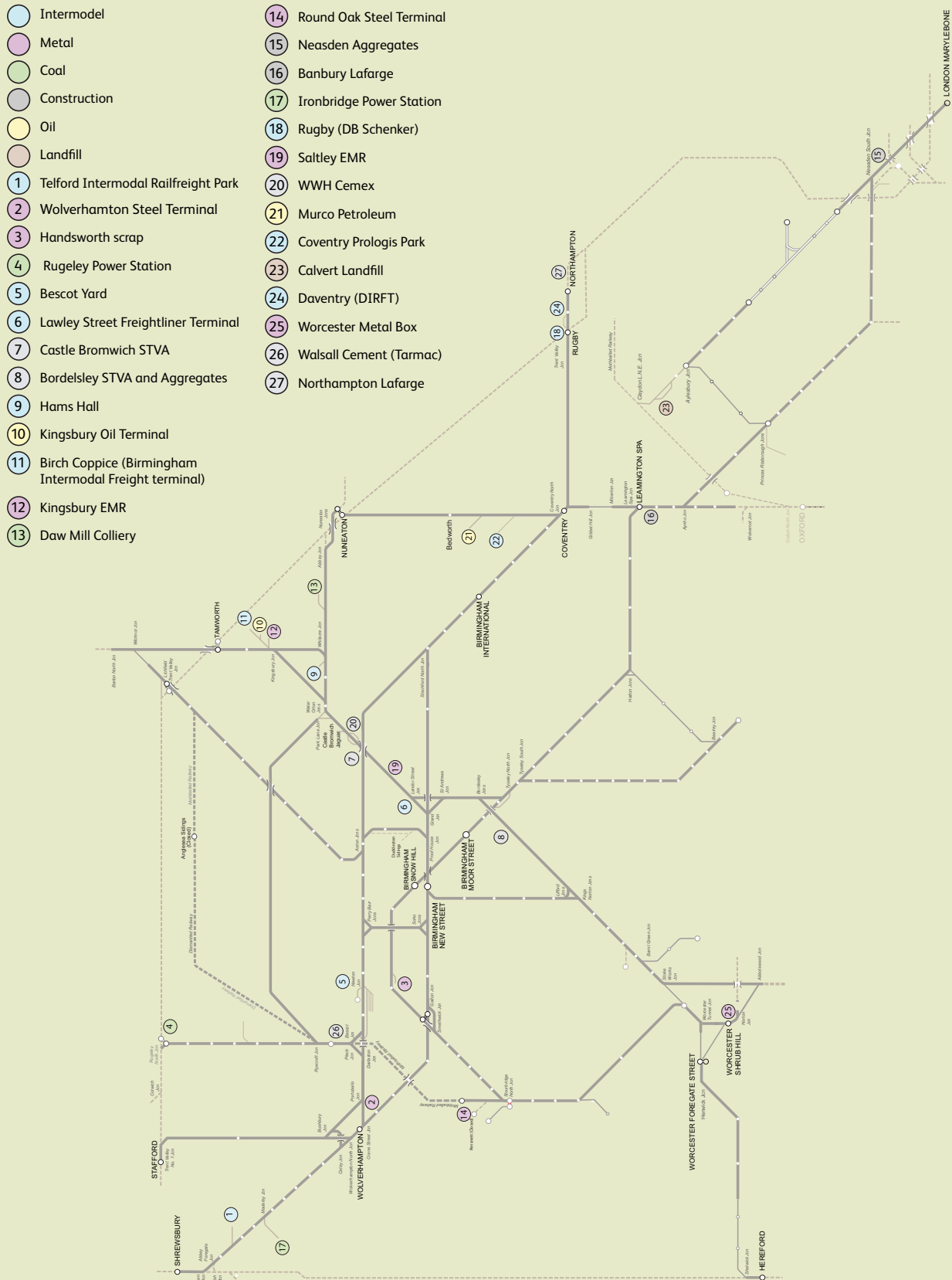


Figure 3.15 – Freight sites by commodity



3. Current demand, capacity and delivery

3.7.2 Major flows

There are significant flows of freight traffic to local terminals and marshalling yards within the West Midlands, and a substantial volume of freight traffic also traverses the route to and from locations outside the region. The main freight markets within the RUS area are described below.

Coal

Coal remains the dominant fuel used for generating electricity in the UK. Taking into account the continuing uncertainty in gas and oil prices and the time it takes to build nuclear power stations, coal is expected to remain in demand for the foreseeable future. Coal traffic in the West Midlands originates from Daw Mill Colliery while the power stations at Ironbridge and Rugeley are served by longer distance coal flows from deep sea ports and loading facilities in Scotland, Liverpool, Bristol and the east coast.

Intermodal

There is high demand for container and intermodal freight transport, and rail is increasing its modal share of this market. The West Midlands region is critical for Freightliner Limited, who generate around 200,000 container movements per year, and Lawley Street in Birmingham is a key intermodal terminal. There are third-party terminals located at

- Hams Hall
- Birch Coppice
- Daventry
- Rugby Up Sidings
- the recently opened terminal in Telford.

Traffic at these terminals comes from deep sea ports, especially the east coast ports and Southampton, and from mainland Europe via the Channel Tunnel.

There was an increase in services to Hams Hall, Daventry and Birch Coppice within the West Midlands area in 2009, and a further increase is expected to be stimulated by the loading gauge clearance schemes across and beyond the route.

Automotive

Automotive flows transport time-sensitive high value products, for which the transit forms part of the production process. Within the RUS area automotive services that provide finished products operate to/ from Hams Hall (car components), Bescot and the Jaguar car plant at Castle Bromwich.

Metals

The West Midlands remains the key UK centre for metal processing and consumption, and as a result there are significant flows of products both into and out of the region. In addition, substantial tonnages, particularly of steel, pass through the area. All these

flows also have balancing movements of empty wagons, adding considerably to the overall capacity utilisation of the network.

Large volumes of semi-finished and finished steel products from both UK manufacturing sites and from a number of Ports around the country are moved into terminals at Round Oak and Monmore Green. In addition, metals for recycling are also despatched to a range of UK destinations from terminals at Handsworth and Kingsbury.

Flows that pass through the West Midlands include large tonnages of steel from South Wales to both the North East and to Corby, and also from the North East and Lincolnshire into South Wales and the South West.

Construction/Aggregates

Aggregates services are operated to terminals at Walsall, Castle Bromwich, Bordesley and Banbury within the RUS area. Freightliner Heavy Haul Limited also operates services to Neasden, Leicestershire and other source points.

Other freight flows within the RUS area include oil and petroleum to Kingsbury Terminal near Tamworth and Murco Terminal at Bedworth, and domestic/industrial waste traffic to the landfill site at Calvert from Cricklewood, Willesden, Bristol and Northolt. Demand is determined by the operating hours at the landfill sites due to environmental restrictions imposed on site operators.

Infrastructure services

The RUS area accommodates significant engineering haulage flows from the virtual quarry at Bescot and concrete sleeper plant at Washwood Heath. These sites support Network Rail infrastructure renewal activities. Additionally, commercial freight traffic also operates from Washwood Heath plant conveying sleepers for use on the London Underground network. In addition, engineering trains operate to and from Bordesley in connection with the Birmingham New Street Gateway project.

Freight capacity and capability

The rise in freight traffic in recent years has placed further pressure on network and terminal capacity in and around the RUS area. The increase in freight flows traversing already busy rail corridors around the RUS area has driven modest network enhancements and expansion at many of the freight terminals and yards – primarily on the Birmingham to Derby and Nuneaton corridors. Some terminals also cause performance-related issues, with difficult access and egress at Kingsbury Junction. Bescot Yard (via Bescot Junction from the Walsall direction) and Monmore Green Steel Terminal are also significant in this respect. This is further compounded by the fact that there remains a limited number of

terminals within the RUS area and these are now operating close to, or at their design capacity, which are situated on busy rail corridors. Other problems and constraints on freight growth include lack of suitably gauge-cleared diversionary routes, and lack of high-speed looping facilities of sufficient length to accommodate the desired future maximum length of train of 775 metres.

Whilst it is recognised that there are a number of corridors which are reaching saturation, network capability has the potential to become a significant constraint as the demand for longer and larger freight services steadily increases. The Oxford to Leamington Spa corridor is a key freight route from Southampton to the West Midlands and beyond, which is restricted in its ability to regulate services due to inadequate looping facilities and the single line section between Leamington Spa and Coventry. Capacity on the Stour Valley line heading north between Coventry, Birmingham and Stafford is constrained especially access to and egress from Wolverhampton steel terminal. Significant capital investment to support expansion of the port of Bristol will drive growth in container traffic to the West Midlands and beyond. The increase in freight demand will require capability improvements in and around the Worcester area, primarily in signalling and junction configurations.

The Birmingham to Derby and Nuneaton corridors act as central arteries for the movement of freight in and around the West Midlands area. This is due to the number of hub-based freight terminals strategically located along the two routes, most of which benefit from main-line access and are in close proximity to major trunk roads and the main motorway network. Freight flows that serve these terminals can affect overall capacity on these sections. This is particularly true of the Kingsbury and Salfley areas.

3.8 Network capacity and utilisation

3.8.1 Capacity utilisation

There is a diverse mix of traffic operating throughout the RUS area, and most of it has to navigate through critical junctions at key locations. Therefore, the effective use of this capacity is a vital consideration for this strategy.

The RUS has measured capacity using the Capacity Utilisation Index (CUI) which is one way of demonstrating how much capacity is utilised by the current timetable and how congested a line is. This is helpful in understanding the scope for additional services, spare capacity and how this may have a negative impact on performance.

The method was developed by the former Strategic Rail Authority in order to provide a useful indication

of remaining plain line capacity. The method is less effective when measuring capacity constraints at junctions and termini.

There is a high level of planned capacity utilisation on most radial routes into central Birmingham and on the lines into London Marylebone, partly due to the high service density and the mix of traffic types. **Figures 3.16 and 3.17** show the CUI for the RUS area. In general, where CUI is greater than 75 per cent accommodating growth becomes challenging and may have a negative impact on performance as the resilience of the timetable decreases.

During the busiest morning period between 06:00 and 09:00 high CUI is experienced on most of the corridors into central Birmingham. Track capacity utilisation is at 100 per cent between Kings Norton and Birmingham New Street at this time, and it is greater than 80 per cent between Birmingham New Street and Wolverhampton, Walsall and Hednesford, Water Orton and Tamworth, Stechford and Coventry and Henley-in-Arden and Wilnecote. This suggests that there is very limited scope for additional train paths within the timetable plan.

3.8.2 Capacity constraints

Capacity constraints exist at a number of locations within the RUS area. These may restrict the ability to operate more trains, and can exacerbate delays during times of perturbation. The following are significant issues to note on the RUS corridors:

- two track section between Birmingham New Street and Kings Norton, due to the dense mix of traffic, station calling patterns and junction layout at Kings Norton
- only two out of the four lines between Kings Norton and Longbridge are electrified, limiting operational flexibility
- steep gradient of the Lickey Incline, between Bromsgrove and Barnt Green impacts on capacity utilisation (particularly freight traffic)
- access arrangements at Kingsbury terminal for services from the North East
- short section of three aspect signalling between Wichnor Junction and Water Orton West Junction (within a prevailing section of four aspect at signalling)
- single line section between Coventry (Gibbet Hill) and Leamington Spa (Milverton Junction)
- mix of planning headways between Worcester and Birmingham Snow Hill
- signalling interface and operating arrangements between London Underground and national rail services.

3. Current demand, capacity and delivery

Figure 3.16 – Capacity utilisation index, 08:00 – 09:00 hours

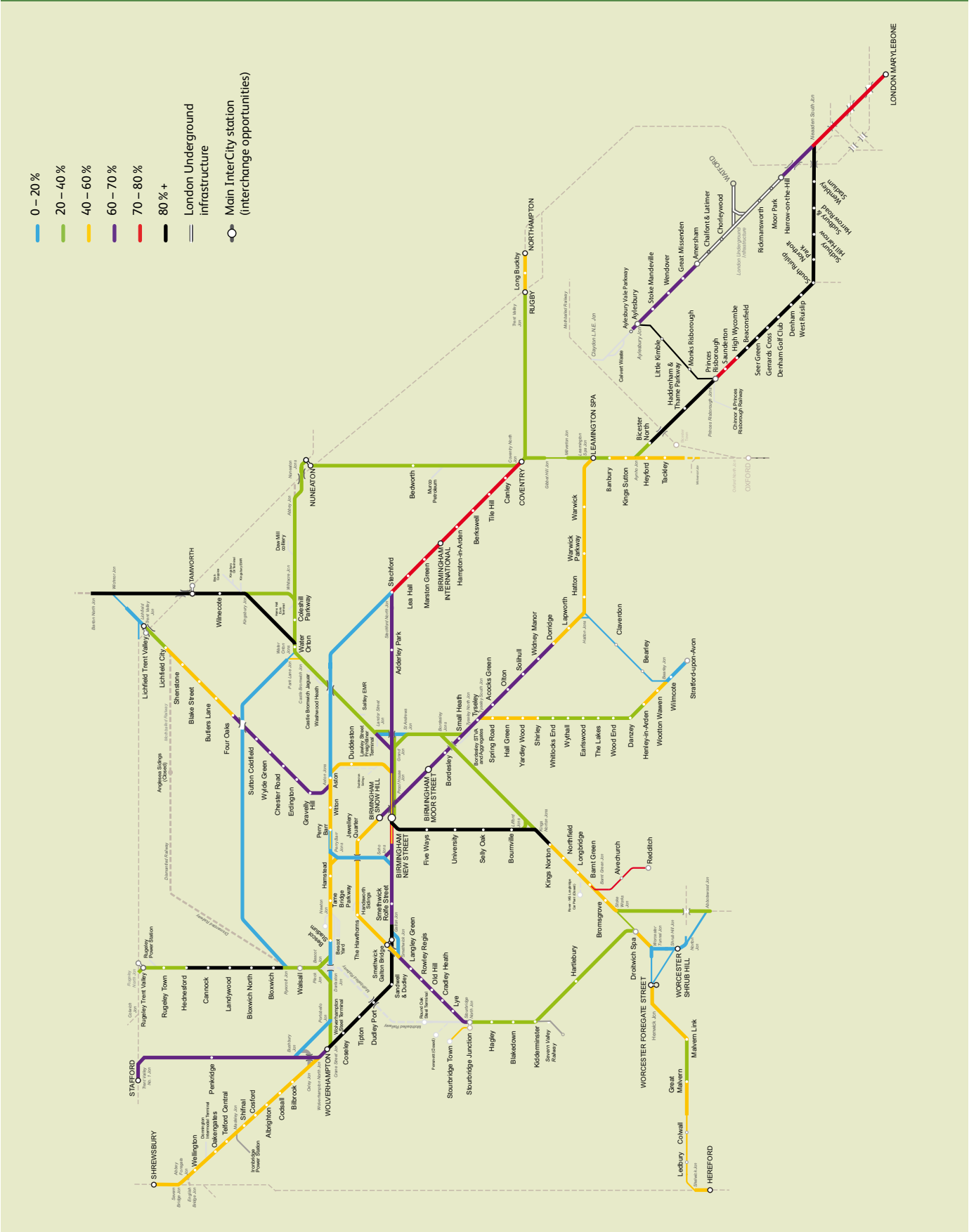
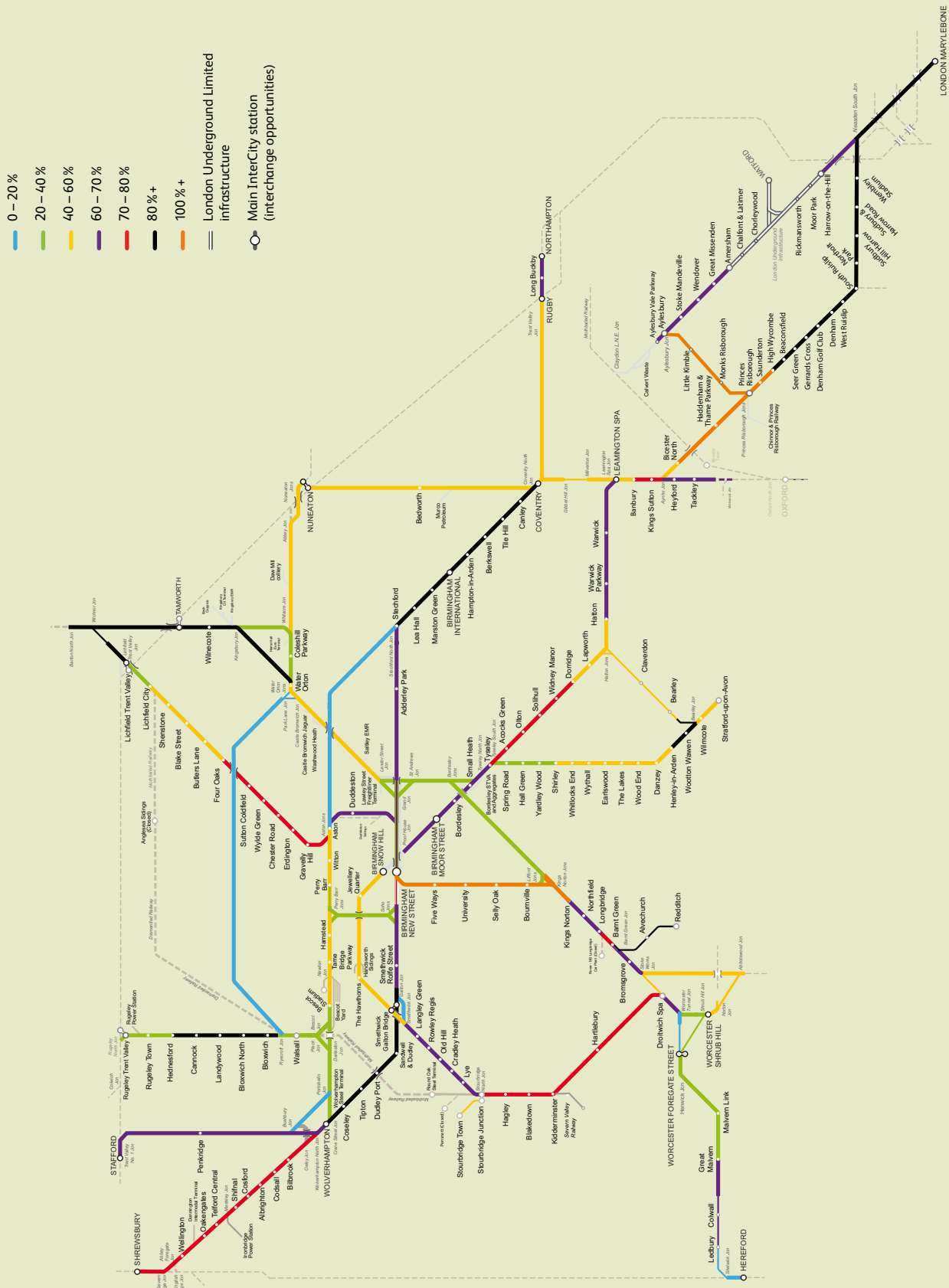


Figure 3.17 – Capacity utilisation index, 06:00 – 09:00 hours



3. Current demand, capacity and delivery

3.9 Rail network

The infrastructure characteristics in the scope area of the West Midlands and Chilterns RUS vary depending on the location, historical service demands and recent developments. This has resulted in different levels of route capability. The principal infrastructure characteristics that have been analysed to establish the current route capability and capacity are:

- planning headways
- linespeeds
- junction speeds
- electrification
- loop lengths
- platform lengths
- loading gauge
- route availability.

The current baseline for each of these sections assumes that the committed projects that are outlined in **Chapter 4** will have been successfully completed.

3.9.1 Planning headways

Planning headways specify how closely one train can be timetabled to follow another on a given route. **Figure 3.18** illustrates the planning headways in the RUS area. Within the RUS area, headways vary from three minutes along core sections in the West Midlands area and, on the Leamington Spa and Chiltern line, to 9 -12 minutes on parts of the Aylesbury line. While the majority of the RUS area has a double track configuration, there are several single line sections which have headways as high as 18 minutes. Single lines restrict the number of services that can run on the route and are generally a performance risk. Principal amongst these in the RUS area are the lines between Princes Risborough and Aylesbury, Barnt Green and Redditch, Gibbet Hill and Milverton junctions on the Leamington Spa and Nuneaton line, and between Stoke Works Junction on the Cross City line and Droitwich Spa. There are also several single line sections on the route between Worcester and Hereford which restrict service frequency and operational flexibility.

At present some of the corridors within the West Midlands area are controlled by older signalling technology which typically requires longer headways, limiting opportunities for additional train paths during peak times. This is especially true on the periphery of a number of the routes, notably in the Worcester area, where there are a number of older type mechanical signal boxes. The mechanical signalling south of Kidderminster restricts capacity, particularly during peak times, making it difficult to enhance the service frequency from Worcester to Birmingham proves difficult

and imports a performance risk to the Bromsgrove and Stourbridge routes. This is because of the tight headways over the shared Droitwich – Worcester section.

The major signalling renewal plans for the radial routes leading into Birmingham will help to address the issue of inadequate headways. Where resignalling schemes are considered to be committed at the time of issue, the proposed enhanced network has been incorporated into the base infrastructure. This is reflected in **Figure 3.18** which shows the planning headways across the RUS area.

3.9.2 Linespeeds

Linespeeds vary greatly across the RUS area, from the high speed sections of 100-125mph to the lower speed sections of 45mph or below. **Figure 3.19** illustrates the differing linespeeds across the RUS area. They have a direct impact on service capacity and achievable journey times. The established linespeeds are generally appropriate to the nature of the service type being operated. Where lower linespeeds exist, these are generally attributable to track condition and signalling constraints. This can cause inefficiency 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 frequently as local services. A proportion of the area has linespeeds that are lower than the predominant rolling stock capability, which is generally 100mph.

There are several committed schemes which will improve the linespeed at various locations within the RUS area which have been included in the baseline analysis. These include the enhancements on the Wolverhampton and Shrewsbury line, the Cannock line, and those being delivered as part of the Evergreen 3 project. This stage of the project involves a suite of enhancements which will improve the journey times between London Marylebone and Birmingham Moor Street. Linespeed improvement works will focus on the area between West Ruislip and Aynho Junction, and will increase the extent of 100mph running on the Chiltern route. The programme of resignalling within the West Midlands has also evaluated potential future linespeed enhancements and, where it is considered appropriate, signals have been sighted and spaced to accommodate these proposals in the scheme plans.

3.9.3 Key junction speeds

Junction turnout speeds in the RUS area are generally 30mph or below, with the majority being 20mph. Some of the lower junction speeds are as a direct result of track geometry. Deceleration from linespeed and subsequent acceleration back to linespeed after traversing a junction creates a penalty in time and capacity. Equally the arrangements for signal approach control often impacts on journey time and decreases capacity.

3.9.4 Electrification

Figure 3.20 shows the extent of electrification within the RUS area. The following routes within the West Midlands are electrified using AC 25000v overhead line:

- Rugby to Stafford – Birmingham New Street
- Grand Junction lines via Aston and Bescot and including Walsall (fast lines only)
- Cross City North as far as Lichfield Trent Valley high-level
- Cross City South (slow lines only – between Kings Norton and Longbridge).

The electrified infrastructure in the RUS area is utilised by Virgin Trains, London Midland and the freight operators. The Chiltern Mainline is not electrified.

The Metropolitan line between Amersham and Harrow-on-the-Hill is electrified using 650v dc fourth rail.

The extent of electrification within the RUS area is planned to be extended through Network Rail's commitment in the Control Period 4 Delivery Plan to extend electrification from Barnt Green to Bromsgrove to facilitate the extension of Cross City services.

3.9.5 Loop length and capability

A diverse mix of passenger and freight traffic operates within the RUS area, with differing speeds, formations and market types. Accommodating this traffic is particularly challenging due to the fact that the majority of the RUS area is double track in formation and there is a limited availability of suitable locations to regulate services (allow faster trains to overtake slower ones).

There are several loops located across the RUS area but most of these are located in less than ideal locations and are unable to accommodate intermodal services for which the desired maximum length is 775 metres. This is further compounded by the inadequate entry and exit speeds and the associated approach control signalling restrictions. It is recognised that the optimal method to regulate services in most cases is by an additional stretch of line that is not necessarily adjacent to, but is sufficiently long to avoid the service being regulated being brought to a standstill. However, where this is not possible, the maximum capability of the loop needs to be exploited.

3.9.6 Platform lengths

The lengths of platforms also vary along a line of route. **Figure 3.21** shows the platform lengths at

stations within the RUS area and indicates the number of vehicles which can be accommodated at each station. The majority of platforms across the RUS area can accommodate six-car train lengths. There are, however, a significant number of stations within the West Midlands, particularly on the Cannock line, which cannot accommodate four-car lengths. It should also be noted that where the platform lengths vary along a line of route, train length and passenger capacity is constrained by the shortest platforms. Where practical, selective door opening or a process of 'skip-stopping' has to be deployed to resolve this issue. However, this may not optimise the timetable or station dwell times.

Platform widths as well as lengths can present issues at some stations. At Birmingham Moor Street and University, for example, the narrow platforms are a problem during times of high passenger demand, and this has been compounded by the continued increase in peak passenger numbers.

3.9.7 Loading gauge

The loading gauge relates to the height and width of traffic and defines the size of vehicles and wagons which can be carried on a specific route. The gauge within the RUS area has evolved as new flows have emerged. A large portion of the RUS area is W8 gauge cleared, but there are also sections of W6, W7, W9 and W10 gauge.

W9 and W10 are the gauges required to transport the largest containers (9' 6" high) on conventional wagons. The absence of this gauge in parts of the RUS area reduces the flexible routing options for W9 and W10 traffic and is a serious limitation on rail's attractiveness in the intermodal market. The mixture of gauges means that diversionary routes can often be long and circuitous, or trains have to be cancelled when the main route is not available. See **Figure 3.22** for the various rail loading gauge profiles. **Figure 3.23** shows the gauge in the RUS area.

3.9.8 Route Availability

Route Availability is a system for determining which types of locomotive and rolling stock can travel over any given section of route and is normally determined by the strength of underline bridges in relation to axle load and speed. **Figure 3.24** shows that the Route Availability across the majority of the RUS area is RA8, with the exception of part of the Leamington Spa and Chiltern corridor which is RA7. In order for RA9 and RA10 traffic to be operated, special clearance is required, and this usually requires local speed restrictions to be applied over weaker structures. This also reduces flexibility during perturbation.

3. Current demand, capacity and delivery

Figure 3.18 – Signalling headways

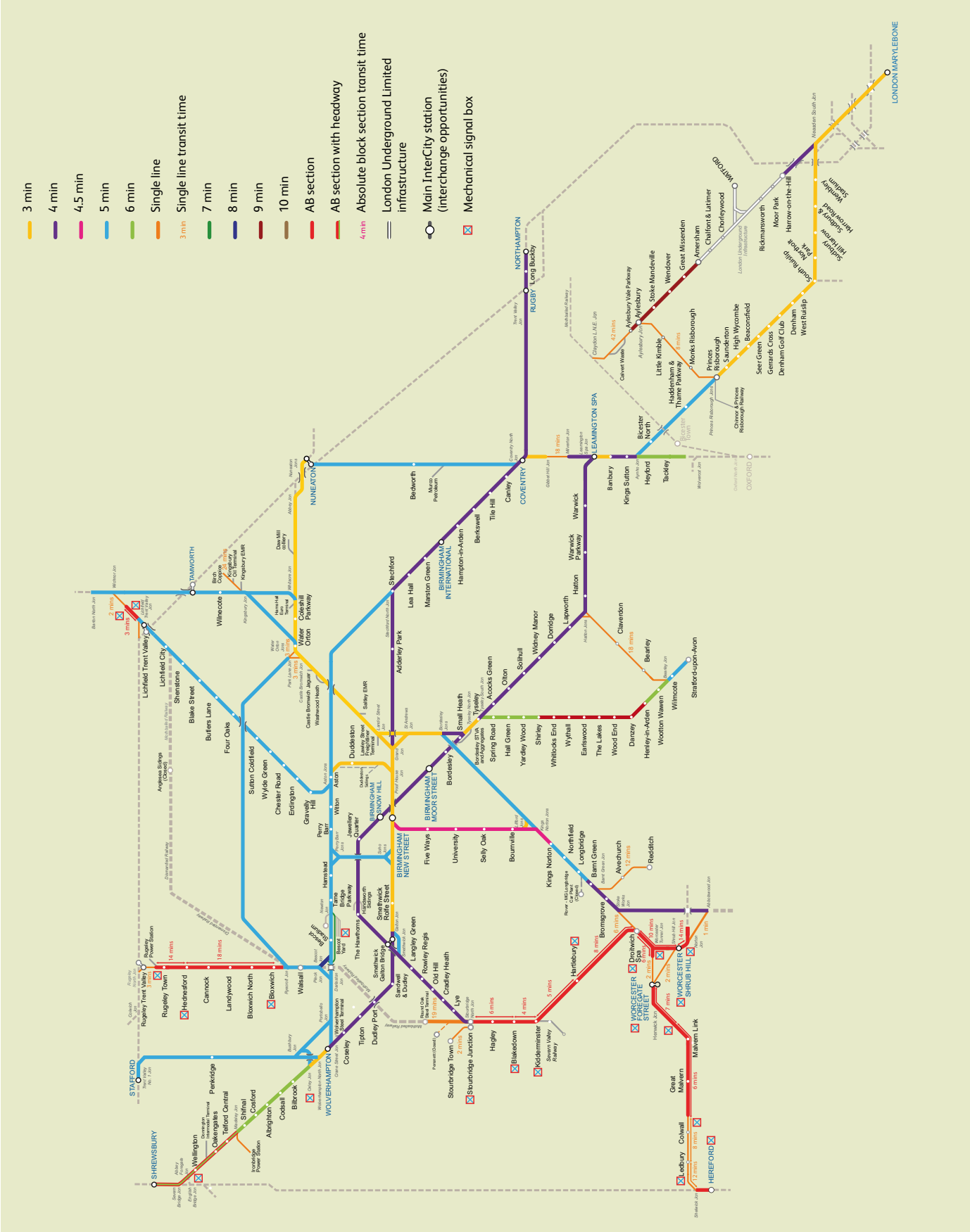
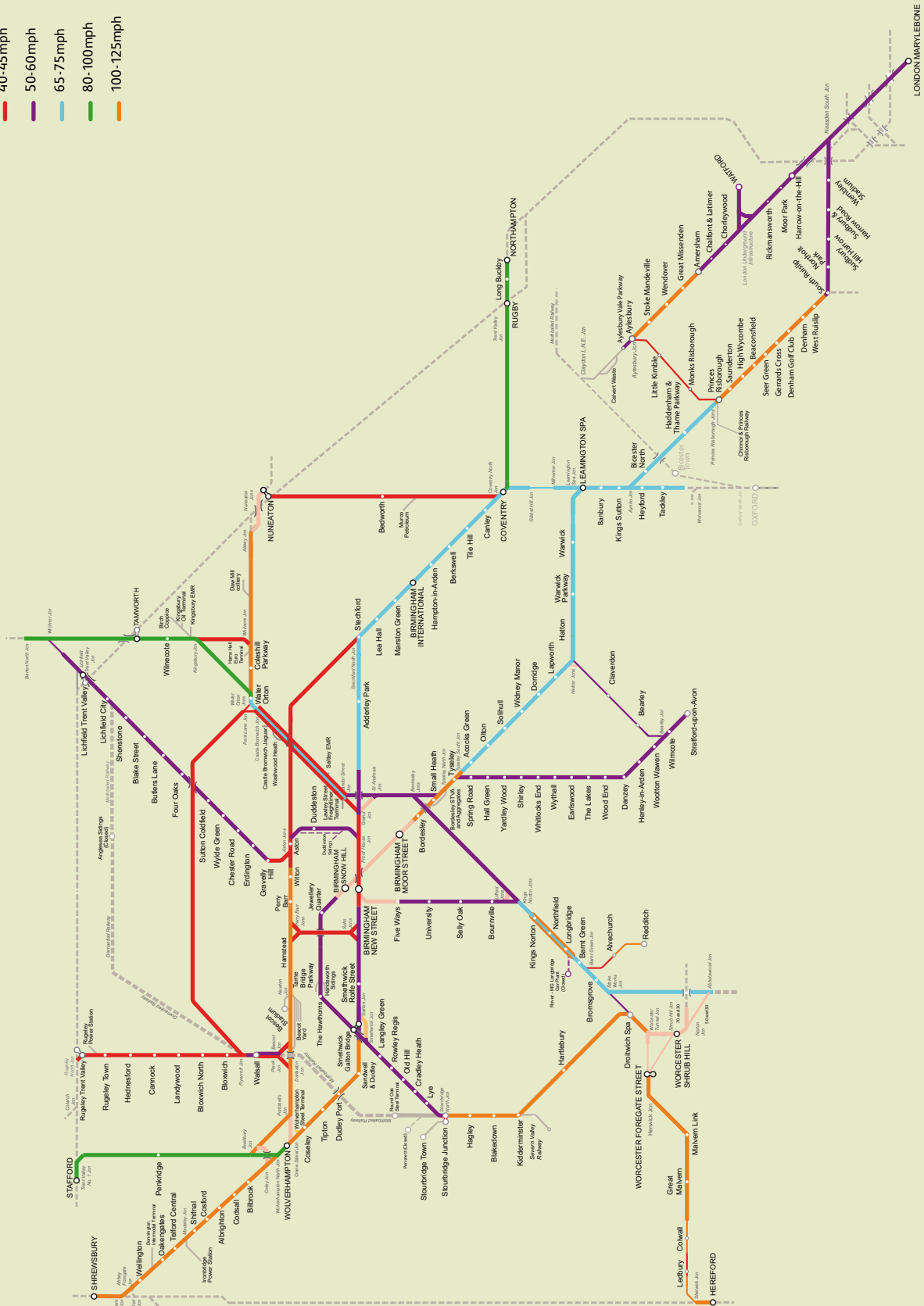


Figure 3.19 – Prevailing linespeed



3. Current demand, capacity and delivery

Figure 3.20 – Electrification in the RUS area

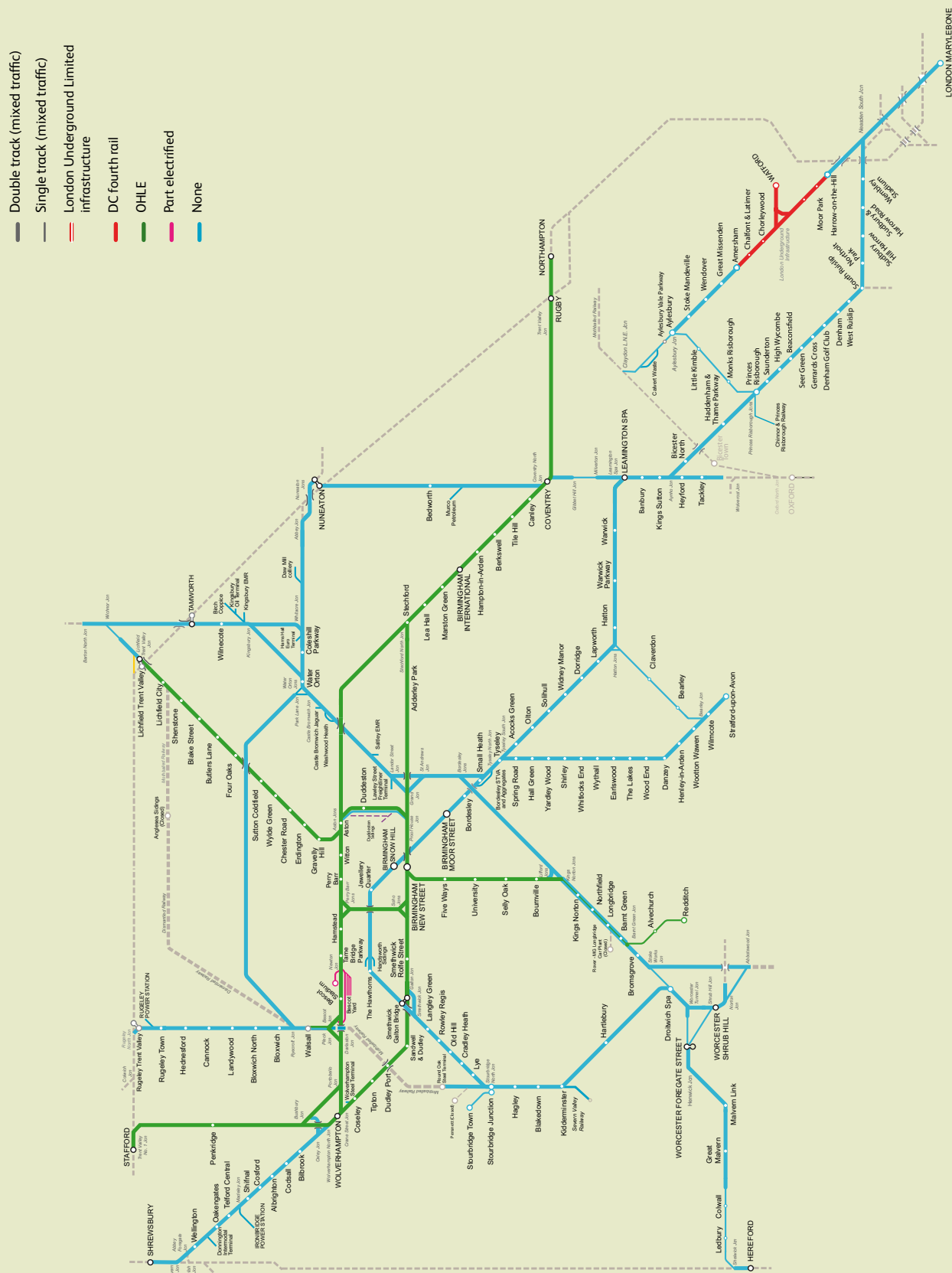
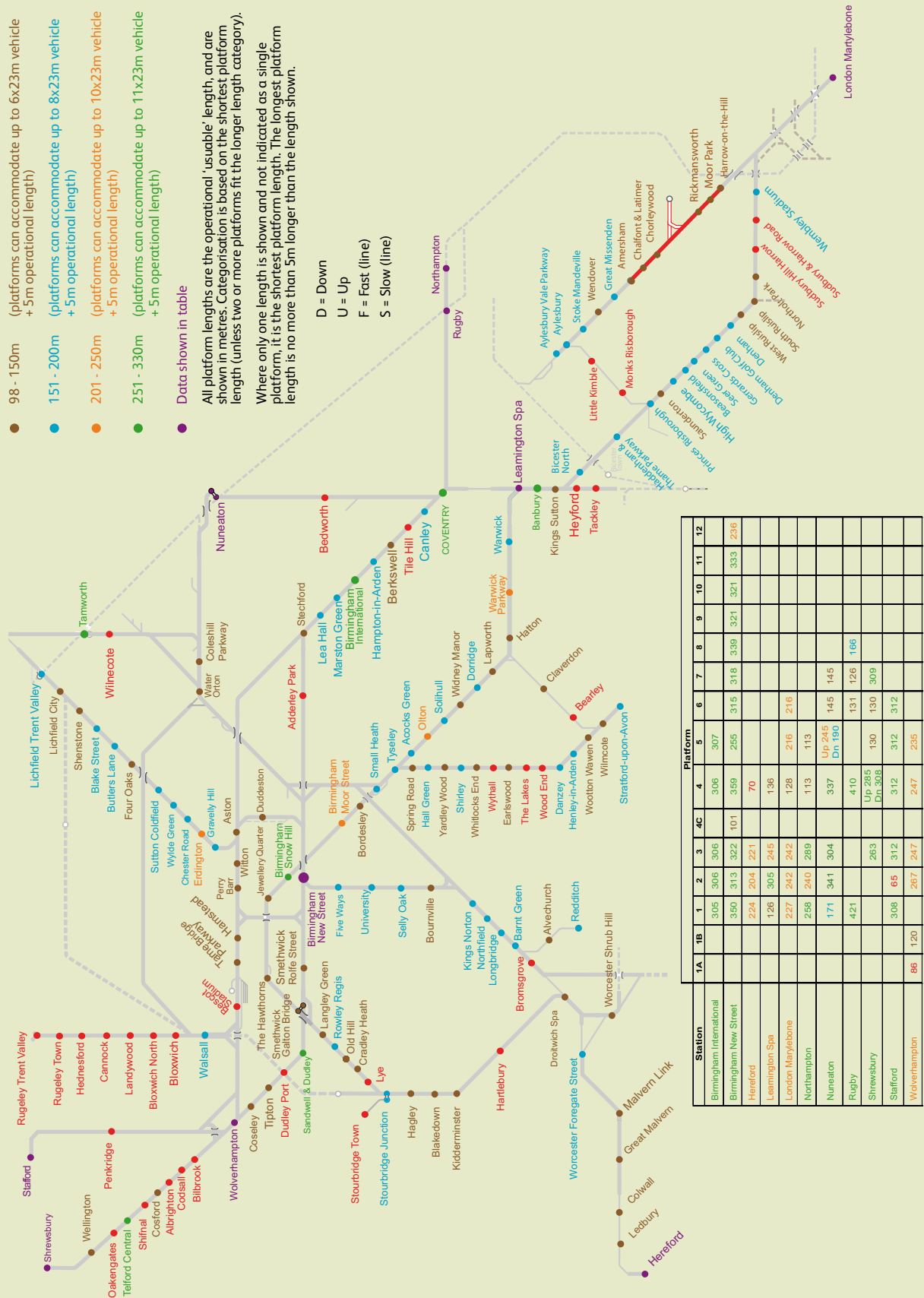


Figure 3.21 – Platform lengths

- 0 - 97m (platforms cannot accommodate 4x23m vehicle + 5m operational length)
- 98 - 150m (platforms can accommodate up to 6x23m vehicle + 5m operational length)
- 151 - 200m (platforms can accommodate up to 8x23m vehicle + 5m operational length)
- 201 - 250m (platforms can accommodate up to 10x23m vehicle + 5m operational length)
- 251 - 330m (platforms can accommodate up to 11x23m vehicle + 5m operational length)
- Data shown in table

All platform lengths are the operational 'usable' length, and are shown in metres. Categorisation is based on the shortest platform length (unless two or more platforms fit the longer length category). Where only one length is shown and not indicated as a single platform, it is the shortest platform length. The longest platform length is no more than 5m longer than the length shown.

D = Down
U = Up
F = Fast (line)
S = Slow (line)



3. Current demand, capacity and delivery

Figure 3.22 – Loading gauge envelopes

- GB1
- GB
- GA
- W12
- W10
- W9
- W8
- W7
- W6

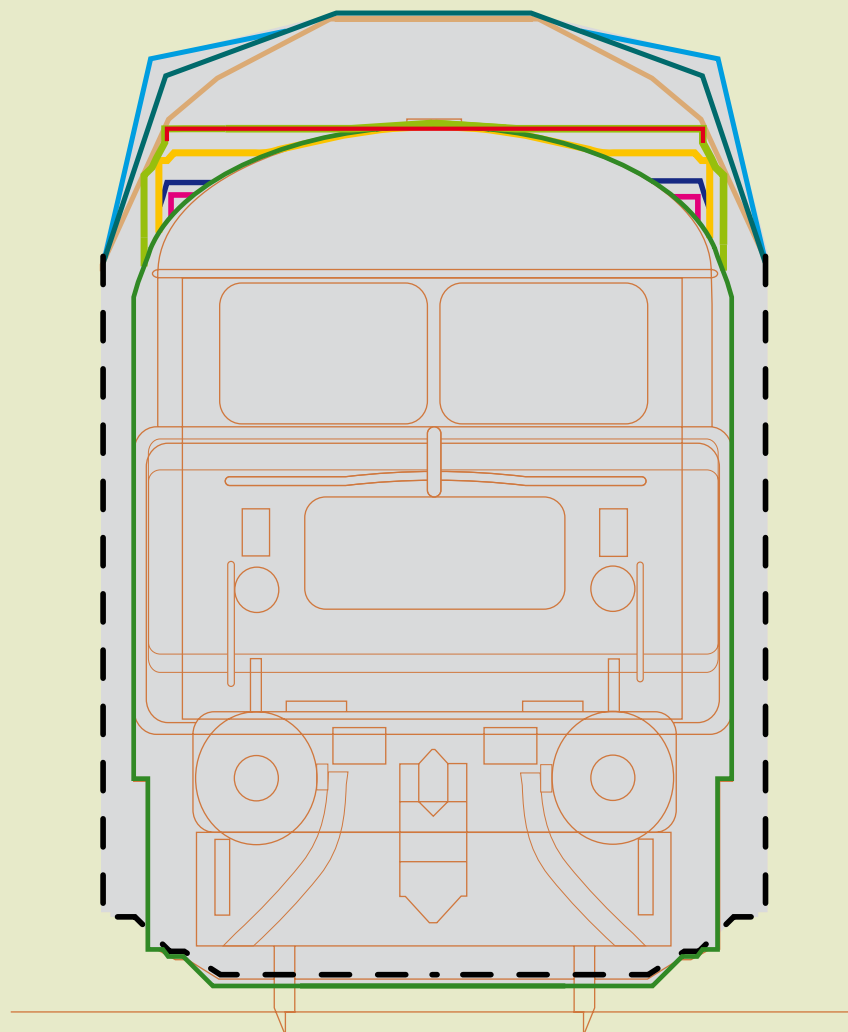
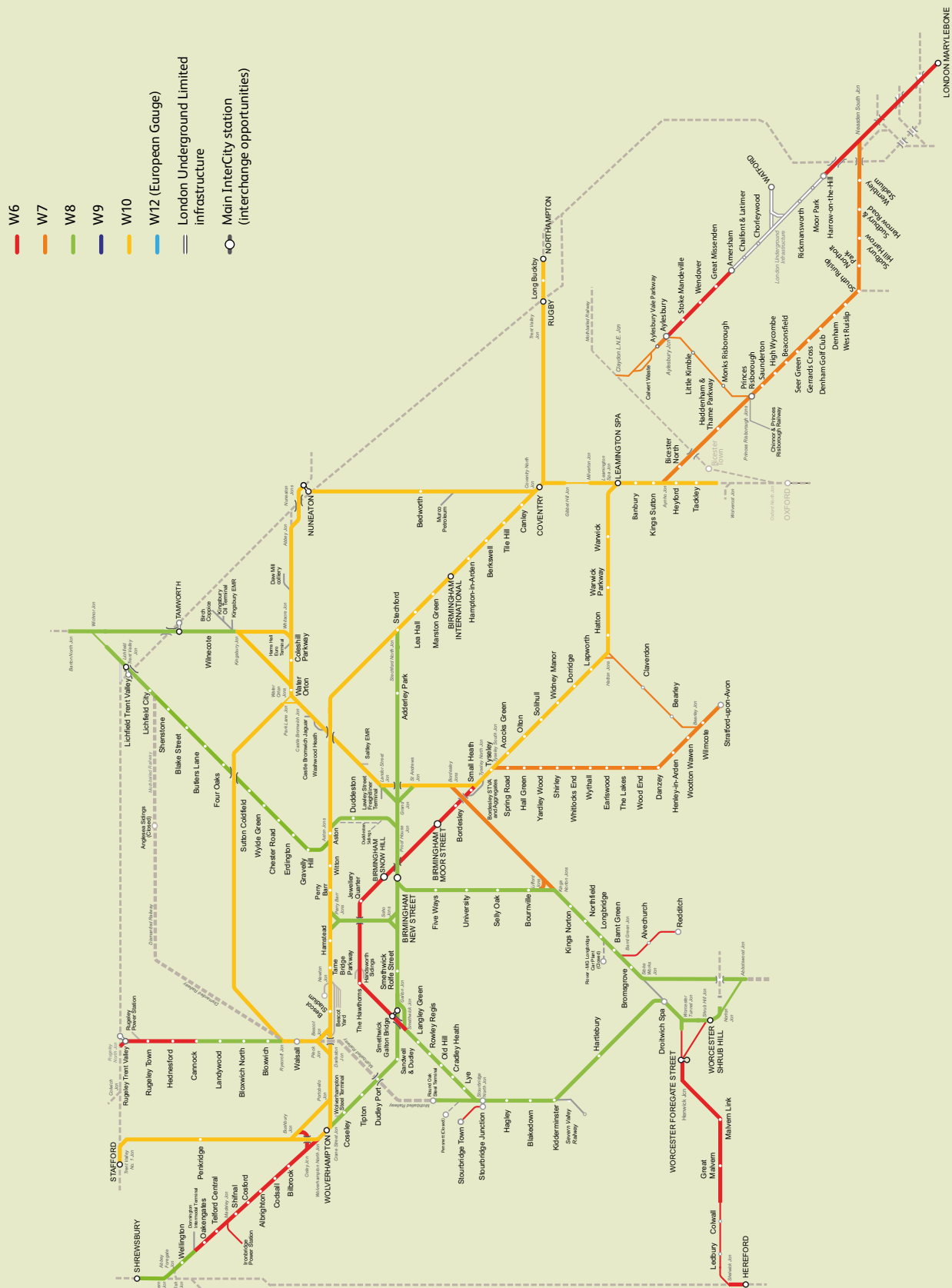
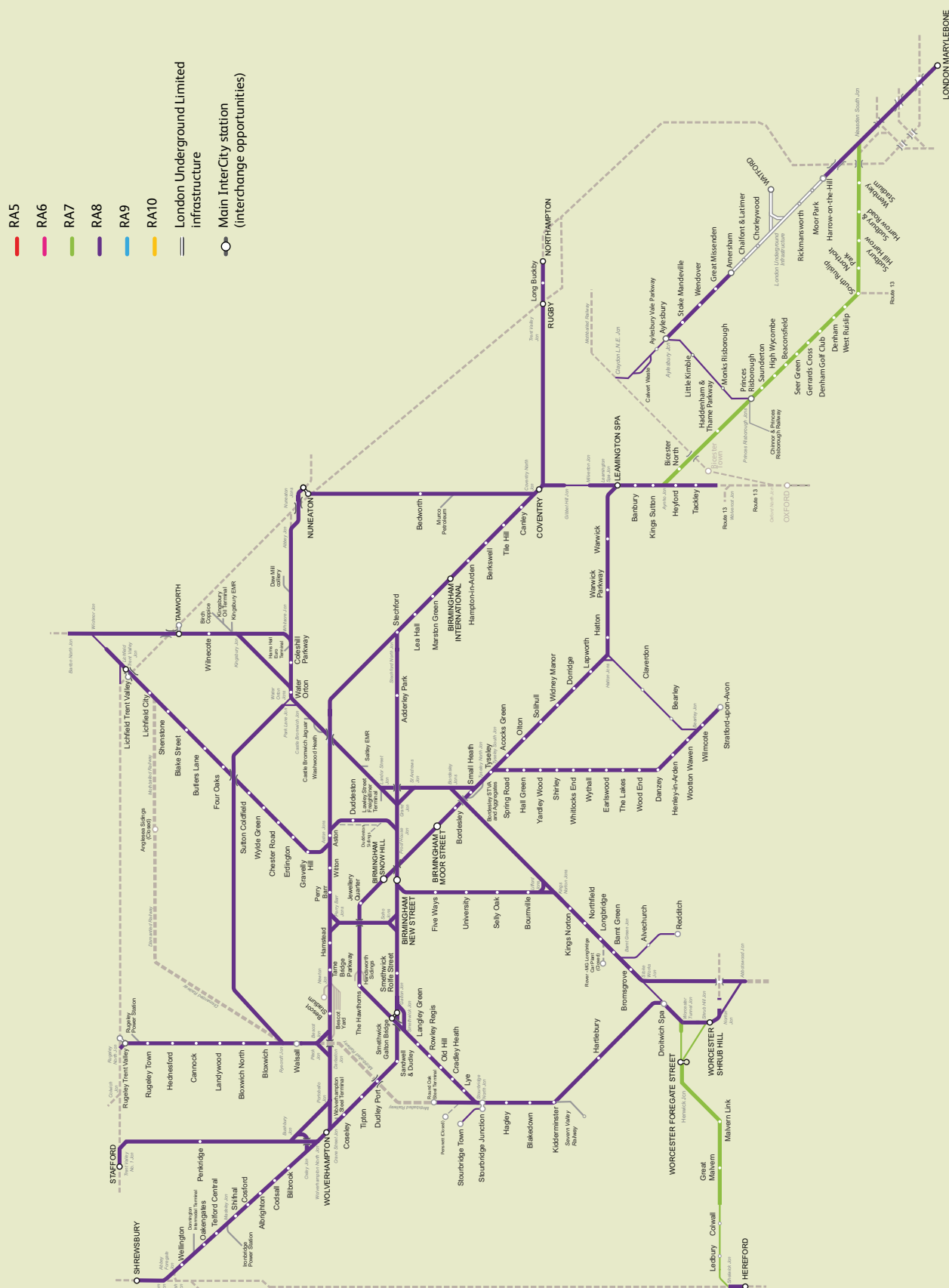


Figure 3.23 – Loading gauge



3. Current demand, capacity and delivery

Figure 3.24 – Route availability



3.10 Reliability and delay

The industry uses two measures to monitor passenger service punctuality and reliability: Public Performance Measure (PPM) and Cancellations and Significant Lateness (CaSL).

PPM is expressed as a percentage and each passenger service that operates across the network contributes to this. PPM measures the number of trains that actually operated punctually as a percentage compared to those that are scheduled to operate in the published timetable. Services operate under one of three sectors (long distance, regional, and London and South East) and dependent on their sector the definition of punctuality varies. Long distance trains are considered punctual if they reach their final destination within 10 minutes of their published arrival time. The regional and London and South East measure of punctuality is that they arrive within five minutes of their published arrival time. Reliability is also included within the PPM metric. A reliability failure under PPM can be a result of deviation from the scheduled calling pattern, failure to reach the final destination or failure to complete any element of the journey.

CaSL is comprised of two principal elements: cancellations and significant lateness. Services are considered cancelled if they fail to complete their full scheduled journey or less than 50 per cent of the journey is completed. If more than 50 per cent of the journey is completed it is considered to be a partial cancellation. The cancellation metric also takes into account services that miss scheduled calling points, these are classed as 'fail to call'. The 'significantly late' metric is applied if a service arrives at its final destination 30 minutes or more after its scheduled arrival time.

Delay minutes are used to determine an individual train's lateness and are captured on a route basis.

Network Rail and all franchised passenger operators are required, under the Network Code, to create annual Joint Performance Improvement Plans (JPIPs) in which individual operator trajectories, annual targets (moving annual averages), underpinning improvement plans and management processes are defined. The combined JPIPs aggregate to the national trajectory for each metric. JPIP delivery is the joint responsibility of the signatories and the agreed trajectories are closely monitored by an industry governance group known as the National Task Force. Similar arrangements do not apply to freight operators where the only regulatory target within CP4 is a Network Rail delay minutes per 100 kilometres of operation. The target is normalised in this way because of the variable volumes of freight traffic.

The industry recognises and measures two types of delay: primary delay and reactionary delay. Primary delay is the delay caused directly to a train by an incident, whereas reactionary is the delay which is indirectly caused to other trains as a result of such an incident. The RUS process only focuses on ways to minimise reactionary delay as the reduction in primary delay is already managed through established industry processes, eg. individual JPIPs.

3.10.1 RUS area performance analysis

The performance analysis for the RUS area assessed primary delay (delay caused directly to a train by an incident) and reactionary delay (delay indirectly caused to other trains as a result of an incident) on a sample period (Period 13, 2007/8). The performance data analysed illustrated the effects that primary delay had on the individual corridors within the RUS area. Additionally, it assisted in the process of appreciating the performance relationship between each corridor in respect of whether reactionary delay was contained on a corridor or transferred to others. The total delay experienced by a corridor is the corridor contained delay (primary delay and reactionary delay contained within a corridor) and imported reactionary delay imported from other corridors. The results of this analysis for each corridor are presented in the performance charts in **Appendix A**.

The analysis indicated that the top three causes of delay related to points, signalling and other assets. The findings demonstrate that, of the total reactionary delay generated within the RUS area, on average over 80 per cent of this delay remained within the RUS area. The majority of delay within the RUS area during the period of analysis was caused by incidents on the Derby, Nuneaton and Camp Hill corridor, followed by the Leamington Spa and Chiltern corridor and the Walsall and Cannock corridor. The Derby, Nuneaton and Camp Hill corridor created over 30,000 minutes including corridor contained delay of over 21,000 minutes. The largest portion of the exported delay was to outside the RUS area, with nearly 5,000 minutes exported, showing the importance of the corridor in the wider rail industry.

This analysis has assisted in identifying where there may be performance-related issues and these factors have been factored in the development of options where appropriate.

3. Current demand, capacity and delivery

3.11 Stations

3.11.1 Facilities

Appendix B provides a detailed list of station facilities at the stations located within the West Midlands and Chilterns RUS area and the integration with other modes of transport.

3.11.2 Links with other transport modes

The ease with which passengers can access stations influences the attractiveness of rail travel relative to other transport modes. Rail is often only one stage of a passenger journey, with some passengers using other modes of transport to access the station.

In terms of travel choices, it is generally assumed that passengers would be able to cycle or walk to the station within the half-mile radius. Beyond half a mile, the main modes of access would be by bus or car, with some passengers choosing to cycle where cycle storage facilities are available at the station. The options available to passengers in the RUS area are outlined below:

3.11.3 Car parking

Providing car parking spaces at rail stations improves accessibility to the rail network, particularly where walking or cycling is not a feasible option. Car parking facilities in the RUS area are summarised in **Appendix B** along with accessibility to the station and interchange opportunities with other modes of transport. It should be noted that the RUS has not collated data on London Underground car parks or alternative parking facilities near to stations.

The majority of stations within the RUS area have a car parking facility. Within the West Midlands Metropolitan Area, Centro operates over 6,000 spaces at 37 stations and has a policy of providing free parking for rail users, apart from at Solihull and Sutton Coldfield. Parking facilities outside the Centro area comprise a mixture of free and charged, and are generally operated by the appropriate train operating company. While there is some evidence of passengers driving to the Centro area to park and catch a train, passengers generally prefer to use their local station subject to there being adequate parking and train service provision at reasonable



cost. There is evidence that at stations where there is a high car parking charge (such as Birmingham International and Warwick Parkway), that usage by local commuters is relatively low.

It is recognised that limited car parking capacity is a widespread issue and recent passenger surveys demonstrate that a significant number of car parks in the RUS area are at or very close to capacity on weekdays by the end of the peak period. In recent years, car parking provision has steadily increased, but demand consistently outstrips supply at many stations. This leads to passengers choosing to park on adjacent streets, driving to different stations or choosing not to travel by rail. This is particularly an issue in the late morning and off-peak periods and can act as a barrier to future rail growth.

There are a number of car park expansion schemes in development which aim to address this issue. These are outlined in **Chapter 4**.

3.11.4 Interchange with other transport modes

The need to improve other means of accessing the rail network should also be considered for passengers who do not have use of a car. Whilst there are high levels of car ownership in certain parts of the RUS area, particularly in Warwickshire and the areas surrounding the Chiltern Main Line, it is important to consider those who are dependent on alternative modes of transport for part of their end-to-end journey. The London area has the highest usage of public transport in the UK and interchange with London Underground and local bus services is therefore of particular importance. Recent analysis has shown that within the Birmingham area one in three people still do not have access to a car and the dependence of young and old people on public transport across the RUS area should not be overlooked.

Promoting alternative modes to car transport also figures prominently in the Government's transport and environmental policies which emphasise the need to reduce road congestion and encourage more sustainable forms of travel. This principle is outlined in the Delivering a Sustainable Transport System report (November 2008), which sets the long-term planning commitment to tackle congestion, crowding and environmental damage within the UK transport system. This is discussed in more detail in **Chapter 5**.

There are several locations where the railway intersects or runs close to other modes of public transport, providing passengers with an opportunity to integrate other transport modes into their overall journey. **Appendix B** highlights the stations that have bus, metro, underground and air interchange facilities. It also illustrates the cycle storage capacity. These modes should be considered as an alternative means to access the rail network for passengers who do not have access to a car or wish to use another mode of access. Stations which are considered to have particularly good interchange facilities are:

- Birmingham Snow Hill (rail, tram and bus)
- Coleshill Parkway (bus, rail and park and ride)
- Birmingham International (air, bus and rail)
- Cradley Heath (rail and bus)
- Princes Risborough (bus and rail)
- Amersham (rail underground and national rail)
- Chalfont and Latimer (rail underground and national rail)
- Sutton Coldfield (bus)
- Solihull (bus)
- Lichfield City (bus).

3.11.5 Station accessibility

As well as providing easy access to the stations on the network, it is also important to ensure that there is an unobstructed and obstacle-free accessible route available within stations to assist with access to services and to facilitate efficient interchange. The lack of adequate step-free access to platforms or large stepping distances between platforms and trains can act as a barrier to using rail for those with reduced mobility, with young children or carrying luggage. **Appendix B** shows the accessibility levels at stations and indicates that this varies across the RUS area. There are several enhancements in development sponsored by the Access for All and National Stations Improvement Programme (NSIP) funds which aim to address accessibility issues at stations. These are discussed in **Chapter 4**.

3.12 Rolling stock, depots and stabling

The principal maintenance depots in the RUS area which maintain and service rolling stock are located at:

- Aylesbury – Chiltern Railways (diesel depot)
- Central Rivers – CrossCountry (diesel depot)
- Northampton – London Midland (electric depot)
- Oxley – Virgin Trains (electric depot)
- Tyseley – London Midland (diesel depot)
- Soho – London Midland (electric depot)
- Wembley – Chiltern Railways (diesel depot)

Each of the depots is different and performs a specific role, based on its location, facilities, processes and assigned rolling stock. Each depot has been developed to operate on a variety of activities which include overnight servicing, maintenance, modifications, wheel set attention, repairs, cleaning and differing levels of repair and overhaul. Each depot has a different layout, with variables such as track layout, berths and stabling roads which dictate the workflow through the site.

3. Current demand, capacity and delivery

3.13 Engineering access

Due to the mixture of traffic and routes within the RUS area, engineering access varies within the RUS area. The current access arrangements around the various route sections are briefly described below.

On the Chiltern line, engineering access is available through a regular pattern of eight hours on Saturday nights and five hours on Sunday nights, as well as possession opportunities on week nights which are limited due to Chiltern Railways late night services and empty stock movements. Possession planning, which is the closure of a line for engineering works, is carefully integrated on the Chiltern route with the Birmingham to Didcot and West Coast Main Line routes, to enable the route to be used as an alternative for passengers and freight from London to the West Midlands.

The Chiltern route can be used as a diversionary route for Virgin Train services, during West Coast South all-line blocks on Bank Holidays, and for First Great Western services during Crossrail and Reading enhancement blockades. The 2010 plan has been carefully planned to ensure that a route through to the Chiltern is maintained whenever possible, and the West Coast South and Chiltern Main Line are not blocked simultaneously.

The RUS area has a reasonable availability for diversionary routing over much of its network, and a refined pattern of cyclical midweek night possessions has been applied. A notable exception

is between Wolverhampton and Stafford and Birmingham and Coventry, where there is no alternative electrified diversionary route. Diversionary routes can create issues for freight customers as freight diversions are constrained by capability requirements of gauge and weight. While freight operators cannot readily divert their traffic to the roads in the same way as passenger operators, some of the freight services have flexibility surrounding the timing and duration of their journeys and possessions that could affect them are targeted at times of little traffic. Growth will increasingly require a route to be available for more of the time.

Network Rail has developed a revised approach to possessions planning which seeks to focus maintenance access at times of least value to users of the network, and optimise engineering costs against revenues and economic benefits. The output should then be incorporated into the annual Rules of the Route planning process.

Improvements to maintenance activities have been incorporated into the Network Availability Implementation Plan, which details the next steps towards delivering improvements to network availability in Control Period 4. This plan also includes improvements to track renewal activities, possession strategies to minimise disruption. Further details of the Network Availability Implementation Plan is presented in **Chapter 4** under committed schemes.



4. Planned changes to infrastructure and services

This chapter outlines the planned changes to supply within the rail network over the period of this Route Utilisation Strategy (RUS). These changes are identified as either committed changes which include planned changes to train services or infrastructure, and proposed or uncommitted changes. These changes do not include those determined through this RUS.

4.1 Committed and uncommitted projects

Where significant renewal and enhancement projects are committed, they form part of the baseline for the RUS. For the purpose of analysis in this RUS, a committed scheme is considered to be one that has confirmed funding and is beyond Guide to Investment Projects (GRIP) stage 4 – single option development. Any interventions proposed by the RUS are assessed against this baseline rather than the current infrastructure. The baseline therefore equates to today's railway as described in **Chapter 3**, plus committed projects. The baseline is defined as the 'do minimum' scenario in analysis work.

The RUS development process also recognises those renewal and enhancement projects that are in the early stages of development; therefore, projects up to and including GRIP stage 4 are classified as uncommitted and have not been included within the baseline. The RUS cannot assume that these projects will go ahead, but where an output from an uncommitted scheme may deliver a resolution to a gap identified by this RUS, the RUS may recommend the same intervention if it proves to be the optimum way forward from the optioneering process.

4.2 Planned changes to infrastructure

This section presents committed enhancement schemes, which includes those included in the Control Period 4 (CP4) Delivery Plan programme to meet targets set in the High Level Output Specification (HLOS) and those committed through the GRIP process. It also outlines the uncommitted schemes that have also been taken into consideration.

4.2.1 HLOS and CP4 Delivery Plan

The HLOS specified various metrics (reliability, capacity and safety) which the collective rail industry is required to achieve during CP4. It prescribed 'people' demand metrics for major urban areas including Birmingham, and the main London termini including Marylebone. The CP4 Delivery Plan outlines the committed outputs Network Rail has been funded to deliver in CP4 which includes those required to meet the HLOS metrics.

Further details on the 2007 White Paper and HLOS metrics are at www.dft.gov.uk

Further details on Network Rail committed CP4 outputs are at www.networkrail.co.uk

The West Midlands and Chilterns RUS is aligned with the delivery of the key outputs specified within the CP4 Delivery Plan. It recognises that many of the issues raised during the gap identification stage of the RUS are addressed and resolved by the committed CP4 enhancements schemes and associated operational plans. The key elements of the CP4 Delivery Plan which need to be considered as part of the baseline for the RUS include the following:

- Strategic Freight Network
- network availability and seven day railway
- train lengthening
- Birmingham New Street Gateway project
- extension of electrification and Cross City services to Bromsgrove
- Redditch branch enhancement
- West Midlands platform lengthening
- Westerleigh Junction to Barnt Green linespeed improvement
- Network Rail Discretionary Fund
- National Stations Improvement Programme

4. Planned changes to infrastructure and services

These are further described below:

4.2.1.1 Strategic Freight Network and Transport Innovation Fund Productivity schemes

In July 2007 the Government published its White Paper 'Delivering a Sustainable Railway' which outlined its plans for the growth and development of the railway in the context of a long-term strategy for the next 30 years. This White Paper presented a proposal to develop a Strategic Freight Network (SFN), which is envisaged as a network of core and diversionary routes which are designed to enable the efficient operation of more and longer freight trains and resolve conflicts between freight and passenger services. This reflects support for further growth of rail freight as a sustainable distribution system.

£200 million has been allocated nationally for the development of the SFN during CP4. This funding supplements schemes already identified for funding through the Productivity Transport Innovation Fund (PTIF) enhancements scheme. These schemes are:

- Felixstowe to Nuneaton loading gauge enhancement (via Peterborough): loading gauge improvements to provide an alternative W10 gauge route from the Port of Felixstowe to the Midlands, avoiding the busy routes via London. Work started along the route in July 2009 and the scheme will be completed by 2011
- Southampton to West Coast loading gauge enhancement: a scheme to construct a W10 gauge cleared route from Southampton to the West Coast Main line via Basingstoke, Reading, Didcot Parkway and Leamington Spa to enable the movement of 9ft 6in containers on standard height wagons on this core route. Preliminary works are underway with completion programmed for 2011.

The SFN funding allows for additional gauge clearance and capacity improvements across the network, to meet industry growth forecasts and prevent this additional freight traffic being forced onto the congested road network. The following SFN schemes will have an impact on the services to and from the West Midlands and Chilterns RUS area have:

- improved capacity between Felixstowe and Peterborough
- increased gauge clearance between Southampton and Basingstoke
- Water Orton – Yorkshire loading gauge enhancement
- other infill gauge and infrastructure improvements across the network.

The SFN includes a specific fund for infill gauge schemes to progress towards the SFN vision of extensive W12 gauge clearance. The freight industry has expressed an aspiration for W12 gauge clearance for sections of the network which could

be used to transport short sea traffic. As a result, the Freight RUS (FRUS) set a policy to clear sections of a route to W12 wherever a structure is being rebuilt.

The SFN also identifies preferred options to meet forecast growth in freight volume. A funding provision of £5 million is included for studies to develop identified schemes for delivery in Control Period 5 (CP5) – between 2014 and 2019 – these are currently being defined and agreed with stakeholders.

Train lengthening opportunities are also being assessed through the SFN, with the Southampton to West Midlands route as a candidate scheme currently being developed, permitting growth without increasing capacity utilisation. In order to facilitate this, infrastructure changes may be necessary.

4.2.1.2 Network availability and seven day railway

The Office of Rail Regulation (ORR) has allocated £160 million nationally to assist in the development of the seven day railway initiative. The programme of change will increase current levels of network availability during engineering works. This is part of the wider aim to develop a railway that reduces disruption to customers (passengers and freight) and better meets their needs, whilst delivering efficient and effective maintenance, renewals and enhancements.

The funding will be spent on both infrastructure enhancements to facilitate the increase in rail operations such as crossovers and bi-directional signalling, and on investment to change Network Rail's work methods. Currently there are no infrastructure schemes being progressed in the RUS area for seven day railway funding. However, there are many initiatives in place which will deliver network availability benefits and it is anticipated that all operators of services within the RUS area will benefit from the ongoing introduction of national pilot initiatives.

A Network Availability Implementation Plan is currently in development and aims to deliver the regulated outputs for network availability in CP4. Network Rail measures network availability using the new possession disruption indices (PDIs) and the metrics are highly sensitive to the location, number and duration of possessions. The Network Availability Plan aims to achieve a 37 per cent improvement in PDI which in effect will deliver substantial improvements in network availability to passenger operators, and potentially allow passenger and freight operators to run additional train services at times that suppress customer demand.

The core initiatives and activities which will improve network availability include improvements to maintenance and renewal activities, more efficient methods of working, new possession strategies to minimise disruption, and the establishment of improved access points.

4.2.1.3 Train lengthening

Following the publication of the White Paper in July 2007, the Government published a rolling stock plan, setting out in more detail how rolling stock would be used to support train lengthening to deliver increased capacity. This plan proposed the introduction of new rolling stock where required, as well as the redeployment of existing rolling stock which is displaced by new. The plan did not set out detailed lists of rolling stock fleets or a planned schedule for their introduction on specific routes.

The train operators have been responsible for the development of operational plans and subsequent procurement of rolling stock in line with HLOS passenger capacity requirements and with a view to providing best value for the investment by strengthening services on busiest routes. The HLOS peak demand requirement for Birmingham is expected to result in additional diesel multiple unit and electric multiple unit stock being provided to London Midland. The operational plan produced by London Midland has considered where additional peak capacity is required within the RUS area and has allocated additional vehicles to achieve this. The planned additional vehicles have formed part of the base for the RUS, and any options analysis undertaken assumes the additional capacity will be delivered.

The DfT recently announced in June 2010 a review of the rolling stock strategy and further details of the plan have not yet been finalised. Whilst the RUS will continue to work on the assumption that the additional vehicles will be delivered, it is therefore important to note that any refinement to the plan would directly affect the assumptions and conclusions of any options analysis.

4.2.1.4 Birmingham New Street Gateway project

The major redevelopment of Birmingham New Street station (Birmingham New Street Gateway) will transform the station into a modern, welcoming and accessible gateway to the city and transport hub for the UK rail network. The focus of the project is on improving the station environment and passenger services, through increased passenger capacity, improved access, better pedestrian links to and through the station and more reliable customer services. The 2007 HLOS confirmed to Network Rail that £128m would be made available for the Gateway project. The total fund for the redevelopment is £600 million as it also includes major funding from Advantage West Midlands, Birmingham City Council and Centro. Network Rail, which owns and operates Birmingham New Street station, will deliver the project.

In addition to the benefits to rail passengers, there are major associated economic and tourism benefits for the region. The project scope includes work to make the platforms clearer and less crowded, a grand

concourse enclosed by a large light-filled atrium and eight new entrances making the station open to all sides of the city centre. Preparatory work has begun on the new concourse, including transformation of a former car park, and the current plan aims for completion of the first phase of works in 2012. The second phase of work to build a second concourse to be combined with the first will be completed in 2015.

4.2.1.5 Extension of electrification and Cross City services to Bromsgrove

The scheme will extend electrification of the Cross City line from Barnt Green to Bromsgrove which will facilitate the extension of Cross City services to provide three trains per hour to Bromsgrove. There is an interface between this scheme and a third-party-funded scheme to relocate Bromsgrove station (see 4.2.1.6). This relocation is required as a prerequisite of the extension of the Cross City line to Bromsgrove, to provide the opportunity to install turn back facilities. The scheme at Bromsgrove has a timetabling interface with the scheme to increase Cross City services to Redditch. The current service of six trains per hour, where four turn round at Longbridge and two carry on to Redditch, will be extended so that three trains per hour run to Bromsgrove and three trains per hour will run to Redditch. The commissioning of the scheme, including the station relocation, is planned in Control Period 4, subject to funding of the station relocation scheme.

4.2.1.6 Bromsgrove station relocation

This scheme is a third-party-funding enhancement to increase capacity and capability for passengers at Bromsgrove. The proposed option is to relocate Bromsgrove station 250 metres southwards along the Birmingham to Bristol main line. The existing station is constrained with limited capacity to meet forecast passenger demand and increased services and does not have the facility to turn back trains without significantly impacting on service performance. Relocating the station enables the development of a larger station with improved passenger facilities at the station, such as car parking, a bus interchange, increased cycle storage and Disability Discrimination Act compliance.

4.2.1.7 Redditch branch enhancement

This scheme will improve capacity on the Redditch branch, by enabling an additional train per hour between Barnt Green and Redditch (in each direction) and thereby delivering a standard 20-minute interval service between Redditch and Birmingham New Street. Network Rail is currently assessing the option of a double track section between Alvechurch and Redditch. The planned commissioning date for the project is December 2012.

The extension of the Cross City services will only require a minimal increase in rolling stock. Currently the service is operated by Class 323 electric multiple units.

4. Planned changes to infrastructure and services

4.2.1.8 West Midlands platform lengthening

This scheme will help to deliver the operational plans agreed by the train operators to achieve HLOS capacity metrics. Achieving the increase in demand set out in the HLOS requires train operators to deploy additional rolling stock. The preferred method for deploying extra stock will be achieved through operating longer trains but this will require platform lengthening and/or the operation of selective door opening (SDO) at some stations. The agreed scope for platform lengthening, following discussions with operators and other stakeholders, is detailed in **Table 4.1**.

4.2.1.9 Westerleigh Junction to Barnt Green linespeed improvement

The scheme will raise the linespeeds to 110mph which will deliver a reduction in journey times of up to two minutes along the Bristol to Birmingham corridor and South Wales to Birmingham corridor which merge north of Gloucester, with associated benefits to the wider cross boundary services. This enhancement will also deliver significant performance improvements as well as providing an increase in both passenger and freight capacity. Implementation is currently programmed for 2013.

4.2.1.10 Network Rail Discretionary Fund

The Network Rail Discretionary Fund (NRDF) is a mechanism for funding minor schemes (nominally under £5 million) which will enhance the capacity or capability of the rail network. An NRDF-funded scheme must deliver value for money and have available resources to deliver the project efficiently. They are therefore schemes which are either linked to renewals or are stand alone schemes. A stand alone scheme is an enhancement undertaken as a separate scheme independent of any planned renewal works, whilst an enhancement undertaken with a renewal is an enhancement implemented as part of a planned renewal.

Schemes that have been funded by the NRDF and completed to date include:

- part doubling of the Coventry to Leamington Spa line as part of Coventry signalling renewal
- second access to Platform 12 at Birmingham New Street
- removal of permanent speed restrictions at Camp Hill and Grand Junction
- linespeed increases on the Cross City (south) line south of Barnt Green
- W10 gauge enhancement on the Sutton Park line.

Table 4.1 – Platform enabling works required for West Midlands train lengthening

Corridor	Rolling stock	Stations	Platforms
Stourbridge	DMU Class 150, 170 and Class 172 type units in formations no greater than 6 vehicles	Droitwich Spa	1, 2
		Kidderminster	1, 2
		Lye*	1, 2
		Langley Green	1, 2
		Cradley Heath	1, 2
Stratford-upon-Avon	DMU Operation Class 150 and Class 172 type units in formations no greater than 6 vehicles	Wythall	1, 2
		Spring Road*	1, 2
		Whitlocks End	1, 2
		Yardley Wood	1, 2
Leamington Spa	DMU Operation Class 150 and Class 172 type units in formations no greater than 6 vehicles	Widney Manor	1, 2
		Small Heath	3, 4
Derby	DMU Operation Class 170 type units in formations of 2, 3, 4 and 5	Wilnecote*	1, 2
Coventry	EMU Operation Class 323, 350 and a likely new build type unit in formations of no greater than 8 vehicles.	Hampton-in-Arden	1, 2
Cannock	DMU Operation Class 170 type units in formations no greater than 4 vehicles.	Hednesford	1
		Rugeley Trent Valley	1

*or SDO, subject to an agreed operational plan

Future schemes currently in development with committed funding from NRDF include linespeed improvements between Wolverhampton and Shrewsbury to provide 90mph running (see 4.3.2), and the scheme to replace the bridge deck outside of Birmingham Moor Street station to improve reliability in the area after the implementation of Chiltern's timetable change at Birmingham Moor Street and Birmingham Snow Hill. Some resignalling projects being delivered in CP4 also have NRDF funded enhancements; these are described in 4.2.2.5.

4.2.1.11 National Stations Improvement Programme

The National Stations Improvement Programme (NSIP) is a DfT-funded cross-industry programme designed to enhance approximately 150 medium-sized stations across routes in England and Wales. It is a committed spending requirement in Network Rail's CP4 Delivery Plan and forms an agreed commitment to deliver station improvements for passengers. The primary objective of the programme is to make noticeable and lasting improvements to the environment at selected stations. The programme is being developed through local delivery groups which enable the NSIP money to be invested in the most effective way by leveraging in third party funding. Local delivery groups include train operators and representatives from Network Rail.

Within the RUS area the stations that have currently been identified for NSIP funding are presented in **Table 4.2** with a brief description of the planned works.

4.2.2 Other committed enhancement schemes in CP4

The following schemes are committed enhancements within the West Midlands and Chilterns RUS area. These schemes, in addition to the capacity schemes specified above, have formed part of the baseline and as such have been taken into consideration during the appraisal work.

4.2.2.1 Additional Class 390 Pendolino vehicles

The DfT sponsored enhancement scheme to lengthen Class 390 vehicles on the West Coast Main Line (WCML) is progressing. The first of the new trains is due to arrive imminently and is expected to be available for service by 2012. The overall aim is to increase capacity on the WCML to accommodate growth forecasts on this route.

4.2.2.2 Platform extensions for lengthened Class 390s

In order for the lengthened sets to operate, platform work is required at a number of stations. Where platform extension is not feasible or economically viable selective door operation (SDO) will be used. Stations affected in the RUS area are Lichfield Trent Valley, Wolverhampton and Coventry. Associated works required at Oxley and Wembley depots are also being implemented as part of this scheme.

4.2.2.3 Evergreen 3 project

The Evergreen 3 project is the third phase of the major infrastructure works which Chiltern Railways have promoted as part of their 20 year franchise to improve services on the Chiltern Main Line. The first and second phase of works delivered additional capacity, improved speeds at certain locations and two new platforms at London Marylebone station.

The third phase of Evergreen is a £274 million project which will deliver faster journeys between London Marylebone to Birmingham via Bicester, and a new route to Oxford, offering new passenger services between London Marylebone and Oxford station. The scheme will deliver linespeed improvements to permit 100mph running on the Chiltern Main Line and additional line capacity will be created by providing passing facilities at Northolt, Princes Risborough and Bicester. This will allow more flexible and logical stopping patterns for suburban and long distance services.

The Evergreen 3 project will also connect the Oxford to Bicester line to the Chiltern Main Line enabling a new Oxford to London Marylebone service via Bicester Town (known as BiOx) via a new south-west chord line. The scheme will rebuild the existing Bicester to Oxford line for 100mph capability, with five-minute planning headways and involves the construction of a new park and ride station at Water Eaton, to the north of Oxford. There will be additional platforms at Bicester Town, Islip and Oxford (the BiOx works outlined here are subject to the granting of ministerial powers following Chiltern Railways TWA application).

All signalling on the route will be controlled by a central location, and it is anticipated that new services will commence by 2012. The 2012 timetable changes that will be delivered following the enhancement programme will provide the following benefits:

- additional 3,300 passenger capacity to Marylebone in the three-hour morning peak
- Class 172 DMUs used on some suburban services
- linespeed improvement to enable faster journey time between London Marylebone and Birmingham (average 1 hour 41 minutes in the peak)
- half-hourly Oxford to London Marylebone service with 66 minutes journey time, calling at Water Eaton Parkway, Islip (some services), Bicester Town, Haddenham and Thame Parkway and High Wycombe
- changes in calling patterns on the long distance services to enable a faster journey
- seven more vehicles on the Aylesbury corridor in the three-hour morning peak
- improvements to freight capability.

4. Planned changes to infrastructure and services

Table 4.2 – Tranche one National Stations Improvement Programme schemes

Station	Planned works
Aylesbury Town	Improvements to the booking hall and waiting area including new glass partition wall to enclose the entrance to the toilets, extension of existing passenger waiting area, new ceramic tiled floor and skirting, and redecoration of booking hall walls. Refurbishment of the existing male, female and disabled toilets is also planned including new slip-resistant ceramic flooring, new heating and ventilation, and new recessed ceiling lighting. NSIP funding will also be used to provide increased cycle facilities which will include reconfiguration to allow for an additional 26 cycle hoops, relocation of security railings, new paved areas and new CCTV camera to view the gateline.
Cannock line: Bloxwich, Bloxwich North, Cannock, Hednesford, Landywood, Rugeley Town	All six stations along the Cannock line will receive new litter bins, renewed waiting shelters and help points. New CCTV coverage will be installed and new public artwork individually designed for each station entrance. Additional scope items include renewal of fencing at Bloxwich North, a new Ticket Vending Machine at Cannock, and renewal of fencing and new ticket machine at Hednesford.
Gerrards Cross	Refurbishment and extension of canopy on southbound platform, installation of lift canopy on northbound platform and relocation of cycle racks to provide more spaces.
Haddenham and Thame Parkway	Installation of four new passenger waiting shelters.
Leamington Spa	Refurbishment of the waiting rooms, including Customer Information systems and speakers and CCTV; facilities to enhance access for all users, including passengers with disabilities, and provision and/or restoration of fabric and fittings key to reflect the Grade II listed status. Also planned is the refurbishment of the disabled/baby change facilities and ladies toilets, and the conversion of current staff facilities on the Southbound platform for passenger use, with the ultimate aim of creating a refreshment room.
Princes Risborough	Improvements include extension of the waiting room, new seating, new CCTV cameras, refurbishment of existing public toilets including disabled toilets, new paving on station forecourt, and additional cycle parking.
Tamworth (High level/Low level)	Improvements include resurfacing with anti-strip materials, cycle storage, and cleaning and redecorating of the main station building. Refurbishment of existing toilets, new passenger seating, new waiting accommodation, new station totem and canopy work will also be delivered.
Telford	Improvements include glazing and re-cladding to building façade, a canopy extension to platform 1, a new waiting shelter on platform 2, improvements to the internal environment (heating, doors, toilets, seating), external landscaping, new cycle facilities and a new station totem.
University	Improvements include widening of platform 2, provision of cycle storage, new station signage and renovation of the waiting room.
Warwick	Refurbishment of the public subway, including new flooring, lighting, wall cladding and improved drainage system. Basic fabric improvements will also be made to a currently disused room for use by passengers, with the ultimate aim of developing a refreshment room.
Wendover	Installation of Disabled Disability Act (DDA) compliant footbridge including lifts. Funding has also been derived from Network Rail renewals, Chiltern Railways and DfT Access for All small schemes.
Wolverhampton	Work focusing on island platforms (2 and 3) include remodel of waiting room and extension of canopy to new footbridge.

The following schemes, which are funded through the CP4 Delivery Plan, directly interface with the Evergreen 3 project with the overall aim of improving capacity and journey times between London Marylebone and the West Midlands.

- Aynho Junction to London Marylebone linespeed improvements:

The scheme focuses on raising the linespeed at Aynho Junction (between Bicester and Banbury) in both directions. In the up direction (towards London) the linespeed will be increased from 60mph to 90mph and in the down direction (towards the West Midlands) the junction speed will be increased from 40mph to 85mph. The scheme will contribute a journey time reduction of 1 minute towards the overall achievement of the 100 minutes journey time objective between London Marylebone and the West Midlands. The aim for completion is April 2011.

- South Ruislip loop:

This scheme comprises track and signalling alternations at South Ruislip in connection with wider remodelling being developed by the Evergreen 3 project to provide capacity and linespeed improvements. It will enable a timetable recast so that stations between London and Gerrards Cross can receive additional inner suburban trains. These services will be looped to allow faster services to overtake during the morning and evening peak hours. This will create additional capacity for key markets such as Beaconsfield, High Wycombe, Haddenham and Thame Parkway and Bicester. Detailed design work is in progress with an aim to complete the overall works at Northolt in April 2011.

4.2.2.4 Metropolitan line resignalling

The subsurface lines resignalling programme is due to be completed by 2018. It is anticipated that the Metropolitan line will be completed before then. In addition to the signalling upgrade works, planned changes include relocation of the signalling to a central location and introduction of new London Underground eight-car 'S' type rolling stock.

4.2.2.5 West Midlands resignalling programme

Table 4.3 outlines the signalling renewals, including proposed enhancement works, planned in the RUS area between 2009 and 2014. The signalling renewals work will replace life-expired assets with modern equivalent equipment. The RUS will consider the renewed enhanced network as the baseline infrastructure during its development.

4.2.2.6 Access for All

Access for All, a 10-year initiative launched by the DfT in 2006 to make more than 200 smaller stations across the country accessible for all, is part of the Railways for All Strategy, which aims to address the issues faced by mobility impaired passengers using railway stations in the UK. Central to the strategy is the commitment of £35 million nationally per year, until 2015, for the provision of an obstacle-free, accessible route to and between platforms at priority stations. This generally involves the provision of lifts or ramps, as well as associated works and refurbishment along the defined route. The stations currently included within the West Midlands and Chilterns RUS area are outlined in Table 4.4.

4.2.2.7 Birmingham Moor Street platforms 3 and 4 reconnection

This scheme will reinstate the connection to the terminal platforms at Birmingham Moor Street station to decongest the through platforms which are currently crowded. The scheme includes the replacement of the bridge deck outside the station, which will be funded by the Network Rail Discretionary Fund. The expected completion date for the scheme is December 2010.

4.2.2.8 Chiltern Railways car park expansion commitments

Part of the franchise commitment made by Chiltern Railways includes the commitment to provide 1,444 new car parking spaces, with a life expectancy of 25 years, at stations on the Chiltern route by 31 March 2011. The plans include the requirement to ensure that all of the parking space areas have appropriate levels of lighting and security. Table 4.5 outlines the minimum number of additional spaces to be created at the listed stations.

4. Planned changes to infrastructure and services

Table 4.3 – Signalling renewals, including proposed enhancement works, planned in the RUS area between 2009 and 2014

Project	Proposed work including enhancement schemes	Opportunities	Planned completion date
Shirley – Stratford-upon-Avon resignalling	<ul style="list-style-type: none"> relocate signalling control to the West Midlands Signalling Centre (WMSC) improved headways between Stratford-upon-Avon and Wood End new crossover at Stratford-upon-Avon for access to platforms 2 and 3 provision of a crossover and shunt signal at Whitlocks End to provide a new turn back facility rationalisation of the track layout at Bearley Junction and Henley In Arden. 	<p>Helps to facilitate future linespeed improvements on the Stratford-upon-Avon line.</p> <p>Helps to enable future service enhancements including the potential to extend the existing service to Whitlocks End and support a potential 20-minute service frequency between Stratford-upon-Avon and Birmingham.</p>	2010
Oxley resignalling	<ul style="list-style-type: none"> relocate signalling control to the West Midlands Signalling Centre (WMSC). 	Signals will be spaced for 90mph operation on the main line to facilitate potential future linespeed enhancement.	2010
Water Orton resignalling	<ul style="list-style-type: none"> relocate signalling control to the West Midlands Signalling Centre four aspect signalling between Nuneaton and Water Orton East junction and three aspect signalling between Park Lane Junction and Aldridge reduced signalling headways on the Sutton Park line and between Water Orton and Nuneaton remodelled junctions at Water Orton and Landor Street. 	Delivers increased capacity, increased operational flexibility and improved performance.	2012
Kidderminster/Hartlebury resignalling	<ul style="list-style-type: none"> relocate signalling control to the West Midlands Signalling Centre reduced signalling headways between Stourbridge Kidderminster higher entry and exit speeds in and out of Kidderminster goods loop new facing crossover at Stourbridge Junction. 	Delivers improved capacity and operational flexibility on the line.	2012/13
Walsall and Cannock resignalling	<ul style="list-style-type: none"> relocate signalling control to the West Midlands Signalling Centre provides signal spacing for 75mph running electrification of the slow lines reduced signalling headways on the Sutton Park line new crossover at Tame Bridge. 	Delivers increased capacity, increased operational flexibility and improved performance.	2013

Table 4.4 – Access for All programme of works

Station	Status
Kidderminster	Completed
Worcester Shrub Hill	Completed
Northfield	2009-11
Selly Oak	2009-11
Sutton Coldfield	2009-11
Henley in Arden	2012-15
Hereford	2012-15
Shirley	2012-15

Table 4.5 – Minimum number of new car parking spaces to be provided at stations by 31 March 2011

Station	Minimum number of new spaces
Gerrards Cross	80
Haddenham & Thame Parkway	200
Bicester North	150
Warwick Parkway	100
Leamington Spa	80
Banbury	200
High Wycombe	200

Over 1,008 new spaces have already been delivered at six stations.

4.3 Uncommitted enhancement schemes

The following are the uncommitted schemes which, if implemented, would have a significant impact within the RUS area.

4.3.1 Signalling renewal schemes in development

A number of resignalling plans are in the early stages of development, with work focusing on determining the scope and benefits which will be delivered. These signalling renewal plans include the Banbury area, Birmingham New Street station area, Droitwich Spa, Wolverhampton area and Worcester area and it is anticipated that these schemes will be delivered during CP5 (2014–19).

Wolverhampton resignalling

The Wolverhampton resignalling project will renew life-expired assets in the Wolverhampton area with modern equivalent equipment. The signalling assets in the Wolverhampton station area, around Bushbury Junction and Dudley Port will be addressed as part of these planned works. The scheme aims to deliver increased capacity, operational flexibility and improved performance. Signalling control will be relocated to the West Midlands Signalling Centre. The project will also include remodelling

work at Bushbury Junction which will simplify the track layout. Four aspect signalling and axle counter train protection will be implemented as part of the scheme. The project is considering an enhancement to provide additional signals which will deliver a capacity improvement. This project is planned for completion during CP5.

Banbury resignalling

The Banbury resignalling project will renew life-expired signalling equipment in the Banbury area, integrating switch and crossing renewals. The signalling assets in the Banbury area are approaching the end of their useful life at a time when their condition can impact on performance and reliability. Remodelling of the Banbury area will present opportunities to renew life-expired track and simplify the track layout, by aligning the switch and crossing replacement programme with the timescales and scope of the resignalling. With the remodelling and resignalling work there will also be opportunities to enhance the capability of the infrastructure, which may include an improvement in headway between Banbury North and the fringes to Marylebone and Oxford signalbox areas, improved operation of Banbury station, and improved access and egress from the other existing platforms. The project is considering a recast of the stabling arrangements at Banbury for passenger rolling

4. Planned changes to infrastructure and services

stock and engineers' plant, potential changes to crossover arrangements around the station, possible bi-directional working over the down line between Banbury and Aynho Junction and reconfiguration of the looping arrangements at the north end of Banbury. This project is planned for completion during CP5.

Birmingham New Street renewals

Birmingham New Street Power Signal Box (PSB) controls a multiple route, high density part of the railway. The scope of this project is to renew all life-expired signalling equipment in the Birmingham New Street PSB control area and to transfer control to the West Midlands Signalling Centre. The boundaries of the project are Five Ways, Smethwick Galton Bridge, Hamstead, Aston, Berkswell, and Adderley Park. The project will consider the options for increasing capacity and linespeed across the area. The use of bi-directional signalling and additional turn back moves to increase flexibility, together with rationalisation of junction layouts to decrease occupation times, are also being investigated. The project is planned for completion during CP5.

Worcester area signalling renewals

There are plans for signalling renewals in the Worcester Area (Worcester Tunnel Junction, Worcester Shrub Hill and Henwick signalboxes) and at Droitwich Spa signal box. The plans include a mixture of complete renewals activity and some elements of life extension.

4.3.2 Wolverhampton to Shrewsbury linespeed improvements

This is an enhancement scheme to deliver journey time reductions on the Wolverhampton to Shrewsbury route. This project is jointly funded by the Network Rail Discretionary Fund and West Midlands regional funding, although the status of this funding is to be confirmed following the Government's Comprehensive Spending Review. The project aims to raise the linespeed from the existing 70mph to 90mph over a distance of around 20 miles, which will help to deliver journey time reductions, increased capacity, timetable flexibility and performance resilience at both Shrewsbury and Wolverhampton.

4.3.3 Cannock line linespeed improvements

This scheme aims to increase the linespeed on the route between Ryecroft Junction (Walsall) and Rugeley from the current 45/50mph to 75mph. The increase will apply to approximately 11 miles of the route in both directions. The objective of the scheme is to enable a timetabled reduction in journey time for passenger services on the route, in order to encourage growth in passenger travel and modal shift, thereby realising socio-economic benefits. The

current plan is for the scheme to be part funded by the Network Rail Discretionary Fund and part funded by a third party. To enable efficient delivery of the scheme, the track, structures and platform works would be delivered by the project, and the signalling works would be delivered separately by the Walsall and Cannock resignalling scheme. It should be noted that it is anticipated that the linespeed increase would be implemented following the completion of the resignalling scheme in 2013.

4.3.4 Stretton and Cannock freight terminals

A new Strategic Rail Freight Interchange is being developed for connection to the network at Stretton, located between Wolverhampton and Penkridge. The 200-acre regional logistic site is expected to be similar to Daventry International Rail Freight Terminal and has a target commercial development of 3.5 million square feet, within easy access of the motorway network. The proposal is to provide two loops for the receipt and despatch of trains up to 775 metres in length, linked to the network by both north and south connections and crossovers. The terminal itself will be to the south of the loops and comprise up to six sidings. There is a significant interface with the Wolverhampton resignalling project and delivery of the main signalling and track works may coincide with the resignalling project, currently expected in 2015. Current analysis indicates that there is sufficient capacity on the network to accommodate rail services to and from the proposed terminal site and no performance risk on other trains will result.

Elsewhere in the RUS area there is an aspiration to establish rail services to its existing intermodal facility (on the site of the former Mid-Cannock Colliery). The 28-acre site has a capacity of about 5,000 20-foot-equivalent units and an existing rail connection, which would be utilised to provide access to a new siding development. There is sufficient capacity on the network to accommodate rail services to and from the Cannock site without impacting on the performance of other trains.

4.3.5 Coventry to Nuneaton rail upgrade

Network Rail is working with Coventry City Council, Warwickshire County Council and Centro on a project to enhance the transport links between Nuneaton, Bedworth and Coventry. Locations along the route were identified as a major growth area in the former West Midlands Regional Spatial Strategy and there are a number of potential locations along the route that could receive significant additional housing. It is forecast that these demands will increase car use and congestion unless there is a good quality public transport alternative.

The proposed scheme includes plans for a new six-car bay platform at Coventry station, new stations at Coventry (Ricoh) Arena and Bermuda Park, and

the extension of platforms at Bedworth station to accommodate three-car trains. The aim is to double the existing hourly service frequency and replace the current single rail car with two-car trains. For events at Ricoh Arena this service would be supplemented by a six-car shuttle service between Coventry and Arena stations, where a new crossover is being provided to allow services to terminate. The new bay platform at Coventry will remove services from the main through platforms at the station, thus delivering capacity and performance benefits.

The route has recently been resigalled with five-minute headways which provides sufficient capacity to handle both the current and future freight traffic alongside the proposed passenger service. Timetabling work has shown that it is possible to operate a half-hourly service from Nuneaton Platform 1 with the scheduled freight traffic that uses this platform.

The scheme is currently in development (Guide to Railway Investment Projects Stage 4), and a major scheme business case has been submitted to the DfT for a funding decision.

Other enhancements being developed in the area include the Friargate major commercial regeneration project and plans to alter traffic flows around Coventry station area, with a potential new access to the station.

4.3.6 Kenilworth station

A third-party scheme is in development to provide a new station at Kenilworth in Warwickshire. A new station in the town would give residents local access to the national rail network and encourage increased use of rail for journeys that might otherwise be undertaken by car. This would help improve accessibility, reduce road congestion and aid economic regeneration in the area through increased access to jobs, education and leisure opportunities. A potential service pattern is currently being investigated.

4.3.7 Stratford Parkway

A third party scheme is in development to provide a new parkway station in Bishopton, near Stratford-upon-Avon, with an aspiration to increase train services between Stratford-upon-Avon and Birmingham. The plan includes the provision of park and ride facilities which would save people from driving into Stratford-upon-Avon town centre to get the train at the existing station. Local developments at the existing station location will limit the potential to further expand the current car park and therefore will constrain the ability of passengers to access the station. Stratford Parkway would mitigate against the increased pressure on the existing Stratford station car park and enable a potential increase in train service frequency to cater for demand generated by the significant new

housing developments planned to the north-west of the town.

4.3.8 Birmingham Snow Hill improvements

Consideration is currently being given to enhancements which may help to facilitate service improvements on the Birmingham Snow Hill line. These include the potential to increase the linespeed between Birmingham Snow Hill and the Jewellery Quarter and an evaluation of options to upgrade the station facilities at Birmingham Snow Hill station. The opportunity to reinstate Platform 4 at Birmingham Snow Hill for heavy rail use following the proposed extension of metro services to the city centre is also being investigated.

4.3.9 East-West Rail

The primary objective of this initiative is to improve east-west connectivity in the Oxford to Cambridge arc. The East-West Rail consortium is planning to reopen railway lines and reintroduce passenger services from Oxford and Aylesbury to Bletchley and Milton Keynes. The primary purpose of the reopened railway is to act as a local transport link to support growth and development, as well as ease traffic congestion problems in Oxford, Bletchley and Milton Keynes. Further development of the route would deliver significant capacity on the Cherwell Valley and other existing routes and is seen as a long-term strategic route, supporting inter-regional passenger services and creating an alternative freight route between the South of England and the Midlands, the North and Scotland.

4.3.10 High Speed 2 Limited

In 2008, Network Rail commissioned a study to consider the case for a new rail line in the UK. The study found a high speed line from London to Birmingham, Manchester and Scotland.

High Speed 2 Limited (HS2 Ltd) is the company formed by the Government in January 2009 to further consider the case for high speed rail services from London to the West Midlands, northern England and Scotland. HS2 Ltd is currently considering the feasibility and credibility of potential options, and the results of this work will inform the Government's overall strategy and programme for establishing a high speed rail network.

4.3.11 The Station Travel Plan initiative

The Station Travel Plan initiative aims to deliver further improvements to stations across the network. It addresses integrated public transport on a national basis and considers ways to reduce the environmental impact of transportation through promotion of 'smarter transport choices'. Within the RUS area, Kings Norton and Leamington Spa have been selected as pilot stations and practical steps are being taken to support walking, cycling, public transport and car-sharing opportunities.

4. Planned changes to infrastructure and services

4.4 Planned service changes

The section below outlines the major planned service changes within the RUS area during CP4:

4.4.1 December 2010 timetable change

This planned timetable change deploys the use of loco-hauled services on selected Chiltern peak-hour trains and two-car Class 172s for use by Chiltern Railways at the south end of the route to improve the journey time of Chiltern Railway's London Marylebone to Birmingham service by approximately 10 minutes. This is a timetable and rolling stock based initiative and requires the committed investment in infrastructure to reinstate two terminal platforms at Birmingham Moor Street and the modification of speeds to enable the operation of the loco-hauled services between Tyseley and Aynho Junction.

The following changes to the London Underground Limited services on the Metropolitan line between Amersham and Baker Street would be provided based upon the December 2012 timetable:

- eight-car S-stock with higher speed and increased capacity (less seating capacity but more standing space increases overall capacity)
- four additional trains between Amersham and Baker Street per period (approximately 130 minutes)
- total of four trains between 8:00 and 9:00 instead of the current two.

Arriva Trains Wales plan in December 2010 to introduce five additional return services between Wolverhampton and Shrewsbury services on Sundays. This will help to provide additional capacity to cater for increased passenger demand between Wales and the West Midlands.

4.4.2 2011 timetable change

This change is facilitated by the first part of the Evergreen 3 project (£100m to improve the linespeed south of Banbury) which aims to achieve a journey time between London Marylebone and Birmingham of one hour 40 minutes. The infrastructure enhancements required to deliver this include linespeed improvements between Neasden and Ruislip, the remodelling of Northolt, West Ruislip, Princes Risborough and Aynho Junction, and linespeed improvements from West Ruislip to just south of High Wycombe.

The scheme will enable a timetable recast to reduce the number of stops made by long distance trains, whilst sustaining frequencies at key locations. It will facilitate potential additional inner-suburban trains between Gerrards Cross and London Marylebone. These services will be timetabled in such a way as to allow faster services to overtake at West Ruislip in the morning peak towards London, and with a similar arrangement at South Ruislip in the evening peak. The benefits of the new timetable structure comprise enhanced capacity provision for key markets such as Beaconsfield, High Wycombe, Haddenham and Thame Parkway and Bicester, consequent from the concentration of inner stops proposed.



4.4.3 May 2012 timetable change

The second stage of the Evergreen 3 project aims to re-link Oxford and High Wycombe through the creation of a new double track curve line linking the Chiltern route just south of Bicester North with the Bicester Town to Oxford line.

4.5 Depots and stabling

It is recognised that the current capacity and facilities available at the electric depot (Soho) within the RUS area may not be able to accommodate any significant increase in additional vehicles required to meet predicted growth. London Midland, Network Rail and the DfT are considering the potential to use the disused carriage sidings and the wagon repair shop at Duddeston, as the most effective site for depot facilities in the area. Depending on the specification of the new electric rolling stock, facilities at current depots will also need to be reviewed as an integral part of the programme.

A study is currently being undertaken to look at the key risk areas relating to the stabling provision at Duddeston, notably track, signals, power, operational flexibility and performance.

A strategic solution to the future provision of adequate depot and stabling facilities is a network-wide issue and will therefore be considered as part of the Network RUS.

5. Planning context and future demand

5.1 Introduction

This chapter considers the planning context for the West Midlands and Chilterns RUS. In order for a RUS to be successful, it needs to develop the railway in a way that accommodates the future requirements of the network based on an understanding of the wider planning and development context in which it is set.

During the development of this RUS, the UK has undergone a change of government and consequently a new approach to local planning has been introduced. These changes have taken place during a challenging time for the UK economy due to the impact of a global recession and the need to significantly reduce the national budget deficit. The immediate focus has been on reducing the deficit and increasing the drive for efficiency savings.

As this Draft for Consultation is published, the future strategy for local government planning is still being determined. The changes being made focus on providing local councils with more flexibility and responsibility to enable them to concentrate on local priorities and manage their budgets more effectively. As local budgets have been reduced as part of the wider Government spending review, the guidance given is for local authorities to use the knowledge and understanding previously used to inform regional strategies and local plans to shape their future priorities.

As part of the emerging changes to local authority planning, the Government has proposed that the responsibilities previously undertaken by the Regional Development Agencies shall be assumed by new Local Enterprise Partnerships (LEPs). At the present time, it is still unclear how responsibility will be distributed at local level, but it is anticipated that transport will be a key area which the LEPs will influence. Early plans also suggest that LEPs may receive a mix of capital and revenue funding through the Regional Growth Fund.

In order for the RUS to understand the priorities for rail in the medium and longer term, it has been vital to consult established planning documents and to work closely with local planning and development bodies in the interim period until the changes are confirmed. It is important to recognise that whilst some of the regional strategies have recently been revoked, the key issues and aims outlined in them are likely to continue to be significant in local government planning and therefore are still of relevance in helping to establish the wider planning context for this RUS.

It is important to recognise that the Government is committed to long-term sustainable transport planning, and rail will have an essential role to play in this. It is worth noting that, even during the recession, rail has continued to experience growth across many market sectors, and forecast changes in population, housing, economy and employment will have an influence on future rail demand.

The following documents have been influential in the RUS process for understanding the planning context in which it is set:

- Regional Planning Assessment for the West Midlands (Department for Transport (DfT), 2006)
- Regional Planning Assessment for the Thames Valley (DfT, 2007)
- Regional Spatial Strategy for the West Midlands (NB. this strategy has now been revoked)
- South East Plan
- Regional Economic Strategy for the West Midlands
- Regional Economic Strategy for the South East
- Delivering a Sustainable Transport System (DfT, 2008)
- The Future of Air Transport (DfT, 2003)
- The Strategic Rail Authority West Midlands Route Utilisation Strategy (SRA, 2005)
- Network RUS: Scenarios and Long Distance Forecasts (2009)
- Network RUS: Electrification Strategy (2009)
- Freight Route Utilisation Strategy (2007)
- West Midlands Rail Development Plan (Centro, 2009)
- North-South rail links in Buckinghamshire (Chiltern Railways, 2008)
- Draft Replacement London Plan (2009)
- Mayor's Transport Strategy (2010).

5.2 Regional planning assessments

The Thames Valley and West Midlands Regional Planning Assessments (RPA) for the railway, published by the Department for Transport (DfT) in June 2007 and July 2006 respectively, consider

the impact of future levels of growth across the rail network and the capacity issues that may emerge from this over the short, medium and long term to 2026. Their focus is on responding to demand, improving rail performance for passenger and freight customers and developing rail's contribution to the improvement of national productivity.

The Thames Valley RPA focuses on rail's role in helping to establish London as a 'world city' as well as strengthening the local economies of other key urban centres. It highlights the importance of rail for linking employers to sources of skilled labour and supporting the growth and integration of London and the south with other regional economies.

The RPA also identifies the Thames Valley as an economic location in its own right. It highlights the fact that the area has experienced population and employment growth significantly above the national average in recent decades and expects this to continue over the next twenty years. In the short to medium term there are plans to promote this growth through the delivery of housing in Aylesbury Vale and the development of Aylesbury as a regional hub, supported by an enhanced public transport system. The role of the Chiltern rail network is seen as fundamental to delivering these regional planning objectives.

The RPA forecasts passenger growth for morning peak arrivals (trains arriving 07:00-09:59) into Marylebone to increase by up to 45 per cent by 2026, and highlights journeys from High Wycombe and Aylesbury into London as having the highest levels of growth. The impact of this growth on capacity is outlined, and it is estimated that on the Aylesbury route crowding via Amersham would become a problem by 2026.

The need to develop intra-regional travel is underlined within the RPA. The relatively poor connectivity between places along the Chiltern route and the rest of the region, the relatively slow journey time between Aylesbury and London and the low service frequency at stations between South Ruislip and London Marylebone are outlined as key transport issues for the area. It also highlights the importance of London Heathrow Airport and the need to improve access from the Thames Valley area. There is an increasing need to address these issues, especially in the light of the fact that the motorways in the Thames Valley area are among the most heavily congested parts of the national road network.

The West Midlands RPA sets similar goals for rail over the next 20 years based on the forecast demand for travel into central Birmingham, the growth in demand for interurban travel between Birmingham and other major cities and towns (especially Worcester, Shrewsbury, Leicester and Northampton), and the significant growth plans at Birmingham International Airport and the National Exhibition Centre. The RPA bases its growth predictions on a base demand forecast scenario in

the region of 22 per cent to 47 per cent between 2002 and 2026 depending on the corridor.

Rail is recognised in the RPA as having about 20 per cent share of the journey to work market into central Birmingham, between 08:00 and 08:59 hours. Birmingham city centre is a key employment location and the recent regeneration and retail expansion have also boosted the increased levels of passenger growth.

The need to improve access to rail stations within the West Midlands area is considered a key requirement for meeting demand. The fact that 40 per cent of the region's population lives further than two kilometres from a railway station means that car parking capacity, integration with other modes of transport and the development of railway stations as interchanges are key areas for review promoted in the RPA and local transport plans.

5.2.1 Regional Spatial Strategies

The Regional Spatial Strategies (RSS) for the West Midlands and the South East (The South East Plan) were developed by the former Regional Development Agencies (RDA) to set the spatial framework for the future development of the regions from 2006 to 2026. Whilst the RDAs and these strategies have now been abolished following the change in UK Government, they have played an influential part in setting the wider planning context for this RUS and still have relevance in outlining the local issues and potential solutions to these. It is important to recognise that the proposals being developed for new LEPs draw upon the experience of the former local planning authorities which produced the RSSs.

The RSSs sought to tackle the major challenges that both regions face in the next 30 years, with their key aim being the need to more closely integrate investment decisions with economic, environmental and social objectives. Rail's role to support the delivery of economic and housing growth within both RSS areas is emphasised, particularly for expanding areas such as Aylesbury Vale and the Black Country. This will continue to be a significant theme in any future local planning strategies.

Improving inter and intra-regional connectivity and access to the wider European and international markets is promoted in both strategies. The need to deliver journey time improvements and increase accessibility to rail forms the basis of key transport policies. The South East Plan describes an area which is a fundamentally outward looking region which relies on its relationship with external regions, particularly London. The West Midlands RSS also emphasises relationships with external areas due to the region being at the centre of the national transport network. It focuses specifically on the functional links with the East Midlands, North West, South East, South West and Wales. Both strategies

5. Planning context and future demand

therefore encourage improvements in the efficiency of freight movements, enhancements to the links both within the region and beyond, and the development of new rail freight terminals.

The South East Plan also highlights the fact that while economic activity in the region remains dominated by London, some areas are also becoming more economically self-contained. One of the key concepts outlined in the strategy is the importance of regional 'hubs', which are centres where the provision of a range of multi-modal transport services support economic, cultural and service activity. The South East Plan identifies a network of 21 regional hubs which represent the centres of economic activity. Of these, Aylesbury and High Wycombe are within the West Midlands and Chilterns RUS area. A key aim for local planning in these areas is to further promote the network of regional hubs and provide a sustainable transport system to support this.

The West Midlands RSS focuses on the need to concentrate development in the major urban areas, which includes Birmingham, Solihull, the Black Country and Coventry. There has been significant development in Birmingham in the last 10 years in educational, retail, cultural and leisure facilities. The changes in employment from manufacturing to distribution and catering, financial and business, and public services is expected to stimulate cultural and economic diversity and growth, and to further encourage the relocation of jobs towards the city centre. The RSS identifies Birmingham as a world city and future priorities focus on diversifying and modernising the economy, improving the skills of the workforce and promoting the region's competitiveness and assets in a global setting.

5.2.2 Regional economic strategies

The regional economic strategies (RES) were produced by the former Regional Development Agencies to address the specific economic needs of a region and provide a framework for regional development by setting priorities and targets for its delivery. The issues and framework outlined in these strategies have provided background information for understanding the economic context for the RUS area, although the downturn in the UK economy following the impact of a global recession and the changes in local planning have also been important considerations during the development of this strategy.

The vision presented in the South East RES was that, by 2016, the South East would be a world class region achieving sustainable prosperity. The RES supported the regional hubs identified in the South East Plan and focused on development in the urban areas. The plan specifically recognised the need to improve the accessibility of Aylesbury to enable growth. The RES also supported the need for the region to improve accessibility from relatively remote and rural areas.

The West Midlands Economic Strategy presented a similar vision of a 'world class region' and focused on sustainable development to achieve high productivity and employment levels, and support a continued globalisation. A key challenge for achieving the goals outlined in the plan was improving public transport links, especially in rural areas, and promoting a shift away from car use. Three high technology corridors were identified as areas where activity to promote high technology, innovation and knowledge transfer can take place. These were the Central Technology Belt, Coventry, Solihull and Warwickshire Technology Corridor and the Wolverhampton to Telford Technology Corridor.

5.2.3 Delivering a Sustainable Transport System

Delivering a Sustainable Transport System (DaSTS) is the DfT's response to the recommendations of the Eddington Report on transport and the economy and the Stern Review on the economics of climate change. The DaSTS approach divides the transport system into national networks, international networks and gateways, and city and regional networks. A number of regional transport studies have been commissioned by the DfT as part of the overall programme, and the outputs from the studies will be used for determining funding decisions for the five-year period from 2014 to 2019.

The main DaSTS report, published in November 2008, outlines five goals for transport, focusing on the challenge of delivering strong economic growth while at the same time reducing greenhouse gas emissions. It outlines the key components of the national infrastructure and discusses the difficulties of long-term planning in the context of uncertain future demand. The five goals are:

- to support national economic competitiveness and growth by delivering reliable and efficient transport networks
- to reduce transport emissions of carbon dioxide and other greenhouse gasses, with the desired outcome of tackling climate change
- to contribute to better safety and health and longer life expectancy by reducing the risk of death, injury or illness arising from transport and by promoting travel modes that are beneficial to health
- to promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society
- to improve quality of life for transport users and non-transport users, and to promote a healthy natural environment.

Rail has the potential to help meet these objectives and Network Rail will continue to engage with the regions and local authorities at all levels of the process. The current aim is to complete the overall programme by 2012.

There are several sub-regional studies currently in progress which are relevant to the area being considered within this RUS:

- Improving connectivity in the Coventry north-south corridor – this aims to assess how transport factors might be inhibiting economic activity and what interventions might address this
- North Staffordshire connectivity – this study is examining key travel patterns for people and goods around the Stoke on Trent journey to work area
- Thames Valley DaSTS study – the objective of this study is to understand the deficiencies of the current transport system in supporting delivery of sustainable economic growth
- Milton Keynes Aylesbury Vale DaSTS study – this study also includes High Wycombe and has an emphasis on the strategic transport links required to support delivery of the substantial planned growth at key locations
- Growth Point Connectivity – Shrewsbury, Telford and Hereford – aims to address the transport issues associated with growth including smarter choices and initiatives to influence travel behaviour
- Cheltenham and Gloucester DaSTS study – the study will assess the impact of the planned housing growth and regeneration programmes on the performance of key transport corridors in these areas. It aims to develop proposals for managing travel demand and making best use of the strategic national corridor and regional and local networks in the area
- Access to Manchester (national study) – is a joint DfT/regional study considering road and rail access to/around Manchester for freight and passengers
- Access to Birmingham (national study) – is a joint DfT/regional study considering road and rail access to/around Birmingham for freight and passengers. It seeks to understand and identify measures to address issues on the national networks to, from and through the Birmingham area. It focuses on the significant gap in the output of the West Midlands economy against leading UK and European comparator regions, and aims to deliver a step-change in the economic performance of the Birmingham, Solihull and Black Country conurbation.

The studies have identified traffic congestion, poor public transport performance, overcrowding and connectivity as specific issues experienced throughout or at certain times of the day in the West Midlands. The West Midlands DaSTS stage one submission has highlighted the fact that there is a significant gap in the output of the West Midlands economy when compared to leading UK and European regions. The recommendations of each of the studies will now

be taken forward into the next stage of the work programme, subject to DfT approval.

5.2.4 The Future of Air Transport

The Government White Paper 'The Future of Air Transport' published in 2003 set out a national strategic framework for the development of airport capacity until 2030. It set out a 'balanced and measured approach' which recognised the importance of air travel and assessed the need to accommodate future demand whilst mitigating the environmental impact of aviation.

Following the White Paper, each airport has produced a Master Plan which outlines each airport's expectations for growth and sets out development plans for the future. These Master Plans have further shaped recent air transport policy. However, since the General Election in 2010, the new Coalition Government's focus for air transport policy has changed, with an emphasis on the need to make better use of existing capacity, rather than the development of new capacity.

The RUS area provides links to major airports in the UK, including direct services to Birmingham International Airport and Stansted airport, and connecting services to Manchester and Heathrow airports. Two services an hour are also provided from Birmingham New Street to Liverpool South Parkway, which has an express bus service running to Liverpool John Lennon Airport. The RUS takes cognisance of air transport policy and the surface access strategies being promoted by these airports in order to understand the needs of passengers accessing these airports by rail. The recent growth and transport policies of airports which are anticipated to have a major impact on the RUS area are outlined below.

5.2.4.1 Birmingham International Airport

Birmingham International Airport (BHX) is the sixth largest airport in the UK, and the second largest outside London. It is expected to experience a significant increase in passenger demand over the next 30 years and a Master Plan has been developed to support this level of growth. Growth forecasts for BHX presented in the new Airport Master Plan for Birmingham International Airport, published in 2007, predict that passenger numbers at BHX will increase from the nine million in 2009 to around 27 million per year in 2030.

The West Midlands Regional Planning Assessment (RPA) set an objective for supporting growth at BHX and also the adjacent National Exhibition Centre. The RUS needs to consider the forecast growth at BHX and the NEC and assess how rail can support this growth. It is important to take into account the plans for development at BHX and the targets set by the airport for increasing its passenger and employee public transport mode share by 25 per cent by 2012.

5. Planning context and future demand

5.2.4.2 Liverpool John Lennon Airport

Liverpool John Lennon Airport (LJA) has experienced rapid growth in the last 10 years, and anticipates passenger numbers to reach around eight million by 2015 and 12.3 million by 2030. The opening of Liverpool South Parkway station in 2006, supported by an integrated bus interchange serving the airport, has increased rail as a surface access choice for air passengers at LJA. LJA aims to increase access by public transport, particularly through the use of rail as an access mode.

5.2.4.3 London Heathrow Airport

London Heathrow Airport is the largest airport in the UK and currently handles around 66 million passengers per year. The opening of Terminal 5 in 2008 has supported recent growth at the airport, and the Heathrow Airport Interim Master Plan forecasts this passenger demand to increase to 87 million per year by 2015/16 and thereafter to around 90-95 million per year. The 2003 White Paper supported further development at London Heathrow Airport, with proposals for a third runway. Since the General Election, and with the new Coalition Government not supporting a third runway at London Heathrow Airport, BAA Limited (who owns London Heathrow Airport) has announced that it does not intend to proceed with a planning application for a third runway and the focus will now be on making better use of the existing runways, extending the current passenger terminals and improving access to the airport.

It is important for the RUS to recognise the forecast growth and the need to improve rail transport links to London Heathrow Airport. There is currently limited rail access from the Chiltern route to London Heathrow Airport. The demand for rail access has been significantly affected by the growth of the airport in recent years and the conditions on the wider road network. The 'North-South rail links in Buckinghamshire' report, produced for Buckinghamshire County Council by Chiltern Railways, assessed the demand for rail access to London Heathrow Airport and concluded that a rail-coach service from High Wycombe to London Heathrow Airport would generate substantial demand.

5.2.4.4 Manchester Airport

Manchester Airport is the UK's fourth largest airport, and the largest outside of London. The Manchester Airport Masterplan to 2030 predicts a continued growth in passenger numbers, with forecasts suggesting around 38 million passengers will use the airport each year by 2015, and as many as 50 million by 2030. The airport strategy to 2030 has a sustainable development commitment which includes a target for 40 per cent of all passenger and airport staff journeys to be made on public transport by 2015.

5.2.4.5 Stansted Airport

Stansted Airport is the UK's third busiest airport, serving around 19 million passengers each year. The airport has experienced significant growth in recent years, supported by the expansion of low cost airlines which generate the majority of traffic at the airport. The 2003 White Paper supported further development at Stansted Airport, with proposals for a second runway. Since the General Election, and with the new Coalition Government not supporting a second runway at Stansted Airport, BAA Limited (who owns Stansted Airport) has withdrawn the planning application for a second runway, and the focus will now be on making better use of the existing runway and passenger terminal facilities, and improving access to the airport.

5.3 Forecast passenger demand

5.3.1 Forecasting approach

The Passenger Demand Forecasting Handbook (PDFH) methodology has been used to predict future growth in passenger rail journeys in the RUS area. PDFH is the industry standard methodology for modelling growth, using demand drivers such as UK demographics, economic growth, employment growth and the characteristics of competing modes to predict the change in passenger demand. An extensive validation exercise has been undertaken to assess how well the PDFH methodology would have explained historic growth in the RUS area. A backcasting exercise for the Chiltern region showed that, once the impact of rail capacity improvement schemes such as Evergreen I and II projects were included, then PDFH methodology was able to predict the actual growth between 1998 and 2007. A similar exercise undertaken by Centro's consultants found that again PDFH methodology was able to reasonably predict historic growth between 2004 and 2007 in the West Midlands region once the impact of rail enhancement schemes was taken into account. Therefore the PDFH methodology has been used to predict passenger growth in the RUS area, with the impact of committed schemes included in the forecast.

The RUS uses passenger counts conducted in autumn 2009 and spring 2010 (post recession) in the base and it is then uplifted by the RUS passenger growth rate to estimate the level of demand in 2019. These forecasts are used to identify gaps between supply and demand by 2019 and to develop options in **Chapter 6**.

The passenger forecast represents the 'do-minimum' situation and takes into account the impact of committed schemes including the Birmingham Gateway Project, service enhancements on the Cross City corridor, committed performance improvement in Control Period 4 (CP4) and the Evergreen 3 project as outlined in **Chapter 4**. These forecasts are unconstrained by on-train crowding. Options recommended in **Chapter 6** are not included in the 'do-minimum' forecasts.

Table 5.1 – High-peak hour (08:00 to 08:59) estimated load factors on arrival at Birmingham central stations, average weekday in 2019/20

Corridor	Passenger market	Load factor: number of passengers compared to seats	Load factor: number of passengers compared to train capacity	Number of services	Estimated number of services with passengers standing	Estimated number of services in excess of capacity
Coventry	Local commuting	110 %	80 %	4	3	1
	Interurban and long distance	56 %	48 %	5	1	0
Cross City North	Local commuting	99 %	81 %	6	3	2
Cross City South	Local commuting	102 %	83 %	6	2	0
	Interurban and long distance	90 %	58 %	6	2	0
Cannock and Walsall	Local commuting	78 %	55 %	4	1	0
Derby and Nuneaton	Interurban and long distance	92 %	75 %	7	4	4
Leamington Spa & Chiltern	Local commuting	112 %	73 %	4	3	0
	Interurban and long distance	130 %	92 %	3	3	1
Shrewsbury	Interurban and long distance	120 %	76 %	3	3	3
Stafford & Wolverhampton	Local commuting	100 %	81 %	3	1	0
	Interurban and long distance	95 %	70 %	6	3	1
Stourbridge	Local commuting	113 %	71 %	7	7	1
Stratford-upon-Avon	Local commuting	111 %	68 %	4	3	0

Source: 2009/10 passenger counts conducted by Arriva Train Wales, Chiltern Railways, CrossCountry, London Midland and Virgin Trains are uplifted by the RUS forecast to 2019/20. Note: Seat and train capacity includes the additional capacities proposed in the CP4 Delivery Plan. Train capacity includes both standard class seats and standing allowance. Services are in excess of capacity when passenger loads exceed the nominal train capacity or when there are passengers standing for more than 20 minutes. This is consistent with DfT policy.

Table 5.2 – Morning three-hour peak (07:00 to 09:59) estimated load factors on arrival at Birmingham central stations, average weekday in 2019/20

Corridor	Passenger market	Load factor: number of passengers compared to seats	Load factor: number of passengers compared to train capacity	Number of services	Estimated number of services with passengers standing	Estimated number of services in excess of capacity
Coventry	Local commuting	85 %	60 %	13	4	2
	Interurban and long distance	50 %	43 %	14	3	2
Cross City North	Local commuting	68 %	55 %	18	5	3
Cross City South	Local commuting	80 %	65 %	18	3	0
	Interurban and long distance	78 %	51 %	13	4	0
Cannock and Walsall	Local commuting	60 %	44 %	11	2	0
Derby and Nuneaton	Interurban and long distance	79 %	64 %	18	6	5
Leamington Spa & Chiltern	Local commuting	90 %	57 %	10	5	0
	Interurban and long distance	95 %	63 %	6	3	1
Shrewsbury	Interurban and long distance	80 %	51 %	8	3	3
Stafford & Wolverhampton	Local commuting	82 %	66 %	6	2	0
	Interurban and long distance	79 %	57 %	14	4	1
Stourbridge	Local commuting	95 %	60 %	17	11	1
Stratford-upon-Avon	Local commuting	84 %	53 %	10	4	0

Source: 2009/10 passenger counts conducted by Arriva Train Wales, Chiltern Railways, CrossCountry, London Midland and Virgin Trains are uplifted by the RUS forecast to 2019/20. Note: Seat and train capacity includes the additional capacities proposed in the CP4 Delivery Plan. Train capacity includes both standard class seats and standing allowance. Services are in excess of capacity when passenger loads exceed the nominal train capacity or when there are passengers standing for more than 20 minutes. This is consistent with DfT policy.

5. Planning context and future demand

The following sections present passenger growth in the West Midlands region, to and from Birmingham, and demand to London Marylebone by route and market sector. The impact of this growth on peak-hour train loadings in 2019 for services into Birmingham and into London Marylebone is also estimated.

5.3.2 Passenger forecasts – West Midlands region

The number of passenger rail journeys made to, from and within the West Midlands region of the RUS area is predicted to increase by 30 per cent between 2008/09 and 2019/20, equivalent to a 2.4 per cent increase per annum.

Centro also commissioned consultants to develop their own set of passenger rail forecasts at a more disaggregated level (eg. by station, corridor and time of day) under various scenarios (eg. with and without uncommitted schemes) for their multimodal transport appraisal purposes. Their aggregated unconstrained forecast that includes the impact of committed schemes predicts all day demand to grow by approximately 28 per cent between 2008 and 2019, which is similar to those developed specifically for the RUS.

5.3.3 Passenger forecasts – Birmingham

The number of passenger rail journeys to or from Birmingham is predicted to increase between 2008 and 2019 by 32 per cent in the peak and a similar growth rate is predicted for all day. This is equivalent to 2.6 per cent per annum. Factors that have been working in favour of rail, such as growing population, structural changes in employment markets, road congestion in Birmingham city centre and increased competitiveness of rail will continue to drive growth in rail demand to Birmingham.

5.3.4 Passenger loadings versus capacity – Birmingham in 2019

The RUS compares the level of demand in 2019 against committed capacity and this identifies gaps in each corridor. Train capacity includes both standard class seats and standing capacity. Typical commuter rolling stock has a standing capacity of 40 per cent of seats although it can vary significantly by rolling stock type. For typical interurban and long distance rolling stock, the standing capacity is around 20 per cent of seats.

The impact of the RUS growth forecast on crowding by 2019 is shown in **Tables 5.1** and **5.2** for the high-peak hour (08:00 to 08:59) and three-hour peak (07:00 to 09:59) respectively. These represent the total number of passengers carried as a proportion of seats and as a proportion of the nominal train capacity, for each corridor, along with the number of services estimated to have passenger standing. Services are considered to be in excess of capacity when passenger loads are more than the nominal

train capacity or when passengers are standing for more than 20 minutes. This is consistent with DfT policy. The proposed vehicles provided through the CP4 Delivery Plan are included to derive the capacity level in 2019.

It should be noted that the seating and train capacity utilisation on the busiest services are higher than the average figures presented in **Tables 5.1** and **5.2**. In general, when the average load factor exceeds 70 per cent, there are likely to be individual services with passengers standing. When the load factor exceeds 90 per cent, the number of passengers on the busiest services is likely to exceed the nominal train capacity that includes standing capacity.

The build-up of the high-peak hour demand against the committed train capacity in 2019 on the local commuter service is presented in **Figure 5.1** to **Figure 5.3**. These graphs plot the total passenger loading against capacity across all trains in the high-peak hour. Therefore on the busiest trains, standing tends to start earlier and capacity utilisation is generally higher than those illustrated in the graphs.

Most corridors are predicted to experience higher levels of crowding in 2019 than current despite the additional vehicles provided by the CP4 Delivery Plan. Every corridor is predicted to have some passengers standing over relatively short distances and some services would have more passengers than the nominal train capacity. More capacity is likely to be required on some corridors to meet future demand, subject to business case and funding being available. The options developed to address these gaps are presented in **Chapter 6**. The following sections discuss each corridor in turn.

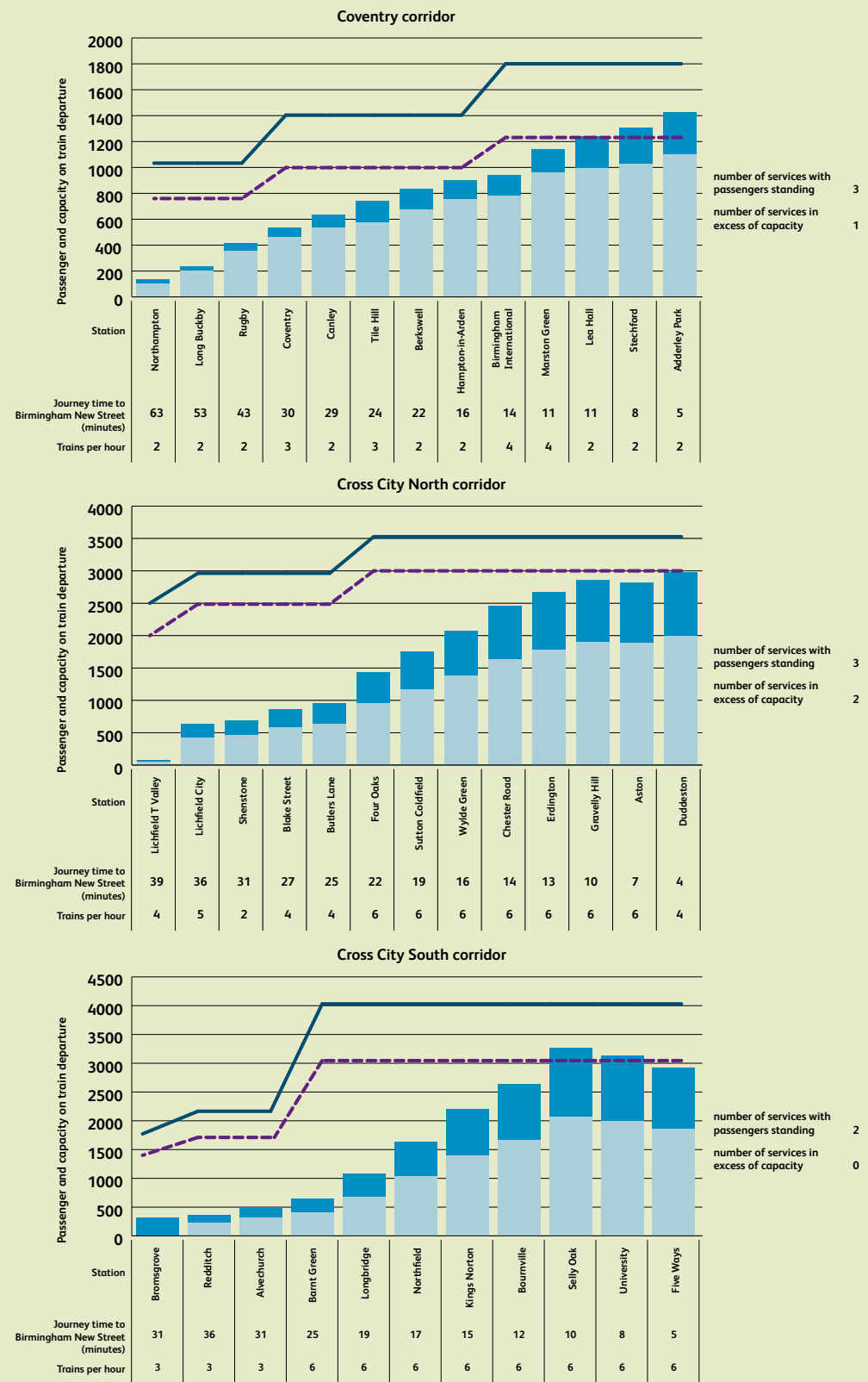
5.3.5 Coventry corridor

The latest operational plan submitted by London Midland indicates that there are plans in CP4 to lengthen the current busiest local suburban service on the Coventry corridor by four cars. This would provide sufficient seating capacity on this particular service. However, on peak-hour services that are not planned to be lengthened under this plan, analysis indicates that more passengers would be required to stand in 2019 and most high-peak hour services would have passengers standing from Marston Green inwards. The busiest train is predicted to have passengers standing from as far as Berkswell, which is more than 20 minutes from central Birmingham and therefore the service would be operating over train capacity.

The RUS assumes that all services formed of Class 390 rolling stock from London Euston to Birmingham/Wolverhampton in the morning peak will be lengthened from nine-car to 11-car by 2019 and this would help to reduce crowding. However, on the non-London long distance services there will be standing on more services particularly in the peak-hour and this is addressed and discussed in detail in **Chapter 6**.

Figure 5.1 – Estimated passenger loadings and capacity for local commuting services into Birmingham by corridor in the morning high-peak hour in 2019

- Train capacity (seating and standing capacity)
- Seats
- Passenger loadings 2009
- Passenger growth to 2019



5. Planning context and future demand

Figure 5.2 – Estimated passenger loadings and capacity for local commuting services into Birmingham by corridor in the morning high-peak hour in 2019

- Train capacity (seating and standing capacity)
- Seats
- Passenger loadings 2009
- Passenger growth to 2019

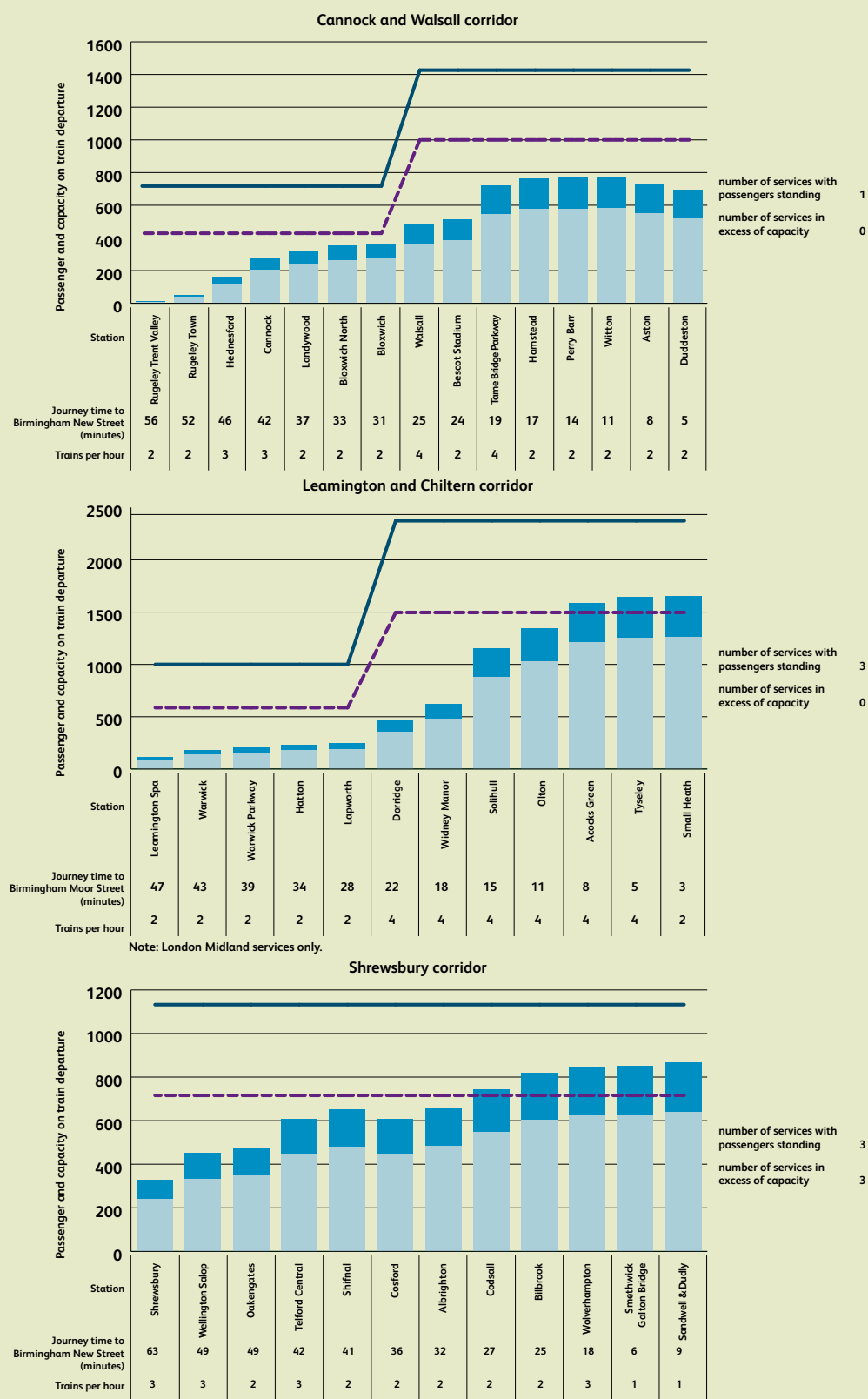
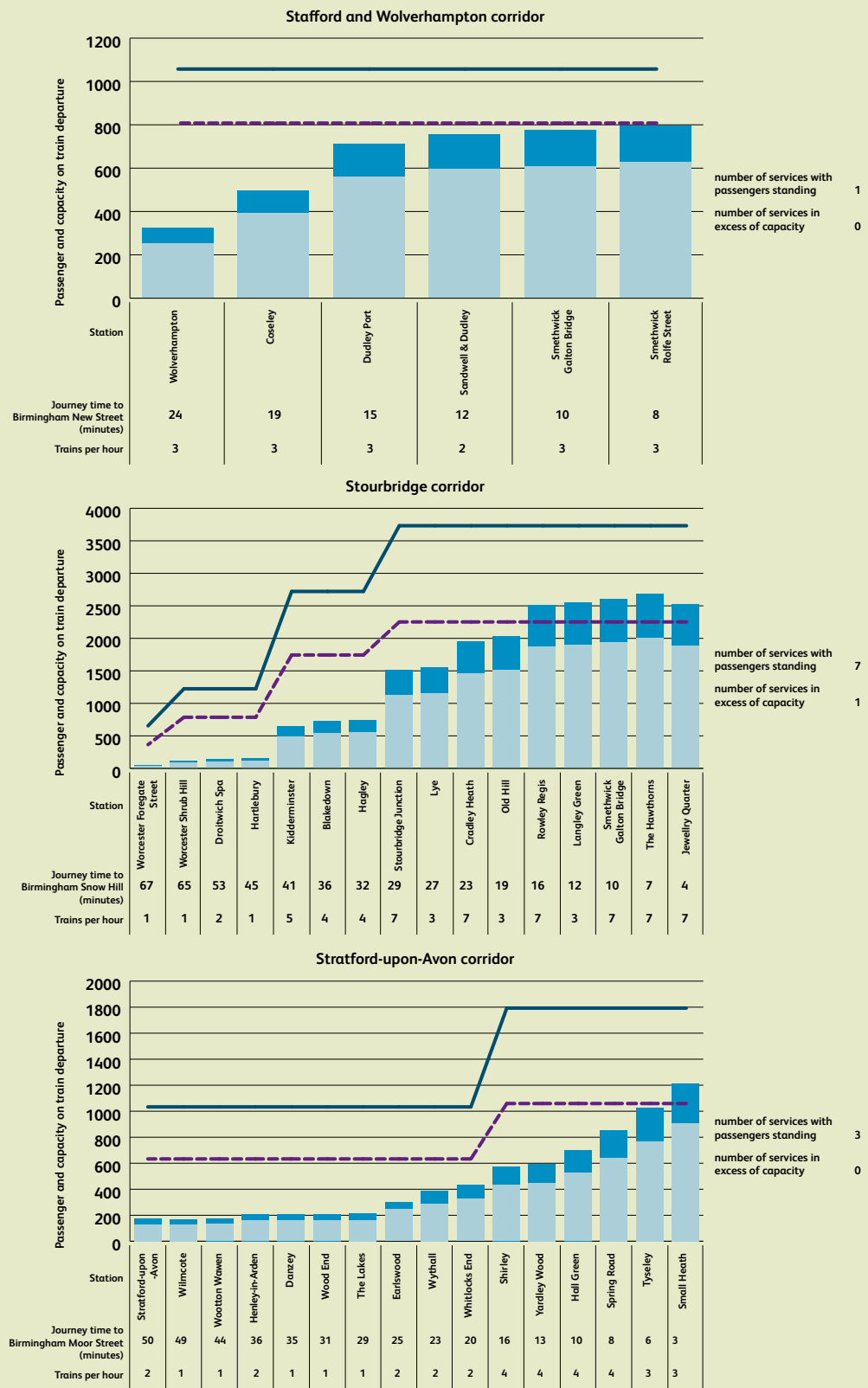


Figure 5.3 – Estimated passenger loadings and capacity for local commuting services into Birmingham by corridor in the morning high-peak hour in 2019

- Train capacity (seating and standing capacity)
- Seats
- Passenger loadings 2009
- Passenger growth to 2019



5. Planning context and future demand

5.3.6 Cross City North corridor

The number of services with passengers standing in 2019 is predicted to increase on the Cross City North corridor despite the additional capacity provided by the CP4 Delivery Plan. Most standing would tend to start from Erdington, which is about 13 minutes from Birmingham, and the busiest train would have passengers standing as far out as Sutton Coldfield. Two out of six services in the morning high-peak hour are forecast to have more passengers than the nominal train capacity on the approach to Birmingham. The option developed to address this gap is discussed further in **Chapter 6**.

5.3.7 Cross City South corridor

On the Cross City South corridor, there is planned service improvement with the Cross City line operating three trains per hour to each of Bromsgrove and Redditch (in each direction) by extending the existing Longbridge services. Additional vehicles are planned in order to operate this service enhancement and to meet demand growth on the rest of the corridor. Analysis shows that in 2019, standing will become more common in the morning peak over relatively short distances as shown in **Figure 5.1** and all standing will be within train capacity.

On the busiest Hereford to Birmingham peak service via Bromsgrove, some passengers would be standing from Worcester which is more than 30 minutes from Birmingham city centre. The Cardiff to Nottingham services would have some passengers standing between Bromsgrove and Birmingham in the morning peak. Crowding on these interurban and long distance services has been identified as a gap and this is analysed and discussed further in **Chapter 6**.

5.3.8 Cannock and Walsall corridor

The high-peak hour load factors on the Cannock and Walsall corridor services are predicted to be similar to current despite growth in rail demand. All services starting at Walsall will become three-car electric multiple units, a change from the current two to three-car diesel multiple unit, and this would increase the overall capacity provided in the peak and throughout the day. Overall there would be sufficient capacity to meet demand in the peak. Some standing will still be observed on the busiest train but this is likely to be for less than 10 minutes.

5.3.9 Derby and Nuneaton corridor

Crowding is forecast to become more acute by 2019 on the interurban and long distance services which connect key urban centres in the North East, Yorkshire, East Midlands and West Midlands. Some services call at local stations such as Tamworth and Water Orton providing demand for local commuting as well as for longer distance passengers. Four out of seven high-peak hour services would be operating above train capacity between Tamworth/Water

Orton and Birmingham in 2019. This is consistent with the findings concluded by the East Midlands RUS which analysed train loadings on the Leicester/Stansted Airport to Birmingham services. No additional vehicles are planned for this corridor in CP4 and the RUS addresses this gap through the options developed in **Chapter 6**.

5.3.10 Leamington Spa and Chiltern corridor

There is generally sufficient capacity to accommodate demand in 2019 on the services to Birmingham. On the local suburban services from Dorridge, standing over short distances will become more common in the high-peak hour and all standing will be within the nominal train capacity. New Class 172 rolling stock is planned to be introduced in CP4 which would offer higher standing capacity and this would allow more passengers to be accommodated than the current Class 150 rolling stock.

On the interurban and long distance services from London Marylebone and Reading, all the high-peak hour services would have passengers standing on arrival at Birmingham and most standing would be for less than 20 minutes. The busiest service would have standing starting from as far out as Leamington Spa. The RUS addresses this issue in **Chapter 6**.

5.3.11 Shrewsbury

Crowding is forecast to become more prevalent between Shrewsbury and Birmingham on the long distance services as illustrated in **Figure 5.2**. All the high-peak hour services from Shrewsbury to Birmingham are expected to have passengers standing for more than 20 minutes. On the busiest train standing would start from Codsall, which is more than 30 minutes from central Birmingham. However, not all passengers would be standing for this amount of time as some will alight at Wolverhampton and more passengers will get on, Wolverhampton being another key major urban centre that attracts high volumes of commuting journeys. No additional vehicles are planned for the Shrewsbury long distance route in CP4 and the RUS proposes options to address this gap in **Chapter 6**.

5.3.12 Stafford and Wolverhampton

The local commuting services that start from Wolverhampton and call at intermediate stations would experience higher load factors by 2019 as there are no additional vehicles being planned for introduction in CP4. However, the majority of the standing would be for less than 10 minutes and the number of passengers on each train is unlikely to exceed the nominal train capacity in 2019.

On the services from Liverpool Lime Street and Manchester Piccadilly, standing is likely to occur between Wolverhampton and Birmingham with the

busiest trains having standing starting even further back as they are used by both commuters and long distance travellers. In calculating the capacity in 2019 on the long distance services, it is assumed that all the current services operated by nine-car Class 390 trains will become 11-car in the peak and this would address crowding on these services. The remaining long distance services on this corridor do not have planned additional capacity in CP4 and crowding will become more acute. The RUS addresses this issue in **Chapter 6**.

5.3.13 Stourbridge

The majority of the Stourbridge services would have passengers standing in the high-peak hour and shoulder-peak for less than 20 minutes and the number of passengers is unlikely to exceed the nominal train capacity. New Class 172 rolling stock is planned for introduction in CP4 and it would offer higher standing capacity enabling more passengers to be accommodated than the current Class 150 rolling stock. However, on the busiest train in the morning peak, standing would start from Stourbridge, which is more than half an hour from Birmingham. The RUS addresses this issue in **Chapter 6**.

5.3.14 Stratford-upon-Avon

The load factor relative to seating on the Stratford upon-Avon line will increase by 2019 but its load factor to capacity will remain similar to current as illustrated in **Figure 5.3**. This is because the new Class 172 rolling stock, planned for introduction in CP4, offers higher standing capacity which will help to accommodate demand growth. Standing over relatively short distances will become more common in the high-peak hour with standing tending to start from Spring Road which is less than 10 minutes from Birmingham.

5.3.15 Passenger forecasts – London Marylebone

The predicted number of passenger arrivals in 2019 at London Marylebone is split into three categories: Aylesbury via Amersham, suburban, and long distance services to London Marylebone on the Leamington Spa and Chiltern corridor. In general, services starting from High Wycombe and south thereof are grouped as suburban services to London with the remaining services on the Leamington Spa and Chiltern corridor grouped as long distance services.

The passenger forecasts at London Marylebone include demand stimulated by the committed Evergreen 3 project, as discussed in **Chapter 4**, and are based on the latest specification (eg. the timetable and rolling stock deployment plan) provided by Chiltern Railways. The Leamington Spa and Chiltern corridor is highly competitive

especially with the implementation of the Evergreen 3 project that gives journey time improvements on the Birmingham route and creates new connectivity between Oxford and London Marylebone. The RUS estimates the impact of this timetable intervention on demand, however it is not able to predict how other competitors (rail and coach operators) would respond to the timetable changes.

Passenger demand to London Marylebone on the Aylesbury corridor, measured in passenger journeys, is predicted to increase by 22 per cent between 2009 and 2019 in the peak, equivalent to two per cent per annum. The majority of this growth is driven by changes in the underlying external factors, predominately employment growth in central London. The Evergreen 3 project will not affect the journey time and service frequency on the Aylesbury corridor. As a result the demand growth forecast to 2019 for the Aylesbury corridor is relatively low compared to the Leamington Spa and Chiltern corridor, which is having significant timetable improvement.

The number of passengers arriving at London Marylebone on the suburban services from the Leamington Spa and Chiltern route is predicted to increase by 28 per cent in the peak between 2009 and 2019, which is 2.5 per cent per annum. Just over half of this growth is driven by external factors, while the remaining growth is generated by the Evergreen 3 project which would give journey time improvements and new rolling stock. Demand in the off-peak hours, predominately comprised of leisure traffic, is likely to increase at a higher level than this but this has not been modelled in the RUS. This is because on-train crowding is not an issue in the off-peak hours.

Demand to London Marylebone on the long distance services is predicted to increase by 35 per cent between 2009 and 2019 in the peak. This is equivalent to 3.1 per cent per annum. The journey time improvement between Birmingham and London Marylebone, as a result of the Evergreen 3 project, would stimulate demand on this corridor and its effect is likely to be more significant in the shoulder-peak and off-peak hours. The committed new half-hourly Oxford to London Marylebone service via a new station at Water Eaton Parkway (as discussed in **Chapter 4**) creates new rail connectivity to major urban centres and cities in the Chiltern region. This would attract new passengers to the Leamington Spa and Chiltern corridor and increase passenger arrivals at London Marylebone in the peak and off-peak. It is anticipated that demand growth in the off-peak hours, predominately comprising leisure trips, would grow at a higher rate than that in the peak-hour. The level of growth particularly in the off-peak hour is also likely to be affected by fares set by Chiltern Railways and how its competitors respond.

5. Planning context and future demand

Table 5.3 – Morning high-peak hour (08:00 to 08:59) load factors on arrival at London Marylebone, average weekday estimates in 2019/20

Corridor and service group	Load factor: number of passengers compared to seats	Load factor: number of passengers compared to train capacity
Aylesbury (via Amersham)	140 %	128 %
Leamington Spa and Chiltern: suburban	113 %	84 %
Leamington Spa and Chiltern: long distance	120 %	120 %
Total	113 %	106 %

Table 5.4 – Morning three-hour peak (07:00 to 09:59) load factors on arrival at London Marylebone, average weekday estimates in 2019/20

Corridor and service group	Load factor: number of passengers compared to seats	Load factor: number of passengers compared to train capacity
Aylesbury (via Amersham)	108 %	91 %
Leamington Spa and Chiltern: suburban	93 %	68 %
Leamington Spa and Chiltern: long distance	113 %	100 %
Total	104 %	84 %

Note: These forecasts do not include passengers on the Metropolitan lines. Train capacity includes both standard class seats and standing allowance. Services are in excess of capacity when passenger loads exceed the nominal train capacity or when there are passengers standing for more than 20 minutes. This is consistent with DfT policy.

5.3.16 Passenger loadings versus capacity at London Marylebone in 2019

The impact of the 2019 passenger forecast on crowding at London Marylebone is shown in **Tables 5.3 and 5.4** for the high-peak (08:00 to 08:59) and three-hour peak (07:00 to 09:59) respectively. These represent the total number of passengers carried as a proportion of seats and as a proportion of the nominal train capacity. The committed capacity provided through the Evergreen 3 project has been taken into account to calculate the capacity level in 2019.

5.3.17 Aylesbury corridor

On the Aylesbury corridor, train capacity is planned to increase by around 20 per cent over the three-hour morning peak by 2019 through committed train lengthening in CP4, however, the increase in capacity will occur in the shoulder peak as all the high-peak hour trains are already operating at their maximum lengths. As shown in **Table 5.3**, the high-peak hour passengers to train capacity ratio is predicted to increase from 102 per cent currently to 128 per cent by 2019. At this level, it generally implies that there will be high levels of crowding, and most high-peak hour services would have more passengers than train capacity. The three-hour peak load factor is likely to remain the same as current due to the extra capacity added in the shoulder-peak. The predicted high-peak hour crowding is discussed further in **Chapter 6**.

5.3.18 Suburban services to London on the Leamington Spa and Chiltern corridor

Peak-hour load factor (passengers to train capacity ratio) at London Marylebone on the suburban services is predicted to remain similar to current. The increase in demand to 2019 would be met by the additional 32 per cent train capacity provided in the morning three-hour peak through the Evergreen 3 project. The new Class 172 rolling stock is planned to be introduced on some of the suburban services and this will allow more passengers to be accommodated. Standing would occur on most high-peak hour trains but this is likely to be over relatively short distances and within train capacity.

5.3.19 Long distance services to London on the Leamington Spa and Chiltern corridor

Peak-hour load factor (passengers to train capacity ratio) at London Marylebone on the long distance services is predicted to be around 120 per cent in the high-peak hour and 100 per cent in the three-hour morning peak by 2019. At this level of crowding it generally indicates that the busiest services will be operating close to or even above train capacity. The Evergreen 3 project, planned to be completed by 2012, increases morning peak train capacity on the long distance services by around 18 per cent, but demand growth to 2019 is likely to be higher than this. The new half-hourly services from Oxford and faster journey times between urban centres and London Marylebone will generate new demand and increase passenger arrivals at London Marylebone.

5.4 Forecast freight demand

5.4.1 Forecast origins and methodology

Freight demand forecasts were developed nationally in the Freight RUS published in March 2007. This strategy focused on accommodating forecast freight traffic across the network over the 10-year period from 2004/05 to 2014/15, and estimated approximately 25 per cent growth in the number of freight trains per day.

Since the publication of the Freight RUS, these forecasts have been reviewed and updated to include the aspirations of the DfT and other stakeholders to increase the proportion of freight carried by rail throughout the United Kingdom. The DfT's White Paper 'Delivering a sustainable railway', published in July 2007, predicted a doubling of rail freight demand over the next 30 years and proposed the development of a Strategic Freight Network in England and Wales to facilitate this growth without having a detrimental impact on network capacity and reliability. The focus is to devise a network of core trunk routes with sufficient capacity and appropriate gauge to accommodate the expected major flows of freight.

Freight demand forecast has been developed nationally to 2019 and 2030 for the Strategic Freight Network. The forecasts were developed, as reported in the Network RUS: Scenarios and Long Distance Forecasts, using the Great Britain Freight Model to assess the aggregate level of demand. The Great Britain Freight Model is designed to forecast freight moved within Great Britain, including freight to and from the ports and the Channel Tunnel. It covers

different modes such as rail and road and produces a matrix of all forecast freight flows. This provides a 'top down' view based on economic modelling.

In common with the method adopted in the Freight RUS, this perspective was complemented by a 'bottom up' view of the markets provided by a review of the forecasts by the industry. The forecast change in demand by commodity type is shown in **Table 5.5** and the forecast daily.

The national Strategic Freight Network forecasts have been assessed by the freight operators who form part of the RUS Stakeholder Management Group, in order to ascertain that they are at an appropriate level to accommodate the expected growth in freight traffic on specific corridors within the RUS area. The outputs of this assessment were agreed by the Stakeholder Management Group as part of the base to be used in option analysis work. **Figures 5.4** and **5.5** show the forecast level of freight paths per hour by line of route required in each direction for both 2019 and 2030.

During the assessment of the freight forecasts for specific corridors in the RUS area, consideration was given to the impact of the recent recession. The Stakeholder Management Group determined that it is reasonable to assume that following a period of relatively static growth, freight will return to, or exceed, previously attained levels of traffic.

5.4.2 Current market scenarios

The potential for freight growth exists in all market sectors, but different rates and extents of growth are envisaged.

Table 5.5 – Forecast change in freight demand by commodity to 2030

	Million tonnes			Billion tonne km		
	2006	2030	Average annual growth	2006	2030	Average annual growth
Solid fuels	51	41	-1 %	8	5	-2 %
Construction	21	32	2 %	4	5	1 %
Metals and Ore	18	19	0 %	3	3	0 %
Ports non bulk	12	50	6 %	4	17	6 %
Domestic non bulk	2	25	11 %	1	12	11 %
Other	12	12	1 %	3	3	1 %
Total	116	179	2%	23	45	3%

5. Planning context and future demand

Figure 5.4 – Forecast number of freight paths per hour in each direction required by line of route in 2019

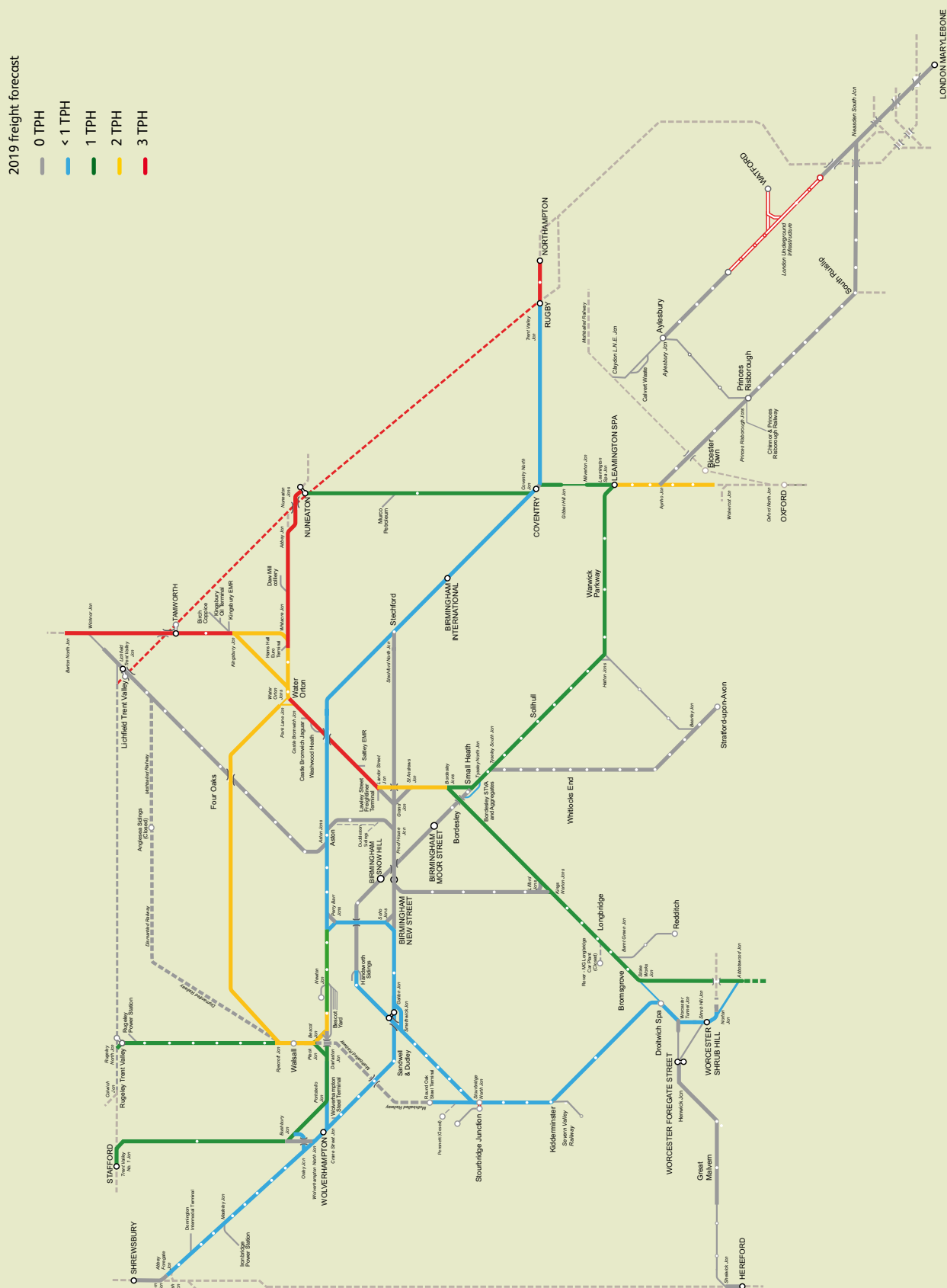
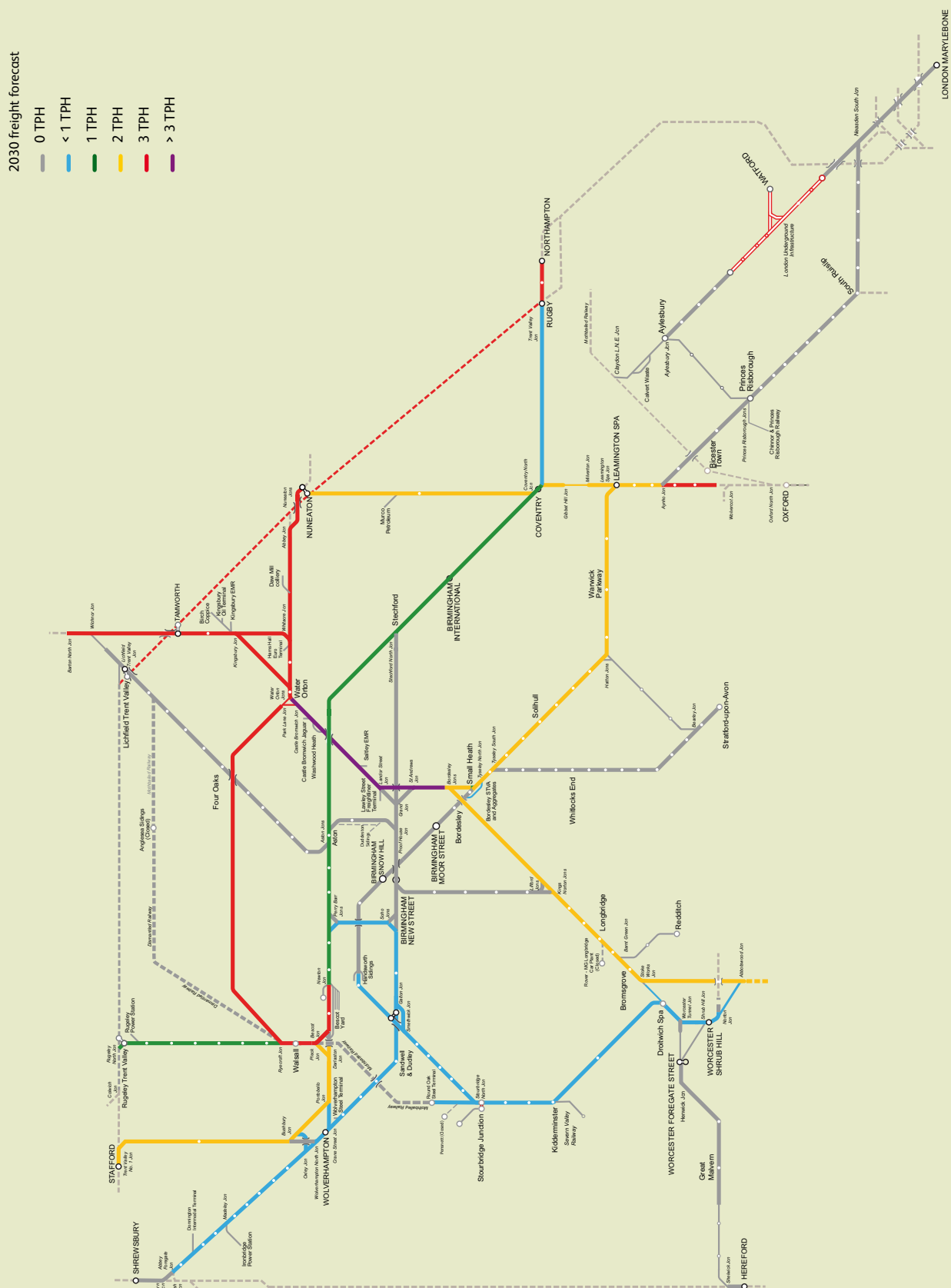
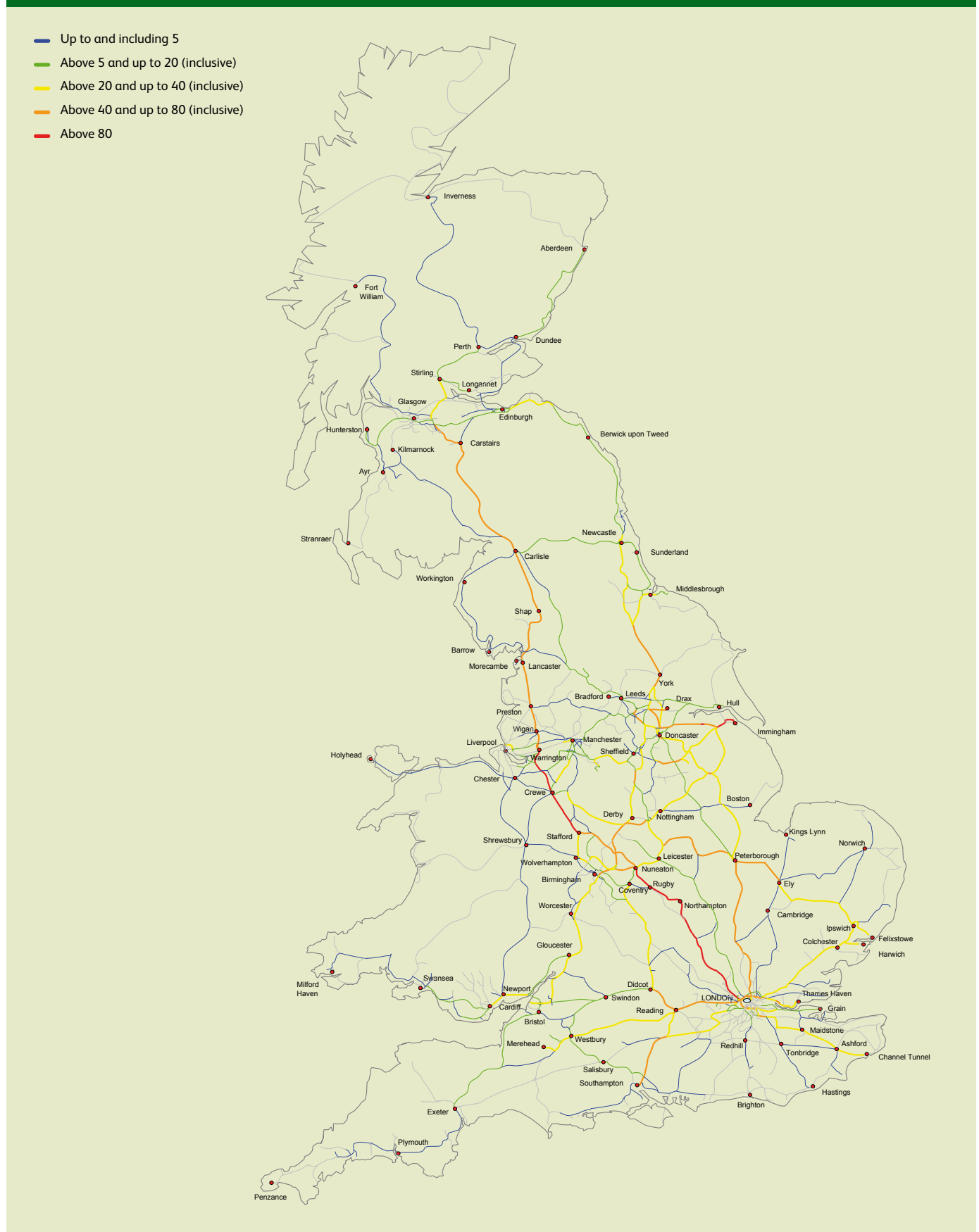


Figure 5.5 – Forecast number of freight paths per hour in each direction required by line of route in 2030



5. Planning context and future demand

Figure 5.6 – Forecast daily freight paths each direction in 2030



5.4.3 Intermodal

Current analysis indicates that the majority of growth in freight demand is forecast to occur in the non-bulk sector, concentrated on deep sea intermodal traffic. Domestic non-bulk traffic is also forecast to grow rapidly, but this is from a low base.

The completion of the W10 gauge clearance schemes which are committed in CP4 will assist the competitive nature of rail in the intermodal market. The Productivity Transport Innovation Fund scheme to enhance the gauge between Southampton and the West Coast Main Line will facilitate the conveyance of 9'6" containers on standard wagons which will drive commercial demand for extra trains from the port of Southampton. Growth in demand is also anticipated from the East Coast ports following the completion of the Felixstowe to Nuneaton Productivity Transport Innovation Fund scheme to provide an alternative route to transport 9'6" high containers between the East Coast ports and the West Coast Main Line, and onto the Midlands, the North West and Scotland.

Further freight traffic growth from the South West is likely to be generated by the proposed Bristol Deep Sea Container Terminal, which will have a total throughput of about 1.5 million equivalent units or approximately one million containers per annum. It is estimated that 40 per cent of this traffic would be transported to and from the port by rail, possibly triggering the need for further capability enhancements on routes via the Lickey Incline and Stourbridge. DfT consent was given for construction of the Deep Sea Container Terminal on 25 March 2010 and construction is expected to take three to four years.

The growth facilitated by these schemes will mean a significant increase in traffic to freight handling facilities within the RUS area. Some of the existing terminals in the RUS area have expansion plans to enable them to cater for continued demand as a number of them are operating at, or close to, their capacity. It is anticipated that the new intermodal terminal at Donnington, near Telford, will stimulate further freight growth on the routes between Crewe, Shrewsbury and Wellington. There are also some new intermodal site aspirations for this route including Mid-Cannock and Stretton.

5.4.4 Bulk sector

The bulk sector is forecast to grow, albeit at a slower rate than the non-bulk sector. There are predicted increases in CP4 in imported coal and aggregates. The forecasts for coal are based on assumptions about the use of alternative fuels such as biomass in the medium to long term. Taking into account the continuing uncertainty in gas and oil prices and the time it takes to build nuclear power stations, coal is expected to remain in demand for the foreseeable future. It is likely that the source points for imported coal to the West Midlands power stations at Rugeley and Ironbridge will change, with greater demand from ports in the South Wales and Bristol area.

Other markets are also expected to experience growth. Growth in the movement of scrap metals is forecast from a number of key sites in the West Midlands area, and petroleum traffic to Kingsbury Oil Terminal from the east coast ports is expected to require either an increase in the number or load of trains which may drive significant terminal modifications. In addition, the market for aggregate traffic into the South East is expected to drive the development of other freight sites near Neasden on the Chiltern main line.

During the development of the West Midlands and Chilterns RUS, an analysis has been carried out to determine the routes within the RUS area where freight growth is expected to require heavier and longer trains:

- inter-modal (75 mph container trains, 1,600 tonnes, 640 metres long) between Southampton/Felixstowe and West Midlands/ North West/North East
- bulk freight (60mph coal, metals, petroleum, aggregates, etc., 2,400 tonnes, 448 metres long) to West Midlands power stations and oil terminals, also through trains between South/ South West and North West/North East)
- trains to Kingsbury Oil Terminal are expected to be at least 3,000 tonnes, 557 metres long.

There is a concentration of freight terminals within the RUS area on the route between Nuneaton and Landor Street Junction. Strategic Freight Network growth has forecast a need for three freight paths per hour.

6. Gaps and options

6.1 Introduction

Previous chapters have presented baseline data (the current capability and requirements of the network), committed schemes and forecasts of future demand and other drivers of change. This chapter builds on this by detailing the process of gap identification, the options to address these gaps and the process of their appraisal.

6.2 Gaps

A RUS gap is defined as the difference between what the system can currently supply, in terms of infrastructure and train services, and what is likely to be demanded of the system, in terms of what it needs to do both now and in the future for passenger and freight at suitable levels of performance. A gap also needs to be considered as consistent with the funding that is, or is reasonably likely to become, available during the period of the RUS.

RUS gaps can be broadly classified into four types:

- capacity and capability – where the size, number and mix of services (passenger and/or freight) does not meet current or future needs
- performance – where the performance outputs of the railway system fall short of requirements
- journey times – where location to location journey times (passenger or freight) do not meet current or future needs
- connectivity – where journeys between locations (passenger or freight) do not meet current or future needs.

6.3 Process

In line with other established RUSs, the process adopted during the West Midlands and Chilterns RUS has been to identify and list where issues exist on the current railway and where they are expected in the future. This has been undertaken through the

baseline study (with stakeholder input) and through an analysis and comparison of current (**Chapter 3**) and predicted changes in demand (**Chapter 5**) as well as a review of strategic documentation for the geographical area. This has provided identification of potential “gaps” between what the railway system delivers now and what it is required to deliver over the timeframe of the RUS.

A list of over 170 issues was assembled from this process, which were then subjected to detailed review by the West Midlands and Chilterns RUS Stakeholder Management Group (SMG) with each issue being categorised as a gap, an option, a constraint or a stakeholder aspiration.

6.4 Identification of gaps

From the list of over 170 identified issues, the SMG determined which issues should be considered as gaps to be addressed by the West Midlands and Chilterns RUS. With the exception of a number of generic gaps, the gaps had been identified against each of the 13 radial corridor routes from central Birmingham outlined in **Chapter 2** and in a number of cases these are replicated across two or more routes. The list of gaps was consolidated for each route in line with the type of options that would need to be tested to address each gap. This review resulted in further refinement of the gaps to be analysed by the West Midlands and Chilterns RUS. The full list of gaps is detailed as follows in **Tables 6.1 to 6.14**, together with those gaps that were considered ‘closed’ at this stage. Issues considered to be gaps are labelled from I-1 to I-136 and the consolidated gaps which they are grouped into are labelled from G-1 to G-46.

A number of generic gaps, relevant to all parts of the RUS area, were also identified by the SMG as part of the gaps process. These are outlined in **Table 6.14**. The RUS will comment on any workstreams or initiatives which may already be established to help address these gaps.

Table 6.1 – Aylesbury corridor

Gap issue number	Gap issue	Consolidated gap	Consolidated gap number
I-1	Crowding close to London identified in the Thames Valley Regional Planning Assessment (RPA) from Aylesbury to Marylebone, south of Harrow. Housing growth also planned.	Aylesbury corridor capacity and service mix.	G-1
I-2	Service mix, especially on Aylesbury corridor on the Metropolitan lines due to the mix of London Underground Limited (LUL) services with heavy rail services that impacts on service provision and performance.		
I-3	Low linespeeds at various locations (especially the Aylesbury corridor on the Metropolitan lines) means relatively slow journey times.	Aylesbury corridor journey time.	G-1a
I-4	North-South Links in Buckinghamshire, particularly connectivity of Aylesbury.	North-South Links in Buckinghamshire, particularly connectivity of Aylesbury.	G-2

Table 6.2 – Leamington Spa and Chiltern corridor

Gap issue number	Gap issue	Consolidated gap	Consolidated gap number
I-5	Overcrowding: Bournemouth – Thames Valley – Banbury – Leamington Spa – Coventry – Birmingham International – Birmingham New Street – Manchester services.	These gap issues have been consolidated and dealt with under consolidated gap no. 16 which assessed these service groups for both passenger and freight across the wider West Midlands and Chilterns RUS area.	N/A
I-6	Lack of direct service Banbury – Leamington Spa – West Yorkshire suppressing rail demand.		
I-7	Capacity on long distance high speed routes between Oxford and Birmingham and beyond.		
I-8	Peak overcrowding RUS area.		
I-9	Seven-day timetable required based on Sunday demand levels for long distance high speed services between Oxford and Birmingham and beyond, currently suppressed.	This gap issue has been consolidated and dealt with under consolidated gap no. 17 which assessed these service groups for both passenger and freight across the wider West Midlands and Chilterns RUS area.	N/A
I-10	Leamington Spa and Chiltern Corridor connectivity to Birmingham Airport.	This gap issue has been closed under consolidated gap no. 45 which considers improved connectivity to Birmingham Airport.	G-45
I-11	High Level Output Specification (HLOS) – peak demand into Birmingham to be accommodated by the end of Control Period 4 (CP4).	These gap issues were closed as they were considered to be dealt with through the HLOS Control Period 4 determination.	N/A
I-12	HLOS – peak demand into London Marylebone to be accommodated by the end of CP4.		
I-13	Capacity: Oxford – Banbury to encompass passenger growth. seven day railway is a priority on this route.	This gap issue has been consolidated and dealt with under consolidated gap no. 17.	N/A

6. Gaps and options

Gap issue number	Gap issue	Consolidated gap	Consolidated gap number
I-14	Poor service provision at some smaller stations within the Chiltern area.	This gap issue was closed as it was considered a day-to-day management issue by the local train operator.	N/A
I-15	Station congestion at London Marylebone in the future resulting from increased demand on Chiltern services, particularly interchange with London Underground and heavy crowding on the Bakerloo line.	This gap issue was closed as station congestion is managed under the station management regime. It should also be noted that the London and South East RUS will consider and assess in detail central London termini capacity over the medium to long term.	N/A
I-16	Freight capacity on the Leamington Spa and Chiltern corridor.	Leamington Spa and Chiltern freight capacity and West Midlands freight routeing.	G-3
I-17	Gauge capability on the Leamington Spa and Chiltern corridor.		
I-18	Peak capacity issues for passenger services: central Birmingham.	Leamington Spa and Chiltern capacity.	G-4
I-19	Peak capacity on Chiltern services.		
I-20	All day capacity Chiltern corridor: London – Birmingham.		
I-21	Unattractive journey time London Marylebone – Birmingham on Chiltern route.		
I-22	Lack of capacity between London Marylebone and Banbury leads to performance problems and rigidity in timetable structure.		
I-23	Inappropriate journey time Oxford – Birmingham New Street.	Inappropriate journey time Oxford – Birmingham New Street.	G-5
I-24	Need to improve the interchange at both Birmingham New Street and other local potential interchange stations.	Need to improve the interchange at both Birmingham New Street and other local potential interchange stations.	G-6
I-25	Station crowding issues: Birmingham Moor Street southbound platform.	Birmingham Moor Street and Birmingham Snow Hill station crowding.	G-7
I-26	Station crowding issues: Birmingham Snow Hill (Platforms 1 and 3) congested.		
I-27	London air passenger demand growth is forecast at London Heathrow Airport so improved rail access required.	Air passenger demand growth is forecast at London Heathrow Airport so improved rail access required.	G-8

Table 6.3 – Stourbridge line

Gap issue number	Gap issue	Consolidated gap	Consolidated gap number
I-28	Freight routeing issues on the Stourbridge line.	Stourbridge line freight routeing.	G-9
I-29	Gauge capability on the Stourbridge line.		
I-30	By 2026/7 growth in demand on Cheltenham and Worcester/Hereford routes is forecast to increase between 42 per cent and 48 per cent compared with 2002/3 in the high-peak hour. Some trains to Worcester from Bristol and Oxford terminate at Worcester Shrub Hill station, not Worcester Foregate Street station, which is closer to the city centre.	Worcester – Hereford – Birmingham capacity.	G-10
		Worcester stations connectivity.	G-10a
I-31	Peak capacity issues for passenger services: Worcester – central Birmingham.	Stourbridge line capacity.	G-11
I-32	Stourbridge line overcrowding (highest level within Centro area), seating constraints for peak passengers from Rowley Regis inwards.		
I-33	HLOS – peak demand into Birmingham to be accommodated by end of CP4.	This gap issue was closed as it was considered to be within the base through the HLOS Control Period 4 determination.	N/A
I-34	Capacity: Bristol – Cheltenham – Worcester – Great Malvern to encompass passenger growth.	This gap issue was closed as it was considered by the Great Western RUS.	N/A
I-35	Inappropriate journey time/capacity Worcester – Hereford.	This gap issue was closed as it is not considered to be a gap given initiatives in place. Option O-34 and Worcester area signalling renewal plans also provide opportunities for improvements.	N/A
I-36	Journey time improvements: Birmingham, Stourbridge, Kidderminster and Worcester.	Journey time improvements on the Stourbridge line.	G-12
I-37	Worcester area infrastructure constraint causes performance issues.	Hereford – Worcester Foregate Street infrastructure constraints causing performance issues.	G-13
I-38	Need to improve the interchange at both Birmingham New Street and other local potential interchange stations.	This gap issue was closed as no specific gap exists on this corridor – see also gap 6.	N/A

Table 6.4 – Stratford-upon-Avon corridor

Gap issue number	Gap issue	Consolidated gap	Consolidated gap number
I-39	Peak capacity: Stratford-upon-Avon – Birmingham.	Peak and all day capacity on the Stratford-upon-Avon corridor.	G-14
I-40	Peak capacity issues for passenger services: central Birmingham.		

6. Gaps and options

Table 6.5 – Coventry corridor

Gap issue number	Gap issue	Consolidated gap	Consolidated gap number
I-41	Capacity: Rugby – Coventry – Stechford to cater for intermodal and passenger demand growth forecasts.	Coventry corridor freight capacity and routeing.	G-15
I-42	Freight routeing issues within the West Midlands.		
I-43	Capacity: Coventry to Birmingham – crowding on local services.	Coventry corridor peak capacity.	G-16
I-44	Capacity: Coventry to Birmingham – crowding on long distance high speed services.		
I-45	Peak capacity issues for passenger services: central Birmingham.		
I-46	Peak overcrowding in the RUS area on long distance high speed services between Oxford and Birmingham and beyond.		
I-47	Lack of direct service Coventry – Derbyshire, South and West Yorkshire and North East suppressing rail demand.	Lack of direct service Coventry – Derbyshire, Yorkshire and North East suppressing rail demand.	G-16a
I-48	Seven-day timetable required based on Sunday demand levels for long distance high speed services between Oxford and Birmingham and beyond, currently suppressed.	Seven-day timetable required based on Sunday demand levels for long distance inter-regional routes within the scope of the West Midlands and Chilterns RUS.	G-17
I-49	Need to improve the interchange at Birmingham New Street and other local potential interchange stations.	This gap issue was closed as no specific gap exists on this corridor – see also gap 6.	N/A

Table 6.6 – Stafford and Wolverhampton corridor

Gap issue number	Gap issue	Consolidated gap	Consolidated gap number
I-50	Engineering access Stafford – Bushbury.	Stafford and Wolverhampton freight capacity and routeing.	G-18
I-51	Gauge capability on the Stafford – Wolverhampton corridor.		
I-52	Intermodal terminal capacity issues – North West Midlands.		
I-53	Peak capacity issues for passenger services: central Birmingham.	Peak and all day capacity on the Stafford and Wolverhampton corridor.	G-19
I-54	Peak overcrowding in the RUS area on long distance high speed services between Manchester and Birmingham and beyond.		
I-55	Track capacity: Wolverhampton – Birmingham.		
I-56	Performance: Wolverhampton – Birmingham.		

I-57	Overcrowding: Bournemouth – Thames Valley – Banbury – Leamington Spa – Coventry – Birmingham International – Birmingham New Street – Manchester Piccadilly services.	Capacity: Manchester to Birmingham.	G-20
I-58	Seven-day timetable required based on Sunday demand levels for long distance high speed services between Manchester and Birmingham and beyond.		
I-59	All day capacity on long distance high speed services between Birmingham and Manchester and beyond.		
I-60	Journey time: Manchester to Birmingham. Gap identified from West Coast Main Line RUS.	Consider diversion of one long distance high speed service between Manchester and Birmingham via Crewe and provision of a third train in each hour between Manchester and Birmingham to operate via Stoke.	G-20a
I-61	HLOS – peak demand into Birmingham to be accommodated by the end of CP4.	This gap issue was closed as it was considered to be within the base through the HLOS Control Period 4 determination.	N/A
I-62	Need to improve the interchange at both Birmingham New Street and other local potential interchange stations.	Dudley Port interchange with proposed West Midlands Metro.	G-21
I-63	Capacity: Stafford to Birmingham.	Capacity: Stafford to Birmingham	G-22
I-64	New station required to meet future demand in Brinsford area.	This gap issue was closed as it was considered to be an aspiration that was not likely to be consistent with available funding.	N/A
I-65	Improved connectivity required: Wolverhampton – Walsall.	Improved connectivity required: Wolverhampton – Walsall.	G-23

Table 6.7 – Shrewsbury corridor

Gap issue number	Gap issue	Consolidated gap	Consolidated gap number
I-66	Freight gauge capability on Shrewsbury – Wolverhampton line.	Shrewsbury line freight capacity and routeing.	G-24
I-67	Wolverhampton – Shrewsbury journey time.	Journey time mid Wales – Shrewsbury – Birmingham.	G-25
I-68	Peak capacity issues for passenger services: central Birmingham.	Peak and all day capacity issues for passenger services: central Birmingham.	G-26
I-69	HLOS – peak demand into Birmingham to be accommodated by end of CP4.		
I-70	Need to improve the interchange at both Birmingham New Street and other local potential interchange stations.	This gap issue was closed as no specific gap exists on this corridor – see also gap 6.	N/A

6. Gaps and options

Table 6.8 – Leamington Spa and Nuneaton corridor

Gap issue number	Gap issue	Consolidated gap	Consolidated gap number
I-71	Freight capacity on Leamington Spa and Nuneaton line.	These gap issues have been consolidated and dealt with under consolidated gap no. 16 which assessed these service groups for both passenger and freight across the wider West Midlands and Chilterns RUS area.	N/A
I-72	Gauge capability on the Leamington Spa and Nuneaton line.		
I-73	Overcrowding on Leamington Spa – Coventry services in morning and evening peak, and throughout the day, limited capacity on single line.	Overcrowding on Leamington Spa – Coventry services in morning and evening peak, and throughout the day, limited capacity on single line.	G-27
I-74	Seven-day timetable required based on Sunday demand levels on long distance high speed services between Oxford and Birmingham and beyond, currently suppressed.	This gap issue has been consolidated and dealt with under consolidated gap no. 17 which assessed these service groups for both passenger and freight across the wider West Midlands and Chilterns RUS area.	N/A
I-75	Large population not served by rail – Kenilworth c.25000. Passenger demand at Kenilworth.	Demand for a rail service in Kenilworth.	G-28
I-76	Improved rail provision Nuneaton – Coventry – Leamington Spa with new stations at Ricoh Arena and Bermuda to accommodate suppressed demand and future demand (housing and business growth).	Improved rail provision Nuneaton – Coventry – Leamington Spa with new stations at Ricoh Arena and Bermuda to accommodate suppressed demand and future demand (housing and business growth).	G-29
I-77	Need to improve the interchange at both Birmingham New Street and other local potential interchange stations.	This gap issue was closed as no specific gap exists on this corridor – see also gap 6.	N/A

Table 6.9 – Cannock and Walsall corridor

Gap issue number	Gap issue	Consolidated gap	Consolidated gap number
I-78	Freight routeing issues on the Cannock and Walsall line in the light of future freight and passenger growth.	Cannock and Walsall line freight growth, West Midlands area routeing and terminal capacity.	G-30
I-79	Gauge capability on the Cannock and Walsall line.		
I-80	Intermodal terminal capacity issues – North West Midlands.		
I-81	Passenger service improvement required to meet demand on the Cannock line.	Cannock and Walsall line peak capacity and growth.	G-31
I-82	Peak capacity issues for passenger services: central Birmingham.		

I-83	Capacity: Brownhills area to cater for housing growth and regeneration. Currently not served by rail.	Demand for rail in Aldridge/Brownhills area.	G-32
I-84	Demand currently not served by rail: Significant housing development around the Walsall area will stimulate demand for travel from Aldridge into Walsall, Wolverhampton and Birmingham.		
I-85	HLOS – peak demand into Birmingham to be accommodated by the end of CP4.	This gap issue was closed as it was considered to be within the base through the HLOS CP4 determination.	N/A
I-86	Need to improve the interchange at both Birmingham New Street and other local potential interchange stations.	This gap issue was closed as no specific gap exists on this corridor – see also gap 6.	N/A
I-87	Inadequate station facilities at Cannock Line stations (all six stations Bloxwich-Rugeley) limiting rail accessibility.	This gap issue was closed as the National Station Improvement Programme (NSIP) scheme will assess any requirements.	N/A

Table 6.10 – Cross City and Lickey corridor

Gap issue number	Gap issue	Consolidated gap	Consolidated gap number
I-88	Freight routing issues on the Cross City and the Lickey Incline.	Cross City and Lickey corridor Freight routing.	G-33
I-89	Gauge capability on Cross City and Lickey Incline.		
I-90	Capacity: Cheltenham Spa – Birmingham New Street 100 per cent capacity utilisation between Kings Norton and Birmingham New Street in peak hours leads to performance problems.	Cross City and Lickey corridor peak and all day capacity.	G-34
I-91	Bromsgrove to Birmingham capacity.		
I-92	Peak capacity issues for passenger services: central Birmingham.		
I-93	Redditch to Birmingham capacity.		
I-94	Station capacity at University to accommodate future growth (including Selly Oak/Queen Elizabeth Hospital redevelopment strategy).	Station capacity at University to accommodate future growth (including Selly Oak/Queen Elizabeth Hospital redevelopment strategy).	G-35
I-95	Inappropriate journey time Birmingham – South West (Cross RUS boundary issue Birmingham – Bristol).	This gap issue has been closed as linespeed improvements are planned between Westerleigh Junction and Barnt Green through the HLOS CP4 determination).	N/A
I-96	Performance West Suburban between Kings Norton and Birmingham and journey time (typically six minutes pathing in fast services).	Performance West Suburban and journey time (typically six minutes pathing in fast services).	G-36
I-97	Need to improve the interchange at both Birmingham New Street and other local potential interchange stations.	This gap issue was closed as no specific gap exists on this corridor – see also gap 6.	N/A
I-98	Reduce road congestion and meet the current demand for car parking in the Longbridge area, which will increase following proposed redevelopment.	This gap issue was closed as the RUS will consider car parking as a generic gap under consolidated gap no. 46.	N/A
I-99	Capacity on long distance high speed services between Bristol and Birmingham and beyond.	This gap issue has been closed as it has been considered by the Great Western RUS.	N/A

6. Gaps and options

Table 6.11 – Derby, Nuneaton and Camp Hill corridor			
Gap issue number	Gap issue	Consolidated gap	Consolidated gap number
I-100	Freight routeing and capacity issues on the Derby, Nuneaton & Camp Hill lines.	Derby, Nuneaton and Camp Hill lines freight capacity and capability and West Midlands area freight routeing and terminal capacity.	G-37
I-101	Kingsbury performance issues – improved access and regulation in connection with Kingsbury and Birch Coppice freight terminals.		
I-102	Gauge capability on the Derby, Nuneaton and Camp Hill lines. Specifically: requirement for increased gauge capability on the Camp Hill line to support additional planned service between Avonmouth and the West Midlands.		
I-103	Runround issues for freight – Nuneaton – Daw Mill traffic.		
I-104	Intermodal terminal capacity issues – east and south east of West Midlands.		
I-105	Peak capacity issues for passenger services: central Birmingham.	Derby, Nuneaton and Camp Hill corridor capacity.	G-38
I-106	Peak overcrowding on long distance high speed services between Sheffield and Birmingham and beyond.		
I-107	Insufficient capacity on peak services between Cardiff and the West Midlands and Nottingham leads to crowding issues.		
I-108	Lack of capacity Birmingham – Derby route.		
I-109	Local service demand on Camp Hill line, currently not served by rail.		
I-110	HLOS – peak demand into Birmingham to be accommodated by the end of CP4.	This gap issue was closed as it was considered to be within the base through the HLOS CP4 determination.	N/A
I-111	Crowding issues: West Midlands – West Yorkshire. Service gap – only 1tph Leeds – Birmingham.	These gap issues have been closed as the East Midlands RUS and the Yorkshire and Humber RUS considered these gaps.	N/A
I-112	Capacity issues: Birmingham – Leicester.		
I-113	Inadequate daytime service frequency West Midlands – Peterborough/ Cambridge/Stansted Airport.		
I-114	All day capacity on long distance high speed services between Sheffield and Birmingham and beyond.	Capacity on long distance high speed routes.	G-39
I-115	Improved evening services within the RUS area.	This gap issue was closed as it was not considered a gap on this corridor.	N/A

Table 6.11 – Derby, Nuneaton and Camp Hill corridor

Gap issue number	Gap issue	Consolidated gap	Consolidated gap number
I-116	Lack of direct services: Birmingham International – north east.	This gap issues has been consolidated and dealt with under consolidated gap no. 16 which assessed this service group for both passenger and freight across the wider West Midlands and Chilterns RUS area.	N/A
I-117	Seven-day timetable required based on Sunday demand levels for long distance high speed services between Sheffield and Birmingham and beyond, currently suppressed.	This gap issue has been consolidated and dealt with under consolidated gap no. 17 which assessed these service groups for both passenger and freight across the wider West Midlands and Chilterns RUS area.	N/A
I-118	Need to improve the interchange at both Birmingham New Street and other local potential interchange stations.	Consider passenger interchange with the West Coast Main Line at Tamworth.	G-40

Table 6.12 – Sutton Park corridor

Gap issue number	Gap issue	Consolidated gap	Consolidated gap number
I-119	Freight capacity for intermodal traffic destined for Yorkshire and North east markets.	Freight capacity and routeing in the West Midlands.	G-41
I-120	Freight routeing issues on the Sutton Park line.		
I-121	Capacity on the single track sections of the Sutton Park line constrains intermodal services to Southampton.	This gap issue has been closed as a result of planned re-signalling initiatives at Water Orton.	N/A
I-122	Gauge capability on key freight routes in RUS area.	This gap issue has been closed as this generic issue will be covered in the assessment of all other freight gaps within the West Midlands and Chilterns RUS.	N/A

6. Gaps and options

Table 6.13 – Birmingham New Street

Gap issue number	Gap issue	Consolidated gap	Consolidated gap number
I-123	Operational capacity: Birmingham New Street (on approach and within station).	Operational capacity at Birmingham New Street (on approach and within station).	G-42
I-124	Need to ensure that passenger flow and interchange at Birmingham New Street following gateway project is efficient (include platform capacity).	These gap issues were closed as they are being addressed by the Birmingham Gateway project which is a committed scheme through the HLOS CP4 determination.	N/A
I-125	Access to platform 12 from the dispersal bridge is extremely limited at Birmingham New Street. This leads to passenger congestion and performance-related issues.		
I-126	Peak capacity issues for passenger services: central Birmingham.	These gap issues have been closed as they are being addressed within the specific radial corridor routes and the assessment of options will consider the specific service groups as required.	N/A
I-127	Peak overcrowding RUS area.		
I-128	Capacity on long distance high speed cross country routes.		
I-129	Improved evening services within RUS area.		
I-130	Seven-day timetable required based on Sunday demand levels for high speed long distance services, currently suppressed.		
I-131	Need to improve the interchange at both Birmingham New Street and other local potential interchange stations.	This gap issue has been closed as it is being bridged by the Birmingham Gateway project which is a committed scheme through the HLOS CP4 determination).	N/A
I-132	HLOS – peak demand into Birmingham to be accommodated by the end of CP4.	This gap issue was closed as it was considered to be within the base through the HLOS CP4 determination.	N/A

Table 6.14 – Generic gaps

Gap issue number	Gap issue	Consolidated gap	Consolidated gap number
I-133	Improved evening services within the RUS area.	Improved evening services within the RUS area.	G-43
I-134	Improved Sunday services within the RUS area.	Improved Sunday services within the RUS area.	G-44
I-135	Birmingham International Airport connectivity.	Birmingham International Airport connectivity.	G-45
I-136	Car-parking.	West Midlands and Chilterns RUS area car parking.	G-46

6.5 Quantification of gaps

During the process of assessing and quantifying the RUS gaps, a number of gap issues have been closed and not taken forward for further analysis as they are considered to be resolved by other planned initiatives or studies, including the HLOS Control Period 4 (CP4) Delivery Plan, other committed enhancement schemes, or work carried out by other RUSs. These are discussed below.

6.5.2 High Level Output Specification and Control Period 4 Delivery Plan

As outlined in **Chapter 4**, Network Rail has responded to the requirements set out by the Department for Transport (DfT) in the July 2007 HLOS and has established a national programme of expenditure to meet the targets set. This is the Control Period 4 (CP4) Delivery Plan for which Network Rail has received committed Government funding to develop and implement between 2009 and 2014. For the purpose of the West Midlands and Chilterns RUS, the key outputs specified in the CP4 Delivery Plan are considered to be part of the base. This also includes the associated operational plans which Network Rail and the Train Operators have formulated to meet the HLOS capacity targets set for individual routes. These are dependent on elements of the Rolling Stock Strategy which the DfT has developed to determine the additional vehicles required to meet the capacity targets outlined in the HLOS.

A number of issues raised during the early stages of the RUS have subsequently been resolved through the commitments made in the CP4 Delivery Plan and associated operational plans and Rolling Stock Strategy. Consequently these issues have not been taken forward into detailed option analysis and are shown as closed in **Tables 6.1 – 6.14**. Where individual enhancement schemes being delivered as part of the CP4 Delivery Plan resolve specific gap issues they have been outlined below. Where capacity gaps have been taken forward for detailed analysis, any additional HLOS vehicles which have been confirmed have been considered as part of the base and RUS analysis work has concentrated on determining whether this fully addresses the gap until 2019.

It is important to note that as the CP4 Delivery Plan is considered as part of the base in this RUS, any refinement to that plan, in the form of changes to specified outputs or funding, would directly affect the assumptions made during the gaps and options analysis. If for any reason there are further changes to the CP4 Delivery Plan which for example leads to any committed scheme not materialising, the RUS would then treat the lack of output as a gap for which the original CP4 enhancement would form a potential option.

The following gaps were closed prior to detailed option analysis as they are resolved through other initiatives or studies, including the CP4 Delivery Plan, other committed enhancement schemes or Third Party initiatives.

6.5.3 Gap issue I-14: Poor service provision at some smaller stations within the Chilterns area

The RUS recognises that there will be opportunities to address the limited service provision at a number of smaller stations on the Chilterns routes following the completion of the Evergreen 3 project. The scheme will deliver linespeed improvements to permit 100mph running on the Chiltern Main Line and network availability benefits will be provided through the provision of bi-directional signalling at key locations on the route. Line capacity will be created north of South Ruislip by providing a loop, which will enable improved timetabling capability for interurban and urban services. Changes to service frequency will be considered during the planning of future timetables.

6.5.4 Gap issue I-15: Future potential station congestion at London Marylebone resulting from increased demand on Chiltern services, particularly interchange with London Underground Limited and heavy crowding on the Bakerloo line

The RUS recognises that increased growth in passenger numbers at London Marylebone, forecast in the HLOS and facilitated by key projects like the Evergreen 3 project, may lead to congestion at the station. This is not considered to be a RUS gap but should be dealt with as part of the ongoing station management regime. Stations on the network are leased to franchised train operating companies who are responsible for the day-to-day management of all facilities and services at the station and should therefore consider these potential issues and provide adequate measures to resolve them.

6.5.5 Gap issue I-34: Capacity: Bristol – Cheltenham – Worcester – Great Malvern to encompass passenger growth

The Great Western RUS considered capacity issues relating to Bristol Temple Meads and Bristol Parkway services and considered interurban travel between Bristol and other main centres. The analysis undertaken as part of the Great Western RUS included a consideration of any proposed or committed initiatives that would have an impact on network capacity. In terms of the route between Bristol and Great Malvern, the RUS developed a business case to enhance track capacity between Dr Days Junction and Filton Abbey Wood which included capacity, journey time, and performance benefits. The Great Western RUS recommended that development of these options be progressed. The West Midlands and Chilterns RUS notes the recommendations of the Great Western RUS.

6. Gaps and options

6.5.6 Gap issue I-64: New station required to meet future demand in the Brinsford area

Consideration has been given to the third-party proposal for a new station in the Brinsford area. This proposal is for a main line railway station to the north of Wolverhampton to serve local commuters and a potential new housing development in the Brinsford area. The aim of the proposal is to provide a new station to meet passenger demand from these areas and ease congestion on the local motorway network. Some feasibility work has been carried out to assess the option of stopping current rail services at the new station. This proposal has not progressed from the early planning stages and no funding has been confirmed. The RUS therefore acknowledges this stakeholder aspiration, but as the proposal is currently not consistent with any funding available it will provide no further assessment at this stage.

6.5.7 Gap issue I-87: Inadequate station facilities at Cannock line stations (Bloxwich – Rugeley inclusive) limiting rail accessibility

The limited station facilities available at the stations on the Cannock line was raised as an issue during the early stages of the RUS. Of particular focus was the inadequate nature of the customer information, station environment and signage at stations, which has a detrimental effect on a passenger's overall journey experience. This issue has been addressed through the CP4 Delivery Plan which provided funding in the form of the National Station Improvements Programme aimed at delivering enhancements at key stations across the network through joint industry working. London Midland and Network Rail, supported by Centro, have worked as a local delivery group to identify and deliver the key improvements on the Cannock line. The stations which were identified for funding are Bloxwich, Bloxwich North, Landywood, Cannock, Hednesford and Rugeley Town. The committed programme includes help points, enhanced lighting, better signage and new ticket machines. A further scheme has also been developed by the Local Delivery Group and Staffordshire County Council, in partnership with the DfT's Access for All programme, to provide real-time train running information. These schemes are considered to address the issues encompassed by gap issue I-87 and the gap is therefore closed by the RUS and no further assessment is required.

6.5.8 Gap issue I-91: Need to accommodate strong growth in peak and off-peak travel at Bromsgrove

Gap issue I-93: Need to accommodate growth between Redditch and Birmingham

The need for further investment in rail services to respond to growing demand in Bromsgrove and Redditch was highlighted during the gap identification stage of the RUS. The issue of congestion and lack of sufficient service capacity to both these locations has been addressed through the committed enhancement schemes which received funding through the CP4 Delivery Plan.

The extension of electrification to Bromsgrove, funded through the CP4 Delivery Plan, will facilitate the extension of Cross City services to Bromsgrove. This scheme has an interface with a third-party-funded scheme to relocate Bromsgrove station, as this will deliver the required turn back facilities for Cross City services. The extension of Cross City services, which is an output of the two schemes, will offer a significantly enhanced service frequency at Bromsgrove, by providing an additional three trains per hour in each direction. These schemes are considered to address RUS gap issue I-91 of strong growth in peak and off-peak travel at Bromsgrove.

The Redditch branch enhancement, funded through the CP4 Delivery Plan, will facilitate a service extension which will address the gap relating to growth at Redditch (gap issue I-93). The project encompasses work on the Redditch branch to enable an increase from the current two to three Cross City services per hour. Option development is in progress to determine the track, signalling and overhead line infrastructure works required to enable the output requirements to be achieved at the most efficient cost. This project has a timetabling interface with the Bromsgrove electrification scheme due to the nature of the Cross City service frequency and pattern.

As the relocation of the station at Bromsgrove is a prerequisite of the CP4 commitment to extend Cross City services it is important to note that, at present, the final funding mechanism for the station is yet to be finalised. If the station scheme is not funded and the associated CP4 outputs can not be delivered, the RUS would consider gap issues I-91 and I-93 as legitimate gaps and recommend the schemes identified in the CP4 Delivery Plan as options to address them.

6.5.9 Gap issue I-95: Inappropriate journey time Birmingham to the South West due to low linespeed (Cross-RUS boundary issue Birmingham to Bristol)

This issue was raised during the early stages of the RUS, and has now been addressed through a committed enhancement scheme funded through the CP4 Delivery Plan to improve the linespeed between Westerleigh Junction and Barnt Green. The project will enhance the linespeed on approximately 18 miles of the route between Bristol Parkway and Gloucester and between Cheltenham and Birmingham. In addition to achieving a linespeed of 100mph, the project will explore the possibility of raising the linespeed capability to 110mph over approximately 30 miles in each direction. This will be realised once relevant level crossing renewals are completed during CP4/early CP5, along with other additional works that may be required. The enhanced linespeed will result in journey time reductions and improved performance between Bristol and Birmingham. The RUS will consider no further intervention as this gap will be addressed by this committed scheme.

6.5.10 Gap issue I-99: Capacity on long distance high speed services between Bristol and Birmingham and beyond

The issue of capacity between the West Midlands and the South West has been considered by the Great Western RUS. It recommends an additional six to nine vehicles on the Edinburgh to Plymouth route and up to one vehicle on the Manchester to Bristol Service.

6.5.11 Gap issue I-111: Crowding issues: West Midlands – West Yorkshire. Service gap – only 1tph Leeds to Birmingham

Gap Issue I-114: Capacity on long distance high speed cross country routes

The issue of capacity between the West Midlands and West Yorkshire areas has been considered by the Yorkshire and Humber and East Midlands RUSs. In the short term it has been recognised that the recent rolling stock seating configuration introduced on CrossCountry's services between Birmingham, Derby and Sheffield will help to alleviate some crowding.

The Yorkshire and Humber RUS considered the option of re-routing the existing Newcastle to Reading services via Leeds and, in the longer term, the potential for significant train lengthening or a third long distance high speed service between Yorkshire and Birmingham.

The West Midlands and Chilterns RUS notes the recommendations of the Yorkshire and Humber RUS as outlined above. The option of assessing a third long distance service between Yorkshire and Birmingham New Street is considered to be a longer-term aspiration in this RUS which will be assessed in further detail during the next review of the cross country franchise. A holistic view has been presented in Option O-40 of the potential infrastructure enhancements which may be required to accommodate this service.

6.5.12 Gap issue I-112: Capacity issues: Birmingham – Leicester

Gap issue I-113: Inadequate daytime service frequency West Midlands – Peterborough/Cambridge/Stansted Airport.

The issue of capacity and service frequency between Birmingham and Stansted Airport, and key locations on that route, was raised in the early stages of both the East Midlands and West Midlands and Chilterns RUSs. The East Midlands RUS has carried out some extensive analysis of these gaps which involved defining the key locations for crowding both in the off-peak and peak times and forecasting the extent of this crowding up to 2019. Analysis has shown that by 2019, trains arriving and leaving Birmingham on the route to Stansted Airport in the morning and evening three-hour peaks are expected to reach seated load factors of 120 per cent at Birmingham. CrossCountry plans to lengthen some interurban services from three to four cars will address crowding in the short term. This will not require additional rolling stock but will involve platform lengthening at Stansted Airport along with the fitment of selective door opening operation to some of the Turbostar fleet. In addition to this planned train lengthening, the East Midlands RUS recommends further train lengthening requiring six additional vehicles targeted at relieving the remaining crowding as soon as rolling stock becomes available. It also proposes to combine this further train lengthening with the extension of the existing Birmingham New Street to Leicester service through to Cambridge from 2011. The West Midlands and Chilterns RUS notes this recommendation as a solution to improve inter-regional connectivity and provide the extra capacity to reduce crowding.

6. Gaps and options

6.5.13 Gap issue I-121: Capacity on the single track sections on the Sutton Park line constraints intermodal services to Southampton

The route between Castle Bromwich Junction and Walsall via the Sutton Park line has been identified as a priority diversionary route for intermodal traffic carrying 9'6" high containers from Southampton to terminals in the West Midlands and beyond in the North East and Yorkshire. It provides an alternative route to the West Coast Main Line and enables freight traffic to avoid the congested area around Birmingham New Street. As rail's market share of the total container traffic in the UK is growing there is a need to provide further capacity for freight services, and the long signalling headways and single track sections on the Sutton Park line are therefore considered to be gaps. The West Midlands and Chilterns RUS recognises that a number of initiatives are in development to address these constraints and so no further interventions are required. Improved signalling headways at the south end of the line and the remodelling of Park Lane Junction has been committed as part of the Water Orton resignalling scheme, planned for 2012. This will help to deliver higher line capacity. The East Midlands RUS has also considered the need to address the capacity requirements to support the increase in container traffic which will be routed from Southampton to the West Midlands and on to Yorkshire and the North East. It recognises that the scheme being developed as part of the Strategic Freight Network programme of works, to provide W10/W12 gauge clearance on the corridor between Water Orton and Doncaster, will provide the required capacity to support freight services. The West Midlands and Chilterns RUS recognises that both these initiatives will address gap issue I-121 and so no further analysis is required in this RUS.

6.5.14 Gap issue I-124: Need to ensure that passenger flow and interchange at Birmingham New Street following the Gateway project is efficient.

Gap issue I-125: Access to Platform 12 from the dispersal bridge is extremely limited at Birmingham New Street. This leads to passenger congestion and performance-related issues

Gap issue I-124 relates to the outputs which will be delivered as part of the Birmingham Gateway project. This gap issue has been addressed in the early stages of the project and no further work has been undertaken by the RUS.

The Birmingham Gateway project will substantially increase passenger capacity at the station and improve passenger flow and interchange. Part of the key outputs defined during detailed project development included greatly increasing the concourse area available to passengers. Significantly improved interchange routes will be provided, with increased provision for vertical circulation between platforms and concourse level. As part of the renewal and enhancement works at platform level, redundant rooms and facilities are being removed to aid passenger flows and maximise space available. Passenger flow modelling has been used to demonstrate that these changes enable Birmingham New Street station to manage the current passenger growth expectations up to 2035.

Gap issue I-125 relates to the outputs which will be delivered as part of the Birmingham Gateway project. This gap issue has been addressed in the early design stages of the project and no further work is therefore required within the RUS. The Gateway project will transform the configuration of the station creating access from the east and west side of the station to Platform 12, thereby using more discrete parts of the platform for passenger access compared to the current station. In addition the project will link Platform 12 to the Navigation Street footbridge thereby improving passenger flow and interchange. This will directly address access, congestion, safety and performance issues highlighted by this gap.

6.6 Option definition

After each gap has been quantified and consolidated as appropriate, it was then assessed against a standard toolkit of option solutions. The option toolkit includes a range of interventions, from the operation of longer trains within current infrastructure, re-timetabling to improve capacity, to platform extensions and the construction of additional infrastructure. Using the toolkit, interventions are defined and developed into proposed options to identify the next steps in the analysis.

As part of this analysis a number of these options were developed to address a number of the consolidated gaps. The full list of gaps, the consolidation of the gaps, and the options to address the consolidated gaps were reviewed and agreed by the SMG prior to commencement of the detailed assessment. **Tables 6.15 to 6.27** presents the gaps and options matrix which provides a brief description of each of the options and specifies which gaps are addressed. For consistency of approach this is structured on a corridor-by-corridor basis.

Table 6.15 – Aylesbury corridor

Consolidated gap number	Consolidated gap	Option number	Options
G-1	Aylesbury corridor capacity and service mix.	O-1	Train lengthening.
		O-2	Timetable study to look at service mix, linespeed increases and impact of new LUL rolling stock.
G-1a	Aylesbury corridor journey time.	O-2	Timetable study to look at service mix, linespeed increases and impact of new LUL rolling stock.
		O-3	Journey time improvement.
G-2	North-South Links in Buckinghamshire, particularly connectivity of Aylesbury.	O-4	Review and comment on the findings of Bucks County Council study, 'North-South Links in Buckinghamshire'.

Table 6.16 – Leamington Spa and Chiltern corridor

Consolidated gap number	Consolidated gap	Option number	Options
G-3	Leamington Spa and Chiltern freight capacity and West Midlands freight routeing.	O-5	West Midlands freight study overlaid onto corridor timetable studies.
G-4	Leamington Spa and Chiltern capacity.	O-6	Train lengthening on all service groups.
		O-7	Timetable study to assess opportunities of Evergreen 3 project.
G-5	Inappropriate journey time Oxford – Birmingham New Street.	O-8	Journey time improvement.
G-6	Need to improve the interchange at both Birmingham New Street and other local potential interchange stations.	O-9	Centro undertaking study to look at Birmingham Central stations
		O-10	Consider crowding mitigation measures.
G-7	Birmingham Moor Street and Birmingham Snow Hill station crowding.	O-10	Consider crowding mitigation measures.
G-8	Air passenger demand growth is forecast at London Heathrow Airport so improved rail access required.	O-11	Review and comment on the findings of Buckinghamshire County Council study, 'North-South Links in Buckinghamshire' in relation to London Heathrow Airport.

Table 6.17 – Stourbridge line

Consolidated gap number	Consolidated gap	Option number	Options
G-9	Stourbridge line freight routeing.	O-5	West Midlands freight study overlaid onto corridor timetable studies.
G-10	Worcester – Hereford – Birmingham capacity.	O-14	Train lengthening on all services between Birmingham and Worcester via Stourbridge.
G-10a	Worcester stations connectivity.	O-12	Timetable study and infrastructure enhancement.
		O-13	Review options that might arise when during Worcester signalling renewals.
G-11	Hereford – Worcester Foregate Street infrastructure constraints causing performance issues.	O-13	Review options that might arise when Worcester is re-signalled.
G-12	Stourbridge line capacity.	O-14	Train lengthening on all services between Birmingham and Worcester via Stourbridge.
G13	Journey time improvements on the Stourbridge line.	O-15	Journey time improvement.

6. Gaps and options

Table 6.18 – Stratford-upon-Avon corridor

Consolidated gap number	Consolidated gap	Option number	Options
G-14	Peak and all day capacity on the Stratford-upon-Avon corridor.	O-16	To be included as part of Leamington Spa and Chiltern timetable study (Gap 4).

Table 6.19 – Coventry corridor

Consolidated gap number	Consolidated gap	Option number	Options
G-15	Coventry corridor freight capacity and routeing.	O-5	West Midlands freight study overlaid onto corridor timetable studies.
G-16	Coventry corridor peak capacity.	O-17a	Train lengthening on peak local Coventry/ Northampton – Birmingham service
		O-17b	Train lengthening on Birmingham New Street – Manchester
		O-18	Timetable study to consider standard interval timetable for local stations and re-routeing of Reading to Newcastle service (in each direction) in each hour from the Solihull route.
G-16a	Lack of direct services Coventry/ Birmingham International – Derbyshire, Yorkshire and North East suppressing rail demand.	O-18	Timetable study to consider standard interval timetable for local stations and diversion of Reading to Newcastle service (in each direction) in each hour from the Solihull route.
G-17	Seven-day timetable required based on Sunday demand levels for long distance inter-regional routes within the scope of the West Midlands and Chilterns RUS.	O-19	Review and consider opportunities arising out of seven day railway workstream.

Table 6.20 – Stafford and Wolverhampton corridor

Consolidated gap number	Consolidated gap	Option number	Options
G-18	Stafford and Wolverhampton freight capacity and routeing.	O-5	West Midlands freight study overlaid onto corridor timetable studies.
G-19	Peak and all day capacity on the Stafford and Wolverhampton corridor.	O-20	Train lengthening – local services.
		O-17b	Train lengthening on long distance services between Manchester and Bournemouth via Coventry and Birmingham International.
G-20	Capacity: Manchester to Birmingham.	O-17b	Train lengthening on long distance services between Manchester and Bournemouth via Coventry and Birmingham International.
		O-21	Timetable intervention between Birmingham and Manchester.
G-20a	Birmingham – Manchester journey time.	O-21	Timetable intervention between Birmingham and Manchester.
G-21	Dudley Port interchange with proposed West Midlands Metro.	O-22	Review and consider requirements for interchange facilities with Midland Metro at Dudley Port.
G-22	Capacity: Stafford to Birmingham.	O-23	Train lengthening: Birmingham New Street – Liverpool.
G-23	Improved connectivity required: Wolverhampton – Walsall.	O-24	Timetable study to consider direct services between Wolverhampton and Walsall.

Table 6.21 – Shrewsbury corridor

Consolidated gap number	Consolidated gap	Option number	Options
G-24	Freight gauge capability on the Shrewsbury – Wolverhampton line.	O-5	West Midlands freight study
G-25	Journey time Mid Wales – Shrewsbury – Birmingham.	O-25	Assess opportunities arising from planned linespeed increases.
		O-26	Journey time improvement.
G-26	Peak and all day capacity issues for passenger services: central Birmingham.	O-27	Train lengthening on all service groups – to be considered in conjunction with gap 19.

Table 6.22 – Leamington Spa and Nuneaton corridor

Consolidated gap number	Consolidated gap	Option number	Options
G-27	Overcrowding on Leamington Spa – Coventry services in morning and evening peak, and throughout the day, limited capacity on the single line.	O-18	Timetable study to consider standard interval timetable for local stations and diversion of Reading to Newcastle service (in each direction) in each hour from the Solihull route.
G-28	Demand for rail service in Kenilworth.	O-29	Review and consider findings of separate workstream that is developing third-party project for a new station at Kenilworth.
G-29	Improved rail provision Nuneaton – Coventry – Leamington Spa with new stations at Ricoh Arena and Bermuda to accommodate suppressed demand and future demand (housing and business growth).	O-30	Review and consider findings of development stage of the third party project to improve rail provision Nuneaton – Coventry with new stations at Ricoh Arena and Bermuda Park.

Table 6.23 – Cannock and Walsall corridor

Consolidated gap number	Consolidated gap	Option number	Options
G-30	Cannock and Walsall line freight growth, West Midlands area routeing and terminal capacity.	O-5	West Midlands freight study overlaid onto corridor timetable studies.
G-31	Cannock and Walsall line peak capacity and growth.	O-31	Train lengthening on all peak service groups.
G-32	Demand for rail in Aldridge/Brownhills area.	O-32	Timetable study. Business case to be assessed for new station and extension of services to Aldridge.

6. Gaps and options

Table 6.24 – Cross City and Lickey corridor

Consolidated gap number	Consolidated gap	Option number	Options
G-10	Worcester – Hereford – Birmingham capacity.	O-33	Train lengthening on all service groups.
G-10	Worcester – Hereford – Birmingham capacity.	O-34	Timetable study to assess opportunities for additional services between Birmingham, Worcester and Hereford and opportunity for wider cross-Birmingham connectivity.
G-33	Cross City and Lickey corridor Freight routeing.	O-5	West Midlands freight study overlaid onto corridor timetable studies.
G-34	Cross City and Lickey corridor peak and all day capacity.	O-35	Lengthening of morning peak services between Birmingham and Lichfield.
G-35	Station capacity at University station to accommodate future growth (including Selly Oak/Queen Elizabeth Hospital redevelopment strategy).	O-36	RUS to comment on opportunities to enhance University station through National Stations Improvement Programme.
G-36	Performance West Suburban between Kings Norton and Birmingham New Street and journey time (typically six minutes pathing time in fast services).	O-37	Journey time improvement.

Table 6.25 – Derby, Nuneaton and Camp Hill corridor

Consolidated gap number	Consolidated gap	Option number	Options
G-37	Derby, Nuneaton and Camp Hill lines freight capacity and capability and West Midlands area freight routeing and terminal capacity.	O-5	West Midlands freight study overlaid onto corridor timetable studies.
G-38	Derby, Nuneaton and Camp Hill corridor capacity.	O-38a	Train lengthening on long distance interurban services between Plymouth and Edinburgh via Derby.
G-38 G-39	Derby, Nuneaton and Camp Hill corridor capacity. Capacity on long distance high speed routes.	O-38b	Train lengthening on long distance interurban services between Nottingham and Birmingham/Cardiff.
		O-39	Timetable study to assess two additional trains in each hour between Tamworth and Birmingham New Street additional service in each hour from Tamworth forming cross-Birmingham service to Worcester. (Option 39a = express service) (Option 39b = local service).
		O-40	Assess impact of third long distance high speed service between Yorkshire and Birmingham.
G-40	Consider passenger interchange with the West Coast Main Line at Tamworth.	O-41	Comment on opportunities for interchange with West Coast Main Line at Tamworth.

Table 6.26 – Sutton Park corridor

Consolidated gap number	Consolidated gap	Option number	Options
G-41	Freight capacity and routeing in West Midlands.	O-5	West Midlands freight study overlaid onto corridor timetable studies.

Table 6.27 – Birmingham New Street

Consolidated gap number	Consolidated gap	Option number	Options
G-42	Operational capacity: Birmingham New Street (on approach and within station).	O-42	Detailed platform assessment to be undertaken to include impact of all radial corridor interventions. This will determine what further interventions need to be considered to provide capacity in central Birmingham.

6.7 Generic gaps

A number of generic gaps, which are considered to have relevance to all parts of the RUS area, were identified by the Stakeholder Management Group (SMG) as part of the gap identification process. A number of workstreams and initiatives are currently in development independent of the RUS to consider the key issues and provide potential solutions. The RUS supports these initiatives and considers that no further work needs to be undertaken separately within the RUS. These initiatives are outlined below:

Generic gap G-43: Improved evening services within the RUS area

The SMG has identified that on some of the routes radiating from central Birmingham the current rail service provision in the evening is not adequate to meet changes in passenger demand. On-train crowding that is sometimes observed on the last evening trains departing central Birmingham is seen to reflect the demand for later evening services.

The RUS recognises that later evening services in the West Midlands should be considered on some corridors to meet current and future demand, especially with Birmingham as a key regional city attracting a large number of leisure travellers. There is currently insufficient robust data to demonstrate the current and potential level of rail demand for late evening services and therefore a detailed business case for each corridor has not been undertaken. The socio-economic benefits of running later evening services is likely to be marginal and therefore the business case, based on socio-economic benefits, is likely to be weak. It is recognised, however, that on some corridors the current last evening services finish earlier than on other corridors, for example on the Stratford-upon-Avon line, and consequently rail demand is being suppressed. The RUS recognises this disparity and therefore proposes that train operators and Centro work together to identify opportunities for each of the radial routes into Birmingham and to understand the operational feasibility and effect on resources. A localised study is likely to be required

to understand the level of potential demand for late evening services. It should be noted that the requirement to close parts of the network in the evening for engineering works can affect the operation and service pattern of late evening services, so this should be taken into account.

Table 6.28 shows the early and late service analysis (including weekends) for services to and from Birmingham, which has been undertaken by Centro. This analysis will help to inform the prioritisation of routes which require earlier and later services.

Generic gap G-44: Improved Sunday services within the RUS area

The SMG has considered the need for increasing Sunday service levels to accommodate weekend demand. Demand for rail trips to key urban centres is increasing due to the growing number of social and leisure activities on Sunday when many retail facilities are open. It is recognised that not being able to operate a timetable on Sunday that is similar to the rest of the week is suppressing rail demand in many market sectors. Sunday is the second busiest day for some interurban and long distance services. Stakeholders have expressed the opinion that some suburban and interurban services in West Midlands are inadequate on Sundays and do not start early enough to meet demand (see gap 17). This service gap is also considered to be more acute on certain corridors in the RUS area, for example there are only two direct trains on Sundays from Hereford to Birmingham, and the first train starts in the afternoon.

The RUS SMG recognises that generic gaps 43 and 44 will be addressed in part by the initiatives being considered within the network availability work stream. This initiative seeks to balance the need for improved late evening and weekend services with the need for engineering access. The concept is being developed by Network Rail with industry stakeholders by examining appropriate route sections. The aim is to increase current levels of network availability on weekday and weekend, both for passenger and freight.

6. Gaps and options

Table 6.28 – First and last service analysis to and from Birmingham summer 2010 timetable

Station	Weekday		Saturday		Sunday ^a	
	First arrival in Birmingham	Last departure from Birmingham	First arrival in Birmingham	Last departure from Birmingham	First arrival in Birmingham	Last departure from Birmingham
Regional destinations						
Northampton	06:16	23:10	07:01	23:57	10:30	23:00
Coventry	06:16	23:53	06:39	23:48	09:06	23:14
Birmingham International	06:16	23:53	06:32	23:13	09:06	23:14
Marston Green	06:16	23:53	06:39	23:13	09:06	23:14
Leamington Spa	06:33	23:33	07:12	23:40	10:26	21:18
Warwick	06:33	23:33	07:12	23:40	10:26	21:18
Solihull	06:17	23:33	07:12	23:40	10:26	21:18
Stratford-upon-Avon	07:15	20:30	07:54	20:30	10:12	18:22
Shirley	06:48	23:28	07:22	23:30	10:12	18:22
Cheltenham Spa	07:56	22:12	07:56	21:12	10:36	22:12
Bromsgrove	06:46	23:00	07:19	20:59	15:37	21:00
Redditch	07:03	23:14	07:02	23:14	10:03	23:15
Longbridge	06:34	23:34	06:34	23:34	10:03	23:15
Hereford	08:37	20:59	09:11	20:59	15:30	21:00
Great Malvern	06:46	21:57	07:19	21:51	11:21	21:35
Worcester Shrub Hill	06:28	22:59	06:53	22:55	10:24	22:52
Kidderminster	06:28	22:59	06:45	22:59	10:20	22:55
Stourbridge Junction	06:28	23:22	06:45	23:23	10:20	22:55
Shrewsbury	06:17	23:32	06:20	23:35	09:15	23:24
Telford Central	06:17	23:32	06:20	23:35	09:15	23:24
Stafford	05:58	23:09	05:55	22:36	09:58	22:55
Wolverhampton	05:26	23:32	05:55	23:35	08:24	23:24
Coseley	06:43	23:09	06:44	23:08	08:46	23:09
Cannock	06:57	23:18	07:28	23:18	10:46	22:40
Walsall	06:28	23:18	06:26	23:18	10:27	23:17
Lichfield City	06:49	23:15	07:01	23:15	10:12	23:06
Sutton Coldfield	06:31	23:15	06:31	23:15	09:42	23:06
Derby	06:52	23:09	06:50	22:49	10:21	22:03
Tamworth	06:52	23:09	06:50	22:49	12:26	22:03
Nuneaton	07:15	22:22	06:43	22:22	12:15	21:52
Colehill Parkway	07:15	22:22	06:43	22:22	12:15	21:52
Long distance destinations						
London Euston	07:27	23:10	07:45	21:30	10:47	23:00
London Marylebone	08:59	21:18	08:59	21:18	10:26	21:18
Milton Keynes	08:03	23:10	09:08	21:30	10:47	23:00
Reading	08:16	22:15	07:51	21:03	10:50	21:03
Bristol	07:56	22:12	07:56	21:12	10:36	22:12
Cardiff	08:45	22:12	08:45	20:30	13:41	19:30
Liverpool	08:17	21:36	08:17	20:01	13:16	19:35
Manchester	06:58	22:28	07:00	22:31	09:58	22:01
Leeds	08:09	21:03	08:08	21:03	10:21	22:03
Sheffield	07:27	21:03	08:08	21:03	10:21	22:03
Nottingham	07:24	23:09	07:24	22:10	12:26	20:49
Leicester	07:15	22:22	06:43	22:22	12:15	21:52
Stansted Airport	08:45	19:22	08:38	19:22	13:39	19:22

Notes:

^a Sunday 8 August 2010 sample (sample sense checked 5 September 2010)

Northbound services on the Leamington and Chiltern and Stratford-upon-Avon corridors – times taken to Birmingham Moor Street

Southbound services on the Stourbridge corridor – times taken to Birmingham Snow Hill

A seven day railway fund has been provided as part of the CP4 Delivery Plan and a network availability plan is currently being developed to deliver substantial improvements in network availability to passenger operators, and where an industry business case can be obtained, to allow passenger and freight operators to run additional train services at times that address suppressed customer demand. The key aims are to:

- implement shorter and more appropriately timed possessions
- achieve network availability regulatory outputs
- achieve productivity and efficiency gains through changes to the technology and processes used to maintain, renew and enhance the network.

The core initiatives and activities which will improve network availability include opportunities for single line working, improved access points, modular switches and crossings work, high output track replacement techniques and more rapid assembly and installation of signalling systems on site.

The enhancements work bank for CP4 has been reviewed nationally to reduce disruption in access requirements over time and across the network. Further work is also being undertaken to explore ways to best optimise network availability across the RUS area. An initial list of candidate sections for additional single line working has been collated which will be prioritised to focus on the key pinch points. Feasibility studies will be required to develop detailed proposals, including any schemes which may be required to facilitate single line working. Access points, junction lighting, Lookout Operated Warning System, and the removal of red zone working prohibitions are some of the schemes which are already being implemented as a result of the Efficient Engineering Access work.

The Network RUS: Electrification Strategy considered the benefits of more electrified diversionary routes for helping the move towards a seven day railway. Electrification schemes which provide diversionary capability for services from other electrified routes improve maintenance accessibility, enable operators to avoid the need for rail replacement buses and provide passengers with an uninterrupted journey. The Network RUS: Electrification Strategy outlined a number of candidate electrification infill schemes to be taken forward for further analysis to evaluate their benefits and determine their affordability. The strategy considered certain key routes within the West Midlands and Chilterns RUS area including between Oxley Junction and Bushbury Junction, Nuneaton to Proof House Junction, Proof House to Derby, Whitacre Junction to Kingsbury, and Walsall to Rugeley Trent Valley. Further analysis should consider funding availability, affordability of the scheme and the rolling stock strategy which would be required.

The option analysis work (option O-32a) which has been undertaken in the West Midlands and Chilterns RUS to address gap 32 – demand for rail in the Aldridge/Brownhills – area has considered the electrification requirements which would enable the extension of the Birmingham to Walsall electric service to a new station at Aldridge. The electrification of this line would also provide an opportunity to link this service through to the Coventry line to provide through service connectivity (option 32b).

The Network RUS Electrification Strategy recommended that further analysis is carried out on the infill schemes including the Walsall to Rugeley Trent Valley line.

Generic gap G-45: Improved connectivity to Birmingham International Airport

During the gap identification process, stakeholders raised connectivity to Birmingham International Airport as a generic gap across the RUS area. Birmingham International Airport is the second largest airport in the UK outside London and is forecast to handle 27 million passengers per year in 2030†. The importance of rail connectivity to Birmingham International Airport has been highlighted in the Airport Master Plan and Airport Surface Access Strategy, published in 2007, and is supported in the Regional Planning Assessment for the West Midlands. The Airport Surface Access Strategy sets out a Passenger Public Transport Modal Share target for the airport of 25 per cent by 2012, with 12 per cent by rail. Similarly, it sets out an Employee Public Transport Modal Share target of 25 per cent by 2012, with six per cent by rail.

Birmingham International Airport is operational 24 hours a day, with air services operating throughout the night and early in the morning, when rail services are either limited or not available. Analysis of airport passenger and employee surveys indicates a strong demand for rail services. Airport passenger surveys in 2008 show that routes with direct rail services to Birmingham International station have more than 20 per cent of its passengers travelling to the airport by rail, highlighting that good connectivity helps to increase rail demand. Airport employee surveys in 2008 show that a large proportion of staff work in shifts and many start their work shifts very early in the morning, when either rail services are not available or limited. This limits the number of workers being able to commute to work by rail. On Saturdays and Sundays the network and frequency of rail services is reduced, compared with weekdays, and compounded by weekend rail maintenance.

It is also recognised that events scheduled at the National Exhibition Centre (NEC), next to Birmingham International Airport, also create significant demand for rail. Currently, rail service

† Source: Airport Master Plan published by Birmingham International Airport.

6. Gaps and options

provision is not considered to be sufficient due to the disparity in timing between the last train services to locations across the RUS area and the ending of events at the NEC and limitations in the range of services available on Saturdays and Sundays.

Consequently options have been developed to address this gap on some of the radial routes into Birmingham. The proposed option (option O-18) of diverting the existing Reading – Newcastle service via Coventry and Birmingham International stations provides direct rail services between the North East, Yorkshire and West Midlands and helps to address this connectivity gap. The proposed option (option O-32b) of linking services on the Cannock and Walsall corridor to Coventry via Birmingham International station would also help to bridge this connectivity gap.

Passenger benefits will also be delivered by the Birmingham New Street Gateway project, which plans to improve connectivity to Birmingham International station through provision of an enhanced Customer Information System. The Customer Information System system to be installed at Birmingham New Street station, as part of the Birmingham New Street Gateway project, will have the capability to display the next fastest available train to designated locations, including Birmingham International Airport and the National Exhibition Centre. This will assist passengers in connecting to Birmingham International station services more efficiently.

Generic gap G-46: West Midlands and Chilterns RUS area car parking

The lack of car parking capacity has been identified as an issue at a number of stations within the RUS area, and has been classified as a generic gap which needs to be addressed in order to prevent limited station car parking facilities being a factor suppressing future passenger demand. **Chapter 4** has outlined where a number of schemes are in development to provide additional car parking capacity, sponsored by the train operating companies, third parties, and Network Rail. There are also a number of stakeholder aspirations, some of which are currently unfunded, to consider increased car parking capacity at stations across the RUS area. These are:

- Worcester Shrub Hill (Worcester County Council)
- Bromsgrove – new station proposed (Worcester County Council)
- Dudley Port (Centro)
- Lichfield Trent Valley (Lichfield District Council)
- Hatton (Warwickshire County Council)
- Stratford-upon-Avon (Warwickshire County Council).

It is recommended that Network Rail continues to work with station operators and Centro to review and assess opportunities for further increases to car park capacity across the RUS area. Joint initiatives with local authorities are also encouraged as a way to secure incremental car park expansions and deliver better access to stations.

A recent study undertaken by Centro indicated that charging for car parking within the Centro area did not offer a credible solution to managing the supply of parking spaces as the overall net costs (in terms of collecting the charge), loss of rail patronage, etc outstripped the revenue generation potential. Centro's capital programme continues to include some provision for on-going expansion of car parks, but it is recognised that it will be impossible to fund sufficient capacity to cater for all potential users. Centro is therefore developing a station access strategy based on an analysis of the demand and capacity available on each route. This strategy will indicate a plan for improving park and ride and other access measures on a route-by-route basis, and will highlight particular stations that future park and ride expansion should be focused on.

6.8 Assessment of options

Each of the options has been assessed for operational and/or economic impact where applicable. Where a specific gap has been identified, timetable and performance analysis has been used to determine whether or not an option is practical, ie the proposed service can actually be timetabled reliably on the network. Where an option is considered to be practical an economic appraisal has been carried out which compares the revenue implications and the socio-economic benefits of changes due to the infrastructure and/or service specifications (frequency, journey time, stopping pattern) against operating cost changes and any capital costs necessary to enhance infrastructure to permit such service alterations.

The option of train lengthening is one of the interventions considered where a gap is based on a mismatch between supply and demand. As part of the options work carried out in this RUS, passenger loadings on each corridor have been assessed in the high-peak hour (between 08:00 and 08:59) and in the three-hour peak (between 07:00 and 09:59) to understand the demand which is anticipated up to 2019. This demand has been measured against the supply in terms of train service provision, including any additional capacity which is committed as part of the CP4 Delivery Plan or other committed service enhancement. Where there is shown to be a mismatch between supply and demand an economic appraisal to assess the value for money of train lengthening has been considered.

Train lengthening and other options developed to address gaps to 2019 have been subject to an appraisal which is compliant with the Department for Transport's (DfT) Transport Analysis Guidance. Where appropriate, benefit cost ratios are reported, which indicate the value for money of any particular scheme. The DfT funding criteria permits recommendation of funding through the RUS process if the benefit cost ratio is at least 1.5, which is indicative of medium value for money. However, schemes involving infrastructure investment are required to offer high value for money indicated by a benefit cost ratio of at least two. The business case presented results from high level feasibility work (equivalent to GRIP 0) unless otherwise stated, and represent the most likely value for money based on a range of key sensitivities.

All option analysis work undertaken starts from a base which includes the HLOS-funded enhancements and any other committed enhancement schemes as outlined in **Chapter 4**. The base for each option also includes the requirements for freight services to 2019 and 2030 as agreed by the Stakeholder Management Group for each of the RUS corridors.

6.9 Option appraisal

The option appraisals that have been carried out for each corridor are presented below, detailing the scope, the process undertaken and the recommendations of the analysis. In some cases an option to address a gap on one corridor relates to a gap on another corridor; this is indicated in the option table.

6.9.1 Aylesbury line – option analysis

Capacity and service mix have been identified as a consolidated gap on the Aylesbury line based on identified overcrowding which is seen as a result of a number of factors including service mix. On-train crowding on the Aylesbury line, particularly south of Harrow, is recognised to be an issue which will be further exacerbated by planned housing growth and redevelopments in the Aylesbury area. The infrastructure between Harrow and Amersham is owned by London Underground Limited (LUL), and the line is shared between LUL services and national rail services operated by Chiltern Railways. This mix of services, together with the current slow journey times and frequent stopping patterns impact on capacity and performance on the line.

In order to determine the capacity requirements on the route between London Marylebone and Aylesbury, passenger demand forecasts to 2019 were assessed. Committed changes which will increase future capacity on this line were included as part of this assessment, including Control Period 4 train lengthening commitments. In the latest Evergreen 3 project specification, all high-peak hour services will be operated at a maximum length of

six cars, with some shoulder peak services operating at this length too. The analysis shows that there will be high levels of crowding in 2019 with most services operating close to or even above train capacity in the high-peak hour.

Option O-1 – Train lengthening of services between Aylesbury and London Marylebone

The mix of linespeed on this line limits the option of increasing peak hour frequency, so the option of providing additional peak hour capacity by train lengthening was considered to help alleviate on-train crowding into London Marylebone. This option would require platform lengthening at various stations along the route to accommodate services that are longer than six-car. It is anticipated that the cost of platform lengthening would be too high to support train lengthening of a few services in the high-peak; as a result no business case has been developed. Option O-2 considers timetable interventions to address crowding on this corridor as these are considered to be a more practical solution.

Option O-2 – Timetable interventions to improve capacity, service mix and journey time between Aylesbury and London Marylebone

The RUS has carried out an initial examination of the potential opportunities to improve capacity, service mix and journey time between Aylesbury Vale Parkway and London Marylebone. This examination has specifically assessed the route between Amersham and Harrow-on-the-Hill where both national rail services and LUL services operate over the LUL infrastructure (Metropolitan Line). Options considered have included an assessment of the impact of new LUL 'S' stock. The 'S' stock has a higher operating speed, the benefits of which will be obtained once the Metropolitan Line is resignalled. Station calling patterns for both LUL and national rail services have also been considered as part of this assessment. This initial examination has identified some potential journey time opportunities. The RUS recommends that these opportunities are developed further to understand the potential journey time savings which could be achieved on this route. The need to understand the effect of resignalling and rolling stock changes is essential. To be effective, this work should be a joint exercise involving Network Rail, Transport for London, London Underground Limited and the relevant train operators

Option O-3 – Journey time improvement

The RUS recommends that further opportunities to improve journey time on this route be considered as part of future planned renewals and other potential capability improvement schemes.

6. Gaps and options

Option O-4 – Conclusions of Buckinghamshire County Council Study ‘North-South Links in Buckinghamshire’

Limited rail links between key towns in Buckinghamshire and the surrounding areas was raised as a gap in the baseline stage of the RUS. Buckinghamshire County Council have commissioned a study, undertaken by Chiltern Railways, to consider potential options to improve transport links. The report, published in 2008, considered the planned population growth in Aylesbury and the options to provide improved public transport links on the Milton Keynes – Aylesbury – High Wycombe – Thames Valley corridor. The rail and infrastructure options proposed included combining East West Rail and Chiltern services. As the options that have been developed did not require extra train paths between Aylesbury Vale Parkway and London Marylebone, a detailed timetable study analysing the impact of the north-south links on the Aylesbury line (as defined in the RUS) is not required in this RUS. The West Midlands and Chilterns RUS acknowledges the strategic objectives of Buckinghamshire County Council as outlined in the study. The delivery of the service and infrastructure enhancements proposed will be dependent on the business case, stakeholder endorsement and an appropriate funding stream becoming available.

6.9.2 Cannock and Walsall line – option analysis

When analysing demand and capacity requirements up to 2019, London Midland's proposed operational plan for CP4 has been included in the base (Do-Minimum). This proposal increases the number of seats by around 500 in the three-hour morning peak. This increase would be delivered through the replacement of the current two to three-car diesel multiple units by three-car electric multiple units between Walsall and Birmingham. However some passengers may still be standing on the busiest peak hour trains on the approach to Birmingham by 2019 although this will be within DfT's standing time allowance guidance. An option of train lengthening beyond the CP4 operational plan has been assessed and reported in this section.

Aldridge and Brownhills area, located to the north of Walsall, are expected to experience housing growth and currently the area is not served by rail. Provision of direct rail services from this area to Birmingham city centre would help to cater for this housing growth and support the regeneration of the area. Timetable analysis and infrastructure requirements to provide direct rail services from Aldridge to Birmingham New Street are examined in this section.

Assessment of option O-31 – Train lengthening on peak service groups			
Gaps addressed	Consolidated gap G-31: Cannock and Walsall line peak capacity and growth.		
Concept	Lengthen one morning and one evening peak train by 2019 on the Walsall to Birmingham New Street service by one or two additional vehicles.		
Operational analysis	No additional services required.		
Infrastructure required	No additional infrastructure is required to support this option.		
Passenger impact	This option assesses the business case for additional vehicles beyond the CP4 operational plan. Additional vehicles and capacity would help to reduce number of passengers standing on the approach to Birmingham.		
Freight impact	Current and future freight demand can be accommodated.		
Financial and economic analysis	The main costs relate to rolling stock. The following table outlines the appraisal results:		
	£million (2002 PV)		
	30-year appraisal	Option 1: One additional vehicle	Option 2: Two additional vehicles
	Costs (present value)		
	Investment cost	0.0	0.0
	Operating cost	1.7	3.4
	Revenue	-0.2	-0.3
	Other Government impacts	0.1	0.1
	Total costs	1.5	3.1
	Benefits (present value)		
	Rail users benefits	1.5	2.1
	Non users benefits	0.4	0.5
	Total quantified benefits	1.9	2.5
	NPV	0.4	-0.5
	Quantified benefit cost ratio	1.2	0.8
Link to other options	None.		
Conclusion	Proposed CP4 additional vehicles under the delivery plan will provide sufficient supply to meet both current and forecast demand to 2019. It offers poor value for money to lengthen peak local services on this corridor beyond the delivery plan. This option is therefore not recommended.		

6. Gaps and options

Assessment of option O-32a – Timetable study to assess new rail station at Aldridge	
Gaps addressed	Consolidated gap G-32: Demand for rail in Aldridge/Brownhills area
Concept	This option relates to the strategic aspiration of Centro to develop a new station at Aldridge. A timetable study has been undertaken to assess how a new station at Aldridge might be served that would provide a direct rail service into Birmingham New Street serving the Aldridge/Brownhills area. The timetable study has focused on providing an Aldridge to Birmingham service via the Walsall corridor.
Operational analysis	<p>Two service options have been considered for assessment – one utilising diesel multiple units (DMU) and the second utilising electric multiple units (EMU) which would require extension of the overhead electrification from Walsall to Aldridge.</p> <p>The use of a DMU to operate this service is discounted due to the need to recast all services to DMU.</p> <p>The extension of the current EMU service would provide a half-hourly service to a potential new station at Aldridge.</p> <p>The current EMU service between Birmingham New Street and Walsall has 17 minutes turnaround time at Walsall, which means a timetable recast would be required to maintain a clockface timetable. Two timetable sub options have been analysed which both offer a half-hourly pattern:</p> <p>Timetable option A – run the current EMU service between Birmingham New Street and Walsall and return 10 minutes later than current to allow for the extension to Aldridge. This would, however, require a retiming of services from Rugeley Trent Valley to Birmingham New Street which conflicts at Soho South Junction and with existing scheduled Rugeley services. This option was therefore dismissed.</p> <p>Timetable option B – run the current EMU service between Birmingham New Street and Walsall 10 minutes earlier and return in the current time slot. This would also require Rugeley Trent Valley services to be retimed from Birmingham. This option is viable if two minute headways are provided between Soho South Junction and Birmingham New Street to prevent service conflict. Services would be required to layover at Birmingham New Street for 20 minutes. The service would not allow provision of direct services through to Wolverhampton.</p> <p>Both options would require additional vehicles and crew resources. The level of resource requirement is being assessed during the consultation period.</p>
Infrastructure required	<p>For option B to work the following would be required:</p> <p>Signalling alterations between Soho South Junction and Birmingham New Street</p> <p>New station at Aldridge (with a bay platform so that freight services are not restricted)</p> <p>Electrification between Walsall and Aldridge</p> <p>In order to improve operational resilience it would be advisable to reinstate platform 4 at Walsall, and enhance the signalling headways and linespeed on the Cannock line.</p>
Passenger impact	Demand for rail in the Aldridge and Brownhills area would be served by the extension of services to a new station. It would provide passengers with connectivity to Birmingham city centre.
Freight impact	Current and future freight demand can be accommodated.
Financial and economic analysis	Centro, the Integrated Transport Authority for West Midlands, is developing a high level business case jointly with Network Rail during the consultation period. The number of additional vehicles and staff required to operate this option would be identified. The above infrastructure requirement, its capital expenditure and operating cost and timetable study will feed into the business case. The appraisal result will be reported in the final RUS.
Link to other options	<p>As part of the timetable study to consider how a new station at Aldridge might be served, the opportunity was taken to consider how services on this corridor might be linked with other corridors to provide cross-Birmingham opportunities (Option O-32b).</p> <p>If the Cannock line was electrified, electric services from Rugeley into Birmingham New Street could be linked with the local service from Birmingham New Street to Wolverhampton.</p>
Conclusion	The option work undertaken concludes that a new station at Aldridge could best be served by an extension of the Birmingham New Street to Walsall electric services. This option would require significant infrastructure enhancements and some additional rolling stock. The RUS supports the ongoing work being undertaken by Centro to develop a business case for Aldridge station.

Assessment of option O-32b – Link the proposed half-hourly Birmingham New Street to Aldridge service to the Coventry corridor	
Gaps addressed	Consolidated gap 32: Demand for rail in Aldridge/Brownhills area and generic gap 45 Birmingham International Airport connectivity.
Concept	Linking the proposed service between Birmingham New Street and a new station at Aldridge through to the Coventry corridor would provide greater connectivity to Birmingham International Airport and Coventry from the Walsall, Brownhills and Aldridge area.
Operational analysis	<p>The two trains per hour from Aldridge to Birmingham, considered in O-32a could be linked to the Coventry corridor. It is assumed that journey time between Aldridge and Walsall is seven minutes.</p> <p>Linking Aldridge with the Coventry corridor does not change the overall number of EMUs required from the stand alone Aldridge to Birmingham New Street service. It does not affect the timetable on the Coventry corridor.</p>
Infrastructure required	No additional infrastructure is required to support this option.
Passenger impact	Demand for rail in the Aldridge and Brownhills area would be served by the extension of services to a new station and connectivity to Birmingham International Airport and Coventry.
Freight impact	Current and future freight demand can be accommodated.
Financial and economic analysis	<p>This option links the proposed new service in option O-32a with the existing services on the Coventry corridor, therefore no additional infrastructure or resource cost beyond option O-32a is required.</p> <p>This option does not change the timetable on the Coventry corridor and therefore it does not generate any disbenefit beyond option O-32a. Its business case is subject to option O-32a and consequently no further appraisal has been undertaken.</p>
Link to other options	Option O-32a
Conclusion	The RUS analysis work demonstrates that if the aspiration for a new station at Aldridge can be funded and a value-for-money business case can be produced, Aldridge services could be linked to Coventry services to provide through service connectivity. This option is recommended for consideration during any further development of the Aldridge new station scheme.

6.9.3 Coventry corridor – option analysis

The Coventry corridor is one of the busiest radial routes into Birmingham with a mix of long distance, interurban and suburban services. The loading analysis in **Chapter 5** showed that by 2019, even with committed schemes, the high-peak seated load factor on the local commuting services will be in excess of 100 per cent. It is predicted that one train in the high-peak hour would be operating in excess of capacity with standing likely to start from as far as Berkswell, which is more than 20 minutes from Birmingham. On the long distance interurban services, standing

will also be experienced as these services are used by both local commuters and long distance travellers. The options of lengthening these services to meet forecast demand are examined.

Currently there are no direct rail services from the North East/Yorkshire/East Midlands to Birmingham International and Coventry and consequently this suppresses rail demand. Options to address this connectivity gap have been developed. Furthermore, options to provide a more even timetable for passengers on the local services have been developed.

6. Gaps and options

Assessment of option O-17a – Train lengthening peak local Coventry/Northampton to Birmingham New Street service	
Gaps addressed	Consolidated gap G-16: Coventry corridor peak capacity.
Concept	Lengthen one morning peak and one evening peak Coventry to Birmingham New Street service by one electric multiple unit (of four-car) each.
Operational analysis	No additional services required. Additional vehicles beyond the CP4 operational plan is required.
Infrastructure required	No additional infrastructure is required to support this option.
Passenger impact	The base (do-minimum) includes the London Midland proposed Operational Plan. This option assesses the business case of providing additional capacity beyond this plan. This capacity would help to reduce crowding by 2019.
Freight impact	Current and future freight demand can be accommodated.
Financial and economic analysis	The main costs relate to rolling stock. The following table outlines the appraisal results.
	30-year appraisal £m (2002 PV)
	Costs (present value)
	Investment cost 0.0
	Operating cost 8.7
	Revenue -3.0
	Other Government impacts 0.5
	Total costs 6.2
	Benefits (present value)
	Rail users benefits 5.1
	Non users benefits 1.5
	Total quantified benefits 6.5
	NPV 0.35
	Quantified benefit cost ratio 1.06
	The requirement to lengthen one EMU imposes significant leasing and mileage-related cost on this option and therefore it offers poor value for money.
Link to other options	None.
Conclusion	It is poor value for money to lengthen peak local services on this corridor beyond the proposed CP4 operational plan by 2019. This option is therefore not recommended. The additional vehicles provided through the CP4 Operational Plan should be utilised to maximise the level of capacity provided in the morning and evening peak. Demand assessment should be undertaken to ensure that the CP4 additional vehicles are used on the busiest train to alleviate crowding and generate maximum benefits. The RUS notes that DfT and London Midland are working on which service group should be lengthened under this Operational Plan.

Assessment of option O-17b – Train lengthening on long distance services between Manchester and Bournemouth via Coventry and Birmingham International																																									
Gaps addressed	Consolidated gap G-16: Coventry corridor peak capacity and consolidated gap G-19 peak and all day capacity on the Stafford & Wolverhampton corridor. Consolidated gap G-20: Capacity Manchester – Bournemouth.																																								
Concept	Lengthen the busiest services between Manchester and Bournemouth affecting the Coventry and Stafford & Wolverhampton corridors in this RUS. This option is part of Option D and recommendation reported in the Great Western RUS, March 2010.																																								
Operational analysis	No additional service is required. The number of additional vehicles required is dependent on the resourcing plan (train diagrams). The theoretical minimum number of trips made by the lengthened train (one return trip per day) and the theoretical maximum number of trips (based on a two-day diagram of May 2009) have been used to establish the range of vehicles required.																																								
Infrastructure required	None.																																								
Passenger impact	This will eliminate most standing between Manchester and Bournemouth via Coventry and Birmingham International. Some standing may still be observed on some sections of the route particularly during the morning and evening peak of key urban centres when the services are used by both commuters and long distance travellers.																																								
Freight impact	Current and future freight demand can be accommodated.																																								
Financial and economic analysis	<p>The main costs relate to rolling stock.</p> <p>The Great Western RUS used passenger counts undertaken by CrossCountry in May 2009 as a basis for a load factor analysis of the current situation. The predicted forecast projections to 2019 were then made and a business case developed for additional vehicles. The business case included the benefits of crowding relief to passengers and also estimated the revenue impact of releasing suppressed demand.</p> <p>A case for providing between two and nine additional vehicles (in traffic) between Manchester and Bournemouth dependent upon the resourcing plan (diagram).</p> <p>The following table outlines the appraisal results.</p> <table> <tr> <th>30-year appraisal</th><th>£ million (2002 PV) One return trip</th><th>£ million (2002 PV) Two-day diagram</th></tr> <tr> <td colspan="3">Costs (present value)</td></tr> <tr> <td>Investment cost</td><td>0</td><td>0</td></tr> <tr> <td>Operating cost</td><td>57</td><td>14</td></tr> <tr> <td>Revenue</td><td>-15</td><td>-4</td></tr> <tr> <td>Other Government impacts</td><td>3</td><td>2</td></tr> <tr> <td>Total costs</td><td>45</td><td>12</td></tr> <tr> <td colspan="3">Benefits (present value)</td></tr> <tr> <td>Rail users benefits</td><td>68</td><td>16</td></tr> <tr> <td>Non users benefits</td><td>6</td><td>2</td></tr> <tr> <td>Total quantified benefits</td><td>74</td><td>18</td></tr> <tr> <td>NPV</td><td>30</td><td>6</td></tr> <tr> <td>Quantified benefit cost ratio</td><td>1.7</td><td>1.5</td></tr> </table> <p>Note: A case exists for nine additional vehicles if the operating costs are based on “one return trip”. This reduces to two vehicles if the operating costs are based on a “two day diagram” instead.</p>		30-year appraisal	£ million (2002 PV) One return trip	£ million (2002 PV) Two-day diagram	Costs (present value)			Investment cost	0	0	Operating cost	57	14	Revenue	-15	-4	Other Government impacts	3	2	Total costs	45	12	Benefits (present value)			Rail users benefits	68	16	Non users benefits	6	2	Total quantified benefits	74	18	NPV	30	6	Quantified benefit cost ratio	1.7	1.5
30-year appraisal	£ million (2002 PV) One return trip	£ million (2002 PV) Two-day diagram																																							
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NPV	30	6																																							
Quantified benefit cost ratio	1.7	1.5																																							
Link to other options	None.																																								
Conclusion	It is recommended that additional vehicles to be provided on the long distance services between Manchester and Bournemouth by 2019 to alleviate crowding on these services.																																								

6. Gaps and options

Assessment of option O-18a – Divert the hourly Reading to Newcastle service via Coventry and Birmingham International in both directions	
Gaps addressed	<p>Consolidated gap G-16a: Lack of direct service Coventry/Birmingham International – Derbyshire, Yorkshire and North East suppressing rail demand.</p> <p>Consolidated gap G-16: Coventry corridor peak capacity.</p> <p>Consolidated gap G-27: Overcrowding on Leamington Spa – Coventry services in the morning and evening peak and throughout the day (limited capacity on single line).</p>
Concept	<p>Since 2008 there has been no direct connectivity between the North East, Birmingham International/Coventry and the East Midlands. The CrossCountry service from Reading to Newcastle is currently routed via Solihull and Leamington Spa. Re-routeing it via the Coventry corridor would provide connectivity between the North East/East Midlands and Birmingham International Airport.</p> <p>Other RUSs have looked at the implications of re-routeing this service in Yorkshire and the potential to extend it to Southampton. These will have an effect on the business case.</p>
Operational analysis	<p>All other passenger services remain as current, with a minor retiming of London Midland and Arriva Trains Wales services.</p> <p>The scheme may necessitate a minor timetable amendment to the local services but it would not change the calling patterns on the Coventry line.</p> <p>Due to the high utilisation of capacity on the Coventry corridor, an analysis using historic annual data of delay minutes was undertaken to estimate the impact on performance for all affected train operators.</p> <p>The business case proved to be very sensitive to the performance assumptions. Consequently two scenarios: a) with and b) without performance impact, are developed to show the range of value for money of this option.</p> <p>It is recognised that this performance analysis is based on 2009 data, and this scheme, if recommended, would be delivered following further base timetable alterations and after the delivery of other CP4 enhancement schemes. The schemes, in development, may alter the performance impact by offering performance improvement benefits. These schemes include the development of Reading and Oxford station areas, Birmingham New Street resignalling, seven day railway schemes and the Evergreen 3 project.</p> <p>It is also recognised that this option would release capacity between Leamington Spa and Birmingham and therefore potentially improve the timetable on the Leamington Spa and Chiltern corridor.</p>
Infrastructure required	<p>Committed linespeed improvements west of Wolverhampton to enable Arriva Trains Wales services to be accelerated</p> <p>Double track between Kenilworth and Milverton Junction to accommodate both passenger and freight traffic (current and future).</p>
Passenger impact	<p>Passengers from the North East would have direct connectivity to Birmingham International and Coventry. This would also improve train frequency and increase capacity between Coventry and Birmingham New Street. The impact of this timetable change has been included in the business case shown in this table.</p> <p>This option would help to reduce crowding on the Manchester and Bournemouth service. The existing Reading – Newcastle service is less crowded than the Manchester – Bournemouth service as concluded by the Great Western RUS, March 2010. The diversion of the Reading – Newcastle service via Birmingham International and Coventry would provide extra capacity for passengers travelling from Reading to Coventry/Birmingham International. The benefit from providing crowding relief on some sections of the route is included in the business case.</p> <p>It is recognised that the level of benefits to passengers is likely to increase when combined with the Great Western RUS recommendation of extending the existing Newcastle to Reading services to Southampton/Bournemouth. This benefit has not been included in the business case shown in this table.</p> <p>The infrastructure enhancement required to double track between Kenilworth and Milverton Junction would increase capacity on this route. This would assist the development of a new station at Kenilworth, which is an aspiration being considered by a third party.</p>

Assessment of option O-18a – Divert the hourly Reading to Newcastle service via Coventry and Birmingham International in both directions																																									
Freight impact	<p>The re-routed Reading – Newcastle service drives the need to double track between Kenilworth and Milverton Junction. The additional infrastructure around Kenilworth is not required to accommodate freight growth to 2030 if the re-routeing of the Reading – Newcastle service does not materialise.</p> <p>A potential positive freight performance and capacity impact is delivered by this option as it will release some capacity between Leamington Spa and Birmingham. However this potential benefit has not been included in the business case. This capacity will also be increased by the Evergreen 3 project.</p>																																								
Financial and economic analysis	<p>The benefit cost ratio (BCR) of this option is very sensitive to performance impact. Its BCR ranges from 3.53 (high value for money) to 1.45 (poor value for money) dependent on performance projection.</p> <table> <tr> <th>60-year appraisal</th><th>£ million (2002 PV) With performance impact</th><th>£ million (2002 PV) Without performance impact</th></tr> <tr> <td colspan="3">Costs (present value)</td></tr> <tr> <td>Investment cost</td><td>31.9</td><td>31.9</td></tr> <tr> <td>Operating cost</td><td>0.0</td><td>0.0</td></tr> <tr> <td>Revenue</td><td>-8.0</td><td>-20.9</td></tr> <tr> <td>Other Government impacts</td><td>1.8</td><td>4.3</td></tr> <tr> <td>Total costs</td><td>25.6</td><td>15.4</td></tr> <tr> <td colspan="3">Benefits (present value)</td></tr> <tr> <td>Rail users benefits</td><td>34.4</td><td>45.4</td></tr> <tr> <td>Non users benefits</td><td>2.9</td><td>8.8</td></tr> <tr> <td>Total quantified benefits</td><td>37.3</td><td>54.2</td></tr> <tr> <td>NPV</td><td>11.6</td><td>38.8</td></tr> <tr> <td>Quantified BCR</td><td>1.45</td><td>3.53</td></tr> </table>		60-year appraisal	£ million (2002 PV) With performance impact	£ million (2002 PV) Without performance impact	Costs (present value)			Investment cost	31.9	31.9	Operating cost	0.0	0.0	Revenue	-8.0	-20.9	Other Government impacts	1.8	4.3	Total costs	25.6	15.4	Benefits (present value)			Rail users benefits	34.4	45.4	Non users benefits	2.9	8.8	Total quantified benefits	37.3	54.2	NPV	11.6	38.8	Quantified BCR	1.45	3.53
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Total quantified benefits	37.3	54.2																																							
NPV	11.6	38.8																																							
Quantified BCR	1.45	3.53																																							
Link to other options	O-18b, O-18c, O-18d and O-29.																																								
Conclusion	This option offers value for money and its level of benefits is dependent on performance. It is recommended that this scheme be taken forward to the next stage of development.																																								

6. Gaps and options

Assessment of option O-18b – Recast local services on the Coventry corridor to provide a more even timetable for passengers	
Gaps addressed	Part of consolidated gap G-16: Coventry corridor peak capacity.
Concept	The option provides all local stations on the Coventry corridor with two trains per hour.
Operational analysis	<p>Recast London Midland local services to provide two trains per hour between Birmingham New Street and Coventry in each direction, and two trains per hour between Birmingham New Street and Northampton calling at Birmingham International, Coventry, Rugby and Long Buckby.</p> <p>All other passenger services would remain as current.</p> <p>The sub option of overtaking local services at Birmingham International was considered.</p>
Infrastructure required	Extensive four tracking would be required between Marston Green and Berkswell to resolve conflicts, with or without the sub option of overtaking at Birmingham International.
Passenger impact	Passengers would benefit from having a more evenly spaced timetable for local services on the Coventry corridor. However, this could only be actioned at the expense of fewer services than currently at some local stations (eg. Marston Green which has three trains per hour currently).
Freight impact	Current and future freight demand can be accommodated.
Financial and economic analysis	No business case has been undertaken due to the high capital cost and the marginal benefits provided by this option. A more evenly spaced timetable leads to less frequent services at some local stations. Therefore it is anticipated that this option would offer no value for money.
Link to other options	Option O-18a, O-18c and O-18d.
Conclusion	This option is not recommended due to the high level capital expenditure and marginal benefits it would provide.

Assessment of option O-18c – Recast local services on the Coventry corridor to provide a more even timetable for passengers (variation on option O-18b in terms of calling pattern at certain stations)

Gaps addressed	Part of consolidated gap G-16: Coventry corridor peak capacity.																										
Concept	The option provides a minimum of two trains per hour at all stations except Marston Green and Tile Hill (which would be served by three trains per hour) and Adderley Park (which would be served by one train per hour).																										
Operational analysis	<p>The recast of local services would provide:</p> <p>two trains per hour fast to Birmingham International then all stations to Coventry but with one train per hour at Marston Green. In both directions.</p> <p>two trains per hour all stations to Birmingham International, then fast to Coventry, continuing to Northampton (with one train per hour calling at Adderley Park and Tile Hill). In both directions.</p> <p>All other passenger services would remain as current.</p>																										
Infrastructure required	<p>Local trains would require an electrified turnback siding at Coventry as turn round time would be 30 and 39 minutes.</p> <p>Performance would require a two minute headway between Birmingham New Street and Birmingham International to ensure a robust timetable.</p>																										
Passenger impact	Passengers would benefit from having a more evenly spaced timetable for local services on the Coventry corridor while maintaining current service frequency.																										
Freight impact	Current and future freight demand can be accommodated.																										
Financial and economic analysis	<p>To operate this option, additional train crew (12 drivers and 10 train managers including spares) and two additional four-car units would be required.</p> <p>This option requires significant capital expenditure and operating cost.</p> <p>The following shows the appraisal result</p> <table> <tr> <th>60-year appraisal</th><th>£m (2002 PV)</th></tr> <tr> <td colspan="2">Costs (present value)</td></tr> <tr> <td>Investment cost</td><td>14.9</td></tr> <tr> <td>Operating cost</td><td>51.1</td></tr> <tr> <td>Revenue</td><td>-6.8</td></tr> <tr> <td>Other Government impacts</td><td>1.5</td></tr> <tr> <td>Total costs</td><td>60.7</td></tr> <tr> <td colspan="2">Benefits (present value)</td></tr> <tr> <td>Rail users benefits</td><td>14.4</td></tr> <tr> <td>Non users benefits</td><td>4.9</td></tr> <tr> <td>Total quantified benefits</td><td>19.3</td></tr> <tr> <td>NPV</td><td>-41.1</td></tr> <tr> <td>Quantified BCR</td><td>0.32</td></tr> </table>	60-year appraisal	£m (2002 PV)	Costs (present value)		Investment cost	14.9	Operating cost	51.1	Revenue	-6.8	Other Government impacts	1.5	Total costs	60.7	Benefits (present value)		Rail users benefits	14.4	Non users benefits	4.9	Total quantified benefits	19.3	NPV	-41.1	Quantified BCR	0.32
60-year appraisal	£m (2002 PV)																										
Costs (present value)																											
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Operating cost	51.1																										
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Benefits (present value)																											
Rail users benefits	14.4																										
Non users benefits	4.9																										
Total quantified benefits	19.3																										
NPV	-41.1																										
Quantified BCR	0.32																										
Link to other options	Option O-18a, O-18b and O18d.																										
Conclusion	This option is not recommended due to the high capital expenditure and operating cost not justified by the level of benefit.																										

6. Gaps and options

Assessment of option O-18d – Recast local services on the Coventry corridor to provide a more even timetable for passengers and diversion of Newcastle to Reading services via Birmingham International and Coventry. This is in effect a combination of Option O-18a and O-18c

Gaps addressed	<p>Consolidated gap G-16a: Lack of direct service Coventry/Birmingham International – Derbyshire, Yorkshire and North East suppressing rail demand and G-16 Coventry corridor peak capacity.</p> <p>Consolidated gap G-27: Overcrowding on Leamington Spa – Coventry services in the morning and evening peak and throughout the day (limited capacity on single line).</p>
Concept	<p>This is a combined option of option O-18a and option O-18c. Diverting the CrossCountry service from Reading to Newcastle via Birmingham International and Coventry (currently routed via Solihull and Leamington Spa) would provide connectivity between the North East/ East Midlands and Birmingham Airport. The option also provides all local stations on the Coventry corridor with two trains per hour (except Marston Green and Tile Hill with three trains per hour and Adderley Park with one train per hour) on a more even timetable.</p>
Operational analysis	<p>The recast of local services would provide:</p> <ul style="list-style-type: none"> – two trains per hour fast to Birmingham International then all stations to Coventry but with one train per hour at Marston Green. In both directions. – two trains per hour all stations to Birmingham International, then fast to Coventry, continuing to Northampton (with one train per hour calling at Adderley Park and Tile Hill) in both directions. The Newcastle to Reading service would be diverted via the Coventry corridor and call at Birmingham International and Coventry.
Infrastructure required	<p>Local trains would require a turn back facility at Coventry.</p> <p>Performance would require a two minute headway.</p> <p>Double tracking with a four minute headway would be required between Kenilworth and Milverton Junction for the second CrossCountry service via Coventry.</p>
Passenger impact	<p>Passengers would benefit from having a more evenly spaced timetable for local services on the Coventry corridor. Passengers from the North East would have direct service to Birmingham International and Coventry.</p>
Freight impact	<p>Current and future freight demand can be accommodated with the additional infrastructure.</p>
Financial and economic analysis	<p>Additional train crew (12 drivers and 10 train managers including spares) and two four-car units would be required.</p> <p>The stand alone business case for the local option (option C-2c) shows that it offers no value for money due to the high capital expenditure and operating cost. On this basis, this combined option does not offer value for money.</p>
Link to other options	<p>Option O-18a and O-18c.</p>
Conclusion	<p>This package of options is not recommended due to the high capital and operating cost that is required for the local option.</p>

Option O-19 – Review and consider opportunities arising out of seven day railway workstream

Consolidated gap G-17: seven-day timetable required based on Sunday demand levels for long distance inter-regional routes within the West Midlands and Chilterns RUS area.

The need to improve the seven-day timetable on key inter-regional routes within the RUS area has been identified as a gap by stakeholders. This gap is currently being addressed through the Network Availability Plan, which forms part of the CP4 Delivery Plan. This is a national plan which aims to deliver substantial improvements in network availability to passenger operators and, in some cases, enables passenger and freight operators to run additional train services at times that address suppressed customer demand. Section 6.7 above outlines the progress made in establishing new techniques and practises which will provide opportunities to increase network availability on key routes during weekends.

In addition to the developments outlined in section 6.7 a route categorisation initiative has been established as part of the Network Availability Plan which supports progress on the long distance inter-regional routes being considered as part of this gap. A small number of key routes, which in aggregate carry 60 per cent of all weekend passengers, have been identified for special attention as part of a passenger route categorisation process. The routes covered by the route categorisation principles include the long distance inter-regional routes between Birmingham and Manchester Piccadilly via Stoke on Trent and between Birmingham and Southampton via Coventry, Oxford and Reading. The passenger route categorisation principles to be applied to these routes to provide the best service to the passenger or freight end customer are:

- passengers will not be transferred onto buses
- diversions away from a train's normal route will not increase passengers' planned journeys times by more than 30 per cent.

Any commitments associated with these principles will take effect from the start of the December 2011 timetable, except when the demands of rail improvement work make achieving this aim impractical.

Further work is also being undertaken to explore ways to best optimise network availability across the whole of the RUS area. An initial list of candidate sections for additional single line working has been collated which will be prioritised to focus on the key pinch points. Feasibility studies will be required to develop detailed proposals, including any schemes which may be required to facilitate single line working. Access points, junction lighting, Lookout Operated Warning System and removal of red zone prohibitions are some of the schemes which are already being implemented as a result of the Engineering Access work.

6.9.4 Cross City (north and south) and Lickey line – option analysis

As discussed in **Chapter 4**, committed service enhancement to Bromsgrove and to Redditch are planned in CP4. This brings additional vehicles and capacity to the Cross City south services (between Birmingham New Street and Redditch/Bromsgrove via Longbridge) and consequently this would help to meet increased passenger demand. As shown in **Chapter 5**, even with this committed increased capacity, several services on the Cross City North corridor (between Birmingham New Street and Four Oaks/Lichfield Trent Valley) are predicted to have more passengers than the nominal train capacity on the approach to Birmingham in the morning peak. Options to address this crowding have been developed.

Demand for rail in the Worcester area is expected to increase. By 2019, one Hereford to Birmingham New Street service via Bromsgrove is predicted to have passengers standing from Worcester which is more than half an hour from Birmingham city centre. Options of train lengthening have been considered. Furthermore timetable and infrastructure changes that would facilitate increases in service frequency between Worcester and Birmingham New Street via the Lickey Line have been proposed to meet passenger demand. These changes would also help to improve connectivity between Worcester Shrub Hill and Worcester Foregate Street.

6. Gaps and options

Assessment of option O-33 – Train lengthening on all service groups between Birmingham and Worcester/Hereford via Bromsgrove		
Gaps addressed	Consolidated gap G-10: Worcester – Hereford – Birmingham capacity.	
Concept	Lengthening one morning peak service Hereford to Birmingham New Street via Bromsgrove and one evening peak service in the opposite direction by one vehicle each.	
Operational analysis	The base includes London Midland's CP4 operational plan which increases capacity in the three-hour morning peak to the Hereford – Birmingham New Street service group. This option assesses additional vehicles beyond CP4 operational plan.	
Infrastructure required	No additional infrastructure is required. However this option assumes selective door operation will be used at some stations to avoid the cost of platform lengthening.	
Passenger impact	Increased capacity and reduced crowding on services between Birmingham and Hereford.	
Freight impact	Current and future freight demand can be accommodated.	
Financial and economic analysis	<p>– One morning and one evening peak train to become six-car rather than five-car as per CP4 Operational Plan.</p> <p>– Assume each additional vehicle makes one round trip per day. Sensitivity test of three round trips.</p> <p>The main costs relate to rolling stock.</p> <p>The following table outlines the appraisal results:</p>	
	30-year appraisal	Assume one round trip per day £m (2002 PV)
		Assume three round trips per day £m (2002 PV)
	Costs (present value)	
	Investment cost	0.0
	Operating cost	2.4
	Revenue	-1.7
	Other Government impacts	0.3
	Total costs	1.1
	Benefits (Present Value)	
	Rail users benefits	2.7
	Non users benefits	0.8
	Total quantified benefits	3.5
	NPV	2.4
	Quantified BCR	3.18
	<p>It is noted that some demand at Bromsgrove may shift to the Cross City service group following the HLOS service changes and therefore demand on the Hereford via Bromsgrove services may not be as high, however this would not affect the value for money of the business case. This is because standing is predicted to start from as far as Worcester by 2019 and the morning peak service considered for lengthening does not call at Bromsgrove currently.</p> <p>This appraisal does not include cost of platform lengthening at a number of stations that cannot accommodate a six-car service and therefore this recommendation can only be made subject to the use of selective door operation.</p>	
Link to other options	None.	
Conclusion	Analysis has identified that a high value for money business case exists for train lengthening of one Hereford to Birmingham morning and evening service. This RUS recommends this option subject to selective door operation required because of some of the short platforms on this route.	

Option O-13 – Review options that might arise during the Droitwich Spa and Worcester area signalling renewals.

One purpose of a RUS is to inform future decisions made by industry funders and suppliers. These decisions include the work to be undertaken to define the output specification for future rail infrastructure renewals and enhancements as these provide both the opportunity and potential funding mechanism to deliver the RUS recommendation. As the signalling at Droitwich Spa and the area

around Worcester is due to be renewed in the period between 2014 and 2022 respectively, this will provide an opportunity to consider the infrastructure issues that impact on capacity and performance. The RUS recommends that as part of the feasibility and option development for the resignalling, consideration should be given to Option O-13, in terms of the infrastructure enhancement required to enable services from London Paddington/Oxford and Birmingham Moor Street to extend from Worcester Shrub Hill and terminate at Worcester Foregate Street, which is closer to the city centre.

Assessment of option O-34 – Timetable intervention to provide additional services between Birmingham New Street and Worcester and Hereford

Gaps addressed	Consolidated gap G-10: Worcester – Hereford – Birmingham New Street capacity.
Concept	Provision of an additional service between Birmingham and Worcester Foregate Street in the off-peak hours which would provide a half-hourly service between Birmingham New Street and Worcester throughout the day. This option includes an opportunity for wider cross Birmingham connectivity through the potential to link this service to the proposed two additional services between Tamworth and Birmingham New Street (option O-39a).
Operational analysis	<p>Two timetable options were analysed:</p> <p>Option 1: Tamworth – Birmingham New Street – Worcester Foregate Street, then run empty stock to Henwick to reverse and layover in the Up Refuge Siding.</p> <p>Option 2: Tamworth – Birmingham New Street – Worcester Foregate Street – Worcester Shrub Hill.</p> <p>The HLOS plan of extension of the Cross City service from Longbridge to Bromsgrove and Redditch was considered in the base.</p> <p>The platform analysis of Birmingham New Street shows that the proposed two additional trains per hour between Tamworth and Birmingham New Street (option 39a) are required to link to the Worcester/Hereford services due to platform constraint at Birmingham New Street.</p>
Infrastructure required	<p>Both options require a new turnback facility at Tamworth.</p> <p>For option 2 a remodelled junction layout would be required to allow trains to run between Birmingham New Street and Worcester Shrub Hill via Worcester Foregate Street. As part of this remodelling the signalling would have to cater for three minute headways and three minute platform re-occupations at Worcester Foregate Street, and the lines between Henwick and east of Worcester Foregate Street would need to remain bi-directional.</p> <p>The proposed infrastructure would allow a reduction in journey time between Worcester and Hereford due to the removal of single line restrictions through Worcester Foregate Street and the 15mph crossover at Henwick. This journey time saving has been factored into the business case.</p>
Passenger impact	<p>Increased capacity and reduced crowding on services between Birmingham New Street and Worcester.</p> <p>Connectivity between Tamworth and Worcester/Hereford.</p> <p>Reduced journey time between Worcester and Hereford.</p>
Freight impact	Current and future freight demand can be accommodated.
Financial and economic analysis	<p>The business case for both options 1 and 2 has been appraised as a package with option O-39a: Two additional Tamworth – Birmingham services per hour in each direction.</p> <p>The main operating costs relate to rolling stock and staff cost. The business case assumes 20 additional drivers and train managers (including spares) are required to operate a half-hourly Hereford/Worcester – Birmingham New Street – Tamworth services.</p> <p>The following table outlines the appraisal results:</p>

6. Gaps and options

Assessment of option O-34 – Timetable intervention to provide additional services between Birmingham New Street and Worcester and Hereford

60-year appraisal	£m (2002 PV)	£m (2002 PV)
	Option 1	Option 2
Costs (present value)		
Investment cost	2.1	7.1
Operating cost	36.1	36.1
Revenue	-16.1	-16.5
Other Government impacts	3.3	3.4
Total Costs	25.4	30.1
Benefits (present value)		
Rail users benefits	43.6	44.8
Non users benefits	8.5	8.7
Total quantified benefits	52.0	53.5
NPV	26.6	23.5
Quantified BCR	2.1	1.8
The business case is very sensitive to the number of crew required to operate this option. If 18 sets of crew are required instead of the 20 being assumed, then both options would offer high value for money (BCR of 2 or above). On this basis, the RUS recommends both options.		
Link to other options	Option O-39a.	
Conclusion	It is proposed that this option is a RUS recommendation.	

Assessment of option O-12 – Timetable interventions and infrastructure enhancement

Gaps addressed	Consolidated gap G-10a: Worcester stations connectivity.
Concept	Some Worcester services from London Paddington/Oxford and Birmingham Moor Street currently terminate at Worcester Shrub Hill which is further away from the city centre than Worcester Foregate Street. This option would enable these services to be extended to Worcester Foregate Street to improve access to the city centre.
Operational analysis	A timetable exercise has been undertaken to consider: connectivity Worcester Shrub Hill – Worcester Foregate Street. connectivity Birmingham New Street – Worcester Foregate Street. expected freight growth, including capacity required if Round Oak – Walsall reopened.
Infrastructure required	The option proposes remodelling the former Rainbow Hill Junction at Worcester together with improved headways and platform re-occupation times at Worcester Foregate Street.
Passenger impact	Better connectivity for passengers into Worcester City Centre as Worcester Foregate Street is closer to the centre than Worcester Shrub Hill – First Great Western services could be extended from Worcester Shrub Hill to Foregate Street. Additional hourly off-peak trains could run between Birmingham New Street and Worcester Shrub Hill via Worcester Foregate Street. Reduction in journey times between Birmingham and Hereford due to the removal of operating restrictions imposed by signalling and track configuration.
Freight impact	Current and future freight demand can be accommodated.
Financial and economic analysis	This option has been appraised as a package of Option O-34 and Option O-39: half-hourly Worcester – Birmingham New Street – Tamworth service.
Link to other options	Option O-13, O-34 and O-39.
Conclusion	The RUS analysis demonstrates the need for this infrastructure enhancement in order to improve rail connectivity between Worcester Foregate Street and Worcester Shrub Hill. The RUS recommends that opportunities to deliver this enhancement are considered in conjunction with Worcester area signalling renewals (see option O-13).

Assessment of option O-35 – Lengthening of morning peak services between Birmingham and Lichfield	
Gaps addressed	Consolidated gap G-34: Cross City and Lickey corridor peak and all day capacity.
Concept	Lengthening one morning peak service and one evening service between Birmingham New Street and Lichfield by one unit (three-car) each.
Operational analysis	The analysis includes London Midland's CP4 operational plan proposal for approximately 1,450 extra seats to the Cross City north corridor in the three-hour morning peak. Analysis shows that despite the CP4 additional capacity, the busiest high-peak service would still have more passengers than the nominal train capacity on the approach to Birmingham by 2019. The appraisal assesses the business case for train lengthening beyond the CP4 operational plan.
Infrastructure required	None.
Passenger impact	Increased capacity and reduced crowding on Cross City north peak services.
Freight impact	Current and future freight demand can be accommodated.
Financial and economic analysis	The main costs relate to rolling stock. The following table outlines the appraisal results:
	30-year appraisal £m (2002 PV)
	Costs (present value)
	Investment cost 0.0
	Operating cost 3.8
	Revenue -0.6
	Other Government impacts 0.1
	Total Costs 3.2
	Benefits (present value)
	Rail users benefits 3.0
	Non users benefits 0.3
	Total quantified benefits 3.2
	NPV 0.1
	Quantified BCR 1.03
	With a BCR of 1.03, the option provides poor value for money.
Link to other options	None.
Conclusion	This option is not recommended for implementation as it represents poor value for money.

6. Gaps and options

Option O-36 – Opportunities to enhance University station through National Stations Improvement Programme

Station capacity at University station on the Cross City line has been identified as a gap in light of the need to accommodate future growth developments at the university and hospital in the vicinity of the station. The RUS recognises that the station environment at University station is being addressed as part of the National Stations Improvement Programme. This programme is a committed spending requirement in Network Rail's CP4 settlement and University has been selected as one of the London Midland stations. The defined programme of work proposed at University includes widening of Platform 2, improving the external elevation of the station building and renovation of the waiting room. The RUS recognises this work provides the opportunity to make significant improvements at the station to enable it to accommodate future forecast passenger numbers and meet their needs.

Option O-37 – Journey time improvement

The RUS recommends that opportunities to improve journey time on this route be considered as part of future planned renewals and other potential capability improvement schemes.

6.9.5 Derby, Nuneaton and Camp Hill corridor – option analysis

Crowding is forecast to become more acute by 2019 on the interurban and long distance services which connect key urban centres in the North East, Yorkshire, East Midlands and West Midlands. Standing above train capacity is predicted on several high-peak hour services as shown in **Chapter 5**. The demand for these services is high since they serve the long distance travellers as well as local commuters at Tamworth and Water Orton. Increased capacity through train lengthening and service enhancement is proposed to meet passenger demand and to reduce the level of crowding on the long distance services.

Assessment of option O-38a – Train lengthening on long distance interurban services between Plymouth and Edinburgh via Derby		
Gaps addressed	Consolidated gap G-38 – Derby, Nuneaton and Camp Hill corridor capacity.	
Concept	Lengthen the busiest services between Edinburgh and Plymouth. This option is option D reported in the Great Western RUS, March 2010 and Option 2.5 reported in the East Midland RUS, February 2010.	
Operational analysis	No additional services are required. The number of additional vehicles required is dependent on the resourcing plan. The theoretical minimum number of trips made by the lengthened train (one return trip per day) and the theoretical maximum number of trips (based on a two-day diagram of May 2009) have been used to establish the range of vehicles required.	
Infrastructure required	None.	
Passenger impact	This will eliminate most standing between Edinburgh and Plymouth. However some standing may still be observed on some sections of the route particularly during the morning and evening peak of key urban centres when the services are used by both commuters and long distance travellers.	
Freight impact	Current and future freight demand can be accommodated.	
Financial and economic analysis	The main costs relate to rolling stock. A case for providing between six and nine additional vehicles (in traffic) between Edinburgh and Plymouth dependent upon resourcing plan (diagram). The following table outlines the appraisal results.	
	30-year appraisal	£ million (2002 PV)
		One return trip
		Two-day diagram
	Costs (present value)	
	Investment cost	0
	Operating cost	71
	Revenue	-29
	Other Government impacts	6
	Total costs	47
	Benefits (Present Value)	
	Rail users benefits	140
	Non users benefits	15
	Total quantified benefits	155
	NPV	108
	Quantified BCR	3.3
	The option offers high value for money business case. Note: A case exists for nine additional vehicles if the operating costs are based on 'one return trip'. This reduces to six vehicles if the operating costs are based on a 'two-day diagram' instead.	
Link to other options	The proposed additional half-hourly Tamworth – Birmingham service in option O-39 would help to alleviate peak crowding from Tamworth to Birmingham.	
Conclusion	It is recommended that additional vehicles to be provided on the long distance services between Edinburgh and Plymouth via Derby by 2019 to alleviate crowding on these services.	

6. Gaps and options

<i>Assessment of option O-38b – Train lengthening on long distance interurban services between Nottingham and Birmingham/Cardiff</i>	
Gaps addressed	Gap G-38: Derby, Nuneaton and Camp Hill corridor capacity.
Concept	Lengthen the busiest services between Nottingham and Cardiff.
Operational analysis	No additional services are required.
Infrastructure required	None.
Passenger impact	Increased capacity and reduced crowding.
Freight impact	Current and future freight demand can be accommodated.
Financial and economic analysis	No business case has been undertaken. It is anticipated that the benefits of reducing localised crowding on five services would be not sufficient to justify the mileage-related cost and rolling stock leasing cost. An alternative option (option O-39) of providing additional half hourly service between Tamworth and Birmingham would help to relieve crowding on the Nottingham – Cardiff services.
Link to other options	Option O-39.
Conclusion	This option is not recommended.

<i>Assessment of option O-39a – Two additional trains per hour between Tamworth and Birmingham New Street</i>	
Gaps addressed	This option addresses the gap: Lack of capacity between Birmingham and Derby, which is part of Consolidated gap G-38: Derby, Nuneaton and Camp Hill capacity.
Concept	Provide two additional trains per hour in each direction between Tamworth and Birmingham New Street calling at Water Orton.
Operational analysis	Class 170 two car unit assumed. Analysis of platform capacity at Birmingham New Street shows that the proposed additional services between Tamworth and Birmingham New Street is required to link to the proposed half-hourly Birmingham New Street to Hereford/Worcester services (option O-13). Timetable analysis shows that it is possible to connect these services and consequently providing connectivity from Tamworth through to Worcester. Two scenarios have been tested: Option 1 links a half-hourly Tamworth to Birmingham New Street service to Worcester/ Hereford and can call at either Worcester Shrub Hill or Worcester Foregate Street. There are infrastructure costs associated with this option and no journey time saving between Worcester and Malvern Link. Option 2 links a half-hourly Tamworth to Birmingham New Street service to Worcester/ Hereford and can call at both Worcester Shrub Hill and Worcester Foregate Street. There are infrastructure costs at Tamworth and Worcester associated with this option and it produces a one-minute journey time saving between Worcester and Malvern Link. To avoid conflict with the proposed express service, the southbound Leicester to Birmingham New Street services would need to depart three minutes earlier at all stations and not call at Water Orton.
Infrastructure required	This option requires a new turnback facility at Tamworth. Option 2 also requires additional infrastructure at Worcester area.
Passenger impact	Improved capacity and reduced crowding on services between Birmingham New Street and Tamworth. More frequent Tamworth – Water Orton – Birmingham New Street services. Connectivity between Tamworth and Hereford/Worcester. Journey time saving of 2.5 minutes on the southbound Leicester to Birmingham service between Nuneaton and Birmingham.
Freight impact	Current and future freight demand can be accommodated.

Assessment of option O-39a – Two additional trains per hour between Tamworth and Birmingham New Street

Financial and economic analysis	The appraisal assumes three trains per hour to Bromsgrove and Redditch in the base. It requires additional resources (four Class 170 two-car units, 20 drivers and 19 train managers including spares). The benefit of relieving crowding on the Nottingham to Birmingham/Cardiff services has been included in the business case.		
	60-year appraisal		
		£ million (2002 PV)	£ million (2002 PV)
		Option 1	Option 2
	Costs (present value)		
	Investment cost	2.1	7.1
	Operating cost	36.1	36.1
	Revenue	-16.1	-16.5
	Other Government impacts	3.3	3.4
	Total Costs	25.4	30.1
	Benefits (present value)		
	Rail users benefits	43.6	44.8
	Non users benefits	8.5	8.7
	Total quantified benefits	52.0	53.5
	NPV	26.6	23.5
	Quantified BCR	2.05	1.8
The business case is very sensitive to the number of crew required to operate this option. If 18 extra crew are required instead of the 20 being assumed, then both options would offer high value for money (BCR of 2 or above). On this basis, the RUS recommends both options.			
Link to other options	Option O-34.		
Conclusion	It is proposed that this forms a RUS recommendation.		

6.9.6 Access to Kingsbury Terminal and four-aspect signalling

The current access arrangement between the main line and Kingsbury terminal, on the line between Kingsbury and Water Orton, currently acts as a constraint on the network and impacts on current performance levels. This is due to the lack of direct access for the North East inbound and outbound traffic, which means that services departing and arriving from the North East of England currently reverse on the main line, an operation that can take up to 15 minutes. This creates a general performance risk to both passenger and freight traffic using the route and restricts capacity for current and additional passenger and freight services.

Creating a direct access to the terminal from the north would enable freight trains from the north to directly access the site and clear the main line. This would require an infrastructure intervention

that involves the installation of a north-facing connection and an extension in the existing shunt neck to accommodate current and proposed freight lengths. The analysis undertaken as part of Option 39a indicates that the line can accommodate the freight service requirements up until 2019 and the proposed additional Tamworth passenger service recommendation.

However, as current performance levels on this line are not robust, and taking into account that additional anticipated future traffic will exacerbate these, it is recommended that infrastructure interventions to improve access to Kingsbury terminal are developed in CP5. As the capacity on this section of route is also constrained by the short section of three-aspect signalling between Wichnor Junction and Water Orton West Junction, consideration should be given to delivering the Kingsbury terminal access enhancement in conjunction with four-aspect signalling on this section of route.

6. Gaps and options

Assessment of option O-39b – Two additional trains per hour, local service, between Tamworth and Birmingham New Street (alternative to Option 39a)	
Gaps addressed	Consolidated gap G-38: Derby, Nuneaton and Camp Hill capacity.
Concept	Provide a new half-hourly local service between Tamworth and Birmingham New Street calling at new stations at Kingsbury, Castle Bromwich and in the Fort area. This is an alternative option to O-39a.
Operational analysis	<p>The business case assumptions include HLOS proposal as the base. Class 170 of two car unit is assumed.</p> <p>This option provides a half-hourly service for local stations between Tamworth and Birmingham New Street including three new stations and also has the potential to link this to the proposed half-hourly Birmingham New Street to Hereford/Worcester services (option O-13) to provide connectivity from Tamworth through to Worcester.</p> <p>The departure from Tamworth service would need to run on the converted passenger line. To avoid a conflict the Leicester to Birmingham service would not call at Water Orton (providing a journey time saving of 2.5 minutes).</p>
Infrastructure required	<p>This option requires:</p> <ul style="list-style-type: none"> – new stations at Kingsbury, Castle Bromwich and Fort Retail – new turnback facility at Tamworth – additional platform at Water Orton – new line between Water Orton West Junction and Castle Bromwich Junction – conversion of the down goods line between Water Orton West Junction and Saltley power signal box to passenger status.
Passenger impact	<ul style="list-style-type: none"> – improved capacity and reduced crowding on services between Birmingham New Street and Tamworth – connectivity between Tamworth and Hereford/Worcester – provide new rail stations and connectivity to Birmingham – journey time saving of 2.5 minutes on the southbound Leicester to Birmingham service between Nuneaton and Birmingham.
Freight impact	Current and future freight demand can be accommodated.
Financial and economic analysis	<p>A detailed analysis based on the above timetable assumption has not been undertaken. The proposed new rail stations on the Tamworth route are Centro's aspirations. A business case undertaken by Centro based on providing a half-hourly local service between Tamworth and Birmingham Moor Street serving new stations of Kingsbury, Castle Bromwich and Fort Parkway gives a high value for money business case (BCR of 2.0) with a net present value of over 60 million (in 2002 prices). This appraisal only includes the incremental cost and benefits beyond the Camp Hill Chord business case.</p>
Link to other options	Option O-34.
Conclusion	The RUS recognises this is Centro's long term aspiration.

Option O-40 – Assess the impact of the third long distance interurban service between Yorkshire and Birmingham

The RUS notes the longer term aspiration which has been identified in the Yorkshire and Humberside RUS for a potential third long distance high speed service between Yorkshire and Birmingham. This would provide an alternative option for increasing capacity on this corridor and also provides additional connectivity benefits in linking Bristol, Birmingham, Manchester, Yorkshire and Newcastle. It is recognised that this aspiration will be assessed in further detail during the next review of the cross country franchise. A holistic view has been taken of the infrastructure enhancements that might be required to accommodate this service and maintain sufficient capacity for modification of current freight and future freight growth. Within the West Midlands and Chilterns RUS area these are:

- improved access to Kingsbury freight terminal
- four-aspect signalling between Kingsbury and Water Orton.

The East Midland RUS, published in February 2010 has identified that four tracks between Wichnor Junction and the Burton-on-Trent area would be required to accommodate both the third long distance interurban service between Yorkshire and Birmingham and predicted freight growth.

Option O-41 – Opportunity to improve connectivity by interchange at Tamworth

The West Coast Main Line RUS is considering the potential for an additional off-peak service from London Euston that could create increased interchange opportunities with the West Midlands area. The current economic analysis, which will be

reported in the West Coast Main Line RUS, suggests stopping at Nuneaton rather than Tamworth is more economically viable. The West Coast Main Line RUS will consider the socio-economic benefits of stopping at the other main Trent Valley stations, which includes Tamworth and Lichfield Trent Valley. These will be presented in the Consultation document, which is planned for publication in December 2010 and commented on in the final West Midlands and Chilterns RUS.

6.9.7 Leamington Spa and Chiltern corridor – option analysis

As discussed in detail in **Chapter 4** and **Chapter 5**, the committed Evergreen 3 project will bring significant capacity and timetable improvement to services into London Marylebone. However some passengers are predicted to be standing on the busiest high-peak hour services by 2019 on arrival at London Marylebone. Standing is also predicted on the suburban and commuting services into Birmingham Moor Street, although in general this is for relatively short distance and within train capacity. Options to address this crowding gap have been developed. Furthermore, connectivity between the Leamington Spa and Chiltern corridor and London Heathrow Airport is considered inadequate by stakeholders and the North-South Links in Buckinghamshire Report by Buckinghamshire County Council proposes ways to address this gap. This is discussed further in the following section.

Station crowding at Birmingham Moor Street and Birmingham Snow Hill has also been raised as an issue that the RUS needs to address. Options to mitigate crowding and to improve accessibility to these stations are considered. Interchange between central Birmingham stations is also examined.

6. Gaps and options

Assessment of option O-6 and option O-7: Train lengthening on Chiltern Railways peak services into London Marylebone and into Birmingham Moor Street

O-7 timetable study to assess opportunities of Evergreen 3 project

Gaps addressed	Consolidated gap G-4: Leamington Spa and Chiltern capacity.
Concept	Lengthen the busiest services into London Marylebone and into Birmingham Moor Street to alleviate crowding.
Operational analysis	<p>Capacity analysis on this corridor includes the committed Evergreen 3 project and its latest specification (proposed timetable and train diagrams) in the base.</p> <p>It is predicted that by 2019, a few morning peak services into London Marylebone on this corridor are likely to have passenger standing above train capacity (including seats and standing allowance) as discussed in Chapter 5. The average high-peak hour load factor at London Marylebone on the long distance service (from Oxford and from Birmingham) would increase to approximately 120 per cent based on the RUS demand forecast. Train lengthening beyond the Evergreen 3 project would help to alleviate crowding on these services.</p> <p>Analysis also shows that by 2019, one long distance service from High Wycombe to Birmingham in the morning high-peak is likely to operate above train capacity.</p>
Infrastructure required	No additional infrastructure beyond the Evergreen 3 project.
Passenger impact	This would alleviate crowding on peak hour services.
Freight impact	No impact on current and future freight.
Financial and economic analysis	<p>No business case has been undertaken based on an appreciation that the Evergreen 3 project timetable for 2012 and associated train diagrams are still being finalised.</p> <p>The step change in timetable particularly for services into London Marylebone in the high-peak hour has the potential to significantly affect demand on individual services. The RUS is currently unable to estimate passenger loadings accurately on a train-by-train level due to uncertainty around the timetable delivered and response of other competitors (rail and coach). It is recommended that when developing and finalising the Evergreen 3 timetable and train lengths, the following should be taken into consideration:</p> <p>Improve utilisation of rolling stock.</p> <p>Timetable solution considering change to proposed calling patterns in the peak hour to meet overall demand requirements on the corridor. The RUS recognises that further timetable refinement may prove difficult due to Permanent Speed Restriction and journey time requirements.</p> <p>Train lengthening subject to train diagram, business case and funding availability.</p> <p>The RUS is analysing the performance impact of the Evergreen 3 Project timetable on the Leamington Spa and Chiltern corridor north of Banbury. The analysis will be reported in the final RUS as part of the wider performance assessment for all radial routes into Birmingham.</p>
Link to other options	None.
Conclusion	The RUS proposes that the initiatives on the Leamington Spa and Chiltern corridor should be re-assessed after a sensible period of operation of the Evergreen 3 project timetable when the full impact of this major timetable and service specification change is known.

Option O-8 – Journey time improvement

Inappropriate journey time between Oxford and Birmingham New Street has been identified as a gap by stakeholders. The RUS recommends that opportunities to improve journey time on this route section be considered as part of future planned renewals and other potential capability improvement schemes.

Option O-9 – Improve interchange at both Birmingham New Street and other local interchange stations

In the West Midlands the network of lines radiating from Birmingham Snow Hill and Moor Street stations, and those operating from Birmingham New Street, are poorly connected with each other for passengers interchanging between services. This has been identified as a gap in the RUS as it reduces the overall connectivity and effectiveness of the network, extends journey times and discourages rail use for local, regional and national services. It is recognised that these issues are currently being reviewed and addressed by Centro, in partnership with Birmingham City Council and other stakeholders, with an aim to improve the connectivity between the stations.

Between Birmingham Snow Hill and Birmingham New Street, Centro is considering plans to extend the current Midland Metro Line 1 tram route between the two stations, and this will provide a high quality public transport link for interchanging passengers.

Between Birmingham Moor Street and Birmingham New Street stations, Centro is developing proposals to upgrade the pedestrian tunnel under the Bullring which provides a 400m direct link between the stations, but which is currently of poor quality. The future construction of a High Speed Line station adjacent to Birmingham Moor Street station, and the Birmingham Gateway project to redevelop Birmingham New Street, will further increase the need to have a high quality pedestrian link on this axis. There is a need to ensure that with the stations' close proximity, passengers feel as comfortable as possible interchanging between services, and that the stations are considered as a single city centre interchange. As part of the wider city centre development plans, Centro is also seeking to improve the bus/rail interchange as well as connections to other modes in order to fully integrate rail into the city's public transport network. Centro is aiming to implement some improvements to the pedestrian tunnel in 2011.

Option O-10 – Station crowding mitigation: Birmingham Moor Street and Birmingham Snow Hill

The need to address station crowding at Birmingham Moor Street and Birmingham Snow Hill stations has been highlighted as an issue that needs to be addressed, especially during any opportunities

which arise in future station development work.

At Birmingham Moor Street station the narrow southbound platform can become very crowded at peak times and at times of service disruption. The Chiltern Railways scheme to provide new bay platforms may slightly ease the situation, but in the evening peak especially it is likely to remain a problem. Platform widening is the long-term solution and this needs to be considered as an integral element of the future High Speed station plans. In the meantime it will be necessary for Chiltern Railways to pro-actively manage congestion issues on the platform.

At Birmingham Snow Hill, patronage growth could lead to passenger congestion at the ticket barriers, which is already an issue when two peak trains arrive together. This will have to be monitored closely when the new second access to the station is opened, as this should relieve some of the pressure on the main barrier line and provide a considerable increase in the passenger handling capacity of the station.

Option O-11 – Conclusion of Buckinghamshire County Council study North South Links in Buckinghamshire in relation to London Heathrow Airport

The need for improved rail links to Heathrow Airport from the Buckinghamshire area has been identified as a gap in this RUS. This gap has been considered as part of the North South Links in Buckinghamshire study which recognises that the airport is one of the largest travel generators in the South East. This study has considered a number of options, including the feasibility of direct coach links from High Wycombe. It concluded that a direct coach service would result in significant additional traffic, but would be dependent on easy interchange with rail at High Wycombe and a simple through ticketing procedure. The West Midlands and Chilterns RUS acknowledges the strategic objectives of Buckinghamshire County Council to establish a regional coach network within the Thames Valley, as outlined in the study.

Option O-18 – Timetable study to consider standard interval timetable for local stations and diversion of Reading to Newcastle service (in each direction) in each hour from the Solihull route

Option O-18 which is outlined in section 6.9.3 considers the issue of limited capacity on the single line between Coventry and Leamington Spa. The overcrowding on this line was identified as a gap in the RUS and has been dealt with as part of the timetable studies undertaken for the Coventry corridor. Part of this timetable study work assessed whether the network could accommodate current passenger services, forecast freight growth and the proposed option to divert a Reading to Newcastle service (in each direction) in each hour from the

6. Gaps and options

Solihull route. The option table outlined in section 6.9.3 shows that the results of this analysis which concluded that an infrastructure enhancement (redouble that section of line) would be required between Milverton Junction and Kenilworth. As the option to divert the Reading to Newcastle service is particularly sensitive to performance, it is recommended that this option be further developed to assess the performance impact on cross country routes once associated key projects are delivered (eg. Oxford layout remodelling). Redoubling of the line between Milverton Junction and Kenilworth is not required to accommodate future project growth.

Option O-29 – Review and consider findings of a separate workstream that is developing the third party project for a new station at Kenilworth

The demand for a rail service at Kenilworth was identified as a gap by stakeholders during the baseline stage of the RUS. It is recognised that this is being considered through the work being undertaken by a third party to develop a new station at Kenilworth. The RUS notes the further development of this scheme to determine options and potential timescales for its development. In light of the gaps and options outlined in this RUS, it is essential that future freight growth is taken into account in any timetable analysis. The potential recommendation of double tracking between Milverton Junction and Kenilworth, as outlined in option 18a, should also be considered during further scheme development.

Option O-30 – Review and consider findings of development of the third party project to improve rail provision Nuneaton – Coventry with new stations at Ricoh Arena and Bermuda Park

The need to improve the rail provision on the Leamington Spa to Nuneaton line in order to serve both current demand and future demand relating to business, housing and leisure developments was identified as a gap during the baseline analysis stage of the RUS. It is recognised that the work being undertaken as part of the proposed scheme to upgrade this line, with potential new stations at Ricoh Arena and Bermuda Park addresses this gap. This scheme, which is currently in development, is outlined in more detail in **Chapter 4**. A business case has been submitted to the DfT for a funding decision.

6.9.8 Shrewsbury line – option analysis

Crowding on the long distance services between Shrewsbury and Birmingham New Street is predicted to become more prevalent by 2019 with some

passengers having to stand for more than 30 minutes on the busiest morning-peak services. The proposed CP4 operational plan does not increase capacity on this corridor and this RUS assesses the business case to lengthen the busiest services from Shrewsbury (both London Midlands and Arriva Train Wales).

Option O-25 – Assess opportunities arising from planned linespeed increases

The journey time between mid-Wales and Birmingham was identified as a gap in the baseline stage of the RUS. An enhancement scheme to deliver journey time reductions on the Wolverhampton – Shrewsbury route is currently in development. This scheme is jointly funded by the Network Rail Development Fund and a third party. The scheme will deliver journey time reductions by raising the linespeed of the route between Wolverhampton and Shrewsbury.

This scheme offers opportunities for a number of rail operators, both passenger and freight, who run services on the Wolverhampton to Shrewsbury line. Passenger services are currently operated by Arriva Trains Wales, London Midland and Wrexham, Shropshire and Marylebone Railway. DB Schenker operates freight services to and from Ironbridge Power Station.

The current prevailing linespeed is 70mph for all types of traffic. An increase in linespeed would reduce journey times, increase capacity, and provide additional timetable flexibility and performance resilience at both Shrewsbury and Wolverhampton. Performance analysis carried out as part of the scheme has indicated that if linespeeds are increased to 90mph for a significant proportion of the route, reductions in sectional running times are achievable for currently-operated rolling stock. The shorter journey times achieved on delivery of the project would be reflected in the timetable.

An opportunity for potential additional benefit arises from Arriva Trains Wales trains arriving earlier at Wolverhampton, resulting in these services reaching their final destination of Birmingham International earlier.

Option O-26 – Shrewsbury line – journey time improvement

The RUS recognises that the options to consider journey time savings between Shrewsbury and Birmingham New Street have been considered in detail as part of the work undertaken for the Wolverhampton to Shrewsbury linespeed improvement project. This scheme is currently in development and the RUS recommends that it is delivered in order to address the journey time gap identified.

Assessment of option O-27a – Lengthening of Arriva Trains Wales peak services between Birmingham International and Shrewsbury	
Gaps addressed	Consolidated gap G-26: Peak and all day capacity issues for passenger services: central Birmingham
Concept	Lengthen one morning and one evening peak Arriva Trains Wales service between Shrewsbury and Birmingham International.
Operational analysis	The latest CP4 operational plan shows that no additional capacity would be provided on the Shrewsbury to Birmingham services. Analysis shows that by 2019 it would have passengers standing for more than 30 minutes in the peak. This analysis assesses the case of providing longer vehicles than current. It is assumed that one morning peak Aberystwyth to Birmingham International service would have an additional vehicle attached to the train at Shrewsbury and it makes three round trips per day.
Infrastructure required	None.
Passenger impact	Reduced crowding between Shrewsbury and Birmingham.
Freight impact	Current and future freight demand can be accommodated.
Financial and economic analysis	The main costs relate to the mileage covered by the additional vehicle. The case was considered for starting the vehicle at Aberystwyth but the mileage related costs were too high to give good value-for-money business case. The option of attaching and detaching the additional vehicle at Shrewsbury is considered and the following reports the business case:
	30-year appraisal £ million (2002 PV)
	Costs (present value)
	Investment cost 0.0
	Operating cost 2.2
	Revenue -1.2
	Other Government impacts 0.2
	Total Costs 1.3
	Benefits (present value)
	Rail users benefits 1.4
	Non users benefits 0.6
	Total quantified benefits 2.0
	NPV 0.7
	Quantified BCR 1.54
Link to other options	Option O-27b.
Conclusion	This option is recommended for implementation as soon as rolling stock becomes available. With option O-29b the overall recommendation for lengthening between Wolverhampton and Shrewsbury is three morning Shrewsbury to Birmingham services (two for London Midland and one for Arriva Trains Wales that continues to Birmingham International) by one car each. These additional vehicles can then be used to lengthen three evening Birmingham to Shrewsbury services.

6. Gaps and options

Assessment of option O-27b – Lengthening of London Midland peak services between Birmingham New Street and Shrewsbury	
Gaps addressed	Consolidated gap G-26: Peak and all day capacity issues for passenger services: central Birmingham.
Concept	Lengthening two morning and two evening peak London Midland services by one car each.
Operational analysis	<p>The latest CP4 operational plan shows that no additional capacity would be provided on the Shrewsbury to Birmingham New Street services. Analysis shows that by 2019, standing would be observed on two morning and two evening Shrewsbury to Birmingham New Street services with some passengers having to stand for more than 30 minutes.</p> <p>The option assesses the business case of providing additional vehicles for these services by 2019.</p>
Infrastructure required	None.
Passenger impact	Lengthening these services helps to reduce on-train crowding.
Freight impact	Current and future freight demand can be accommodated.
Financial and economic analysis	<p>The main costs relate to rolling stock. It is assumed that each additional vehicle would make three round trips per day.</p> <p>The following table outlines the appraisal results:</p>
	<div>30 year appraisal£m (2002 PV)</div>
	Costs (present value)
	Investment cost0.0
	Operating cost4.0
	Revenue-1.8
	Other Government impacts0.4
	Total Costs2.6
	Benefits (present value)
	Rail users benefits3.4
	Non users benefits0.9
	Total quantified benefits4.3
	NPV1.7
	Quantified BCR1.7
	This option provides medium value for money business case.
Link to other options	Option O-27a.
Conclusion	<p>This option is recommended for implementation as soon as rolling stock becomes available. With option O-27a the overall recommendation for lengthening between Wolverhampton and Shrewsbury is three morning Shrewsbury to Birmingham services (two London Midland and one Arriva Trains Wales) by one car each. These additional vehicles can then be used to lengthen three evening Birmingham to Shrewsbury services.</p>

6.9.9 Stafford/Wolverhampton to Birmingham – option analysis

Stafford and Wolverhampton has a mixture of interurban long distance and local suburban services. It is predicted that by 2019, several long distance services would have passengers standing from Wolverhampton. On the busiest trains, standing would start even further back, such as from Stafford. The level of crowding is high on these services as they both serve long distance travellers as well as local commuters. Crowding is more prevalent in the morning peak.

The West Coast Main Line RUS is assessing a series of options that would improve capacity, journey time and connectivity between Manchester and

Birmingham. An option of diverting an existing Manchester and Birmingham service via Crewe is considered to improve journey time between Manchester and Birmingham and the analysis will consider providing an additional hourly service between Manchester and Birmingham and consequently increasing capacity between these two cities. The results of this analysis will be reported in the West Coast Main Line RUS Draft for Consultation, which will be published in December 2010.

This RUS analysed the business case for lengthening the local peak Wolverhampton to Birmingham New Street services and the Liverpool/Crewe to Birmingham New Street services.

Assessment of option O-20 – Train lengthening one local peak Wolverhampton to Birmingham service

Gaps addressed	Gap G-19: Peak and all day capacity on the Stafford and Wolverhampton service.
Concept	Lengthen the busiest Wolverhampton starter that calls at intermediate stations by one car each.
Operational analysis	Require additional rolling stock.
Infrastructure required	No additional infrastructure is required to support this option.
Passenger impact	Reduce number of passengers standing.
Freight impact	Current and future freight demand can be accommodated.
Financial and economic analysis	Analysis shows that by 2019 there would be some passenger standing on the busiest peak train, however all standing would be within train capacity (including standing capacity) and no passengers would be required to stand for more than 20 minutes. Consequently train lengthening is unlikely to generate enough benefit to justify the additional vehicle leasing and mileage-related cost.
Link to other options	None.
Conclusion	It is not value for money to lengthen peak local Wolverhampton to Birmingham service on this corridor by 2019. This option is therefore not recommended.

Option 17b – Train lengthening Birmingham New Street – Manchester

Option 17b considers train lengthening on long distance services between Manchester and Birmingham New Street as a solution to provide additional capacity on the Stafford and Wolverhampton line. The results of this analysis are outlined in section 6.9.3 (See page 117).

6. Gaps and options

Assessment of option O-23 – Lengthening of Liverpool Lime Street to Birmingham New Street peak services		
Gaps addressed	Consolidated gap G-22: Capacity – Stafford to Birmingham New Street	
Concept	Lengthen one morning Liverpool Lime Street to Birmingham New Street and one evening Birmingham New Street to Liverpool Lime Street peak train.	
Operational analysis	No additional services required.	
Infrastructure required	No additional infrastructure is required to support this option.	
Passenger impact	Without lengthening the busiest Liverpool Lime Street to Birmingham New Street service, standing would be observed between Wolverhampton and Birmingham. Lengthening this service helps to alleviate crowding.	
Freight impact	Current and future freight demand can be accommodated.	
Financial and economic analysis	<p>The main costs relate to rolling stock.</p> <p>The option of lengthening by one car is considered and its gives a medium value for money business case. However it is not practical to lengthen the existing Class 350 (EMU of four cars per unit) by one car each. Consequently the business case for lengthening by one unit of Class 350 (four-car) is considered.</p> <p>The following table outlines the appraisal results:</p>	
	£million (2002 PV)	
	30-year appraisal	
		Option 1: Add one car
		Option 2: Add one unit (of 4-car)
	Costs (present value)	
	Investment cost	0.0
	Operating cost	3.0
	Revenue	-1.3
	Other Government impacts	0.1
	Total costs	1.8
	Benefits (present value)	
	Rail users benefits	2.0
	Non users benefits	0.6
	Total quantified benefits	2.7
	NPV	0.9
	Quantified BCR	1.5
	<p>The option offers no value for money business case if the service is to be lengthened by four cars. Options O-17, O-20 and O-27 help to increase capacity between Wolverhampton and Birmingham New Street and this would help to address crowding between Wolverhampton and Birmingham New Street.</p>	
Link to other options	None.	
Conclusion	<p>This option is not recommended as the crowding levels are not high enough to justify the extra unit of rolling stock and mileage-related cost. However if the opportunity of vehicle cascade arises, then it should consider operating the Liverpool Lime Street to Birmingham New Street peak hour service with a higher capacity rolling stock.</p> <p>The timetable intervention between Birmingham New Street and Manchester considered in option 21 may help to increase capacity between Stafford/Wolverhampton and Manchester and therefore crowding is likely to be reduced on the Liverpool Lime Street to Birmingham New Street services on the approach to Birmingham New Street.</p>	

Option O-21 – Timetable intervention between Birmingham New Street and Manchester

Capacity and journey time gaps were identified as gaps in this RUS and are being considered as part of the options analysis being undertaken in the West Coast Main Line RUS. The West Coast Main Line RUS is assessing a series of options that would improve capacity, journey time and connectivity between Manchester and Birmingham New Street. An option of diverting an existing Manchester to Birmingham service via Crewe is considered to improve journey time between Manchester and Birmingham. The analysis will consider providing an additional hourly service between Manchester and Birmingham New Street and consequently increasing capacity between these two cities. This would address the capacity gap between Stafford and Birmingham New Street. The results of this analysis will be reported in the West Coast Main Line RUS Draft for Consultation, which will be published in December 2010.

Option O-22 – Consider requirements for interchange facilities with Midland Metro at Dudley Port

Centro has long-term aspirations to provide a tram service on the Brierley Hill to Wednesbury route (part of the Walsall to Stourbridge proposed freight line) where it would connect with the existing Midland Metro Line 1. This tram route crosses the Birmingham to Wolverhampton line at Dudley Port where there is an opportunity to significantly improve the quality of the existing station in order to provide interchange between the routes. Dudley Port therefore has the potential to become a major transport hub for the Black Country, and Centro is currently improving the park and ride facilities as a first step. While delivery of the tram service is a long-term project, the current station is among the poorest quality in the West Midlands, and suffers from very narrow platforms, limited waiting accommodation, no disabled access and a portacabin booking office. Considerable investment is therefore required and Centro will be working with partners to identify potential funding streams.

Assessment of option O-24 – Timetable study to consider half-hourly interval direct service between Walsall and Wolverhampton

Gaps addressed	Consolidated gap G-23: Improved connectivity between Walsall and Wolverhampton.
Concept	This would help to provide direct connectivity between Wolverhampton and Walsall.
Operational analysis	The running time between Wolverhampton and Walsall via Portobello with no intermediate stops is 13 minutes. A six-minute turnaround is required at Wolverhampton for trains from/to Walsall. Two units would be required to run a self-contained half-hourly shuttle service. Due to the intensity of departures from Platforms 2, 3 and 4 at Wolverhampton towards Birmingham New Street, it is not possible to inter-work the Walsall – Wolverhampton (direct) service with the Walsall – Wolverhampton service that operates via Birmingham New Street.
Infrastructure required	A radically different track layout would be required at Wolverhampton to enable the direct service to link to the Walsall-Wolverhampton service via Birmingham New Street, with an additional platform with independent access to/from the Portobello line for maximum flexibility.
Passenger impact	Passengers would be able to travel directly from Wolverhampton to Walsall.
Freight impact	Current and future freight demand can be accommodated.
Financial and economic analysis	No business case appraisal carried out due to the high capacity expenditure is unlikely to be justified by the level of benefit it gives.
Link to other options	None.
Conclusion	This option is not recommended as analysis indicates that the significant capital expenditure required cannot be justified. A high level consideration of an hourly service has also been carried out and shows that there is a potential to accommodate this on the existing infrastructure. The RUS therefore supports the strategic aspiration of Centro to continue work to develop this scheme as an hourly service.

6. Gaps and options

6.9.10 Stourbridge line – option analysis

As shown in **Chapter 5**, the committed introduction of Class 172s rolling stock on the Stourbridge and Stratford-upon-Avon corridor would overall provide sufficient capacity to meet demand in the morning peak. In 2019, standing would become more

common although most of these would be within train capacity. However a high peak hour train from Worcester to Birmingham via Stourbridge is predicted to have passengers standing from Stourbridge, which is more than 20 minutes from Birmingham city centre. Options of lengthening the busiest service have been developed to address crowding.

Assessment of option O-14 – Train lengthening one morning peak Worcester to Birmingham Snow Hill via Stourbridge

Gaps addressed	Consolidated gaps G-12: Stourbridge line capacity and G10: Worcester – Hereford – Birmingham capacity.																										
Concept	Lengthen one morning peak and one evening peak Worcester to Birmingham Snow Hill service via Stourbridge.																										
Operational analysis	Require additional rolling stock.																										
Infrastructure required	No additional infrastructure is required to support this option.																										
Passenger impact	<p>The London Midland franchise has a commitment to replace the current Class 150 fleet with new Class 172's. The Class 172 vehicle has a greater capacity volume in comparison with the Class 150.</p> <p>Subsequently, the London Midland HLOS capacity proposal injects additional vehicles through the retention in a small fleet of displaced Class 150 vehicles.</p> <p>The base includes the additional capacity generated by the design of the Class 172 vehicle and the proposed London Midland operational plan which deploys retained Class 150 vehicles. Analysis shows that even with these vehicles, one morning peak hour service would still have passengers standing for more than 20 minutes and by lengthening this train will help to alleviate crowding. This option assesses the business case for providing vehicles beyond the CP4 operational plan.</p>																										
Freight impact	Current and future freight demand can be accommodated.																										
Financial and economic analysis	<p>The main costs relate to rolling stock. Assume each additional vehicle makes three round trips per day.</p> <p>The following table outlines the appraisal results.</p> <table> <tr> <th>30-year appraisal</th><th>£ million (2002 PV)</th></tr> <tr> <td colspan="2">Costs (present value)</td></tr> <tr> <td>Investment cost</td><td>0.0</td></tr> <tr> <td>Operating cost</td><td>2.4</td></tr> <tr> <td>Revenue</td><td>-0.6</td></tr> <tr> <td>Other Government impacts</td><td>0.1</td></tr> <tr> <td>Total Costs</td><td>2.0</td></tr> <tr> <td colspan="2">Benefits (present value)</td></tr> <tr> <td>Rail users benefits</td><td>1.5</td></tr> <tr> <td>Non users benefits</td><td>0.3</td></tr> <tr> <td>Total quantified benefits</td><td>1.8</td></tr> <tr> <td>NPV</td><td>-0.2</td></tr> <tr> <td>Quantified BCR</td><td>0.9</td></tr> </table> <p>With a BCR of less than one, it indicates that the option offers no value for money business case.</p>	30-year appraisal	£ million (2002 PV)	Costs (present value)		Investment cost	0.0	Operating cost	2.4	Revenue	-0.6	Other Government impacts	0.1	Total Costs	2.0	Benefits (present value)		Rail users benefits	1.5	Non users benefits	0.3	Total quantified benefits	1.8	NPV	-0.2	Quantified BCR	0.9
30-year appraisal	£ million (2002 PV)																										
Costs (present value)																											
Investment cost	0.0																										
Operating cost	2.4																										
Revenue	-0.6																										
Other Government impacts	0.1																										
Total Costs	2.0																										
Benefits (present value)																											
Rail users benefits	1.5																										
Non users benefits	0.3																										
Total quantified benefits	1.8																										
NPV	-0.2																										
Quantified BCR	0.9																										
Link to other options	None.																										
Conclusion	<p>This option is therefore not recommended as it is not value for money to lengthen peak local services on this corridor beyond the Control Period 4 Delivery plan by 2019.</p> <p>The RUS acknowledges that a review of the service patterns on this corridor is planned which may identify the requirement for additional infrastructure and/or timetable intervention. The RUS recognises the potential option of a turn back facility at Rowley Regis being considered by Centro as part of this review. This facility would enable a timetable pattern change to facilitate an inner suburban all stations service and the speeding up of outer suburban services.</p>																										

Option O-15 – Journey time improvement

The RUS recommends that opportunities to improve journey time on the Stourbridge line be considered as part of future planned renewals and other potential capability improvement schemes

6.9.11 Stratford-upon-Avon line – option analysis

Assessment of option O-16 – Train lengthening one morning peak Stratford-upon-Avon to Birmingham service	
Gaps addressed	Consolidated gap G-14: Peak and all day capacity on the Stratford-Upon-Avon corridor.
Concept	Lengthen the busiest Stratford-upon-Avon/Shirley to Birmingham service by one car.
Operational analysis	Require additional rolling stock.
Infrastructure required	No additional infrastructure over and above what is already committed for CP4 is required to support this option.
Passenger impact	The London Midland franchise has a commitment to replace the current Class 150 fleet with new Class 172's. The Class 172 vehicle has a greater capacity volume in comparison with the Class 150. Subsequently, the London Midland CP4 operational plan proposal injects additional vehicles through the retention in a small fleet of displaced Class 150 vehicles. The base includes the additional capacity generated by the design of the Class 172 vehicle and the proposed London Midland CP4 operational plan which deploys retained Class 150 vehicles.
Freight impact	Current and future freight demand can be accommodated.
Financial and economic analysis	Analysis shows that with the planned CP4 vehicles, there would be sufficient capacity to meet expected demand in 2019. Some standing for less than 20 minutes would still be observed on the busiest services. However it is anticipated that the benefit of crowding relief from train lengthening beyond CP4 operational plan would not be high enough to justify the additional vehicle and mileage related cost.
Link to other options	None.
Conclusion	It is not value for money to lengthen peak local services on this corridor beyond the CP4 operational plan by 2019. This option is therefore not recommended.

6. Gaps and options

6.10 Birmingham New Street

Option O-42 – Operational Analysis – Birmingham New Street (on approach and within the station)

As it is recognised that Birmingham New Street station is already operating close to its operational capacity, it was identified as a gap in the RUS which would need to be assessed taking into account the increased demand for services and capacity requirements arising out of the interventions that are proposed in this RUS. The RUS has analysed the operational impact of all of the emerging conclusions on each of the corridor routes, together with the recommendations from other RUSs and all committed schemes.

The analysis included the acceleration of the Aberystwyth/Holyhead to Birmingham International services delivered through the Wolverhampton to Shrewsbury linespeed improvement, the diversion of long distance services between Newcastle and Reading to run via Birmingham International, the recommendation of an all-day half-hourly service between Tamworth and Worcester, and the potential linking of the Walsall Corridor and Coventry Corridor services. Analysis indicated that the proposed additional Tamworth to Birmingham services have to be linked to the Birmingham to Hereford/

Worcester services due to platform constraint at Birmingham New Street. The analysis determined that, provided the service between Nottingham and Birmingham are interworked with the services between Stansted/Leicester and Birmingham, there will be sufficient capacity at Birmingham New Street station to accommodate the recommendations made in this RUS.

It should be noted that the potential recommendations of West Coast Main Line RUS were not included in this analysis as this can only be done once they are finalised. Other stakeholder aspirations and uncommitted schemes have also not been factored as they do not form established changes to the network. Further operational analysis may need to be carried out during the consultation period to assess the impact of the West Coast Main Line RUS recommendations and any additional committed change to the network.

6.11 Performance

As part of the development of the RUS it has been recognised that performance through the centre of Birmingham can have a critical impact on large areas of the rail network nationally. During the consultation phase of this RUS, a performance model will be undertaken to establish the impact of all committed schemes and proposed RUS interventions on performance throughout the RUS area.

Table 6.29 – Freight gaps

Corridor	Consolidated gap number	Gap description
Leamington Spa and Chiltern	G-3	Leamington Spa and Chiltern corridor freight capacity and West Midlands freight routeing
Stourbridge	G-9	Stourbridge line freight routeing
Coventry	G-15	Coventry corridor freight capacity and routeing
Stafford and Wolverhampton	G-18	Stafford and Wolverhampton freight capability and routeing
Shrewsbury-Wolverhampton	G-24	Freight gauge capability on Shrewsbury-Wolverhampton line
Cannock and Walsall	G-30	Cannock and Walsall line freight growth, West Midlands area routeing, and terminal capacity
Derby, Nuneaton and Camp Hill	G-37	Derby, Nuneaton and Camp Hill lines freight capacity and capability and West Midlands area freight routeing and terminal capacity
Sutton Park line	G-41	Freight capacity and routeing in the West Midlands (Sutton Park line)

6.12 Freight

During the gap analysis process the Stakeholder Management Group considered a number of freight gaps that were raised on the corridors within the RUS area. These are shown in **Table 6.29**.

These gaps were considered together as part of the overall analysis undertaken to consider freight growth forecasts and requirements within the RUS area. Freight requirements have been considered at a holistic level, across the whole RUS area. As outlined in **Chapter 5**, the growth forecasts used in this analysis are those agreed as part of the Strategic Freight Network. These forecasts have been reviewed by the freight operators within the RUS stakeholder management group. Options appraisal sub groups were held to undertake option analysis with a specific focus on freight requirements, in terms of capacity and routing.

Up to 2019

The key findings of this analysis are that freight growth within the RUS area can be accommodated up to 2019 on the baseline infrastructure and timetable, with the exception of the route between Bromsgrove and Birmingham New Street via the Lickey Incline.

The growth in freight traffic from the proposed Bristol Deep Sea Container Terminal in the South West is expected to generate the need for further capacity and capability enhancements within the RUS area. It is anticipated that the route up the Lickey Incline, which has a steep prevailing gradient, will become an increasing constraint on forecast freight growth, including from the proposed Bristol Deep Sea Container Terminal. The capacity pressures on the line will be exacerbated during CP4 due to the extension of Cross City services to Bromsgrove, and current analysis indicates that an intervention will be needed by 2019 in order to accommodate anticipated heavier and additional freight services.

A scheme to provide an alternative freight route through the West Midlands via Worcester, Round Oak and Walsall is currently being considered by the Strategic Freight Network for implementation in the medium term. Work has also been undertaken by Centro to develop a value for money business case for re-opening the Walsall to Round Oak freight line to accommodate the forecast additional freight traffic by 2019 and by 2030 from Bristol to Yorkshire/North East/Scotland, Devon to North West/ Yorkshire and South Wales to Yorkshire.

The scheme has an estimated capital cost of £98m and involves reinstating the double tracks between Round Oak and Pleck Junction in Walsall, reinstating the Bescot Curve line, altering tracks at Round Oak and providing new signals.

The business case developed by Centro shows that the scheme generates a Benefit Cost Ratio of 2.01 which offers high value for money. It includes the freight benefits of accommodating freight growth to 2019 and to 2030 by rail which is unlikely to be accommodated on the Lickey Incline. The freight benefit is quantified using Sensitive Lorry Miles which are the standard values and approach used in rail freight appraisal. There are also other un-quantified and wider benefits generated by schemes which are not included in the business case and this includes the following:

- operation of longer and heavier freight trains
- resource saving to freight operators (e.g. reduced requirement for the banking engine required on the Lickey Incline and shorter routings for some flows)
- use as a diversionary route
- may be used to accommodate further potential freight demand
- supports the development of freight terminals on the route, such as Corus at Round Oak
- support regeneration of the area
- support the Camp Hill Chords scheme
- support potential new services on the Camp Hill and Tamworth line
- support Centro's aspiration of a tram-train scheme in the area.

The scheme is aligned with local and regional transport planning objectives.

In addition, the reopening of the Round Oak to Walsall route will assist in operational flexibility and improve performance levels on other routes. It is likely that the freight traffic diverted along this corridor would also be routed via the Sutton Park line and Kidderminster. The planned Walsall and Cannock line and Stourbridge to Hartlebury re-signalling schemes will improve the planning headways on these routes and analysis indicates that they will be sufficient to accommodate the re-routed freight services.

6. Gaps and options

The RUS has reviewed the business case developed by Centro and considered what additional infrastructure would be required to enable the diversion of freight through the West Midlands via Worcester, Round Oak and Walsall. This analysis has indicated that there is a need for an infrastructure enhancement at Abbotswood Junction, which does not materially alter the business case but it is required to accommodate the freight traffic assumed in the appraisal. It is also recognised that the planned renewals in the Worcester area and at Droitwich Spa signal box may provide opportunities for enhancing the signalling capacity along this route.

The West Midlands and Chilterns RUS recommends that this scheme is considered for further development in CP5. Opportunities for implementing associated infrastructure enhancements need to be considered as part of planned renewals and resignalling programmes. When developing the business case further, the RUS advises that the impact of further freight growth is taken into account. In particular the further development of the Port of Bristol is likely to be a key driver for freight flows using the route. The RUS recognises this growth affects the strength of the business case and, while the current business case shows the requirement for the line by 2019, faster or slower growth may affect this date. It is also acknowledged that a significant amount of freight would be routed on this line were it to be opened today, and many of the benefits would be realised independent of the freight growth occurring.

Post 2019

The analysis carried out in the West Midlands and Chilterns RUS shows that in order to accommodate forecast freight growth post 2019, four-aspect signalling would be required between Kingsbury and Water Orton to improve the signalling headways. This infrastructure requirement forms a longer term recommendation of the RUS. The infrastructure enhancement at Kingsbury freight terminal, identified as a requirement to reduce performance risks and create additional network capacity, would be also required post 2019 to enable direct access for freight services from the north and remove the need to perform a shunt move into the terminal from the main line.

6.13 Summary

The findings of the RUS options analysis work presented in this chapter indicate that in general the proposed capacity interventions committed in the CP 4 Delivery Plan will cater for the passenger demand forecast up to 2019. The analysis does however identify some areas of localised crowding, and recommendations for train lengthening are made where a value-for-money business case can be made.

In terms of service recommendations to enhance capacity and connectivity, a case can be made for an additional half-hourly service between Tamworth and Birmingham New Street which can be extended through to Worcester and Hereford. Infrastructure interventions on the line between Wichnor Junction and Water Orton West Junction are recommended to provide performance resilience in light passenger growth anticipated on the route.

A recommendation is made to further develop the case to re-route the Reading to Newcastle service via the Coventry corridor to provide connectivity between Birmingham International, Coventry and the North East.

In order to accommodate forecast freight growth up to 2019, the RUS recommends further consideration of the business case to re-open the mothballed route between Round Oak and Walsall. Post 2019, analysis has indicated that there is a need for signalling and infrastructure interventions on the Derby, Nuneaton and Camp Hill corridor, namely four-aspect signalling between Kingsbury and Water Orton and improved access to Kingsbury freight terminal. These form longer-term recommendations in the RUS.

The RUS recommends that consideration is given to undertaking feasibility of the re-opening of the Walsall to Lichfield route in the longer term. This would provide for additional freight capacity and freight diversionary capability that avoids the Water Orton area.

7. Emerging strategy and longer-term vision

7.1 Introduction

This chapter draws together the initial conclusions from the RUS analysis into an emerging strategy to 2019. This strategy will be further refined in the light of consultation responses, together with further analysis and option appraisal if required, to form a concluding strategy for recommendation in the final document. This concluding strategy will also take into account the conclusions of work in associated RUSs which are still in development.

7.2 Strategy for Control Period 4 (2009–14)

The RUS is aligned with the delivery of the key outputs specified within the High Level Output Specification (HLOS) and Control Period 4 (CP4) Delivery Plan. These committed schemes, which are presented in detail in **Chapter 4**, are summarised below:

- delivery of the HLOS capacity metrics identified for the Birmingham major urban area (Birmingham central stations) and London Marylebone
- delivery of the HLOS programme relevant to the RUS area funded through the CP4 Delivery Plan including the following key outputs:
 - Bromsgrove electrification
 - Redditch branch enhancement
 - Westerleigh Junction – Barnt Green Linespeed increase
 - Birmingham New Street Gateway project
 - West Midlands platform lengthening
 - National Station Improvements Programme
 - Access for All programme
 - Strategic Freight Network
 - Cotswold line enhancement scheme

The strategy for CP4 also encompasses the other committed schemes presented in **Chapter 4** which include:

- Evergreen 3 project
- Transport for London/London Underground Limited planned infrastructure and service changes
- Southampton to West Coast Main Line gauge enhancement
- Wolverhampton to Shrewsbury linespeed improvement
- West Midlands area resignalling schemes

The completion of the CP4 Delivery Plan and other committed schemes will develop the existing rail network. It will facilitate the delivery of an enhanced service level and longer trains on key routes within the RUS area. **Chapter 4** has outlined the committed changes to the network which will help to resolve a substantial number of the capacity gaps and issues which have been raised in this RUS. These include the additional HLOS vehicles planned on a number of routes and the specified outputs at Bromsgrove and Redditch which will deliver the extension of Cross City services to these stations.

The major signalling renewals programme planned on a number of routes within the RUS area between 2009 and 2014 will improve capacity, performance and journey time through headway improvements and other proposed enhancement schemes.

The committed Evergreen 3 project (including the associated CP4 enhancements) and the interventions planned on the London Underground network will also help to resolve a number of capacity issues within the Chiltern area. In addition to the journey time benefits, which will be delivered by the Evergreen 3 project, the linespeed enhancement and introduction of new rolling stock will help to create additional capacity into London Marylebone during peak times. The committed interventions on the London Underground network, including new higher capacity 'S' stock and LUL resignalling, will increase capacity on the Metropolitan line by enabling additional peak hour services to operate.

7. Emerging strategy and longer-term vision

The committed schemes outlined in **Chapter 4** also help to address other types of gaps that have been raised in the RUS. The need for journey time improvement was identified on the Chilterns route between London Marylebone and Birmingham Snow Hill, between Birmingham and the South West and between Wolverhampton and Shrewsbury. These capability gaps will be addressed respectively through the Evergreen 3 project, Westerleigh Junction to Barnet Green linespeed improvement and Wolverhampton to Shrewsbury linespeed improvement.

The need for station facility improvements at a number of stations in the RUS area is also being addressed as part of the CP4 Delivery Plan. The limited facilities at stations on the Cannock line are being upgraded as part of the National Stations Improvement Programme (NSIP). Station capacity at University station on the Cross City line was also identified as a gap requiring improvements to enable it to accommodate the anticipated growth in passenger numbers associated with hospital and university developments in the locality. This station is also benefiting from improvements funded through NSIP.

The Birmingham New Street Gateway project, which received committed funding in the CP4 Delivery Plan, will help to transform the station and meet the needs of current and future passengers. Birmingham New Street is one of the busiest and most important interchange stations on the national rail network, used by around 31 million passengers per year, a substantial number of which interchange between services. The redevelopment of the station will substantially improve passenger flow, capacity and interchange. It will enhance the provision of live passenger information to assist passengers in connecting to other services, including to Birmingham International Airport. This will help to address issues specific to Birmingham New Street station and also assist with interchange into the wider network. Project development work has demonstrated that the new station will be able to manage passenger growth expectations up until 2035.

7.2.1 Timetable changes

The RUS recommends a continual review of existing timetables as an ongoing measure. This includes the review of the Evergreen 3 timetable after a sensible period of operation to ensure it is delivering the optimum service pattern and accommodating demand requirements. Initial RUS analysis has indicated that there may be a need for further capacity into London Marylebone during peak hours in 2019, and it is also recognised that the enhanced timetable may stimulate further demand.

The RUS strategy for CP4 focuses on the delivery of the committed schemes that form the baseline and address many of the gaps raised. The RUS

recognises that these CP4 commitments will deliver significant improvements to network capacity, capability and enhance the overall operation of the railway. The predominant focus of the RUS is on capacity improvements, and the CP4 Delivery Plan and other committed schemes outlined in the RUS are recognised as being the first step in addressing the capacity related issues within the RUS area.

As this recommended strategy for CP4 is based on the delivery of the committed outputs, it is important to recognise should there be any refinement to these outputs in the form of changes to the specified outputs or funding, the RUS would review this strategy. If for any reason the current plans to deliver the committed schemes did not materialise, the RUS would treat the lack of output as a gap for which the original planned scheme would form a potential option.

7.2.2 Stakeholder aspirations and uncommitted schemes

In addition to the committed schemes, the RUS appreciates that there is a potential to address some of the gaps raised through uncommitted enhancement schemes or aspirations which are being developed by third parties. These include aspirations for new stations, new services and related infrastructure enhancements. It is recognised that these schemes are at different stages of development, with some aiming to deliver an output in CP4 and others requiring more detailed development to determine funding availability and timescales for delivery.

Nuneaton to Coventry rail service upgrade – Proposals for a new service between Nuneaton and Coventry with new stations at Ricoh Arena and Bermuda Park are being developed by Centro in partnership with local authorities. The aim of this rail service upgrade is to accommodate increasing demand in the local areas associated with retail, housing and leisure developments. The RUS recognises the ongoing work to develop these plans which includes the need for a new six-car bay platform at Coventry station, new stations at Coventry Ricoh Arena and Bermuda Park, and the extension of platforms at Bedworth station.

East-West Rail – This initiative aims to improve east-west connectivity between Oxford and Cambridge to support growth and development in housing and employment, and ease road congestion. The East-West Rail Consortium is assessing options to re-introduce passenger services from Oxford and Aylesbury to Bletchley and Milton Keynes. The East-West Rail link is being planned in three distinct phases, with part of the proposed route, between Bicester and Oxford, being developed as part of the committed Evergreen 3 project. The

RUS recognises that the East West Rail route may offer important strategic benefits in the medium to longer term and, if implemented, could potentially release capacity within the RUS area and create an alternative freight route between the south of England and the Midlands. The link could also act as a diversionary route during planned or emergency blockades. Further development work will aim to determine the most appropriate timescales for implementation.

Aldridge station – The option to provide a new station for the Aldridge/Brownhills area in Walsall is a strategic aspiration of Centro. This has been evaluated by this RUS, as sufficient potential demand is evident to justify further detailed analysis. The RUS timetable study has demonstrated that a new station at Aldridge could be best served by an extension of the Birmingham New Street to Walsall electric services. The option to operate an electric service would require significant infrastructure enhancement and some additional rolling stock. The RUS recognises the benefits associated with this new station and supports the further development of the business case by Centro. Analysis has also shown that the potential exists to link the Aldridge/Walsall service to the Coventry corridor to provide cross-Birmingham opportunities and increase rail connectivity to Birmingham International Airport.

Kenilworth station – A third-party project to develop a new station in Kenilworth is being developed to improve accessibility in the area, reduce road congestion and meet an increasing demand for improved public transport. The service pattern is being investigated as part of this work. The RUS recognises this stakeholder aspiration, and supports further development of the project. It is noted that forecast freight growth, which needs to be accommodated on the route between Leamington Spa and Nuneaton, should be taken into account during further development work. The infrastructure enhancement to redouble the track between Milverton Junction and Kenilworth, which is required to enable the proposed re-routeing of the Reading to Newcastle service, would assist with capacity on the route and should also be factored into the station development work.

Stratford Parkway station – An aspiration exists to develop a new park and ride station at Bishopton and increase the train service frequency between Stratford-upon-Avon and Birmingham. The RUS notes the Stratford Parkway development, recognising its potential to reduce road congestion, support the growth in demand generated by local housing developments and serve longer distance passengers who wish to commute into the West

Midlands conurbation. The parkway station will also increase accessibility to rail services through its planned bus interchange, and will help to mitigate against the increased pressure for car parking at the current town centre station in Stratford-upon-Avon.

North-South Links in Buckinghamshire – The study undertaken by Chiltern Railways on behalf of Buckinghamshire County Council analyses a number of options to improve public transport links within Buckinghamshire. These include changing service patterns, developing new service opportunities and considering interchange opportunities with coach services. The study assesses the opportunities that will be available through the proposed re-opening of the East-West Rail link and its service proposals would be consistent with that project. The RUS notes the strategic aspirations outlined in this study and recognises the conclusions that have been reached. Some of the gaps raised within this RUS would be resolved by the options proposed in the report, if funding were to become available to progress these.

Centro rail service review

Centro has a number of strategic aspirations which are currently in the early stages of feasibility study. It is anticipated that more detailed development will be undertaken during CP4 to develop the business cases required to determine funding availability and potential timescales for implementation.

- Stourbridge line timetable review – The RUS acknowledges that Centro are reviewing the service pattern on the Stourbridge corridor with the aim of addressing localised crowding that is evident in some peak hours between Stourbridge and Worcester. This review considers the option of a turn back facility at Rowley Regis which would enable a timetable change to provide a new inner suburban service calling at all stations and the speeding up of an outer suburban service. The RUS recognises the development of this option and the potential benefits it would deliver.
- Wolverhampton to Walsall hourly local service – The RUS analysis does not support a half-hourly service between these two locations as it cannot be accommodated without significant capital expenditure. The RUS does, however, recognise that Centro has a strategic aspiration to develop the case to provide an hourly service on the existing infrastructure.
- Solihull to Stratford-upon-Avon service – Centro is considering an option to extend some services which operate between Birmingham Snow Hill and Dorridge, through to Stratford-upon-Avon. This is to increase the direct rail service provision between Solihull and Stratford-upon-Avon.

7. Emerging strategy and longer-term vision

Birmingham central stations study – Centro are currently developing a study to consider options to reduce station crowding at Birmingham Moor Street and Birmingham Snow Hill, and improve the interchange between these stations and Birmingham New Street. The work being undertaken in this study is supported by the RUS and the emerging conclusions may help to address some of the issues identified in this strategy.

Car parking strategy – The increasing demand for further car parking capacity has been identified throughout the RUS area. The RUS supports the ongoing commitments made by train operators, Network Rail, Centro and local authorities to improve car parking capacity at stations.

Stratford-upon-Avon – Honeybourne – There is an aspiration to re-open the former rail route between Stratford-upon-Avon and Honeybourne. There are potential passenger and freight benefits associated with this, in particular through releasing capacity on existing routes and by the facilitation of new services on the line. This is currently an unfunded aspiration.

7.3 Strategy for Control Period 5 (2014–19)

7.3.1 RUS recommendations

In order to accommodate the forecast levels of passenger and freight growth up to 2019, the RUS has made recommendations for train lengthening, changes to the service provision, and infrastructure enhancements where required to facilitate such growth of both passenger and freight markets.

7.3.2 Train lengthening

By carrying out an analysis of forecast passenger loadings on each RUS corridor, it has been possible to identify where there may be potential capacity issues by the end of Control Period 5. Where necessary, a business case for train lengthening has been assessed based on forecast demand analysis. The results of this work demonstrate that in the majority of cases the CP4 capacity schemes are sufficient to cater for forecast growth to 2019, but in some cases the option of train lengthening beyond HLOS interventions is recommended to alleviate localised crowding and accommodate forecast growth. These train lengthening recommendations are made on one Hereford to Birmingham morning and evening service, and three morning and evening Shrewsbury to Birmingham services. The RUS also notes the recommendation made in the Great Western RUS to lengthen selective Manchester to Bournemouth services which operate via Leamington Spa and Coventry, Manchester to Bristol and Edinburgh to Plymouth services and the East Midlands RUS proposal to lengthen the Birmingham New Street to Leicester/Stansted Airport service throughout the week and at weekends.

7.3.3 Timetable interventions

In some cases, the RUS strategy recommends a timetable intervention by means of an additional or new service to address capacity or connectivity gaps on specific routes. The RUS has identified that an option exists to provide two additional services per hour between Tamworth and Birmingham New Street to help reduce on-train crowding. Further analysis has demonstrated that the business case would support the extension of these services to Worcester to provide an all day half-hourly Tamworth to Worcester service. This service enhances an existing Birmingham New Street to Hereford service in one half of the hour and includes an additional service in the second half of each hour helping to address crowding on this route. This extension provides additional capacity, improves cross-city connectivity and reduces the requirement to turn back services at an already congested Birmingham New Street station. An infrastructure enhancement would be required at Tamworth in the form of a turn back facility, and this forms part of the RUS recommendation. It is also proposed that infrastructure interventions on the line between Wichnor Junction and Water Orton West Junction are developed to provide performance resilience in the light of passenger growth anticipated on the route service aspirations.

The RUS has considered re-routeing of the Reading to Newcastle service (in both directions) from its existing routeing via Solihull to the Coventry corridor, in order to provide connectivity between Coventry and Birmingham International, and the East Midlands, Yorkshire and the North East. The analysis showed that the business case to recommend this option offers value for money, but its level of benefits is particularly sensitive to performance on the Coventry corridor and West Coast Main Line. The option also requires the redoubling of the route between Kenilworth and Milverton Junction, as it cannot be accommodated in light of the forecast freight growth on this route without this infrastructure enhancement. The RUS recommends that further work be undertaken to consider both the impact of other timetable developments and the delivery of infrastructure schemes in development which may offer further benefits to support the business case. These schemes include Reading and Oxford station area development schemes, Birmingham New Street resignalling, the Evergreen 3 project and seven day railway schemes.

Consideration has been given to the need to provide earlier and later services where this is currently limited within the RUS area, and also increase Sunday service levels particularly on long distance interurban services. It has proven difficult to develop a detailed socio-economic business case for these service enhancements as there is currently lack of robust data to reflect current demand and localised study would be required to understand the potential demand for these services.

The RUS therefore recommends that train operators, Centro and the local authorities identify the locations within the RUS area which receive particularly poor levels of service at these times and would be considered priorities for future service enhancements. Consideration should then be given to any constraints which exist to prevent train companies from running additional services if they recognise that a significant gap exists. It is recognised that the seven day railway initiatives may also offer opportunities for improved train operator access to the rail network which would help to facilitate service enhancements.

The RUS analysis of forecast passenger demand on the Leamington Spa and Chiltern corridor has shown that overall the planned Evergreen 3 timetable interventions provide sufficient capacity up to 2019, although there may be some standing evident on short distance journeys into Birmingham Moor Street and some peak and shoulder peak hour crowding on longer distance services into London Marylebone. The RUS recommends that further consideration should be given to the timetable on this corridor after a period of operation of the Evergreen 3 timetable. Consideration should be given to improve the utilisation of rolling stock, to deliver potential changes in calling patterns in the high-peak hours to support additional calls at stations close to London.

The RUS also supports further consideration of timetable options on the Aylesbury line where national rail services and London Underground Limited (LUL) services operate over LUL infrastructure between Harrow-on-the-Hill and Amersham. In order to be effective this consideration should be a joint exercise between Network Rail, Transport for London, London Underground and the relevant train operators, and should align with the introduction of new 'S' type rolling stock on the LUL line and longer-term resignalling plans.

West Coast Main Line RUS

The RUS also notes the work currently in development in the West Coast Main Line RUS which is of relevance to the West Midlands and Chilterns RUS area. The results of this analysis work will be reported in the West Coast Main Line RUS Draft for Consultation, which will be published in December 2010 and will be commented on in the final West Midlands and Chilterns RUS. These options are:

- an assessment of a series of options to improve capacity, journey time and connectivity between Manchester and Birmingham. An option of diverting an existing Manchester to Birmingham service via Crewe is being considered to improve journey time between Manchester and Birmingham. The analysis is considering the case to provide an additional hourly service between Manchester and Birmingham to increase capacity between these two cities.

- consideration of the potential for an additional long distance off-peak service from London Euston to the north west that could create increased interchange opportunities with the West Midlands area. The current economic analysis, which will be reported in the West Coast Main Line RUS, suggests that stopping at Nuneaton has greater value than stopping at Tamworth. The West Coast Main Line RUS will consider the socio-economic benefits of stopping at the other main Trent Valley stations, which includes Lichfield Trent Valley.

7.3.4 Infrastructure enhancements

The RUS has undertaken analysis to consider improved connectivity in the Worcester area and has considered a number of potential infrastructure options. Some services currently terminate at Worcester Shrub Hill and are unable to serve Worcester Foregate Street which is closer to the city centre. The RUS has considered enhancements that would enable the current service frequency to be enhanced and to allow such services to serve Worcester Foregate Street. The emerging option is to remodel the junctions in the Worcester area together with signalling changes to provide improved headways and platform re-occupation times at Worcester Foregate Street. These enhancements would also help to cater for forecast and potential freight growth in this area, and also help to reduce journey times between Birmingham and Hereford.

The RUS strategy recommends that these options are considered as part of Worcester area signalling renewal plans which are scheduled between 2014 and 2022. In the short term, some interim measures are proposed for consideration including a turn back facility at Hereford, intermediate block signals and infrastructure improvements in the Malvern Wells area.

7.3.5 Freight

The RUS has assessed forecast freight growth, and considered the overall requirements for routing freight flows across all of the corridor routes within the RUS area. The analysis aimed to identify where any constraints may exist which are attributable to a limitation in the baseline infrastructure or as a result of a recommendation made in this RUS.

The key findings of this analysis are that freight growth can be accommodated up until 2019 on the baseline infrastructure and timetable, with the exception of the route up the Lickey Incline between Bromsgrove and Kings Norton. The gradient of the Lickey Incline presents an operating constraint for current freight services, and this constraint will be exacerbated following the extension of Cross City passenger services to Bromsgrove in CP4. Current analysis of forecast freight growth indicates that heavier and additional freight services cannot be accommodated on the Lickey Incline and an intervention will be needed in the medium term to address this.

7. Emerging strategy and longer-term vision

The RUS has considered the business case that has been developed by Centro to provide an alternative route for freight through the West Midlands via Worcester, Round Oak and Walsall. The business case developed shows that re-opening the Walsall to Round Oak freight line would provide high value for money and would accommodate forecast freight growth to 2019 and to 2030, offering diversionary opportunities and wider regeneration benefits. It has been identified that an opportunity may exist through the Droitwich Spa and Worcester area signalling renewal plans to carry out the infrastructure work required to enable the diversion of freight services via Worcester.

The RUS recommends that the scheme is considered for further development in CP5 and that the opportunities to enhance signalling headways in the Droitwich Spa and Worcester areas are considered during the development of the planned Droitwich Spa and Worcester area signalling renewals projects. It is recognised that additional infrastructure work will also be required at Abbotswood Junction (north of Ashchurch for Tewkesbury).

7.3.6 Birmingham New Street operational capacity

The RUS has analysed the operational impact of the emerging recommendations on each of the corridor routes at Birmingham New Street station to ensure that they can be accommodated. The analysis considered whether there is sufficient platform capacity at Birmingham New Street to accommodate the emerging RUS recommendations, taking into account the recommendations from other RUSs and all committed schemes which will also impact on platform capacity.

The committed schemes and recommendations included in this analysis are:

- additional Class 390 vehicles
- lengthening of Manchester to Bournemouth, Manchester to Bristol and Edinburgh to Plymouth long distance services
- acceleration of the Aberystwyth/Holyhead to Birmingham International services delivered through the Wolverhampton to Shrewsbury linespeed improvement
- diversion of long distance services between Newcastle and Reading to run via Birmingham International
- recommendation of an all day half-hourly service between Tamworth and Worcester, and the potential linking of the Walsall corridor and Coventry corridor services.

The analysis determined that, provided the service between Nottingham and Birmingham is interworked with the services between Stansted Airport/Leicester and Birmingham, there will be sufficient capacity at Birmingham New Street station to accommodate the recommendations made in this RUS.

It should be noted that the potential recommendations of the West Coast Main Line RUS were not included in this analysis as this can only be done once they are finalised. Other stakeholder aspirations and uncommitted schemes have also not been factored as they do not form established changes to the network. Further operational analysis may need to be carried out during the consultation period to assess the impact of the West Coast Main Line RUS recommendations and any additional committed changes to the network.

During the development of the RUS it has been evident that service perturbation within the West Midlands area and particularly through the central core of Birmingham New Street can have a critical impact on other areas of the rail network. During the consultation period performance modelling will be undertaken to assess the affects of the proposed RUS interventions on performance throughout the RUS area.

7.3.7 Strategy for Control Period 6 (2019–24) and beyond

The previous sections have outlined how the committed schemes and RUS recommendations will address the capacity requirements of the West Midlands and Chilterns RUS area up to 2019. In the longer term, the RUS recognises that a number of major developments are currently being considered to address future capacity requirements both within the RUS area, and nationally. These developments have the potential to significantly impact on the current capacity and capability of the network in a way that would influence the future strategy of the route.

7.3.8 Freight beyond 2019

Current analysis work indicates that forecast freight growth cannot be accommodated on the route between Kingsbury and Water Orton beyond 2019. In order to accommodate this predicted growth, the RUS recommends that the case be considered for four-aspect signalling to provide improved headways between Kingsbury and Water Orton and for infrastructure interventions to improve access to Kingsbury freight terminal. These interventions are proposed for consideration in CP5 to address performance-related issues on this line. The analysis of forecast freight growth indicates that these interventions would need to be in place to accommodate predicted freight requirements beyond 2019.

7.3.9 Electrification

The RUS notes the consideration given in the Network RUS: Electrification Strategy to future electrification schemes across the national rail network. The Electrification Strategy outlined a number of candidate electrification infill schemes within the West Midlands and Chilterns area to be taken forward for further analysis to evaluate their benefits and determine their affordability. The key

routes identified included between Oxley Junction and Bushbury Junction, Nuneaton to Proof House Junction, Whitacre to Kingsbury, and Walsall to Rugeley Trent Valley.

Electrification schemes which provide diversionary capability for services from other electrified routes improve maintenance accessibility, enabling operators to avoid the need for rail replacement buses and providing passengers with a continuous journey. The RUS supports further analysis to consider funding availability, affordability and rolling stock requirements for the key routes which have been identified.

The option analysis work assessed options to accommodate demand for rail in the Aldridge/Brownhills area. It concluded that the most favourable option for a new service would be an extension of the existing electric service between Birmingham New Street and Walsall. This would require the electrification of the line between Walsall and Aldridge. The West Midlands and Chilterns RUS supports the continued work to consider this option as part of the strategic aspiration to provide a new station at Aldridge.

7.3.10 Services between Yorkshire and Birmingham

The RUS notes the aspiration outlined in the Yorkshire and Humberside RUS for a third long distance high speed service between Yorkshire and Birmingham. If this service change was committed, infrastructure enhancements would be required within the RUS area to enable this, namely four-aspect signalling between Water Orton and Kingsbury and improved access at Kingsbury. These enhancements are also required to accommodate forecast freight growth in 2030 and therefore form part of the strategy for Control Period 6 presented in this RUS.

7.3.11 Camp Hill Chords

Centro has aspirations to introduce new stations and services to address wider transport requirements in the West Midlands. One option being developed is to connect the Camp Hill lines with Birmingham Moor Street, with new station proposals at Hazelwell, Kings Heath and Moseley.

The feasibility study undertaken has demonstrated that rail is the most viable solution to the current congestion issues on the A435 corridor into Birmingham, with a 20 minute frequency local service between Kings Norton and Birmingham Moor Street calling at the new stations. Timetable work has indicated that this service could work with forecast freight service requirements, but the re-opening of the route between Round Oak and Walsall for freight services would strongly benefit the

scheme. Infrastructure works at Kings Norton and a new terminal platform at Birmingham Moor Street would also be required in addition to the chord line south of Birmingham Moor Street station.

This project would create new routeing opportunities and additional capacity into central Birmingham. The Camp Hill chord lines would help to release capacity at Birmingham New Street by enabling services to be diverted into Birmingham Moor Street. This would also help to improve performance in the West Midlands.

The RUS recognises the work which has been undertaken by Centro and supports the continued development of this study as a future transport option to accommodate increasing demand for travel which cannot be served by current transport choices. The chord lines would offer an opportunity to divert some services away from Birmingham New Street and into Birmingham Moor Street which would deliver train service reliability and performance benefits.

7.3.12 High Speed 2 Limited

Although not yet a committed scheme, a new High Speed Line is Government policy. In 2008 Network Rail commissioned a study to consider the case for a new rail line in the UK. The study found a strong case to take forward a self-contained high speed line from London to Birmingham, Manchester and Scotland, including a link via the East Midlands to Leeds.

HS2 Ltd was set up by the Government in 2009 to further consider the case for creating a new high speed rail line between London and the West Midlands, and the potential for high speed rail services linking London, East Midlands, northern England and Scotland. HS2 Ltd issued a report in 2009 which recommended a route between London and the West Midlands. Since that report and the establishment of a new Government, HS2 Ltd was asked to carry out further work to consider connecting the West Midlands, East Midlands, Manchester and Leeds. This is now the preferred network option, and further work will be undertaken in 2011 to refine the 'Y' shaped high speed rail network with separate legs from the West Midlands to Manchester and to Leeds.

The rail network in the RUS area would be significantly affected by the construction of the new high speed line. In addition to the journey time benefits delivered, the introduction of services on a high speed line would create additional capacity on the current rail network. A comprehensive consideration of how this additional capacity might be used in the West Midlands, and elsewhere, will be required when the current HS2 Ltd plans are implemented.

8. Stakeholder consultation

8.1 Purpose

Consultation with stakeholders within and outside the rail industry is essential to the successful development of a Route Utilisation Strategy (RUS). Close involvement of stakeholders helps to make sure that: knowledge and experience is maximised and shared, the correct gaps are identified, the widest range of options is considered, and the most appropriate solutions recommended. It is an industry approach to a long-term strategy.

According to the Office of Rail Regulation (ORR) guidelines on RUSs:

“Network Rail should develop a Draft RUS in conjunction with relevant stakeholders. It should then publish this Draft RUS, specifying a reasonable consultation period within which representations may be made. Having taken account of any representations received, Network Rail should publish and provide to ORR the RUS it proposes to establish, together with any representations.”

ORR Guidelines on Route Utilisation Strategies
April 2009

8.2 Process

In order to fulfil Network Rail's obligation in an effective and consistent manner, two consultative groups were established for the West Midlands and Chilterns RUS:

- Industry Stakeholder Management Group (SMG)
- Wider Stakeholder Group (WSG).

The SMG consists of representatives from passenger and freight train operators, Association of Train Operators, Department for Transport, Transport for London, Passenger Focus and London Travelwatch, and the ORR (as an observer).

This group acts as a steering group for the RUS, meeting on a regular basis throughout the process as required. The group reviews progress and discusses the way forward. Detailed analysis is completed through subgroups which are established to focus and discuss specific issues such as passenger demand and option generation and appraisal with the relevant representatives, presenting back the findings to the SMG.

The SMG has formally agreed the gaps, options and strategy presented within this document, and SMG members have been fully involved in its drafting.

The WSG is a larger group containing representatives from:

- regional transport partnerships
- local authorities
- rail user groups.

This group exists so that stakeholders beyond the rail industry have the opportunity to contribute to the RUS and that they are briefed and prepared to make best use of the formal consultation period.

A WSG briefing will take place in conjunction with the publication of this draft document where the draft strategy, recommendations and other findings will be briefed enabling wider stakeholders to contribute to the final strategy. A further WSG briefing will be convened for the final publication of the West Midlands and Chilterns RUS.

8.3 How you can contribute

On behalf of the West Midlands and Chilterns RUS SMG, Network Rail welcomes contributions to assist in developing this RUS. Specific consultation questions have not been set as we would appreciate comments on the content of the document as a whole.

This RUS will have a formal consultation period of 12 weeks. The deadline for receiving responses is therefore 4 February 2011.

However, earlier responses would be appreciated in order to maximise the time available to consider and respond in the final RUS.

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

westmidlandsandchilternsrus@networkrail.co.uk

West Midlands and Chilterns RUS Consultation Response
RUS Programme Manager
Network Rail
Floor 4, Kings Place
90 York Way
London
N1 9AG

Please note that all consultation responses will be published on our website.

Appendix A

This appendix shows the results of the performance analysis undertaken on a sample period (Period 13, 2007/08) for the RUS baseline exercise.

The **delay codes** are outlined to show the way in which primary delay is categorised. These delay codes are referenced in the maps and charts to show the main reasons for delay on each corridor.

The **matrix** provides a breakdown in delay minutes of corridor contained delay, imported delay from other corridors and reactionary delay exported to other corridors and outside of the RUS area. For example, the Aylesbury corridor has 1,121 minutes of corridor contained delay, and exported 211 minutes of reactionary delay to the Leamington Spa and Chiltern corridor, and 160 minutes outside of the RUS area. It also imported 345 minutes from the Leamington Spa and Chiltern corridor and small

amounts from the Stratford-upon-Avon, Stourbridge and Derby, Nuneaton and Camp Hill corridors.

The analysis shown in the **charts and maps** is broken down by corridor to show the overall corridor contained delay (primary delay and reactionary delay contained within a corridor), the resulting reactionary delay transported to other corridors and the main reasons for the delay.

The **corridor comparison chart** provides a summary of the total delay that was experienced during Period 13, 2007/08 across the RUS area. The orange bar shows the corridor contained delay, the purple bar shows the reactionary delay created by the corridor and exported to other corridors, and the green bar shows the total delay on a corridor which includes the corridor contained delay and the reactionary delay which it imported from other corridors.

Delay codes		
Category	KPI Category Name	JPIP Category
101	Points failures.	Points, signalling and Other Assets.
102	Problems with trackside signs including TSR boards.	Network Management/Other.
103	Level crossing failures.	Points, signalling and Other Assets.
104A	TSR's Due to Condition of Track.	Track.
104B	Track faults (including broken rails).	Track.
104C	Gauge Corner Cracking.	Track.
104D	Reactionary delay to P-coded TSRs.	Track.
105	Civil Engineering structures, earthworks & buildings.	Severe weather/Autumn & Structures.
106	Other infrastructure.	Network Management/Other.
106A	Track Patrols & related possessions.	Network Management/Other.
107A	Possession over-run and related faults.	Network Management/Other.
107B	Possession work left incomplete.	Network Management/Other.
108	Mishap – infrastructure causes.	Network Management/Other.
109	Animals on line.	Points, signalling and Other Assets.
110A	Severe weather (beyond design capability of infrastructure).	Severe weather/Autumn & Structures.
110B	Other weather (impact on infrastructure or network operation).	Severe weather/Autumn & Structures.
111A	Wheel slip due to leaf fall.	Severe weather/Autumn & Structures.
111B	Vegetation Management failure.	Network Management/Other.
112	Fires starting on Network Rail infrastructure.	External.
150	Low adhesion inc. Autumn (Network Rail).	Severe weather/Autumn & Structures.
201	OLE/Third rail faults.	Points, signalling and Other Assets.
301A	Signal failures.	Points, signalling and Other Assets.
301B	Track Circuit failures.	Points, signalling and Other Assets.
302A	Signalling System & Power Supply failures.	Points, signalling and Other Assets.
302B	Other signal equipment failures.	Points, signalling and Other Assets.
303	Telecoms failures.	Points, signalling and Other Assets.
304	Cable faults (signalling & comms).	Points, signalling and Other Assets.
304A	Change of Aspects – NFF.	Points, signalling and Other Assets.
305	Track circuit failures – leaf fall.	Severe weather/Autumn & Structures.
401	Bridge strikes.	External.
402	External infrastructure damage – Vandalism/Theft.	External.
403	External level crossing/road incidents (not bridges).	External.
501A	Network Rail Operations – signalling.	Network Management/Other.
501B	Network Rail Operations – control.	Network Management/Other.
501C	Network Rail Operations – railhead conditioning trains.	Network Management/Other.
501D	Network Rail Operations – other.	Network Management/Other.
502A	Operational Planning.	Network Management/Other.
502C	Network Rail commercial takeback/other.	Network Management/Other.
503	External fatalities and trespass.	External.
504	External police on line/security alerts.	External.
505	External fires.	External.
506	External other.	External.
601	All Z codes – Unexplained.	Network Management/Other.
701A	Non-technical Fleet delays.	Fleet.
701B	Train Operations.	Operations.
701C	Traincrew causes.	Traincrew.
701D	Technical Fleet delays.	Fleet.
701E	Station delays.	Stations.
701F	External causes (Train Operator).	TOC Other.
701G	Freight Terminal/Yard delays.	TOC Other.
750	Low Adhesion inc. Autumn (Train Operator).	TOC Other.

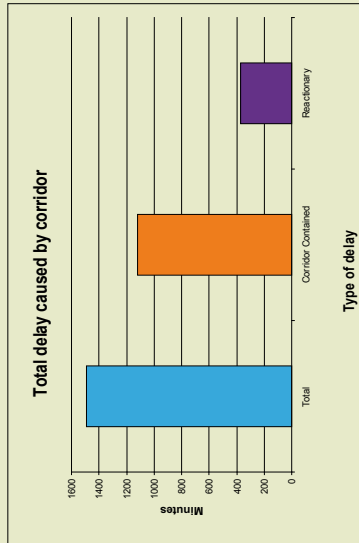
Performance Matrix – Period 13 2008		CORRIDOR IMPACT															
	Aylesbury	Leamington Spa & Nuneaton	Coventry	Cross City	Derby, Nuneaton & Camp Hill	Leamington Spa & Chiltern	Shrewsbury	Stafford & Wolverhampton	Stourbridge	Stratford-upon-Avon	Sutton Park Line	Walsall & Cannock	West Midlands Orbital	Birmingham New Street	Outside of Area	Total Delay	
	1121	0	0	0	0	211	0	0	0	0	0	0	0	0	160	1492	
	0	752	97	9	140	53	0	0	0	0	0	0	0	21	207	1279	
	0	137	8753	585	370	392	148	2595	70	0	15	2496	0	1657	4116	21344	
	0	13	209	3956	91	64	4	108	123	0	0	151	0	408	383	5510	
	2	531	559	511	21644	1260	0	109	55	4	47	295	0	520	4940	30477	
	345	116	661	224	1002	18087	64	207	1375	846	0	179	0	663	2134	25903	
	0	8	86	9	0	18	1583	277	0	0	0	291	0	177	405	2854	
	0	26	1013	355	283	274	227	4711	75	21	8	871	0	755	1246	9865	
	3	3	5	104	54	1234	0	22	3695	420	0	6	0	59	170	5775	
	3	0	6	9	0	751	0	0	311	707	0	0	0	3	25	1815	
	0	0	0	3	3	0	0	0	0	0	274	237	0	12	58	587	
	0	15	975	329	1949	132	79	896	107	7	210	14699	0	1088	3788	24274	
	0	0	0	3	0	6	0	0	0	432	0	0	0	0	237	1396	
	0	22	565	1089	358	210	99	446	88	10	0	296	0	2752	1183	7118	
1474 1623 12929 7186 25894 22692 2204 9371 6331 2015 554 19521 718 8115 19052																	
DELAY CORRIDOR																	

Corridors comparison P13 2007/8 – summary

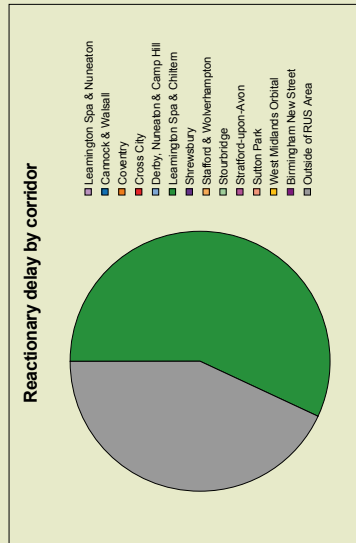


Delay by corridor: Aylesbury

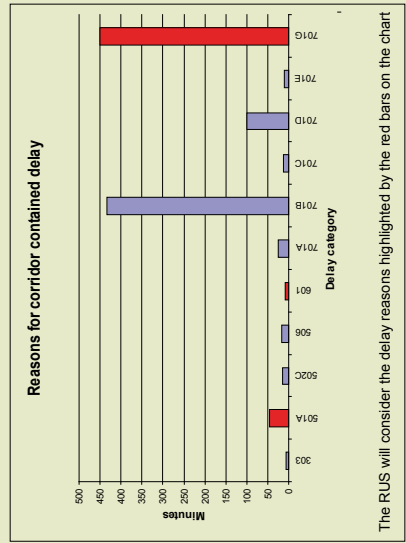
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3.

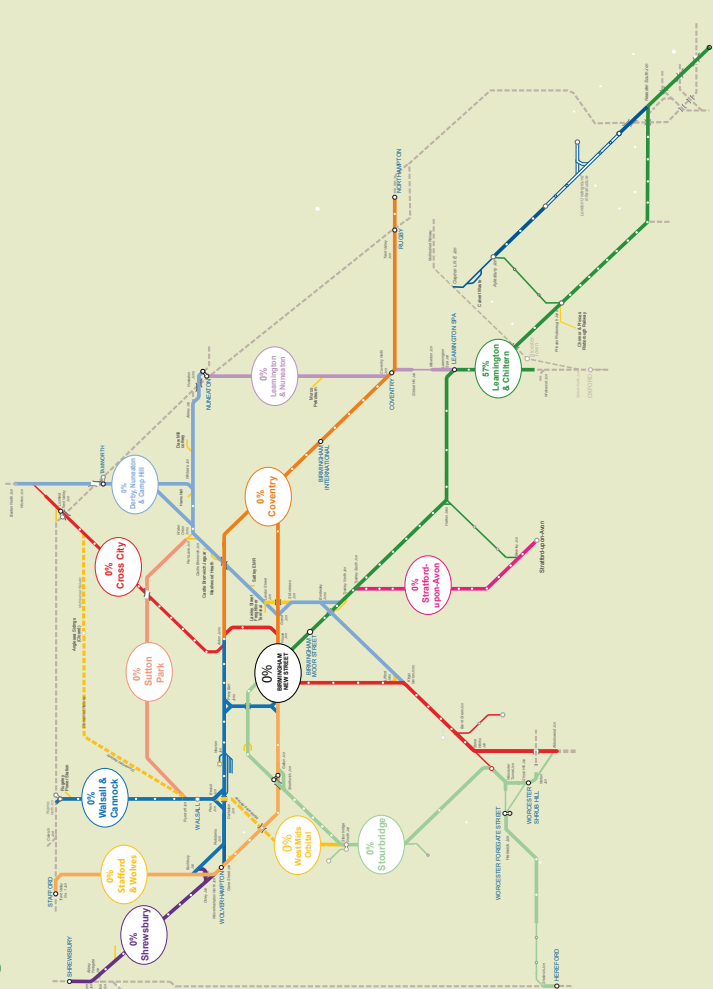


4.



The RUS will consider the delay reasons highlighted by the red bars on the chart

1.



Performance

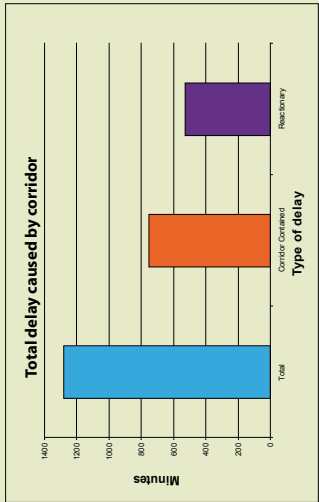
1. Schematic map – overview of delay caused by the Aylesbury corridor, including percentage of reaction delay on other corridors
2. Bar chart – total minutes delay broken down into corridor contained and reactionary
3. Bar chart – breakdown of reactionary delay (by corridor)
4. Bar chart – reasons for corridor contained delay

Notes:

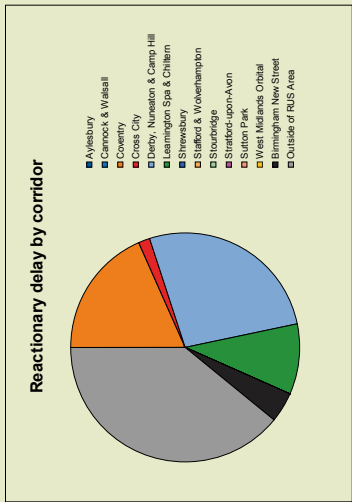
Of the total reactionary delay on this corridor, 43 per cent impacted outside of the RUS area. Information based on period 13 2008 data supplied by Network Rail Performance team. Corridor contained delay includes primary delay and self-contained reactionary delay on the corridor.

Delay by corridor: Leamington Spa and Nuneaton

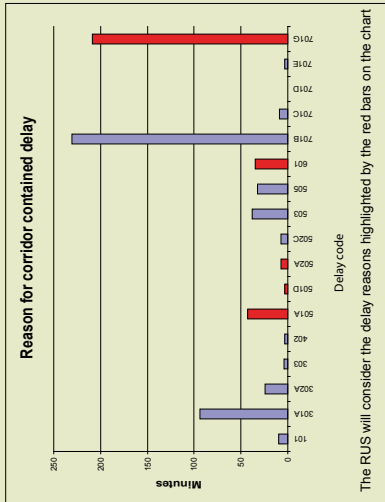
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3.

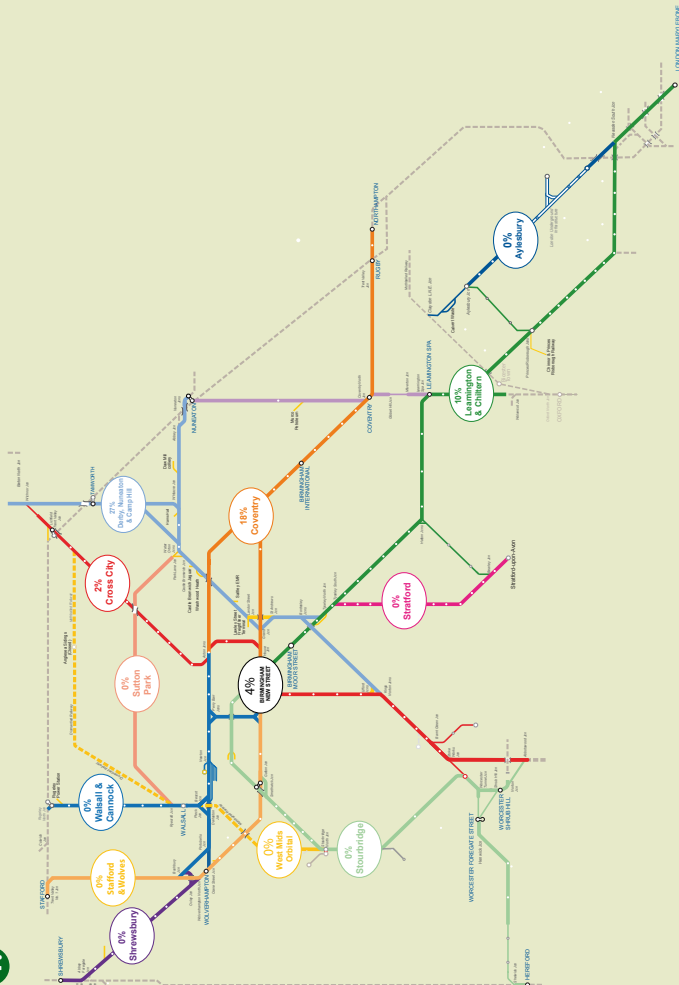


4.



The RUS will consider the delay reasons highlighted by the red bars on the chart

1.



Performance

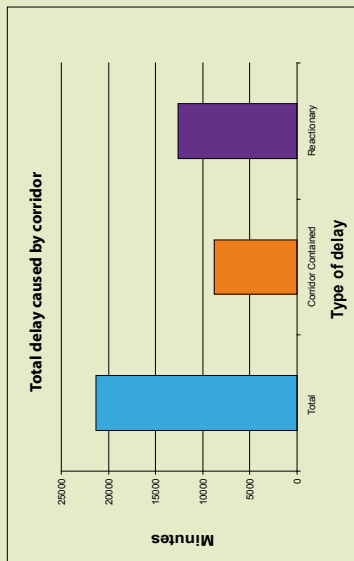
1. Schematic map – overview of delay caused by the Leamington Spa and Nuneaton corridor, including percentage of reactionary delay on other corridors
2. Bar chart – total minutes delay broken down into corridor contained and reactionary
3. Pie chart – breakdown of reactionary delay (by corridor)
4. Bar chart – reasons for corridor contained delay

Notes:

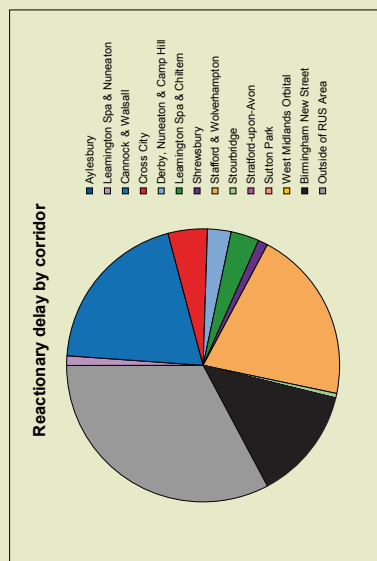
Of the total reactionary delay on this corridor, 39 per cent impacted outside of the RUS area. Information based on period 13 2008 data supplied by Network Rail Performance team. Corridor contained delay includes primary delay and self-contained reactionary delay on the corridor.

Delay by corridor: Coventry

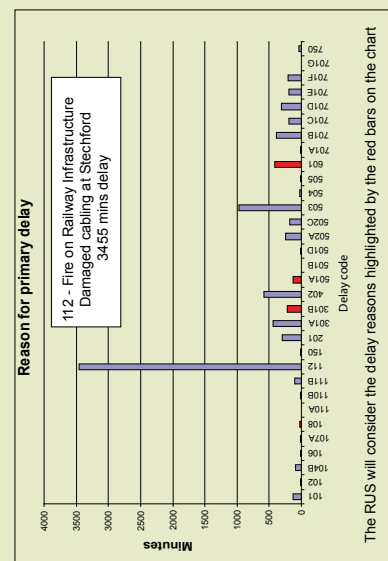
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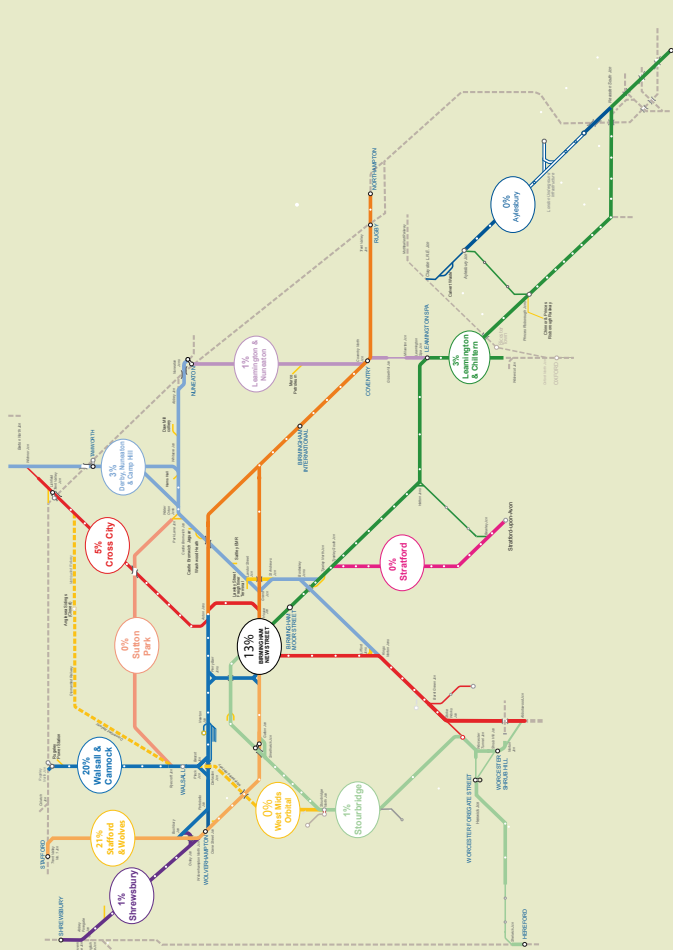


4.



The RUS will consider the delay reasons highlighted by the red bars on the chart

1.



Performance

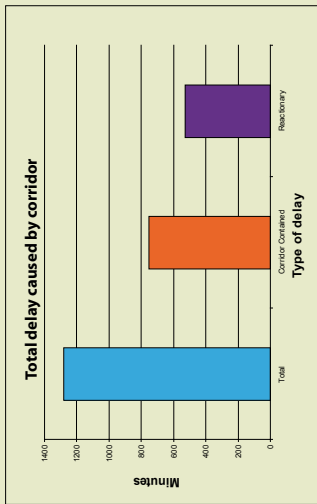
1. Schematic map – overview of delay caused by the Coventry corridor, including percentage of reactionary delay on other corridors
2. Bar chart – total minutes delay broken down into corridor contained and reactionary
3. Pie chart – breakdown of reactionary delay (by corridor)
4. Bar chart – reasons for corridor contained delay

Notes:

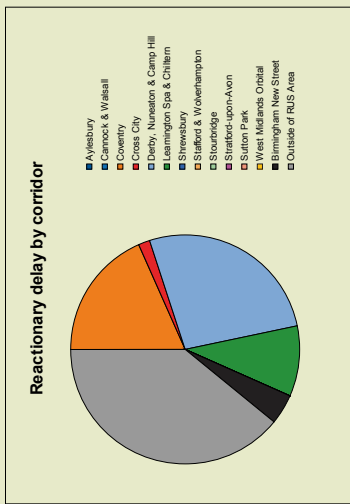
Of the total reactionary delay on this corridor, 33 per cent impacted outside of the RUS area. Information based on period 13 2008 data supplied by Network Rail Performance team. Corridor contained delay includes primary delay and self-contained reactionary delay on the corridor.

Delay by corridor: Cross City and Lickey Incline

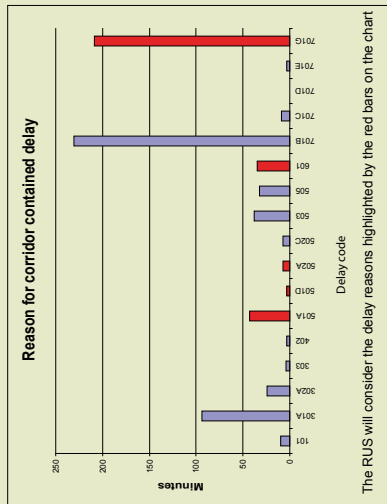
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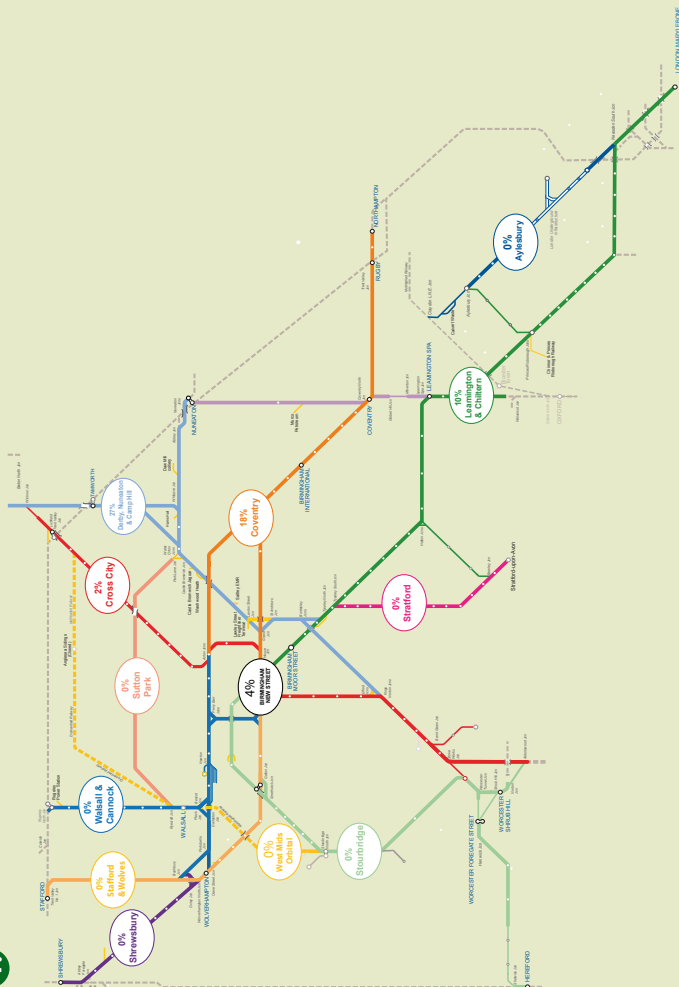


4.



The RUS will consider the delay reasons highlighted by the red bars on the chart

1.

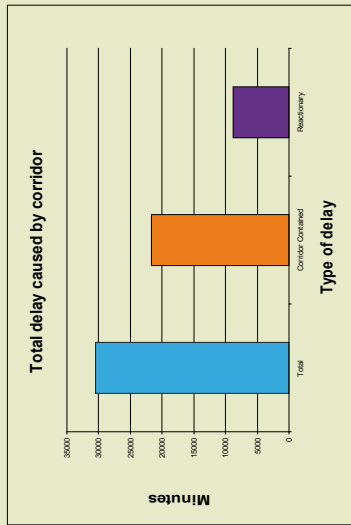


Performance

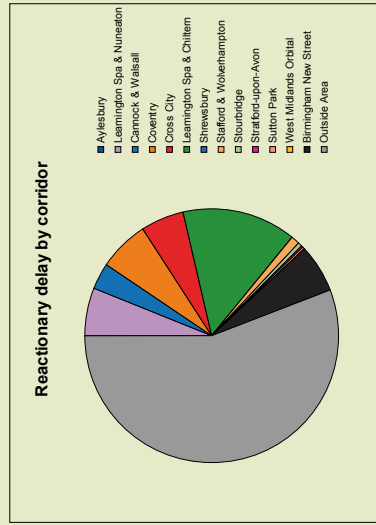
1. Schematic map – overview of delay caused by the Cross City corridor, including percentage of reactionary delay on other corridors
 2. Bar chart – total minutes delay broken down into corridor contained and reactionary
 3. Pie chart – breakdown of reactionary delay (by corridor)
 4. Bar chart – reasons for corridor contained delay
- Notes:
Of the total reactionary delay on this corridor, 25 per cent impacted outside of the RUS area.
Information based on period 13 2008 data supplied by Network Rail Performance team.
Corridor contained delay includes primary delay and self-contained reactionary delay on the corridor.

Delay by corridor: Derby, Nuneaton and Camp Hill

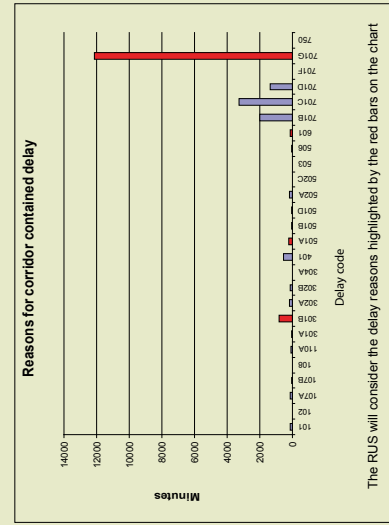
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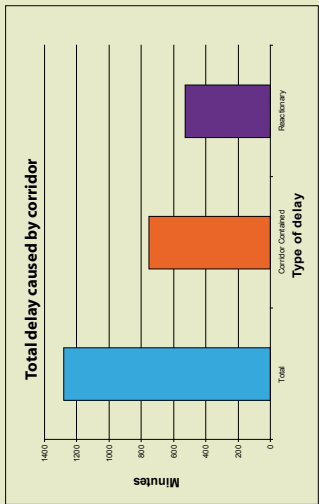


4.

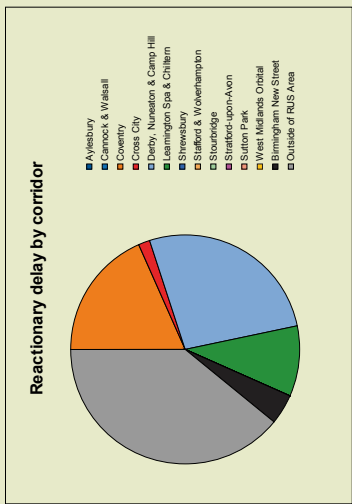


Delay by corridor: Leamington Spa and Chiltern

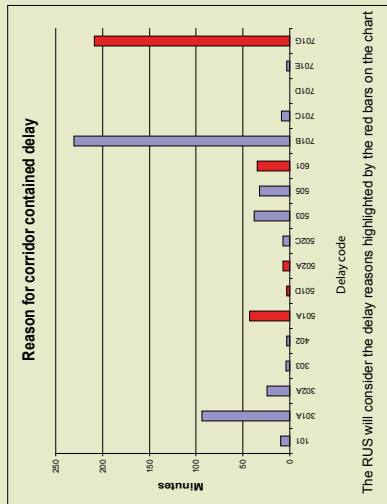
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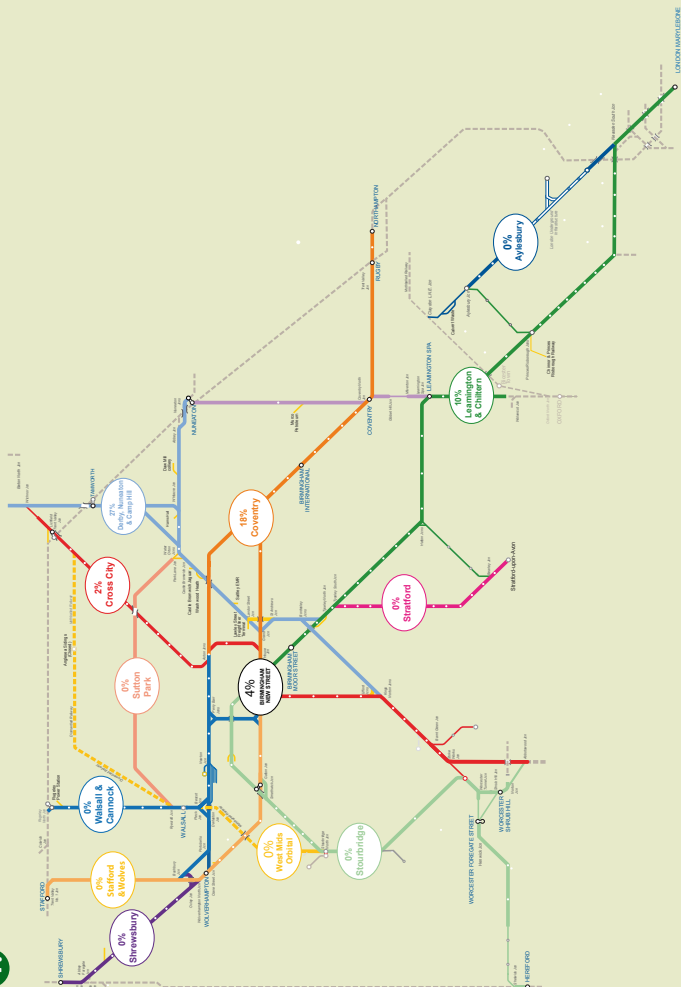


4.



The RUS will consider the delay reasons highlighted by the red bars on the chart

1.

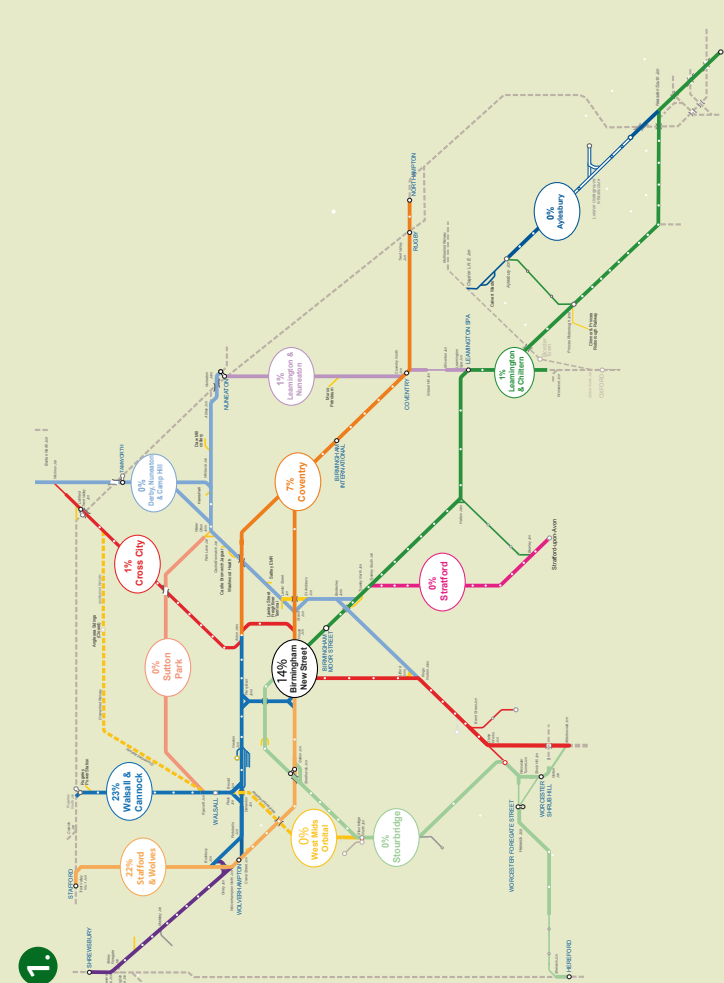
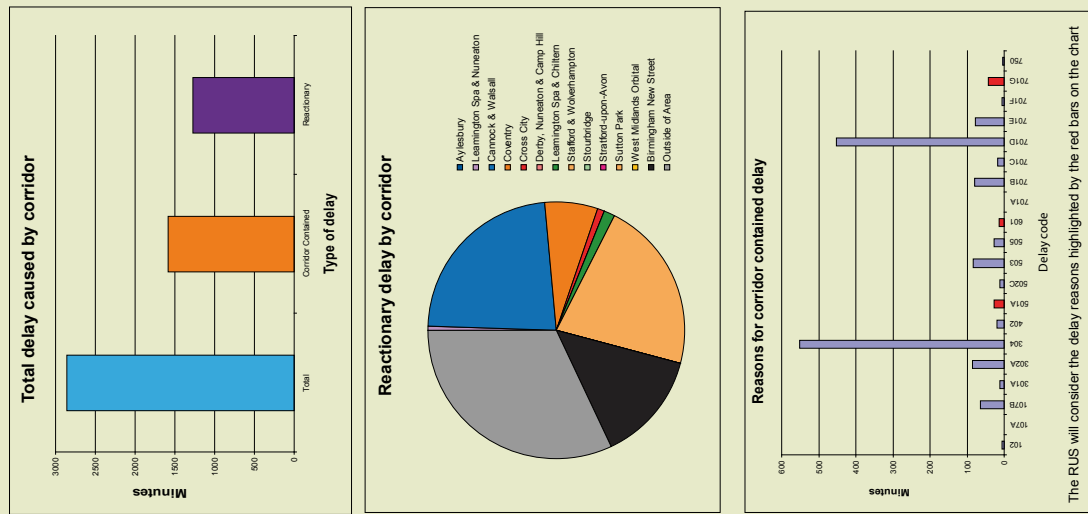


Performance

1. Schematic map – overview of delay caused by the Leamington Spa & Chiltern corridor, including percentage of reactionary delay on other corridors
2. Bar chart – total minutes delay broken down into corridor contained and reactionary
3. Pie chart – breakdown of reactionary delay (by corridor)
4. Bar chart – reasons for corridor contained delay

Notes:
Of the total reactionary delay on this corridor, 27 per cent impacted outside of the RUS area.
Information based on period 13 2008 data supplied by Network Rail Performance team.
Corridor contained delay includes primary delay and self-contained reactionary delay on the corridor.

Delay by corridor: Shrewsbury



Performance

1. Schematic map – overview of delay caused by the Leamington Spa & Chiltern corridor, including percentage of reactionary delay on other corridors
2. Bar chart – total minutes delay broken down into corridor contained and reactionary
3. Pie chart – breakdown of reactionary delay (by corridor)
4. Bar chart – reasons for corridor contained delay

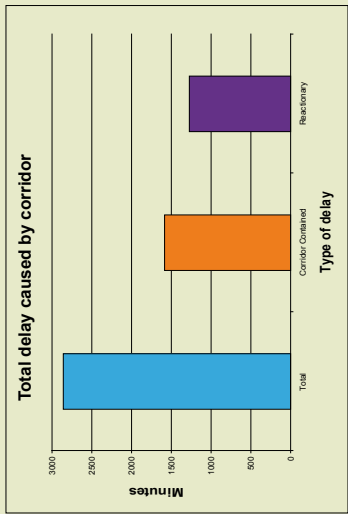
Notes:

Off the total reactionary delay on this corridor, 27 per cent impacted outside of the RUS area. Information based on period 13 2008 data supplied by Network Rail Performance team.

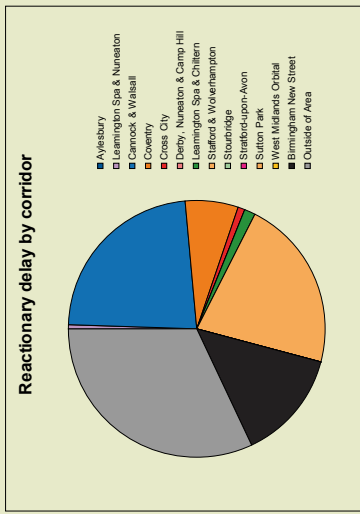
Corridor contained delay includes primary delay and self-contained reactionary delay on the corridor.

Delay by corridor: Stafford and Wolverhampton

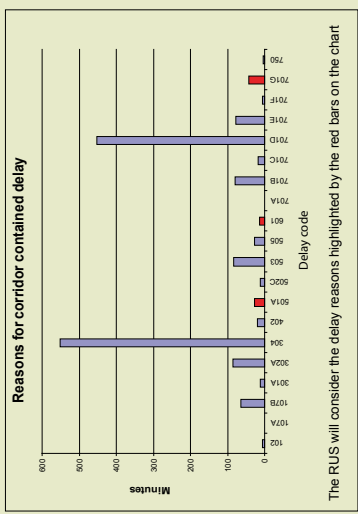
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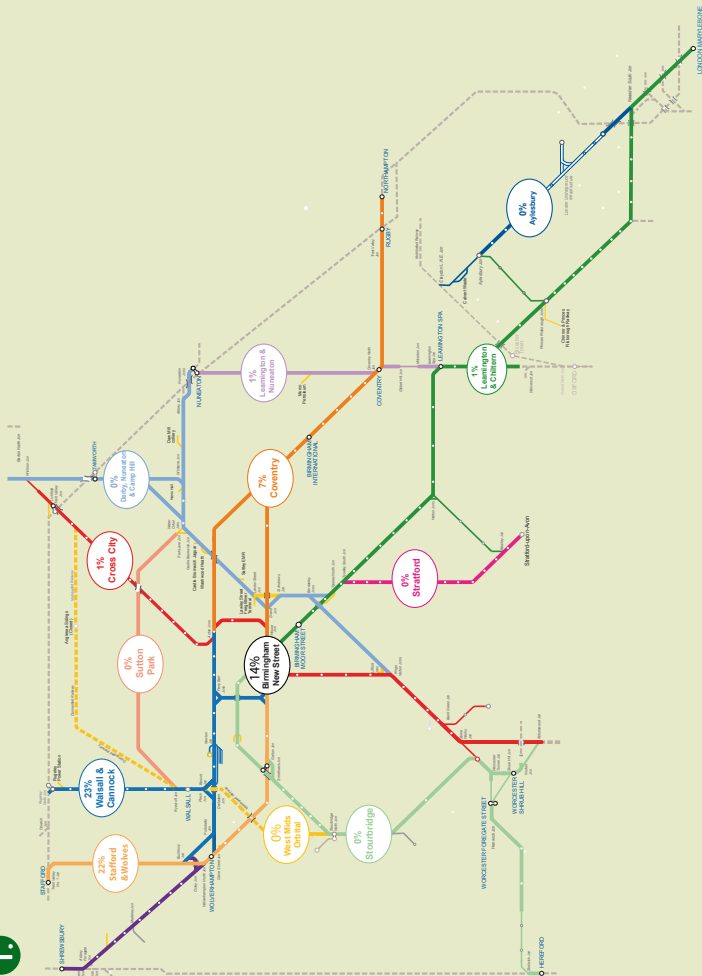


4.



The RUS will consider the delay reasons highlighted by the red bars on the chart

1.



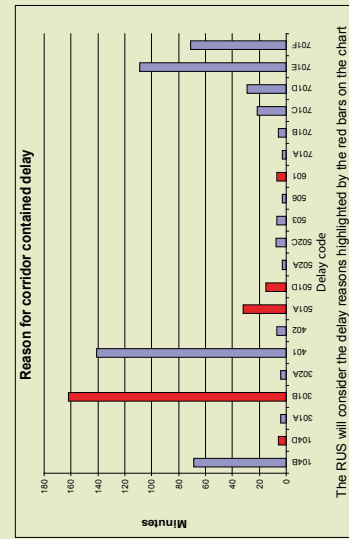
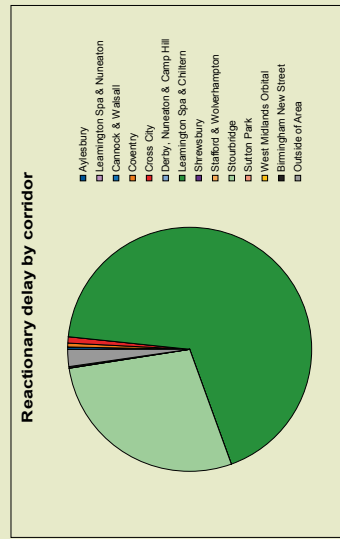
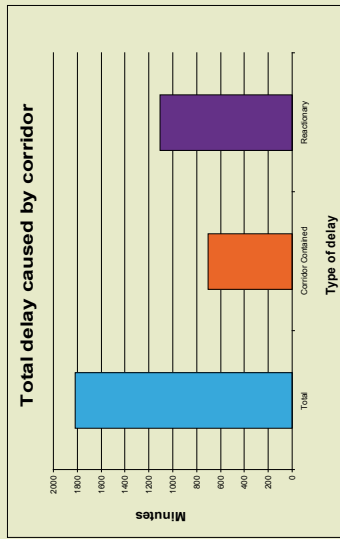
Performance

1. Schematic map – overview of delay caused by the Stafford & Wolverhampton corridor, including percentage of reactionary delay on other corridors
2. Bar chart – total minutes delay broken down into corridor contained and reactionary
3. Pie chart – breakdown of reactionary delay (by corridor)
4. Bar chart – reasons for corridor contained delay

Notes:

Of the total reactionary delay on this corridor, 24 per cent impacted outside of the RUS area. Information based on period 13 2008 data supplied by Network Rail Performance team. Corridor contained delay includes primary delay and self-contained reactionary delay on the corridor.

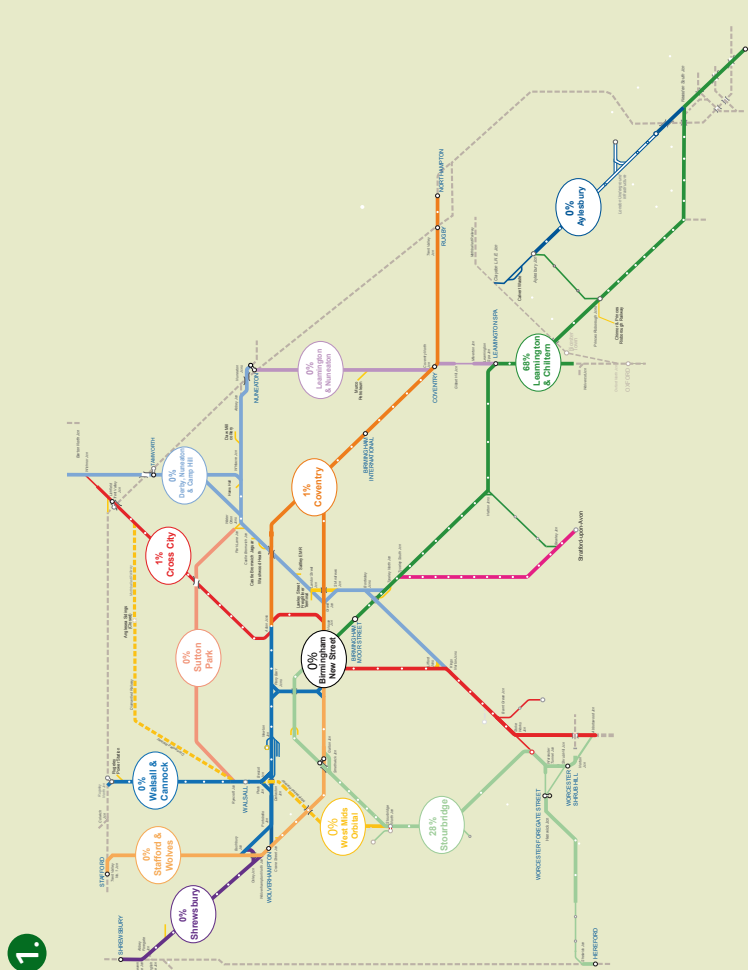
Delay by corridor: Stratford-upon-Avon



2.

3.

4.



1.

Performance

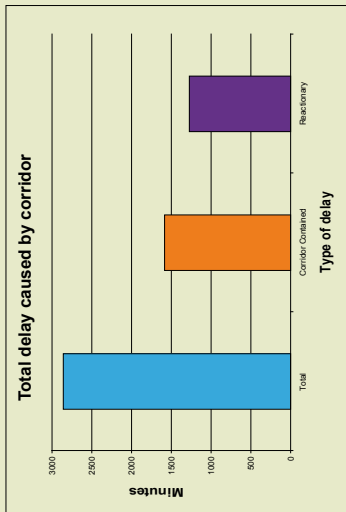
1. Schematic map – overview of delay caused by the Stratford corridor, including percentage of reactionary delay on other corridors
2. Bar chart – total minutes delay broken down into corridor contained and reactionary
3. Pie chart – breakdown of reactionary delay (by corridor)
4. Bar chart – reasons for corridor contained delay

Notes:

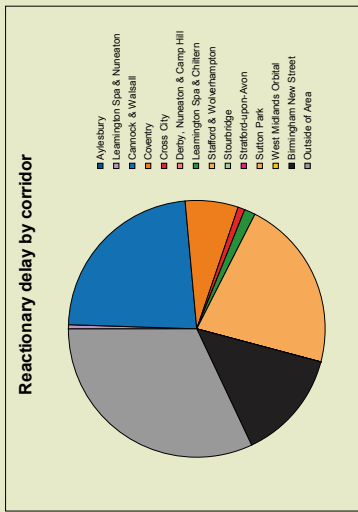
Of the total reactionary delay on this corridor, 2 per cent impacted outside of the RUS rea. Information based on period 13 2008 data supplied by Network Rail Performance team. Corridor contained delay includes primary delay and self-contained reactionary delay on the corridor.

Delay by corridor: Cannock and Walsall Lines

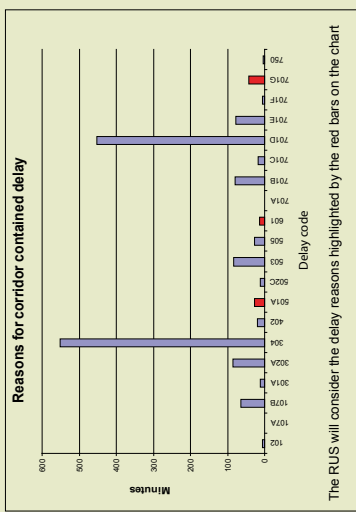
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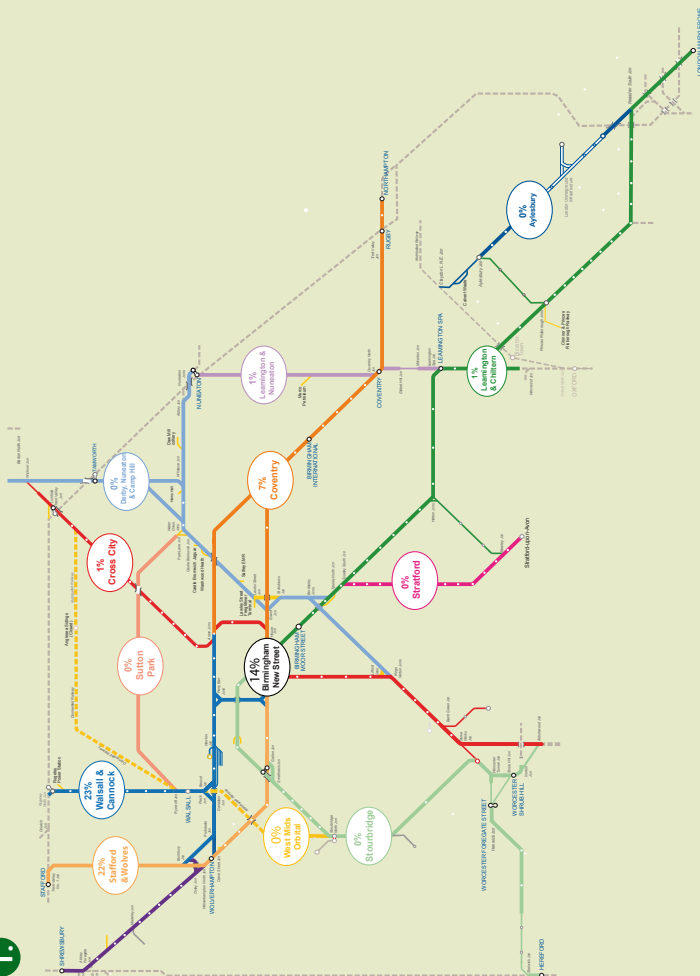


4.



The RUS will consider the delay reasons highlighted by the red bars on the chart

1.



Performance

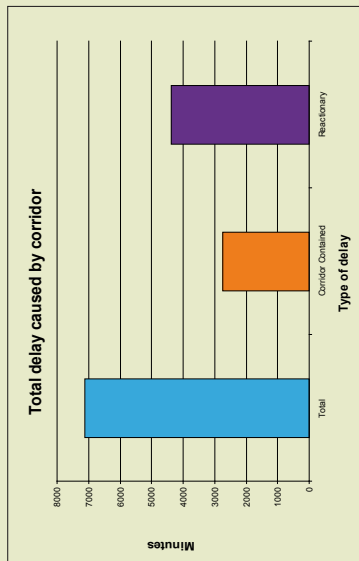
1. Schematic map – overview of delay caused by the Cannock & Walsall corridor, including percentage of reactionary delay on other corridors
2. Bar chart – total minutes delay broken down into primary and reactionary
3. Pie chart – breakdown of reactionary delay (by corridor)
4. Bar chart – reasons for corridor contained delay

Notes:

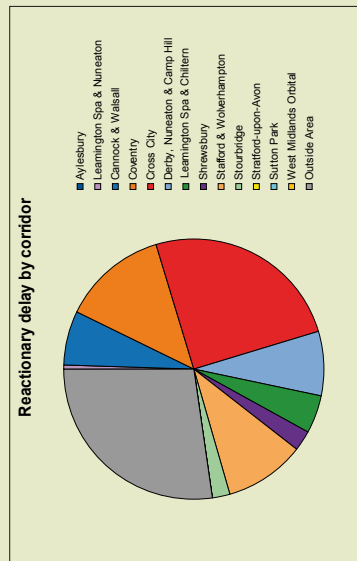
Of the total reactionary delay on this corridor, 40 per cent impacted outside of RUS area. Information based on period 13 2008 data supplied by Network Rail Performance team. Corridor contained delay includes primary delay and self-contained reactionary delay on the corridor.

Delay by corridor: Birmingham New Street

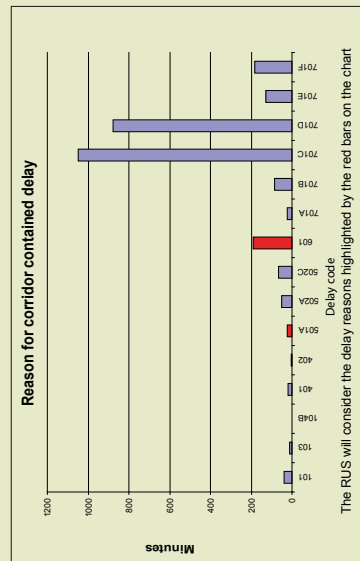
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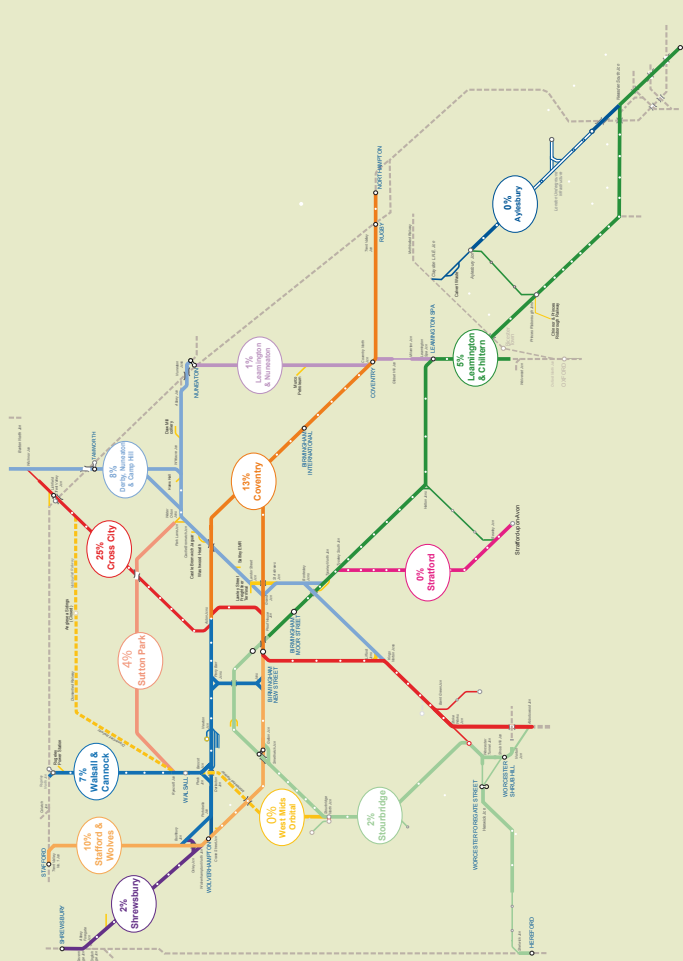
3.



4.



1.



Performance

1. Schematic map – overview of delay caused by Birmingham New Street, including percentage of reactionary delay on other corridors
2. Bar chart – total minutes delay broken down into corridor contained and reactionary
3. Pie chart – breakdown of reactionary delay (by corridor)
4. Bar chart – reasons for corridor contained delay

Notes:

Of the total reactionary delay on this corridor, 27 per cent impacted outside of the RUS area. Information based on period 13 2008 data supplied by Network Rail Performance team. Corridor contained delay includes primary delay and self contained reactionary delay on the corridor.

Appendix B

This appendix provides a list of station facilities at the stations located within the West Midlands and Chilterns RUS area and highlights the integration with other modes of transport.

Station	No of car park spaces	Disabled car park spaces	Car park operator	Disabled access to platforms	Transport Interchange					
					Taxi	Bus	Cycle (storage numbers where known)	Metro	Airport	London Underground
Acoccks Green	132	Y	Network West Midlands	N	N	Y	9	N	N	N
Adderley Park	-	-	-	N	N	N	2	N	N	N
Albrighton	-	-	-	Partial	N	N	0	N	N	N
Alvechurch	50		Meteor Parking Ltd	Partial	N	N	0	N	N	N
Amersham	700	Y	Local Authority	Partial	N	Y	56	N	Y	Y
Aston	-	-	-	Partial	N	N	0	N	N	N
Aylesbury	302	Y	Vinci Parking Ltd	Y	Y	Y	40	N	N	N
Aylesbury Vale Parkway	501	Y	Chiltern Railways	Y	Y	Y	40	N	N	N
Banbury	720	Y	Chiltern Railways	Y	Y	Y	60	N	N	N
Barnt Green	60	N	Meteor Parking Ltd	Partial	N	N	8	N	N	N
Bearley	-	-	-	Y	N	N	0	N	N	N
Beaconsfield	696	Y	Chiltern Railways	Y	Y	Y	26	N	N	N
Bedworth	23	-	Local Authority	Y	N	N	0	N	N	N
Berkswell	83	Y	Network West Midlands	Y	N	N	10 *	N	N	N
Bescot Stadium	122	Y	Network West Midlands	N	N	N	2	N	N	N
Bicester North	575	N	Chiltern Railways	Partial	Y	Y	40	N	N	N
Bilbrook	-	-	-	Y	N	N	0	N	N	N
Birmingham International	2225	Y	Virgin Trains	Y	Y	Y	35	N	Y	N
Birmingham New Street	40	N	APCOA Parking (UK) Limited	Y	Y		12			N
Birmingham Moor Street	-	-	-	Y	N	Y	28	N	N	N
Birmingham Snow Hill	800	Y	Local Authority	Y	Y	Y	12 *	Y	N	N
Blake Street	155	Y	Network West Midlands	Y	N	N	12	N	N	N
Blakedown	10	N	London Midland	Y	N	N	0	N	N	N
Bloxwich	-	-	-	Y	N	N	0	N	N	N
Bloxwich North	26	Y	Network West Midlands	Y	N	N	0	N	N	N
Bordesley	-	-	-	N	N	N	0	N	N	N
Bournville	-	-	-	Partial	N	Y	2 *	N	N	N
Bromsgrove	83	Y	Local Authority	Partial	N	N	8	N	N	N
Butlers Lane	-	-	-	N	N	N	2	N	N	N
Canley	94	Y	Network West Midlands	Partial	N	N	5 *	N	N	N
Cannock	86	Y	Local Authority	Partial	Y	Y	6	N	N	N
Chalfont and Latimer	361	Y	NCP Ltd	Y	Y	Y	7	N	Y	Y
Chester Road	150	Y	Network West Midlands	Y	N	N	7	N	N	N
Chorleywood	238	Y	NCP Ltd	Y	Y	Y	0	N	Y	Y
Claverdon	-	-	-	Y	N	N	0	N	N	N
Codsall	-	-	-	Partial	N	N	0	N	N	N
Coleshill Parkway	240	Y	Meteor Parking Ltd	Y	N	Y	20	N	N	N

Appendices

Station	No of car park spaces	Disabled car park spaces	Car park operator	Disabled access to platforms	Transport Interchange					
					Taxi	Bus	Cycle (storage numbers where known)	Metro	Airport	London Underground
Colwall	20	N		Y	N	N	0	N	N	N
Coseley	243	Y	Network West Midlands	Y	N	Y	7	N	N	N
Cosford	-	-	-	N	N	N	0	N	N	N
Coventry	798	Y	Virgin Trains	Y	Y	Y	34	N	N	N
Cradley Heath	243	Y	Network West Midlands	Y	N	Y	8 *	N	N	N
Danzey	50	Y	London Midland	Partial	N	N	0	N	N	N
Denham	162	Y	Chiltern Railways	Y	Y	Y	5	N	N	N
Denham Golf Club	-	-	-	Y	N	N	2	N	N	N
Dorridge	NWM - 93	Y	Network West Midlands	Y	N	N	23	N	N	N
	Chiltern – 121	Y	Chiltern Railways							
Droitwich Spa	105	N	APCOA Parking (UK) Limited	Partial	N	N	9	N	N	N
Duddeston	-	-	-	Y	N	Y	0	N	N	N
Dudley Port	36	Y	Network West Midlands	N	N	N	2 *	N	N	N
Earlswood	12	N	Network West Midlands	Y	N	N	0	N	N	N
Erdington	-	-	-	Y	N	N	2	N	N	N
Five Ways	-	-	-	Y	N	N	0	N	N	N
Four Oaks	275	Y	Network West Midlands	Y	N	N	20	N	N	N
Gerrards Cross	462	Y	Chiltern Railways	Partial	Y	Y	30	N	N	N
Great Missenden	407	Y	Vinci Parking Ltd	Y	Y	Y	20	N	N	N
Gravelly Hill	-	-	-	Y	N	N	1	N	N	N
Great Malvern	122	Y	Meteor Parking Ltd	Y	Y	N	14	N	N	N
Haddenham and Thame Parkway	488	Y	Chiltern Railways	Y	Y	Y	45	N	N	N
Hagley	33	N	Meteor Parking Ltd	Partial	N	N	6	N	N	N
Hall Green	105	Y	Network West Midlands	Y	N	N	3 *	N	N	N
Hampton in Arden	68	Y	Network West Midlands	Partial	N	Y	8	N	N	N
Hamstead	-	-	-	Partial	N	N	0	N	N	N
Harrow on the Hill	89	N	NCP Ltd	N	N	Y	Y	N	Y	Y
Hartlebury	20	N	Meteor Parking Ltd	Y	N	N	0	N	N	N
Hatton	18	Y	Chiltern Railways	Partial	N	N	12	N	N	N
Hednesford	58	Y	Local Authority	Partial	N	Y	0	N	N	N
Henley in Arden	20	N	London Midland	Partial	N	N	0	N	N	N
Hereford	175	Y	NCP Ltd	Partial	Y	Y	12	N	N	N
Heyford	28	N	APCOA Parking (UK) Limited	Partial	N	N	20	N	N	N
High Wycombe	340	Y	Chiltern Railways	Y	Y	Y	38	N	N	N

Station	No of car park spaces	Disabled car park spaces	Car park operator	Disabled access to platforms	Transport Interchange					
					Taxi	Bus	Cycle (storage numbers where known)	Metro	Airport	London Underground
Jewellery Quarter	-	-	-	Y	N	N	5	N	N	N
Kidderminster	224	Y	Meteor Parking Ltd	Partial	Y	Y	48	N	N	N
Kings Norton	105	Y	Network West Midlands	Y	N	N	12 *	N	N	N
Kings Sutton	23	Y	Vinci Parking Ltd	Partial	N	N	10	N	N	N
Landywood	26	N		Y	N	N	0	N	N	N
Langley Green	30	Y	Network West Midlands	Y	N	N	7	N	N	N
Lapworth	20	Y	Chiltern Railways	Partial	N	N	10	N	N	N
Lea Hall	28	Y	Network West Midlands	Y	N	N	7 *	N	N	N
Leamington Spa	177	Y	Vinci Parking Ltd	Y	Y	Y	57	N	N	N
Ledbury	50	Y		Partial	N	N	0	N	N	N
Lichfield City	92	Y	Meteor Parking Ltd	Y	Y	Y	16	N	N	N
Lichfield Trent Valley	95	Y	Meteor Parking Ltd	Partial	N	N	5	N	N	N
Little Kimble	4	Y	Chiltern Railways	Y	N	Y	1	N	N	N
London Marylebone	-	-	-	Y	Y	Y	54	N	N	Y
Longbridge	-	-	-	Y	N	Y	0	N	N	N
Lye	16	Y	Network West Midlands	Y	N	Y	2	N	N	N
Malvern Link	81	Y	Meteor Parking Ltd	Partial	N	N	20	N	N	N
Marston Green	96	Y	Meteor Parking Ltd	Y	N	N	8 *	N	N	N
Monks Risborough	-	-	-	Y	N	Y	0	N	N	N
Moor Park (Tube)	-	-	-	Partial	N	Y	0	N	N	Y
Northampton	813	Y	Meteor Parking Ltd	Y	Y	Y	40	N	N	N
Northolt Park	-	-	-	Y	N	Y	6	N	N	N
Northfield	205	Y	Network West Midlands	Partial	N	N	8 *	N	N	N
Nuneaton	175	Y	Meteor Parking Ltd	Y	Y	Y	15	N	N	N
Oakengates	-	-	-	Y	N	N	0	N	N	N
Old Hill	51	Y	Network West Midlands	N	N	N	6	N	N	N
Olton	98	Y	Network West Midlands	Y	N	Y	6 *	N	N	N
Penkridge	15	N	Network West Midlands	Y	N	N	0	N	N	N
Perry Barr	-	-	-	Partial	N	N	0	N	N	N
Princes Risborough	280	Y	Vinci Parking Ltd	Partial	Y	Y	36	N	N	N
Redditch	156	Y	Meteor Parking Ltd	Y	Y	Y	8	N	N	N
Rickmansworth	294	Y	Waitrose	Partial	Y	Y	Y	N	Y	Y
Rowley Regis	380	Y	Network West Midlands	Y	N	Y	14	N	N	N
Rugby	739	Y	Virgin Trains	Y	Y	Y	30	N	N	N
Rugeley Town	110	N	Local Authority	Partial	Y	Y	0	N	N	N
Rugeley Trent Valley	24	N	Meteor Parking Ltd	Partial	N	N	0	N	N	N

Appendices

Station	No of car park spaces	Disabled car park spaces	Car park operator	Disabled access to platforms	Transport Interchange					
					Taxi	Bus	Cycle (storage numbers where known)	Metro	Airport	London Underground
Sandwell and Dudley	369	Y	Network West Midlands	Y	Y	N	4 *	N	N	N
Saunderton	35	Y	Chiltern Railways	Partial	N	Y	2	N	N	N
Seer Green	117	Y	Vinci Parking Ltd	Y	N	Y	24	N	N	N
Selly Oak	376	Y	Network West Midlands	Y	N	N	16	N	N	N
Shenstone	20	N	London Midland	Partial	N	N	0	N	N	N
Shifnal	80	N	London Midland	Partial	N	N	0	N	N	N
Shirley	80	Y	Network West Midlands	Partial	N	Y	19	N	N	N
Shrewsbury	156	Y	NCP Ltd	Y	Y	Y	56 + 34	N	N	N
Small Heath	-	-	-	Partial	N	N	4	N	N	N
Smethwick Galton Bridge	77	Y	Network West Midlands	Y	N	N	3 *	N	N	N
Smethwick Rolfe Street	-	-	-	N	N	N	Y	N	N	N
Solihull	290	Y	Network West Midlands	Y	N	N	16	N	N	N
South Ruislip	37	Y	NCP Ltd	N	Y	Y	2	N	N	Y
Spring Road	-	-	-	Partial	Y	Y	Y *	N	N	N
Stafford	350	Y	Virgin Trains	Y	Y	N	20	N	N	N
Stechford	-	-	-	N	N	Y	2	N	N	N
Stoke Mandeville	270	Y	Vinci Parking Ltd	Y	Y	Y	35	N	N	N
Stourbridge Junction	797	Y	Network West Midlands	Y	N	N	17 *	N	N	N
Stourbridge Town	353	Y	Local Authority	Y	Y	Y	5	N	N	N
Stratford Upon Avon	320 ⁺	Y	Meteor Parking Ltd	Partial	Y	N	10	N	N	N
Sudbury Hill Harrow	-	-	-	N	N	Y	2	N	N	Y
Sudbury Harrow Road	-	-	-	N	N	Y	0	N	N	N
Sutton Coldfield	320	Y	Network West Midlands	Y	N	N	10 *	N	N	N
Tackley	-	-	-	Partial	N	N	16	N	N	N
Tame Bridge Parkway	237	Y	Network West Midlands	Y	N	Y	11 *	N	N	N
Tamworth	290	Y	Meteor Parking Ltd	Y	Y	N	10	N	N	N
Telford Central	182	Y	Meteor Parking Ltd	Y	Y	Y	Y	N	N	N
The Hawthorns	184	Y	Network West Midlands	Y	N	N	13	N	N	N
The Lakes	-	-	-	Y	N	N	0	N	N	N
Tile Hill	129	Y	Network West Midlands	Y	N	Y	18	N	N	N
Tipton	55	Y	Network West Midlands	Y		N	2	N	N	N
Tyseley	-	-	-	Partial	Y	N	0	N	N	N
University	-	-	-	Y	N	N	0 *	N	N	N
Walsall	-	-	-	Partial	N	Y	6 *	N	N	N
Warwick	50	Y	Vinci Parking Ltd	Partial	Y	Y	6	N	N	N

Station	No of car park spaces	Disabled car park spaces	Car park operator	Disabled access to platforms	Transport Interchange					
					Taxi	Bus	Cycle (storage numbers where known)	Metro	Airport	London Underground
Warwick Parkway	589	Y	Chiltern Railways	Y	Y	Y	12	N	N	N
Water Orton	40	Y	Local Authority	N	N	N	0	N	N	N
Wellington	109	Y	London Midland	Y	Y	Y	0	N	N	N
Wembley Stadium	-	-	-	Y	N	Y	4	N	N	N
Wendover	183	Y	Vinci Parking Ltd	Y	Y	Y	15	N	N	N
West Ruislip	136	Y	Chiltern Railways	Partial	N	Y	4	N	N	Y
Whitlocks End	111	Y	Network West Midlands	Y	N	N	2 *	N	N	N
Widney Manor	273	Y	Network West Midlands	Y	N	N	24 *	N	N	N
Wilmcote	-	-	-	Partial	N	N	Y	N	N	N
Wilnecote	-	-	-	Partial	N	Y	0	N	N	N
Witton	-	-	-	Partial	N	N	0	N	N	N
Wolverhampton	477	Y	Virgin Trains	Y	Y	Y	32	Y	N	N
Wood End	-	-	-	N	N	N	0	N	N	N
Wooten Wawen	-	-	-	Y	N	N	0	N	N	N
Worcester Foregate Street	-	-	-	Y	Y	Y	15	N	N	N
Worcester Shrub Hill	121	Y	Meteor Parking Ltd	Partial	Y	Y	26	N	N	N
Wylde Green	51	Y	Network West Midlands	Y	N	N	0 *	N	N	N
Wythall	-	-	-	Y	N	N	0 *	N	N	N
Yardley Wood	100	Y	Network West Midlands	Y	N	N	17	N	N	N

* Part of the Centro cycle storage improvement programme
09/10 and 11/12


† Will reduce to 140 after the cattle market development

Glossary

<i>Term</i>	<i>Meaning</i>
ACORP	Association of Community Rail Partnerships.
Approach Control	A method of controlling train speed when approaching junctions.
ATOC	Association of Train Operating Companies.
BCR	Benefit Cost Ratio.
BHX	Three-letter airport code for Birmingham International Airport.
Capacity (of rolling stock)	Capacity is deemed to be the number of standard class seats and standing spaces available on a train.
Capacity (of infrastructure)	The capacity of a given piece of railway infrastructure is an assessment of the maximum number or mix of trains which could operate over it. This is quantified through a Capacity Utilisation Index.
Capacity (of stations)	The pedestrian capacity of a station is an assessment of the maximum number of passengers it can acceptably handle, given the station layout at the site concerned.
CaSL	Cancellations and Significant Lateness.
Centro	West Midlands' Integrated Transport Authority.
Community Rail Partnership	Organisation whose members may include local authorities, community groups, rail user groups, train operating companies and sometimes Network Rail. They are funded by the partners who will then typically seek additional funding to support their activities which aim to involve the local community more closely in the development of a local or rural railway line.
Connectivity	The ability to travel between two stations or conurbations within an acceptable journey time or frequency options compared to other modes of transport.
Control Period 4 (CP4)	The five-year period between 2009 and 2014.
Control Period 5 (CP5)	The five-year period between 2014 and 2019.
Control Period 6 (CP6)	The five-year period between 2019 and 2024.
CUI	Capacity Utilisation Index – Indicative measure of how much capacity is being utilised on a section of railway based on the current timetable.
DaSTS	Delivering a Sustainable Transport System – a coordinated national approach to providing sustainable solutions to identified transport issues, as defined by the DfT.
DfT	Department for Transport.
DMU	Diesel Multiple Unit.
EEA	Efficient Engineering Access.
EMU	Electric Multiple Unit.
FOC	Freight Operating Company.
Gap	Where the network does not meet the specification or demand required of it, now or in the future.
GRIP	Guide to Railway Investment Projects – Network Rail's process for project management of schemes through development and implementation.
Headway	The minimum time interval possible between trains on a particular section of track.
HLOS	The DfT's High Level Output Specification, which specifies the outputs which Network Rail and the rail industry need to deliver within a Control Period.
Intermodal trains	Freight trains which convey traffic that could also be conveyed by road or sea (eg. containerised traffic).

Term	Meaning
Integrated Transport Authority	Authority responsible for an integrated transport strategy (formerly the Passenger Transport Executive).
JPIP	Joint Industry Performance Improvement Plan.
LDHS	Long Distance High Speed.
LEP	Local Enterprise Partnership.
LENNON	An industry database recording ticket sales.
Load factor compared to seats	The amount of seats occupied on a train service expressed as a percentage of seats.
Load factor compared to train capacity	Train capacity includes both standard class seats and standing allowance. Standing allowance is usually estimated at 0.45 square metre per passenger, in accordance to Department for Transport High Level Output Specification for Control Period 4. For a typical commuter rolling stock, its standing allowance is 40 % of standard class seats although this can vary significantly by rolling stock type. The standing allowance of typical interurban and long distance rolling stock is around 20 %.
Loading gauge	Loading gauge is the profile for a particular route within which all vehicles or loads must remain to ensure that sufficient clearance is available at all structures.
LDG	Local Delivery Group.
LUL	London Underground Limited.
MOIRA	Industry standard demand forecasting model.
NEC	National Exhibition Centre.
NPV	Net present value.
NRDF	Network Rail Discretionary Fund.
NSIP	National Stations Improvement Programme.
Optimism bias	A proportional uplift to scheme cost estimates to allow for historical systematic optimism on the part of UK scheme promoters.
Option	The options as identified in this document are aimed at addressing the identified gaps.
ORR	Office of Rail Regulation.
PDFH	Passenger Demand Forecasting Handbook – An industry document that summarises the effects of service quality, fares and external factors on rail demand.
Perturbation	Describes disruption to the planned train service pattern.
Possession	Where part of the infrastructure is closed to services to carry out maintenance, renewals or enhancement works.
PPM	Public Performance Measure.
PSR	Permanent Speed Restriction.
Red Zone working	Red Zone working is the terminology that is used to describe the working environment when undertaking work activity on the railway while the rail network is open and operative.
RES	Regional Economic Strategy.
RFG	Rail Freight Group.
RIFF	Rail Industry Forecasting Framework.
Route Availability (RA)	The system which determines which types of locomotive and rolling stock can travel over any particular route. The main criteria for establishing RA usually concerns the strength of underline bridges in relation to axle loads and speed, 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.
RPA	Regional Planning Assessment.
RSS	Regional Spatial Strategy.
RUS	Route Utilisation Strategy.
S&C	Switches and crossings.

Term	Meaning
SDO	Selective Door Opening – a means of ensuring that only certain doors open when a train is stopped at a station, leaving closed any doors which overhand short platforms. Not all rolling stock is fitted with this facility; those types which are so fitted vary in the permutations of doors which can be kept closed in this way.
Services in excess of capacity	When passenger loads exceed train capacity or when there are passengers standing for more than 20 minutes.
Seven day railway	Network Rail initiative implementing techniques which will minimise the impact on passengers and freight of engineering work for maintenance, renewal and enhancements.
SFN	Strategic Freight Network.
SFO	Station Facility Owner.
SMG	Stakeholder Management Group.
TEE	Transport Economic Efficiency table.
TfL	Transport for London.
TOC	Train Operating Company.
TPH	Trains Per Hour.
Train path	A slot in a timetable for running an individual train.
WCML	West Coast Main Line.
WSG	Wider Stakeholder Group.
WSMR	Wrexham, Shropshire and Marylebone Railway.



Network Rail
Kings Place
90 York Way
London N1 9AG

Tel: 020 3356 9595

www.networkrail.co.uk